SOME NEW AND RARE COPEPODA CALANOIDA FROM EAST INDIAN SEAS

by

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The rich material of Copepods collected by the Snellius Expedition in the seas of the Eastern part of the Malay Archipelago was placed at my disposal in 1943 by Prof. Dr. H. Boschma. The material proved to be very interesting and contained, besides new species, many rare forms found for the first time in the Indo-pacific area. A report on the families Calanidae, Eucalanidae, Paracalanidae, and Pseudocalanidae will be published in Temminckia, vol. VIII, pp. 1-181. A report on the family Aetideidae was completed in 1946 but, as the printing difficulties created by the war have not yet sufficiently improved to warrant the publication of this report within a short time, it seems desirable to publish a preliminary account of some new or interesting forms. Further particulars about the Aetideidae in the Snellius collections, along with notes on geographical and vertical distribution and complete synonymy of the species concerned will be published in the final report on the Aetideidae which, I hope, will be printed in the course of time. Full particulars about the various stations at which material was obtained during the Snellius Expedition may be found in Boschma (1936). As the material collected by the Siboga Expedition (vide A. Scott, 1909), present in the Zoölogisch Museum at Amsterdam, has now become available to me, the present paper also contains some information about Siboga specimens. A complete review of the Siboga Copepods, although much desired, is almost impossible as the specimens from the various stations have not been kept separately.

Family AETIDEIDAE G. O. Sars, 1902

Genus **Snelliaetideus** nov. gen.

Females. The head and the 1st thoracic segment are fused, the frontal part of the head is vaulted and rounded, produced into a distinct, bifurcated rostrum. The rami of the rostrum are distinct and separated from each other by a considerable space; they are long and acutely pointed and directed downwards and very slightly backwards. The 4th and 5th thoracic

segments are fused, the lateral thoracic margin is smoothly rounded and not produced into a flap or spine.

The abdomen consists of 4 free segments, the genital segment is the longest of these four; it is swollen laterally when seen from above, the receptacula are very distinct, the genital swelling is slight.

The joints of the furca are about 3 times as long as wide, with 4 long, plumose, marginal setae, 1 short external seta and a curved ventral (internal) seta. The marginal setae are subequal in length and slightly longer than the abdomen, the margins of the furca have no hairs.

The 2nd antennae, mouth parts and legs are identical with those of *Aetideus* Brady 1883, and *Euaetideus* G. O. Sars, 1925; the endopod of the 1st pair of legs is 1-jointed; of the 2nd pair 2-jointed and of the 3rd and 4th pairs 3-jointed. The terminal spines of the 3rd exopodal joints of the 2nd to 4th pairs of legs have a reduced number of fairly strong spinules. The 5th pair of legs is absent.

Males unknown.

Type species: *Snelliaetideus arcuatus* nov. spec.

Snelliaetideus arcuatus nov. spec. (fig. 1)

Adult stage. ♀, total length, 1.43-1.67 mm.

The proportional lengths of the cephalothorax and the abdomen are as 80 to 28, so that the length of the abdomen is contained 2.86 times in that of the anterior part of the body.

The general shape of the cephalothorax is as in *Aetideus armatus* (Boeck, 1872), especially with regard to the shape of the head, but it differs strongly in the shape of the last thoracic segment.

The head and the 1st thoracic segment are fused, the head is distinctly vaulted and smoothly rounded into the prominent rostrum. This rostrum, as in *A. armatus,* consists of two well separated rami, pointing downwards and slightly backwards. In dorsal aspect the head appears to be conical, resembling the condition found in *Calanoides carinatus* (Kröyer, 1849). The 4th and 5th thoracic segments are fused, the lateral thoracic margin is not produced into spines, but smoothly rounded.

The abdomen consists of 4 segments and the furca, that have the following proportional lengths: $\frac{\text{segment } 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{34 \quad 16 \quad 13 \quad 15 \quad 22 = 100}$. The genital segment is distinctly swollen in dorsal aspect; it is slightly onion-shaped, about as long as wide and in lateral aspect provided with a slight but distinct genital swelling. The receptacula are very distinct. The rami of the furca are long, about 3 times as long as wide, with 4 marginal, subequal, plumose

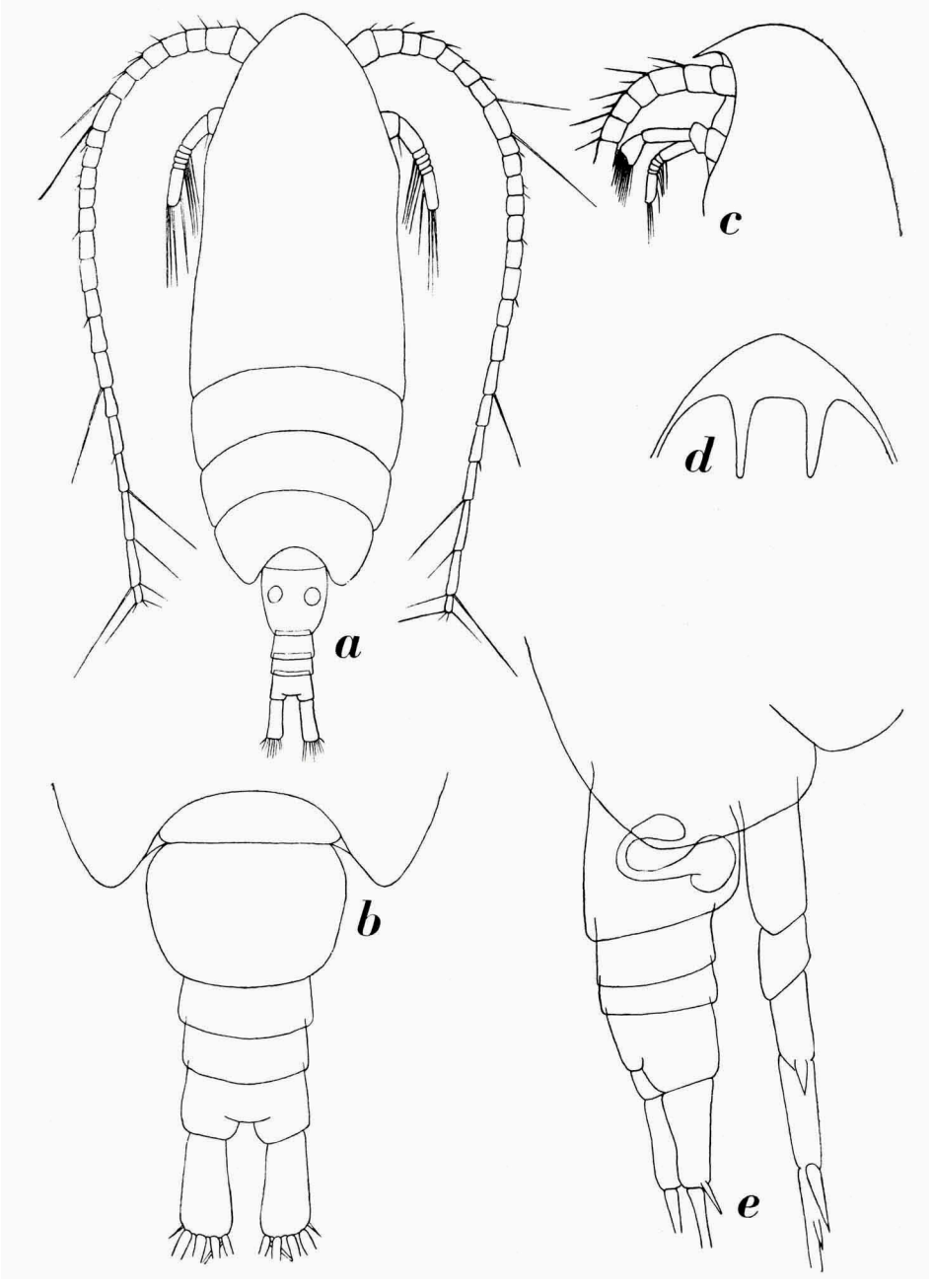

Fig. 1. *Snelliaetideus arcuatus* nov. spec., adult ♀ from Sta. 105. a, whole animal in dorsal view; b, abdomen in dorsal view; c, head in lateral view from the left side; d, head in ventral view, showing the rostrum; e, abdomen in lateral view from the right side. a, c, × 60; b, d, e, × 170.

setae, a short external seta and a long and curved ventral (internal) seta. There are no hairs on the joints of the furca.

The 1st antenna reaches the distal margin of the genital segment. It consists of 24 free joints, the 8th and 9th joints are completely fused, the segmentation between the 24th and 25th joints is rather indistinct. The various joints have the following proportional lengths:

1	2	3	4	5	6	7
37	35	21	22	23	25	28

8+9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
50	24	28	29	32	35	44	50	50	56	67	60	51	67	72	75	19	= 1000.

The arrangement of the setae on the joints is as in *Aetideus armatus* (cf. Sars, 1902, pl. 14).

The 2nd antennae, mouth parts and legs are identical with those of *Aetideus armatus*, which have been figured by Sars (l.c., pl. 14); no figures of these appendages are therefore given here.

The endopod of the 2nd antenna is slightly shorter than the exopod. The 1st basal joint has only one seta; the 2nd basal 2 setae on the internal, terminal corner. The 1st endopodal joint has 1 almost terminal seta, the 2nd endopodal joint has 7 setae on the internal, 6 setae on the external lobe. The 1st and 2nd exopodal joints are separated, the 1st has about half the length of the 2nd and carries 1 internal seta. The 3rd to 6th exopodal joints are small and each have 1 internal seta. The terminal (7th) joint is long, almost as long as the first 2 joints together, and has 1 median and 3 terminal setae.

The mandible is as in *A. armatus*, with 7 distinct teeth on the manducatory part. The 2nd basal segment is triangular, with 2 internal setae. The endopod is 2-jointed, the 1st joint with 2, the 2nd with 7 strong setae. The exopod is 4-jointed, the first 3 joints with 1, the terminal joint with 3 setae.

The 1st maxilla has 8 plumose setae on the 1st outer lobe, the 2nd outer lobe appears to be absent. The 1st inner lobe has 8 strong, spinulose setae and 4 much smaller setae; the 2nd inner lobe has 2, the 3rd inner lobe 4 setae. The 2nd basal joint has 4 setae; the endopod 9 and the exopod 10 setae.

The 2nd maxilla resembles the figure of the appendage of *A. armatus* given by Sars (l.c., pl. 14), but I could not observe the accurate number of setae on the various lobes. There are 5 distinct lobes, carrying strong setae; there are apparently 2 terminal joints which carry 5 much thinner setae. On each of the 2 terminal joints there is one much stronger seta, set with one row of small, hair like spinules, while the other setae have more rows of spinules or have these spinules irregularly distributed.

The maxilliped has 2 setae on the 1st lobe of the 1st basal joint, 3 on

the 2nd lobe and 3 on the terminal lobe, one of which is almost spine like. The 2nd basal joint has 3 median and 2 terminal setae. The 1st endopodal joint has 3, the 2nd 3, the 3rd 2, the 4th 4 and 1 external, the 5th 4 setae.

The 1st pair of legs has a 1-jointed endopod, with a distinct internal knob on that joint, set with a row of hairs. The exopod of the 1st pair is 3-jointed, without an external spine on the 1st exopodal joint. The endspine of the 3rd expodal joint is longer than that of the 2nd. Internal margin of the basal joints with long hairs. Endopod of the 2nd pair of legs 2-jointed, of the 3rd and 4th pairs 3-jointed. All exopods are 3-jointed. Terminal spine of the 3rd exopodal joint of the 2nd to 4th pairs of legs with a reduced number of external spinules; on the 2nd pair there are 15, on the 3rd 17 and on the 4th 16. The 5th pair of legs is absent.

Localities: Sta. 97 (Arafoera Sea, 4° 49′.0 S, 135° 27′.0 E); Sta. 105 (6° 59′.5 S, 132° 26′.5 E), and Sta. 140 (Dao Strait, 10° 37′.0 S, 122° 13′.5 E).

Aetideopsis trichechus nov. spec. (figs. 2, 3)

Aetideopsis rostrata p.p. A. Scott, 1909, p. 40.

Adult stage. ♀, total length, 3.38 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 52 to 16, so that the length of the abdomen is contained 3.25 times in that of the anterior part of the body.

The general shape of the body is as in *Aetideopsis rostrata* G. O. Sars, 1903. It is elongated, dilated in the oral region and narrowed in front of that part of the body. The frontal part of the head has a very prominent, somewhat rounded, produced part, carrying a very distinct frontal organ and the rostrum.

The rostrum is very distinct, the rami are very long and slender, separated already at the base, pointing downwards and forwards, diverging at the end, giving the head a very characteristic appearance.

The head and the 1st thoracic segment are fused, with a distinct line of separation on the dorsal surface only. The 4th and the 5th thoracic segments are also separated, the line of separation is less distinct here than between the other segments of the thorax. Lateral margins of the last thoracic segment produced into very acute points, reaching far beyond the middle of the genital segment of the abdomen. Posterior thoracic margin between the lateral spines rounded. The whole integumentum of the thorax shows a pitted structure, as has also been described in *Aetideopsis minor* by Wolfenden (1908).

The abdomen consists of 4 segments and the furca, which have the following proportional lengths: $\frac{\text{segment}\quad 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{38 \quad 20 \quad 14 \quad 10 \quad 18 = 100}$. The genital segment is rounded in dorsal aspect and is exactly as long as broad. The distal borders of the 1st to 3rd abdominal segments are set

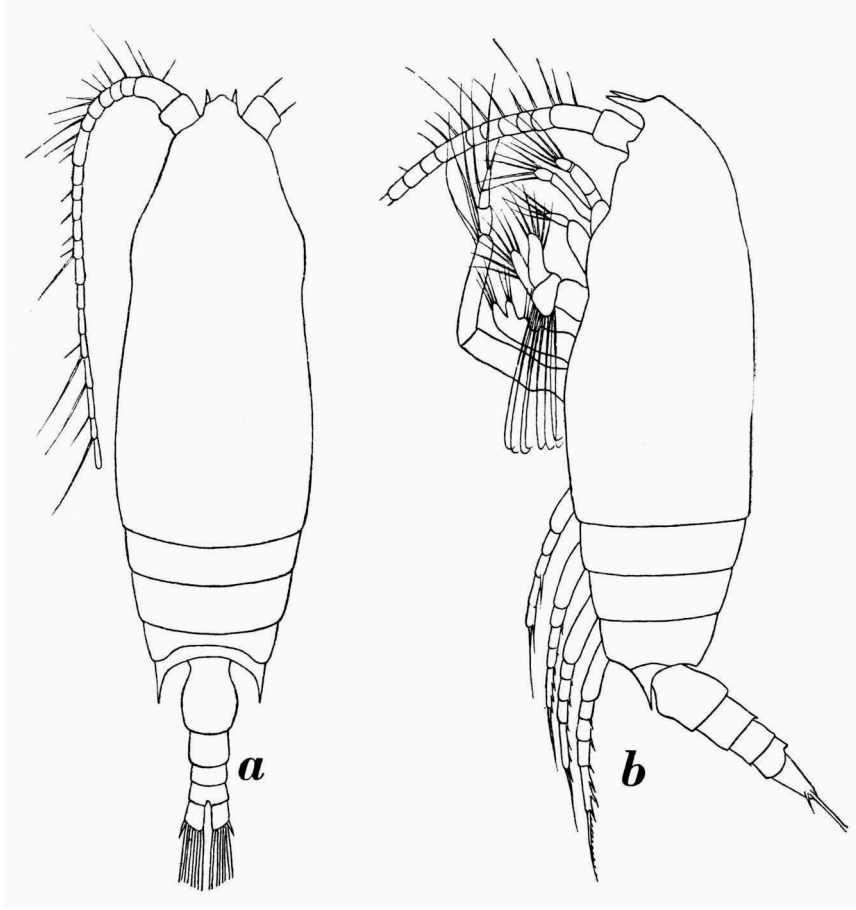

Fig. 2. *Aetideopsis trichechus* nov. spec., adult ♀ from Sta. 175. a, whole animal in dorsal view; b, the same, lateral view from the left side. × 30.

with a longitudinal row of small spinules. The furcal joints are 1.5 times as long as broad and parallel; the internal margin of the rami is densely haired. Each joint carries 4 densely plumose, subequal setae and a very short external seta.

The 1st antenna reaches beyond the furca by the last joint. It consists of 24 free segments, the 8th and 9th joints are completely fused. The

various joints have the following proportional lengths:

1	2	3	4	5	6	7	8 + 9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
40	44	22	20	24	27	29	64	28	29	29	36	38	45	48	48	44	60	68	44	59	68	72	16	= 1000.

Only the left antenna is present in the type specimen, the arrangement of the setae is as in *A. rostrata.*

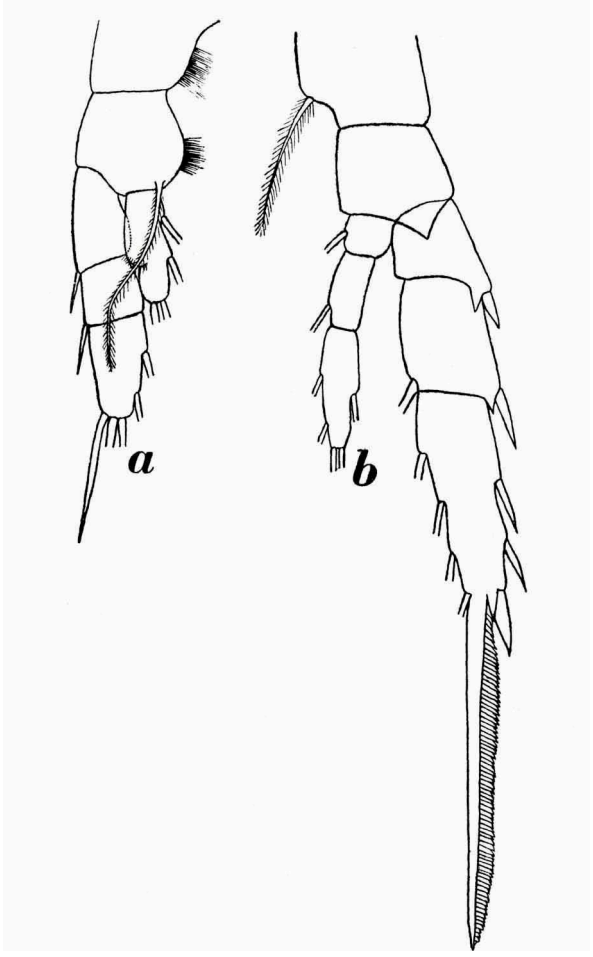

Fig. 3. *Aetideopsis trichechus* nov. spec., adult ♀ from Sta. 175. a, 1st leg; b, 4th leg. × 115.

The 2nd antennae, mouth parts and legs are identical with those of *A. rostrata* and need not be described in detail here.

Localities: Sta. 175 (Flores Sea, near Paternoster Islands, 7° 47′.0 S, 118° 12′.0 E). A young female was found amongst other specimens from the Siboga collection labelled "*Aetideopsis rostrata* Sars".

The type specimen is the single female captured at Sta. 175 by the Snellius Expedition. The present species shows some resemblance with a form described by Esterly (1911, p. 316) as *Aetideopsis divaricata,* but the prominent frontal part of the head seems to be absent in the latter species.

Gaidius pungens Giesbrecht, 1895 (fig. 4)

Gaidius pungens Giesbrecht, 1895, pp. 246, 248, pl. 1 figs. 1-4.

Adult stage. ♀, total length, 2.65 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 42 to 10, so that the length of the abdomen is contained 4.20 times in that of the anterior part of the body.

The general shape of the body resembles that of *Gaidius tenuispinus* (G. O. Sars, 1900) rather closely, but it is more slender and elongated, somewhat dilated in the oral region. The frontal part of the head is rounded in dorsal aspect and slightly triangular in outline.

The rostrum is distinct and 1-pointed; the frontal organ is also distinct and a little prominent. In lateral aspect the head appears to be distinctly depressed on the dorsal surface and rounded in front of that part. The head and 1st thoracic segment as well as the 4th and 5th thoracic segments are fused.

The last thoracic segment is produced into acute, lateral spines, which have a length of about $^3/_5$ of the genital segment of the abdomen. In dorsal aspect these points are placed fully laterally; they are slender though rather strong, distinctly but not strongly curved internally. In lateral view they are placed close to the dorsal end of the segment, leaving a large, rounded ventral part of the last thoracic segment free, which covers the anterior part of the first abdominal segment. The place of the lateral spines shows a marked difference from *Gaidius tenuispinus* and *Gaidius robustus* (vide infra).

The abdomen consists of 4 free segments and the furca, that have the following proportional lengths: $\frac{\text{segment } 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{34 \quad 17 \quad 15 \quad 15 \quad 19} = 100$. The genital segment is as long as wide, in lateral aspect it shows a distinct genital swelling, although the genital tubercle is less produced than in *G. tenuispinus.* The receptacula are distinct and covered by a large operculum.

The joints of the furca are as long as wide, they have each 4 marginal, subequal, plumose setae, a curved ventral seta as figured by Giesbrecht (l.c., pl. 1 fig. 2) and a short external seta. The internal margin of both joints is densely haired.

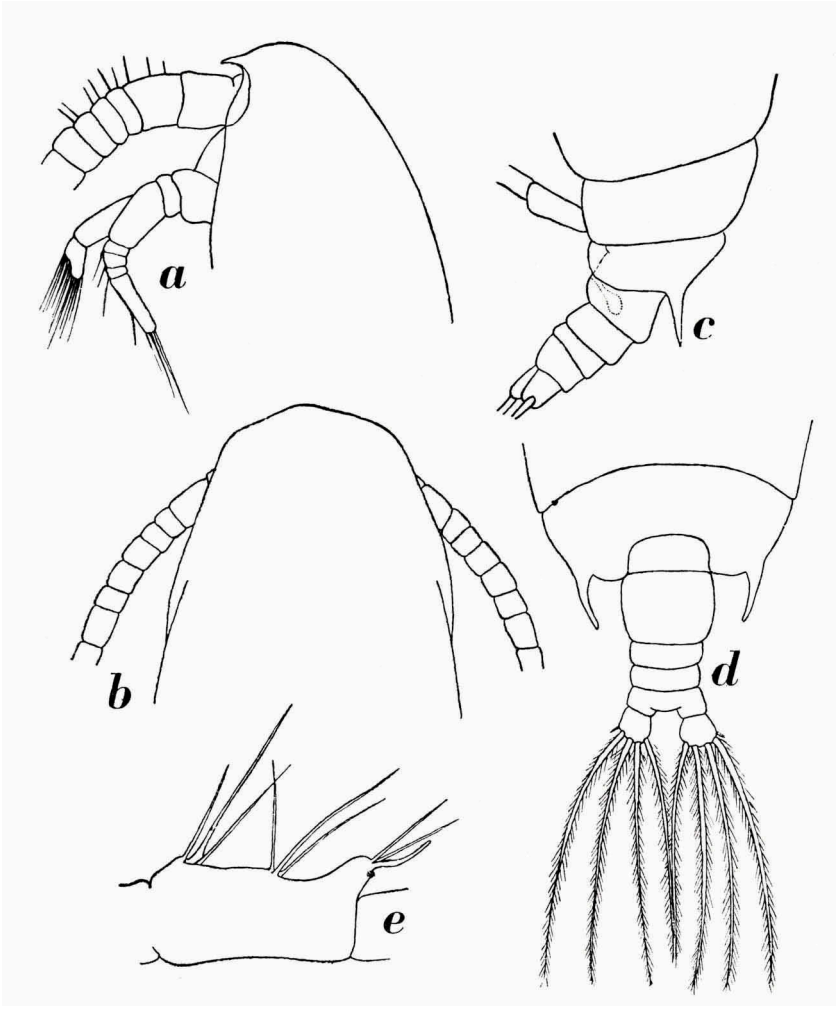

Fig. 4. *Gaidius pungens* Giesbrecht, 1895, adult ♀ from Sta. 113. a, head in lateral view from the left side; b, the same, dorsal view; c, abdomen in lateral view from the left side; d, the same, dorsal view; e, 1st basal joint of the maxilliped. a-d, × 50; e, × 115.

The 1st antenna reaches the end of the cephalothorax and consists of 24 free joints. The 8th and 9th joints are completely fused. The various joints have the following proportional lengths:

1	2	3	4	5	6	7
72	46	16	20	23	20	26

8 + 9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
39	26	24	26	39	42	49	52	56	55	69	63	50	63	56	48	20	= 1000.

The 2nd antennae, mouth parts and legs resemble those of *G. tenuispinus*

very closely (vide Sars, 1900, 1902, 1903). The 1st basal joint of the maxilliped shows no trace of a lamella. The terminal lobe of this joint carries a distinct (sensory?) tubercle, a strong, curved seta and 2 smaller setae. The 2nd basal joint of the same appendage has no haired widening of its basal part as is present in *Gaidius robustus*.

The exopod of the 1st pair of legs is 2-jointed, the segmentation between the 1st and 2nd exopodal joint is absent. The endopod of the 1st pair is 1-jointed, the external tubercle on this joint carries a row of spine like hairs. The exopod of the 2nd pair of legs is 3-jointed, the endopod 1-jointed. Both rami of the 3rd and 4th pairs of legs are 3-jointed. The number of spinules on the endspine of the 3rd exopodal joints is 19, 19 and 20 respectively. The 1st basal joint of the 4th pair of legs has a row of ± 10 tube like spinules across the posterior surface.

Localities: Sta. 113 (Arafoera Sea, off Sermata, 8° 17'.5 S, 129° 10'.5 E); Sta. 175 (Flores Sea, near Paternoster Islands, 7° 47'.0 S, 118° 12'.0 E).

Gaidius robustus nov. spec. (figs. 5, 6)

Adult stage. ♀, total length, 3.90-4.00 mm.

The proportional lengths of the cephalothorax and the abdomen are as 62 to 17, so that the length of the abdomen is contained 3.65 times in that of the cephalothorax.

The general shape of the body resembles *Gaidius tenuispinus* rather closely but it is more robust, more dilated in the oral region and considerably contracted in front of that part of the body. In lateral view the frontal part of the head appears to be distinctly flattened, and it is more obtuse than in *Gaidius pungens* or *G. tenuispinus*.

The head and the 1st thoracic segment as well as the 4th and 5th thoracic segments are completely fused. The lateral margin of the last thoracic segment is produced into long and acute points, in dorsal aspect slightly converging, reaching about the middle of the genital segment of the abdomen. In lateral aspect these acute points are placed in the middle of the lateral margin and are distinctly curved ventrally; the ventral part of the last thoracic segment is rounded, but not so produced as in *G. pungens*.

The 1st antenna scarcely reaches the lateral thoracic margin. It consists of 24 free joints, the 8th and 9th joints are fused. The various joints have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10	11
72	58	24	19	25	27	30	53	29	31

12	13	14	15	16	17	18	19	20	21	22	23	24	25	
33	53	48	43	41	39	48	55	56	53	53	45	43	22	= 1000

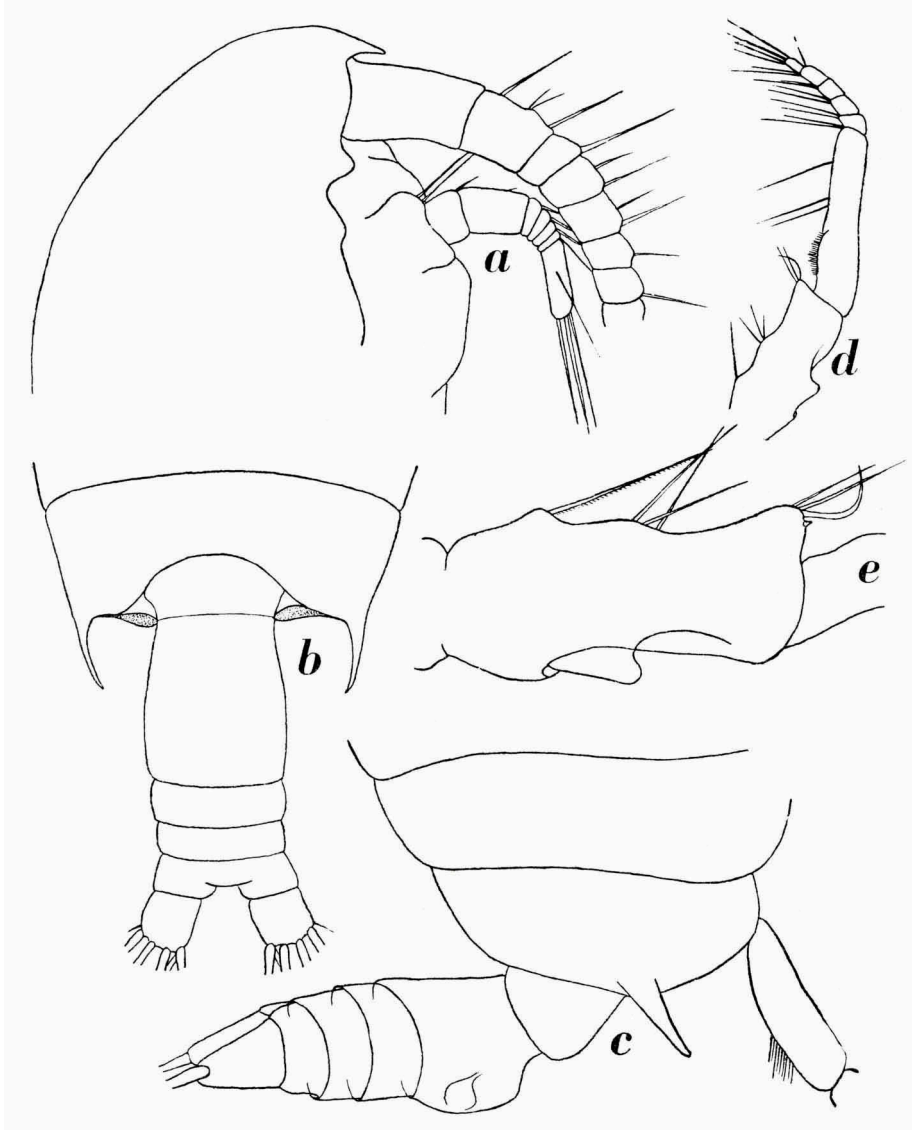

Fig. 5. *Gaidius robustus* nov. spec., adult ♀ from Sta. 175. a, head in lateral view from the right side; b, abdomen in dorsal aspect; c, the same, lateral view from the right side; d, maxilliped; e, 1st basal joint of the maxilliped. a-d, × 50; e, × 115.

The abdomen consists of 4 free segments and the furca, that have the following proportional lengths: $\frac{\text{segment}\quad 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{39 \quad 15 \quad 13 \quad 11 \quad 22 \quad = 100}$. The genital segment is 1.5 times as long as wide; in dorsal aspect it is scarcely

rounded but distinctly elongated, in lateral aspect it shows a distinct and large genital swelling. The receptacula are distinct and covered by the genital operculum.

The furcal joints are as long as wide and carry 4 marginal setae, which are all broken in the present specimens. Moreover, there is a slender and

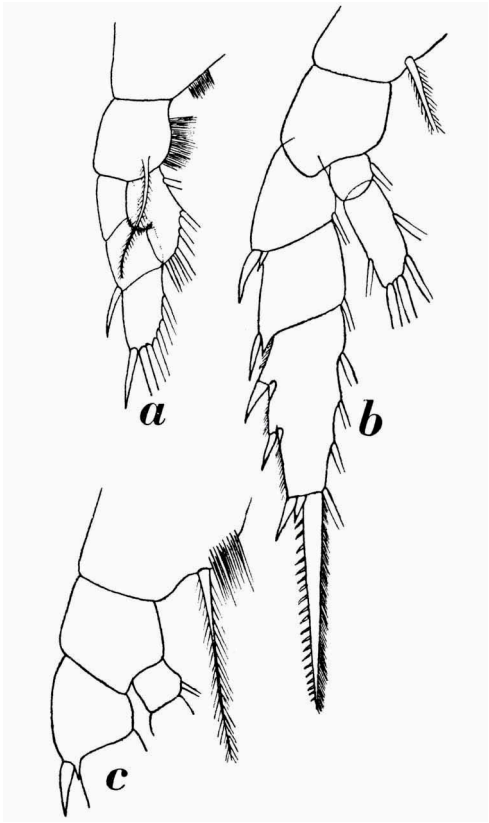

Fig. 6. *Gaidius robustus* nov. spec., adult ♀ from Sta. 175. a, 1st leg; b, 2nd leg; c, basal portion of the 4th leg. × 80.

curved ventral seta and a short external seta. The internal margin of the furcal joints is densely haired.

The 2nd antenna, mouth parts and legs differ in some characteristics from those of *G. tenuispinus*. The 1st basal joint of the maxilliped has a lamella, which is placed in the middle of the external margin. Its shape is linguiform and it is rounded near the apex. In this character *G. robustus* differs fundamentally from *G. pungens* and *G. tenuispinus*. Only one seta could be observed on the basal lobe of this joint; the terminal lobe has the

usual (sensory?) tubercle and 3 setae, one of which is strong and curved. The 2nd basal joint of the maxilliped has a distinctly swollen basal part set with a longitudinal row of hair like spinules.

The exopod of the 1st pair of legs is distinctly 3-jointed, the 1st exopodal joint has no lateral spine; the endopod is 1-jointed. Endopod of the 2nd pair of legs 2-jointed. Posterior surface of the 1st basal joint of the 4th pair of legs with 5-6 rows of fine, hair like tubes running across the joint in its distal corner.

Locality: Sta. 175 (Flores Sea, near Paternoster Islands, 7° 47'.0 S, 118° 12'.0 E).

The type specimen is a female of 4.00 mm length, captured at Sta. 175 by the Snellius Expedition. The species resembles *Gaidius brevicaudatus* G. O. Sars, 1907, in several respects but differs markedly by the shape of the head and the long lateral spines.

Gaidius tenuispinus (G.O. Sars, 1900) (fig. 7)

Chiridius tenuispinus Sars, 1900, p. 67, pl. 18.

Adult stage. ♀, total length, 3.60-3.75 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 57 to 17, so that the length of the abdomen is contained 3.36 times in that of the anterior part of the body.

The general shape of the frontal part of the body is as in *G. robustus*, although it is slightly less obtuse in dorsal view than in that form. The rostrum is also very distinct and the frontal organ is prominent.

The head and the 1st thoracic segment as well as the 4th and 5th thoracic segments are completely fused. The lateral spines of the last thoracic segment are almost straight and as long as the genital segment. They are distinctly thickened at the base. In lateral aspect they are slightly curved upwards but placed more dorsally than in *G. robustus*.

The abdomen consists of 4 free segments and the furca, that have the following proportional lengths: $\frac{\text{segment}\quad 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{42 \quad 16 \quad 14 \quad 12 \quad 16 = 100}$. The genital segment of the abdomen is as long as wide and shows a distinct genital swelling in lateral aspect, which, however, is less produced than in *G. robustus*. In dorsal view the genital segment is elongated and not rounded. The joints of the furca are as long as wide, they each have 4 strong, subequal, plumose setae, a curved ventral seta and a very small external seta. The internal margins of the joints are set with some long hairs.

The 1st antenna is as long as the cephalothorax. It consists of 24 free

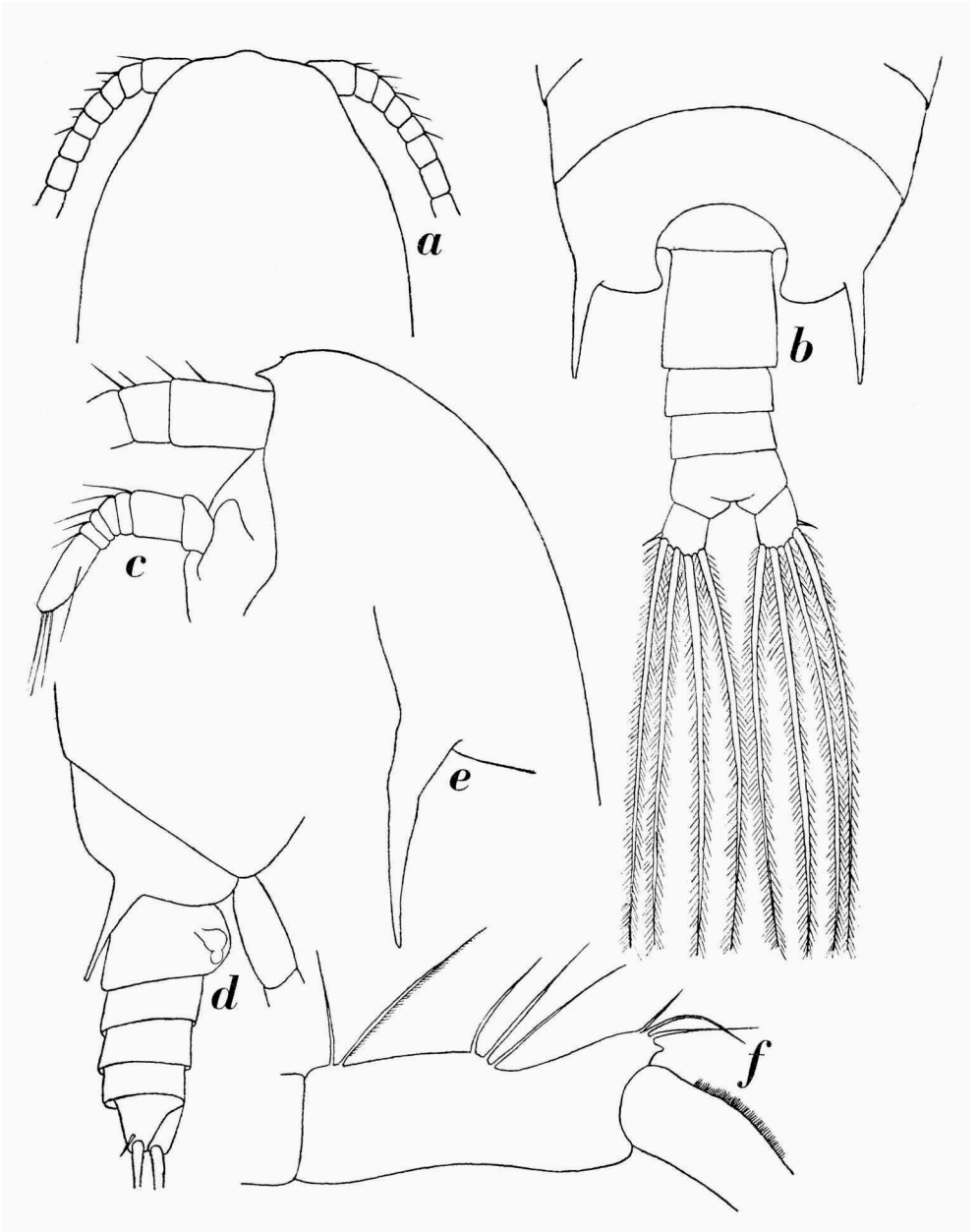

Fig. 7. *Gaidius tenuispinus* (G. O. Sars, 1900), adult ♀ from Sta. 80. a, head in dorsal view; b, abdomen in dorsal view; c, head in lateral view from the left side; d, abdomen in lateral view from the right side; e, spine of the left lateral thoracic margin; f, 1st basal joint of the maxilliped. a-d, × 50; e, f, × 115.

joints, the 8th and 9th joints are fused. The various joints have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10	11	12	13	14	15
83	44	22	23	26	27	28	43	22	23	24	41	43	48

16	17	18	19	20	21	22	23	24	25	
48	52	55	64	56	46	61	56	48	17	= 1000.

The 2nd antennae, mouth parts and legs differ scarcely from descriptions given by Sars (1900, 1902, 1903) and With (1915). The 1st basal joint of the maxilliped has no trace of a lamella, the terminal lobe, besides carrying a (sensory?) tubercle, has 3 setae (only 2 are figured by With).

The exopod of the 1st pair of legs appears to be 3-jointed, although the articulation between the 1st and 2nd joints is less distinct than between the following two joints. The 1st exopodal joint of that pair has no external spine. The endopod of the 2nd pair of legs is distinctly 2-jointed. The 1st basal joint of the 4th pair of legs carries 5 to 6 rows of hair like tubes on the posterior surface in the distal corner.

Localities: Sta. 74 (Celebes Sea, 4° 21′.5 N, 120° 01′.0 E); Sta. 76 (Celebes Sea, 2° 33′.5 N, 121° 25′.5 E); Sta. 80 (Moluccan Sea, 1° 06′.5 S, 126° 46′.5 E).

The Snellius specimens differ scarcely from Atlantic specimens extensively described by Sars (l.c.) and With (l.c.). One female of *G. tenuispinus* is present in the Siboga collection amongst specimens labelled "*Gaidius similis* (T. Scott)".

Euchirella bella Giesbrecht, 1888 (figs. 8a, 9c, g)

Euchirella bella Giesbrecht, 1888, p. 336.

Adult stage. ♂, total length, 3.15 mm.

The general shape of the body resembles the male of *Euchirella messinensis* (Claus, 1863) in many respects. The cephalothorax is less robust than in the female; it is elongated, the frontal part of the head is rounded in lateral aspect and carries a low but distinct crest. The rostrum is very distinct and points slightly forwards.

The head and the 1st thoracic segment are fused, as are the 4th and 5th thoracic segments.

The 1st antennae on both sides are broken.

The 2nd antenna has the endopod slightly longer than half the length of the exopod; the terminal segment of the endopod has 6 setae on both the internal and external lobe, the most internal seta is very small.

The mouth parts agree with those of *E. messinensis* and *Euchirella orientalis* (cf. Sewell, 1929, p. 118); they were not studied in detail.

The exopod of the 1st pair of legs is 2-jointed, the 1st and 2nd exopodal

joints are fused and have 2 small, external spinules as in the female, the terminal joint has 1 strong terminal spine. The endopod of the 1st pair of legs is 1-jointed.

The 2nd pair of legs has a 2-jointed endopod and a 3-jointed exopod; the 3rd and 4th pairs of legs have both rami 3-jointed. The endspine on the 3rd exopodal joint of the 2nd pair of legs has an increased number of

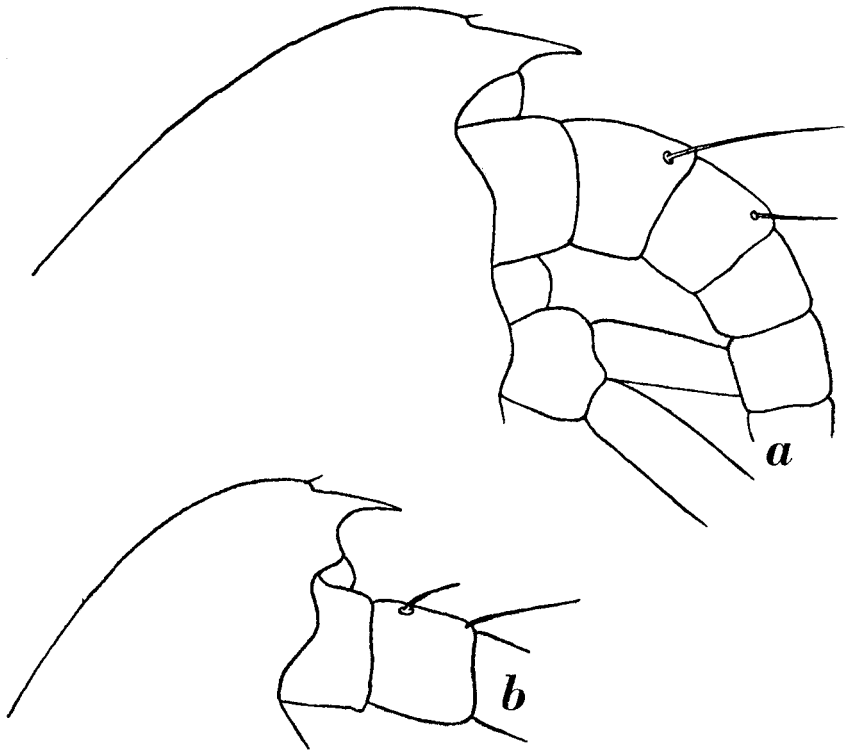

Fig. 8. a, *Euchirella bella* Giesbrecht, 1888, adult ♂ from Sta. 154*, head in lateral view from the right side. b, *Euchirella indica* nov. spec., adult ♂ from the Siboga collection, head in lateral view from the right side. a, × 115; b, × 80.

teeth, which are smaller than those found along the endspines of the 3rd and 4th pairs.

The 5th pair of legs resembles the figure of that pair of appendages in *Euchirella orientalis* (Sewell, 1929, textfig. 44e). These male specimens figured by Sewell were later on (Sewell, 1947) attributed to *Euchirella pulchra* (Lubbock, 1856). There are minor differences in length and shape of the exo- and endopodal joints of the right leg. The shape of the terminal portion of the left leg differs slightly from Sewell's figure (Sewell, 1947,

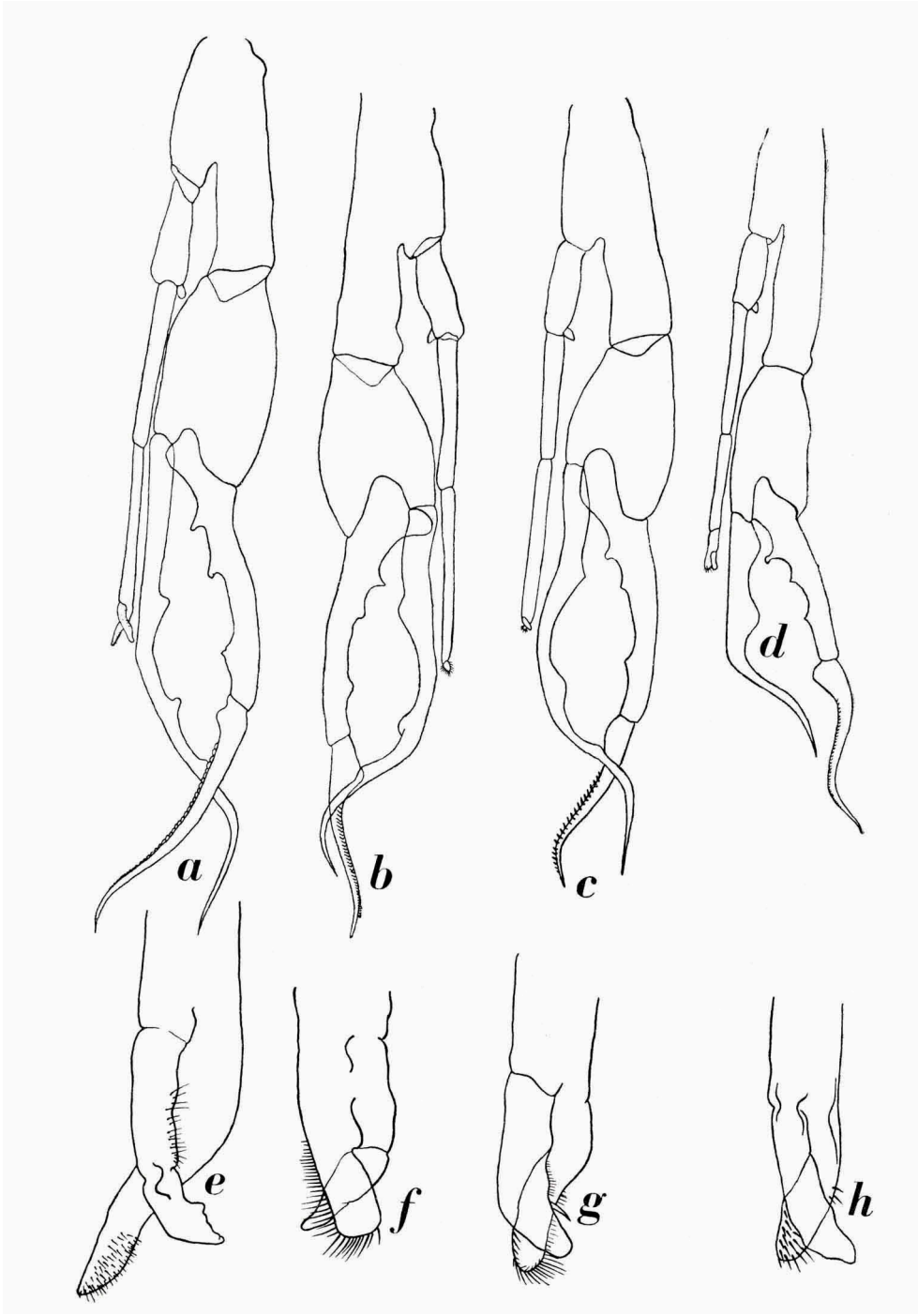

Fig. 9. a, e, 5th pair of legs and terminal part of the left 5th leg of *Euchirella messinensis* (Claus, 1863), adult ♂ from the Siboga collection. b, f, the same appendages of *Euchirella indica* nov. spec., adult ♂ from the Siboga collection. c, g, the same appendages of *Euchirella bella* Giesbrecht, 1888, adult ♂ from Sta. 154*. d, h, the same appendages of *Euchirella pulchra* (Lubbock, 1856), adult ♂ from the Siboga collection. a-d, × 60; e-h, × 175.

textfig. 13 f). The appearence of the claw on the left 5th leg depends on the angle from which this appendage is seen and on the position of the short, 3rd exopodal joint.

Localities. Sta. 74 (Celebes Sea, 4° 21'.5 N, 120° 01'.0 E); Sta. 79 (Moluccan Sea, 1° 52'.0 N, 125° 41'.0 E); Sta. 97 (Arafoera Sea, 4° 49'.0 S, 133° 27'.0 E); Sta. 115 (Arafoera Sea, 8° 51'.5 S, 129° 01'.5 E); Sta. 127 (Timor Sea, 10° 49'.5 S, 123° 59'.0 E); Sta. 154* (Sawoe Sea, 10° 26'.5 S, 122° 28'.0 E); Sta. 161* (Ombai Strait, 8° 45'.5 S, 123° 59'.5 E); Sta. 163 (Ombai Strait, 8° 51'.5 S, 124° 24'.5 E); Sta. 164* (Flores Sea, 7° 25'.0 S, 123° 20'.5 E); Sta. 175 (Flores Sea, 7° 47'.0 S, 118° 12'.0 E); Sta. 181* (Flores Sea, 8° 02'.5 S, 120° 13'.5 E); Sta. 197 (Flores Sea, 8° 00'.5 S, 121° 41'.0 E); Sta. 212 (Banda Sea, 3° 33'.0 S, 124° 32'.5 E); Sta. 241* (Banda Sea, 6° 45'.0 S, 128° 11'.0 E); Sta. 272* (Pacific Ocean, 4° 44'.0 N, 129° 17'.0 E).

The description is taken from a male collected at Sta. 154*. Another male of this species was found in the Siboga collection among specimens labelled "*Euchirella pulchra* (Lubbock)."

Euchirella pulchra (Lubbock, 1856) (figs. 9d, h)

Undina pulchra Lubbock, 1856, p. 26, pl. 4 figs. 5-8, pl. 7 fig. 6.

Localities: Sta. 22 (Indian Ocean, 3° 48'.0 N, 63° 48'.0 E); Sta. 49 (Celebes Sea, 1° 40'.0 N, 122° 02'.0 E); Sta. 64 (Sulu Sea, 7° 41'.0 N, 121° 01'.5 E); Sta. 82 (Obi Strait, 1° 14'.0 S, 128° 11'.5 E); Sta. 90 (Ceram Sea, 2° 50'.0 S, 131° 14'.5 E); Sta. 97 (Arafoera Sea, 4° 49'.0 S, 133° 27'.0 E); Sta. 113 (Arafoera Sea, 8° 17'.5 S, 129° 10'.5 E); Sta. 163 (Ombai Strait, 8° 51'.5 S, 124° 24'.5 E); Sta. 175 (Flores Sea, 7° 47'.0 S, 118° 12'.0 E).

The Snellius collection contains only females of this species, which vary in length between 2.90 and 3.55 mm. Females have been accurately figured by Sewell (1947, textfig. 16) and Sars (1925, pl. 20 figs. 5-7). A male specimen occurs in the Siboga collection, along with males of *E. messinensis, E. bella,* and females of *E. pulchra,* amongst specimens labelled "*Euchirella pulchra* (Lubbock)". This male specimen agress closely with Sewell's (1947, p. 80) description; a figure of the 5th legs of the Siboga specimen is reproduced here.

Euchirella venusta Giesbrecht, 1888 (fig. 10)

Euchirella venusta Giesbrecht, 1888, p. 336.

Adult stage. ♀, total length, 4.25-4.60 mm.

The proportional lengths of the cephalothorax and the abdomen are as

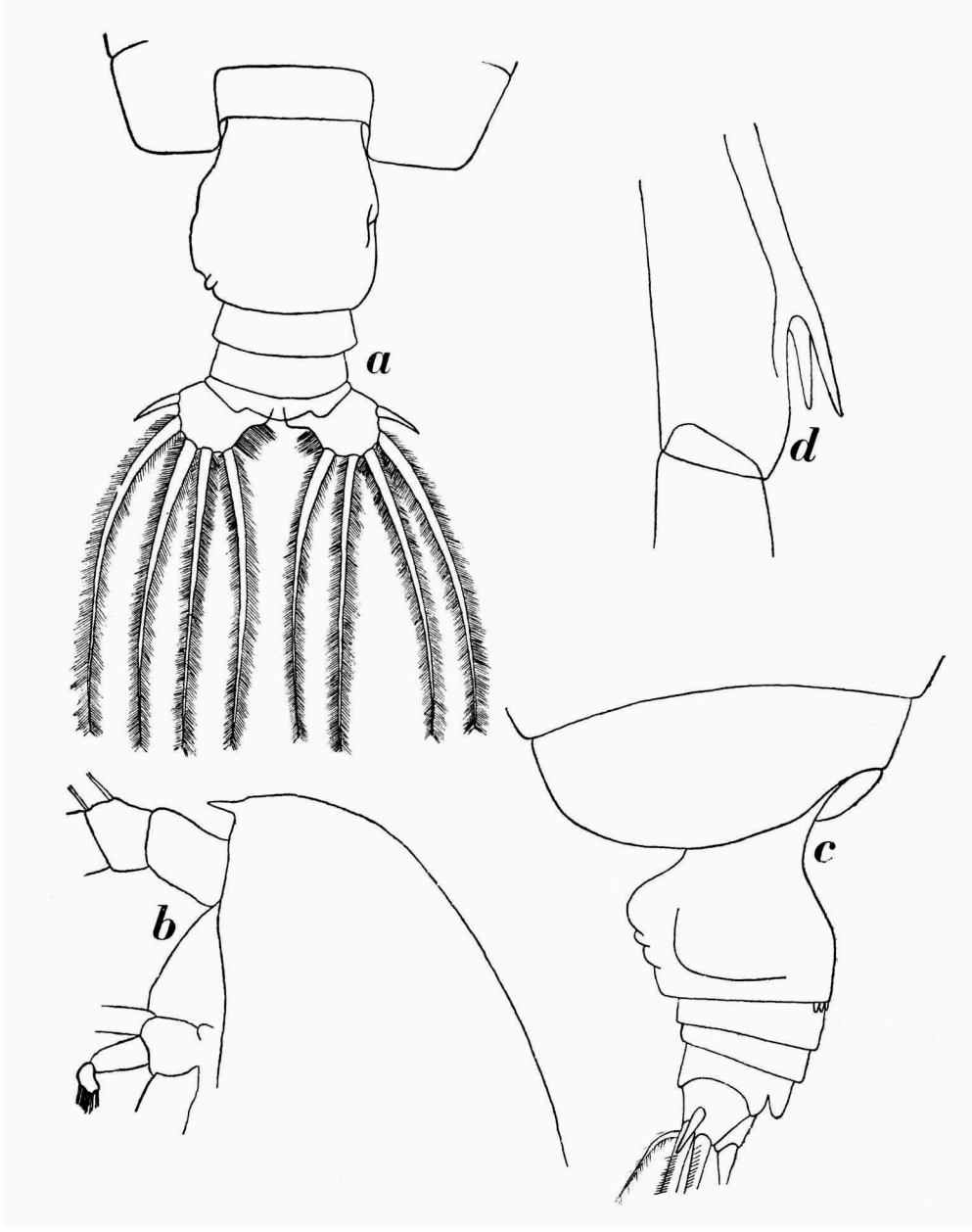

Fig. 10. *Euchirella venusta* Giesbrecht, 1888, adult ♀ from Sta. 112. a, abdomen in dorsal view; b, head in lateral view from the left side; c, abdomen in lateral view from the left side; d, basal portion of the 4th leg, showing the spines on the 1st basal point. a-c, × 50; d, × 115.

74 to 17.5, so that the length of the abdomen is contained 4.25 times in that of the anterior portion of the body.

The shape of the body is robust, resembling that of *Euchirella indica* (vide infra) very closely, but in lateral aspect the dorsal surface of the head appears to be more flattened.

The rostrum is distinct but small, it is one pointed and directed straightly downwards. The head and the 1st thoracic segment as well as the 4th and 5th thoracic segments are completely fused. In dorsal aspect the lateral thoracic margins are very obtuse, they appear to be cut off almost perpendicularly; in lateral view they are rounded.

The abdomen consists of 4 segments and the furca, that have the following proportional lengths:

segment	1 + 2	3	4	5	furca	
	55	12	11	7	15	= 100

The genital segment is distinctly as long as broad, slightly asymmetrical as the left side is somewhat produced and the right side has a small but distinct tubercle in the middle of its length. In lateral aspect the left side of the genital segment shows a distinct transverse groove, close to the distal margin. The genital swelling is more prominent than in *E. indica*. The 2nd abdominal segment and in some specimens also the 1st segment, are armed with a row of small, triangular spinules along the dorsal distal margin. The anal operculum on the last abdominal segment is distinct.

The rami of the furca are as long as wide, they bear 4 strong, plumose subequal setae; in addition there is an external, small seta and a curved ventral seta on each ramus. The internal margins of the rami are densely haired.

The 1st antenna reaches the middle of the genital segment. It consists of 24 free joints, the 8th and 9th joints are completely fused; the articulation between the 24th and 25th joints is very incomplete. The various joints have the following proportional lengths:

1	2	3	4	5	6	7	8 + 9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
49	42	21	19	21	21	21	37	24	28	27	47	50	66	68	72	65	70	61	49	48	42	38	14	= 1000

The 3rd, 7th, 8th-9th, 14th, 16th, 18th, 21st, 23rd, 24th and 25th joints each have an unusually thick seta, the last two joints each have two strong setae.

The 2nd antenna has a very small endopod, which does not reach the middle of the fused 1st-2nd joints of the exopod. The number of setae on this appendage is as in *E. messinensis* and *E. indica*; the internal lobe of the 2nd endopodal joint has 4, the external lobe 5 setae.

The mouth parts agree so closely with those of *E. messinensis* that a complete description of these appendages is unnecessary. The endopod of the mandible has 9 setae, the 2nd basal joint of the 1st maxilla has 3, the

endopod of that appendage 4 setae. The number of setae of the maxilliped is exactly as in *E. indica.*

The legs show small differences from those of *E. messinensis.* The exopod of the 1st pair is 2-jointed, the 2 marginal spines are smaller than those of *E. messinensis* and straight, the 1st spine is much stronger developed than the 2nd, which stands near the articulation of this joint with the terminal joint. The endspine of the terminal joint of the exopod of the 1st pair of legs is very distinct. The internal margin of the fused 1st-2nd joints of the exopod of that pair is fringed with hairs.

The endspine of the 3rd exopodal joint of the 3rd pair of legs has 18 spinules, that of the 4th pair 17 spinules. The endopod of the 2nd pair of legs is 1-jointed. The 1st basal joint of the 4th pair of legs has 2 nearly equal spines on the posterior surface near the internal margin, both reaching beyond the articulation between the two basal joints of that leg.

Localities: Sta. 74 (Celebes Sea, 4° 21′.5 N, 120° 01′.0 E); Sta. 80 (Moluccan Sea, 1° 06.′5 S, 126° 46′.5 E); Sta. 112 (Arafoera Sea, 8° 39′.0 S, 130° 35′.0 E); Sta. 127 (Timor Sea, 10° 49′.5 S, 123° 59′.0 E); Sta. 163 (Ombai Strait, 8° 51′.5 S, 124° 24′.5 E); Sta. 175 (Flores Sea, 7° 47′.0 S, 118° 12′.0 E); Sta. 197 (Flores Sea, 8° 00′.5 S, 121° 41′.0 E); Sta. 259* (Moluccan Sea, 0° 27′.5 S, 126° 54′.0 E); Sta. 268* (Pacific Ocean, 5° 46′.0 N, 126° 37′.0 E); Sta. 272* (Pacific Ocean, 4° 44′.0 N, 129° 17′.0 E); Sta. 300 (Celebes Sea, 4° 45′.0 N, 124° 31′.5 E).

Euchirella indica nov. spec. (figs. 8b, 9b, f, 11, 12a, b)

Euchirella messinensis A. Scott, 1909, p. 65.

Adult stage. ♀, total length, 4.25-5.05 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 75 to 17, so that the length of the abdomen is contained 4.41 times in that of the anterior part of the body.

The general shape of the body resembles *E. messinensis* (cf. Giesbrecht, 1892) and *E. orientalis* (cf. Sewell, 1929). In several respects it is intermediate between these two forms, especially with regard to the shape of the abdomen.

The outline of the cephalothorax is oblong-ovate, only slightly dilated in the oral region and somewhat contracted in front of that part. The frontal part of the head is depressed; the rostrum is very distinct, one pointed and directed straightly downwards. There is no trace of a crest. The head and the 1st thoracic segment as well as the 4th and 5th thoracic segments are fused. In lateral aspect the last thoracic segment appears to be smoothly rounded.

The abdomen consists of 4 free segments and the furca, that have the following proportional lengths: $\frac{\text{segment } 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{55 \quad 14 \quad 11 \quad 18 \quad 12 = 100}$. The genital segment is slightly longer than wide, in a proportion of 35 to 32.

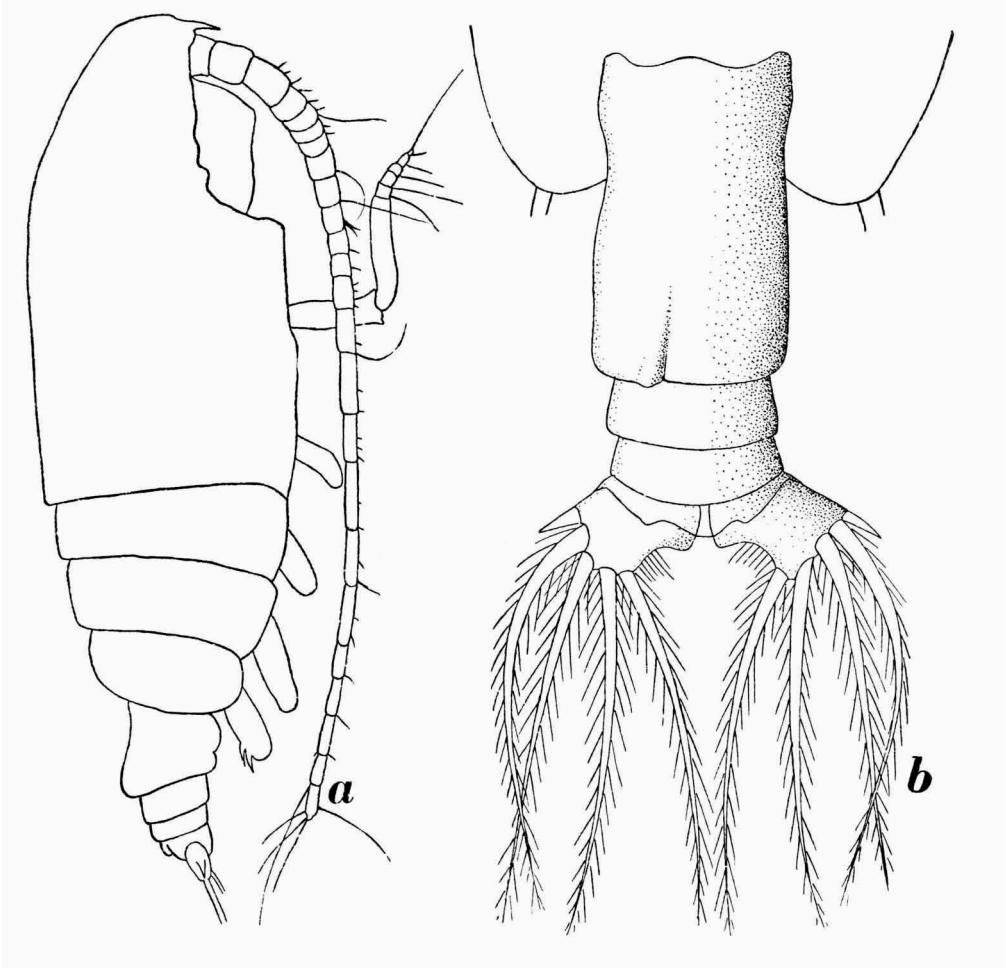

Fig. 11. *Euchirella indica* nov. spec., adult ♀ from Sta. 74. a, whole animal in lateral view from the right side; b, abdomen in dorsal view. a, × 30; b, × 55.

In dorsal aspect it is slightly asymmetrical, as it is produced on the left side. In lateral aspect the genital segment shows a distinctly produced part on the left dorsal side, forming a distinct elevation, reaching above the level of the other abdominal segments. The development of this produced part varies slightly in various specimens, but it always results in an asymmet-

rical deformation of the genital segment. Sometimes the sack-shaped protuberance on the left side extends slightly backwards, thus covering a very small portion of the 2nd abdominal segment.

The genital operculum is very distinct. The dorsal margin of the 2nd

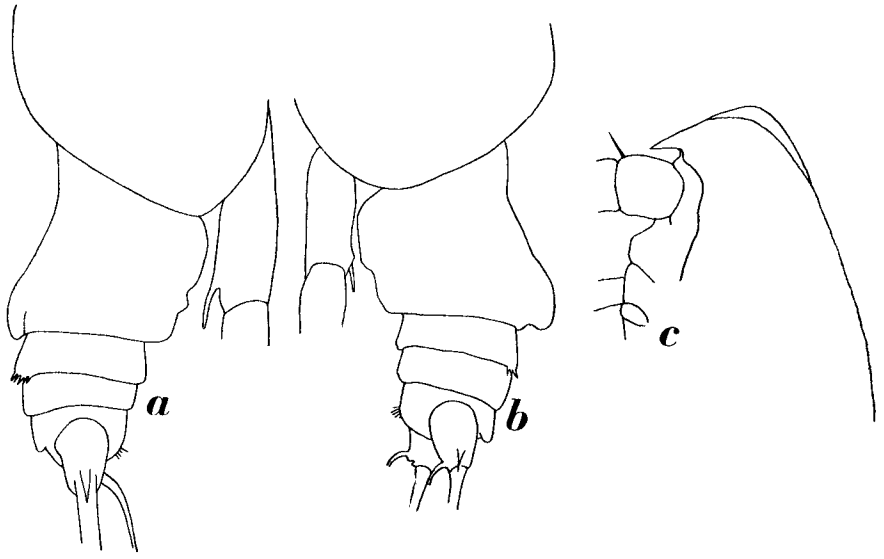

Fig. 12. a, b, *Euchirella indica* nov. spec., adult ♀ from Sta. 74. a, abdomen in lateral aspect from the right side; b, the same, lateral aspect from the left side. c, *Euchirella messinensis* (Claus, 1863), adult ♂ from Sta. 74, head in lateral view from the left side. a, b, × 45; c, × 25.

abdominal segment distally has a row of small, triangular spinules, the distal margins of the other abdominal segments are unarmed.

The furcal joints are as long as wide, carrying each 4 equal, plumose marginal setae, a short external and a curved ventral (internal) seta. The internal margins of the joints of the furca are densely haired.

The 1st antenna reaches the distal margin of the 2nd abdominal segment. It consists of 24 free joints, the 8th and 9th joints are completely fused, the segmentation between the 24th and 25th joints is very incomplete. The various joints have the following proportional lengths:

1	2	3	4	5	6
46	43	28	21	23	20

7	8 + 9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	
23	40	26	31	31	45	51	68	68	73	66	71	56	46	43	36	35	10	= 1000

The 3rd, 7th, 8th-9th, 14th, 18th, 21st, 24th and 25th joints each are provided with a strong seta, the 24th and 25th joints each have two.

The 2nd antennae and the mouth parts show a great resemble with those of *E. messinensis*, which are described in detail by Giesbrecht (1892). The

rami of the 2nd antenna are very unequal, the 2nd endopodal joint scarcely reaches the middle of the fused 1st-2nd exopodal joints. The number of setae on the 2nd antenna is as in *E. messinensis,* the 2nd endopodal joint has 4 setae on the internal and 5 setae on the external lobe, these setae are not, as in *E. messinensis,* plumose.

The endopod of the mandible has 9 setae.

The 1st maxilla has the exopod stronger than in *E. messinensis,* the setae on this lobe are much stronger too. The 2nd basal joint of the 1st maxilla has 3 setae, the endopod 4 setae. The number of setae on the maxilliped seems to be slightly different from that in *E. messinensis.* The 1st endopodal joint has 4, the 2nd 2, the 3rd 3, the 4th 3 and 1 external, and the 5th 3 and 1 external seta.

The legs agree in great lines with those of *E. messinensis.* The 1st pair of legs has a 2-jointed exopod; the 1st and 2nd joints are fused. The external margin of these fused joints has 2 rather strong spines, which are not curved as in *E. messinensis,* but straight; the 3rd exopodal joint has a straight, terminal spine. The endopod of the 1st pair of legs is 1-jointed, a row of small, hair like spinules is present along the knob like projection of this joint.

The 2nd pair of legs has a 3-jointed exopod and a 1-jointed endopod; the rami of the 3rd and 4th pairs are 3-jointed. The terminal spine of the 3rd exopodal joint of the 2nd pair has 19, of the 3rd 19, and of the 4th 17 spinules. The 1st basal joint of the 4th pair of legs has 2 strong, unequal spines on the posterior surface near the internal border; the shorter (internal) spine reaches the articulation between the two basal joints; the 2nd (outer) spine reaches beyond the articulation.

♂, total length, 3.40 mm.

The proportional lengths of the cephalothorax and the abdomen are as 54 to 16, the length of the abdomen is thus contained 3.38 times in that of the cephalothorax.

The general appearance of the male resembles the description of the male of *Euchirella orientalis* (cf. Sewell, 1947, p. 77), although there are some differences.

The cephalothorax is more slender than in the female, it is elongated and has a distinct but very low crest on the head, especially visible in lateral aspect. The rostrum is distinct and points straightly downwards.

The head and the 1st thoracic segment as well as the 4th and 5th thoracic segments are completely fused, the lateral thoracic margin is rounded. The abdomen consists of 5 free segments and the furca. The last (anal) segment is almost completely telescoped into the 4th abdominal segment. The distal

margins of the 2nd to 4th abdominal segments each have a row of small, triangular spinules along the dorsal part of these margins. The joints of the furca as long as wide. Each joint has 4 strongly plumose setae. As contrasted to the female the 2nd internal seta on each side is elongated, about twice as long as the other marginal setae. In addition there is a short external and a very thin and curved ventral seta on each ramus.

The 1st antenna reaches the proximal margin of the 3rd abdominal segment. The right antenna has 23 free joints, the left 24. On both sides the 8th and 9th joints are fused and the articulation between the 8th-9th and 10th, the 12h and 13th, the 14th and 15th and the 24th and 25th joints is more or less incomplete; on the right side the 20th and 21st joints are also fused. The various joints of the (right) 1st antenna have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10	11
49	38	18	20	20	23	24	37	24	26

12	13	14	15	16	17	18	19	20+21	22	23	24	25	
26	50	51	67	66	70	65	65	107	53	49	37	15	= 1000

The endopod of the 2nd antenna is much stronger developed in the male than in the female, it has about half the length of the exopod. The 1st and 2nd exopodal joints of this appendage are separated, the two lobes of the 2nd endopodal joint each have 6 setae.

The mouth parts are identical with those of *E. messinensis*.

The legs of the male differ in several respects from those of the female. They show a great resemblance with those of *E. messinensis* and will be described below. The 1st pair of legs has a 2-jointed exopod, the proximal (1st-2nd) joint has one very small external spine near the articulation with the terminal joint, this last joint has a well developed terminal spine. The teeth on the terminal spine of the 3rd exopodal joint of the 2nd pair of legs are small, their number is smaller than on the corresponding spine of *E. messinensis*; only 35 to 40 are present. There is a connecting basal lamella between them. The endopod of the 2nd pair of legs is 1-jointed.

The 5th pair of legs resembles that of *E. messinensis* closely, but there are small differences in the structure of the right exopodal and endopodal joints, as well as in the shape of the terminal portion of the left 5th leg. I failed to observe teeth along the internal margin of the 1st exopodal joint of the right 5th leg, as normally present in *E. messinensis*. These teeth, however, are present in some males from the Siboga collection which I have referred to the present species. The exo- and endopodal joints have about the same length as the basal portion; the distal margin of the left leg reaches about the middle of the 1st-2nd right exopodal joints.

Localities: Sta. 74 (Celebes Sea, 4° 21'.5 N, 120° 01'.0 E); Sta. 105 (Arafoera Sea, 6° 59'.5 S, 132° 26'.5 E); Sta. 112 (Arafoera Sea, 8° 39'.0 S, 130° 35'.0 E); Sta. 115 (Arafoera Sea, 8° 51'.5 S, 129° 01'.5 E); Sta. 127 (Timor Sea, 10° 49'.5 S, 123° 59'.0 E); Sta. 147* (Indian Ocean, 9° 43'.5 S, 118° 06'.0 E); Sta. 163 (Ombai Strait, 8° 51'.5 S, 124° 24'.5 E); Sta. 175 (Flores Sea, 7° 47'.0 S, 118° 12'.0 E); Sta. 192 (Flores Sea, 5° 58'.0 S, 121° 32'.0 E); Sta. 212 (Banda Sea, 3° 33'.0 S, 124° 32'.5 E); Sta. 236* (Banda Sea, 5° 57'.0 S, 129° 56'.5 E); Sta. 268* (Pacific Ocean, 5° 46'.0 N, 126° 37'.0 E); Sta. 272* (Pacific Ocean, 4° 44'.0 N, 129° 17'.0 E); Sta. 300* (Celebes Sea, 4° 45'.0 N, 124° 31'.5 E).

The type specimen is a female from Sta. 74, the description of the male has been taken from a specimen collected by the Snellius expedition at Sta. 147*. *Euchirella indica* approaches *E. messinensis* rather closely, but differs by the structure of the abdomen in the female and the shape if the 5th pair of legs in the male. All Siboga specimens recorded by Scott (1909) as *Echirella messinensis* (Claus) belong to *Euchirella indica* (9 females and 3 males). Another female of *E. indica* was traced amongst specimens from the Siboga collection labelled "*Euchirella venusta* Giesbrecht".

Euchirella messinensis (Claus, 1863) (figs. 9a, e, 12c)

Undina messinensis Claus, 1863, p. 187, pl. 31 figs. 8-18.

Localities: Sta. 74 (Celebes Sea, 4° 21'.5 N, 120° 01'.0 E); Sta. 79 (Moluccan Sea, 1° 52'.0 N, 125° 41'.0 E); Sta. 112 (Arafoera Sea, 8° 39'.0 S, 130° 35'.0 E).

The Snellius collection contains males only, which vary in length between 3.90 and 4.65 mm. As stated above, all Siboga specimens recorded by Scott (1909) as *Euchirella messinensis* belong to *E. indica*. The only specimens referable to *E. messinensis* in the Siboga collection are three males from a tube labelled "*Euchirella pulchra* (Lubbock)". The head and the 5th pair of legs of one of these specimens has been figured here.

Euchirella intermedia With, 1915 (fig. 13)

Euchirella venusta p.p. A. Scott, 1909, p. 57.

Euchirella intermedia With, 1915, p. 124, pl. 4 fig. 4, pl. 8 fig. 3, textfig. 32.

Localities: Sta. 112 (Arafoera Sea, 8° 39'.0 S, 130° 35'.0 E); Sta. 127 (Timor Sea, 10° 49'.5 S, 123° 59'.0 E); Sta. 163 (Ombai Strait, 8° 51'.5 S, 124° 24'.5 E); Sta. 263* (Ombai Strait, 8° 51'.5 S, 124° 24'.5 E).

The Snellius specimens vary in length from 5.55 to 6.05 mm. Another female from East Indian waters was found between specimens of *Euchirella venusta* in the Siboga collection.

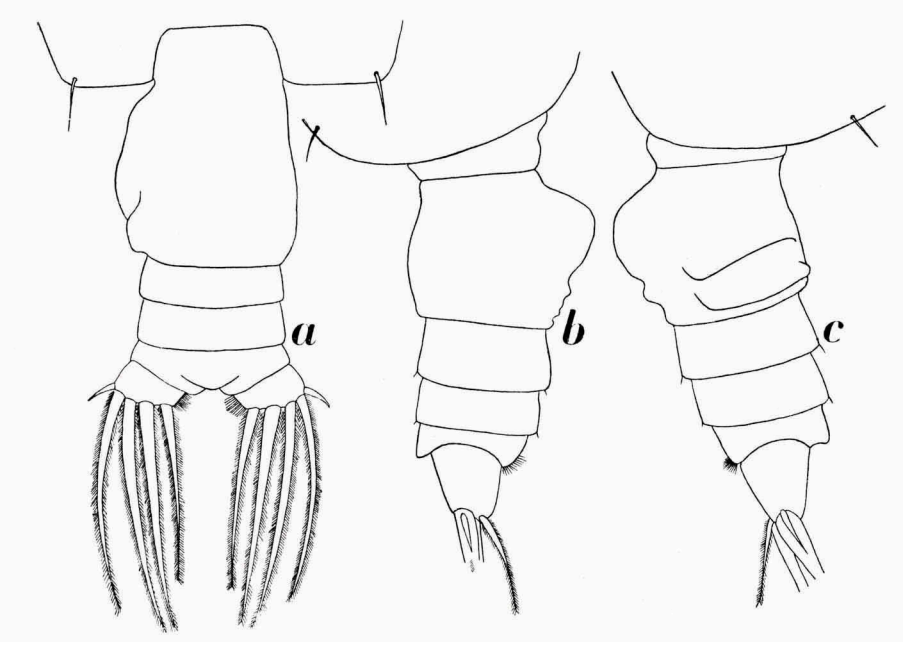

Fig. 13. *Euchirella intermedia* With, 1915, adult ♀ from the Siboga collection. a, abdomen in dorsal view; b, the same, lateral aspect from the right side; c, the same. lateral aspect from the left side. × 40.

Euchirella formosa nov. spec. (figs. 14, 15)

Adult stage. ♀, total length, 5.10-5.20 mm.

The proportional lengths of the cephalothorax and the abdomen are as 86 to 17, so that the length of the abdomen is contained 5.06 times in that of the anterior portion of the body.

The general shape of the body resembles *E. intermedia,* but differs distinctly by the appearance of the abdomen. The cephalothorax is elongated in outline, in dorsal aspect it is robust, as the frontal part of the head is somewhat obtuse; in lateral aspect the frontal part of the head appears to be gently rounded, although the dorsal part shows a slight depression. There is no trace of a crest on the head.

The rostrum is very strong, of the usual type, pointing straightly downwards. The frontal organ is distinct, in dorsal view it is visible as a pair of minor knobs.

The head and the 1st thoracic segment as well as the 4th and 5th thoracic segments are completely fused. In lateral aspect the margin of the last thoracic segment appears to be rounded, in dorsal aspect the lateral corners are cut off rectangularly, with two hairs on each side.

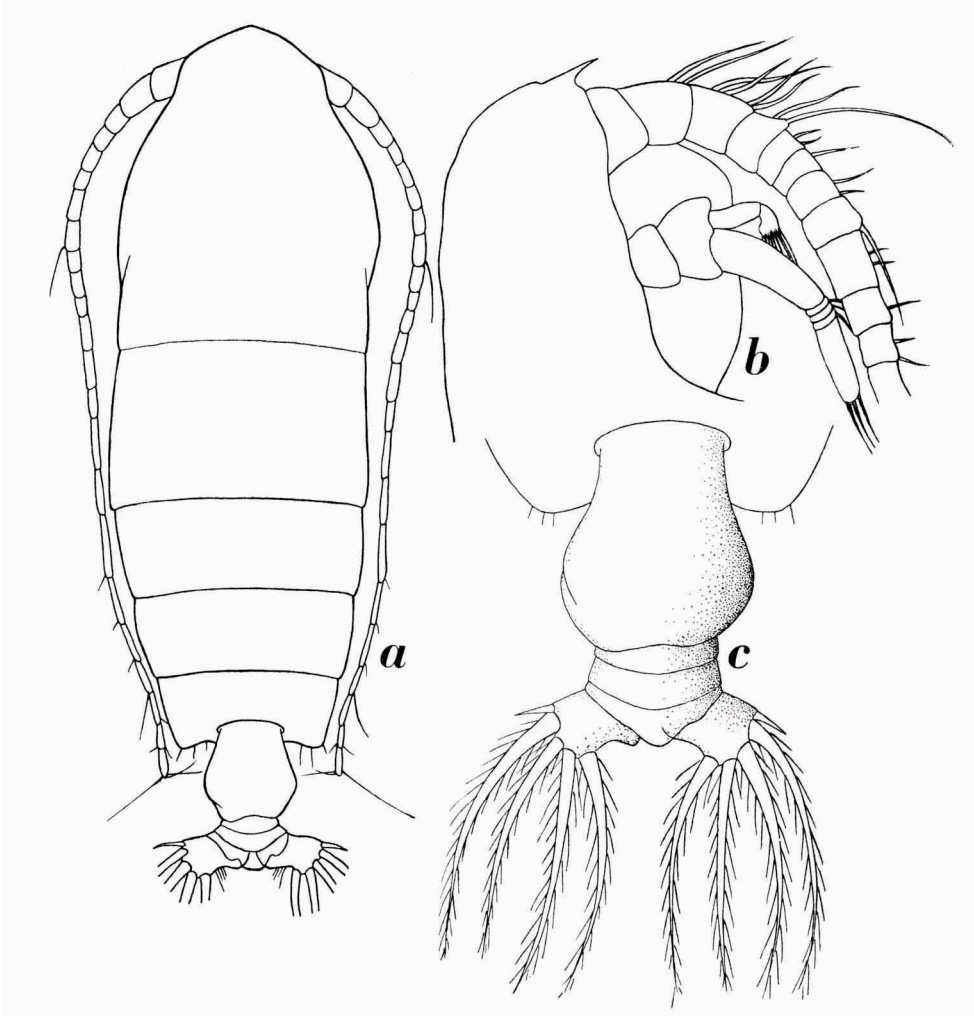

Fig. 14. *Euchirella formosa* nov. spec., adult ♀ from Sta. 127. a, whole animal in dorsal view; b, head in lateral view from the right side; c, abdomen in dorsal aspect. a, × 25; b, × 40; c, × 45.

The abdomen consists of 4 free segments and the furca, that have the following proportional lengths: $\frac{\text{segment}\ 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{55 \quad 10 \quad 11 \quad 10 \quad 14 = 100}$. The genital segment is about as long as wide, in dorsal aspect asymmetrical, as it is more produced on the left side. There are two distinct sack shaped protuberances visible in dorsal view on the left side, the distal protuberance covers the beginning of the 2nd abdominal segment. On the right

side the genital segment is produced into a rounded swelling. In lateral aspect the left side of the genital segment shows the two protuberances very distinctly, they project above the level of the other abdominal segments. The genital swelling is very distinct. The 2nd abdominal segment has one row of triangular, leaf like spinules on the dorsal part of the distal margin.

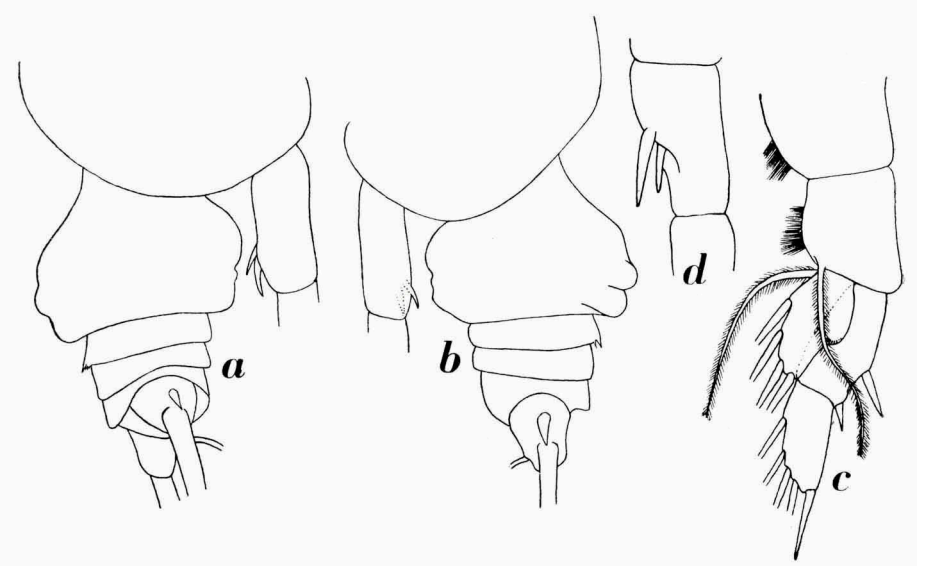

Fig. 15. *Euchirella formosa* nov. spec., adult ♀ from Sta. 127. a, abdomen in lateral view from the right side; b, the same, lateral view from the left side; c, 1st leg; d, basal portion of the 4th leg, showing the spines on the 1st basal joint. a, b, × 45; c, d, × 75.

The joints of the furca are as long as wide; they each have the usual 4 strong, plumose, subequal setae, a short external seta and a curved ventral (internal) seta. The internal margin of the furcal joints is densely haired.

The 1st antenna reaches the distal margin of the 1st abdominal segment. It consists of 24 free joints, that have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10	11	12	13	14	15	16	17	18	19	20	21
45	42	22	19	21	23	23	44	31	31	31	48	55	68	74	77	65	73	52	40

22	23	24	25	
39	35	29	13	= 1000

. The 8th and 9th joints of the 1st antenna are completely fused, the jointing between the 24th and 25th joints is more or less incomplete. The 3rd, 7th, 8th-9th, 14th, 18th, 21st, 24th and 25th joints each are provided with a very strong seta, the last two joints each have two setae.

The 2nd antenna has a very small endopod, distinctly shorter than half

the length of the fused 1st-2nd joints of the exopod. The internal lobe of the 2nd endopodal joint has 4, the external lobe 5 setae.

The mouth parts agree closely with those of *Euchirella messinensis* and *E. intermedia*; the external margin of the 2nd basal joint of the maxilliped has two very distinct elevations or lobes. The endopod of this appendage is damaged in the Snellius specimens, so that I could not observe the accurate number of setae.

The legs resemble those of *E. messinensis*. The 1st pair has a 2-jointed exopod and a 1-jointed endopod, the fused 1st and 2nd exopodal joints have 2 external spines, which are straight and diverge from the joint. The first spine is stronger than the second, which is placed close to the articulation with the terminal joint. The last exopodal joint has a strong and straight terminal spine. The endopod of the 2nd pair of legs is 1-joined. The number of teeth of the terminal spine on the 3rd exopodal joint of the 2nd pair of legs is 20, on the 3rd pair 20 and on the 4th pair 18. The last basal joint of the 4th pair of legs has two unequal spines, the internal spine is longer than the other, reaching the articulation of the 1st and 2nd basal joints.

Localities: Sta. 127 (Timor Sea, 10° 49'.5 S, 123° 59'.0 E); Sta. 310* (Makassar Strait, 0° 44'.5 S, 118° 26'.5 E).

The type specimen is a female from the Snellius collection, Sta. 127, which has a length of 5.20 mm. *Euchirella formosa* resembles *E. intermedia* in some respects, but differs fundamentally in the shape of the genital segment of the abdomen.

Euchirella galeata Giesbrecht, 1888 (fig. 16)

Euchirella galeata Giesbrecht, 1888,. p. 336.

Adult stage ♀, total length, 5.20-5.90 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 93 to 21, so that the length of the abdomen is contained 4.43 times in that of the anterior portion of the body.

The general shape of the body is robust, although elongated in outline. The head has a very distinct helmet shaped crest (cf. Giesbrecht, 1892, pl. 36 fig. 26), the dorsal part of the cephalothorax is slightly vaulted in dorsal aspect, the rostrum is distinct and points straightly downwards.

The head and the 1st thoracic segment as well as the 4th and 5th thoracic segments are completely fused. In dorsal aspect the lateral thoracic margin is cut off almost rectangularly (cf. Sewell, 1929, textfig. 41 a), with 2 hairs on each side; in lateral view the margin of the last thoracic segment is rounded.

The abdomen consists of 4 free segments and the furca, that have the

following proportional lengths: $\frac{\text{segment}\ \ 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{47 \quad 14 \quad 12 \quad 9 \quad 18 = 100}$. The genital segment is very asymmetrical, distinctly broader than long, much produced on the left side, flattened on the right side. In lateral aspect there

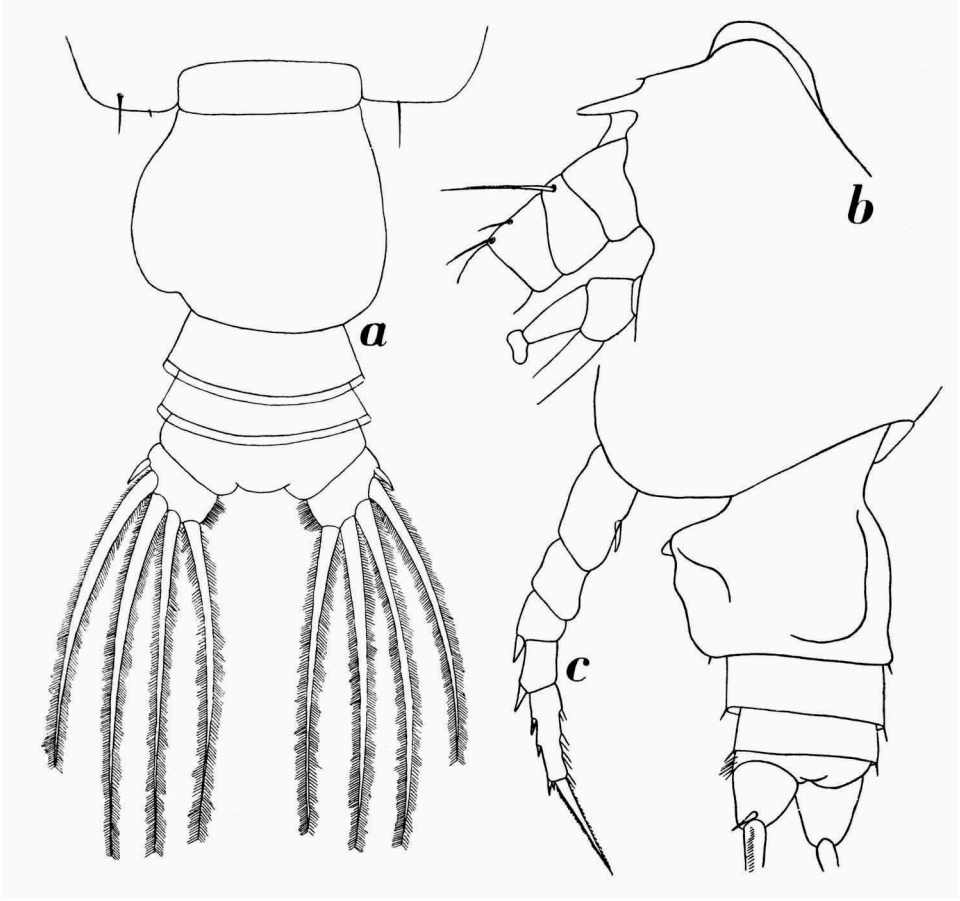

Fig. 16. *Euchirella galeata* Giesbrecht, 1895, adult ♀ from the Siboga collection. a, abdomen in dorsal view; b, head in lateral view from the left side; c, abdomen in lateral view from the left side. × 45.

is no dorsally produced tubercle on the genital segment. The swelling on the left lateral side of the genital segment has a characteristic shape, it is rounded and much produced distally (cf. Sewell, 1929, textfig. 41a). The genital swelling is distinct and prominent. The dorsal margins of the 1st to 3rd abdominal segments are armed with a row of small, leaf like spinules.

The furcal joints are as long as wide, with 4 equal, plumose setae, a

short, external seta and a curved ventral seta. The internal margin of the furcal joints is densely haired.

The 1st antenna reaches the distal margin of the 3rd abdominal segment. It consists of 24 free segments, that have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10	11	12	13	14	15	16	17	18	19	20	21	22
38	41	23	20	26	27	26	44	29	32	32	53	54	70	72	78	64	67	53	41	37

23	24	25	
32	29	12	= 1000

. The 8th and 9th joints of the 1st antenna are completely fused, the articulation between the 24th and 25th joints is partly developed. The arrangement of the setae is as in *E. venusta.*

The endopod of the 2nd antenna is about half as long as the fused 1st-2nd joints of the exopod. The 1st endopodal joint is short and plump, the 2nd joint has 6 setae on each of its lobes.

The mouth parts are almost identital with those of *E. messinensis,* the 1st maxilla has 3 setae on the 2nd basal joint and 4 on the endopod; the maxilliped has on the 1st joint of the endopod 4, on the 2nd 3, on the 3rd 2, on the 4th 3 and 1 external, and on the 5th 4 setae.

The legs agree with those of *E. messinensis* in great lines. The 1st pair is as figured by Sewell (1929, textfig. 41d). The endopod of the 2nd pair is 1-jointed. On the terminal spine of the exopod of the 2nd pair there are 21 teeth, on the 3rd pair 20 and on the 4th pair 19. The 1st basal joint of the 4th pair of legs has a distinct spine in all specimens, which does not reach the articulation between the two basal joints.

Localities: Sta. 22 (Indian Ocean, 3° 48'.0 N, 63° 48'.0 E); Sta. 66 (Sulu Sea, 6° 35'.5 N, 120° 02'.0 E); Sta. 74 (Celebes Sea, 4° 21'.5 N, 120° 01'.0 E); Sta. 80 (Moluccan Sea, 1° 06'.5 S, 126° 46'.5 E); Sta. 90 (Ceram Sea, 2° 50'.0 S, 131° 14'.5 E); Sta. 112 (Arafoera Sea, 8° 39'.0 S, 130° 35'.0 E); Sta. 163 (Ombai Strait, 8° 51'.5 S, 124° 24'.5 E); Sta. 175 (Flores Sea, 7° 47'.0 S, 118° 12'.0 E); Sta. 192 (Flores Sea, 5° 58'.0 S, 121° 32'.0 E); Sta. 197 (Flores Sea, 8° 00'.5 S, 121° 41'.0 E); Sta. 212 (Banda Sea, 3° 33'.0 S, 124° 32'.5 E); Sta. 268* (Pacific Ocean, 5° 46'.0 N, 126° 37'.0 E); Sta. 272* (Pacific Ocean, 4° 44'.0 N, 129° 17'.0 E); Sta. 300* (Celebes Sea, 4° 45'.0 N, 124° 31'.5 E).

The Snellius specimens agree with Sewell's (1929, p. 110) description, but differ from Giesbrecht's account of East-pacific specimens by the shape of the abdomen. It is possible that the Indian and East-pacific form of *E. galeata* will prove to be specifically distinct, but as the latter specimens have not yet been sufficiently described, it seems advisably to leave this question undecided at present. Sewell (1929, 1947) considers *Euchirella bitumida* With, 1915, as the Atlantic form of *Euchirella galeata. E.*

bitumida occurs in the Snellius collection and appears to be quite different from *E. galeata*; Sewell's suggestion, therefore, seems to be extremely doubtful. I consider *E. bitumida* as a valid species and have given a description of the Snellius specimen below. Specimens of *Euchirella galeata* also occur in the Siboga collection; a female from this collection has been figured here.

Euchirella bitumida With, 1915 (fig. 17)

Euchirella bitumida With, 1915, p. 131, pl. 5 fig. 9, pl. 8 fig. 4, textfig. 34.

Adult stage. ♀, total length, 6.15 mm.

The proportional lengths of the cephalothorax and the abdomen are as 100 to 23, so that the length of the abdomen is contained 4.35 times in that of the anterior part of the body.

The shape of the body resembles *E. galeata* in several respects, but in dorsal view the shape of the head is distinctly triangular. In lateral aspect a distinct and high crest appears to be present on the frontal part of the head, which differs in shape from that of *E. galeata,* as it distinctly protrudes forwards (cf. Sars, 1925, pl. 21). The rostrum is distinct and points straightly downwards.

The head and the 1st thoracic segment, as well as the 4th and 5th thoracic segments, are fused. In dorsal view the lateral thoracic margins are cut off almost rectangularly, in lateral aspect they are smoothly rounded, with 2 hairs on each side.

The abdomen consists of 4 free segments and the furca, that have the following proportional lengths: $\frac{\text{segment}\ \ 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{52 \quad 15 \quad 13 \quad 6 \quad 14 = 100}$. The genital segment is about as long as wide and asymmetrical, it is more produced on the right side than on the left. Both lateral sides show a rounded tubercle, with is stronger developed on the right side than on the left. When the genital segment is seen from the left lateral side, the tubercle appears to be sack shaped, beginning at about the middle of the segment and produced backwards and upwards. On the right side the tubercle is also sack shaped and produced dorsally and distally. The tubercle on the left side does not strongly deform the shape of the genital segment; the tubercle on the right side gives the genital segment a very asymmetrical appearance. Both dorsal, elevated parts of the right and left tubercle are connected, so that a rounded ridge is present on the dorsal surface of the genital segment. The distal margins of the 1st to 3rd abdominal segments are armed on their dorsal part with a row of leaf like spinules.

The furcal joints are as long as wide, each wich 4 long, densely plu-

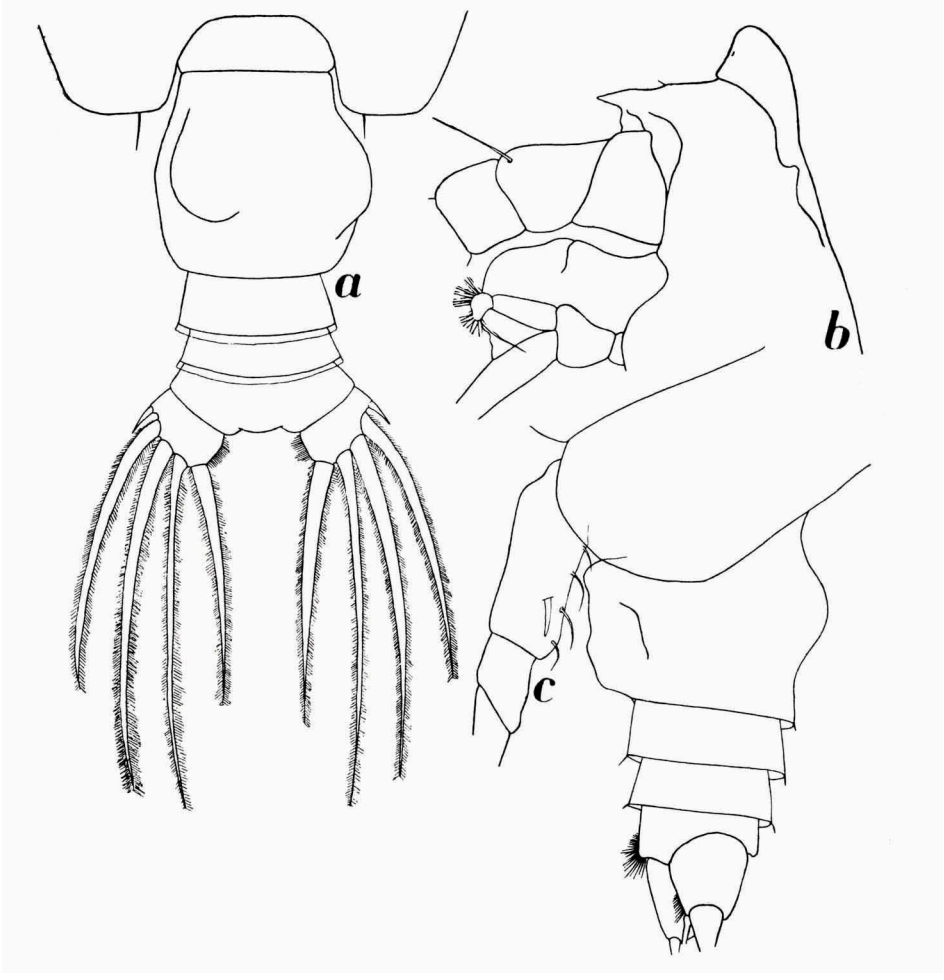

Fig. 17. *Euchirella bitumida* With, 1915, adult ♀ from Sta. 175. a, abdomen in dorsal view; b, head in lateral view from the left side; c, abdomen in lateral aspect from the left side. × 45.

mose setae, 1 short external seta and a curved, ventral seta. The 2nd outer seta on the left side is about 1.5 times as long as the other setae. The internal margin of the furcal rami is set with hairs.

The 1st antenna scarcely reaches the distal margin of the genital segment, when not folded against the body it reaches the middle of that segment. It consists of 24 free joints, that have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10	11	12	13	14	15	16	17	18	19
41	47	27	21	23	22	25	41	30	33	30	49	49	64	62	71	60	66

$\frac{20\ 21\ 22\ 23\ 24\ 25}{57\ 47\ 47\ 40\ 37\ 11 = 1000}$. The 8th and 9th joints are fused, the 24th and 25th are partly separated. The arrangement of the setae is as in *E. messinensis* and *E. venusta.*

The endopod of the 2nd antenna is distinctly longer than in *E. galeata*; it has about half the length of the fused 1st and 2nd exopodal joints. The 1st endopodal joint is slender, the 2nd joint has 6 setae on each of its lobes. The mouth parts agree with those of *E. messinensis* and were not studied in detail.

The legs resemble those of *E. galeata* very closely. The 1st pair of legs has the 2nd external spine of the fused 1st-2nd joints stronger than the 1st. The endopod of the 2nd pair is 1-jointed. The external margin of the end spine on the 3rd exopodal joint of the 2nd pair has 18 teeth, of the 3rd pair 20, and of the 4th pair 20. The 1st basal joint of the 4th pair has a strong, somewhat curved spine, which does not reach the articulation between the two basal joints of that pair.

Locality: Sta. 175 (Flores Sea, 7° 47'.0 S, 118° 12'.0 E).

Pseudochirella obtusa (G. O. Sars, 1905) (fig. 21c)

Undeuchaeta obtusa Sars, 1905, pp. 4, 13.

Adult stage. ♂, total length, 4.80 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 70 to 15, so that the length of the abdomen is contained 4.67 times in that of the anterior part of the body.

The general shape of the body resembles closely the male of *Pseudochirella notacantha* Sars, 1905 (cf. Sars, 1925, p. 87, pl. 24 figs. 10-12); the body is more slender than in the female, there is no trace of a crest on the head.

The head and 1st thoracic segment are partly fused, a line of separation is visible on the dorsal surface only; the 4th and 5th thoracic segments are separated. The frontal part of the head is rounded in lateral aspect, the rostrum is distinct and points downwards. The lateral thoracic margin is rounded and completely devoid of spines.

The abdomen consists of 5 free segments and the furca, that have the following proportional lengths: $\frac{\text{segment}\quad 1\quad 2\quad 3\quad 4\quad 5\quad \text{furca}}{14\ 26\ 22\ 21\ 4\ 13 = 100.}$. The 5th abdominal segment is almost completely telescoped into the 4th abdominal segment, the distal borders of the 2nd and 3rd abdominal segments have a row of small, triangular spinules. The joints of the furca are about as long as wide, the arrangement of the setae is as in the female;

they are broken in the present specimen. The 1st antennae too are broken near the base on both sides.

The endopod of the 2nd antenna has $^3/_5$ the length of the exopod, the 2nd endopodal joint has 5 setae on the internal and 6 on the external lobe. The mouth parts and legs agree with those of the female; there are no spines on the basal joints of the 4th pair of legs.

The 5th pair of legs resembles the condition found in *P. notacantha,* but differs in the proportional length and shape of the various joints. The 5th pair is biramose, the 1st basal joints of both sides are partly fused, the 2nd basal joints are swollen and have about the same length. The left exopod is 3-jointed, the joints are short and swollen; the right exopod is 2-jointed, the joints are slender. The 2nd left exopodal joint has 3 strong, internal teeth, the 3rd left exopodal joint carries a patch of hairs near the apex. The endopods of the left and right side are 1-jointed.

Localities: Sta. 90 (Ceram Sea, 2°50'.0 S, 131°14'.5 E); Sta. 112 (Arafoera Sea, 8°39'.0 S, 130°35'.0 E); Sta. 115 (Arafoera Sea, 8°51'.5 S, 129°01'.5 E); Sta. 127 (Timor Sea, 10°49'.5 S, 123°50'.0 E); Sta. 175 (Flores Sea, 7°47'.0 S, 118°12'.0 E); Sta. 192 (Flores Sea, 8°51'.5 S, 121°32'.0 E); Sta. 197 (Flores Sea, 8°00'.5 S, 121°41'.0 E); Sta. 212 (Banda Sea, 3°33'.0 S, 124°32'.5 E).

The females in the Snellius collection vary in length from 5.25 to 6.45 mm, the male from which the description has been taken was collected at Sta. 212. I have also studied the specimens recorded by Scott (1909, p. 60) as *Euchirella dubia,* which appear to belong to the present species, as was already supposed by Sewell (1929, p. 131). As Scott's *Euchirella dubia* is a distinct *Pseudochirella* the trivial name *dubia* cannot be used for this form, as it is preoccupied by *Pseudochirella dubia* (G. O. Sars, 1905). The Siboga specimens (two females) have a densely haired abdomen, whereas the Snellius specimens show much variability in this characteristic, as haired, naked and intermediate specimens are present.

Pseudochirella bilobata nov. spec. (fig. 18)

Adult stage, ♀, total length, 5.05 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 82 to 24, so that the length of the abdomen is contained 3.42 times in that of the anterior portion of the body.

The general shape of the body resembles *Pseudochirella scopularis* (G. O. Sars, 1905) and *P. pustulifera* (G. O. Sars, 1905) (cf. Sars, 1925). The cephalothorax is elongated, dilated in the oral region and considerably

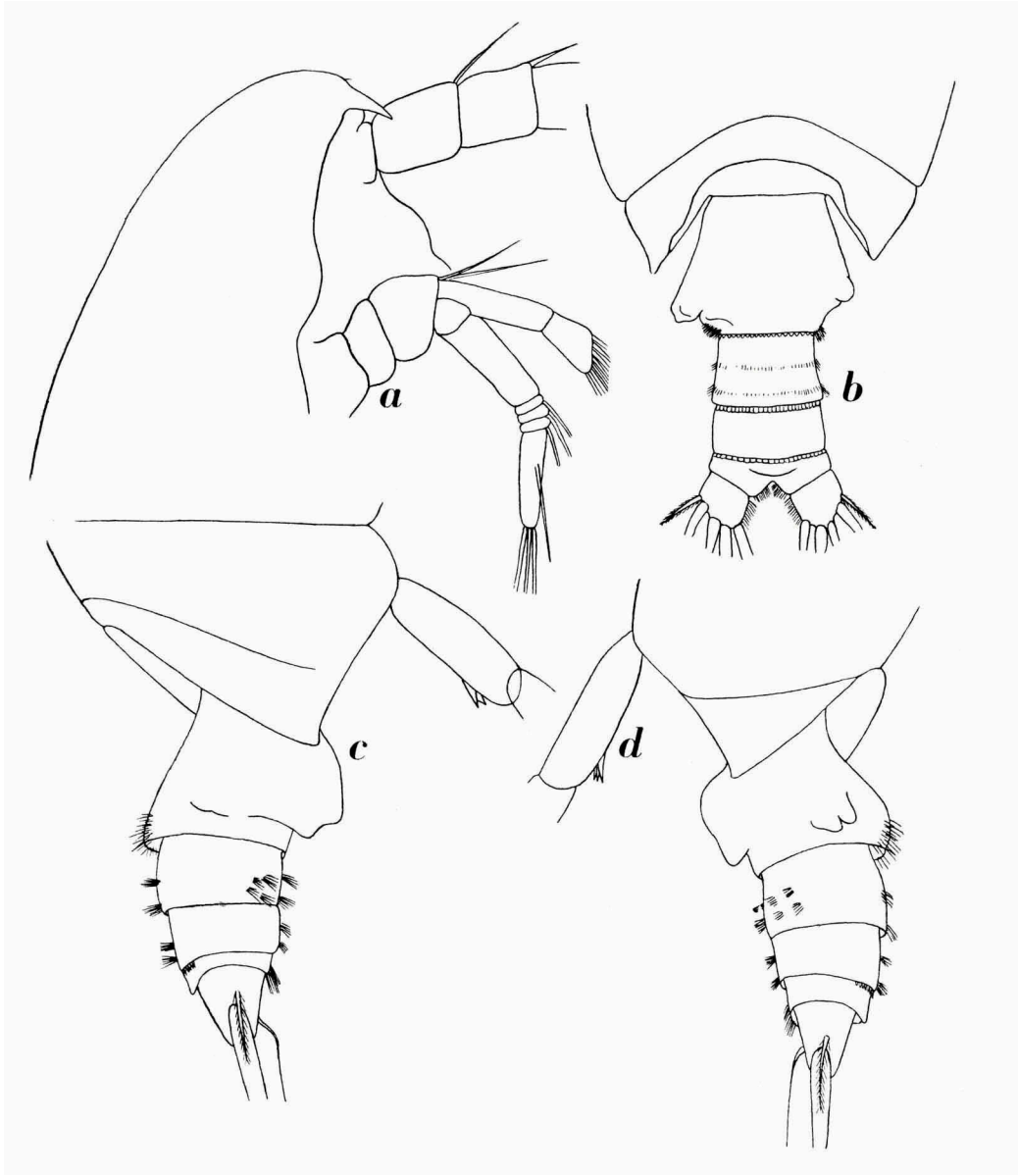

Fig. 18. *Pseudochirella bilobata* nov. spec., adult ♀ from Sta. 197. a, head in lateral view from the right side; b, abdomen in dorsal view; c, the same, lateral aspect from the right side; d, the same, lateral aspect from the left side. × 45.

contracted in front of that part; the frontal part of the head is very obtuse. In lateral aspect the head appears to be smoothly rounded, the rostrum is distinct and strong, pointing downwards and a little backwards.

The head and the 1st thoracic segment, as well as the 4th and 5th thoracic segments, are separated; the line separating these parts is only visible on the dorsal surface. The last thoracic segment is perfectly symmetrical in dorsal view, the lateral margin is almost triangular in lateral aspect and obtusely pointed.

The abdomen consists of 4 free segments, that have, with the furca, the following proportional lengths:

segment	1 + 2	3	4	5	furca	
	43	21	16	6	14	= 100

. The genital segment is distinctly broader than long and slightly asymmetrical. On both sides it has a sack shaped projection, directed upwards and backwards. On the left side the projection is more produced than on the right. In lateral aspect the dorsal surface of the genital segment appears to be highly vaulted, crowned with patches of long hairs. On the left side the swelling is distinctly visible in lateral aspect, when seen from the right side this swelling is much less pronounced. The genital segment has a huge genital swelling.

The distal borders of the 1st to 3rd abdominal segments are armed with a row of small, triangular spinules. There are patches of hairs too, especially on the dorsal and latero-ventral sides of these segments; the 4th abdominal segment only has a ventral patch of hairs.

The rami of the furca are as long as wide. The setae differ from the type usually found in *Pseudochirella* as the external (dorsal) seta is not thin but more or less spine like, as in the genus *Euchirella,* and almost entirely external, although more slender than usually found in *Euchirella.* In addition there are 4 strongly plumose, subequal setae and a curved internal seta on each joint. The internal margin of the furcal joints is densely haired.

The 1st antenna consists of 24 free joints, the 8th and 9th are completely, the 24th and 25th partly fused. It reaches the distal margin of the 1st abdominal segment; the various joints have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10	11	12	13	14	15	16	17	18	19
59	45	21	19	30	27	27	41	27	30	28	43	42	52	56	59	47	71

20	21	22	23	24	25	
64	42	59	59	42	10	= 1000

.

The endopod of the 2nd antenna is much shorter than in the other species of the genus *Pseudochirella,* it is nearly $^2/_5$ the length of the exopod. There are 8 setae on the internal and 7 on the external lobe of the 2nd endopodal joint. The 1st and 2nd exopodal joints are separated.

The mouth parts agree with those of *Pseudochirella obtusa* (G. O. Sars,

1905); there are 5 setae on the 2nd basal joint of the 1st maxilla and 15 on the endopod of this appendage.

The legs resemble those of *P. obtusa.* The exopod of the 1st pair is distinctly 3-jointed, the external spine of the 1st joint is slender, those of the 2nd and terminal joint have about the same length. That of the 1st joint is straight and reaches the base of that of the 2nd, which is placed at an angle with the joint. The endopod of the 2nd pair of legs is 2-jointed. The posterior surface of the 1st basal joint of the 4th pair of legs has 12 spines, shorter than in *P. obtusa,* but more slender and acute, such as have been figured for *P. divaricata* (G. O. Sars, 1905) and *P. palliata* (G. O. Sars, 1907) by Sars (1925, pl. 25 figs. 7, 10).

The terminal spines on the 3rd exopodal joints of the 2nd to 4th pairs of legs have a reduced number of very acute teeth. About 50 are present along the external margin; a much larger number usually occurs in the genus *Pseudochirella* (about 90). The teeth are very acute and differ from the obtuse, small teeth of other species of the present genus. The internal margin of these spines has a lamelliform row of hairs, smaller in this species than is usually found in *Pseudochirella.*

Locality: Sta. 197 (Flores Sea, 8° 00'.5 S, 121° 41'.0 E), one female (type specimen).

Pseudochirella gibbera nov. spec. (fig. 19)

Adult stage. ♀, total length, 5.50 mm.

The proportional lengths of the cephalothorax and the abdomen are as 98 to 23, so that the length of the abdomen is contained 4.26 times in that of the anterior part of the body.

The general shape of the body is as in *P. obtusa.* It is elongated in outline, distinctly dilated in the oral region. The frontal part of the head is obtuse, although distinctly more triangular than in *P. obtusa.*

The head and the 1st thoracic segment as well as the 4th and 5th thoracic segments are separated, the line separating the head and the 1st segment is less distinct than that between the other segments and only pronounced on the dorsal surface. In lateral aspect the head is smoothly rounded, with a strong and prominent, one pointed rostrum, which is directed straightly downwards.

The last thoracic segment is asymmetrical in dorsal view; the border is gently rounded on the left side, but broader and more flattened posteriorly on the right side, where a distinct, dorsally placed spine is present. In lateral view the last thoracic segment is produced, covering the beginning

of the genital segment, rounded on the left, with the distinct spine on the right side.

The abdomen resembles that of *P. pustilifera,* but the shape of the genital segment shows a great difference, as is easily seen from a compari-

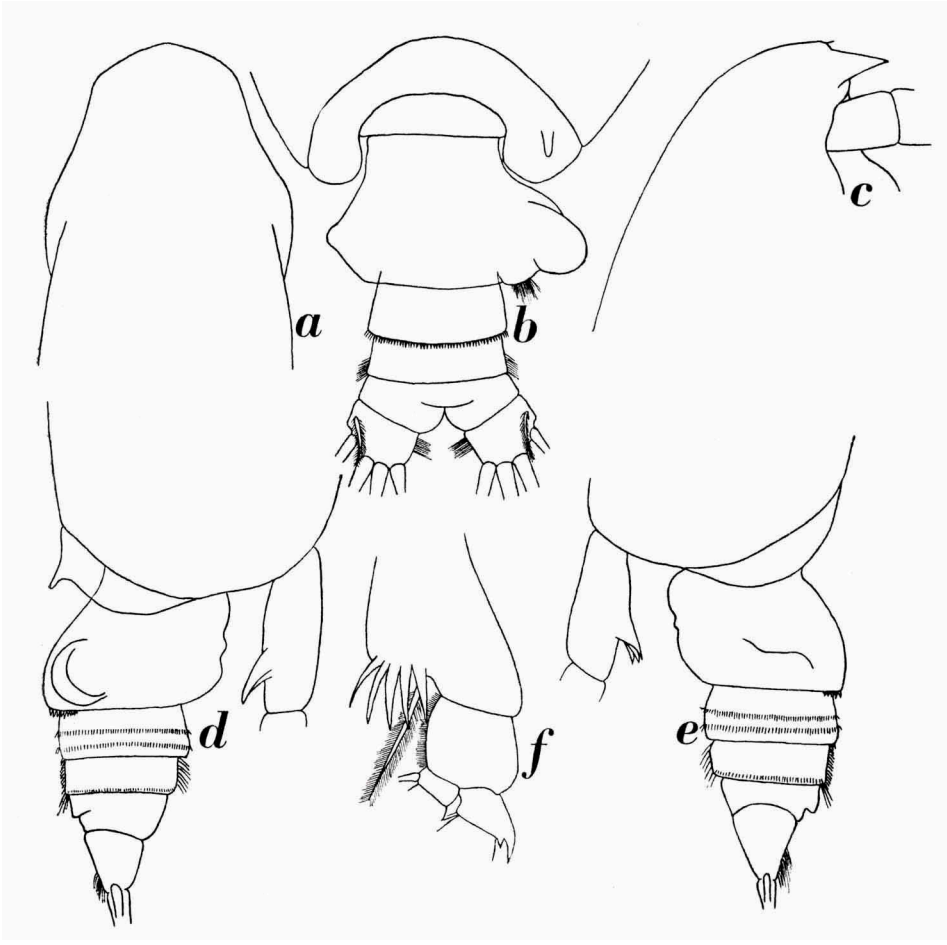

Fig. 19. *Pseudochirella gibbera* nov. spec., adult ♀ from Sta. 127. a, head in dorsal view; b, abdomen in dorsal view; c, head in lateral view from the right side; d, abdomen in lateral aspect from the right side; e, the same, lateral aspect from the left side; f, basal portion of the 4th leg showing the spines on the 1st basal joint. a, × 20; b-e, × 40; f, × 65.

son between the figure of the genital segment in this paper with those in Farran (1908), With (1915) and Sars (1925). There are 4 free abdominal segments and the furca, that have the following proportional lengths:

$\frac{\text{segment}\ \ 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{45 \quad 17 \quad 14 \quad 8 \quad 16 = 100}$. The genital segment is very asymmetrical, it is distinctly broader than long. In dorsal aspect it is produced on the right side into large, sack shaped tubercle, carrying a patch of hairs on the distal surface. On the left side there is also a sack shaped tubercle, but much less strongly developed than on the right side. The left side, when seen laterally, hardly shows any swelling; but the right side then shows its swelling very distinctly, protruding slightly above the dorsal surface of the segment. The dorsal part of the distal margin of the genital segment carries some small spinules. The 2nd abdominal segment has a row of spinules along the dorsal part of the distal border; in addition there are two rows of small, hair like spinules running more proximally on the segment, parallel with the distal row of stronger spinules. The 3rd abdominal segment only carries some patches of hairs on dorsal and ventral surface and a small row of fine spinules along the distal border. The anal operculum of the last abdominal segment is distinct.

The rami of the furca are about as long as wide. The internal margin and dorsal surface have dense patches of hairs. Each joint carries 4 strong, densely plumose setae, which are broken in the Snellius specimen, one very thin external (dorsal) seta and a curved ventral seta.

The 1st antenna is broken in the present specimen.

The endopod of the 2nd antenna has about half the length of the exopod; the number of setae on the 2nd endopodal joint could not be recognized; the 1st and 2nd exopodal joints are separated.

The mouth parts and legs are almost identical with those of *P. obtusa* and need no description in detail. The exopod of the 1st maxilla has 11 setae, the 1st outer lobe has 9 and the endopod 15 setae.

The 1st pair of legs has a 3-jointed exopod and a 1-jointed endopod. The 1st joint of the exopod has a densely plumose external seta, the 2nd a strong and straight external spine, directed posteriorly and reaching the base of the terminal spine of the 3rd joint, which in the specimen on both sides is broken.

The 2nd pair of legs has a 1-jointed endopod.

The endspines of the exopods of the 2nd to 4th pairs of legs have a large number ($\pm$ 60) of small, obtuse spinules along the external margin; the internal margin of the spines has the characteristic lamelliform row of hairs. The posterior surface of the 1st basal joint of the 4th pair of legs has 5 strong and very acute teeth, reaching the middle of the 2nd basal joint of that pair.

Locality: Sta. 127 (Timor Sea, 10° 49'.5 S, 123° 59'.0 E), one female (type specimen).

Pseudochirella semispina nov. spec. (fig. 20)

Adult stage. ♀, total length, 5.50-5.85 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 95 to 20, so that the length of the abdomen is contained 4.75 times in that of the anterior part of the body.

The general shape of the cephalothorax resembles *P. gibbera* nov. spec. very closely. It is elongated and slightly dilated in the oral region. The frontal part of the head is obtuse and somewhat triangular in outline.

The head and the 1st thoracic segment as well as the 4th and 5th thoracic segments are separated. The head is smoothly rounded in lateral aspect, with a strong rostrum, directed downwards.

The last thoracic segment is asymmetrical. The left side, when seen laterally, is smoothly rounded, but the right side is somewhat produced and has a distinct spine. This spine is situated dorsally and points downwards. The lateral border of the 5th thoracic segment is haired.

The abdomen consists of 4 free segments and the furca, that have the following proportional lengths: $\frac{\text{segment}\quad 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{44 \quad 22 \quad 15 \quad 8 \quad 11 = 100}$. The genital segment is as long as broad and distinctly symmetrical, in the middle of each lateral surface with a small and haired tubercle. The genital swelling is distinct. The distal margins of the abdominal segments are unarmed.

The rami of the furca are as long as wide, each with 4 strong, plumose setae of about the same length, 1 very thin external (dorsal) seta and a curved ventral seta. The internal margin of the rami is haired.

The 1st antenna reaches the middle of the abdomen. It consists of 24 free segments, the 8th and 9th joints are fused, the separation between the 24th and 25th is partly developed. The various joints have the following proportional lengths: $\frac{1 \quad 2 \quad 3 \quad 4 \quad 5 \quad 6 \quad 7 \quad 8+9 \quad 10 \quad 11 \quad 12 \quad 13 \quad 14 \quad 15 \quad 16}{49 \quad 46 \quad 28 \quad 26 \quad 30 \quad 29 \quad 24 \quad 57 \quad 30 \quad 36 \quad 35 \quad 43 \quad 44 \quad 51 \quad 48}$

$\frac{17 \quad 18 \quad 19 \quad 20 \quad 21 \quad 22 \quad 23 \quad 24 \quad 25}{53 \quad 59 \quad 56 \quad 53 \quad 43 \quad 51 \quad 55 \quad 43 \quad 11 = 1000}$.

The endopod of the 2nd antenna has about $^4/_5$ the length of the exopod. The internal lobe of the 2nd endopodal joint has 8, the external lobe 7 setae; the 1st and 2nd exopodal joints are separated.

The mouth parts resemble those of *P. obtusa* very much and are not described in detail here. The 2nd basal joint of the 1st maxilla has 5, the endopod 15 setae.

The legs are as in *P. obtusa*. The 1st pair has a 3-jointed exopod, the jointing between the first two exopodal joints is less complete. The external spine of the 1st joint is slender, of the 2nd joint very strong and of the

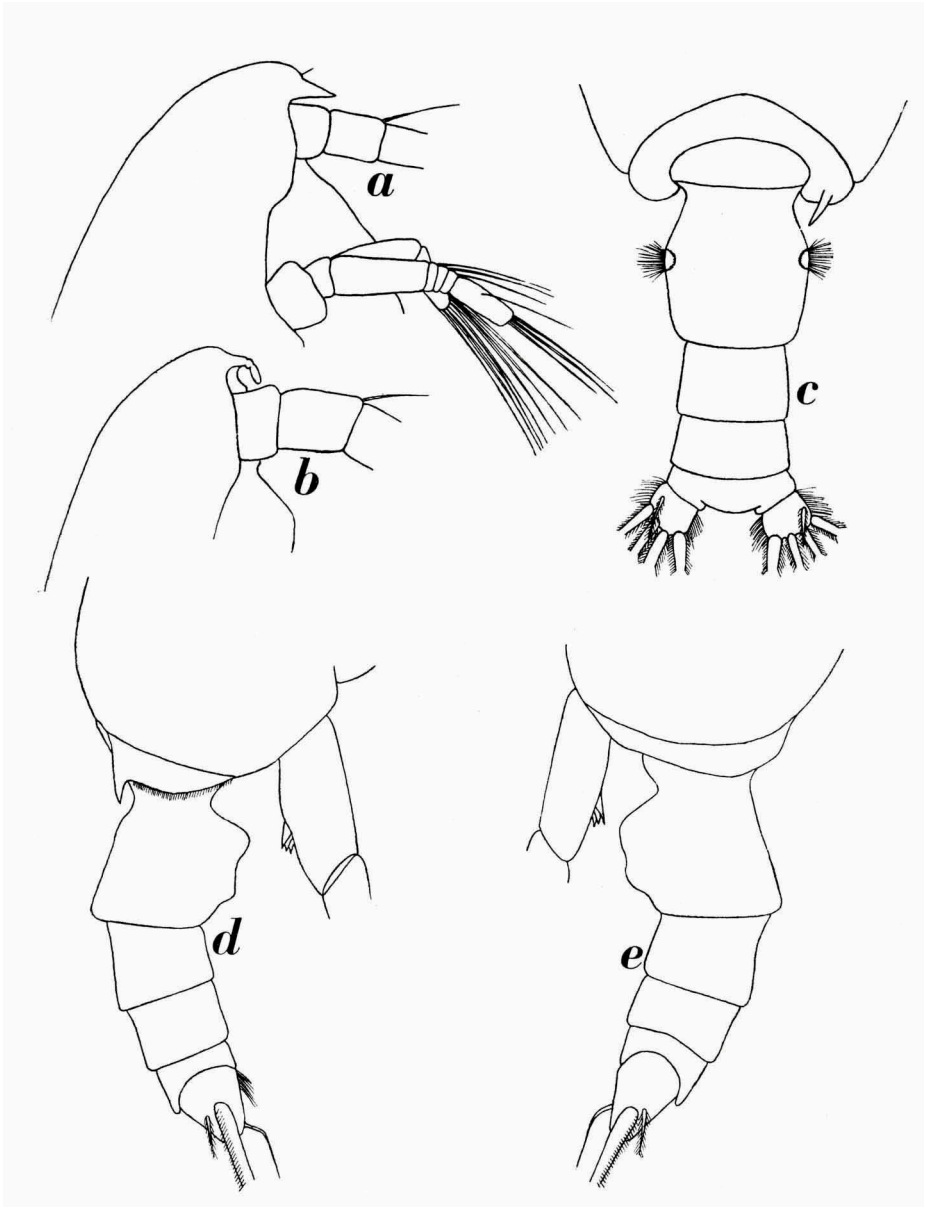

Fig. 20. *Pseudochirella semispina* nov. spec., adult ♀ from Sta. 80. a, head in lateral view from the right side; head of abnormal female from the right side; c, abdomen in dorsal view; d, the same, lateral view from the right side; e, the same, lateral view from the left side. × 40.

terminal joint slender again. The endopod of the 1st pair is 1-jointed. The endopod of the 2nd pair of legs is 1-jointed. The terminal spines on the 3rd exopodal joints of the 2nd to 4th pairs of legs have a large number of small, obtuse spinules along their margin; the internal margin has the usual lamelliform row of hairs. The posterior aspect of the 1st basal joint of the 4th pair of legs has 7-8 strong, acute spines, resembling those found in *P. obtusa*.

Localities. Sta. 80 (Moluccan Sea, 1° 06'.5 S, 126° 46'.5 E); Sta. 112 (Arafoera Sea, 8° 39'.0 S, 130° 35'.0 E); Sta. 127 (Timor Sea, 10° 49'.5 S, 123° 59'.0 E).

The type specimen is a female of 5.55 mm length from Sta. 112. *Pseudochirella semispina* resembles *P. gibbera* and *P. notacantha*. From the former it differs distinctly by the shape of the abdomen; the latter has the lateral spine on both sides of the lateral thoracic margin. The specimens in the Snellius collection (4 females) show that the presence of the right spine only is not due to damage, as there is no trace of a basal part of a spine on the left side. The specimen from Sta. 127 has a slightly developed patch of hairs on the left side of the genital segment and a row of hairs along the lateral margin of the last thoracic segment. One of the females from Sta. 80 shows a curious condition of the rostrum (fig. 20b), which suggests that it has been broken off and later on restored.

Pseudochirella scopularis (G. O. Sars, 1905) (figs. 21a, b)

Undeuchaeta scopularis Sars, 1905, pp. 4, 14.

Adult stage. ♀, total length, 6.00 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 98 to 28, so that the length of the abdomen is contained 3.50 times in that of the anterior part of the body.

The general shape of the body resembles the figure of this species as it is given by Sars (1925, pl. 25 figs. 1, 2) very closely. The cephalothorax is elongated, the frontal part of the head is obtuse in dorsal view and rounded. The head is smoothly rounded in lateral view; the rostrum is strong and although pointing downwards, it curves very slightly backwards.

The head and the 1st thoracic segment, as well as the 4th and 5th thoracic segments, are separated; the line separating the head and the 1st segment is distinct on the dorsal surface only.

The lateral margin of the last thoracic segment on both sides is produced into nearly triangular lobes, but less acutely pointed than has been figured by Sars (l.c.).

The abdomen consists of 4 free segments and the furca, that have the following proportional lengths: $\frac{\text{segment}\quad 1+2 \quad 3 \quad 4 \quad 5 \quad \text{furca}}{37 \quad 25 \quad 21 \quad 10 \quad 7 \quad = 100}$. The genital segment is a little longer than wide and very asymmetrical, as it is more produced on the proximal left side than on the right. The left lateral margin has a distinct patch of hairs. The distal margins of the 1st to 3rd

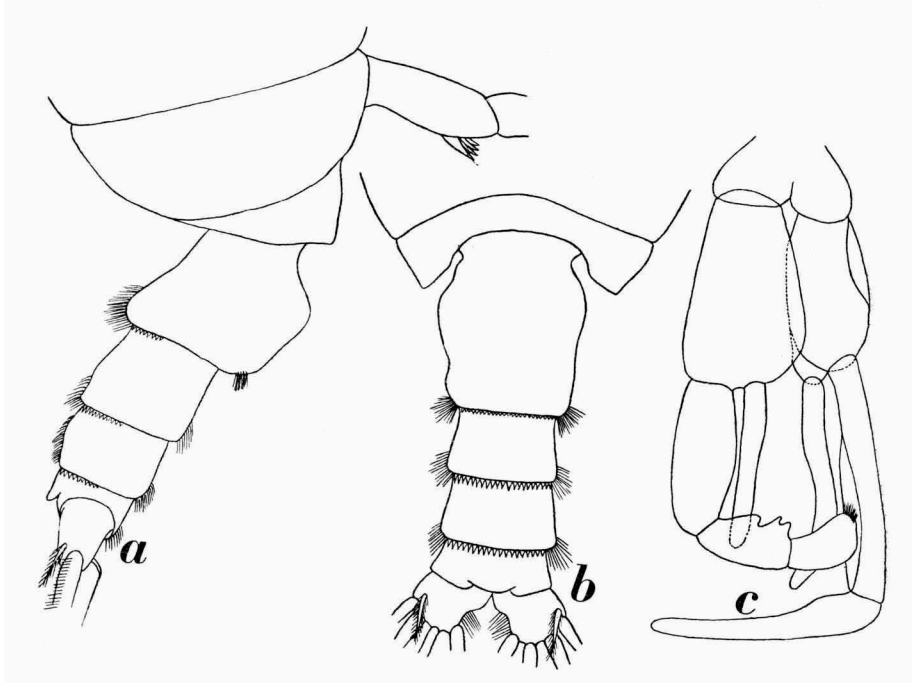

Fig. 21. a, b, *Pseudochirella scopularis* (G. O. Sars, 1905), adult ♀ from Sta. 80. a, abdomen in lateral view from the right side; b, the same, dorsal view. c, *Pseudochirella obtusa* (G. O. Sars, 1905), adult ♂ from Sta. 212, 5th pair of legs. a, b, × 40; c, × 65.

abdominal segments are armed with a row of small, leaf like spinules; the distal surface of these segments has long hairs, very prominent on the dorsal surface.

The joints of the furca are as long as wide. As in the other species of this genus there are 4 densely plumose, subequal, marginal setae, a thin external (dorsal) seta and a curved ventral seta. The internal margin of the joints is densely haired, the ventral surface of the 4th abdominal segment has a patch of hairs.

The 1st antenna reaches the distal margin of the abdominal segment. It

has 24 free segments, the 8th and 9th are completely, the 24th and 25th partly fused. The various joints have the following proportional lengths:

1	2	3	4	5	6	7	8+9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25
55	44	27	25	27	29	30	49	27	33	30	49	47	57	55	60	49	47	66	38	60	49	36	11

= 1000.

The endopod of the 2nd antenna has $^3/_5$ the length of the exopod. The 2nd exopodal joint has 8 setae on the internal and 7 on the external lobe.

The mouth parts and legs are as in *P. obtusa*. The 1st maxilla has 5 setae on the 2nd basal joint and 15 on the endopod.

The endopod of the 1st pair of legs is 3-jointed, the 2nd pair has a very indistinctly 2-jointed endopod. On the posterior surface of the 1st basal joint of the 4th pair there are 9 slender spines.

Locality: Sta. 80 (Moluccan Sea, 1° 06'.5 S, 126° 46'.5 E).

The description is taken from one female in the Snellius collection. The lateral thoracic margins seem to be slightly less acutely pointed than in Sars' specimens.

Pseudochirella magna (Wolfenden, 1911) (figs. 22, 23)

Chirundina magna Wolfenden, 1911, p. 241, pl. 28 figs. 10-13, textfigs. 27.

Adult stage. ♂, total length, 6.70 mm.

The proportional lengths of the cephalothorax and of the abdomen are as 96 to 36, so that the length of the abdomen is contained 2.67 times in that of the cephalothorax.

The general shape of the body is less robust than in the female, but more robust than in the other males of this genus known at present (*Pseudochirella obtusa, notacantha,* and *pustulifera*).

In dorsal aspect the head appears to be distinctly triangular, with a distinct but low crest, protruded forwards, slightly dilated in the oral region. In lateral aspect the rostrum appears to be very strong, pointing straigthly downwards. The frontal organ is distinct.

The head and the 1st thoracic segment, as well as the 4th and 5th thoracic segments, are fused. The lateral thoracic margin is not produced, but smoothly rounded in lateral aspect.

The abdomen is 5-segmented; the various segments have, with the furca, the following proportional lengths:

segment	1	2	3	4	5	furca
	17	25	25	21	3	9

= 100.

The 1st and 2nd abdominal segments are symmetrical, the 1st with a distal smelling on the left lateral margin, the 2nd with a minor swelling on the same side. The 2nd to 4th abdominal segments are armed along their distal

border with a row of very small, triangular spines. The 5th abdominal segment is almost completely telescoped into the 4th, on the ventral side with a patch of hairs.

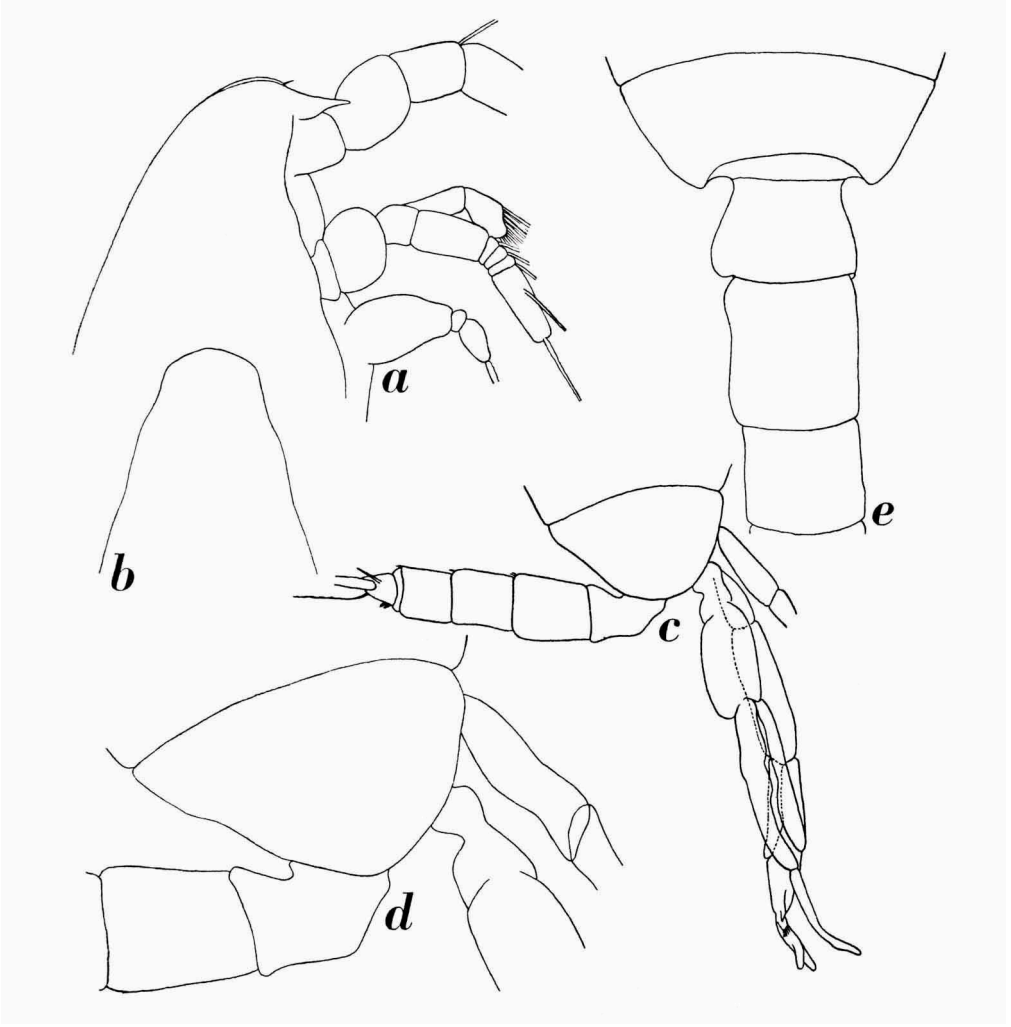

Fig. 22. *Pseudochirella magna* (Wolfenden, 1911), adult ♂ from Sta. 175. Head in lateral view from the right side; b, the same, dorsal view; c, abdomen and 5th legs in lateral view from the right side; d, proximal part of the abdomen in lateral view from the right side; e, the same, dorsal view. a, d, e, × 40; b, c, × 20.

The joints of the furca are as long as wide, each with 4 strong, plumose setae, a small external (dorsal) seta and a curved ventral seta. On each

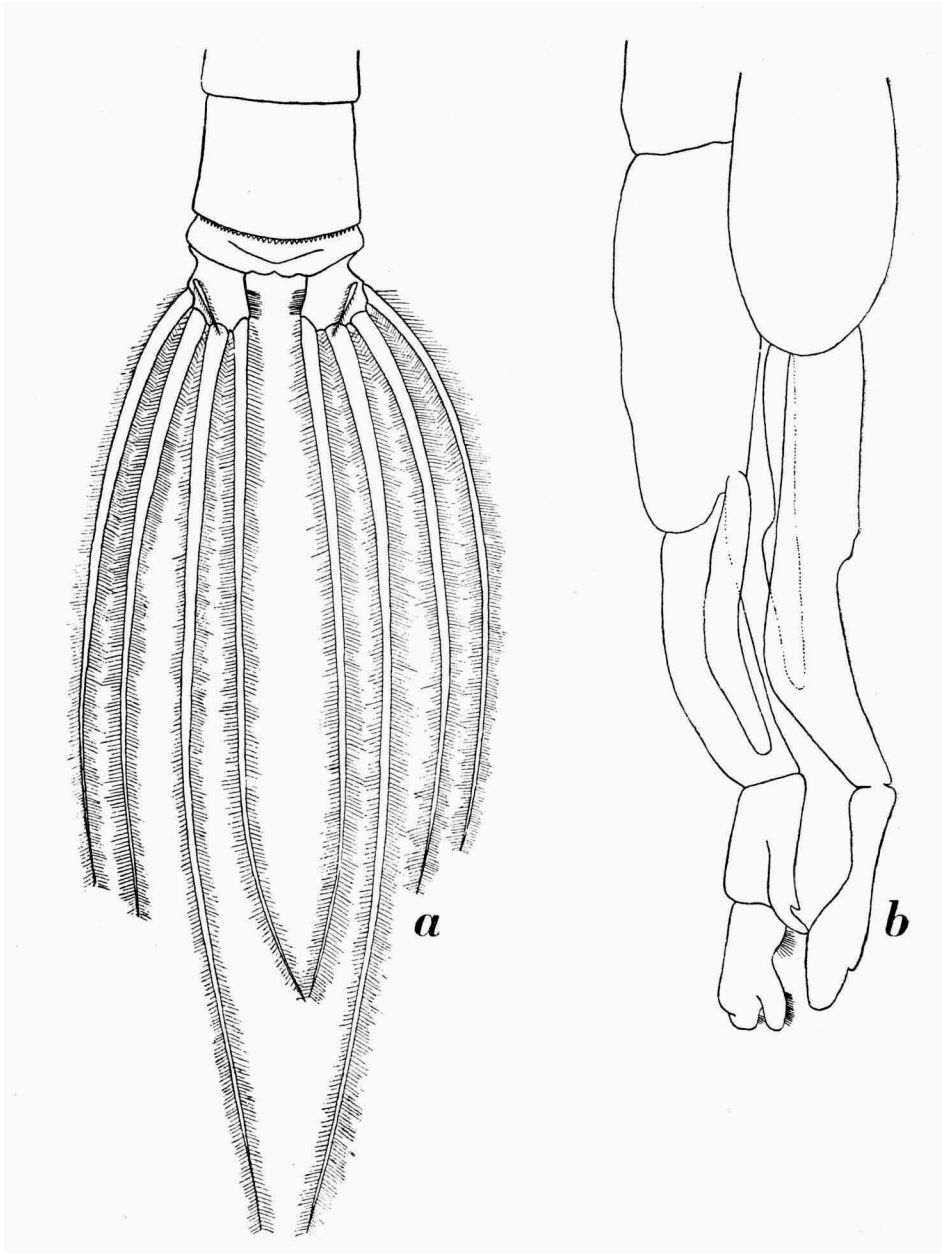

Fig. 23. *Pseudochirella magna* (Wolfenden, 1911), adult ♂ from Sta. 175. a, distal part of the abdomen and the furca in dorsal view; b, 5th pair of legs. × 50.

side the 2nd internal seta is elongated, its total length is about 1.5 times that of the other marginal setae. The internal margins of the furcal joints are densely haired.

The 1st antenna reaches the middle of the 4th-5th thoracic segments, it is considerably shorter than in the female. It consists of 24 free joints, that have the following proportional lengths: $\frac{1\ 2\ 3\ 4\ 5\ 6\ 7\ 8{+}9\ 10}{58\ 47\ 20\ 20\ 23\ 25\ 28\ 53\ 26}$ $\frac{11\ 12\ 13\ 14\ 15\ 16\ 17\ 18\ 19\ 20\ 21\ 22\ 23\ 24\ 25}{29\ 35\ 38\ 39\ 50\ 50\ 58\ 48\ 69\ 66\ 47\ 55\ 60\ 50\ 6 = 1000}$. The 8th and 9th joints of this appendage are completely fused, the jointing between the 8th-9th and 10th, the 12th and 13th, the 24th and 25th joints is incompletely developed. The 3rd joint on each side has a very strong seta.

The 2nd antenna is as in the female. Sewell (1929) called attention to the presence of a patch of hairs on the 1st basal joint of the 2nd antenna in the female of this species; it is also present in the male.

The mouth parts and the 1st to 4th pairs of legs agree fully with those of the female. I found the same number of setae on the mouth parts as mentioned in the description by Sewell (1929) for the female. There is no row of spinules on the 1st basal joint of the 4th pair of legs in the male. The external spine of the 1st exopodal joint of the 1st pair of legs has almost completely disappeared. The endspine on the last exopodal joint of the 2nd pair of legs has an increased number of spinules, about 50 are present, only 30 are found in the female.

The 5th pair of legs is of the *Pseudochirella* type. Both left and right legs are biramose. The 1st basal joints of both sides, although they have not the same length, are partly fused; the 2nd basal joints are large and swollen, on the left side larger than on the right. The left leg has a 3-jointed exopod and a 1-jointed endopod. The 1st exopodal joint is cylindrical, a little longer than the slender endopod. The 2nd and 3rd exopodal joints are flattened, the 2nd with a large and a small external tooth, the 3rd joint of a characteristic appearance, with a basal and terminal patch of hairs.

The right exopod is 2-jointed, the endopod is shorter than the 1st exopodal joint; the 2nd exopodal joint has half the length of the 1st. Right and left exopod have almost the same length.

Localities: Sta. 79 (Moluccan Sea, 1° 52′.0 N, 125° 41′.0 E); Sta. 90 (Ceram Sea, 2° 50′.0 S, 131° 14′.5 E); Sta. 163 (Ombai Strait, 8° 51′.5 S, 124° 24′.5 E); Sta. 175 (Flores Sea, 7° 47′.0 S, 118° 12′.0 E); Sta. 197 (Flores Sea, 8° 00′.5 S, 121° 41′.0 E); Sta. 212 (Banda Sea, 3° 33′.0 S, 124° 32′.5 E); Sta. 236* (Banda Sea, 5° 57′.0 S, 129° 56′.5 E).

The description of the male has been taken from a single male specimen

captured at Sta. 175. The male, which has hitherto remained undescribed, is easily recognized by the presence of a low crest, the fusion of the head and 1st thoracic segments, as well as of that of the 4th and 5th thoracic segments, and the characteristic 5th pair of legs.

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