PROCEEDINGS

AND

TRANSACTIONS

OF THE

LIVERPOOL BIOLOGICAL SOCIETY.

VOL. XVI.

SESSION 1901-1902.

LIVERPOOL:
C. TINLING & Co., PRINTERS, 53, VICTORIA STREET.

1902.

ON SOME RED SEA AND INDIAN OCEAN COPEPODA.

By Andrew Scott.

(With Plates I-III.)

[Read April 11th, 1902.]

Two collections of sub-tropical Copepoda made by (1) Mr. H. C. Robinson and (2) Dr. H. Lyster Jameson, were given to me for investigation during the past year (1901). These collections, on examination, were found to contain a number of interesting species of Copepoda, including some forms apparently new to Science, and now described and figured.

(1) Mr. Robinson's Collection.

The first and most extensive collection was forwarded to me by Professor Herdman, F.R.S., my esteemed chief, to whom I am much indebted for the opportunity of examining what proved to be a profitable series of tow-nettings. This collection was taken between Suez and Colombo, by Mr. H. C. Robinson, in the latter part of March, 1901, during his voyage out to Siam. It was commenced on March 21st, soon after the ship left Suez, and completed on March 31st, shortly before Colombo was reached. The collection represents roughly a continuous section of the Copepoda, &c., living near the surface of the sea between these two ports at that particular time of the year. This collection was made by attaching a fine tow-net to a tap in one of the bathrooms which was supplied

with sea water continuously pumped up from the sea by the ship's pump. The water was allowed to strain through the net day and night continuously throughout the period, except on one or two occasions. The contents of the net were taken out in the morning and evening of each day, and preserved in separate bottles. Mr. Robinson's collection was contained in twenty bottles, and represented ten day and nine night gatherings. None of the gatherings contained more than one c.c. of solid matter, whilst the majority contained about half a c.c. only. Although the gatherings were small in bulk, many of them were very rich in number of species. As a rule there was a considerable difference in the number of species of Copepoda found in the gatherings taken during the day and those taken during the night. The greatest number of species found in any day gathering was thirty-three and the lowest ten. On the other hand six out of the nine night gatherings contained over thirty-three species; the greatest number found in a night gathering was forty-two, and the lowest twenty-one. The average number of species for the ten days gatherings was slightly over nineteen and a half, and for the nine gatherings collected during the night slightly over thirty-two and a half.

Day	1	3	5	7	10	12	14	15	17	19	
	33	17	19	31	10	17	16	12	17	24	species.
Night	2	4	6	8	9	11	13	16	18		
	21	38	36	36	37	22	25	36	42		species.

In addition to well-known oceanic Copepoda contained in the gatherings, the following new species were observed:—*Candacia bradyi, Calanopia minor, Stenhelia irrasa, Stenhelia erythræa, Delavalia inopinata, Delavalia minuta, Laophonte inornata, Laophonte herdmani, Dactylopus robinsonii, Lichomolgus minor.* The total number of species of Copepoda

observed in the Robinson collection was 86, belonging to eight families, as under:—

Calanidæ	15	species.
Centropagidæ	10	,,
Candaciidæ	5	,,
Pontellidæ	8	,,
Cyclopidæ	3	,,
Harpacticidæ	22	,,
Corycaeidæ	22	,,
Lichomolgidæ	1	,,

The following list gives the period of time and date when each gathering was made. The numbers 1 to 19 represent the different bottles, and will be used in referring to the distribution of the species.

1. 9-15 a.m. to 3-15 p.m., and 3-15 p.m. to 5-45 p.m., 23.3.01. Commenced 13° S. of Suez. Position of ship at noon 29°09′ N., 32°46′ E. Sky clear, sea smooth. (Two bottles).
*2. 7-15 p.m., 21.3.01 to 6 a.m., 22.3.01. Shadwan light at end of Gulf of Suez passed about 9 p.m., dead calm.
3. 9-0 a.m. to 6-0 p.m., 22.3.01. Position of ship at noon 24°36′ N., 36°08′ E. Dead calm.
*4. 7-15 p.m., 22.3.01 to 6-20 a.m., 23.3.01. Slight N.N.E. breeze, sea smooth.
5. 9-0 a.m. to 5-45 p.m., 23.3.01. Position of ship at noon 19°58′ N., 39°08′ E. S.E. breeze, slight swell.
*6. 7-15 p.m., 23.3.01 to 6-10 a.m., 24.3.01. Strong S.E. breeze, sea moderate to rough.
7. 9-0 a.m. to 5-50 p.m., 24.3.01. Position of ship at noon 15°19′ N., 41°55′ E. Strong S. breeze, heavy swell.
*8. 7-30 p.m., 24.3.01 to 6-15 a.m., 25.3.01. South breeze, moderate swell. (40′ W. of Aden.)
*9. 7-15 p.m., 25.3.01 to 6-25 a.m., 26.3.01. Wind East, slight swell. (40′ E. of Aden.)
10. 9-15 a.m. to 6-0 p.m., 26.3.01. Position of ship at noon 12°24′ N., 49°24′ E. Wind East, sea calm.
*11. 6-0 p.m., 26.3.01 to 6-10 a.m., 27.3.01. Wind East, slight swell.
12. 9-0 a.m. to 6-0 p.m., 27.3.01. Position of ship at noon 11°33′ N., 54°53′ E. Wind East, nearly calm.

*13. 7-15 p.m., 27.3.01 to 6-10 a.m., 28.3.01. Wind East, sea calm.
14. 9-15 a.m. to 6-0 p.m., 28.3.01. Position of ship at noon 10°35′N., 60°22′E. Wind E.N.E., sea calm.
15. 9-0 a.m. to 6-0 p.m. 29.3.01. Position of ship at noon 9°36′N., 65°56′E. Wind E.N.E., sea calm.
*16. 7-15 p.m., 29.3.01 to 6.30 a.m., 30.3.01. Wind E.N.E., sea calm.
17. 9-15 a.m. to 6-20 p.m., 30.3.01. Position of ship at noon 8°37′N., 71°27′E. Wind E., sea calm.
*18. 7-30 p.m., 30.3.01 to 6-50 a.m., 31.3.01. Wind E., slight swell.
19. 9-0 a.m. to 6-0 p.m., 31.3.01. Position of ship at noon 7°21′N., 76°53′E. Wind E., slight swell.

* For the sake of simplicity, the night gatherings are marked with an asterisk.

Notes on the Copepoda.

Calanus pauper, Giesbrecht.

Occurrence, Nos. 1, 2, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19.

This species has already been recorded from the Red Sea, &c., by Mr. Thompson, (Trans. L'pool Biol. Soc., Vol. XIV., p. 275), and from the Pacific Ocean by Dr. Giesbrecht.

Calanus vulgaris (Dana).

Occurrence, Nos. 4, 6, 7, 8, 9, 13, 14, 16, 17, 18.

A widely distributed and sometimes very common species in tropical and sub-tropical collections of Copepoda.

Calanus darwini (Lubbock).

Occurrence, Nos. 14, 18.

There is no difficulty in recognising the adult female of this species, which has the last thoracic segment considerably prolonged on the left side, but immature females present some difficulty owing to the last thoracic segments ending in a minute tooth, as in *Calanus propinquus*. There is, however, a considerable difference in size between the two species. *Calanus carolli*, Giesbrecht, of which only

the male is known, has the fifth pair of feet very like those of the male *Calanus darwini*, and may easily be passed over as only a form of the latter.

Eucalanus subtenius, Giesbrecht.

Occurrence, Nos. 6, 7, 18.

This species is closely allied to *Eucalanus attenuatus*, but is distinguished by the form of the forehead and its smaller size. It has hitherto only been found in the Atlantic and Pacific Oceans. Prof. Cleve records it from the Malay Archipelago.

Eucalanus crassus, Giesbrecht.

Occurrence, No. 8. A night gathering.

The female of this species is easily recognised by its robust form and by the appearance of the thoracic segments, which are clothed with fine hairs. The species is widely distributed, and has been recorded from the Faröe Channel by my father, Mr. T. Scott (XV. Ann. Rept., Fishery Board for Scotland, Part III. (1897), p. 312), and from the Moray Firth (XVIII. A.R., F.B.S., pt. III. (1900), p. 382). Dr. R. N. Wolfenden also records it from the Faröe Channel, (Jour. Marine Biol. Asso., N.S., Vol. VI., No. 3, January, 1902). Dr. Giesbrecht records it from the Atlantic and Pacific Oceans and from the Mediterranean. It has also been recorded from the Malay Archipelago.

Rhincalanus nasutus, Giesbrecht.

Occurrence, Nos. 8, 11. Night gatherings.

There seems to be some doubt whether this Copepod should be regarded as a distinct species, or only a small form of *Rhincalanus gigas*, Brady. The fifth pair of feet of the female are very like those of *R. gigas*. Dr. Giesbrecht's species measures 3·9 mm. to 5·1 mm. (female), while Dr. Brady gives 8·5 to 10 mm. as the size of *R. gigas*. *R. nasutus* appears to have a wide distribu-

tion, and has been recorded from the Faröe Channel, Atlantic and Pacific Oceans, and from the Mediterranean.

Rhincalanus cornutus (Dana).

Occurrence, No. 6. A night gathering.

This species is easily recognised by its projecting forehead, and is usually not nearly so rare in tropical plankton as *R. nasutus*. Its distribution is also more extensive.

Paracalanus aculeatus, Giesbrecht.

Occurrence, Nos. 2, 4. Night gatherings.

This *Paracalanus* is not unlike the next species, but is easily distinguished from it by the structure of the female fifth pair of feet. It has already been recorded from the Indian, Atlantic and Pacific Oceans, and also from the Mediterranean.

Paracalanus parvus (Claus).

Occurrence, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 16, 17.

This species has practically a world-wide distribution.

Acrocalanus gibber, Giesbrecht.

Occurrence, Nos. 4, 5, 6, 7, 8, 9, 12, 15, 16, 19.

This species resembles *Paracalanus* in size, but is distinguished from that genus by the fifth pair of feet in the female being very rudimentary or wanting altogether. It is widely distributed in tropical and sub-tropical regions.

Calocalanus pavo (Dana).

Occurrence, Nos. 2, 3, 4, 6, 7, 12, 13, 16, 18.

Perfect specimens of this species, which is so well illustrated by Dr. Giesbrecht, are very rarely obtained in collections taken by the ship's pump, the beautiful caudal setæ, as a rule, are broken off, and also the long setæ on the antennules. The species is easily identified, however, when the caudal furca alone are present; they project at

right angles to the abdomen. It has a wide distribution in the warmer waters of the sea.

Calocalanus plumosus (Claus).

Occurrence, Nos. 4, 5, 6, 7, 8, 9, 16, 18.

This species is distinguished from *C. pavo* by its more slender form and three-jointed abdomen. In *C. pavo* the abdomen is two-jointed. The fifth pair of feet of the female are also different from *C. pavo*. Its distribution is somewhat similar to the above, but it does not appear to have been previously recorded from the Red Sea and Indian Ocean.

Clausocalanus furcatus (Brady).

Occurrence, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 11, 13, 14, 15, 16, 17, 18, 19.

Closely allied to *Clausocalanus arcuicornis* (Dana), but easily distinguished from that species by the genital or first abdominal segment being shorter than each of the two following segments, and by the caudal furca being nearly twice as long as broad. It will probably be found to have a wide distribution.

Euchaeta marina (Prestandrae).

Occurrence, Nos. 6, 8, 9, 13, 14, 15, 17, 18.

This is one of the most widely distributed and usually most abundant members of the genus.

Scolecithrix danæ (Lubbock).

Occurrence, Nos. 9, 11, 16, 18.

This appears to be a widely distributed species, but does not appear to have been recorded from the upper regions of the Indian Ocean. No. 9 gathering was taken about 40′ E. of Aden. All the four gatherings were taken during the night.

Centropages furcatus (Dana).

Occurrence, Nos. 2, 3, 6, 8, 9, 16, 18, 19.

Centropages orsinii, Giesbrecht.
Occurrence, Nos. 4, 5, 8, 9, 11, 12.

This species has only been recorded from the Red Sea, and the present collection extends its distribution into the Gulf of Aden.

Centropages calaninus (Dana).
Occurrence, Nos. 1, 2, 3.

This species resembles *C. violaceus* in appearance, but the male is easily recognised by its fifth pair of feet. It has only previously been recorded from the Pacific Ocean.

Centropages elongatus, Giesbrecht. Plate I., figs. 13 and 14.
Occurrence, Nos. 4, 5, 12, 14, 18, 19.

This *Centropages* also resembles *C. violaceus* in appearance, but the fifth pair of feet in the male are quite distinct from *C. violaceus* or *C. orsinii*. Dr. Giesbrecht found this species in plankton collected by the aid of the ship's pump by Dr. A. Kramer, when passing through the Red Sea at the end of July, 1895. The gatherings in which *C. elongatus* were found by Giesbrecht were taken between 15° N. and 27° N. well inside the Red Sea. The Robinson collection extends the distribution into the Indian Ocean to near Colombo. The figures show a dorsal view of the male, which measured 2·2 mm., and the male fifth feet.

Pseudodiaptomus serricaudatus (T. Scott). Plate I., fig. 6.
Occurrence, Nos. 8, 9. Both night gatherings, near Aden.

This species was first discovered by Mr. T. Scott in a collection of Copepoda, &c., from the Gulf of Guinea, West Coast of Africa. It has since been recorded from India.

Temora stylifera (Dana).
Occurrence, Nos. 6, 7, 8, 9, 10, 12, 13, 14, 16, 18, 19.

Temora discaudata, Giesbrecht.
Occurrence, Nos. 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 13, 16, 18.

These two species were widely distributed throughout the Robinson collection.

Pleuromamma abdominalis (Lubbock).
Occurrence, Nos. 2, 3, 4, 6, 7, 8, 9, 16, 18.

This appears to be a widely distributed species, and is recorded from the Faröe Channel and the Shetland waters by Dr. Wolfenden. It is also recorded from the Mediterranean, Red Sea, Atlantic, Pacific and Indian Oceans, and from the Malay Archipelago.

Pleuromamma gracilis (Claus).
Occurrence, Nos. 9, 13, 18. All night gatherings.

The distribution of this species is somewhat similar to the last, but it has not been found so far north as the Faröe Channel.

Lucicutia flavicornis (Claus).
Occurrence, Nos. 2, 4, 6, 7, 9, 18.

Candacia æthiopica Dana.
Occurrence, Nos. 9, 13, 14, 15, 16, 17, 18, 19.

This distinct species was observed in all the gatherings taken after leaving the Gulf of Aden. It has already been recorded from the Indian Ocean and Bay of Bengal by Mr. Thompson.

Candacia catula, Giesbrecht.
Occurrence, Nos. 6, 16, 18, 19.

Giesbrecht records this species from the Pacific Ocean and Red Sea. Professor Cleve (Kongl. Svenska Veten. Akad. Handl. Band. 35, No. 5, p. 5), records it from the Malay Archipelago, which appears to be all the distribution yet known.

Candacia bispinosa, Claus.

Occurrence, No. 11. A night gathering.

This species has been recorded from the Mediterranean and Pacific Ocean only.

Candacia truncata, Dana.

Occurrence, Nos. 4, 9, 12, 16, 18.

The distribution of this species is similar to that of *Candacia æthiopica* referred to above.

Candacia bradyi, n. sp. Plate I., figs. 9-12.

1883. *Candace pectinata*, part, Brady Rept. voy. "Challenger" Copepoda, vol. 8, p. 67, pl. xxx., fig. 9 only.

Occurrence, Nos. 8, 9. Both night gatherings, near Aden.

Only the male of this species has been observed. Length 2 mm. In general appearance it resembles the male of *C. varicans*, Giesbrecht, but the terminal spines of the last thoracic segment are much smaller and the abdomen is slightly asymmetrical. The chief difference between *Candacia bradyi* and the other described species is in the structure of the fifth pair of feet. The drawing, fig. 11, represents this pair, which is practically the same as the fig. (9) given by Professor Brady on Plate XXX. of his Report on the "Challenger" Copepoda, but is quite different from the fifth feet of the male of *Candacia pectinata*, occasionally taken in British waters. I have compared with specimens of *C. pectinata* from the Clyde collected by my father.

Calanopia elliptica (Dana).

Occurrence, Nos. 1, 2, 4, 6, 7, 8, 11.

This species is widely distributed throughout the Robinson collection, and has already been recorded from the same region by Mr. Thompson.

Calanopia minor, n. sp. Plate I., figs. 1-5.

Occurrence, Nos. 4, 6, 7, 8, 11, 13, 16, 18.

Length of female, 1·15 mm. Length of male, 1·16 mm. This species resembles *C. elliptica*, but can be easily identified by its smaller size and more slender abdomen. The side view of the female abdomen shows it to be very little wider than the caudal furca. The species is mainly distinguished from *C. elliptica*, however, by the structure of the fifth pair of feet. The fifth pair in the female is one-branched, and each foot is composed of three joints of nearly equal length. The right and left feet are quite symmetrical. The second joint has one short seta on the middle of the outer margin. The third, or terminal joint, has one seta on the outer margin about two-thirds from the base and two on the apex, the inner one being rather longer than the joint. The inner seta on the right foot is rather longer than the same seta on the left foot. The fifth pair in the male is also one-branched, and each foot is composed of four joints. The basal joint of the left foot is very small, and only about two-fifths the length of the second joint. Second and third joints of nearly equal length. The second joint has a projection on the inner margin near the base. Fourth joint small and only about half the length of the third joint. The right foot is modified for grasping. See fig. 5.

Calanopia americana, Dahl, (Ber. Ges. Freiburg N.S., Vol. 8, p. 21, t. 1, figs. 23-26), and *Calanopia aurivillii*, Cleve, (Kongl. Vet. Akad. Handl. Bd. 35, No. 5, p. 32, pls. 2 and 3), are very like *Calanopia minor* in general appearance, but the structure of the fifth pair of feet, both in the male and female, are different.

Labidocera acuta (Dana).

Occurrence, No. 8. A night gathering, 40′ west of Aden.

Labidocera minuta, Giesbrecht.

Occurrence, Nos. 7, 10, 16.

The only localities recorded for this species are Pacific Ocean—Hong-Kong—and Red Sea (Giesbrecht), and from the Arabian Sea by Professor Cleve.

Pontella fera, Dana.

Occurrence No. 6. A night gathering, near the end of the Red Sea.

This species has been recorded from the Pacific and Indian Oceans only: the Red Sea is therefore a new locality for it.

Pontellina plumata (Dana).

Occurrence, Nos. 2, 9, 12, 16, 18.

Pontellina plumata has a wide distribution, and has been recorded from the Mediterranean, Atlantic, Pacific, and Indian Oceans, but not from the Red Sea.

Acartia negligens, Dana.

Occurrence, Nos. 1, 2, 3, 4, 5, 6, 8, 9, 13, 14, 16, 18, 20.

This is a widely distributed species, and has been recorded from the Mediterranean, Red Sea, and Pacific Ocean. The Robinson collection extends its distribution into the Indian Ocean. Cleve has recently recorded it from the Arabian Sea and Malay Archipelago.

Acartia erythræa, Giesbrecht.

Occurrence, Nos. 1, 5, 6, 8. No. 1, Gulf of Suez; 5, 6, 8, Red Sea.

Until recently the Red Sea was the only region where it was known to live. Mr. Thompson (Trans. L'pool Biol. Soc., Vol. XIV., p. 284), records it from the Indian Ocean, and Prof. Cleve, *op. cit.*, records it from the Malay Archipelago.

Oithona plumifera, Baird.

Occurrence, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 13, 14, 16, 18, 19.

Oithona plumifera has not previously been recorded from the Red Sea. Mr. Thompson records it from the Indian Ocean, and Professor Cleve from the Arabian Sea and Malay Archipelago.

Oithona similis, Claus.

Occurrence, Nos. 1, 2, 5, 6, 7, 8, 9, 10, 15, 16, 17, 18, 19.

This *Oithona* has already been recorded from the Red Sea and Indian Ocean by Mr. Thompson. Professor Cleve records it from the Arabian Sea, and doubtfully from the Malay Archipelago.

Oithona minuta, T. Scott.

Occurrence, Nos. 4, 7, 8, 12, 16, 19.

This very small but quite distinct species occurred sparingly in the gatherings referred to. It does not appear to have been recorded from any other region excepting the Gulf of Guinea, where it was first found.

Longipedia coronata, Claus.

Occurrence No. 1. Near Suez.

Not previously recorded from this region.

Ectinosoma atlanticum (Brady & Robertson).

Occurrence, Nos. 1, 4, 8, 11, 16, 17, 19.

This species has a wide distribution, and ranges from the Faröe Channel to the warm seas.

Enterpe acutifrons (Dana).

Occurrence, Nos. 1, 2, 3, 4, 6, 7, 8, 9, 10, 11, 13.

This species has also a wide distribution.

Setella gracilis, Dana.

Occurrence, Nos. 1, 2, 4, 5, 6, 7, 8, 9, 11, 12, 13, 15, 16, 17, 18, 19.

Miracia efferata, Dana.

Occurrence No. 13. A night gathering.

Clytemnestra scutellata, Dana.

Occurrence, Nos. 4, 6, 7, 8, 9, 11, 12, 13, 15, 17, 18, 19.

Ectinosoma atlanticum, *Enterpe acutifrons*, *Setella gracilis*, *Miracia efferata*, and *Clytemnestra scutellata*, have already been recorded by Mr. Thompson from the greater part of the region traversed by the Robinson collection.

Stenhelia irrasa, n. sp. Plate III., figs. 6-10.

Occurrence, Nos. 4, 5.

Description of the Female—Length ·76 mm. Body elongate, slender; rostrum small and slightly curved. The abdomen is ornamented with a few rows of minute spines on the dorsal and lateral surfaces near the posterior end of the joints. The antennules are short and five-jointed; the fourth joint is smaller than any of the others, and the fifth joint in some positions has an indication of a dividing line near the middle. The formula shows the proportional lengths of the joints.

Proportional lengths of the joints	6	2	3	1	3
Number of the Joints	1	2	3	4	5

Antennæ, mandibles, maxillæ, and foot jaws somewhat similar to those of *Stenhelia ima*, Brady. First four pairs of swimming feet also resembling those of *S. ima*. The fifth pair of feet are small and foliaceous. The inner branches are sub-triangular, and furnished with three plumose setæ on the inner distal margin and two on the apex. The outer branches are pyriform in shape, and furnished with two plumose setæ on the outer, and two on the inner distal margins, and one on the apex (fig. 9). Caudal furca very short.

Remarks.—This species, though somewhat like *Stenhelia ima*, is readily distinguished from it, and any of the other members of the genus, by the structure and proportional lengths of the joints of the antennules, and by the form of the fifth pair of feet.

Stenhelia erythræa, n. sp. Plate III., figs. 11-14.

Occurrence, Nos. 4, 5.

Description of the Female—Length ·79 mm. Body elongate, slender; rostrum prominent and curved. Abdomen without any ornamentation. The antennules are moderately long and slender, eight-jointed; the fifth and sixth joints are shorter than any of the others. The formula shows the proportional lengths of the joints.

Proportional lengths of the joints	12	12	8	8	3	2	4	7
Number of the joints	1	2	3	4	5	6	7	8

The antennæ, mandibles, maxillæ, and foot jaws are similar to those of *S. irrasa*. The first four pairs of swimming feet are somewhat like those of *S. ima*. The fifth pair of feet are larger than those of *S. irrasa*, and more elongated. The inner branches are furnished with four plumose setæ on the inner distal margin and two on the apex. The outer branches have four plumose setæ on the outer distal margin, one on the apex, and one on the inner margin near the apex (fig. 14). Caudal furca very short.

Remarks.—This species is distinguished from *S. irrasa* by the structure of the antennules, and by the form of the fifth pair of feet.

Delavalia inopinata, n. sp. Plate III., figs. 19-22.

Occurrence, Nos. 1, 4, 12, 19.

Description of the Female—Length ·63 mm. In general appearance somewhat similar to *D. palustris*, Brady. The antennules are eight-jointed, and resemble those of *D. æmula*, T. Scott. The formula shows their proportional lengths.

Proportional lengths of the joints	6	5	5	4	3	4	3	4
Number of the joints	1	2	3	4	5	6	7	8

The antennæ, mandibles, maxillæ, and foot jaws are

similar to those of *D. palustris*. The first pair of swimming feet have the inner branches composed of two joints, as in *D. palustris*, but the first joint is proportionally shorter and the second joint longer and narrower than in that species. The second joint is furnished with two setæ on the inner margin and two at the apex: the outer branches are armed like those of *D. palustris*. The second, third, and fourth pairs of swimming feet resemble those of *D. palustris*. The fifth pair of feet have the basal joints only slightly produced. The apex of the joints is irregularly angular, and furnished with four setæ placed equidistant from each other. The outer branches are subquadrangular in shape, being longer than broad. They are furnished with one setæ on the outer margin near the apex, and four on the apex, the second from the exterior being shorter than the other setæ (fig. 22). Caudal furca slightly longer than the last abdominal segment.

Remarks.—This species at first sight is not unlike *Delavalia palustris*, but on examination is easily distinguished from it by the proportional lengths of the joints of the antennules, the structure of the first feet, and also of the fifth feet.

Delavalia minuta, n. sp. Plate III., figs. 15-18.

Occurrence, Nos. 1, 3, 4, 19.

Description of the Female—Length ·48 mm. Somewhat similar in shape to the last species, but smaller and with rather longer caudal furca. The antennules are eight-jointed, and resemble those of *D. robusta*, Brady. The formula shows the proportional lengths of the joints.

Proportional lengths of the joints -	5	8	5	4	4	4	3	5
Number of the joints - - - -	1	2	3	4	5	6	7	8

The first pair of swimming feet have the inner branches two-jointed, like those of *D. inopinata*, but the basal joint is proportionally longer, and the second joint shorter and

wider throughout its length. The second, third and fourth pairs of swimming feet are similar to those of *D. inopinata*. The fifth pair of feet have the basal joint very small and triangular in shape, and furnished with two setæ at the apex. The outer branch is pyriform, and resembles that of *D. robusta*. The inner and outer margins are each furnished with one seta, while the apex has three (fig. 18). Caudal furca equal to the combined lengths of the last two abdominal segments.

Remarks.—This species is easily distinguished from *D. inopinata* by the structure of the fifth pair of feet and the longer caudal furca.

Laophonte pygmæa, T. Scott.

Occurrence, No. 1.

This species does not appear to have been recorded from any other region outside the Gulf of Guinea, where it was first found by Mr. T. Scott.

Laophonte inornata, n. sp. Plate II., figs. 9-14; Plate I., fig. 16.

Occurrence, Nos. 1, 3, 5.

Description of the Female—Length ·66 mm. Body slender, with very angular jointed thorax. Rostrum small and entire, with a minute seta at each side. Antennules slender, seven-jointed. The fourth and fifth joints are very small. The second joint has a minute but distinct tooth on its lower surface. The formula shows the proportional lengths of the joints.

Proportional lengths of the joints -	8	8	8	2	2	3	6
Number of the joints - - -	1	2	3	4	5	6	7

Antennæ, mandibles, maxillæ, and foot jaws, as in *Laophonte similis*, Claus. The inner branches of the first pair of swimming feet are slender, and armed with a moderately long terminal claw. The outer branches are

small and three-jointed, and do not reach to the middle of the first joint of the elongated inner branches (fig. 12). The outer branches of the second, third, and fourth pairs of feet are three-jointed. The inner branches are short and two-jointed, with the first joint very small. The structure of the fifth pair is similar to those of *L. denticornis*, T. Scott, except that the basal joint is not rounded on its inner margin. The basal joint is furnished with three plumose setæ on the inner margin, and two sub-apical setæ. The outer branch is furnished with three small sub-apical setæ on the outer margin, one small sub-apical seta on the inner margin, and one long apical seta. Caudal furca slender, about two-thirds the length of the last abdominal segment.

Remarks.—This species resembles *Laophonte thoracica* in some of its characters, but the structure of the antennules, the fifth pair of feet, and the caudal furca easily distinguish it.

Laophonte herdmani, n. sp. Plate II., figs. 3-8; Plate I., fig. 15.

Occurrence, Nos. 1, 3, 5.

Description of the Female—Length ·66 mm. Body slender, with straight jointed thorax; rostrum small and cleft, with a minute seta at each side. Antennules moderately robust, six-jointed. The fourth and fifth joints are very small. The second joint has a minute tooth on its lower surface. The proportional lengths of the joints are shown by the following formula:—

Proportional lengths of the joints -	11	10	10	2	2	8
Number of the joints - - - -	1	2	3	4	5	6

The antennæ, mandibles, maxillæ and foot jaws are similar to those of *L. inornata*. The inner branches of the first pair of swimming feet are robust, and armed with a strong terminal claw. The outer branches are small and three-jointed, scarcely reaching to the middle of the first joint of the inner branches. The middle joint of the outer branches is considerably longer than either the first or third joints. The outer branches of the second, third, and fourth pairs of feet are three-jointed. The inner branches are short and two-jointed. The fifth pair of feet resemble those of *L. curticauda* in shape, but the basal joint is much larger, and the outer joint is wider at the apex than at the base. The inner margin of the basal joint is furnished with three plumose setæ. There is also one apical seta. The apex of the outer branch is furnished with five setæ of unequal lengths. Caudal furca robust, and longer than the last abdominal segment.

Remarks.—This species is easily distinguished from any of the other described species by the structure of the antennules and fifth pair of feet.

Cletodes limicola, Brady.

Occurrence, Nos. 1, 9, 16.

This quite distinct and easily identified species does not appear to have been recorded from any region outside the British seas.

Dactylopus tisboides, Claus.

Occurrence, No. 1.

Not previously recorded from this region.

Dactylopus strömii (Baird).

Occurrence, No. 1.

Not previously recorded from this region.

Dactylopus robinsonii, n. sp. Plate III., figs. 1-5.

Occurrence, No. 18.

Description of the Female—Length ·62 mm. Body moderately robust; rostrum prominent and curved. Antennules slender and eight-jointed. The fifth, sixth and seventh joints are all of about equal size, and much

smaller than any of the others. The formula shows the proportional lengths.

Proportional lengths of the joints -	6	6	5	6	2	2	2	5
Number of the joints - - -	1	2	3	4	5	6	7	8

Antennæ, mandibles, maxillæ, and foot jaws resembling those of *D. strömii*. Both branches of the first pair of swimming feet robust and three-jointed. The outer branch scarcely reaches to the end of the first joint of the inner branch, the second joint is shorter than the first and the third joint is shorter than the second. The second and third joints of the inner branch are very short and of about equal size. The third joint is furnished at its apex with one short, stout claw and one long flexed seta. There is also a minute seta on the inner apical angle. The second, third and fourth pairs resemble those of *D. strömii*, but are smaller. The fifth pair of feet are somewhat similar to the fifth pair in *Stenhelia longa* already described. The inner margin of the basal joint is furnished between the middle and the apex with three plumose setæ, and there are two sub-apical setæ on the outer margin. The apex is destitute of setæ, so that there is a distinct space between the setæ on the outer and inner margins. The outer branch is furnished with two setæ on the outer, two on the inner margins and one on the apex (fig. 4). Caudal furca very short.

Remarks.—The characters of the antennules and fifth feet easily distinguish this small species from any of the other described members of the genus.

Pseudothalestris major (T. & A. Scott).

1895. *Pseudowestwoodia major*. T. & A. S. Ann. & Mag. Nat. Hist., Ser. 6, vol. xv., p. 56, pl. vi., figs. 17-20.

Occurrence, No. 1.

This small species, which closely resembles *Westwoodia*

nobilis (Baird) in general appearance, has not previously been recorded from any region outside the British seas.

Harpacticus chelifer (Muller).

Occurrence, Nos. 1, 3, 6, 17.

Harpacticus chelifer has been recorded from the Gulf of Guinea and Franz-Joseph Land by Mr. T. Scott, which indicates that the species has a wide distribution.

Altectha hopyroides, Claus.

Occurrence, Nos. 1, 4.

This species is frequently found in surface tow-net gatherings taken in the British seas.

Idya furcata (Baird).

Occurrence, Nos. 1, 13, 17, 18, 19.

From the above records it will be seen that this species had a wide distribution in the Robinson collection.

Ilyopsyllus affinis, T. Scott.

Occurrence, No. 1.

This species appears to be quite distinct from *I. coriaceus*, Brady and Robertson. The caudal setæ in the female are not spatulate. The species does not appear to have been recorded from any other region outside the Gulf of Guinea.

Lichomolgus minor, n. sp. Plate II., figs. 15-24; Plate I., fig. 17.

Occurrence, No. 1.

Description of the Female—Length ·9 mm. In general appearance resembling *Lichomolgus furcillatus*, Thorell. Antennules seven-jointed; the last joint very small. The formula shows their proportional lengths.

Proportional lengths of the joints -	10	18	7	13	13	9	4
Number of the Joints - - -	1	2	3	4	5	6	7

The antennæ are four-jointed, the third joint being much smaller than any of the others. The apex of the fourth

joint is furnished with five setæ. The mandibles are small, dilated at the base, and produced into a long curved stylet-shaped seta ciliated in both margins. Basal part of the anterior foot jaws stout, and produced into a long slender spine, ciliated on its upper margin. There is also a moderately long ciliated spine attached to the outer margin, near the apex of the stout basal part. Posterior foot jaws three-jointed; last joint very short, and furnished with a claw. Both branches of the first, second, and third pairs of swimming feet three-jointed. The outer branches of the fourth pair of feet are also three-jointed, but the inner branches are composed of two joints; basal joints small. The fifth pair of feet are small, and consist of a single joint, furnished with two setæ. The abdomen is composed of four joints, the third joint being smaller than any of the others. Caudal furca nearly as long as the combined lengths of the last three abdominal segments.

Remarks.—This species is a true *Lichomolgus*, the genus being now restricted to species having the inner branches of the fourth pair of feet composed of two joints. Formerly the genus included other two types, which have the inner branches of the fourth pair composed of one and three joints respectively, as follows:—

Pseudanthessius. Inner branches of fourth pair composed of one joint.
Lichomolgus. " " " two joints.
Hermanella. " " " three joints.

Oncea venusta, Phillipi.

Occurrence, Nos. 1, 2, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18.

Oncea conifera, Giesbrecht.

Occurrence, Nos. 6, 11, 13, 16, 18.

Oncea venusta has already been recorded by Mr. Thompson from the Red Sea, but it does not appear to have been previously recorded from the region between

Aden and Colombo. *O. conifera* has not been recorded from the region traversed by the Robinson collection.

Oncea notopus, Giesbrecht.

Occurrence, Nos. 3, 5, 7.

Only previously recorded from the Pacific Ocean.

Oncea media, Giesbrecht.

Occurrence, Nos. 4, 6.

Not previously recorded from the Red Sea. Professor Cleve has recently recorded it from the Arabian Sea, Indian Ocean and Malay Archipelago.

Lubbockia squillimana, Claus.

Occurrence, Nos. 4, 8.

This species has not previously been recorded from the Red Sea region.

Sapphirina nigromaculata, Claus.

Occurrence, Nos. 4, 7, 12.

This *Sapphirina* has already been recorded from the Red Sea.

Sapphirina auronitens, Claus.

Occurrence, Nos. 16, 17, 18.

Previously recorded from the Atlantic and Mediterranean only.

Sapphirina vorax, Giesbrecht.

Occurrence, Nos. 6, 13, 18.

Previously recorded from the Atlantic and Mediterranean only.

Sapphirina pyrosomatis, Giesbrecht.

Occurrence, Nos. 9, 16.

Previously recorded from the Atlantic and Mediterranean only.

Sapphirina maculosa, Giesbrecht.

Occurrence, No. 8.

Previously recorded from the Atlantic and Mediterranean only.

None of the last four *Sapphirina* appear to have been recorded from the region traversed by the Robinson collection.

Copilia mirabilis, Dana.
Occurrence, Nos. 7, 9.

Corycæus ovalis, Claus.
Occurrence, Nos. 1, 7, 10, 18.

Not previously recorded from the Gulf of Suez or the Red Sea.

Corycæus venustus, Dana.
Occurrence, Nos. 1, 2, 4, 6, 7, 9, 11, 13, 14, 16, 17, 19.

Mr. Thompson has already recorded this species from the region traversed by the Robinson collection.

Corycæus danae, Giesbrecht.
Occurrence, Nos. 1, 7, 8, 9, 18, 19.

This species has not previously been recorded from the Gulf of Suez or the Red Sea. Professor Cleve records it from the Arabian Sea and Indian Ocean.

Corycæus speciosus, Dana.
Occurrence, Nos. 1, 2, 3, 4, 5, 6, 7, 8, 9, 12, 13, 18.

Mr. Thompson records this *Corycæus* from the Indian Ocean, but there appears to be no record of its occurrence between the Island of Socotra and Suez.

Corycæus gibbulus, Giesbrecht.
Occurrence, Nos. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19.

Corycæus gibbulus occurred in all the gatherings with the exception of No. 1. Mr. Thompson records it from the Red Sea region, &c., and Professor Cleve from the Arabian Sea and Indian Ocean.

Corycæus carinatus, Giesbrecht.
Occurrence, Nos. 16, 18.

Mr. Thompson records this species from the middle of the Indian Ocean. It has also been recorded from the Pacific.

Corycæus furcifer, Claus.
Occurrence, No. 9. Gulf of Aden.

Not previously recorded from this region.

Corycæus gracilicaudatus, Giesbrecht.
Occurrence, No. 9. Gulf of Aden.

Professor Cleve records this species from the Indian Ocean and Malay Archipelago.

Corycæus obtusus, Dana.
Occurrence, Nos. 1, 4, 6, 8, 9, 10, 12, 14, 19.

There appear to be no previous records from the Gulf of Suez or Red Sea. Professor Cleve records it from the Arabian Sea, Indian Ocean, and Malay Archipelago.

Corycæus concinnus, Dana.
Occurrence, Nos. 12, 13, 14, 15, 16, 17, 18, 19.

Corycæus lubbocki, Giesbrecht.
Occurrence, Nos. 4, 5, 7, 8, 12, 13, 14, 16, 17, 19.

The last two *Corycæus* have not previously been recorded from the region traversed by the Robinson collection.

The two following species of Ostracoda were observed in the collection:—

Philomedes gibbosa. (Dana.)
Occurrence, Nos. 2, 3, 4, 6, 18.

Halocypris atlantica, Lubbock.
Occurrence, Nos. 4, 13.

(2) Dr. Jameson's Collection.

The second collection was given to me by Dr. H. Lyster Jameson, by whom it was made, with the following note: "This collection was taken at the end of April, 1901, on "the 'Shelling Grounds' in Fortescue Straits, a passage "about half a mile wide and five miles long, between "Sidea, Basilisk Island, and Basilaki, Moresby Island. "The depth varies from fifteen fathoms to forty fathoms. "Currents, up to so much as five knots per hour, run "through it between the Coral Sea and Goschen Strait. "The tidal current runs direct between the Pacific and "Indian Oceans. The shell is *Margaritifera maxima*, "Jameson—one of the pearl oysters. This species of pearl "oyster is always found on grounds where there is a "tremendously rich plankton."

The collection was represented by one surface tow-netting, containing about five c.c. of solid matter, chiefly Copepoda. The Copepoda consisted of thirty-five species. Although no new species were obtained, the gathering is of much interest, as it increases our knowledge of the distribution of described forms.

Amongst the other organisms in the collection, a number of examples of the Peridinian, *Ceratium tripos*, in the chain condition, were observed. According to Mr. George Murray, this state of *Ceratium* has been observed only in the open sea, far away from land. It is probable that the strong currents referred to by Dr. Jameson may have been the means of conveying it so close to land in this instance.

List of Copepoda.

Calanus minor (Claus).
Mecynocera clausii, I. C. Thomps.
Oithona plumifera, Baird.
" *linearis*, Giesb.
" *brevicornis*, Giesb.

Paracalanus aculeatus, Giesb.
" *parvus* (Claus).
Calocalanus pavo, Dana
" *plumosus* (Claus).
Acrocalanus gibber, Giesb.
Clausocalanus furcatus (Brady).
Centropages brachiatus (Dana).
" *orsinii*, Giesb.
" *furcatus* (Dana).
Temora discaudata, Giesb.
Haloptilus longicornis (Claus).
Calanopia elliptica (Dana).
**Pontellopsis krämeri* (Giesb).
Acartia erythræa, Giesb.
Tortanus gracilis, Brady.
Oithona nana, Giesb.
Ectinosoma atlanticum (B. & R.)
" *rosea* (Dana).
Enterpe acutifrons (Dana).
Setella gracilis, Dana.
Oncea venusta, Phillppi.
" *conifera*, Giesb.
Corycæus venustus, Dana.
" *obtusus*, Dana.
" *speciosus*, Dana.
" *gibbulus*, Giesb.
" *robustus*, Giesb.
" *concinnus*, Dana.
" *lubbocki*, Giesb.
Conœa rapax, Giesb.
Halocypris aculeata, T. Scott.

* *Pontellopsis krämeri* (Giesbrecht). Plate I., figs. 7 and 8; Plate II., figs. 1 and 2.

1896, Monops krämeri. Giesb. Zool. Jahrb. Syst., vol. 9, p. 323, t. 5, figs. 1 and 2.

The occurrence of this species in Fortescue Strait is particularly interesting. The species has hitherto only been known to occur in the Red Sea, where it was discovered by Dr. Giesbrecht in plankton collected with the aid of a ship's pump by Dr. Krämer, when sailing up in 1895. Only the female was found. One male and one female were obtained from Dr. Jameson's collection.

Length of female, 1·98 mm. Length of male, 1·6 mm. The female is easily distinguished from any of the other *Pontellopsis* by the right caudal furca being about twice as long and broad as the left furca. The fifth pair of feet are also very distinct. The male, in general

appearance, resembles the males of *P. strenua* and *P. perspicax*, but, unlike them, it has no spine on the left extremity of the last thoracic segment. The last thoracic segment of *P. krämeri* ends in a rounded knob on the left side, and in a long, almost straight spine on the right side. The spine reaches to near the end of the third joint of the abdomen. The third abdominal joint is larger than any of the other joints, and has a prominent protuberance on the right margin near its articulation with the second joint. The right foot of the fifth pair has the claw on the grasping joint nearly as long as the end hook.

List of Works referred to.

Das Tierreich, Copepoda. 1. Gymnoplea.

Fauna u. Flora des, Golfes von Neapal. Vol. xix. Pelagischen copepoden.

Monograph British Copepoda. G. S. Brady. (Ray Society).

Die Frei lebenden Copepoden, Claus.

Report on Entomostraca from the Gulf of Guinea, T. Scott, Trans. Linn. Soc., London, ser. ii., vol. vi.

Report on two collections of Tropical and more Northerly Plankton, I. C. Thompson, Trans. L'pool Biol. Soc., vol. xiv.

Annual Reports Fishery Board for Scotland (Part III.), papers on Copepoda by T. Scott.

Plankton from the Indian Ocean and the Malay Archipelago.

P. T. Cleve (Kongl. Svenska Vetenskaps-Akademiens Handlinger. Bandet 35, No. 5).

Piel Laboratory,

April, 1902.

Explanation of Plates.

Plate I.

Fig. 1. *Calanopia minor*, n. sp., female, dorsal view. × 51.

Fig. 2. *Calanopia minor*, n. sp., female, last thoracic segment and abdomen, left side. × 51.

Fig. 3. *Calanopia minor*, n. sp., male, last thoracic segment and abdomen, dorsal view. × 77.

Fig. 4. *Calanopia minor*, n. sp., female, fifth pair of feet. × 210.

Fig. 5. *Calanopia minor*, n. sp., male, fifth pair of feet. × 154.

Fig. 6. *Pseudodiaptomus serricaudatus*, (T. Scott), female, fifth pair of feet. × 154.

Fig. 7. *Pontellopsis krämeri* (Giesb.), male, fifth pair of feet. × 77.

Fig. 8. *Pontellopsis krämeri* (Giesb.), female, fifth pair of feet. × 55.

Fig. 9. *Candacia bradyi*, n. sp., male, dorsal view. × 31.

Fig. 10. *Candacia bradyi*, n. sp., male, last thoracic and first abdominal segments, left side. × 51.

Fig. 11. *Candacia bradyi*, n. sp., male, fifth pair of feet. × 77.

Fig. 12. *Candacia bradyi*, n. sp., male, left branch of fifth pair of feet, lateral view. × 77.

Fig. 13. *Centropages elongatus* (Giesb.), male dorsal view. × 38.5.

Fig. 14. *Centropages elongatus* (Giesb.), male, fifth pair of feet. × 77.

Fig. 15. *Laophonte herdmani*, n. sp., female, foot of fifth pair of feet. × 210.

Fig. 16. *Laophonte inornata*, n. sp., female, foot of fifth pair of feet. × 210.

Fig. 17. *Lichomolgus minor*, n. sp., female, mandible. × 180.

Plate II.

Fig. 1. *Pontellopsis krämeri* (Giesb.), male, dorsal view. × 38.5.

Fig. 2. *Pontellopsis krämeri* (Giesb.), female, last thoracic segment and abdomen. × 38.5.

Fig. 3. *Laophonte herdmani*, n. sp., female, left side. × 77.

Fig. 4. *Laophonte herdmani*, n. sp., female, rostrum. × 260.

Fig. 5. *Laophonte herdmani*, n. sp., female, antennule. × 210.

Fig. 6. *Laophonte herdmani*, n. sp., female, foot of first pair of feet. × 210.

Fig. 7. *Laophonte herdmani*, n. sp., female, foot of fourth pair of feet. × 210.

Fig. 8. *Laophonte herdmani*, n. sp., female, last abdominal segments and caudal furca. × 100.

Fig. 9. *Laophonte inornata*, n. sp., female, left side. × 77.

Fig. 10. *Laophonte inornata*, n. sp., female, rostrum. × 260.

Fig. 11. *Laophonte inornata*, n. sp., female, antennule. × 210.

Fig. 12. *Laophonte inornata*, n. sp., female, foot of first pair of feet. × 210.

Fig. 13. *Laophonte inornata*, n. sp., female, foot of fourth pair of feet. × 210.

Fig. 14. *Laophonte inornata*, n. sp., female, last abdominal segments and caudal furca. × 100.

Fig. 15. *Lichomolgus minor*, n. sp., female, dorsal view. × 77.

Fig. 16. *Lichomolgus minor*, n. sp., female, rostrum. × 175.

Fig. 17. *Lichomolgus minor*, n. sp., female, antennule. × 210.

Fig. 18. *Lichomolgus minor*, n. sp., female, antenna. × 175.

Fig. 19. *Lichomolgus minor*, n. sp., female, anterior foot jaw. × 210.

Fig. 20. *Lichomolgus minor*, n. sp., female, posterior foot jaw. × 210.

Fig. 21. *Lichomolgus minor*, n. sp., female, foot of first pair of feet. × 150.

Fig. 22. *Lichomolgus minor*, n. sp., female, foot of fourth pair of feet. × 150.

Fig. 23. *Lichomolgus minor*, n. sp., female, foot of fifth pair of feet. × 175.

Fig. 24. *Lichomolgus minor*, n. sp., female, last abdominal segment and caudal furca. × 175.

Plate III.

Fig. 1. *Dactylopus robinsonii*, n. sp., female, left side. × 77.

Fig. 2. *Dactylopus robinsonii*, n. sp., female, antennule. × 216.

Fig. 3. *Dactylopus robinsonii*, n. sp., female, foot of first pair of feet. × 216.

Fig. 4. *Dactylopus robinsonii*, n. sp., female, foot of fifth pair of feet. × 216.

Fig. 5. *Dactylopus robinsonii*, n. sp., last abdominal segments and caudal furca. × 100.

Fig. 6. *Stenhelia irrasa*, n. sp., female, left side. × 77.

Fig. 7. *Stenhelia irrasa*, n. sp., female, antennule. × 216.

Fig. 8. *Stenhelia irrasa*, n. sp., female, foot of first pair of feet. × 154.

Fig. 9. *Stenhelia irrasa*, n. sp., female, foot of fifth pair of feet. × 216.

Fig. 10. *Stenhelia irrasa*, n. sp., female, last abdominal segments and caudal furca. × 100.

Fig. 11. *Stenhelia erythræa*, n. sp., female, left side. × 77.

Fig. 12. *Stenhelia erythræa*, n. sp., female, antennule. × 216.

Fig. 13. *Stenhelia erythræa*, n. sp., female, foot of first pair of feet. × 135.

Fig. 14. *Stenhelia erythræa*, n. sp., female, foot of fifth pair of feet. × 216.

Fig. 15. *Delavalia minuta*, n. sp., female, left side. × 77.

Fig. 16. *Delavalia minuta*, n. sp., female, antennule. × 216.

Fig. 17. *Delavalia minuta*, n. sp., female, foot of first pair of feet. × 216.

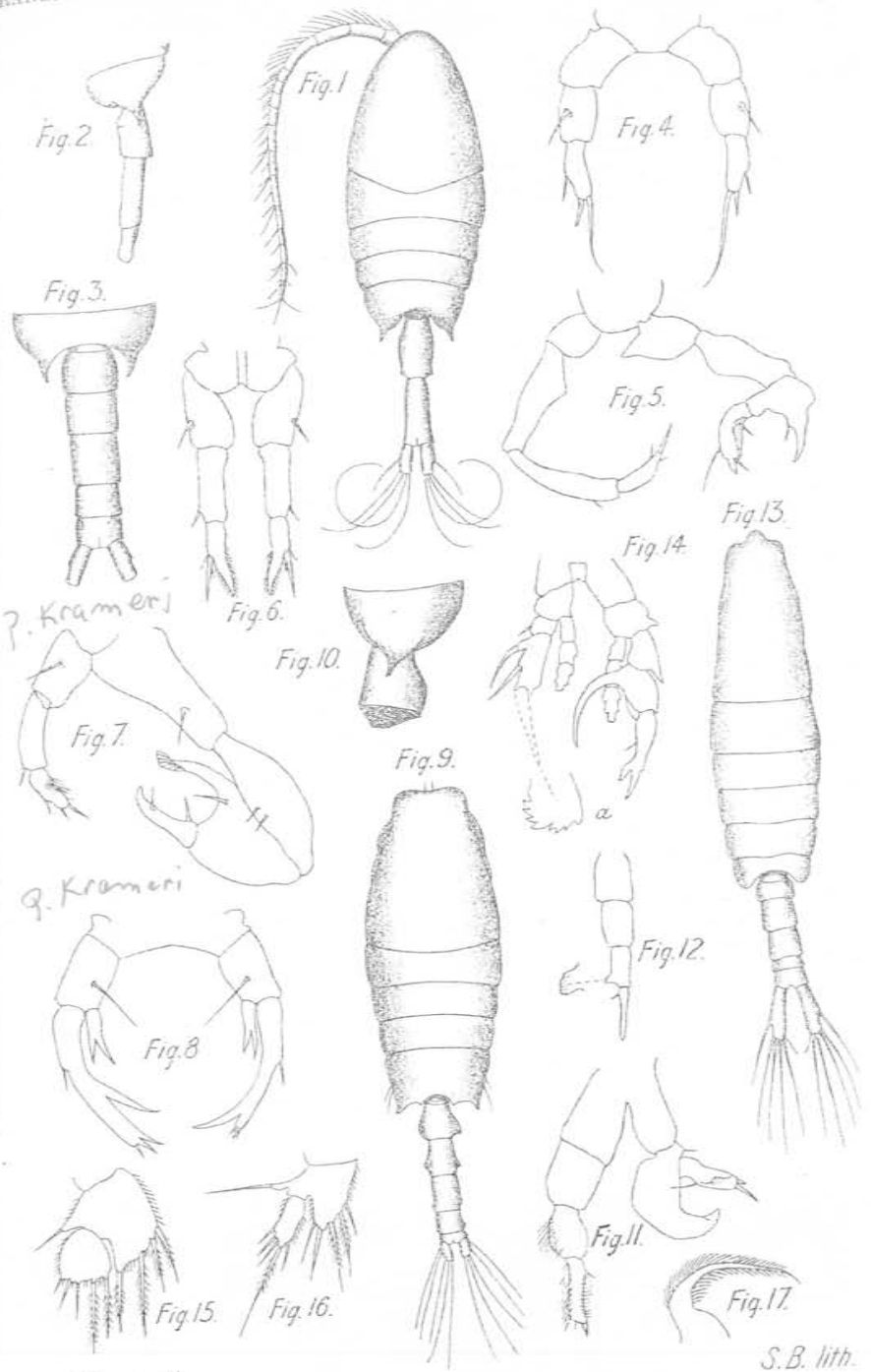
Fig. 18. *Delavalia minuta*, n. sp., female, foot of fifth pair of feet. × 216.

Fig. 19. *Delavalia inopinata*, n. sp., female, left side. × 77.

Fig. 20. *Delavalia inopinata*, n. sp., female, antennule. × 216.

Fig. 21. *Delavalia inopinata*, n. sp., female, foot of first pair of feet. × 180.

Fig. 22. *Delavalia inopinata*, n. sp., female, foot of fifth pair of feet. × 135.



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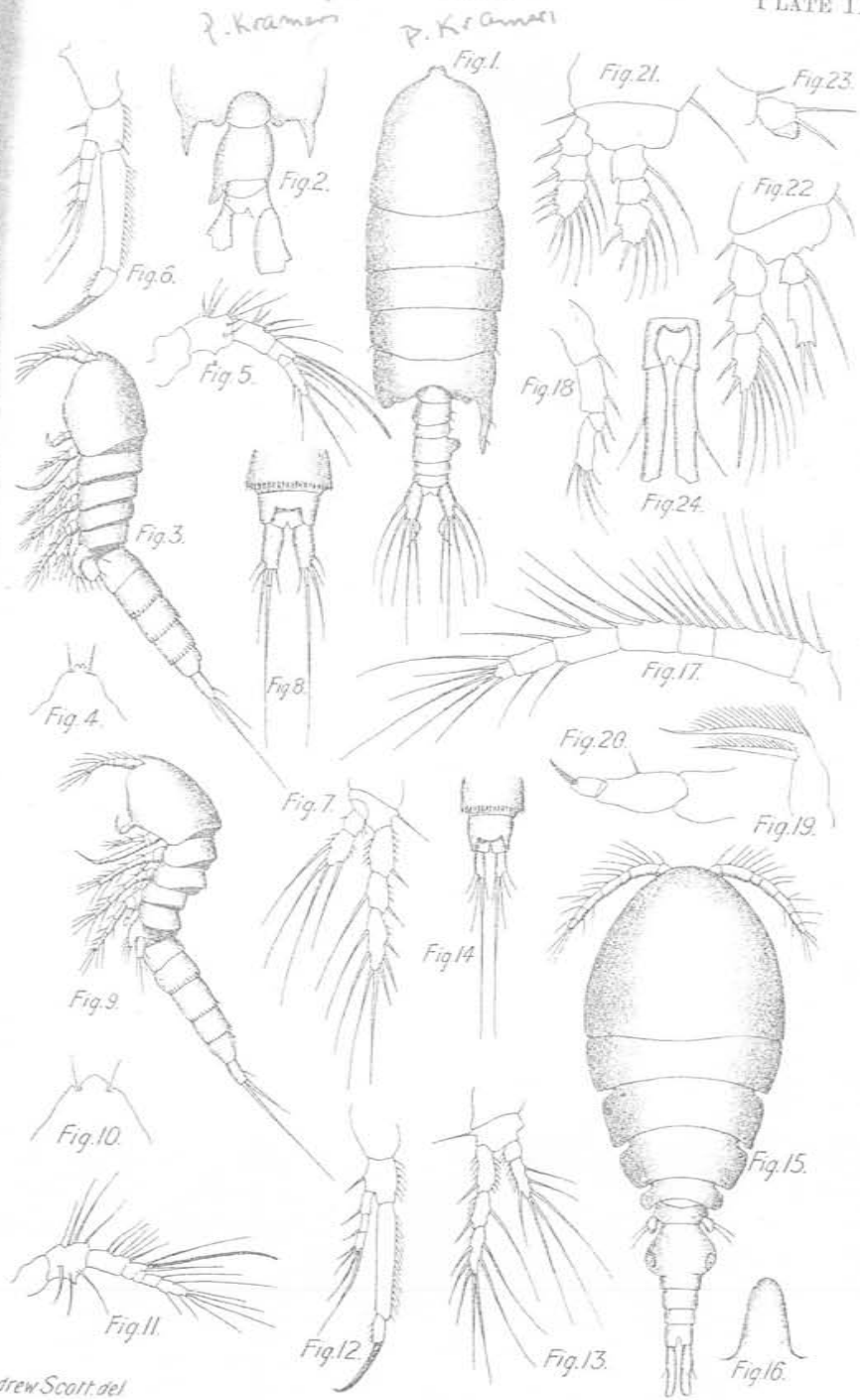
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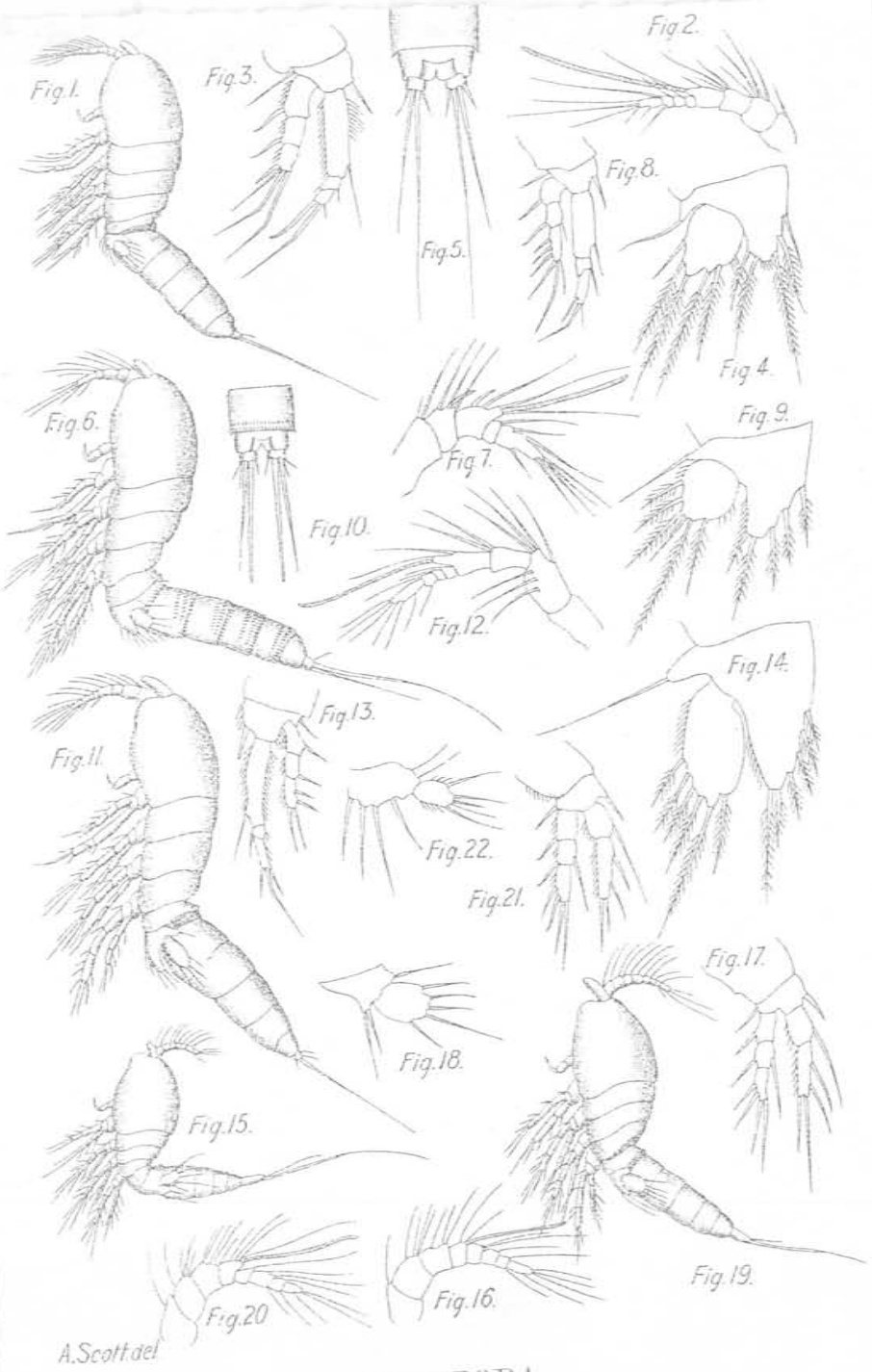
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