

1937

THE PELAGIC COPEPODA FROM THE NEIGHBOURING WATERS OF JAPAN.

By

Takamochi Mori

INTRODUCTION

The present paper deals with the pelagic Copepoda collected principally by the author during the years 1927-1935 from the neighbouring Waters of Japan, and the samples also have been presented to me from Mr. Tetsuo Yamada, Mr. Masafumi Takemoto, Mr. Kiyoshi Okashima and Mr. Toraihiro Kinoshita.

In my collections I used the vertical haul only. The plankton net with the net-mouth of one-tenth square meter was sunken into the water and hauled up vertically to the surface. These collections were performed by the following orders.

(1) In 1927 on board the ship Choshu-Maru belonging to the Yamaguchi-Ken fishery Experimental Station, in the Chosen Strait (St. 1-24).

(2) In 1929 on board the fishing boat Hono-Maru belonging to Mr. Cho Kawabata and the Steamer Chikugogawa-Maru belonging to the O. S. K. near Amamioshima and the Tokara Islands (St. 25-34).

(3) In 1930 on board the ship Ryokai-Maru belonging to the Formosan Government Fishery Experimental Station, off the eastern coast of Formosa, in the Formosan Strait and the East China Sea (St. 35-66).

(4) In 1932 on board the ship Kiyō-Maru belonging to the Wakayama-Ken Fishery Experimental Station, in the Pacific Ocean near Shikoku and Wakayama-Ken (St. 67-84).

(5) In 1933 on board the ship Daito-Maru belonging to the Miyagi-Ken Fishery Experimental Station, off the Cape of Kinkazan in the Pacific Ocean (St. 85-105).

(6) In 1934 on board the fishing boat Hachijo-Maru and the Azuma-Maru belonging to the Tokyo-Fu, in the Pacific Ocean near Hachijo-Island (St. 109-119).

(7) And in 1935 on board the fishing boat Kasuga-Maru belonging to Captain I. Maiwa, in the Pacific Ocean off the eastern coast of Hokkaido (St. 122-125).

Yamada's samples were taken near Chosen (Korea), Takemoto's samples from the Pacific Ocean (St. 105-108), Okashima's samples from the Pacific Ocean near the Truk Islands (St. 120-121) and Kinoshita's samples near Hokkaido (St. 126-145).

I express my sincere gratitude to Mr. Hisatoshi Marukawa, the pioneer of this line of science in our country, for his valuable advice.

I desire to take this occasion to express my sense of indebtedness and obligation to my intimate friends Mr. Matsutaro Tamura and Mr. Tetsuo Yamada, for the kindness support and advice to my work. My gratitude is due to the Fishery Experimental Stations, for their kind offer of ships when I collected the samples. And I am also grateful to the gentlemen mentioned above, for their supply of the samples and the convenience of

collection.

The position and date of the collections.

Each position of the collections mentioned above, and its own collecting date and the depth of haul are shown on the following table.

(St. 1-24, in the Chosen Strait).

Station No.	Position	Date	Depth of hauling (in meter)
1	34° 29' 30'' N 130° 55' 30'' E	Aug. 18, 1927	48½-0 M
2	34° 35' 56'' N 130° 46' 7'' E	"	"
3	34° 42' 23'' N 130° 36' 44'' E	"	"
4	34° 48' 50'' N 130° 27' 20'' E	"	"
5	34° 55' 16'' N 130° 17' 57'' E	Aug. 21, 1927	"
6	35° 1' 43'' N 130° 8' 33'' E	"	"
7	35° 8' 10'' N 129° 59' 10'' E	"	"
8	35° 14' 36'' N 129° 49' 47'' E	"	"
9	35° 21' 3'' N 129° 40' 23'' E	Aug. 22, 1927	"
10	35° 27' 30'' N 129° 31' 0'' E	"	"
11	35° 30' 0'' N 129° 27' 0'' E	"	"
12	35° 23' 30'' N 129° 22' 30'' E	"	"
13	35° 15' 0'' N 129° 16' 30'' E	"	"
14	35° 8' 30'' N 129° 10' 30'' E	"	"
15	35° 4' 30'' N 129° 16' 0'' E	Aug. 26, 1927	"
16	35° 0' 40'' N 129° 21' 16'' E	"	"
17	34° 56' 50'' N 129° 32' 33'' E	"	"
18	34° 53' 0'' N 129° 43' 49'' E	"	"
19	34° 49' 10'' N 129° 55' 6'' E	"	"
20	34° 45' 20'' N 130° 6' 23'' E	"	"
21	34° 41' 30'' N 130° 17' 40'' E	"	"
22	34° 37' 40'' N 130° 28' 56'' E	"	"
23	34° 33' 50'' N 130° 40' 13'' E	Aug. 27, 1927	"
24	34° 30' 0'' N 130° 51' 30'' E	"	"

(St. 25-34, in the East China Sea near Amami Oshima and the Tokara Islands).

25	28° 29' 15'' N 128° 38' 5'' E	Aug. 4, 1927	60-0 M
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26	28° 23' 50" N 128° 53' 50" E	Aug. 4, 1929	60-0 M
27	28° 29' 15" N 128° 38' 5" E	Aug. 7, 1929	"
28	29° 9' 40" N 129° 12' 0" E	Aug. 12, 1929	30-0 M
29	29° 26' 30" N 129° 35' 0" E	"	"
30	29° 36' 30" N 129° 44' 0" E	"	20-0 M
31	29° 40' 30" N 129° 33' 0" E	"	30-0 M
32	29° 53' 0" N 129° 32' 30" E	"	"
33	29° 49' 30" N 129° 50' 30" E	"	20-0 M
34	29° 59' 30" N 129° 54' 0" E	"	25-0 M
(St. 35-45, off the eastern coast of Formosa).			
35	23° 8' 42" N 121° 25' 0" E	Aug. 2, 1930	100-0 M
36	23° 8' 42" N 121° 41' 10" E	"	"
37	23° 8' 42" N 121° 57' 11" E	Aug. 3, 1930	"
38	23° 8' 42" N 122° 13' 5" E	"	"
39	23° 8' 42" N 122° 29' 50" E	"	"
40	23° 8' 42" N 122° 46' 0" E	"	"
41	23° 8' 42" N 123° 2' 7" E	"	"
42	23° 8' 42" N 123° 13' 50" E	"	"
43	23° 8' 42" N 123° 33' 0" E	Aug. 3, 1930	"
44	23° 8' 42" N 123° 51' 52" E	"	"
45	23° 8' 42" N 124° 8' 20" E	"	"
(St. 46-61, in the east China Sea).			
46	25° 12' 0" N 124° 39' 15" E	Aug. 6, 1930	"
47	25° 16' 0" N 124° 22' 0" E	"	"
48	25° 20' 50" N 124° 7' 30" E	"	"
49	25° 25' 10" N 123° 52' 2" E	"	"
50	25° 29' 45" N 123° 36' 10" E	Aug. 7, 1930	"
51	25° 34' 2" N 123° 20' 50" E	"	"
52	25° 38' 50" N 123° 5' 4" E	"	"
53	25° 43' 45" N 122° 49' 30" E	"	"

Station No.	Position	Date	Depth of hauling (in meter)
54	25° 48' 0" N 122° 34' 0" E	Aug. 7, 1930	100-0 M
55	25° 52' 0" N 122° 18' 0" E	"	50-0 M
56	25° 58' 30" N 121° 54' 0" E	"	"
57	26° 3' 55" N 121° 48' 2" E	"	"
58	26° 7' 30" N 121° 22' 10" E	"	"
59	26° 12' 0" N 121° 6' 7" E	Aug. 8, 1930	"
60	26° 16' 10" N 120° 50' 0" E	"	"
61	26° 20' 30" N 120° 34' 25" E	"	25-0 M
(St. 62-66, in the Formosan Strait).			
62	24° 30' 0" N 120° 31' 0" E	Aug. 11, 1930	45-0 M
63	24° 37' 0" N 120° 16' 30" E	"	50-0 M
64	24° 44' 40" N 120° 1' 30" E	"	"
65	24° 51' 32" N 119° 47' 0" E	"	"
66	24° 58' 2" N 119° 33' 1" E	"	"
(St. 67-70, in the Ki Channel).			
67	33° 30' 29" N 135° 12' 25" E	Aug. 20, 1932	100-0 M
68	33° 27' 30" N 135° 1' 30" E	"	150-0 M
69	33° 21' 20" N 134° 39' 0" E	"	100-0 M
70	33° 18' 50" N 134° 27' 2" E	"	"
(St. 71-75, near Shikoku).			
71	33° 4' 30" N 134° 10' 52" E	"	"
72	32° 54' 30" N 134° 10' 52" E	"	"
73	32° 44' 30" N 134° 10' 52" E	"	"
74	32° 34' 30" N 134° 10' 52" E	"	70-0 M
75	32° 24' 30" N 134° 10' 52" E	"	100-0 M
(St. 76-80, off the southern coast of the Cape Shionomisaki).			
76	33° 15' 40" N 135° 45' 45" E	Aug. 22, 1932	"
77	33° 5' 40" N 135° 45' 45" E	"	"
78	32° 55' 40" N 135° 45' 45" E	"	"
79	32° 45' 40" N 135° 45' 45" E	"	"
80	32° 35' 40" N 135° 45' 45" E	"	"
(St. 81-84, in the Ki Channel).			
81	34° 6' 40" N 134° 57' 55" E	Aug. 24, 1932	40-0 M

Station No.	Position	Date	Depth of hauling (in meter)
82	33° 56' 38" N 134° 57' 0" E	Aug. 24, 1932	40-0 M
83	33° 46' 0" N 134° 55' 0" E	"	"
84	33° 36' 30" N 134° 53' 30" E	"	"
(St. 85-105, on the course of 355 miles east from the Cape of Kinkazan).			
85	38° 17' 0" N 141° 42' 0" E	Aug. 5, 1933	100-0 M
86	38° 17' 0" N 141° 49' 0" E	"	"
87	38° 17' 0" N 142° 1' 0" E	"	"
88	38° 17' 0" N 142° 12' 0" E	Aug. 6, 1933	"
89	38° 17' 0" N 142° 25' 0" E	"	"
90	38° 16' 0" N 142° 36' 0" E	"	50-0 M
91	38° 16' 0" N 142° 47' 0" E	"	"
92	38° 16' 0" N 142° 59' 0" E	"	"
93	38° 16' 0" N 143° 11' 0" E	"	"
94	38° 16' 0" N 143° 22' 0" E	"	"
95	38° 16' 0" N 143° 35' 0" E	"	"
96	38° 16' 0" N 144° 5' 0" E	"	"
97	38° 26' 0" N 144° 40' 0" E	Aug. 7, 1933	"
98	38° 26' 0" N 145° 7' 0" E	"	"
99	38° 31' 0" N 145° 39' 0" E	"	"
100	38° 32' 0" N 146° 4' 0" E	"	"
101	38° 37' 0" N 146° 38' 0" E	Aug. 8, 1933	"
102	38° 40' 0" N 147° 18' 0" E	"	"
103	38° 48' 0" N 147° 46' 0" E	"	"
104	38° 48' 0" N 148° 11' 0" E	"	"
105	38° 48' 0" N 148° 41' 0" E	"	"
(St. 106-108, in the Pacific Ocean, off the eastern coast of Miyagi-Ken).			
106	38° 20' 0" N 144° 40' 0" E	Dec. 8, 1933	"
107	36° 30' 0" N 151° 0' 0" E	Nov. 26, 1933	"
108	35° 40' 0" N 152° 30' 0" E	Nov. 27, 1933	"
(St. 109-119, in the Pacific Ocean, near Hachijo Island).			
109	33° 6' 30" N 139° 42' 0" E	Aug. 2, 1934	60-0 M

Station No.	Position	Date	Depth of hauling (in meter)
110	33° 6' 30'' N 139° 39' 0'' E	Aug. 2, 1934	60-0 M
111	33° 10' 0'' N 139° 48' 30'' E	"	"
112	32° 58' 0'' N 139° 59' 30'' E	Aug. 3, 1934	"
113	32° 52' 0'' N 139° 59' 30'' E	"	"
114	33° 7' 30'' N 139° 56' 30'' E	Aug. 4, 1934	"
115	33° 7' 30'' N 140° 2' 30'' E	"	"
116	33° 17' 0'' N 139° 52' 30'' E	Aug. 7, 1934	"
117	33° 26' 30'' N 139° 55' 0'' E	"	"
118	33° 36' 0'' N 139° 57' 30'' E	"	"
119	33° 46' 30'' N 140° 1' 0'' E	"	"
120	near the Truk Islands	"	"
121	near the Truk Islands	"	"
(St. 122-125, on the course of 35 miles SE/S from Kushiro).			
122	42° 54' 30'' N 144° 26' 0'' E	Aug. 7, 1935	70-0 M
123	42° 47' 0'' N 144° 35' 0'' E	"	"
124	42° 39' 10'' N 144° 44' 0'' E	"	"
125	42° 32' 0'' N 144° 52' 0'' E	"	"
(St. 126-145, near Hokkaido).			
126	41° 15' 0'' N 139° 48' 20'' E	Oct. 10, 1924	20-0 M
127	41° 12' 0'' N 142° 31' 10'' E	May 24, 1930	"
128	41° 25' 30'' N 142° 33' 30'' E	Oct. 14, 1924	120-60 M
129	42° 8' 0'' N 142° 5' 30'' E	Jun. 20, 1926	20-0 M
130	41° 28' 30'' N 142° 5' 30'' E	"	"
131	41° 45' 30'' N 143° 15' 0'' E	Aug. 2, 1926	60-20 M
132	41° 25' 20'' N 143° 15' 0'' E	"	120-60 M
133	39° 55' 20'' N 143° 15' 0'' E	Jul. 2, 1926	"
134	39° 56' 40'' N 144° 5' 10'' E	Aug. 1, 1926	240-120 M
135	42° 55' 0'' N 144° 27' 0'' E	Jul. 28, 1924	60-20 M
136	42° 19' 0'' N 144° 22' 0'' E	Jul. 11, 1924	20-0 M
137	41° 58' 30'' N 144° 22' 0'' E	"	240-120 M
138	41° 48' 0'' N 144° 22' 0'' E	"	60-20 M

Station No.	Position	Date	Depth of hauling (in meter)
139	41° 57' 0" N 144° 42' 0" E	Aug. 7, 1924	240-120 M
140	43° 24' 30" N 145° 56' 0" E	Aug. 5, 1924	20-0 M
141	42° 53' 20" N 145° 49' 0" E	Aug. 8, 1926	240-120 M
142	42° 44' 0" N 145° 49' 0" E	Jul. 20, 1924	60-20 M
143	42° 33' 40" N 145° 49' 0" E	"	20-0 M
144	44° 28' 20" N 145° 29' 0" E	Aug. 26, 1926	120-60 M
145	45° 4' 50" N 142° 43' 30" E	Sep. 5, 1925	60-20 M

Order Copepoda Milne-Edwards.

In the body of a pelagic Copepod two portions are readily distinguishable, the anterior and the posterior division.

In the first Sub-order Gymnoplea, the anterior division consists typically of the head and 5 thoracic segments; but the head is often fused with the first thoracic segment, and the 4th with the 5th thoracic segment. The posterior division consists typically of 5 abdominal segments in the male and always less than 5 in the female, but the fusions often reduce the number of abdominal segments to as few as one or 2.

In the case of 2nd Sub-order Podoplea, the last thoracic segment is entered into the posterior division.

The 1st abdominal segment (the 1st posterior in Gymnoplea and the 2nd in Podoplea) in each sex bears genital pore, is called the genital segment; the last abdominal segment contains the opening of the alimentary canal, and is called the anal segment.

The anterior portion of the head projects ventrally into the rostrum which terminates the simple or bifurcate end. The anal segment possesses a pair of appendages those are called the furcal styles.

The head has usually 6 pairs of appendages; (1) the anterior or 1st antennae (2) the posterior or 2nd antennae (3) the mandibles (4) the maxillae (5) the anterior or 1st maxillipeds and (6) the posterior or 2nd maxillipeds.

The anterior antennae in the Gymnoplea are uniramous and consist typically of 25 segments, but this number may be reduced by fusion. The segments of these antennae possess setae and sometimes sensory hairs or aesthetascs. One side of the anterior antennae of the male may be modified to form a grasping antenna.

The posterior antennae, mandibles and maxillae are biramous, but the 1st and 2nd maxillipeds are uniramous.

In the mandibles, the 1st segments of the basipodites are modified to form the masticatory apparatus (Pl. 2, fig. 3).

In the case of the completely developed maxilla (Pl. 2, fig. 4), the 1st segment of basipodite has 4 lobes—the 1st inner or masticatory lobe (a), the 2nd and 3rd inner lobes (b, c) and the outer lobe (d). The endopodite (En) has 1-3 segments; and the exopodite (Ex) has 1 segment.

The exopodites of the 1st and 2nd maxillipedes are absent.

Each thoracic segment possesses a pair of swimming feet. The 5th pair usually is modified in each sex, but sometimes is absent in the female.

The biramous foot consists of the 2-jointed basipodite, the exopodite and endopodite. The exopodite and endopodite consist typically of 3 segments, but the fusions often reduce the number of segments to as few as 1 or 2.

I. Sub-order *Gymnoplea* Giesbrecht.

Gymnoplea Giesbrecht, 1892, p. 41.

The 1st segment of the posterior division is of the first abdominal one. The genital pores are situated in the 1st segment of the posterior division in both sexes; these pores are ventral and paired in the female, unpaired and lateral in the male.

The 5th pair of feet in the female may be like the preceding pairs, degenerated or lacking. In the male, the 5th pair of feet always present, and are often modified into an asymmetrical grasping organ.

The 1st segment of the posterior division never bears appendages.

The anterior antennae of the female are symmetrical; but in the male, the identical ones may be symmetrical or one may form a grasping organ. In the case of fully developed grasping antenna; the proximal 12 segments are called the proximal section; from the 13th to the 18th segments which are dilated, are called the middle section; from the 19th to the end are composed of the terminal section. There is knee-like articulation between the 18th and 19th segments.

The 1st segment of basipodite of the mandible makes a masticatory apparatus.

The *Gymnoplea* that is treated in this paper, includes 37 genera and 126 species belonging to 4 families.

Key to the families of the *Gymnoplea*.

- | | | |
|-----|---|--|
| (0) | { | The body is usually depressed laterally; the fore-head is round or protruded in dorsal view, sometimes with a median crest or spine.(1) |
| | | The body is depressed dorso-ventrally; the fore-head shows the truncate-shape in dorsal view. <i>Candacidae</i> (p. 77) |
| (1) | { | The 3rd and 4th pairs of feet with the 3-jointed endopodites (except Gen. <i>Temora</i> and <i>Eurytemora</i> which have the 2-jointed ones).(2) |
| | | The 3rd and 4th pairs of feet with the 2-jointed endopodites (except <i>Bathypontia</i> which with the 3-jointed ones)..... <i>Pontellidae</i> (p. 87) |
| (2) | { | The endopodites of the 1st pair of feet with 3 segments (except <i>Temora</i> and <i>Eurytemora</i>); one of the 1st antennae of the male constitutes a grasping antenna. <i>Centropagidae</i> (p. 55) |
| | | The endopodites of the 1st pair of feet with one or 2 segments (except <i>Calanus</i> which with the 3-jointed endopodites); the 1st antennae of the male not make the grasping organ..... <i>Calanidae</i> (p. 9) |

(1) Fam. Calanidae (Dana).

Sub-fam. Calanidae Dana, 1852.

The fore-head is round or protruded in dorsal view, sometimes with the median crest or spine. The abdomen of the female is generally composed of 4, but seldom 3 or 2 segments. The abdomen of the male consists of 5 segments.

The anterior antennae of the female have 16-25 segments. The anterior antennae of the male are not modified into the grasping organ, these are nearly or wholly symmetrical.

The anterior 4 pairs of feet generally with the 3-jointed exopodites. The endopodites of the 1st and 2nd pairs of feet with 1 or 2 segments; but only the case of *Calanus*, the identical ones with 3 segments. The endopodites of the 3rd and 4th pairs of feet with 3 segments.

The 5th pair of feet of the female either is like the preceding ones or in various stages of degeneration, often shows complete loss. The 5th pair of feet of the male often is modified to form the grasping organ.

Key to the Genera of the Calanidae.

- | | | | |
|-----|---|---|---------------------|
| (0) | { | The endopodite of the 1st foot with 3 segments. | <i>Calanus</i> |
| | | The endopodite of the 1st foot with 2 segments. | (1) |
| | | The endopodite of the 1st foot with 1 segment. | (5) |
| (1) | { | The 3rd segment of exopodite of the 4th foot with 3 marginal spines. | (2) |
| | | The identical segment with 2 marginal spines. | (3) |
| (2) | { | The exopodite of the 1st foot with 3 segments; the 5th feet of female are absent. | <i>Eucalanus</i> |
| | | The exopodite of the 1st foot with 2 segments; the 5th feet of female are present. | <i>Rincalanus</i> |
| (3) | { | The external margin of exopodites of the feet are not denticulated. | <i>Calocalanus</i> |
| | | The identical portions of the feet are denticulated. | (4) |
| (4) | { | The 5th pair of feet of female is absent or very degenerated; in the male only the left 5th foot present. | <i>Acrocalanus</i> |
| | | In the male, both sides of the 5th pair of feet are present and asymmetrical. | <i>Paracalanus</i> |
| (5) | { | The endopodite of the 2nd foot with 3 segments. | <i>Mecynocera</i> |
| | | The endopodite of the 2nd foot with 2 segments. | (6) |
| | | The endopodite of the 2nd foot with 1 segment. | (28) |
| (6) | { | The terminal segments of exopodites of the 2nd-4th feet with 5 setae. | (7) |
| | | The identical segments with 4 setae. | (8) |
| (7) | { | The rostrum is absent. | <i>Spinocalanus</i> |
| | | The rostrum with the bifurcate ends. | <i>Oxycalanus</i> |
| (8) | { | The surface of rami of the 2nd to 4th feet without large spines; the anterior maxillipedes only with the setae or hooks. | (9) |
| | | The surface of rami of the 2nd-4th feet with large spines; the anterior maxillipedes with the vermiform or pencillated appendages. | (18) |

- (9) { The 2nd segments of basipodites of the 2nd and 3rd feet, are irregularly toothed on the distal borders. *Clausocalanus*
 { The 2nd segments of the basipodites of the 2nd and 3rd feet, are like the 4th one. (10)
- (10) { The outer marginal spines of the terminal segments of exopodites of the 3rd and 4th feet are denticulated. *Ctenocalanus*
 { These spines are not denticulated. (11)
- (11) { The lateral angles of the last thoracic segment are sharply pointed; the head with the median spine. *Gaetanus*
 { The lateral angles of the last thoracic segment are pointed; the head without a median spine. *Bradyidius*
 { The lateral angles of the last thoracic segment are not pointed; the head without a median spine. (12)
- (12) { The surface of the endopodites of the 2nd, 3rd and 4th feet with small spines. *Monacilla*
 { The identical portions without small spines. (13)
- (13) { The 5th feet are symmetrical or absent. (14)
 { The 5th feet are asymmetrical. (16)
- (14) { The 5th feet are absent. *Pseudocalanus* ♀
 { The 5th feet with 2 segments. (15)
- (15) { The terminal setae of the 5th feet are much longer than the 1st segment.
 { *Drepanopus* ♀
 { The terminal setae of the 5th feet are nearly as long as the 1st segment.
 { *Stephus* ♀
- (16) { The 5th feet with 5 segments on the left, and 4 on the right. (17)
 { The 5th feet with 5 segments on both sides. *Stephus* ♂
- (17) { The 5th feet are stylet-like, and about as long as the abdomen. *Pseudocalanus* ♂
 { The 5th feet are shorter than the abdomen; the right foot with a terminal hook. *Drepanopus* ♂
- (18) { The anterior division is nearly round in dorsal view. *Phacna*
 { The anterior division is ellipsoidal. (19)
- (19) { The head is distinct from the thorax. (20)
 { The head is fused with the thorax. (23)
- (20) { The rostrum is very stout, and slightly bifurcate. (21)
 { The rostrum is bifurcate largely; and the rami are moderately long. (22)
- (21) { The exopodites of the 1st feet are 3-jointed. *Brachycalanus*
 { The exopodites of the 1st feet are 2-jointed. *Heteramalla*
- (22) { The head with the median spine. *Cornucalanus*
 { The head without median spine. *Xanthocalanus*
- (23) { The exopodites and endopodites of 2nd antennae are about equal length. (24)
 { The exopodites of the 2nd antennae are longer than the endopodites. (25)
- (24) { The rami of the rostrum are stout. *Lophothrix*
 { The rostrum consists of 2 very long filaments. *Scaphocalanus*

- (25) { The head with a lens-like organ on the frontal portion. *Macandrewella*
 { The head without that organ. (26)
- (26) { The head with a median crest. *Scottocalanus*
 { The head without a median crest. (27)
- (27) { The 5th feet of female are absent; the 5th feet of the male are about 2 times
 { as long as the abdomen, each foot is about equal length. *Scolecithrix*
 { The 5th feet of female present; the 5th feet of the male are about as long as
 { the abdomen, the left foot is longer than the right one. *Scolecithricella*
- (28) { The rostrum is bifurcated. (29)
 { The rostrum terminates one end, or may be absent. (31)
- (29) { The lateral angles of the last thoracic segment are pointed. (30)
 { The lateral angles of the last thoracic segment are not pointed. *Valdiviella*
- (30) { The 4th thoracic segment fuses the 5th one. *Aetidicus*
 { The 4th and 5th thoracic segments are distinctly separated. *Aetidopsis*
- (31) { The 5th feet are absent. (32)
 { The 5th feet are present. (37)
- (32) { The posterior angles of the last thoracic segment are produced into spines. (33)
 { The posterior angles of the last thoracic segment are round or knob-like. (34)
- (33) { The exopodite of the 1st foot with 3 segments. *Chiridius* ♀
 { The exopodite of the 1st foot with 2 segments. *Gaidius* ♀
- (34) { The rami of the 2nd antennae are about equal length. *Euchaeta* ♀
 { The exopodites of the 2nd antennae are largely longer than the endopodites. (35)
- (35) { The internal margin of the 1st segment of basipodite of the 4th foot is naked
 { or feathered. (36)
 { The identical portion with the teeth or spines. *Euchirella* ♀
- (36) { The posterior angles of the last thoracic segment are round. *Undeuchaeta* ♀
 { The posterior angles of the last thoracic segment are produced into knob-like
 { process. *Chirundina* ♀
- (37) { The endopodite of the right 5th foot is well developed. (38)
 { The endopodite of the right 5th foot is degenerated. *Gaidius* ♂
- (38) { The right 5th foot roughly constitutes the forceps. (39)
 { The rami of the right 5th foot make the stylets; this foot not makes the
 { forceps. (40)
- (39) { The endopodite of the 2nd antenna is shorter than half of the exopodite.
 { *Euchirella* ♂
 { The endopodite of the 2nd antenna is slightly shorter than the exopodite.
 { *Chirundina* ♂
- (40) { The exopodite of the 2nd antenna is about as long as the endopodite. *Euchaeta* ♂
 { The exopodite of the 2nd antenna is about $1\frac{1}{2}$ times as long as the endopodite.
 { *Undeuchaeta* ♂

Gen. Calanus Leach 1819.

The head and the 1st thoracic segment are fused or separated. The 4th thoracic segment

is distinct from the 5th. The abdomen consists of 4 segments in the female, 5 segments in the male.

The 1st antennae are composed of 25 segments, in the female; but the case of the male, the 1st segment often is fused with the 2nd.

The exopodite of the 2nd antenna consists of 7 segments, and is about as long as the endopodite.

The masticatory edge of the mandible possesses about 8 teeth. The maxilla is complete, and has 4 lobes on the 1st segment of the basipodite (Pl. 2, fig. 4). The 1st maxillipede has long setae on inner border, and a plumose seta on outer border. The endopodite of the 2nd maxillipede with 5 segments.

The exopodites and endopodites of the 1st to 4th pairs of feet have 3 segments. The 1st, 2nd and 3rd segments of exopodites of all feet have 1, 1, and 2 marginal spines, respectively. The margins of the terminal spines are smooth.

The 5th pair of feet of the female resembles the other pairs; but the case of the male those feet are somewhat modified, at a time the left foot is composed of a grasping forceps.

Some authors assert the division of this Genus into some Genera. But the species in this Genus, are closely related with one another. If this Genus is divided into some Genera, we may find the connecting links between the Genera.

For example, Sars' *Neocalanus* in 1925, including *N. gracilis*, *N. robustior* and *N. tenuicornis*, is closely related to the *Calanus* by a species *N. tenuicornis*. Sars' *N. gracilis* and *N. robustior* were included in the *Megacalanus* by A. Scott in 1909, but *N. tenuicornis* was included in the *Calanus* by same author.

The *Undimula* by Scott, is peculiar on the 5th feet of the male, but the shape of the female is difficult to distinguish from those of the *Calanus*.

So I think it rather suitable to hold the *Calanus* by Giesbrecht.

Key to the species.

Female;

- | | | | |
|-------|---|--|--|
| (0) | { | The head is separated from the thorax; the anterior division with 6 segments....(1) | |
| | | The head is fused with the 1st thoracic segment; the anterior division with 5 segments.(5) | |
| (1) | { | The fore-head with the median crest..... <i>C. cristatus</i> | |
| | | The fore-head without the median crest.(2) | |
| (2) | { | The 1st antennae are at least $1\frac{1}{2}$ times as long as the body. <i>C. tenuicornis</i> | |
| | | The 1st antennae are about as long as the body, or slightly longer than the body.(3) | |
| (3) | { | The internal margin of the 1st segment of basipodite of the 5th foot is smooth. <i>C. plumchrus</i> | |
| | | The identical portion is denticulate.(4) | |
| (4) | { | The fore-head is strongly convex..... <i>C. helgolandicus</i> | |
| | | The fore-head is slightly convex. <i>C. finmarchicus</i> | |
| (5) | { | The 1st antennae are at least $1\frac{1}{2}$ times as long as the body.(6) | |
| | | The 1st antennae are about as long as the body, or slightly longer.....(7) | |

- (6) { The ventral surface of the genital segment is strongly convex. *C. robustior*
 { The ventral surface of the genital segment is rather slightly convex. *C. gracilis*
- (7) { The distal portions of the external margins of the 3rd segment of exopodites of
 the 2nd and 3rd feet are denticulate. *C. darwini*
 { The identical portions are smooth. (8)
- (8) { The external margin of the 2nd segment of exopodite of the 2nd foot with a
 notch. *C. vulgaris*
 { The identical portion without a notch. (9)
- (9) { The internal margin of the 1st segment of basipodite of the 5th foot is furnished
 with the teeth. *C. minor*
 { The identical portion is smooth. *C. pauper*

Male;

- (0) { The distal 6 segments of the 1st antennae extend beyond the body end.
 *C. tenuicornis*
 { The 1st antennae are about as long as the body. (1)
- (1) { The left 5th foot is modified into the forceps. (2)
 { The left 5th foot is not modified into the forceps. (3)
- (2) { The forceps of the left 5th foot with vermiform appendage. *C. vulgaris*
 { The forceps of the left 5th foot without vermiform appendage. *C. darwini*
- (3) { The external margins of the 3rd segment of exopodites of the 2nd to 4th feet
 are denticulate. (4)
 { The external margins of the identical feet are smooth or feathered. (5)
- (4) { The endopodites of the 5th pair of feet are symmetrical. *C. gracilis*
 { The endopodite of the left 5th foot without the actae, is shorter than the right
 one. *C. robustior*
- (5) { The head is separated from the thorax. (6)
 { The head is fused with the 1st thoracic segment. (7)
- (6) { The exopodite of the left 5th foot is 2 times as long as the endopodite.
 *C. helgolandicus*
 { The exopodite of the left 5th foot is shorter than 2 times of the endopodite.
 *C. finmarchicus*
- (7) { The inner margin of the 1st segment of basipodite of the 5th foot is denticulate.
 *C. minor*
 { The inner margin of the 1st segment of basipodite of the 5th foot is smooth.
 *C. pauper*

Calanus finmarchicus (Gunner) 1765.

Pl. 2, figs. 9-11.

C. finmarchicus, Sars G. O. 1909, p. 9, Pl. I-III.

„ , Breemen, 1906, p. 7, fig. 1 a-c.

„ , With C. 1915, p. 10.

The head is separated from the thorax. The lateral angles of the last thoracic segment

is round. The furca and the furcal setae are symmetrical. The anterior antennae extend about the end of the abdomen.

The inner marginal seta of the 2nd segment of basipodite of the 1st foot has no process on the base. There are no teeth or notches on the outer margin of exopodites of all feet.

The inner margin of the 1st segment of basipodite of the 5th foot is curved, and furnished with the teeth. The left 5th foot of the male is not modified to form the forceps.

Length; Female about 4-5 mm, male about 3.6 mm.

Distribution; The present species seems to be especially characteristic of the northern ocean. Recorded from—off the Norwegian coasts, near Iceland, near Greenland, the Arctic Ocean and the Behring-Sea.

I have obtained only one individual of the female that is slightly ruined, at the St. 145 in the Ochotsk-Sea.

Calanus helgolandicus (Claus) 1863.

Pl. 1, figs. 1-9; Pl. 2, figs. 1-8.

Cetochilus helgolandicus, Claus, 1863, p. 171, Taf. XXVI, fig. 2-9.

C. finmarchicus, Brady, 1876, p. 38, Pl. I, figs. 1-12.

„, Brady, 1883, p. 32, Pl. I, figs. 1-10.

„, Giesbrecht, 1892, p. 89, Taf. 6, fig. 19-21; Taf. 7, fig. 8, 13, 32, 33;
Taf. 8, fig. 3, 15, 20, 21, 31, 33.

„, Giesbrecht u. Schmeil, 1898, p. 14 (Part).

C. helgolandicus, Sars, 1903, p. 11, Pl. IV.

„; Breemen, 1906, p. 8, fig. 2 a, b.

C. finmarchicus, Sato, 1913, p. 1, Pl. I, figs. 1-5.

„, Mori, 1929, p. 167, Pl. III, figs. 1-4.

This species is closely allied to *C. finmarchicus*, but the fore-head of the former is more convex than that of the latter. The anterior division of the body is more slender than that of the *C. finmarchicus*.

The exopodite of the left 5th foot of the male is 2 times as long as the endopodite; but the case of *C. finmarchicus*, the exopodite is shorter than 2 times of the endopodite.

By some authors, this species is identified with *C. finmarchicus*. These respects were thoroughly discussed by C. With in 1915.

The specimens which are identical with the Sars' descriptions of *C. helgolandicus*, are found commonly in the neighbouring waters of Japan. But the typical form of *C. finmarchicus* is so rare in the Japanese waters; for I have found only one specimen from the Ochotsk-Sea. And I have been unable to find the intermediate forms between *C. finmarchicus* and *C. helgolandicus*.

So I will treat this species as independent from *C. finmarchicus*, for the time being.

Length; Female about 3 mm, Male about 2.8 mm.

Distribution; This species has relatively wide distribution in the southern zone.

Recorded from;—the Atlantic Ocean, the Pacific Ocean, near Australia and near Japan etc.

The present species may be commonly found near Japan, and I have taken at the St. 5, 8, 10-14, 16-20, 25-29, 31-33, 36, 38-47, 51, 52, 64, 66, 76, 81, 84, 85-89, 93-99, 101, 103, 104, 106, 122, 126, 128, 133, 136, 139.

Calanus cristatus Kröyer 1848.

Pl. 3, figs. 1-4.

C. cristatus, Giesbrecht, 1892, p. 91, Taf. 6, fig. 14, 15.

„ , Giesbrecht u. Schmeil, 1898, p. 16.

„ , Breemen, 1906, p. 10, fig. 6 a-b.

„ , Sato, 1913, p. 5, Pl. II, figs. 9-11.

„ , With, 1915, p. 11.

We know only about the immature female of this species. The head is separated from the thorax. The forehead has a median crest which is never seen in other *Calanus*. The furca and furcal setae are symmetrical.

The anterior 4 pairs of feet resemble those of *C. finmarchicus*. The exopodite and endopodite of the 5th foot have 2 segments, for the character of immature individuals.

The inner margin of the 1st segment of basipodite of the 5th foot is smooth.

Length; About 7-8.5 mm.

Distribution; Recorded from the Pacific Ocean and the Atlantic Ocean.

This species seems to be the resident in the cold currents. Near Japan, we may find abundantly in the cold current Oyashio, in the Pacific Ocean; and also the cold current in the Japan-Sea.

I have taken at the St. 86, 123-125, 127, 129, 130, 133, 134, 138, 139, 142, 143.

Calanus plumchrus Marukawa 1921.

Pl. 3, figs. 5-8.

Calanus sp. Sato, 1913, p. 3, Pl. II, figs. 6-8.

C. plumchrus, Marukawa, 1921, p. 10, Pl. I, figs. 1-9.

This species only is known the immature female.

The shape of this species resembles that of *C. finmarchicus*, but the inner margin of the 1st segment of basipodite of the 5th foot is smooth. The 2nd terminal setae on both sides of the furca are relatively longer than those of *C. finmarchicus*.

This species was described for the first time by Sato in 1913. But he had not given the name to this form, by the reason of immature.

The denticulation of the inner margin of the 1st segment of basipodite of the 5th foot of *C. helgolandicus*, may be observed already in the immature stage. This respect also is described by With in 1915, about the case of *C. finmarchicus*.

Therefore, this species is clearly independent from *C. finmarchicus* and *C. helgolandicus*.

Length; Female about 5 mm, male is unknown.

Distribution; The distribution in the neighbouring waters of Japan, is as like as of

C. cristatus. I have taken at the St. 86, 88, 91, 122-126, 127, 129-133, 136, 137-139, 141-143, 145.

***Calanus tenuicornis* Dana 1849.**

Pl. 3, figs. 9, 10; Pl. 4, figs. 1-3.

- C. tenuicornis*, Dana, 1852, p. 1069, Pl. 37 fig. 10 a-b.
 „ , Giesbrecht, 1892, p. 90, Taf. 6, fig. 12, 13; Taf. 7, fig. 5, 16, 23; Taf. 8, f. 18, 27.
 „ , Giesbrecht u. Schmeil, 1898, p. 18.
 „ , Esterly, 1905, p. 127, fig. 3.
 „ , Bremen, 1906, p. 11, fig. 8 a-d.
 „ , Scott, A. 1908, p. 8.
 „ , Marukawa, 1908, p. 3, Pl. I, figs. 1-5.
 „ , Sato, 1913, p. 7, Pl. I, figs. 12-21.

Neocalanus tenuicornis, Sars, 1925, p. 9.

C. tenuicornis, Mori, 1929, p. 170, Pl. III, figs. 20-23; Pl. IV, fig. 1.

The head is separated from the thorax. The lateral angles of the last thoracic segment are round. The furca and its setae are symmetrical.

The 1st antennae are about $1\frac{1}{2}$ times as long as the body. The external margin of exopodites of the anterior 4 pairs of feet, neither denticulated nor notched. The internal margin of the 1st segment of basipodite of the 5th foot is not denticulate.

There is no appendage on the base of the inner marginal seta of the 2nd segment of basipodite of the 1st foot. The 5th foot of the male is not modified to form the forceps.

Length; Female about 1.8-2.0 mm, Male about 1.5-1.8 mm.

Distribution; This species is widely distributed in the tropical and subtropical oceans.

In the Japanese waters, the present species has been recorded that it is in the Japan-Sea, near the Ogasawara-Islands and Hokkaido.

I have obtained at the following positions; St. 5, 32, 35, 38, 49, 85-87, 93, 97, 112, 113, 126, 128, 144.

***Calanus gracilis* (Dana) 1849.**

Pl. 3, fig. 12; Pl. 4, figs. 7-9.

Cetochilus longicornis, Claus, 1863, p. 171, Taf. XXVI, fig. 1.

C. gracilis, Brady, 1883, p. 35, Pl. V and XLVI.

- „ , Giesbrecht 1892, p. 90, Taf. 1, f. 1; Taf. 6, f. 1; Taf. 7, f. 26; Taf. 8, f. 2, 4, 6-8, 12, 16, 26.
 „ , Giesbrecht u. Schmeil, 1898, p. 17.
 „ , Esterly, 1905, p. 128, fig. 4.

Megacalanus gracilis, Scott A. 1909, p. 12.

Neocalanus gracilis, Sars, 1925, p. 7.

Female; Allied to *C. tenuicornis* but the head is fused with the 1st thoracic segment; the 2nd terminal seta of the left side of furca is longer than the identical of the right;

there is a process at the base of the marginal seta of the 2nd segment of basipodite of the 1st foot.

Male; The head is separated from the thorax. The furcal setae are symmetrical. The anterior antennae are slightly shorter than the body.

The exopodites of the 2nd to 4th feet have the denticulation on the external margins. The endopodite of the left 5th foot with setae.

Length; Female about 3.2 mm.

Distribution; The present species has been recorded from the tropical and subtropical zones of the Atlantic Ocean, the Pacific Ocean and the Mediterranean Sea. In the Japanese waters, this species may be found in the warm current or Kuroshio—off Formosa, off the Cape Shiono-Misaki and the Kinkazan; and near Hachijo-Island.

I have taken only the female, at the St. 29, 35-40, 43, 44, 46, 47, 51-54, 63, 64, 71, 72, 76-80, 84, 104, 108, 109-113, 115, 119.

Calanus robustior Giesbrecht 1888.

Pl. 3, fig. 11; Pl. 4, figs. 4-6.

C. robustior, Giesbrecht, 1892, p. 91, Taf. 7, f. 15, 19, 30; Taf. 8, f. 34.

„ , Giesbrecht, u. Schmeil, 1898, p. 18.

„ , Esterly, 1905, p. 129, fig. 5 a-d, (fig. 5 d is slightly erroneous).

Megacalanus robustior, Scott A. 1909, p. 13.

Neocalanus robustior, Sars, 1925, p. 8.

Female; Closely allied to *C. gracilis*, but the ventral side of the genital segment is more convex than that of *C. gracilis*.

Male; Differs from *C. gracilis*, on the 5th pair of feet. The endopodite of the left 5th foot without setae, is stylet-like. The exopodite of that foot is relatively longer than that of *C. gracilis*.

Length; Female about 3.15-4 mm.

Distribution; This species has been recorded from the Pacific Ocean and the Atlantic Ocean. In the Japanese waters, we may find in the warm current; but appearances rather are rare. I have taken only the female individuals at the St. 29, 36, 71, 76, 109, 110.

Calanus minor (Claus) 1863.

Pl. 5, figs. 1-5.

Cetochilus minor, Claus, 1863, p. 172.

C. valgus, Brady, 1883, p. 33, Pl. III, figs. 1-7.

C. minor, Giesbrecht, 1892, p. 90, Taf. 6, f. 3, 16, 22; Taf. 7, f. 6, 22; Taf. 8, f. 1, 9, 19, 30.

„ , Giesbrecht u. Schmeil, 1898, p. 15.

„ , Esterly, 1905, p. 126, fig. 2.

„ , Sato, 1913, p. 8, Pl. III, figs. 22, 23.

Nannocalanus minor, Sars, 1925, p. 9.

C. minor, Mori, 1929, p. 169, Pl. III, figs. 11-15.

The head is fused with the 1st thoracic segment. The lateral angles of the last thoracic segment is round. The anterior antennae are about as long as the body.

The terminal segments of exopodites of all feet have no teeth or notches on the external margins. The inner margin of the 1st segment of basipodite of the 5th foot is straight, and more coarsely denticulate than that of *C. helgolandicus*.

The 5th pair of feet of the male is very peculiar.

Length; Female about 2 mm, Male about 1.8 mm.

Distribution; This species is distributed in the tropical and subtropical zones of the Pacific Ocean, the Atlantic Ocean and the Indian Ocean. In the Japanese waters, the present species has been recorded from the Tsugaru-Strait and the Japan-Sea etc.

I have taken at the following positions. St. 5, 6, 8, 25, 29, 39-42, 44-49, 51, 52, 54-56, 69, 81, 83, 88, 96, 98, 100, 101, 106, 108, 109-113, 115, 119, 126.

Calanus pauper Giesbrecht 1888.

Pl. 6, figs. 4-10.

C. pauper, Giesbrecht, 1892, p. 91, Taf. 6, f. 4; Taf. 8, f. 25.

„, Giesbrecht u. Schmeil, 1898, p. 16.

Canthocalanus pauper, Scott A. 1909, p. 9.

C. pauper, Yamada T. 1935, p. 74.

The shape resembles that of *C. minor*, but the inner margins of the 1st segments of basipodites of the 5th feet of both sexes, are not denticulated. The inner marginal seta of the 2nd segment of basipodite of the 1st foot is thick, and has a very short appendage at the base.

The exopodite of the right 5th foot of the male, has no inner marginal setae. The endopodite of the left 5th foot has only 2 setae on its apex.

The 1st segment of basipodite of the 1st foot has a process on the anterior distal margin. On that fact, Gen. *Canthocalanus* has been established by A. Scott, to receipt the present species. But I think that character is too insignificant to establish the Genus.

Length; Female about 1.5 mm, Male about 1.4 mm.

Distribution; The present species has been recorded from the tropical zone in the Pacific Ocean. Near Japan, this species seems to be distributed in the warm currents Kuroshio and the Tsushima-Current.

I have taken at the St. 29, 31-35, 37, 40, 42, 44, 47, 54-59, 62, 64, 65, 72, 74, 75, 76, 81, 82, 109, 114, 118, 121.

Calanus darwinii (Lubbock).

Pl. 5, figs. 6-12.

Undina darwinii, Brady, 1883, p. 54, Pl. XVI, figs. 1-4, 6-14.

C. darwinii, Giesbrecht, 1892, p. 91, Taf. 6, f. 5; Taf. 7, f. 29; Taf. 8, f. 37.

„, Giesbrecht u. Schmeil, 1898, p. 17.

Undinula darwinii, Scott A. 1909, p. 17.

C. darwinii, Sato, 1913, p. 10, Pl. III, figs. 24-29.

„ , Mori, 1929, p. 168, Pl. III, figs. 5-10.

C. ramosus, Mori, 1929, p. 169, Pl. X, figs. 9-15.

Female; The head is fused with the 1st thoracic segment. The lateral angles of the last thoracic segment are protruded, but not pointed; the left side is slightly longer than the right. The furcal setae are symmetrical.

The posterior margins of the 1st and 2nd abdominal segments have the spinules. The distal portions of the last segments of exopodites of the 2nd and 3rd feet are denticulated on the outer margins.

Male; The left 5th foot constitutes of the forceps, but without vermiform appendage on it.

Deformity; The furcal setae of this species often are ramified into several branches. Such deformed individuals were described erroneously as a new species *C. ramosus* by the author, in 1929. But I read the correction on this respect, at the 7th annual meeting of the Zoological Society of Japan, in 1931. The summary of that paper is described on the Dobutsugaku-Zasshi Vol. 46, p. 81, in 1934.

Distribution; The present species has been described that it is in the warm regions of the Pacific Ocean, the Atlantic Ocean and the Indian Ocean. In the Japanese waters, this species seems to be the inhabitant in the warm currents—the Kuroshio and the Tsushima-Current.

I have taken at the following positions. St. 4, 5, 18, 20, 23, 24, 25-27, 29-35, 37, 38, 40-55, 58, 63, 69-71, 75-80, 82-84, 96, 98, 99, 101, 104, 106, 107, 109-116, 118, 119.

Calanus vulgaris (Dana) 1852.

Pl. 5, figs. 13, 14; Pl. 6, figs. 1-3.

Undina vulgaris, Dana, 1852, p. 1093, Pl. 77, fig. 8 a-d.

„ , Brady, 1883, p. 53, Pl. XV, figs. 11-15; Pl. XVIII, fig. 6.

C. vulgaris, Giesbrecht, 1892, p. 92, Taf. 6, f. 11; Taf. 7, f. 2, 24, 27; Taf. 8, f. 17, 35.

„ , Giesbrecht u. Schmeil, 1898, p. 17.

„ , Marukawa, 1908, p. 4, Pl. I, figs. 16, 17; Pl. II, figs. 60-62.

C. orientalis, Marukawa, 1908.

Undinula vulgaris, Scott A. 1909, p. 16.

C. vulgaris, Sato, 1913, p. 11, Pl. III, figs. 30-33.

Undinula vulgaris, Sars, 1925, p. 10.

C. vulgaris, Mori, 1929, p. 168, Pl. III, figs. 16-19, 24; Pl. IV, fig. 2.

Female; The head is fused with the 1st thoracic segment. The lateral angles of the last thoracic segment are pointed, and often bifurcate. The 1st antennae are about as long as the body. The 2nd segment of exopodite of the 2nd foot has a notch on its external margin.

The inner margin of the 1st segment of basipodite of the 5th foot without the teeth. The 1st segment of endopodite of the 5th foot has a stout spine instead of the seta of

other *Calanus*.

Male; Characters resemble those of *C. darwinii*, but the left 5th foot consists of a grasping organ which with the vermi-form appendage.

Deformity; The deformity sometimes may be occur on the furcal setae of this species. Some setae are ramified into the branches. Such deformed individuals were erroneously described as a new species *C. orientalis* by H. Marukawa, in 1908. About that respect, I discussed at the 7th annual meeting of the Zoological Society of Japan, in 1931; with the case of the deformity of *C. darwinii*.

Distribution; The distribution of the present species is similiar of *C. darwinii*. I have obtained at the St. 1, 2, 4-10, 13-29, 31, 33-35, 37, 39-41, 44, 45, 47, 49, 52-59, 61-69, 76-78, 80, 82-84, 98, 100, 104, 109-120.

Gen. *Eucalanus* Dana 1848.

Eucalanus, Dana, 1848, p. 11.

The head is triangular, often elongate and fused with the 1st thoracic segment. The abdomen is short, that of the female has 3 or 4 segments, of the male has 5 segments. The anal segment is fused with the furca. The 2nd terminal seta on the left side of furca is longer than that of the right.

The anterior antennae are longer than the body; the sensory hairs of the male are conspicuously developed. There are 23 segments on the anterior antennae of the female.

The 2nd basal of mandible of the female makes with the exopodite a cylindrical body on which the endopodite articulates proximally to the exopodite.

The swimming feet are short, and with the 3-jointed exopodites. The endopodites of the 1st pair with 2 segments, of the 2nd to 4th pairs with 3 segments. The 5th pair is absent in the female; the right side often is absent in the male.

Key to the species.

Female;

- | | | | |
|-----|---|---|-----------------------|
| (0) | { | There are 2 segments between the anal and the genital segments..... | (1) |
| | | There is 1 segment between the anal and genital segments. | (2) |
| (1) | { | The lateral angles of the last thoracic segment are pointed. | <i>E. elongatus</i> |
| | | The identical portions are round..... | <i>E. giesbrechti</i> |
| (2) | { | The inner margin of the 2nd segment of basipodite of the mandible is divided | |
| | | into 2 nearly equal portions by the insertion of the endopodite..... | <i>E. attenuatus</i> |
| | | The proximal portion is much longer than the distal. | (3) |
| (3) | { | The 2nd terminal seta of the left side of furca is slightly longer and hardly | |
| | | thicker than the identical seta of the right; the genital segment is much | |
| | | broader than its length..... | <i>E. crassus</i> |
| | | The 2nd terminal seta of the left side of furca is longer and much thicker | |
| | | than the identical seta of the right; the genital segment is slightly broader | |
| | | than its length..... | (4) |

- (4) { The 2nd segment of basipodite of the maxilla with 5 inner marginal setae.....
*E. subcrassus*
 (5) { The 2nd segment of basipodite of the maxilla with 4 inner marginal setae..... (5)
 (5) { The forehead is triangular, and rounded in front.*E. subtenuis*
 { The forehead is sharply pointed.*E. mucronatus*

Male;

- (0) { Both feet of the 5th pair are present. (1)
 { The right 5th foot is absent. (3)
 (1) { The exopodite of the posterior antennae does not extend by far to the distal
 margin of the 1st segment of endopodite. (2)
 { The exopodite reaches about the distal margin of the 1st segment of endopodite.
*E. attenuatus*
 (2) { The lateral angles of the last thoracic segment are pointed.....*E. elongatus*
 { The identical portions are round.....*E. giesbrechti*
 (3) { The 2nd segment of basipodite of the maxilla with 5 inner marginal setae..... (4)
 { The 2nd segment of basipodite of the maxilla with 4 inner marginal setae..... (5)
 (4) { The 2nd terminal seta on the left side of furca is slightly longer and thicker
 than the identical seta of the right.*E. crassus*
 { The 2nd terminal seta on the left side of furca is enormously longer and thicker
 than that of the right.*E. subcrassus*
 (5) { The terminal segment of the 5th foot is shorter than its apical seta.....*E. subtenuis*
 { The terminal segment of the 5th foot is longer than its apical seta....*E. mucronatus*

Eucalanus elongatus* (Dana) 1849.*Pl. 7, figs. 1-5.**

E. elongatus, Giesbrecht, 1892, p. 131, Tal. 11, f. 2, 7, 12, 20, 25, 32, 36; Taf. 35, f. 1, 2, 13, 23, 24.

E. spinifera, Scott T. 1894, p. 29, Pl. I, figs. 15-23.

E. elongatus, Giesbrecht u. Schmeil, 1898, p. 20. (part)

„, Esterly, 1905, p. 131, fig. 6 c, d. (only the male).

„, Breemen, 1906, p. 14, fig. 10 a-d.

„, With, 1915, p. 48, Pl. I, figs. 5 a-d; text-figs. 9 a-f.

„, Farran, 1926, p. 230.

„, Tanaka, 1935, p. 143, Pl. I, figs. 1-3.

Female; The head is triangular. The lateral angles of the last thoracic segment are pointed. There are 2 segments between the anal and genital segments.

The 1st and 2nd segments of exopodite of the 2nd antenna are not fused; the 1st segment of endopodite is slightly longer than the 2nd, and over 3 times as long as its broad.

The inner margin of the 2nd segment of basipodite of the mandible with 3 setae, is divided into 2 nearly equal portions by the insertion of the endopodite. The endopodite has 2 setae on the 1st segment, 5 setae on the 2nd.

The maxilla with the 2nd lobe. The 3rd lobe of maxilla has 4 setae. The 2nd segment of basipodite has 5 marginal setae.

Male; The lateral angles of the last thoracic segment are pointed as like as the female. Both feet of the 5th pair are present; the terminal segments with 1 seta respectively.

Length; Female about 4.5 mm, male about 3.2 mm.

Distribution; The present species has been recorded that it is in the warm waters of the Mediterranean Sea, the Pacific and Atlantic Oceans.

I have taken at the St. 46, 49, 77-80, 97 and 112.

Bungia Bungia
Eucalanus giesbrechti sp. nov.

Pl. 7, figs. 6-8.

E. elongatus v. bungii, Giesbrecht, 1892, p. 149.

E. elongatus, Esterly, 1905, p. 131, fig. 6 a, b. (only the female).

E. elongatus?, Sato, 1913, p. 13, Pl. II, figs. 34-38.

E. elongatus v. bungii, Tanaka, 1935, p. 143, Pl. I, figs. 5-15.

Characters resemble those of the *E. elongatus*, but the forehead is tapered than that of the latter. The lateral angles of the last thoracic segment are round. The terminal segment of both feet of the 5th pair of the male with 2 setae.

This species traditionally has been put in the group of *E. elongatus* by many authors. But the difference between this *Eucalanus* and typical *E. elongatus*, is more distinct than that of between *E. subtenuis* and *E. mucronatus*.

The female of *E. elongatus* was described by Esterly in 1905; this species can be identified without any doubt as *E. giesbrechti*.

Length; Female about 6 mm, male about 5 mm.

Distribution; This species seems to be the inhabitant in the northern waters.

In the Japanese waters, this species has been recorded that it is off the Kinkazan, near Hokkaido and in the Okotsuk-Sea. I have taken at the St. 122, 125, 129, 131-136, 139, 141, 143.

Eucalanus attenuatus (Dana) 1849.

Pl. 8, figs. 1-6.

E. attenuatus, Dana, 1852, p. 1018, Pl. 75.

Calanella mediterranea, Claus, 1863, p. 176, Taf. 28, fig. 6-11.

E. attenuatus, Giesbrecht, 1892, p. 131, Taf. 3, f. 1; Taf. 11, f. 1, 11, 13, 16, 18, 40; Taf. 35, f. 3, 6, 17, 25, 34, 37.

„ , Giesbrecht u. Schmeil, 1898, p. 20.

„ , Esterly, 1905, p. 133, fig. 7 a-c.

„ , Breemen, 1906, p. 16, fig. 12 a-d.

„ , Sars, 1925, p. 21.

„ , Farran, 1929, p. 218.

E. attenuatus, Tanaka, 1935, p. 145, Pl. II, figs. 1-6.

Female; The forehead is triangular, and sometimes indented on each side. There is 1 segment between the anal and genital segments which is longer than its broad.

The 1st segment of endopodite of the posterior antenna is 4 times as long as its broad, and longer than the 2nd segment.

The inner margin of the 2nd segment of basipodite of the mandible is divided into approximately equal portions by the insertion of the endopodite. The 2nd segment of endopodite carries 4 setae on its apex.

The maxilla resembles that of *E. elongatus*. The 2nd lobe is present. The 2nd segment of basipodite has 5 inner marginal setae.

Male; Both feet of the 5th pair are present. The terminal portion of the left foot with dagger-like seta.

Length; Female about 4-5.5 mm, male about 3.5 mm.

Distribution; This species is distributed in the warm currents of the Mediterranean Sea, the Atlantic and Pacific Oceans.

Near Japan, this species may be found commonly in the Kuroshio or Japanese current. I have taken at the following positions. St. 25-29, 31-35, 39, 41-43, 45-47, 52-55, 63, 64, 71, 72, 74, 76-80, 83, 84, 86, 88, 97, 106, 107, 109-119.

Remarks; Between the individuals in this species, we may often recognizable some variations, about the shape of the forehead, the 5th feet of the male and the number of the setae of each segment of the 2nd maxillipede etc. Some individuals are smooth but the others are hairy. These variations may be seen as the respects which depend perhaps to the developmental stage of the individuals.

***Eucalanus crassus* Giesbrecht 1888.**

Pl. 9, figs. 7-11.

E. crassus, Giesbrecht, 1892, p. 132, Taf. 11, f. 8, 17, 21, 22, 38; Taf. 35, f. 4, 20, 26-28.

„ , Giesbrecht u. Schmeil, 1898, p. 22.

„ , Esterly, 1905, p. 134, fig. 8 a-d.

„ , Breemen, 1906, p. 16, fig. 13 a-d.

„ , Scott A. 1909, p. 19.

„ , With, 1915, p. 53, Pl. I, fig. 7, text-fig. 11.

E. oculanus, Marukawa, 1921, p. 11, Pl. 4, figs. 1-14.

E. crassus, Sars, 1925, p. 22.

„ , Farran, 1926, p. 231; 1929, p. 220.

„ , Tanaka, 1935, p. 149, Pl. V, figs. 1-14.

Female; The body is hairy, especially in immature stages. The forehead is somewhat round. The genital segment is much broader than its length, and onion-shaped; between it and the anal segment with 1 segment.

The anal segment is fused with the furca. The left 2nd terminal seta of the furca is slightly longer than that of the right.

The proximal 2 segments of the exopodite of the posterior antenna are fused. The 1st segment of endopodite is about 2 times as long as its broad, and shorter than the 2nd.

The endopodite of mandible reaches the distal margin of the 2nd segment of basipodite; the 1st segment of endopodite with 2 setae, and the 2nd with 4 setae.

The 2nd lobe of the maxilla is absent; the 3rd lobe with 3 setae. The 2nd segment of basipodite of the maxilla has 5 inner marginal setae.

E. oculus which was described by Marukawa in 1921, is only the case of immature stage of this species.

Male; The Secondary sexual characters are not distinct. The right foot of the 5th pair is absent. Figures show the young stage of the male.

Length; Female 3.0-3.7 mm, male about 3 mm.

Distribution; This species is distributed in the warm waters of the world. In the Japanese waters, this species may be found in the warm current or Kuroshio, near Formosa, off the Shiono-Misaki, the Sagami-Bay and off the Kinkazan etc. I have taken at the St. 59-61, 63-65, 77, 78, 96, 98, 106, 114.

***Eucalanus subcrassus* Giesbrecht 1888.**

Pl. 9, figs. 1-6.

E. subcrassus, Giesbrecht, 1892, p. 132, Taf. 11, f. 6, 14, 19, 30, 39; Taf. 35, f. 12, 16, 31, 32.

„ , Giesbrecht u. Schmeil, 1898, p. 22.

„ , Scott A. 1909, p. 21.

„ , Farran, 1929, p. 219.

„ , Tanaka, 1935, p. 149, Pl. IV, figs. 9-16.

Female; Allied to *E. crassus* but the 2nd terminal seta on the left side of furca is much longer than that of the right. The genital segment is relatively more narrow than that of *E. crassus*.

The 1st segment of endopodite of the 2nd antenna is shorter than 3 times as long as its broad. The endopodite of the mandible with 2 setae on the 1st segment, 4 setae on the 2nd; and reaches the distal end of the 2nd segment of basipodite.

The maxilla resembles that of *E. crassus* but the 3rd lobe carries 4 setae, instead of 3 of the latter.

Male; The 2nd terminal setae on both sides of the furca are largely asymmetrical as the case of female.

The right foot of the 5th pair is absent. The apical seta is longer than the last segment.

Length; Female about 2.5 mm, male about 2.4 mm.

Distribution; This species is distributed in the tropical zone of the Pacific Ocean, and carried to the subtropical zone by the warm currents.

I have taken at the following positions. St. 33-35, 43, 44, 46, 48-55, 65, 66, 68, 69, 72, 78, 80, 84, 97, 109-115, 118, 119.

Eucalanus mucronatus Giesbrecht 1888.**Pl. 8, figs. 7-11.**

- E. mucronatus*, Giesbrecht, 1892, p. 132, Taf. 11, f. 9, 26, 34; Taf. 35, f. 15, 35, 38.
 „ , Giesbrecht u. Schmeil, 1898, p. 21.
 „ , Scott A. 1909, p. 20.
 „ , Sars, 1925, p. 21.
 „ , Farran, 1929, p. 218.
 „ , Mori, 1929, p. 171, Pl. IV, figs. 10, 11.
 „ , Tanaka, 1935, p. 147, Pl. III, figs. 1-4.

Female; The forehead is triangular and sharply pointed. The 2nd terminal setae on both sides of the furca are asymmetrical. The inner margin of the 2nd segment of basipodite of the mandible with 3 setae, is divided into 3:1, by the insertion of the endopodite. The endopodite of mandible with 2 short setae on the 1st segment, and 4 setae on the 2nd segment; the terminal portion not reaches the distal margin of the 2nd basal.

The inner margin of the 2nd segment of basipodite of the maxilla with 4 setae.

This species has been distinguished from *E. subtenuis*, by Giesbrecht, about the respect that the forehead of the former is more taper than that of the latter.

Tanaka described in 1935, that the inner margin of the 2nd segment of basipodite of the mandible without setae; the endopodite with 1 seta on the 1st segment, and 4 setae on the 2nd. But his figure (Tanaka, 1935, Pl. III, fig. 3) shows 3 setae on the 2nd segment of basipodite of the mandible, and 2 setae on the 1st segment of endopodite.

So I think, that room is leaved for doubt about the difference between 2 species.

Male; The right foot of the 5th pair is absent. The apical seta of the left 5th foot is shorter than the terminal segment. This fact differs from that of *E. subtenuis*.

This male is distinguishable from that of the *E. subcrassus*, about the number of the marginal setae on the 2nd segment of basipodite of the maxilla.

I have found the male of this species in the data of Plankton which taken near Hachijo-Island.

Length; Female about 3 mm, male 2.7-2.9 mm.

Distribution; The present species is distributed in the warm regions of the Mediterranean Sea, the Atlantic Ocean and the Indian Ocean.

I have taken at the St. 4, 18, 48, 49, 72, 76-78, 80, 109-112, 114, 119.

Eucalanus subtenuis Giesbrecht 1888.

- E. subtenuis*, Giesbrecht, 1892, p. 132, 150, Taf. 11, f. 4, 23, 42; Taf. 35, f. 9-11, 18, 29, 30.
 „ , Giesbrecht u. Schmeil, 1892, p. 21.
 „ , Esterly, 1905, p. 135, fig. 9 a-b.
 „ , Marukawa, 1908, p. 6, Pl. I, figs. 35-41; Pl. II, figs. 42-48.
 „ , Scott A. 1909, p. 21.

E. subtenuis, Sars, 1925, p. 21.

„ , Farran, 1929, p. 218.

„ , Mori, 1929, p. 170, Pl. III, figs. 25-28; Pl. IV, figs. 3-9.

„ , Tanaka, 1935, p. 147, Pl. III, figs. 5-12.

Female; Allied to *E. mucronatus*, but the forehead is triangular, and its apical portion is round. The 2nd segment of basipodite of the mandible has 2 setae on the inner margin.

Male; Character resembles that of *E. mucronatus* but the terminal seta of the left 5th foot is longer than the last segment.

Length; Female about 2.8 mm, male about 2.7 mm.

Distribution; This species is distributed in the Pacific, Atlantic and Indian Oceans. Also is recorded from the Arabian-Sea.

In the Japanese waters, I have taken at the following positions. St. 1-5, 8, 16, 19, 20, 23, 24, 25, 27, 30-34, 36, 37, 47, 49, 50, 67-71, 75-80, 83, 84, 95-98.

Gen. *Rhincalanus* Dana 1848.

Female; The forehead is produced into a snout-like process. The head is fused with the 1st thoracic segment. The 4th thoracic segment is distinct from the 5th.

The abdomen with 3 segments. The anal segment is obscurely separated from the furca. The 2nd terminal setae on both sides of the furca are asymmetrical. The abdominal and thoracic segments with spines.

The anterior antennae with 23 segments, are longer than the body. The rami of posterior antennae are equal in length.

The swimming feet are short; the rami of the 1st pair have 2 segments; from the 2nd to 4th pairs have 3 segments.

The 5th pair of feet is uniramous, and has 3 segments on both sides.

Male; Characters resemble those of the female but the anterior antennae are considerably shorter.

The right 5th foot with 3 segments, is uniramous, and has a terminal claw. The left 5th foot is biramous; the exopodite has a terminal claw.

Rhincalanus nasutus Giesbrecht 1888.

Pl. 10, figs. 6-9.

R. nasutus, Giesbrecht, 1892, p. 152, Taf. 3, f. 6; Taf. 9, f. 6, 14; Taf. 12, f. 9-12, 14, 16, 17; Taf. 35, f. 46, 47, 49.

„ , Giesbrecht u. Schmeil, 1898, p. 22.

„ , Sars, 1903, p. 15, Pl. VI, VII.

„ , Esterly, 1905, p. 136, fig. 10 a-b.

„ , Breemen, 1906, p. 17, fig. 14 a-d.

R. gigas, Scott A. 1909, p. 24.

R. nasutus, Sars, 1925, p. 23.

„ , Schmaus, 1927, text-fig. 3, 19.

R. nasutus, Farran, 1929, p. 220.

„ , Wilson, 1932, p. 34, fig. 18 a-c.

„ , Tanaka, 1935, p. 151, Pl. IV, figs. 1-4.

The rostral filaments are situated under the frontal projection, and are hardly visible from above.

Both feet of the 5th pair of the female are 3-jointed and uniramous. Those feet with 1 seta on the 2nd segment, and 3 setae on the 3rd segment.

The right 5th foot of the male is uniramous, and has a slender and curved terminal claw. The left foot is biramous. The endopodite consists of 2 segments which are about equal each other, and is about 3 times as long as the exopodite. The exopodite consists of 1 segment; and with a long plumose seta and a short unplumose one.

Length; Female about 4.5 mm, male about 3.5 mm.

Distribution; This species is distributed in the Atlantic, Pacific and Indian Oceans. This species seems to be relatively rare in the Japanese waters. I have taken at the following positions. St. 35, 80, 96 and 106.

Rhincalanus cornutus Dana 1852.

Pl. 10, figs. 1-5.

R. cornutus, Dana, 1852, p. 1083, Pl. 76, figs. 2 a-d.

„ , Brady, 1883, p. 41, Pl. VII, figs. 1-10.

„ , Giesbrecht, 1892, p. 153, Taf. 12, f. 13, 15.

„ , Scott T. 1894, p. 30.

„ , Giesbrecht u. Schmeil, 1898, p. 23.

„ , Breemen, 1906, p. 18, fig. 15 a-c.

„ , Scott A. 1909, p. 32.

„ , Schmaus, 1927, text-fig. 1, 11.

„ , Sars. 1925, p. 22.

„ , Farran, 1929, p. 220.

„ , Mori, 1929, p. 171, Pl. IV, figs. 12-16.

„ , Wilson, 1932, p. 35, fig. 19 a-c.

„ , Tanaka, 1935, p. 151, Pl. VI, figs. 5-7.

The rostral filaments are divergent laterally, and visible in dorsal view.

The 5th feet of the female without seta on the 2nd segment; and with a stout, curved and denticulate seta on the 3rd segment.

The right 5th foot of the male is uniramous, 3-jointed, and carries a stout and nearly straight terminal claw. The left foot is biramous. Both rami of that foot are about equal each other. The 1st segment of endopodite is longer than the 2nd.

Length; Female about 3.6 mm, male about 2.6 mm.

Distribution; This species is distributed in the tropical and sub-tropical zones of the Pacific and Atlantic Oceans; the Gulf of Guinea etc.

In the Japanese waters, the present species may be found in the Kuroshio and the Tsushima-current. I have taken at the St. 10, 18, 36, 46, 49, 54, 77-81, 109, 110, 112,

113, 115.

Gen. *Mecynocera* Thompson 1888.

The forehead is round. The head is distinct from the thorax. The lateral angles of the last thoracic segment are round.

The abdomen consists of 3 segments in the female; the genital segment is symmetrical and swelled. The furca is distinct from the anal segment.

The anterior antennae are longer than 2 times as long as the body, and composed of 23 segments. The endopodite of the 2nd antenna is longer than 2 times as long as the exopodite.

The exopodites of the feet from the 1st to 4th are 3-jointed. The endopodite of the 1st foot is composed of 1 segment; from the 2nd to 4th are composed of 3 segments.

The 5th pair of feet of the female without exopodites, is symmetrical and composed of 5 segments.

Mecynocera clausi Thompson 1888.

Pl. 11, figs. 1-3, Pl. 23, figs. 1-3.

- M. clausi*, Giesbrecht, 1892, p. 160, Taf. 5, f. 1; Taf. 11, f. 43-45; Taf. 35, f. 21-22.
 „ , Scott T. 1893, p. 80, Pls. I-II.
 „ , Giesbrecht u. Schmeil, 1898, p. 23.
 „ , Esterly, 1905, p. 137, fig. 11.
 „ , Breemen, 1906, p. 19, fig. 16 a-b.
 „ , Scott A. 1909, p. 25.
 „ , Wolfenden, 1911, p. 202.
 „ , Sars, 1925, p. 23.
 „ , Farran, 1929, p. 221.
 „ , Wilson, 1932, p. 36.
 „ , Tanaka, 1935, p. 152, Pl. IV, figs. 8-10.

Female; Character agrees with that of the generic description.

Male; I have found the male which has 4 segments on the abdomen; both feet of the 5th pair are composed of 4 segments (Pl. 23, figs. 1-3). Such male was described as adult by Wilson in 1932.

But I think that the male perhaps seems to be only an immature stage of this species.

Length; about 1 mm.

Distribution; This species has been recorded that it is in the Pacific, Atlantic and Indian Oceans; the Mediterranean Sea and the Gulf of Guinea etc. In the Japanese waters, this species may be found in the warm currents.

I have taken at the following Stations. St. 25-27, 36, 37, 40, 47, 69, 70, 73, 76-79, 108, 109, 110, 112-116, 126.

Gen. *Paracalanus* Boeck 1864.

The head and the posterior angles of the last thoracic segment are round.

The head is fused with the 1st thoracic segment; the 4th and 5th thoracic segments are fused in the female.

The abdomen has 4 segments in the female, 5 segments in the male.

The 1st antennae of the female have 25 segments; but the case of the male, fusions reduce the number of segments to 19 or 20.

The 1st pair of feet has 2 segments on the endopodites; the other 3 pairs have 3 segments on the endopodites. The exopodites of the first 4 pairs of feet have 3 segments.

The proximal division of the external margin of the 3rd segment of exopodite of the 4th foot is over twice as long as the distal.

The 5th pair of feet is uniramous and symmetrical in the female, and is asymmetrical in the male.

Paracalanus parvus (Claus) 1863.

Pl. 11, figs. 11-15.

Calanus parvus, Claus 1863, p. 173, Taf. 26, fig. 10-14; Taf. 24, fig. 1-4.

P. parvus, Giesbrecht 1892, p. 164, Taf. 1, f. 5; Taf. 6, f. 28-30; Taf. 9, f. 5, 11, 25, 27, 31, 32.

„ , Scott T. 1894, p. 26, Pl. 1, figs. 9-14.

„ , Giesbrecht u. Schmeil, 1898, p. 24.

„ , Sars, 1903, p. 17, Pls. VIII and IX.

„ , Esterly, 1905, p. 140, fig. 12 a-e.

„ , Breemen, 1906, p. 20, fig. 17 a-e.

„ , Scott A. 1909, p. 27.

„ , Sato, 1913, p. 15, Pl. III, figs. 39-42.

„ , With, 1915, p. 54, text-fig. 12.

„ , Sars, 1925, p. 24.

„ , Mori, 1929, p. 171, Pl. IV, figs. 17-20.

„ , Wilson, 1932, p. 38, fig. 21 a-c.

Female; Head is fused with the 1st thoracic segment; the 4th and 5th thoracic segments also are fused. The 1st antennae, when reflexed, extend beyond the middle portion of the abdomen.

The 1st marginal spine of the terminal segment of exopodite of the 4th foot is situated on the distal portion of the external margin. The external margin of the 2nd segment of exopodite of the 4th foot is naked.

The proximal divisions on the external margins of the 3rd segments of exopodites of the 3rd and 4th pairs of feet are denticulate.

The 5th pair of feet is uniramous and symmetrical, and composed of 2 segments. The 2nd segments of those feet have 2 setae which are different in length.

Male; The 5th thoracic segment is distinct from the 4th.

The external margin of the 2nd segment, and the distal division of the external margin of the 3rd segment of exopodite of the 4th foot are denticulate.

The 5th pair of feet is uniramous and asymmetrical. The right foot consists of 2 segments, the left consists of 5 segments. The terminal 2 setae on both feet are different in length.

Length; Female 0.7–1.2 mm, male 0.8–1.2 mm.

Distribution; This species seems to be very widely distributed in the tropical and subtropical zone of the oceans. We may obtain commonly from the Japanese waters.

In my collections, this species has been obtained at the following Stations. St. 1–13, 15–24, 26, 33, 35, 62, 69, 70, 82, 85–88, 90, 91, 93–95, 99, 113.

Paracalanus aculeatus Giesbrecht 1888.

Pl. 11, figs. 4–10.

P. aculeatus, Giesbrecht, 1892, p. 164, Taf. 9, f. 20, 26, 30.

„ , Scott T. 1894, p. 26, Pl. I, figs. 9–14.

„ , Giesbrecht u. Schmëil, 1898, p. 24.

„ , Scott A. 1909, p. 26.

„ , Sars, 1925, p. 24.

„ , Mori, 1932, p. 167, Text-fig. 1 a-c.

Female; Allied to *P. parvus* but the anterior antennae extend beyond the body end. The furcal setae are longer than the abdomen.

The spines on the posterior surface of the 2nd segment of endopodite of the 4th foot are more prominent than those of *P. parvus*. The surfaces of the 1st segment of basipodites from the 2nd to 4th pairs of feet are naked.

Male; The 5th thoracic segment is fused with the 4th.

The anterior antennae are shorter than the body. The first 6 segments of those antennae are fused together, but the 7th and 8th are separated distinctly.

The swimming feet from the 2nd to 4th pairs resemble those of the female.

The 5th pair of feet is characteristic; the right foot has 3 segments. The left foot consists of 5 segments; the basipodite are very wide.

Length; Female about 1 mm, male about 0.7–0.9 mm.

Distribution; This species seems to be distributed in the tropical zone of the Atlantic, Pacific and Indian Oceans and also in the Mediterranean Sea.

Near Japan, this species spreads over the waters which are influenced by the warm currents—near Formosa, the Korea Strait, off the Cape Shiono-Misaki and near Hachijo-Jima etc. I have taken at the St. 32, 33, 50, 56, 72, 80, 110, 113, 115–117, 119.

Gen. Acrocalanus Giesbrecht 1888.

Characters resemble those of *Paracalanus*, but the proximal division of the external margin of the 3rd segment of exopodite of the 4th foot is shorter than 2 times as long as the distal.

The 5th pair of feet is vestigial or absent in the female; the right foot is absent in the male.

Key to the species.

Female;

- (1) { The terminal 5 segments of the 1st antenna extend over the body end.....*A. longicornis*
 { At the most, the terminal 3 segments extend beyond the body end.....(2)
- (2) { At the lateral view, the forehead shows the truncate shape.....*A. monachus*
 { At the lateral view, the forehead is round.....(3)
- (3) { At the lateral view, cephalothorax is dorsally convex at the opposite portion of
 mouth.....*A. gibber*
 { At the lateral view, the identical portion is gradually curved.....*A. gracilis*

Acrocalanus gracilis Giesbrecht 1888.

Pl. 12, figs. 1-5.

A. gracilis, Giesbrecht, 1892, p. 171, Taf. 6, f. 27; Taf. 10, f. 35.

„, Giesbrecht u. Schmeil, 1898, p. 25.

„, Scott A. 1909, p. 29.

„, Mori, 1929, p. 172, Pl. IV, figs. 24-25, Pl. V, fig. 1.

Female; At the lateral view, the forehead is round; and the dorsal side of cephalothorax is gradually curved at the opposite portion of the mouth.

The anterior antennae, when reflexed, extend beyond the body end by the terminal 2 or 3 segments.

The external margins of the 3rd segment of exopodites of the 2nd to 4th pairs of feet are denticulate.

Male; Characters resemble those of the female.

The 5th pair of feet is asymmetrical; the right foot is vestigial or absent; the left foot consists of 5 segments.

Length; Female about 1.2 mm, male about 1.1 mm.

Distribution; This species has been recorded from the Red Sea, and also the Atlantic, Pacific and Indian Oceans.

Near Japan, this species commonly appears in the warm currents. I have taken at the following positions. St. 1, 22, 24, 25, 26, 46, 50, 54, 56, 58, 59, 64, 78, 96-98, 100, 106, 107, 109.

Acrocalanus longicornis Giesbrecht 1888.

Pl. 12, fig. 6.

A. longicornis, Giesbrecht, 1892, p. 171, Taf. 6, f. 25, 33; Taf. 10, f. 23, 36, 39.

„, Giesbrecht u. Schmeil, 1898, p. 25.

„, Scott A. 1909, p. 28.

„, Mori, 1929, p. 172, Pl. IV, figs. 21-23; Pl. V, fig. 2.

Female; This species can be easily distinguished from the other, by the length of its anterior antennae. The anterior antennae, when reflexed, extend beyond the body end by the terminal 5 segments.

The forehead is round, and the dorsal surface of cephalothorax is smoothly curved, when viewed from the side.

Length; Female about 1.1 mm.

Distribution; This species has been recorded from the tropical zone of the Atlantic, Pacific and Indian Oceans, and also from the Red Sea.

Near Japan, this species appears in the warm currents, as the preceding species. Only the females occurred at the following Stations. St. 1-6, 21, 23, 24-26, 37, 39, 84, 96, 100, 107.

Acrocalanus gibber Giesbrecht 1888.

Pl. 12, figs. 7-9.

A. gibber, Giesbrecht, 1892, p. 171, Taf. 6, f. 32; Taf. 10, f. 37.

„ , Giesbrecht u. Schmeil, 1898, p. 25.

„ , Scott A. 1909, p. 29.

Female; The forehead is round, the dorsal surface of cephalothorax is convex at the opposite portion of the mouth, when viewed from the side.

The anterior antennae, when reflexed, extend beyond the body end by 3 segments.

Male; Characters resemble those of the female.

The 5th pair of feet is asymmetrical; the right foot is vestigial or absent as the case of *A. gracilis*.

Length; Female 0.9-1.2 mm; male about 1 mm.

Distribution; This species has been recorded from the Pacific and Indian Oceans, and also from the Red Sea.

Near Japan, this species appears in the southern waters. In my collections, this species has been obtained at the following Stations which are situated near Formosa. St. 50, 52, 54, 55, 57-59, 65, 66.

Acrocalanus monachus Giesbrecht 1888.

Pl. 12, fig. 10; Pl. 13, figs. 13, 14.

A. monachus, Giesbrecht, 1892, p. 171, Taf. 6, f. 26, 31; Taf. 10, f. 38.

„ , Giesbrecht u. Schmeil, 1898, p. 25.

„ , Scott A. 1909, p. 30.

Female; The forehead is moderately broad and truncate shape, at the lateral view.

The anterior antennae, when reflexed, extend beyond the body end by 3 segments.

The external margins of the terminal segment of exopodites of the feet are roughly denticulate.

Length; Female 0.9-1.0 mm.

Distribution; This species has been recorded from the Pacific and Indian Oceans,

and from the Red Sea.

In the Japanese Waters, this species is more widely distributed to the northern regions, than the other 3 species in this Genus. In my collections, this species has been obtained only the female at the following stations; and I have found that this species has been distributed near Hokkaido.

St. 32, 33, 37, 39, 43, 44, 46, 50, 110, 114, 116, 119, 125, 132, 144.

Gen. *Calocalanus* Giesbrecht 1888.

Female; Characters somewhat resemble those of *Paracalanus*, but the abdomen has 2 or 3 segments. The terminal segments of the anterior antennae are at least 2 times as long as the preceding ones.

The 2nd segment of basipodite of the 1st foot has no marginal seta on the inner margin. The external margin of exopodites of feet are not denticulate. The 5th pair of feet consists of 3 or 4 segments.

Male; The anterior antennae are symmetrical; the 1st segment is fused with the 2nd; from the 3rd to 6th, the 25th and 24th are also fused.

The 5th pair of feet is asymmetrical; the right foot consists of 4 segments, the left consists of 5 segments.

Calocalanus pavo (Dana) 1849.

Pl. 13, figs. 1-3.

Calocalanus pavo, Giesbrecht, 1892, p. 175, Taf. 1, f. 13; Taf. 4, f. 15; Taf. 9, f. 3, 4, 13, 19; Taf. 36, f. 43-45.

„ „, Scott T. 1894, p. 37, Pl. VI, figs. 9-10.

„ „, Giesbrecht u. Schmeil, 1898, p. 26.

„ „, Bremen, 1906, p. 22, fig. 18 a-d.

„ „, Scott A. 1909, p. 30.

„ „, Wilson, 1932, p. 39, fig. 22.

Female; The head is fused with the 1st thoracic segment; the 4th thoracic segment is obscurely separated from the 5th.

The abdomen with 2 segments; the genital segment is onion shape. The furca and its setae are symmetrical.

The 1st segment of basipodite of the 1st foot has marginal seta on its inner margin. The proximal division of the external margin of the terminal segment of exopodite of the 4th foot is about 2 times as long as the distal.

The 5th pair of feet is uniramous and symmetrical; each foot is about as long as the basipodite of the 4th foot.

Length; Female 0.85-1.4 mm.

Distribution; This species has been recorded from the tropical and subtropical zones of the Mediterranean and Red Seas, and also from the Atlantic, Pacific and Indian Oceans.

Near Japan, this species is distributed in the Korea St. near the Amami-Islands, near

Gen. *Pseudocalanus* Boeck 1872.

Characters resemble those of *Clausocalanus* but differ on the following respects.

The anterior antennae of the female have 24 segments; the 8th segment fuses with the 9th, but the 25th is separated from the preceding.

The distal margins of the posterior sides of the 2nd segments of basipodites of the 3rd and 4th feet are not denticulate.

The anterior antennae of the male have 19 segments. The 5th pair of feet of the male is asymmetrical, the left has 5 segments, and the right has 4 segments respectively.

Pseudocalanus minutus (Kröyer) 1847.

Pl. 15, figs. 1-7.

P. elongatus (Boeck), Giesbrecht 1892, p. 197, Taf. 10, f. 22, 31-33.

" " , Giesbrecht u. Schmeil, 1898, p. 28.

" " , Sars, 1900, p. 69.

" " , Sars, 1903, p. 20, Pl. X, XI.

" " , Breemen, 1906, p. 25, fig. 22 a-f.

" " , Sato, 1913, p. 18, Pl. II, figs. 43-44; Pl. IV, figs. 33, 34.

P. minutus, (Part—Giesbrecht's *P. elongatus* only) With, 1915, p. 57, Pl. I, fig. 8; text-fig. 13 a-f, 14 a-c.

P. minutus, Wilson, 1932, p. 43, fig. 25 a-b.

Female; The head is fused with the 1st thoracic segment; the 4th thoracic segment also is fused with the 5th. The forehead is smoothly rounded. The abdomen with 4 segments and is about $\frac{1}{2}$ times as long as the cephalothorax.

The furcal style is about 3 times of its width. The anterior antennae, when reflexed, extend about the distal margin of the 2nd abdominal segment.

Male; The abdomen has 5 segments. The 1st antennae with 19 segments and are extend about the distal margin of the 2nd abdominal segment.

The 5th pair of feet is asymmetrical; the left foot is uniramous and consists of 5 segments, the right foot also is uniramous and consists of 4 segments.

Length; Female about 1.3 mm, male about 1.2 mm.

Distribution; This species is neritic and distributed in the cold waters. So the appearance of this species often indicate us the presence of the cold currents.

Near Japan, this species is distributed off the eastern coast of Chosen, off the Cape Kinkazan, and near Hokkaido etc.

I have found this species abundantly in the samples which are collected by Mr. Yamada off the eastern coast of Chosen in the winter of 1933. In my collections, this species has been obtained at the following Stations.

St. 85-88, 90, 92-95, 122-125, 128-133, 135, 138-141, 144, 145.

Pseudocalanus gracilis Sars 1903.

Pl. 14, figs. 12-17.

P. gracilis, Sars, 1903, p. 554, Suppl.—Pl. I.

Female; Characters resemble those of *P. minutus* but the body is relatively slender. At the lateral view, the forehead is more convex than that of *P. minutus*. The abdomen is shorter than $\frac{1}{2}$ times as long as the cephalothorax. The furcal style is about 4 times as long as its width.

The anterior antennae, when reflexed, extend beyond the end of the 3rd abdominal segment.

Length; This species is slightly larger than *P. minutus*, female about 1.6 mm.

Distribution; This species has been recorded from the Scottish coast and also the Baltic Sea.

Near Japan, this species is likely to be distributed about the same region with *P. minutus*. But the appearance is rather rare.

I have taken only the females at the following Stations.

St. 87, 89, 131, 140.

Gen. *Ctenocalanus* Giesbrecht 1888.

Female; Allied to *Clausocalanus* and *Pseudocalanus*, but the marginal spines on the 3rd segments of exopodites of the 3rd and 4th pairs of feet are denticulate.

The distal margins of the 2nd segments of basipodites of the 2nd and 3rd pairs of feet are not denticulate.

Ctenocalanus longicornis sp. nov.

Pl. 15, figs. 12-16.

Female; Allied to *C. vanus* Giesbrecht but the 5th pair of feet is absent. The anterior antennae are 24-segmented; the 8th segment is fused with the 9th. These antennae, when reflexed, extend beyond the body end by the terminal 3 segments.

Length; Female about 1.23 mm.

Distribution; Only the females of this species were obtained by the author in the Ki-Channel in the summer of 1932. St. 83, 84.

Gen. *Actideus* Brady 1883.

Actideus, Brady, 1883, p. 75.

Female; The forehead is round, or sometimes has a median crest. The head and the 1st thoracic segment are fused. The 5th thoracic segment is fused with the 4th one.

The lateral angles of the last thoracic segment are produced into the spines. The rostrum is stout and bifurcated. The posterior division consists of 4 segments.

The anterior antennae consist of 23 segments. The 8th is fused with the 9th, and the 24th also is fused with the 25th segment. The endopodite of the 2nd antenna is about as long as the exopodite.

The exopodites of from the 1st to 4th pairs of feet have 3 segments. The endopodites of the 1st and 2nd pairs of feet consist of 1 segment. The endopodites of the 3rd and

4th pairs of feet have 3 segments. The 5th pair of feet is absent.

Male; Characters resemble those of the female but the posterior division consists of 5 segments; the anal segment is very short.

The anterior antennae are composed of 20 segments; from the 8th to 10th, 12th with 13th, 20th with 21st, and 24th with 25th are fused respectively.

The left 5th foot is uniramous and consists of 5 segments, the right 5th foot is absent.

***Aetideus armatus* (Boeck) 1872.**

Pl. 16, figs. 1-10.

- Actidius armatus*, Brady, 1883, p. 76, Pl. X, figs. 5-16.
 ,, , Giesbrecht u. Schmeil, 1898, p. 31. (part)
 ,, , Sars, 1903, p. 25, Pls. XIII, XIV.
 ,, , Esterly, 1905, p. 154, fig. 14 a-b.
 ,, , Bremen, 1906, p. 30, fig. 30 a-d.
 ,, , Scott A. 1909, p. 37, Pl. IV, figs. 14-25.
 ,, , Wolfenden, 1911, p. 209, text-fig. 4 a-c.
 ,, , With, 1915, p. 75, Pl. II, fig. 1 a-d; text-fig. 16.
 ,, , Farran, 1916, p. 246.
 ,, , Wilson, 1932, p. 45, fig. 26 a-b.

Female; The forehead is round. There is no trace of a crest. The head is fused with the 1st thoracic segment. (figured female—Pl. 16, figs. 8, 9,—is not fully matured, so the head is incompletely separated from the 1st thoracic segment, and the genital segment is not fully developed). The last 2 thoracic segments of the cephalothorax also are fused.

The lateral angles of the last thoracic segment are produced into the spines which extend to the end of the genital segment.

Male; With the characters of the Genus.

Length; Female about 2.0 mm. male about 1.3 mm.

Distribution; This species is widely distributed in the tropical and subtropical zones of the Atlantic, Pacific and Indian Oceans, and also in the Mediterranean Sea.

The appearance in the adjacent waters of Japan is rather rare. In my collections, this species has been found at the following Stations. St. 77 and 133.

***Aetideus giesbrechti* Cleve.**

Pl. 16, figs. 11-13.

- A. giesbrechti*, Scott A. 1909, p. 36, Pl. IV, figs. 1-13.
 ,, , Wolfenden, 1911, p. 209, Taf. XXIV, fig. 8; text-fig. 5 a-b.
Enaetideus giesbrechti, Sars, 1925, p. 42, Pl. XIV, fig. 1-3.
A. giesbrechti, Farran, 1926, p. 247.

Female; Allied to *A. armatus* but the forehead has a distinct median crest. The rostrum is very stout, and its rami are situated with a relatively broad interval.

The lateral angles of the last thoracic segment are produced into strong spines which extend beyond the end of the 2nd abdominal segment.

Length; Female about 2.0 mm.

Distribution; This species has been recorded that it is in the tropical and subtropical zones of the Pacific, Atlantic and Indian Oceans, and is also in the Mediterranean Sea.

Near Japan, this species may be found in the warm currents. The females and immature males are obtained at the following Stations.

St. 35, 36 and 77.

Gen. *Bradyidius* Giesbrecht 1897.

Female; Characters resemble those of *Actideus* but the head is separated from the 1st thoracic segment. The anterior antennae consist of 24 segments; the 25th segment is distinct from the 24th.

The endopodites of the 2nd pair of feet have 2 segments.

Bradyidius armatus (Brady) 1878.

Pl. 16, figs. 14-16; Pl. 17, figs. 1-5.

B. armatus, Giesbrecht u. Schmeil, 1898, p. 32.

Undinopsis bradyi, Sars, 1903, p. 32, Pls. XIX, XX.

B. armatus, Breemen, 1906, p. 31, fig. 39 a-c.

„ „, Scott A. 1909, p. 39, Pl. VI, figs. 1-11.

Female; The anterior division seen from above appears oval in outline. The forehead is round and has no median crest.

The head is separated from the 1st thoracic segment. The lateral angles of the last thoracic segment are produced into spines which scarcely reach to the distal margin of the genital segment.

The rostrum is bifurcate and smaller than that of *Actideus*. The abdomen is composed of 4 segments.

The anterior antennae consist of 24 segments; the 8th is fused with the 9th. These antennae, when reflexed, extend about the genital segment.

The exopodite of the 2nd antenna is slightly longer than the endopodite. The endopodite of the 1st foot has 1 segment; of the 2nd foot has 2 segments, of the 3rd and 4th feet have 3 segments.

Length; Female about 2.6 mm.

Distribution; This species has been recorded from the north Atlantic and Indian Oceans. I have found only the females in the samples which were collected by Mr. Yamada, off the eastern coasts of Chosen (Korea) in the winter of 1933. These specimens have a very small rostrum.

Gen. *Gaetanus* Giesbrecht 1888.

Female; Allied to *Actidens* but differs on the following respects.

The rostrum is short, and is not bifurcated. The forehead has a median spine. The endopodite of the 2nd antenna is shorter than the exopodite.

The exopodite of the 1st foot sometimes is 2-segmented. The endopodite of the 2nd foot has 2 segments.

Gaetanus armiger Giesbrecht 1888.

Pl. 17, figs. 8-13.

G. armiger, Giesbrecht, 1892, p. 219, Taf. 14, f. 19, 20, 22, 23, 26, 28, 29; Taf. 36, f. 2, 4, 5.

„ , Breemen, 1906, p. 39, fig. 44 a-c.

„ , Scott A. 1909, p. 45, Pl. VIII, figs. 16-22.

„ , Sars, 1925, p. 59, Pl. XVIII, fig. 1, 2.

Female; The frontal spine is relatively small. The lateral angles of the last thoracic segment are furnished with the spines which extend beyond the middle of the genital segment.

The anterior antennae are shorter than the body. There is a small knob with a seta, on the inner margin of the 2nd segment of exopodite of the 2nd antenna.

The exopodite of the 1st foot has 3 segments. The 1st segment of basipodite of the 4th foot is furnished with a number of stout setae along its inner margin.

Length; Female about 3.5 mm.

Distribution; This species has been recorded from the Atlantic, Pacific and Indian Oceans. The appearance of this species in the adjacent waters of Japan seems rather rare. I have obtained only the females at the following Stations. St. 88, 133 and 139.

Gen. *Undeuchaeta* Giesbrecht 1888.

Female; The head is fused with the 1st thoracic segment. The 4th and 5th thoracic segments are also fused. The rostrum is not bifurcated.

The lateral angles of the last thoracic segment are rounded. The abdomen consists of 4 segments. The genital segment is asymmetrical.

The anterior antennae consist of 23 segments; the 8th and 9th, and the terminal 2 segments are fused. The exopodite of the 1st foot has 2 segments. The exopodites from the 2nd to 4th pairs of feet have 3 segments. The endopodites of the 1st and 2nd pairs of feet have 1 segment. The endopodites of the 3rd and 4th pairs of feet have 3 segments.

The 5th pair of feet is absent.

Male; The abdomen consists of 5 segments. The anal segment is very short. The furcal style is about as long as its width.

The exopodite of the 1st foot has 3 segments. The 5th pair of feet is asymmetrical.

Undeuchaeta plumosa (Lubbock) 1865.

Pl. 17, figs. 6-7.

Euchaeta australis, Brady, 1883, p. 65, Pl. XXI, figs. 5-11.

Undeuchaeta minor, Giesbrecht, 1892, p. 228, Taf. 14, f. 31-34; Taf. 37, f. 55, 58.

E. australis, Scott T. 1894, p. 85, Pl. VI, fig. 23.

U. minor, Giesbrecht u. Schmeil, 1898, p. 34.

„ , Esterly, 1905, p. 149, fig. 17 a-b.

„ , Breemen, 1906, p. 44, fig. 50.

U. plumosa, Scott A. 1909, p. 62, Pl. XXII, figs. 1-8.

U. minor, With, 1915, p. 132, Pl. V, fig. 3 a-g. text-fig. 35 a-g.

U. plumosa, Sars, 1925, p. 79, Pl. XIII, fig. 1-6.

U. minor, Wilson, 1932, p. 61, fig. 40 a-c.

Female; There is no median crest on the forehead. The genital segment has a spine on the above side.

Male; There is no median crest on the forehead. The 5th pair of feet is asymmetrical. The right foot is uniramous; the exopodite has 3 segments; as the case of the specimen which I show in Pl. 17, fig. 7, the endopodite has 3 segments instead of 2 segments described by Scott.

The left foot also is biramous. The exopodite has 3 segments; the terminal portion of the last segment is pointed. The endopodite has 1 segment.

Length; Female about 3.2 mm, male about 3.1 mm.

Distribution; This species has been recorded from the Atlantic, Pacific and Indian Oceans. I have taken immature females and mature males at the Stations 36 and 48.

Remarks; The male which I show in Pl. 17, fig. 6 has the abnormal furcal setae. The left 2nd seta and the right setae are ramified into several branches.

Gen. Euchirella Giesbrecht 1888.

Female; The head and the 1st thoracic segment are fused or separated. The 4th and 5th thoracic segments always are fused. The forehead often is furnished with a median crest. The lateral angles of the last thoracic segment are not pointed.

The abdomen consists of 4 segments. The genital segment and the furcal setae are symmetrical or asymmetrical.

The anterior antennae with 23 segments, are shorter than the body. The endopodite of the posterior antenna is $\frac{1}{3}$ to $\frac{1}{2}$ times as long as the exopodite.

The exopodite of the 1st foot has 2 segments. The exopodites of from the 2nd to 4th pairs of feet have 3 segments. The endopodites of the 1st and 2nd feet have 1 segment. The endopodites of the 3rd and 4th feet have 3 segments. The 5th pair of feet is absent.

Male; The abdomen consists of 5 segments. The anal segment is very short. The 20th and 21st segments of the right 1st antenna are fused. The endopodite of the 2nd antenna is relatively longer than that of the female.

The 5th pair of feet is asymmetrical. The right foot is composed of a forceps. The left foot is of style-like.

Euchirella amoena Giesbrecht 1888.

Pl. 18, figs. 1-9.

E. amoena, Giesbrecht, 1892, p. 233, Taf. 15, f. 20.

„ , Giesbrecht u. Schmeil, 1898, p. 36.

„ , Esterly, 1905, p. 155, fig. 21 a-b.

„ , Scott A. 1909, p. 53.

Female; Only the male of this species has been described by Giesbrecht. I have found the female recently.

The head fused with the 1st thoracic segment. The 5th thoracic segment also is fused with the 4th. There is no median crest on the forehead.

The lateral angles of the last thoracic segment are rounded. The furcal style is about as long as its width. The anterior antennae, when reflexed, reach about the anal segment.

The 1st segment of basipodite of the 2nd antenna is fused with the 2nd. The endopodite of the 2nd antenna is shorter than $\frac{1}{4}$ times as long as the exopodite.

The other characters are identical with the descriptions of the Genus.

Male; There is no crest on the forehead.

The 5th pair of feet is asymmetrical. The right foot is composed of a forceps. The 1st segment of exopodite has a stout spine on its inner margin. The inner margin of the terminal segment is denticulate.

The left foot is style-like, and is shorter than the right.

Length; Female about 3.5 mm, male about 3.3 mm.

Distribution; This species has been recorded from the Pacific Ocean. In my collections, this species has been obtained at the Station No. 76, off the Cape Shiono-Misaki.

Gen. Euchaeta Philippi 1843.

Female; The head is usually distinct from the 1st thoracic segment. The last 2 segments of the cephalothorax are fused. The rostrum is one pointed.

The abdomen consists of 4 segments. The genital segment is more or less asymmetrical. The inner marginal setae of the furca are very long.

The anterior antennae have 23 segments. The exopodites and the endopodites of the posterior antennae are about equal in length. The masticatory edge of the mandible has few but strong teeth.

The exopodite of the 1st foot is 2-jointed. The exopodites from 2nd to 4th pairs of feet are 3-segmented. The endopodites of the 1st and 2nd pairs of feet are 1-jointed; these of the 3rd and 4th pairs are 3-jointed. The 5th pair of feet is absent.

Male; The head is fused with the 1st thoracic segment. The abdomen consists of 5 segments. The inner marginal setae of the furca are short.

The mandible, maxilla and 1st maxillipede are stunted. The exopodite of the 1st foot

has 3 segments. The 5th pair of feet is asymmetrical.

Gen. *Pareuchaeta* was established by Scott in 1909, for the reception of some species which resemble *E. norvegica*. But the variation between the *Euchaeta* and *Pareuchaeta* is obscure and gradual.

Scott describes that the difference between the females of *Euchaeta* and *Pareuchaeta* may be detected on the armature of the setae on the apex of the 1st maxillipede. In *Euchaeta*, 2 of the 6 apical setae on the 1st maxillipede have a number of moderately long and conspicuous spinules; in spite of the case of *Pareuchaeta*, the apical setae are furnished with fine short spinules only.

But the females of *E. flava* and *E. japonica* which are regarded to be included in *Pareuchaeta*, among the 6 apical setae, have a seta that is furnished with long spinules.

Scott describes that the male of *Pareuchaeta* has a short and rudimentary 3rd segment of exopodite on the left 5th foot; instead of the long and spiniform 3rd segment of *Euchaeta*.

But the case of *E. hebes*, the 3rd segment of exopodite of the left 5th foot is short.

I had treated *E. flava* as *Pareuchaeta* in 1932, again I will include the *Pareuchaeta* into the *Euchaeta*.

Key to the species.

Female;

- (0) { Forehead with a prominent cone on the base of rostrum. (1)
 { Forehead with a low cone or without a cone. (5)
- (1) { 3 marginal spines on the outer margin of 3rd segment of exopodite of the 2nd
 foot is about equal in length. (2)
 { The middle spine on the same portion is the longest. (4)
- (2) { The 1st antennae reach the body end. *E. longicornis*
 { The 1st antennae reach the end of genital segment. (3)
- (3) { The genital segment is nearly symmetrical. *E. plana*
 { The genital segment with a large protuberance on the right side. *E. concinna*
- (4) { The genital segment is as long as the following 3 segments together. *E. wolfendeni*
 { The genital segment is shorter than the following 3 segments together. *E. marina*
- (5) { The genital segment is nearly symmetrical at the dorsal view. (6)
 { The genital segment is asymmetrical at the dorsal view. *E. media*
- (6) { The lateral angles of the last thoracic segment with the knob. *E. japonica*
 { The identical portions are round and without the knob. (7)
- (7) { The genital pore is anchor-like. *E. flava*
 { The genital pore is not anchor-like. *E. daitomarii*

Euchaeta marina (Prestandrea) 1833.

Pl. 19, figs. 1-8.

E. prestandrae, Claus, 1863, p. 185, Taf. 30, fig. 8-17.

E. prestandrae, Brady, 1883, p. 60, Pl. XVIII, figs. 7-15.

E. marina, Giesbrecht, 1892, p. 245, Taf. 15, f. 31, 33; Taf. 16, f. 1, 2, 8, 15-17, 22, 23, 28-30, 41, 46; Taf. 37 f. 30, 37, 38, 49.

„, Scott T. 1894, p. 75.

„, Giesbrecht u. Schmeil, 1898, p. 38.

„, Breemen, 1906, p. 50, fig. 55 a-d.

„, Marukawa, 1908, p. 9, Pl. II, figs. 74-82; Pl. III, figs. 83-92.

„, Scott A. 1909, p. 67, Pl. XIX, figs. 9-20.

„, Sars, 1925, p. 104.

„, Farran, 1929, p. 237.

„, Wilson, 1932, p. 63, fig. 42 a-c.

Female; The body is hairy. There is a prominent cone on the base of the rostrum. The genital segment is asymmetrical, the right side with a swelling, and is shorter than the following 3 segments together.

The inner marginal (appendicular) setae on the furca are straight, thicker than the terminal setae and about twice as long as the body.

The anterior antennae, when reflexed, extend beyond the end of the 2nd abdominal segment. Among the 3 marginal spines on the 3rd segment of exopodite of the 2nd foot, the middle spine is the longest.

Male; The abdomen consists of 5 segments. The genital segment is symmetrical.

The 5th pair of feet is asymmetrical. The last segments of exopodites are terminated into stylet-like processes. The right exopodite consists of 2 segments; the left consists of 3 segments.

There are a coarsely toothed process and a much shorter smooth one on the 2nd segment of the left exopodite.

Length; Female about 3.3 mm, male about 3.1 mm.

Distribution; This species is distributed in the Atlantic, Pacific and Indian Oceans. Near Japan, this species is very common in the warm currents. I have taken at the following Stations.

St. 4-23, 25-36, 38-45, 47-49, 51-56, 59, 60, 65-67, 69-71, 75-84, 96-98, 100, 101, 109-115, 117, 119.

***Euchaeta wolfendeni* Scott A. 1909.**

Pl. 20, figs. 6-11.

E. wolfendeni, Scott A. 1909, p. 68, Pl. XVII, figs. 1-12.

Female; Characters resemble those of *E. marina* but the genital segment is as long as the combined length of the following 3 segments. There is a tubercle on the distal portion of right side of the genital segment.

Among the 3 outer marginal spines on the 3rd segment of exopodite of the 2nd foot, the middle spine is the longest. The middle spine of *E. marina* extends to the end of the 3rd segment but that spine of *E. wolfendeni* not reaches to the end of segment.

Male; Characters resemble those of *E. marina*, but differ on the 2nd segment of

exopodite of the left 5th foot.

A process on the 2nd segment of exopodite of the left 5th foot are furnished with the smaller spinules than the case of *E. marina*.

The 3rd segment of the left exopodite is furnished with 4 long and moderately strong spines on the inner margin.

Length; Female about 2.7 mm, male about 2.5 mm.

Distribution; This species has been described by Scott, that it is in the Malay Archipelago and the Indian Ocean.

Near Japan, this species is distributed in the Formosan Strait, off the Cape Kinkazan, near Hachijo-Island etc. I have taken at the following Stations. St. 64, 96, 106, 107, 109, 111, 113, 115, 118, 119.

***Euchaeta longicornis* Giesbrecht 1888.**

Pl. 18, figs. 10-14.

E. longicornis, Giesbrecht, 1892, p. 246, Taf. 16, f. 35, 37; Taf. 37, f. 45, 46.

„, Giesbrecht u. Schmeil, 1898, p. 40.

„, Scott A. 1909, p. 66.

„, Farran, 1929, p. 238.

Female; There is a prominent cone on the base of the rostrum. The genital segment is longer than the following 3 segments together, and has a flap on its right side. The flap has a process on its apex.

The anterior antennae, when reflexed, reach the end of the furca. The 3 marginal spines on the outer margin of the 3rd segment of exopodite of the 2nd foot are about equal in length.

Length; Female about 2.7 mm.

Distribution; Only the female of this species has been recorded from the Pacific Ocean. I have taken only the females at the St. 29, 36, 37, 46, 54, 63, 67, 79, 80, 109, 113-115, 119.

***Euchaeta concinna* Dana 1849.**

Pl. 20, figs. 1-5.

E. concinna, Giesbrecht, 1892, p. 246, Taf. 15, f. 32; Taf. 16, f. 19, 40; Taf. 37, f. 52, 53.

„, Giesbrecht u. Schmeil, 1898, p. 39.

„, Scott A. 1909, p. 65, Pl. XIX, figs. 21-27.

Female; There is a prominent cone on the base of rostrum. The lateral angles of the last thoracic segment are protruded but not pointed.

The genital segment has a large protuberance on the middle portion of the right side. The anterior antennae, when reflexed, extend about the end of the genital segment.

The marginal spine on the 2nd segment of exopodite of the 2nd foot is moderately long and stout. It extends over the apex of the 1st marginal spine of the 3rd segment.

The marginal spines on the 3rd segment of exopodite of the 2nd foot are short, and about equal in length.

Length; A specimen of the female which I have obtained, is about 3.0 mm.

Distribution; This species has been recorded from the Pacific Ocean and the Indian Ocean. I have taken only a female at the Station No. 119, near Hachijo-Island.

***Euchaeta plana* sp. nov.**

Pl. 21, figs. 1-8.

Female; Allied to *E. concinna* but the genital segment has no protuberance on its right side. The peripheral constitution of the genital pore somewhat differs that of *E. concinna*.

There is a prominent cone on the base of the rostrum. The lateral angles of the last thoracic segment are more smoothly rounded than those of *E. concinna*. The genital segment is nearly symmetrical, and has a small knob on the distal portion of right side.

The anterior antennae, when reflexed, extend about the end of the genital segment. The shape of the 2nd foot is as like as the case of *E. concinna*.

Male; The margin of the process on the 2nd segment of exopodite of the left 5th foot, is more coarsely toothed than that of *E. concinna*.

Length; Female about 3.1 mm, male about 3.0 mm.

Distribution; Near Japan, this species is distributed in the East China Sea, the Formosan Strait and the Chosen-Strait. I have obtained at the following Stations. St. 59-61, 65.

Remarks; The males of *E. wolfendeni*, *E. concinna* and *E. plana* are very closely allied. These species only may be distinguished on the structure of the 2nd segment of exopodite of the left 5th foot.

***Euchaeta media* Giesbrecht 1888.**

Pl. 18, figs. 9-13.

E. media, Giesbrecht, 1892, p. 246, Taf. 16, f. 13, 36; Taf. 37, f. 39, 40.

„ , Giesbrecht u. Schmeil, 1898, p. 39.

„ , Esterly, 1905, p. 160, fig. 25 a-g.

„ , Scott A. 1909, p. 66, Pl. XX, figs. 10-18.

„ , Farran, 1929, p. 238.

Female; The process on the base of the rostrum is flat. The lateral angles of the last thoracic segment is round.

The genital segment is asymmetrical. The proximal portion of the left side, and the distal portion of the right side of the genital segment are protruded.

The marginal spine on the 2nd segment of exopodite of the 2nd foot extends beyond the base of the 1st marginal spine of the 3rd segment. Among the 3 outer marginal spines on the 3rd segment of exopodite of the 2nd foot, the middle spine is the longest,

it reaches to the base of the 3rd marginal spine.

Length; Female about 3.5 mm.

Distribution; This species has been recorded from the Atlantic, Pacific and Indian Oceans. In my collections, only the females of this species has been obtained at the following Stations which is in the East China Sea. St. 55, 56.

Euchaeta flava Giesbrecht 1888. = *P. simplex tanaka*
Pl. 21, figs. 9-14; Pl. 22, figs. 1-2.

1958 x
 Tanaka 1958

E. flava, Giesbrecht, 1892, p. 246, Taf. 16, f. 45; Taf. 37, f. 43, 44.

„, Giesbrecht u. Schmeil, 1898, p. 40.

E. barbata, Mori T. 1929, p. 137, Pl. X, figs. 21-27.

Pareuchaeta flava, Mori T. 1932, p. 168 and 174, Pl. I, figs. 1-9.

Female; Character resembles that of *E. norvegica*, but the ventral dilatation of the genital segment is smaller than that of the latter. The genital pore is anchor-like.

The process on the base of the rostrum is low. The marginal spine of the 2nd segment of exopodite of the 2nd foot extends beyond the tip of the 1st marginal spine of the 3rd segment. Among the 3 marginal spines of the 3rd segment, the middle one is the longest, it extends about the apex of the 3rd marginal spine.

The appendicular setae of the furca are curved.

Male; The terminal portion of the left 5th foot differs from that of all other species in this Genus, mainly on the process of the 2nd segment of exopodite (thumb). The thumb somewhat resembles that of *E. barbata* or *E. norvegica*, but the terminal end of the thumb not triangulated as that of *E. barbata* nor sharply pointed as that of *E. norvegica*.

Length; Female about 3.73 mm, male about 3.45 mm.

Distribution; This species has been described by Giesbrecht at the first time, off the western coast of South America.

Near Japan, this species is distributed in the Chosen-Strait, the Formosan Strait, off the Cape Shiono-Misaki, and off the Cape Kinkazan etc.

I have taken at the St. 7-12, 19-24, 63, 79, 80, 96, 98.

Euchaeta japonica Marukawa 1921.

Pl. 22, figs. 3-11.

E. japonica, Marukawa, 1921, p. 11, Pl. 1, fig. 14; Pl. 2, figs. 5-10; Pl. 3, figs. 1-7.

Femal; Characters resemble those of *E. norvegica* and *E. flava*.

The process on the base of the rostrum is flat. The lateral angles of the last thoracic segment are protruded and terminate into the knob-like processes.

The genital pore opens on the ventral dilatation which is smaller than that of *E. norvegica*, and situated more proximally than the case of *E. norvegica*.

This species may be distinguished from *E. norvegica* by the shape of the genital pore and its peripheral structure.

The shape of the 2nd foot resembles that of *E. flava* but the middle spine on the

outer margin of the 3rd segment of exopodite, not reaches to the base of the 3rd marginal spine.

The appendicular setae of the furca are curved.

Male; Character resembles that of the *E. norvegica*, but the terminal portion of the left 5th foot differs from that of the latter.

The 2nd segment of exopodite of the left 5th foot has a rounded thumb, 2 denticulate and a haired processes.

Marukawa has described only the immature males. But I have obtained 2 individuals of the mature male, near Hokkaido.

Length; Female about 8.0 mm, male about 8.4 mm.

Distribution; Near Japan, this species appears in the cold currents of the Pacific Ocean and also of the Japan Sea. I have taken at the following Stations.

St. 88, 139 and 141.

***Euchaeta daitomarui* sp. nov.**

Pl. 23, figs. 4-8.

Female; There is a low cone on the base of the rostrum. The head is obscurely separated from the 1st thoracic segment. The lateral angles of the last thoracic segment are rounded.

The genital pore opens on the ventral dilatation of the genital segment. This species may be distinguished from the other by the peculiar shape of the genital pore and its peripheral structure.

The shape of the 2nd foot is as like as that of *E. flava*. Among the 3 outer marginal spines of the 3rd segment of exopodite, the middle spine is the longest; it extends about the base of the 3rd marginal spine.

The inner marginal setae of the furca are long and curved.

Length; Female about 3.7 mm.

Locality; Only 2 individuals of the female have been collected on board the ship Daito-Marui belonging to the Miyagi-Ken Fishery Experimental Station, at the Station No. 108.

Gen. *Scottocalanus* Sars 1905.

The head is fused with the 1st thoracic segment. The forehead is furnished with a median crest. The last 2 thoracic segments are fused.

The rostrum is bifurcate, each ramus with an articulated apical spine. The abdomen consists of 4 segments in the female, of 5 segments in the male.

The exopodite of the 2nd antenna is longer than the endopodite. The exopodites of the first 4 pairs of feet are 3-segmented. The endopodite of the 1st foot has 1 segment; of the 2nd has 2 segments; of the 3rd and 4th feet have 3 segments.

The 5th pair of feet of the female is symmetrical; each foot is uniramous, and furnished with 2 spines on the terminal segment.

The 5th pair of feet of the male is asymmetrical; each foot is biramous.

Scottocalanus helenae (Lubbock) 1856.

Pl. 23, figs. 9-15.

Scolecithrix securifrons, Scott T. 1894, p. 47, Pl. IV.

Undina helenae, Giesbrecht u. Schmeil, 1898, p. 52.

Scottocalanus helenae, Scott A. 1909, p. 111, Pl. XXVII, figs. 1-9.

Male; Only the male of this species is known.

Characters are identical with the descriptions of the Genus. The posterior sides of the 2nd segment of endopodite of the 2nd foot, and the last 2 segments of endopodite of the 3rd foot are furnished with the spines.

The 5th pair of feet is asymmetrical. The 2nd segment of basipodite of the right foot is swelled. The exopodite consists of 3 segments; the 2nd segment is curved; and the terminal segment is very short. The endopodite is curved and extends beyond the tip of the 1st segment of exopodite.

The exopodite of the left foot consists of 3 segments. The terminal segment is narrow and short. The endopodite with 1 segment, not reaches to the end of the 1st segment of exopodite.

Length; Male about 4.1 mm.

Distribution; This species has been recorded from the Gulf of Guinea, the Atlantic Ocean and the Pacific Ocean near Halmahera Island.

I have taken only 2 males at the Station No. 35 which is off the eastern coast of Formosa.

Gen. Scaphocalanus Sars 1900.

The head with or without a median crest, and fused with the 1st thoracic segment. The 4th and 5th thoracic segments also are usually fused.

The abdomen consists of 4 segments in the female, of 5 segments in the male. The first 4 pairs of feet resemble those of *Scottocalanus*. The 5th pairs of feet in both sexes also are somewhat resemble those of *Scottocalanus*.

This Genus are allied to the *Scottocalanus* but the exopodite of the 2nd antenna is nearly as long as the endopodite.

Scaphocalanus pacificus Mori 1932.

Pl. 24, figs. 1-11.

S. pacificus, Mori T. 1932, p. 169 and 174, Pl. II, figs. 1-11.

Female; The head without a median crest, and is fused with the 1st thoracic segment. The 5th thoracic segment is separated from the 4th. The lateral angles of the last thoracic segment are pointed but not produced into spines.

The rostrum is bifurcate, each ramus has an articulated slender apical spine. The

genital segment is 2 times as long as the next 2 segments together.

The anterior antennae are shorter than the body. The shapes of the 2nd antennae, and the swimming feet are identical with the description of the Genus.

The 5th pair of feet is symmetrical; each foot consists of 2 segments. The 2nd segment of that foot is longer than the 1st one, and furnished with 4 spines.

This species resembles *Scaphocalanus acutus* Wolfenden but the distal 2 segments of endopodite of the 4th foot has no spines on its posterior side; the 2nd segments of the 5th pair of feet are shorter than the 1st ones.

Length; Female about 2.6 mm.

Locality; Only a female has been obtained at the Station No. 38 which is off the eastern coast of Formosa.

(1965)

Scaphocalanus echinatus Farran 1909.

Pl. 24, figs. 12-16.

S. echinatus, Rose, 1933, p. 149, fig. 153.

Female; The forehead without median crest. The 5th thoracic segment is fused with the 4th. The lateral angles of the last thoracic segment are slightly produced but not pointed.

The furcal style is slightly longer than its width. The 2nd setae on the furca are about 2 times as long as the abdomen. The anterior antennae, when reflexed, extend nearly the end of the genital segment.

The posterior sides of the endopodites, from the 2nd to 4th pairs of feet are furnished with the spines.

The 5th pair of feet is symmetrical; each foot consists of 2 segments. The 2nd segment has an outer marginal, a terminal and an inner marginal spines. The outer marginal spine is very short; the inner marginal one is furnished with the spinules.

Length; Female about 1.94 mm. Male unknown.

Distribution; This species has been recorded from the Atlantic Ocean. I have taken 3 females at the Station No. 49 which is in the East China Sea.

Gen. Scolecithricella Sars 1903.

Scolecithricella, Sars, 1903, p. 54.

Female; The head is fused with the 1st thoracic segment; the last 2 segments on the cephalothorax usually are fused. There is no median crest on the forehead. The rostrum is bifurcate. The abdomen consists of 4 segments.

The exopodite of the 2nd antenna is longer than the endopodite. The terminal segment of the anterior maxillipede is furnished with a tuft of vermiform sensory hairs.

The swimming feet, from the 2nd to 4th pairs resemble those of the *Scaphocalanus*. The 5th pair of feet always is present.

Male; The abdomen is composed of 5 segments. The 5th pair of feet is asymmetrical, and is about as long as the abdomen.

Scolecithricella minor (Brady) 1883.**Pl. 25, figs. 1-7.**

Scolecithrix minor, Brady, 1883, p. 58, Pl. XVI, figs. 15, 16; Pl. XVII, figs. 1-5.

„ „, Giesbrecht, 1892, p. 266.

Scolecithricella minor, Sars, 1903, p. 55, Pl. XXXVII and XXXVIII.

Scolecithrix minor, Breemen, 1906, p. 73, fig. 85 a-c.

„ „, Sato, 1913, p. 23, Pl. IV, figs. 56-58.

Scolecithricella minor, With, 1915, p. 204, Pl. VII, fig. 13; Pl. VIII, fig. 10 a-c.; text-fig. 65 a-c.

„ „, Sars, 1925, p. 188.

„ „, Wilson, 1932, p. 83, fig. 57 a-b.

Female; The forehead is round. The 4th and 5th thoracic segments are completely fused. The lateral angles of the last thoracic segment are rounded.

The anterior antennae consist of 22 segments, when reflexed, extend about the end of the anterior division.

The 5th pair of feet is symmetrical. Each foot consists of 1 segment, and has a slender seta on the outer margin, a short spine on the apex and a long spine on the inner margin.

Male; The 5th pair of feet is asymmetrical. The right foot is uniramous, sometimes with a vestigial endopodite; the terminal segment is lamelliform.

The left foot is biramous. The endopodite has only 1 segment, and extends about the middle portion of the 2nd segment of exopodite. The terminal segment of exopodite is elongated and sharply pointed.

Length; Female about 1.4 mm, male about 1.4 mm.

Distribution; This species has been recorded from the Atlantic and Pacific Oceans, and also from the Arctic Ocean.

I have taken at the following Stations which are situated off the eastern coast of the Cape Kinkazan.

St. 87, 88, 91, 93.

Scolecithricella bradyi (Giesbrecht) 1883.**Pl. 25, figs. 8-12.**

Scolecithrix bradyi, Giesbrecht, 1892, p. 266, Taf. 4, f. 7; Taf. 13, f. 1, 3, 7, 11, 21, 28; Taf. 37, f. 1, 2, 9.

„ „, Scott T. 1894, p. 51, Pl. V, figs. 29-39.

„ „, Giesbrecht u. Schmeil, 1898, p. 42.

„ „, Esterly, 1905, p. 165, fig. 27.

„ „, Breemen, 1906, p. 71, fig. 81 a-c.

Scolecithricella bradyi, Scott A. 1909, p. 89.

Female; The 5th thoracic segment is obscurely separated from the 4th. The posterior margins of the 5th thoracic segment are asymmetrical and produced but not

pointed. The right side is more prominent than the left and extends beyond the end of the genital segment.

The genital segment is asymmetrical, it is about as long as the combined length of the 3 following segments. The anal segment is as long as the preceding segment.

The 5th pair of feet is very small; each foot consists of lamelliform 1-jointed appendage.
Length; Female about 1.2 mm.

Distribution; This species is recorded from the Atlantic, Pacific and Indian Oceans, and also from the Mediterranean Sea. I have taken only a female at the Station No. 114 which is near Hachijo-Island.

***Scolecithricella abyssalis* (Giesbrecht) 1888.**

Pl. 25, fig. 13; Pl. 26, figs. 7-10.

Scolecithrix abyssalis, Giesbrecht, 1892, p. 266, Taf. 13, f. 15, 40.

Scolecithrix tumida, Scott T. 1894, p. 52, Pl. III, figs. 33-38.

Scolecithrix abyssalis, Giesbrecht u. Schmeil, 1898, p. 43.

Scolecithricella abyssalis, Scott A. 1909, p. 89.

„ „, Sars, 1925, p. 189, Pl. LII, fig. 7-14.

Female; Only the female of this species is known.

The 4th and 5th thoracic segments are completely fused. The lateral angles of the last thoracic segment are rounded.

The anterior antennae are composed of 22 segments, when reflexed, extend about the furca. The marginal spine on the 2nd segment of exopodite of the 2nd foot is curved.

The 5th pair of feet is symmetrical. Each foot consists of 1 segment, and its terminal portion is somewhat triangulated. There are 3 spines on that foot; the outer marginal spine is very short; the inner marginal spine is stout and much longer than the terminal one.

Length; Female about 2.1 mm.

Distribution; This species has been recorded from the Atlantic and Pacific Oceans, and also from the Mediterranean Sea and the Gulf of Guinea. I have taken the females at the Station No. 36, off the eastern coast of Formosa.

***Scolecithricella orientalis* sp. nov.**

Pl. 25, figs. 14, 15; Pl. 26, figs. 1-6.

Female; The forehead is round. The last 2 segments of the cephalo-thorax are completely fused. The lateral angles of the last thoracic segment are round.

The anterior antennae consist of 22 segments, when reflexed, extend about the middle portion of the last thoracic segment. The outer marginal spine on the 2nd segment of exopodite of the 2nd foot extends beyond the tip of the 1st marginal spine of the 3rd segment.

The 3rd marginal spine on the 3rd segment of exopodite of the 3rd foot is stout and long.

The 5th pair of feet is symmetrical. Each foot is lamelliform, and its apex is round. That foot has a long inner marginal and a short apical spines.

Length; Female about 1.1 mm.

Locality; Only 3 individuals of female have been taken at the Station No. 80.

***Scolecithricella spinipedata* sp. nov.**

Pl. 26, figs. 11-16.

Female; The forehead is round. The 4th and 5th thoracic segments are fused. The lateral angles of the last thoracic segment are pointed.

The genital segment is slightly longer than the combined length of the other abdominal segments. The furca is short.

The anterior antennae, when reflexed, extend about the end of the genital segment. The marginal spine of the 2nd segment of exopodite of the 2nd foot not reaches to the base of the 1st marginal spine on the 3rd segment.

The 5th pair of feet is peculiar. Each foot is 1-jointed, its apex is pointed, and furnished with many spines on its posterior surface. That foot has a stout spine with the spinules, on the inner margin near the apex.

Length; Female about 1.8 mm.

Locality; This species seems to be the inhabitant of the warm waters. I have taken only the females at the following Stations.

St. 38, 48, 84.

Gen. *Scolecithrix* Brady 1883.

Scolecithrix Brady, 1883, p. 56.

Characters resemble those of the *Scolecithricella*, but the 5th pair of feet of the female is absent, of the male is present and about 2 times as long as the abdomen.

***Scolecithrix danae* (Lubbock) 1856.**

Pl. 27, figs. 1-8.

S. danae, Brady, 1883, p. 57, Pl. XVII, figs. 1-12.

„ , Giesbrecht, 1892, p. 256, Taf. 13, f. 4, 9, 14, 17.

„ , Scott T. 1894, p. 49.

„ , Giesbrecht u. Schmeil, 1898, p. 42.

„ , Esterly, 1905, p. 164, fig. 26 a-d.

„ , Breemen, 1906, p. 70, fig. 80 a-b.

„ , Scott A. 1909, p. 88.

„ , Wilson, 1932, p. 82, fig. 56 a-b.

Female; The anterior division is elliptical at the dorsal view. The 5th thoracic segment is separated from the 4th. The genital segment has a shovel-like process on its ventral side. The terminal setae on the furca are about equal in length.

The anterior antennae with 19 segments, when reflexed, extend beyond the end of the cephalothorax. The exopodite of the 2nd antenna is longer than the endopodite.

The first 4 pairs of feet resemble those of *Scolecithricella* and *Scaphocalanus*. The 5th pair of feet is absent.

Male; The abdomen consists of 5 segments. The 5th pair of feet is asymmetrical. The right foot is uniramous. The left foot is biramous; the exopodite with 3 segments; endopodite with 1 segment.

Length; Female about 2.4 mm, male about 2.2 mm.

Distribution; This species has been recorded that it is in the tropical and subtropical zones of the Atlantic and Pacific Oceans.

Near Japan, this species commonly appears in the warm waters. I have taken at the St. 19-21, 23, 26, 27, 29, 30, 33, 36, 39-47, 52, 53, 63, 69-71, 76, 77, 79, 80, 82, 83, 96-101, 104, 106, 107, 109-115, 117-119.

Gen. *Phaenna* Claus 1863.

Phaenna, Claus, 1863, p. 188.

Female; The anterior division is nearly round at the dorsal view. The head is distinct from the 1st thoracic segment. The 5th thoracic segment is incompletely fused with the 4th.

The abdomen consists of 4 segments. The genital segment is slightly longer than the combined length of the following 3 segments. The anal segment is very short. The furcal style is about as long as its width.

The anterior antenna with 24 segments; the terminal segment is distinct from the preceding one. The exopodite of the 2nd antenna is longer than the endopodite.

The first 4 pairs of feet resemble those of the *Scaphocalanus*. The 5th pair of feet is absent.

Male; The anterior division is somewhat elongated. The abdomen consists of 5 segments.

The right 1st antenna has 18 segments, and the left one has 19 segments.

The 5th pair of feet is asymmetrical. The left foot is uniramous and composed of 5 segments. The right foot also is uniramous and composed of 4 segments; the terminal portion is pointed.

Phaenna spinifera Claus 1863.

Pl. 27, figs. 9-15.

Ph. spinifera, Claus, 1863, p. 189, Taf. XXXI, fig. 1-7.

„, Giesbrecht, 1892, p. 293, Taf. 5, f. 3; Taf. 12, f. 1-8, 35-37; Taf. 37, f. 17-21.

„, Scott T. 1894, p. 81, Pl. VI, VII.

„, Giesbrecht u. Schmeil, 1898, p. 50.

„, Breemen, 1906, p. 56, fig. 63 a-c.

Ph. spinifera, Scott A. 1909, p. 80.

„ , Pesta, 1909, p. 22.

„ , Pesta, 1912, p. 24.

„ , With, 1915, p. 241, Pl. VII, fig. 1 a-c; text-fig. 79.

Female; Characters are as like as of the generic description.

Length; Female 1.8-2.1 mm.

Distribution; This species is distributed in the Atlantic and Pacific Oceans, and also in the Mediterranean Sea. In my collections, the females and the immature males of this species have been obtained at the following Stations which is near Hachijo-Island.

St. 109, 110, 114.

Fam. Centropagidae Giesbrecht.

Fam. Centropagidae, Giesbrecht, 1892, p. 58.

The rostrum terminates bifurcated ends. The head is generally separated from the thorax. The last 2 thoracic segments are usually fused.

The abdomen of the female is composed of 3 or 4, seldom 2 segments; the abdomen of the male as a rule, is composed of 5 segments.

The 1st antennae of the female are usually symmetrical, and with 23-25 segments on each antenna. One of the 1st antenna of the male constitutes a grasping organ. There is a knee-like articulation between the 18th and 19th segments.

The endopodites of the 3rd and 4th pairs of swimming feet generally (except *Temora* and *Eurytemora* which with the 2-jointed endopodites) with 3 segments.

The 5th pair of feet of the female is as like as the previous, or degenerated. The 5th pair of feet of the male is usually modified to form the grasping organ.

Key to the Genera of the Centropagidae.

- | | | | |
|-----|---|---|--------------------|
| (0) | { | The endopodite of the 1st foot with 1 segment..... | <i>Eurytemora</i> |
| | | The endopodite of the 1st foot with 2 segments..... | (1) |
| | | The endopodite of the 1st foot with 3 segments..... | (2) |
| (1) | { | The furcal style at least is 6 times as long as its width..... | <i>Temora</i> |
| | | The furcal style is slightly longer than its width..... | <i>Temoropia</i> |
| (2) | { | The 1st segment of the anterior division with a black or brown knob on the left | |
| | | or right side..... | <i>Pleuromamma</i> |
| | | The 1st segment of the anterior division without the pigmented knob..... | (3) |
| (3) | { | The inner margin of the 1st segment of endopodite of the 2nd foot is furnished | |
| | | with the curved hook..... | <i>Metridia</i> |
| | | The identical portion is furnished with a seta..... | (4) |
| (4) | { | The 2nd terminal seta of the left furcal style are much longer than the other.... | (5) |
| | | The furcal setae are symmetrical..... | (7) |
| (5) | { | The furca are symmetrical; the anterior maxillipedes with 2 stout spines..... | |
| | | | <i>Mesorhabdus</i> |
| | | The furca are asymmetrical; the anterior maxillipedes without stout spines..... | (6) |

- (6) {The masticatory edges of the mandibles with 3 or 4 teeth.....*Heterorhabdus*
 {The masticatory edges of the mandibles with at least 8 teeth.*Disseta*
- (7) {The anterior antennae are symmetrical.(8)
 {The anterior antennae are asymmetrical.(14)
- (8) {The abdomen with 3 segments.....(9)
 {The abdomen with 4 segments.....(11)
- (9) {The 4th thoracic segment is fused with the 5th one.(10)
 {The 4th thoracic segment is separated from the 5th.....*Centropages* ♀
- (10) {The endopodites of the 5th feet with 2 or 3 segments.....*Augaptilus* ♀
 {The endopodites of the 5th feet with 1 segment.*Isias* ♀
- (11) {The rami of the 5th feet with 3 segments.....(13)
 {The exopodites with 3, and the endopodites with 2 segments, on the 5th feet.
*Isochaeta* ♀
 {On the 5th feet, the exopodites with 3 segments, the endopodites are absent....
*Phyllopus* ♀
 {On the 5th feet, the exopodites with 1 segments, the endopodites are rudimentary. (12)
 {Each 5th foot is composed of 1 segment.*Paraugaptilus* ♀
- (12) {The 1st antennae are symmetrical; the furcal setae are about equal each other.
*Arietellus* ♀
 {The left 1st antenna is longer than the right one; the inner most 3 furcal setae
 are longer than the other.....*Scottula* ♀
- (13) {The terminal segment of endopodite of the 5th foot with 5 setae.....*Lucicutia* ♀
 {The terminal segment of endopodite of the 5th foot with 6 setae.....*Haloputilus* ♀
- (14) {The right 1st antenna constitutes a grasping organ.(15)
 {The left 1st antenna constitutes a grasping organ.....(17)
- (15) {The endopodites of both feet of the 5th pair consist of 3 segments and with
 the plumose setae.(16)
 {The endopodites of the 5th feet, are absent on the right, rudimentary on the
 left.....*Isias* ♂
- (16) {The 4th thoracic segment fuses the 5th; the endopodite of the right 5th foot
 not makes the forceps.*Augaptilus* ♂
 {The 4th thoracic segment are fairly separated from the 5th; the endopodite of
 the right 5th foot makes the forceps.*Centropages* ♂
- (17) {Each ramus of the left 5th foot with 3 segments, of the right with 2 segments.
*Lucicutia* ♂
 {Both exopodites of the 5th feet with 3 segments; the endopodites are rudi-
 mentary.....*Arietellus* ♂
 {Both exopodites of the 5th feet with 3 segments; the endopodites are absent.
*Scottula* ♂
 {The rami of the 5th pair of feet with 2 segments.(18)
 {The rami of the 5th pair of feet with 3 segments.....*Haloputilus* ♂

- (18) { The endopodite of each 5th foot with 2 segments, but that endopodite is rudimentary. *Paraugaptilus* ♂
 { The right 5th foot without the endopodite, the left with a rudimentary endopodite. *Phyllopus* ♂

Gen. *Centropages* Kröyer 1849.

Female; The forehead without median crest. The head is separated from the 1st thoracic segment. The 5th thoracic segment also is distinct from the 4th. The abdomen consists of 3 segments. The genital segment often is asymmetrical.

The anterior antennae consist of 24 segments. The terminal segment is fused with the preceding one. The exopodite of the 2nd antenna is longer than the endopodite.

The mandible and the maxilla resemble those of *Calanus*. The distal setae of the anterior maxillipede are longer and thicker than the proximal setae, and furnished with the spinous hairs. The 1st segment of basipodite of the posterior maxillipede has the protruding lobes which with the setae.

The rami of the swimming feet are usually 3-segmented. The 1st segments of basipodites of from the 1st to 4th pairs of feet have the inner marginal setae, of the 5th pair without the same setae.

The 5th pair of feet always is present. The 2nd segment of exopodite has a stout inner marginal spine.

Male; The abdomen consists of 5 segments. The anterior antennae are asymmetrical. The right antenna is modified into the grasping organ. The proximal section (from the 1st to the 12th) has the common structure. But the middle section (from the 13th to the 18th) is swelled. The terminal section (from the 19th to the end) is articulated by a knee-joint, to the end of the middle section. The last 2 segments of the middle section and the proximal segment of the terminal section usually are denticulated.

The 5th pair of feet is asymmetrical. The right foot is modified into the grasping organ. The last 2 segments of the exopodite make a forceps.

The exopodite of the left foot is 2-jointed.

Key to the species.

Female;

- (1) { Lateral angles of the last thoracic segment are pointed. (2)
 { Lateral angles of the last thoracic segment are rounded. (6)
- (2) { Lateral angles of the last thoracic segment with accessory spines. *C. furcatus*
 { Same portions without accessory spines. (3)
- (3) { The inner marginal spines of the 2nd segments of exopodites of the 5th feet extend beyond the end of the 3rd segments. *C. elongatus*
 { Those spines not reach to the end of the 3rd segments. (4)
- (4) { Ventral side of the genital segment without spine. *C. yamadai*
 { Ventral side of the genital segment with spine. (5)

(Key says last thoracic segment of C. elongatus pointed - this is not so!)

- (5) { The last thoracic segment and genital segment are about symmetrical. *C. orsinii*
 { The last thoracic segment and genital segment are asymmetrical. *C. abdominalis*
- (6) { Furca is asymmetrical. *C. calaninus*
 { Furca is symmetrical. (7)
- (7) { Both sides of the 2nd abdominal segment have the knobs which with the
 { spinules. *C. gracilis*
 { The identical portions are smooth. (8)
- (8) { Genital segment with spinules. *C. violaceus*
 { Genital segment without spinules. (9)
- (9) { Genital segment with the ventral ball-like swelling. *C. longicornis*
 { Genital segment without ball-like swelling. *C. bradyi*

Male;

- (1) { The lateral angles of the last thoracic segment are pointed. (2)
 { The same portions are rounded. (4)
- (2) { The outer marginal spines on the 2nd segments of exopodites of the 4th pair
 { of feet are asymmetrical; the right is longer than the left. *C. yamadai*
 { The same spines are symmetrical. (3)
- (3) { The 3rd outer marginal spines on the 3rd segments of exopodites of the 4th pair
 { of feet are asymmetrical; the right is longer than the left. *C. abdominalis*
 { The same spines are symmetrical. *C. orsinii*
- (4) { The terminal segment of the grasping foot is sharply bent. *C. calaninus*
 { The terminal segment of the grasping foot is smoothly curved. (5)
- (5) { The terminal segment of the grasping foot with a triangulated process on the
 { inner margin. *C. gracilis*
 { The terminal segment of the grasping foot without triangulated process. (6)
- (6) { The terminal segment of exopodite of the left 5th foot with 4 outer marginal
 { appendages. *C. bradyi*
 { The same portion with 2 outer marginal appendages. *C. violaceus*

Centropages abdominalis Sato 1913.

Pl. 28, figs. 1-6.

C. abdominalis, Sato, 1913, p. 26, Pl. IV, figs. 63, 65; Pl. V, figs. 64, 66-68.

Female; Characters resemble those of *C. hamatus*, but the genital segment is enormously asymmetrical. The inner marginal spine of the 2nd segment of exopodite of the 5th foot is longer than the segment itself.

The lateral angles of the last thoracic segment are pointed and asymmetrical. The genital segment has a spine in front of the genital pore.

Male; Allied to *C. hamatus* but the inner margin of the terminal claw of the grasping foot has a process. The thumb is relatively slender and longer than that of *C. hamatus*.

The 3rd marginal spine on the 3rd segment of exopodite of the right 4th foot is longer than that of the left foot.

Length; Female about 1.3 mm, male about 1.2 mm.

Distribution; This species has been recorded near Hokkaido. I have taken from the Inland Sea of Japan and also found at the following Stations. St. 122 and 129.

Centropages yamadai Mori 1934.

Pl. 28, figs. 7-12.

C. orsinii, (Female only) Mori T. 1929, p. 147, Pl. VI, figs. 2-3.

C. kröyeri, (Male only) Mori T. 1929, p. 147, Pl. VI, fig. 47.

C. yamadai, Mori T. 1934, p. 81.

Female; The lateral angles of the last thoracic segment are symmetrical, and projecting into the spines. The genital segment is symmetrical. The covering of the genital pore is rounded, and has no spine on that covering.

The furcal style is about 3 times as long as its breadth. The terminal setae of the furca are swelled at the proximal portions.

The anterior antennae, when reflexed, extend beyond the end of the body by about the last 2 segments. There are no spines on the 1st, 2nd and 5th segments of those antennae.

The endopodites of the feet, from the 1st to 4th pairs, have 3 segments.

The 5th pair of feet somewhat resembles that of *C. orsinii*. Those feet are asymmetrical. The internal spine of the 2nd segment of exopodite of the right foot is curved, and has many spinules. The posterior side of the 2nd segment of endopodite of the right foot is hairy.

The 2nd segment of exopodite of the left foot has a common internal spine which has no spinules; and that spine is shorter than the segment itself. The posterior side of the 2nd segment of endopodite of the left foot is not hairy.

The 1st segment of endopodites of the 5th pair of feet have a marginal seta on the inner margin.

Male; The furcal style is more than 3 times as long as its width. The grasping antenna has a spine on the 18th segment. There are 3 segments on the endopodites of feet, from the 1st to 4th pairs.

The outer marginal spine on the 2nd segment of exopodite of the right 4th foot is longer than the left one. The 3rd outer marginal spines on the 3rd segments of exopodites of the 4th pair of feet are symmetrical.

The exopodite of the right 5th foot makes a grasping organ. The thumb is shorter than the terminal claw. On that fact, this species differs from *C. kröyeri*.

Length; Female 1.5-1.7 mm, male 1.27-1.54 mm.

Locality; This species has been taken in the Korea St. and the Ki-Channel by the author, and also in the Bay of Fusan by Yamada.

St. 10, 12, 14, 81, 83.

Centropages orsinii Giesbrecht 1889.**Pl. 29, figs. 1-7.**

C. orsinii, Giesbrecht, 1892, p. 305, Taf. 17, f. 35, 36, 41, 42; Taf. 18, f. 2, 14, 23; Taf. 38, f. 12, 19.

„ , Giesbrecht u. Schmeil, 1898, p. 57.

„ , Scott A. 1909, p. 115.

Female; The lateral angles of the last thoracic segment are pointed. The furcal style is about 2 times as long as its width. The genital segment is symmetrical, and has a spine on the ventral side.

The anterior antennae without spines on the 1st, 2nd and 5th segments, when reflexed, extend the end of the furca.

The endopodites of the feet, from the 1st to 4th pairs, have 2 segments.

The 5th pair of feet is nearly symmetrical. The inner marginal spine of the 2nd segment of exopodite not reaches to the end of the 3rd segment, and has the spinules.

Male; The lateral angles of the last thoracic segment are pointed. The terminal claw of the grasping foot is longer than the thumb. The terminal portion of the 3rd segment of exopodite of the left 5th foot are projecting into a spine.

Length; Female about 1.4-1.6 mm, male about 1.25-1.30 mm.

Distribution; This species has been recorded from the Red Sea and also from the Indian Ocean. I have obtained at the following Stations.

St. 27, 58, 59, 120.

Centropages bradyi Wheeler 1899.**Pl. 29, figs. 8-13.**

C. violaceus, Brady, 1883, p. 83, Pl. XXXVII, figs. 1-14.

C. bradyi, Esterly, 1905, p. 172, fig. 32 a-c.

„ , Sato, 1913, p. 25, Pl. V, fig. 59; Pl. IV, figs. 60-62.

„ , Wilson, 1932, p. 86, fig. 59 a-b.

Female; The lateral angles of the last thoracic segment are round. The head has a spine on the dorsal side near the posterior end.

The genital segment without spine on the ventral side, and is symmetrical. The furcal style has a short, truncated rod-like projection on the terminal portion between the 2 outer setae.

The anterior antennae, when reflexed, extend beyond the end of furca by about the last 5 segments. Those antennae have no spines on the 1st, 2nd and 5th segments.

The 2nd segment of exopodite of the 5th foot has a short smooth spine on the inner margin.

Male; The terminal claw of the grasping foot is longer and more slender than the thumb. The exopodite of the left 5th foot is as long as the endopodite. The 2nd segment has 4 outer marginal spines, and the terminal portion is notched.

Length; Female about 1.7 mm, male about 1.6 mm.

Distribution; This species has been recorded from the Atlantic and Pacific Oceans. Near Japan, this species may be found near Hokkaido. I have taken at the Station No. 128.

Centropages elongatus Giesbrecht 1896.

Pl. 30, figs. 1-3.

C. elongatus, Giesbrecht u. Schmeil, 1898, p. 58.

„, Scott A. 1909, p. 113.

Female; The lateral angles of the last thoracic segment are pointed. The genital segment is symmetrical. The 2nd and 3rd abdominal segments are about equal in length.

The furca is symmetrical. The furcal style is longer than 3 times as long as its width. The anterior antennae, when reflexed, extend beyond the end of the furcal style by the last 2 segments.

The inner marginal spine on the 2nd segment of exopodite of the 5th foot is slightly longer than the 3rd segment. There is a notch on the inner margin of the 1st segment of exopodite of the 5th foot.

Length; Female 1.5-1.9 mm.

Distribution; This species has been recorded by A. Scott, from the Celebes Sea and the Sulu Sea. I have taken only 3 females at the Stations No. 114 and 115 which is situated near Hachijo-Island.

Centropages calaninus (Dana) 1849.

Pl. 30, figs. 4-7.

Hemicalanus calaninus, Dana, 1852, p. 1105, Pl. 78.

Centropages calaninus, Giesbrecht, 1892, p. 305, Taf. 17, f. 27, 28, 43; Taf. 18, f. 11; Taf. 38, f. 1, 21.

„, Giesbrecht u. Schmeil, 1898, p. 58,

„, Scott A. 1909, p. 112.

Female; The lateral angles of the last thoracic segment are rounded. The genital segment is somewhat swelled and symmetrical. The anal segment is longer than 2 times as long as the preceding segment. The furca is asymmetrical.

The anterior antennae, when reflexed, extend beyond the end of the furcal style by the last 2 segments.

The inner marginal spine of the 2nd segment of exopodite of the 5th foot is longer than the 3rd segment. There is a notch on the inner margin of the 1st segment of exopodite of the 5th foot.

Male; The terminal claw of the grasping foot is longer than the thumb, and sharply bent.

Length; Female about 1.9 mm, male about 1.8 mm.

Distribution; This species is distributed in the tropical zone of the Pacific Ocean and also in the Malay Archipelago.

P not so in lateral view

Near Japan, this species appears in the warm currents. I have taken at the following Stations. St. 31, 33, 42, 69, 76, 78-80, 109, 111, 117, 118, 120, 121.

Centropages longicornis Mori 1932.

Pl. 30, figs. 8-11.

C. longicornis, Mori, 1932, p. 170, Text-fig. 2 a-d.

Female; The lateral angles of the last thoracic segment are rounded. The genital segment without spinules, and is largely swelled at the ventral side and makes a ball-like dilatation.

The furca is symmetrical; the furcal style is more than 3 times as long as its width. The anterior antennae, when reflexed, extend beyond the end of the furcal style by the last 5 segments.

There is a notch on the inner margin of the 1st segment of exopodite of the 5th foot. The inner marginal spine of the 2nd segment of exopodite of the 5th foot not reaches to the end of the 3rd segment.

This species is allied to *C. violaceus* and *C. calaninus* but easily distinguishable by the ball-like dilatation of the genital segment.

Length; Female 1.97 mm.

Locality; I have taken only a female at the Station No. 47 in the East China Sea.

Centropages gracilis (Dana) 1849.

Pl. 31, figs. 1-7.

Hemicalanus gracilis, Dana, 1852, p. 1108, Pl. 78.

C. gracilis, Giesbrecht, 1892, p. 305, Taf. 17, f. 31, 32, 46; Taf. 38, f. 4, 13.

„ , Giesbrecht u. Schmeil, 1898, p. 57.

„ , Scott A. 1909, p. 114.

Female; The lateral angles of the last thoracic segment are rounded. The 2nd abdominal segment has a pair of knobs on the lateral sides. Those knobs are furnished with many hook-like spinules. The furca is symmetrical.

The anterior antennae, when reflexed, extend beyond the end of the furca by about the last 5 segments.

The inner marginal spine on the 2nd segment of exopodite of the 5th foot not reaches to the end of the 3rd segment.

Male; The terminal claw of the grasping foot is longer than the thumb, and has a triangulated process on the inner margin.

Length; Both sexes are about 1.8 mm.

Distribution; *C. gracilis* is known from the Pacific and Indian Oceans. Near Japan, this species appears in the warm currents. I have taken at the following Stations. St. 26, 27, 31, 36, 38, 43, 54, 110.

Centropages violaceus (Claus) 1863.**Pl. 31, figs. 8-14.**

Ichthyophorba violacea, Claus, 1863, p. 199, Taf. XXXV, fig. 13, 14.

C. violaceus, Giesbrecht, 1892, p. 304, Taf. 4, f. 5; Taf. 17, f. 29, 30, 44; Taf. 18, f. 1, 8; Taf. 38, f. 16, 18.

„, Scott T. 1894, p. 78.

„, Giesbrecht u. Schmeil, 1898, p. 57.

„, Mori, 1929, p. 174, Pl. V, figs. 20-24; Pl. VI, fig. 1.

Female; Allied to *C. gracilis* but the 2nd segment of the abdomen without the knobs which with the spinules. The genital segment is moderately swelled and furnished with the spinules on the lateral sides.

The structure of the 5th pair of feet resembles that of *C. gracilis*.

Male; The thumb of the grasping foot is sharply bent at the proximal portion, and shorter than the terminal claw. The terminal claw has no triangulated process on the inner margin. The 2nd segment of the exopodite of the left 5th foot has 2 outer marginal appendages.

Length; Both sexes about 1.8 mm.

Distribution; This species has been recorded from the Mediterranean Sea. Near Japan, this species seems to be present in the warm currents. I have taken at the following Stations. St. 4, 25-27, 76, 91, 99, 115.

Centropages furcatus (Dana) 1849.**Pl. 32, figs. 1-2.**

C. furcatus, Brady, 1883, p. 83, Pl. XXVIII, figs. 1-11.

„, Giesbrecht, 1892, p. 304, Taf. 17, f. 33, 34, 50; Taf. 18, f. 13, 17; Taf. 38, f. 5, 15, 20, 22.

„, Scott T. 1894, p. 77.

„, Giesbrecht u. Schmeil, 1898, p. 56.

„, Scott A. 1909, p. 113.

„, Yamada, 1935, p. 71, Pl. II, figs. 1-7.

Female; The head has a ventral eye which is ball-like. The lateral angles of the last thoracic segment are pointed and have an accessory spine on the interior sides.

The genital segment without spine on the ventral side. The anal segment is asymmetrical, and longer than 2 times as long as the 2nd abdominal segment. The furcal style is relatively slender.

The anterior antennae have the spines on the 1st, 2nd and 5th segments. The inner marginal spine of the 2nd segment of exopodite of the 5th foot not reaches to the end of the 3rd segment.

Male; The lateral angles of the last thoracic segment are slightly asymmetrical; the left side is more protruded than the right. The furcal style is slender.

The thumb of the grasping foot has a rounded protrusion on the proximal portion.

The terminal claw is stout, and has a spine on the inner margin, 2 spines on the outer margin.

Length; Female 1.6-1.7 mm, male 1.55-1.7 mm.

Distribution; *C. furcatus* has been recorded from the tropical zone of the Atlantic, Pacific and Indian Oceans, and also from the Red Sea.

Near Japan, this species is distributed in the warm currents—the Kuroshio and the Tsushima-current. I have taken the few males and many immature females at the following Stations. St. 32, 45, 52, 76, 106, 119.

Gen. *Temora* Baird 1850.

The head is round at the dorsal view, and separated from the 1st thoracic segment. The last 2 thoracic segments are fused.

The abdomen consists of 3 segments in the female, 5 segments in the male. The furcal style is slender, and furnished with the hairs on the inner margin.

The anterior antennae consist of 24 segments. The 25th segment is fused with the 24th. The right anterior antenna of the male are modified into the grasping antenna. The terminal section of that antenna has 3 segments.

The endopodites of the first 4 pairs of feet have 2 segments. The exopodites of the first 4 pairs of feet have 3 segments; but the 2nd to 4th pairs of the female, the articulation between the proximal 2 segments is very obscure.

The 5th pair of feet of the female is symmetrical. Each foot is uniramous and composed of 3 segments.

The 5th pair of feet of the male is asymmetrical. The left foot has 4 segments, and is modified into the forceps. The 2nd segment has a thumb-like process on the inner margin.

The right foot consists of 3 segments; the terminal segment is hook-like.

Temora turbinata (Dana) 1849.

Pl. 32, figs. 3-8.

- T. turbinata*, Giesbrecht, 1892, p. 329, Taf. 17, f. 14, 17, 18, 21; Taf. 38, f. 27.
 „ , Giesbrecht u. Schmeil, 1898, p. 101.
 „ , Marukawa, 1908, p. 11, Pl. III, figs. 108-113; Pl. IV, figs. 114-120.
 „ , Scott A. 1909, p. 119.
 „ , Sato, 1913, p. 29, Pl. VI, figs. 72-73; Pl. V, fig. 74.
 „ , Mori, 1929, p. 175, Pl. VI, figs. 14-15.
 „ , Wilson, 1932, p. 107, fig. 71 a-c.

Female; The anterior division is gradually tapering posteriorly. The lateral angles of the last thoracic segment are rounded. The anal segment is symmetrical, and its length is shorter than the 2nd abdominal segment.

The furca is nearly symmetrical. The 2nd terminal seta of the right furcal style is shorter than the left side.

The 5th pair of feet is symmetrical. The inner marginal spine of the 3rd segment is shorter than the apical 2 spines.

Male; The anal segment and the furca are symmetrical. The terminal setae of the furcal styles are not swelled at the bases.

The 5th pair of feet is asymmetrical. The left foot makes a forceps. The thumb-like process of the 2nd segment is slender, gradually curved, and extends about the end of the last segment.

The 3rd segment of the right foot is gradually curved and hook-like.

Length; Female 1.1–1.6 mm, male 1.1–1.5 mm.

Distribution; *T. turbinata* has been recorded from the North Atlantic and Pacific Oceans, Gulf of Guinea, Sulu Sea, near New Zealand and the Gulf of Maine etc. Near Japan, this species is distributed in the warm currents. In the autumn and winter, this species often is carried near Hokkaido by the Tsushima Current. This species also appears in the Inland Sea of Japan, in the spring.

I have taken at the St. 1, 2, 23, 24, 67–70, 72, 81–84, 95.

Temora discaudata Giesbrecht 1889.

Pl. 32, figs. 9–12.

T. discaudata, Giesbrecht, 1892, p. 328, Taf. 17, f. 3, 20, 23; Taf. 38, f. 24, 25, 28.

„ , Giesbrecht u. Schmeil, 1898, p. 101.

„ , Scott A. 1909, p. 118.

„ , Sato, 1913, p. 31, Pl. VI, figs. 77–80; Pl. VII, fig. 81; Pl. V, fig. 82.

„ , Mori, 1929, p. 175, Pl. VI, figs. 8–13.

Female; The lateral angles of the last thoracic segment are protruded into the spines. The anal segment and the furca are asymmetrical. The terminal setae of the furca are not swelled at the bases.

The 5th pair of feet is symmetrical. The inner marginal spine of the 3rd segment is much longer than the 2 terminal spines which are about equal in length.

Male; The lateral angles of the last thoracic segment are pointed, and slightly asymmetrical. The middle section of the grasping antenna are swelled.

The thumb-like process of the 2nd segment of the left 5th foot is wide. The terminal segment of that foot is lamelliform, and furnished with 4 marginal spines.

The 3rd segment of the right 5th foot is hook-like, and sharply bent back against the outside of the foot.

Length; Female 1.7–2.0 mm, male 1.7–1.9 mm.

Distribution; This species is distributed in the Pacific Ocean and the Red Sea. Near Japan, this species commonly appears in the warm currents. I have taken at the following Stations.

St. 1, 2, 4–7, 9, 15–28, 30, 32, 35, 46, 47, 49–54, 56–58, 60–62, 64–66, 76, 84, 96, 98–100, 109, 114, 115, 117–119, 126, 128.

Temora stylifera (Dana) 1849.**Pl. 33, figs. 1-2.**

T. armata, Claus, 1863, p. 195, Taf. XXXIV, fig. 12, 13.

„ , Brady, 1883, p. 80.

T. stylifera, Giesbrecht, 1892, p. 328, Taf. 5, f. 2; Taf. 17, f. 2, 4, 6, 12, 19, 22;
Taf. 38, f. 26, 29.

„ , Wilson, 1932, p. 104, fig. 69 a-c, (fig. 69 a, is erroneous).

Female; Allied to *T. discandata* but the furca is symmetrical.

The lateral angles of the last thoracic segment are pointed. The anal segment and the furca are symmetrical. The furcal style is about 6 times as long as its width.

The 5th pair of feet is symmetrical. The inner marginal spine of the 3rd segment is much longer than the 2 apical spines.

Male; Allied to *T. discandata* but the end of the thumb-like process of the 2nd segment of the left 5th foot is slender. The 3rd segment of the right 5th foot is relatively shorter than that of *T. discandata*.

Length; Female about 1.5 mm, male about 1.4 mm.

Distribution; *T. stylifera* has been recorded from the tropical zone of the Atlantic and Pacific Oceans, and also from the Mediterranean Sea and the Red Sea.

Near Japan, this species is distributed in the southern waters. I have taken the mature females and the immature males at the following Stations.

St. 25-27, 29, 50, 52, 55, 64.

Gen. Eurytemora Giesbrecht 1881.

Female; The head is separated from the 1st thoracic segment. The 5th thoracic segment also is separated from the 4th. The lateral angles of the last thoracic segment are pointed, often makes the wing-like processes.

The abdomen consists of 3 segments. The furca is symmetrical; the furcal style is slender. The exopodites of the first 4 pairs of feet have 3 segments. The endopodites of the 1st pair of feet are 1-segmented, of the 2nd, 3rd and 4th pairs 2-segmented.

The 5th pair of feet is symmetrical. Each foot is uniramous, and consists of 4 segments.

Male; The abdomen has 5 segments. The right anterior antenna is modified into the grasping organ. The terminal section usually consists of 2 segments.

The 5th pair of feet is asymmetrical. Each foot is uniramous, and consists of 4 or 5 segments. The terminal segment of the left foot is enlarged.

Eurytemora herdmani Thompson and Scott 1897.**Pl. 33, figs. 3-11.**

E. herdmani, Giesbrecht u. Schmeil, 1898, p. 103.

„ , Bremen, 1906, p. 100, fig. 11 a-c.

E. herdmanni, Sato, 1913, p. 32, Pl. VI, figs. 83-86.

„ , Wilson, 1932, p. 112, fig. 75 a-b.

Male; The 5th pair of feet is asymmetrical. The right foot consists of 5 segments. The terminal segment is longer than the preceding one. The 3rd segment is longer than the 2nd, and the combined length of the 4th and 5th.

The left foot consists of 4 segments. The 2nd segment without spine, is swelled but a little. The 4th segment is enlarged distally, and terminated at the truncated end.

Length; Male 1.15-1.5 mm.

Distribution; *E. herdmanni* has been recorded from the St. Lawrence Bay, the Gulf of Maine, off Woods Hole.

Near Japan, this species is distributed in the Japan Sea, and near Hokkaido. In my collections, only a male of this species has been taken at the Station No. 140.

Remarks; A female of *Eurytemora* which I show in Pl. XXXIII, figs. 11-13, shows the immature character on the structure of the 5th pair of feet—the 4th segment is not distinct from the 3rd.

I have found this female, in the sample which is taken at the same haul with the male of *E. herdmanni*. So that immature female perhaps may be identified with *E. herdmanni*. But the seta on the 2nd segment of the 5th foot, and the obliquely protruded inner marginal spine on the 3rd segment of the 5th foot, shows the character of *E. lacustris* (Poppe).

Gen. *Metridia* Boeck 1868.

Female; The head is round, and separated from the 1st thoracic segment. The 4th and 5th thoracic segments are fused.

The abdomen consists of 3 segments; the genital segment is the longest. The furcal style is truncated at the end.

The rami of the first 4 pairs of feet have 3 segments. The 1st segment of endopodites of the 2nd pair of feet have a hook-like spine on the inner margins.

The 5th pair of feet is uniramous, and 4-segmented.

Male; The posterior division consists of 5 segments. The right or left anterior antenna is modified into the grasping organ.

The 5th pair of feet is asymmetrical. The left foot has 5 segments; the terminal segment is longer than the combined length of the other segments.

The right foot consists of 5 segments. The 3rd segment has a long inner marginal process.

Metridia lucens Boeck 1864.

Pl. 34, figs. 1-5.

M. hibernica, Giesbrecht, 1892, p. 340, Taf. 33, f. 2, 12, 16, 22, 28, 36, 39.

M. lucens, Giesbrecht u. Schmeil, 1898, p. 106.

„ , Sars, 1903, p. 113, Pl. LXXVII.

- M. lucens*, Esterly, 1905, p. 177, fig. 35 a-d.
 „ , Breemen, 1906, p. 108, fig. 124 a-c.
 „ , Sato, 1913, p. 36, Pl. V, figs. 92-96.
 „ , Sars, 1925, p. 198.
 „ , Wilson, 1932, p. 119, fig. 79 a-f.

The difference between *M. lucens* and *M. longa*, has been described by many authors, about the relative length of the furcal styles, the structure of the 5th pair of feet and the shape of the lateral angles of the last thoracic segment etc. But there are several variations about the relative length of the furcal styles and the shape of the 5th pair of feet of both species.

I think that there is no suitable character to separate 2 species, without the shape of the lateral angles of the last thoracic segment.

Female; The lateral angles of the last thoracic segment are pointed. The furcal style is about twice as long as its width. The genital segment is slightly shorter than the combined length of the 2 succeeding segments. The anterior antennae, when reflexed, extend beyond the end of the last thoracic segment.

The 5th foot is uniramous, and 4-segmented. Sars' figure (Sars, 1903 Pl. LXXVII) shows only a case of the immature individual. There are several variations about the shape of that foot, according to the individuals and the stages of maturity.

Male; The abdomen consists of 5 segments. A side of antenna is modified into the grasping antenna.

The structure of the 5th pair of feet is as like as the generic description; the last segment not tapers as that of *M. longa*.

Length; Female 2.5-4 mm, male 2-3 mm.

Distribution; This species are the inhabitant of the cold waters, and recorded from the North Atlantic and Pacific Oceans. In the Japanese Waters, this species is distributed near Hokkaido, off the Cape of Kinkazan and off the eastern coast of Chosen (Korea). I have taken at the following Stations. St. 85-89, 91-93, 95, 105, 122, 123, 125-127, 130-134, 136-138, 140, 144, 145.

Gen. *Pleuromamma* Giesbrecht 1898.

Pleuromamma, Giesbrecht, 1898, p. 108.

Female; The head is either separated from, or fused with, the 1st thoracic segment. The 5th thoracic segment is fused with the 4th one. There is a black-pigmented knob or luminous organ on the right or left side of the cephalothorax. The lateral angles of the last thoracic segment is round.

The abdomen consists of 3 segments; the genital segment is somewhat swelled ventrally.

The rami of the first 4 pairs of feet are 3-segmented. The 1st segment of exopodite of the 3rd foot has a notch on the outer margin. The terminal spine of that exopodite is short, and bent outward.

The 1st segment of endopodites of the 2nd pair of feet with the hook-like spines on

the inner margins.

The 5th pair of feet is uniramous.

Male; The abdomen and the furca are usually asymmetrical; the abdomen consists of 5 segments. The right or left side of the anterior antenna is modified into the grasping organ.

The 1st segment of endopodite of the 2nd pair of feet, has the spines on the inner margin, only on the one side foot.

The 5th pair of feet is asymmetrical, uniramous and 5-segmented.

Key to the species.

Female;

- (1) { 5th foot is 2-segmented; terminal 3 setae are about equal in length. *P. gracilis*
 { 5th foot is 4-segmented; the inner most terminal seta is the longest..... (2)
- (2) { Fore-head with a pointed process. *P. xiphias*
 { Fore-head without a pointed process. (3)
- (3) { The 1st segment of anterior antenna with a stout curved spine..... *P. abdominalis*
 { The 1st segment of anterior antenna with a small straight spine. *P. robusta*

Male;

- (1) { Fore-head with a pointed process. *P. xiphias*
 { Fore-head without a pointed process. (2)
- (2) { Abdomen is asymmetrical..... *P. abdominalis*
 { Abdomen is symmetrical. *P. gracilis*

Pleuromamma abdominalis (Lubbock) 1856.

Pl. 34, figs. 6-9; Pl. 35, figs. 6-7.

Pleuromma abdominale, Claus, 1863, p. 197, Taf. 5, fig. 1-6, 13-14.

" , Brady, 1883, p. 46, Pl. XI, figs. 1-13.

Pleuromma abdominale, and *P. abdominale abyssalis*, Giesbrecht, 1892, p. 347, 356, Taf. 5, f. 8; Taf. 32, f. 3, 5, 13, 22, 25-30; Taf. 33, f. 43, 44, 48, 49, 52.

P. abdominalis, Giesbrecht, 1898, p. 109.

" , Esterly, 1905, p. 174, fig. 33 a-b.

" , Breemen, 1906, p. 104, fig. 119 a-f.

" , Scott A. 1909, p. 122.

" , Sars, 1925, p. 201.

" , Mori, 1929, p. 175, Pl. VI, figs. 16-20; Pl. VII, fig. 1.

" , Wilson, 1932, p. 125, fig. 83 a-b.

" , Steuer, 1933, p. 5, Text-fig. 16-34.

Female; The forehead without pointed process. The cephalothorax has a black-pigmented knob on the right or left side. The anterior antennae have a stout curved

spine on the 1st, a straight spine on the 2nd segment.

The 5th pair of feet is symmetrical; each foot consists of 4 segments. The terminal segment has 3 apical setae, among which the inner most seta is the longest.

Male; The cephalothorax has the pigmented-knob on the left side. The proximal 2 segments of the anterior antennae, have only the small spines. The right anterior antenna makes a grasping organ. The 1st segment of endopodite of the left 2nd foot has the spines on the inner margin. The abdomen and the furca are asymmetrical.

The 5th pair of feet is asymmetrical. The terminal segment of the left foot is lamelliform.

Length; Female 2.5-4.0 mm, male 2.5-4.3 mm.

Distribution; This species is widely distributed in the warm waters. Near Japan, this species has been found in the warm currents. I have taken at the St. 8, 25, 35-37, 44, 45, 48-50, 75, 87, 96, 105.

Pleuromamma xiphias (Giesbrecht) 1889.

Pl. 34, figs. 1-5.

Pleuromamma xiphias, Giesbrecht, 1892, p. 347, Taf. 32, f. 14; Taf. 33, f. 42, 45, 50.

Pleuromamma xiphias, Giesbrecht u. Schmeil, 1898, p. 109.

„, Esterly, 1905, p. 176, fig. 34 a-c.

„, Breemen, 1906, p. 105, fig. 120 a-c.

„, Scott A. 1909, p. 124.

„, Sars, 1925, p. 202, Pl. LV, fig. 1-12.

„, Wilson, 1932, p. 124, fig. 82 a-b.

„, Steuer, 1933, p. 3, Text-fig. 1-15.

Allied to *P. abdominalis*, but the forehead has a pointed process on the base of the rostrum.

Length; Female about 4.4 mm, male about 4.3 mm.

Distribution; *P. xiphias* has been recorded from the Atlantic, Pacific and Indian Oceans. Near Japan, this species is distributed near Formosa.

In my collections, this species has been obtained at the following Stations. St. 35-38, 44, 45, 49, 64.

Pleuromamma robusta (Dahl) 1893.

Pl. 35, figs. 8-10.

P. robusta, Giesbrecht u. Schmeil, 1898, p. 110.

„, Sars, 1903, p. 115, Pl. LXXVIII and LXXIX.

„, Breemen, 1906, p. 106, fig. 121 a-c.

„, Sars, 1925, p. 205.

„, Wilson, 1932, p. 126, fig. 84 a-c.

„, Steuer, 1933, p. 11, Text-fig. 44-56.

Female; Allied to *P. abdominalis*, but the 1st and 2nd segments of the anterior antennae with smaller spines than those of the latter.

The 5th pair of feet is symmetrical; each foot consists of 4 segments. The terminal segment is furnished with 3 apical setae, among which the inner most seta is the longest.

Length; Female 3-4 mm.

Distribution; This species has been recorded from the Atlantic and Indian Oceans, and also from the Red Sea. I have taken only a female at the Station No. 36 which is off the eastern coast of Formosa.

Pleuromamma gracilis (Claus) 1863.

Pl. 35, figs. 1-5.

Pleuromamma gracile, Claus, 1863, p. 197, Taf. V, fig. 7-11.

„ „, Giesbrecht, 1892, p. 347, Taf. 5, f. 7; Taf. 32, f. 6, 18-20; Taf. 33, f. 41, 47.

„ „, Scott T. 1894, p. 42.

Pleuromamma gracilis, Giesbrecht u. Schmeil, 1898, p. 110.

„ „, Esterly, 1905, p. 175, fig. 33 c.

„ „, Breemen, 1906, p. 106, fig. 122 a-d.

„ „, Scott A. 1909, p. 123.

„ „, Sato, 1913, p. 35, Pl. VI, figs. 90-91.

„ „, Sars, 1925, p. 204.

„ „, Wilson, 1932, p. 127, fig. 85 a-b. (b. erroneous)

„ „, Steuer, 1933, p. 16, Text-fig. 69-78.

Female; The cephalothorax has a black-pigmented knob on the right side. The proximal 2 segments of the anterior antennae have only small teeth. The 5th pair of feet is symmetrical. Each foot consists of 2 segments, and has 3 short spine-like setae on the apex.

Male; The black-pigmented knob is on the right side. The abdomen is symmetrical. The left anterior antenna is modified into the grasping organ. The 1st segment of endopodite of the 2nd foot with hooks on the right side only.

The terminal segment of the right 5th foot is enlarged and lamelliform.

Length; Both sexes 1.2-2.0 mm.

Distribution; This species has been recorded from the Atlantic, Pacific and Indian Oceans, and also from the Mediterranean Sea. Near Japan, this species is in the warm currents. I have taken at the following Stations. St. 25, 26, 29, 35-37, 44, 45, 48-51, 64, 81, 96, 110, 112, 113.

Gen. Lucicutia Giesbrecht u. Schmeil 1898.

Lucicutia, Giesbrecht u. Schmeil, 1898, p. 110.

Female; The head is separated from the 1st thoracic segment. The last 2 thoracic segments are fused. The abdomen consists of 4 segments. The furca is symmetrical.

The anterior antennae are 24 or 25-segmented. The exopodite of the posterior antenna

consists of 8 segments. The exopodites of the first 4 pairs of feet are 3-segmented. The endopodites of the 1st pair are 2-segmented, of the 2nd to 4th pairs are 3-segmented.

The 5th pair of feet is symmetrical. The rami of each foot consist of 3 segments. The inner margin of the 2nd segment of exopodite has a stout spine.

Male; The abdomen consists of 5 segments. The left anterior antenna are modified into the grasping organ.

The 5th pair of feet is asymmetrical. The rami of the right foot are 3-segmented; the exopodite without inner marginal setae. The rami of the left foot consist of 2 segments; the exopodite without inner marginal setae; the terminal segment of exopodite is curved.

Lucicutia ovalis Wolfenden 1911.

Pl. 36, figs. 6-13.

L. ovalis, Wolfenden, 1911, p. 319, Taf. XXXV, fig. 6; Text-fig. 61 a-c.

Female; The head without horn-like processes and lateral hooks, and is rounded at the dorsal view. The genital segment is about as long as the combined length of the other abdominal segments, and swelled at the ventral side. The anal segment is slightly longer than the preceding one.

The furca is symmetrical; the furcal style is about 4 times as long as its width.

Length; Female about 1.4 mm.

Distribution; *L. ovalis* has been recorded from the Atlantic Ocean, near St. Helena. I have taken only the females at the Station No. 25 which is in the East China Sea, and also the St. No. 76, off the Cape Shiono-Misaki.

Lucicutia flavicornis (Claus) 1863.

Pl. 37, figs. 1-6.

Leuckartia flavicornis, Claus, 1863, p. 183, Taf. XXXII, fig. 17.

„ , Giesbrecht, 1892, p. 358, Taf. 5, f. 4; Taf. 19, f. 2, 3, 15-17, 21, 23, 29, 38; Taf. 38, f. 38, 40.

Lucicutia flavicornis, Giesbrecht u. Schmeil, 1898, p. 111.

„ , Esterly, 1905, p. 180, fig. 36 a-c.

„ , Breemen, 1906, p. 112, fig. 129 a-d.

„ , Sato, 1913, p. 38, Pl. V, figs. 98-101; Pl. VI, fig. 97.

„ , Scott A. 1909, p. 125.

„ , Sars, 1925, p. 207.

Female; The head without lateral hooks, and is rounded at the dorsal view. The anal segment is shorter than the preceding one.

The furca is symmetrical. The furcal style is about 6 times as long as its width. The 2nd terminal setae of the furca is thick, and twice as long as the abdomen.

The anterior antennae, when reflexed, extend beyond the middle portion of the furca. The 2nd segment of basipodite of the maxilla has 4 setae.

The 5th pair of feet is symmetrical. The endopodite reaches to the end of the 2nd

segment of exopodite. The 3rd segment of exopodite is twice as long as the terminal spine.

Male; The 5th pair of feet is asymmetrical. The inner margin of the 2nd segment of basipodite of the right foot is denticulate; the distal portion is protruded. The terminal segment of endopodite has 5 setae.

The rami of the left foot consist of 2 segments. The 1st segment of exopodite is about as long as the 2nd one.

Length; Female about 1.6 mm, male about 1.5 mm.

Distribution; This species has been recorded from the Pacific, Atlantic and Indian Oceans, and also from the Mediterranean Sea. Near Japan, this species commonly appears in the warm currents. I have taken at the following Stations. St. 35, 36, 40, 44, 50, 51, 68, 75, 76, 78, 80, 82, 86, 95, 96, 106, 110, 112, 116, 133.

Gen. *Heterorhabdus* Giesbrecht u. Schmeil 1898.

Heterorhabdus, Giesbrecht u. Schmeil, 1898, p. 113.

Female; The forehead with a papilla which is furnished with the rostral filaments. The head is separated from the thorax. The 4th and 5th thoracic segments are fused.

The abdomen consists of 4 segments. The furca is slightly asymmetrical; the left style is longer than the right, not articulated with the anal segment, and is furnished with the very long 2nd terminal seta.

The anterior antennae consists of 25 segments. The endopodite and exopodite of the 2nd antenna are about equal in length. The masticatory edge of the mandible has 3 or 4 teeth.

The 1st segment of the posterior maxillipede has a stout curved seta on the inner margin.

The rami of the feet have 3 segments. The terminal segment of exopodite of the 3rd foot is swelled.

The 5th pair of feet is symmetrical. The inner marginal spine of the 2nd segment of exopodite is much stout.

Male; The abdomen consists of 5 segments. The left anterior antennae are modified into the grasping organ. The 5th pair of feet is asymmetrical.

Heterorhabdus papilliger (Claus) 1863.

Pl. 37, figs. 7-13; Pl. 38, figs. 1-4.

Heterochaeta papilligera, Claus, 1863, p. 182, Taf. III, fig. 10-13, 15.

" , Giesbrecht, 1892, p. 372, Taf. 20, f. 4, 7, 10, 15, 17, 23, 35, 36; Taf. 39, f. 40, 53.

Heterorhabdus papilliger, Giesbrecht u. Schmeil, 1898, p. 114.

" , Esterly, 1905, p. 184, fig. 38 a-g.

" , Breemen, 1906, p. 120, fig. 138 a-g.

" , Scott A. 1909, p. 132.

Heterorhabdus papilliger, Sars, 1925, p. 229, Pl. LXII, fig. 13-19.

Female; The forehead has a papilla that is elongated but not pointed. The anterior antennae, when reflexed, scarcely reach to the end of the furca.

The anterior maxillipede has 1 short and 2 longer setae on the 4th lobe, 2 long stout setae on the 5th lobe. The terminal seta also is long and stout.

The 1st segment of the posterior maxillipede has a spine and 2 setae on the distal portion, and a stout curved seta near the middle portion.

The inner marginal spine of the 2nd segment of exopodite of the 5th foot is longer than the 3rd segment.

Male; The 5th pair of feet is asymmetrical. The proximal portion on the inner margin of the 2nd segment of exopodite of the right foot has a process. The 3rd segment of exopodite of the right foot is much wider than the left side.

Length; Female about 2.0 mm, male about 1.9 mm.

Distribution; This species has been recorded from the Pacific, Atlantic and Indian Oceans, and also from the Mediterranean Sea. Near Japan, this species is distributed in the warm currents. I have taken at the following Stations.

St. 36-38, 41, 43, 47, 53, 68, 109, 112, 116, 132.

Gen. *Haloptilus* Giesbrecht u. Schmeil 1898.

Haloptilus, Giesbrecht u. Schmeil, 1898, p. 117.

Female; The body is very transparent, and flattened dorso-ventrally. The head is separated from the 1st thoracic segment. The 4th and 5th thoracic segment are fused. The abdomen consists of 4 segments. The furca is symmetrical.

The anterior antennae are 25-segmented. The endopodite of the posterior antenna is much longer than the exopodite. The masticatory edge of the mandible has 2 large teeth.

The rami of the feet are 3-segmented. The 5th pair of feet is symmetrical. The 2nd segment of basipodite has a long seta. The last inner marginal seta on the 3rd segment of exopodite usually is longer than the other setae.

Male; The abdomen consists of 5 segments. The left anterior antenna are modified into the grasping organ.

The 5th pair of feet is slightly asymmetrical. The rami of both feet are 3-segmented. The exopodites without inner marginal setae.

Key to the species.

Female;

- | | |
|-----|---|
| (1) | {Forehead is rounded. (2) |
| | {Forehead is pointed..... (3) |
| (2) | {First antennae extend beyond the end of furca by the 9 last segments.... <i>H. longicornis</i> |
| | {First antennae extend beyond the furcal end by the 5 last segments..... <i>H. ornatus</i> |

- (3) { Forehead is protruded into the slender spine.....*H. oxycephalus*
 { Forehead is protruded into short spine only. (4)
- (4) { 1st antennae reach about the body end; endopodite of the maxilla with 3 setae.
 { *H. mucronatus*
 { 1st antennae extend beyond the body end by 6 last segments; endopodite of
 { the maxilla with 4 setae.*H. acutifrons*

Haloptilus longicornis (Claus) 1863.

Pl. 38, figs. 5-14.

Hemicalanus longicornis, Claus, 1863, p. 179, Taf. XXIX, fig. 1.

„ , Brady, 1883, p. 44, Pl. IX, figs. 1-7.

„ , Giesbrecht, 1892, p. 384, Taf. 1, f. 4; Taf. 2, f. 13; Taf. 27,
 f. 3, 8-10, 29.

„ , Scott T. 1894, p. 32.

Haloptilus longicornis, Giesbrecht u. Schmeil, 1898, p. 118.

„ , Sars, 1903, p. 121, Pls. LXXXII and LXXXIII.

„ , Bremen, 1906, p. 128, fig. 146 a-c.

„ , Scott A. 1909, p. 140.

„ , Sars, 1925, p. 240.

Female; This species can readily be recognised by the knob-like projection on the forehead at the dorsal view, and by the very long anterior antennae. The anterior antennae, when reflexed, extend beyond the end of furca by about 9 last segments.

In the female, the 5th pair of feet is nearly symmetrical. The last inner marginal seta of the 3rd segment of exopodite is not longer than the other setae.

Length; Female about 2.3 mm.

Distribution; This species is distributed in the Pacific, Atlantic and Indian Oceans, and also in the Mediterranean Sea. Near Japan, this species seems to be in the warm currents. I have taken the females only, at the following Stations. St. 36, 77, 78, 109.

Haloptilus ornatus (Giesbrecht) 1892.

Pl. 39, figs. 5-8.

Hemicalanus ornatus, Giesbrecht, 1892, p. 384, Taf. 27, f. 1, 6, 7, 21, 38; Taf. 42,
 f. 1, 9, 19.

Haloptilus ornatus, Giesbrecht u. Schmeil, 1898, p. 120.

„ , Bremen, 1906, p. 130, fig. 148 a-c.

„ , Scott A. 1909, p. 141.

„ , Sars, 1925, p. 247, Pl. LXXIII, fig. 1-5.

Female; The head is somewhat triangulated when viewed from above. The forehead is rounded. The anterior antennae, when reflexed, extend beyond the end of the furca by 4 or 5 last segments.

The endopodite of the maxilla is 1-segmented, and has 2 setae. The 1st maxillipede

has a stout spine on the 5th lobe, and also a same size one on the 6th lobe.

Length; Female 3-5 mm.

Distribution; *H. ornatus* is distributed in the Pacific and Atlantic Oceans, and also in the Mediterranean Sea. Near Japan, this species seems to be in the warm currents. I have taken only the females at the following Stations. St. 77, 79, 80.

Haloptilus spiniceps (Giesbrecht) 1892.

Pl. 39, figs. 9-14.

Hemicalanus spiniceps, Giesbrecht, 1892, p. 384, Taf. 27, f. 6, 40; Taf. 42, f. 3, 8, 10, 11.

Haloptilus spiniceps, Giesbrecht u. Schmeil, 1898, p. 120.

„ „, Bremen, 1906, p. 131, fig. 149 a-d.

„ „, Scott A. 1909, p. 141.

„ „, Sars, 1925, p. 249, Pl. LXXIII, fig. 6-10.

Male; The forehead of the female is pointed, but the case of the male is rounded. The left anterior antenna is modified to from the grasping organ. The endopodite of the maxilla is 1-segmented, and has 3 setae.

The shape of the anterior maxillipede resembles that of *H. ornatus*. The 5th pair of feet is slightly asymmetrical. The exopodites without inner marginal setae.

Length; Male about 2.3 mm.

Distribution; This species has been recorded from the Pacific and Atlantic Oceans, and also from the Mediterranean Sea. Near Japan, this species appears in the warm currents. I have taken an immature male only at the Station No. 68.

Haloptilus mucronatus, (Claus) 1863.

Pl. 38, figs. 15-18.

Hemicalanus mucronatus, Claus, 1863, p. 179, Taf. XXIX, fig. 2.

„ „, Giesbrecht, 1892, p. 384, Taf. 3, f. 10; Taf. 27, f. 11, 18, 19; Taf. 42, f. 4, 6, 13, 14.

Haloptilus mucronatus, Giesbrecht u. Schmeil, 1898, p. 119.

„ „, Sars, 1925, p. 249, Pl. LXXIII, fig. 11-15.

Female; The head is taper anteriorly. The forehead is pointed. The anterior antennae reach about the end of the furca. The endopodite of the maxilla is 1-segmented, and has 3 setae on it. The anterior maxillipede only has a spine on the 5th lobe.

Length; Female about 3.2 mm.

Distribution; This species has been recorded from the Atlantic Ocean and the Mediterranean Sea. Near Japan, this species is in the warm currents.

I have taken the females only, at the following Stations. St. 48, 50.

Haloptilus acutifrons (Giesbrecht) 1892.**Pl. 39, figs. 1-4.**

Hemicalanus acutifrons, Giesbrecht, 1892, p. 348, Taf. 3, f. 11; Taf. 27, f. 12; Taf. 42, f. 12, 20.

Haloptilus acutifrons, Giesbrecht u. Schmeil, 1898, p. 119.

„, Bremen, 1906, p. 129, fig. 174.

„, Sars, 1925, p. 250, Pl. LXXIV, fig. 1-11.

Female; Allied to *H. mucronatus*, but the body is relatively wider than that of the *H. mucronatus*. The anterior antennae reach beyond the end of the furca by about 6 last segments. The endopodite of the maxilla is 1-segmented, and has 4 setae. The anterior maxillipede resembles that of *H. mucronatus*.

Length; Female 2.5-3.0 mm.

Distribution; This species has been recorded from the Atlantic and Pacific Oceans, and also from the Mediterranean Sea.

I have taken the females only at the Stations 25 and 27.

Haloptilus oxycephalus (Giesbrecht) 1889.**Pl. 40, figs. 1-2.**

Hemicalanus oxycephalus, Giesbrecht, 1892, p. 384, Taf. 42, f. 7, 16.

Haloptilus oxycephalus, Giesbrecht u. Schmeil, 1898, p. 119.

„, Sars, 1925, p. 252, Pl. LXXIV, fig. 12-16.

Female; *H. oxycephalus* may be readily recognizable by the long spine on the forehead.

Male; Unknown.

Length; Female about 3 mm.

Distribution; This species has been recorded from the tropical zone of the Pacific Ocean, and the Mediterranean Sea. I have taken only a female at the Station No. 112, near Hachijo-Island.

Fam. Candacidae Giesbrecht.

Fam. Candacidae, Giesbrecht, 1892, p. 67.

The head without a rostrum, is separated from the 1st thoracic segment. The 5th thoracic segment is fused with the 4th one.

The forehead shows the truncate form at the dorsal view. The lateral angles of the last thoracic segment terminate the pointed ends.

The abdomen consists of 3 segments in the female, 5 segments in the male. The anterior antennae of the female consist of 23 or 24 segments. The proximal 6 or 7 segments of each antenna are thickened. The right anterior antenna of the male is modified to form a grasping organ.

The 5th pair of feet of the female is uniramous; each foot consists of 3 segments.

In the case of the male, the 5th feet are composed of the grasping organ.

This family includes only one Genus *Candacia*.

Gen. *Candacia* Dana 1846.

Female; Characters agree with the description of the Family. The head has no rostrum, and is separated from the thorax. The 2 last thoracic segments are fused in the fully matured individuals. The forehead shows the truncate shape at the dorsal view. The lateral angles of the last thoracic segment are pointed. The abdomen consists of 3 segments. The furca is symmetrical.

The anterior antennae consist of 23 or 24 segments. The proximal 6 or 7 segments are thickened. The exopodite of the 2nd antenna is much smaller than the endopodite, and consists of 6 segments, among which the 2nd segment is the longest. The 1st segment of the endopodite is fused with the 2nd segment of basipodite.

The masticatory edge of the mandible is bifurcate. The anterior maxillipede is enormously large, and consists of 3 segments. The 3rd segment is furnished with 2 marginal, and 3 apical spines. The posterior maxillipede is weakly developed.

The exopodites of the first 4 pairs of feet are 3-segmented. The endopodites of the 1st pair of feet are 1 or 2-segmented, of the 2nd to 4th pairs are 2-segmented.

The 5th pair of feet is uniramous and symmetrical; each foot consists of 3 segments.

Male; The lateral angles of the last thoracic segment often are asymmetrical. The abdomen consists of 5 segments. The right anterior antenna is modified into the grasping organ.

The 5th pair of feet is asymmetrical. The left foot consists of 4 segments. The right foot consists of 3 segments, usually makes a forceps.

Key to the species.

Female;

- | | | | |
|-------|---|--|----------------------|
| (1) | { | Endopodite of the 1st foot with 1 segment. | (2) |
| | | Endopodite of the 1st foot with 2 segments. | (3) |
| (2) | { | 5th foot terminates trifurcate end. | <i>C. discandata</i> |
| | | 5th foot terminates a pointed end. | <i>C. bradyi</i> |
| (3) | { | Terminal spine of exopodite of the 3rd foot resembles that of the 2nd and 4th foot. | (4) |
| | | Terminal spine of the same portion is bent, and is at least as long as the interval between 2 last marginal spines. | (7) |
| | | Terminal spine of the same portion is bent, that is much shorter than the interval between 2 last marginal spines. | (8) |
| (4) | { | The 1st marginal spine of the 3rd segment of the 1st maxillipede is thicker, and longer than the 2nd. | <i>C. catula</i> |
| | | The 1st marginal spine of the same portion is much thinner, and shorter than the 2nd. | (5) |

Candacia longimana, Scott A. 1909, p. 153.

„ „, Sars, 1925, p. 349.

Female; The genital segment is symmetrical. The anal segment and the furca are short. The anterior antennae consist of 24 segments, of which the proximal 7 segments are thickened.

The 1st marginal spine of the 3rd segment of anterior maxillipede is slightly thinner and shorter than the 2nd. The terminal spine of the 3rd segment of exopodite of the 3rd foot is much shorter than the interval between 2 last marginal spines.

The 5th pair of feet is symmetrical. The 3rd segment terminates into 3 small spines which are about equal in length.

Male; The lateral angles of the last thoracic segment are asymmetrical. The right side of the genital segment are produced into blunt process. The right anterior antenna consists of a grasping organ.

The 5th pair of feet is asymmetrical. The right foot is modified into forceps.

Length; Female about 3.7 mm, male 3.3 mm.

Distribution; This species has been recorded from the Pacific and Atlantic Oceans, and also from the Malay Archipelago and the Mediterranean Sea. I have taken 1 immature female, and 1 male, respectively at the Station No. 35 and 36, off the eastern coast of Formosa.

***Candacia bradyi* Scott 1902.**

Pl. 53, figs. 8-12.

Candacia bradyi, (male only) Scott A. 1909, p. 156, Pl. XLVII, figs. 1-9.

Candacia curva, (female only) Mori, 1932, p. 171 and 175, Pl. III, figs. 8-12.

Candacia bradyi, Tanaka, 1935, p. 212, Pl. IV, figs. 5-7.

At the first time, only the male of this species has been reported by Scott. The female had been obtained by the author, separately from the male, and reported as *C. curva* in 1932. After that time, Tanaka has collected that female with the male of *C. bradyi* in a hauling.

Female; General form resembles that of *C. discaudata*, but the abdominal segments are jointed zigzag-like, so the abdomen curved slightly.

The anterior antennae consist of 23 segments, of which, the proximal 6 segments are thickened. The 1st marginal spine of the 3rd segment of the anterior maxillipede is thicker and slightly longer than the 2nd. The endopodite of the 1st foot is 1-segmented.

The 5th pair of feet is symmetrical. Each foot consists of 3 segments. The 3rd segment has 3 spines on the outer margin, and 2 setae on the inner margin near the terminal end. The terminal end of this segment is one pointed.

Length; Female about 1.94 mm.

Distribution; This species is distributed near the Malay Archipelago, the Formosan Strait, the Bay of Sagami etc. I have taken 5 females at the following Stations.

St. No. 65 and 66, in the Formosan Strait.

Candacia discaudata Scott 1909.

Pl. 54, figs. 1-7.

C. discaudata, Scott, A. 1909, p. 157, Pl. XLVII, figs. 10-20.

Female; The lateral angles of the last thoracic segment are pointed and symmetrical; somewhat curved ventrally, when viewed from the side.

The genital segment is about as long as the combined length of the next 2 segments. The anal segment is very short, and distinctly asymmetrical. The furca is symmetrical; the furcal style is 2 times as long as its width.

The anterior antennae consist of 23 segments, among which the proximal 6 segments are thickened. The 1st marginal spine of the 3rd segment of the anterior maxillipede is much thicker and longer than the 2nd. The endopodite of the 1st foot is 1-segmented.

The 5th pair of feet is nearly symmetrical. Each foot consists of 3 segments. The 3rd segment is very long and slender, and furnished with 2 outer marginal spines, and 2 inner marginal setae. The apex of this segment is produced into 3 spines.

Male; The abdomen consists of 5 segments. The distal angle of the right side of the 1st segment is swelled.

The right anterior antenna is modified into the grasping organ. The terminal section consists of 6 segments. The 2 preceding segments of the knee-like articulation are finely denticulated. The 5th pair of feet is asymmetrical; the right consists of a forceps.

Length; Female about 1.8 mm, male about 1.7 mm.

Distribution; This species has been recorded near the Malay Archipelago, by Scott. I have taken at the following Stations. St. 29, 59.

Candacia catula Giesbrecht 1889.

Pl. 54, figs. 8-13.

Candacia catula, Giesbrecht, 1892, p. 425, Taf. 21, f. 13; Taf. 22, f. 3, 27, 28.*Candacia catula*, Giesbrecht u. Schmeil, 1898, p. 129.

,, , Scott A. 1909, p. 152.

,, , Yamada, 1935, p. 71, Pl. III, figs. 1-10.

,, , Tanaka, 1935, p. 213, Pl. V, figs. 1-12.

Female; The genital segment is symmetrical. Both side are swelled. The furcal style is nearly twice as long as its width.

The anterior antennae consist of 23 segments, among which, the proximal 6 segments are thickened. The 1st marginal spine of the 3rd segment of the anterior maxillipede is longer than the 2nd. The endopodite of the 1st foot is 2-segmented. The terminal spine of the 3rd segment of exopodite of the 3rd foot resemble that of the 2nd and 4th feet.

The 5th pair of feet is symmetrical. Each foot has 3 segments. The 3rd segment is long, and has 2 outer marginal spines, and 3 inner marginal setae. The apex is furnished with 3 teeth.

Male; The abdomen consists of 5 segments. The anal segment is very short. The right antenna is modified into a grasping organ. The terminal section with 6 segments,

The 5th pair of feet is asymmetrical. The right foot consists of a forceps. The terminal spine of the claw-like 3rd segment is long and curved.

Length; Female 1.4–1.65 mm, male 1.3–1.6 mm.

Distribution; This species has been recorded from the tropical zone of the Pacific Ocean, and the Red Sea.

Near Japan, this species is distributed in the warm currents. I have taken at the following Stations. St. 25–27, 34, 40, 42, 44, 51, 60, 68, 83, 97.

***Candacia truncata* (Dana) 1849.**

Pl. 55, figs. 1–6.

Candace truncata, Brady, 1883, (part) p. 69, Pl. XXIX, fig. 9.

„ „, Giesbrecht, 1892, p. 425, Taf. 21, f. 14; Taf. 22, f. 16, 23; Taf. 39, f. 26, 28.

Candacia truncata, Giesbrecht u. Schmeil, 1898, p. 130.

„ „, Scott A. 1909, p. 155.

„ „, Yamada, 1935, p. 72, Pl. V, figs. 1–14.

„ „, Tanaka, 1935, p. 214, Pl. VI, figs. 1–16.

Female; The lateral angles of the last thoracic segment are pointed, and curved ventrally. The anal segment is short, often fused with the furca, in fully matured individuals.

The anterior antennae consist of 23 segments, of which, the proximal 6 segments are thickened. The 2nd marginal spine of the 3rd segment of the 1st maxillipede is much thicker and longer than the 1st spine. The endopodite of the 1st foot with 2 segments. The terminal spine of the 3rd segment of exopodite of the 3rd foot resembles that of the 2nd and 4th feet.

The 3rd segment of the 5th foot is furnished with 3 outer marginal, and 2 inner marginal spines, and terminates simple end.

Male; The abdomen and the furca are symmetrical. The right anterior antenna is modified into grasping organ. The terminal section consists of 5 segments. The next segment of the knee-like articulation without a rounded protuberance on the distal portion of the anterior margin. The preceding segment of the knee-like articulation is not denticulated on the anterior margin.

The 5th pair of feet is asymmetrical. The terminal segment of the left foot has 3 setae. The right foot not makes a forceps; the apex of the 3rd segment is furnished with a very long hairy seta.

Length; Both sexes about 2.1 mm.

Distribution; *C. truncata* is distributed in the Pacific Ocean.

Near Japan, this species has been recorded that it is in the warm currents—the Kuroshio and the Tsushima current, by Yamada and Tanaka.

I have taken at the following Stations. St. 25–27, 29, 31, 33, 34, 38, 40, 41, 43–47, 49, 51, 63, 69, 71, 76, 77, 83.

Candacia pectinata Brady 1878.

Pl. 55, figs. 7-12.

Candace pectinata, Brady, 1878, p. 49, Pls. VIII and X.

„, Giesbrecht, 1892, p. 424, Taf. 4, f. 3; Taf. 21, f. 2, 12; Taf. 22, f. 9, 17, 18, 31, 43-46; Taf. 32, f. 1, 22, 24, 25.

Candacia pectinata, Giesbrecht u. Schmeil, 1898, p. 128.

Male; The lateral angles of the last thoracic segment are slightly asymmetrical. The right side is more slender, and curved inwardly. The abdomen consists of 5 segments. The 1st segment has a pointed process on the right side.

The left anterior antenna consists of 23 segments, of which the proximal 6 segments are thickened. The right anterior antenna is modified into a grasping organ. The anterior margin of the preceding segment of the knee-like articulation is denticulate.

The 1st marginal seta of the 3rd segment of the 1st maxillipede is nearly as long as the 2nd. The endopodite of the 1st foot is 2-segmented.

The terminal spine of the 3rd segment of exopodite of the 3rd foot is curved, and about as long as the interval between 2 distal marginal spines.

The 5th pair of feet is asymmetrical. The right foot consists of a forceps.

Length; Male 1.7-2.4 mm.

Distribution; *C. pectinata* has been recorded from the Atlantic Ocean, and the Mediterranean Sea. I have taken a male only, at the Station No. 78.

Candacia curta Dana 1849.

Pl. 56, figs. 1-8; Pl. 57, figs. 1-5.

Candace pectinata (part), Brady, 1883, p. 67, Pl. XXX, figs. 10, 12, 13.

Candace curta, Giesbrecht, 1892, p. 424, Taf. 21, f. 15; Taf. 22, f. 12, 24; Taf. 39, f. 8-10, 12.

Candace intermedia, Scott T. 1894, p. 61, Pl. IV, figs. 30-37.

Candacia curta, Giesbrecht u. Schmeil, 1898, p. 129.

„, Esterly, 1905, p. 196, fig. 46 a-c.

„, Sars, 1925, p. 351.

Candacia bicornuta, Mori, 1932, p. 170 and 175, Pl. III, figs. 1-7.

Candacia curta, Yamada, 1935, p. 72, Pl. IV, figs. 1-1'.

„, Tanaka, 1935, p. 212, Pl. II, figs. 9-13; Pl. III, figs. 1-9.

Female; The genital segment has a spine on the right side, but rarely has spines on both sides. The anterior antennae consists of 23 segments, of which the proximal 6 segments are thickened.

The 1st marginal spine of the 3rd segment of the 1st maxillipede is slightly shorter than the 2nd. The endopodite of the 1st foot has 2 segments. The terminal spine of the 3rd segment of exopodite of the 3rd foot is bent, and much shorter than the interval between 2 last marginal spines.

The 5th pair of feet is symmetrical. The terminal segment has an outer marginal

spine or seta, and a large inner marginal spine. The apex terminates 2 spines.

Male; The lateral angles of the last thoracic segment are asymmetrical. The right side is more slender than the left, and curved inwardly. The 1st abdominal segment has a large process on the right side.

The right anterior antenna consists of a grasping organ. The preceding 2 segments of the knee-like articulation are roughly denticulated. The terminal section consists of 5 or 6 segments.

The 5th pair of feet is asymmetrical. The right foot makes a forceps.

Length; Female 2.2–2.7 mm, male 2.2–2.65 mm.

Distribution; *C. curta* has been recorded from the tropical and subtropical zones of the Pacific and Atlantic Oceans. And also from the Red Sea. Near Japan, this species is distributed in the warm currents. I have taken at the St. No. 25, 26, 76–78, 83, 110–112, 114.

Remarks; I have described *C. bicornuta* which resembles *C. curta*. But the characters of the latter which is distributed near Japan, are slightly different from the description by Giesbrecht, and rather identical with the description of the former, except the spines on both sides of the genital segment of the female. So I identify *C. bicornuta* with *C. curva*.

Candacia bispinosa Claus 1863.

Pl. 56, figs. 9–14.

Candace bispinosa, Claus, 1863, p. 191, Taf. XXXIII, fig. 5; Taf. XXVII, fig. 9–16.

„ , Giesbrecht, 1892, p. 424, Taf. 21, f. 6, 7, 16, 27; Taf. 22, f. 4, 8, 22, 33, 35, 38, 39; Taf. 39, f. 15–17, 20.

Candacia bispinosa, Giesbrecht u. Schmeil, 1898, p. 129.

„ , Scott A. 1909, p. 151.

„ , Sars, 1925, p. 352.

„ , Tanaka, 1935, p. 214, Pl. V, figs. 10–16.

Female; The genital segment is asymmetrical, and furnished with the spini-form processes on both sides.

The anterior antennae consist of 23 segments, of which, the proximal 6 segments are thickened. The 2nd marginal spine of the 3rd segment of the anterior maxillipede is much thicker and longer than the 1st. The endopodite of the 1st foot is 2-segmented. The terminal spine of the 3rd segment of exopodite of the 3rd foot is resembles that of the 2nd and 4th feet.

The 3rd segment of the 5th foot has 3 outer marginal spines, and 2 inner marginal setae. The apex terminates a stout process.

Length; Female about 1.8 mm.

Distribution; *C. bispinosa* has been recorded from the Pacific and Atlantic Oceans, and also from the Mediterranean Sea. Near Japan, this species appears to be in the warm currents. I have taken the females only, at the following Stations. St. 48, 51, 112.

Candacia aethiopica Dana 1849.**Pl. 57, figs. 6-10.***Candace melanopus*, Claus, 1863, p. 191, Taf. XXXIII, f. 1, 2, 3.*Candace aethiopica*, Giesbrecht, 1892, p. 424, Taf. 4, f. 13; Taf. 21, f. 1, 9; Taf. 22, f. 1, 6, 13, 14, 32, 40-42; Taf. 39, f. 7, 11, 13.*Candacia aethiopica*, Giesbrecht u. Schmeil, 1898, p. 128.

,, , Esterly, 1905, p. 196, fig. 47 a-h.

,, , Sars, 1925, p. 250.

,, , Yamada, 1935, p. 71, Pl. I, figs. 7-10; Pl. III, figs. 11-14.

,, , Tanaka, 1935, p. 212, Pl. III, figs. 10-14; Pl. IV, figs. 1-4.

Female; The genital segment is somewhat asymmetrical, and furnished with the small processes on both sides of this segment.

The anterior antennae consist of 23 segments, of which, the proximal 6 segments are thickened. The 1st marginal spine of the 3rd segment of the anterior maxillipede is slightly shorter than the 2nd. The endopodite of the 1st foot is 2-segmented. The terminal spine of the 3rd segment of exopodite of the 3rd foot is curved, and much shorter than the interval, between 2 distal marginal spines.

Male; The lateral angles of the last thoracic segment are asymmetrical. The right side of the genital segment is produced into a small process.

The right anterior antenna is modified into a grasping organ. The preceding segment of the knee-like articulation is finely denticulated.

The apex of the terminal segment of the left 5th foot has a long spine. The right 5th foot consists of a forceps.

Length; Female 2.15-2.8 mm, male 2.0-2.3 mm.**Distribution**; *C. aethiopica* has been recorded from the Atlantic and Pacific Oceans, and also from the Mediterranean Sea. Near Japan, this species is distributed in the warm currents. I have taken at the following Stations. St. 29, 41, 42, 76, 78, 80, 83, 84, 109, 115.**Candacia pachydactyla Dana 1849.****Pl. 58, figs. 1-5.***Candace pachydactyla*, Brady, 1883, p. 68, Pl. XXXI, figs. 2-9.

,, , Giesbrecht, 1892, p. 424, Taf. 21, f. 17; Taf. 22, f. 11, 19; Taf. 39, f. 30-39.

,, , Scott T. 1894, p. 60.

Candacia pachydactyla, Giesbrecht u. Schmeil, 1898, p. 128.

,, , Scott A. 1909, p. 153.

,, , Sars, 1925, p. 351.

,, , Wilson, 1932, p. 141, fig. 96 a-b.

,, , Tanaka, 1935, p. 211, Pl. I, figs. 10-12; Pl. II, figs. 1-8.

Female; Allied to *C. aethiopica*, but the genital segment is furnished with the very

long processes on both sides. The apex of the 3rd segment of the 5th foot has 3 stout spines. The inner margin has 3 slender setae.

Male; Allied to *C. aethiopica*, but the 1st abdominal segment has a very large process on the right side.

Length; Female 2.4–2.8 mm, male 2.3–2.6 mm.

Distribution; This species is distributed in the Pacific and Atlantic Oceans. I have taken at the following Stations. St. 84, 109 and 115.

***Candacia bipinnata* Giesbrecht 1889.**

Pl. 58, figs. 6–12.

Candace bipinnata, Giesbrecht, 1892, Taf. 22, f. 20; Taf. 39, f. 27, 29.

Candacia bipinnata, Giesbrecht u. Schmeil, 1898, p. 129.

„, Esterly, 1905, p. 195, fig. 45 a–c.

„, Scott A. 1909, p. 151.

„, Sato, 1913, p. 40, Pl. VII, figs. 102–109.

„, Sars, 1925, p. 351.

„, Mori, 1929, p. 176, Pl. VI, figs. 21–23; Pl. VII, figs. 2–4.

„, Tanaka, 1935, p. 210, Pl. I, figs. 1–9.

Female; The genital segment is broad, and has the wing-like expansion on both sides.

The anterior antennae consist of 23 segment, of which the proximal 6 segments are thickened. The 1st marginal spine of the 3rd segment of the anterior maxillipede is shorter than the 2nd. The endopodite of the 1st foot is 2-segmented. The terminal spine of the 3rd segment of exopodite of the 3rd foot is bent, and longer than the interval between 2 distal marginal spines.

The 3rd segment of the 5th foot has 3 outer marginal spines, and terminates into a simple end.

Male; The lateral angles of the last thoracic segment are asymmetrical. The 1st abdominal segment has a process on the right side. The right anterior antenna is modified into a grasping organ. The terminal section consists of 5 segments.

The 5th pair of feet is asymmetrical. The right foot consists of a forceps.

Length; Both sexes about 2.4 mm.

Distribution; *C. bipinnata* has been recorded from the Pacific and Atlantic Oceans. I have taken at the following Stations.

St. 5–7, 16, 18, 21, 23, 85–89, 94–98, 104, 114, 128.

***Candacia simplex* Giesbrecht 1889.**

Pl. 59, figs. 2–5.

Candace simplex, Giesbrecht, 1892, p. 424, Taf. 21, f. 10, 30, 31; Taf. 22, f. 21, 29; Taf. 39, f. 3, 14.

Candacia simplex, Giesbrecht u. Schmeil, 1898, p. 130.

Candacia simplex, Scott A. 1909, p. 154.

„ „, Sars, 1925, p. 351.

Female; Allied to *C. bispinosa*, but the both sides of the genital segment without spine-like processes.

Length; Female about 1.9 mm.

Distribution; *C. simplex* has been recorded from the Pacific, Atlantic and Indian Oceans, and also from the Mediterranean Sea. I have taken a female that is not fully matured, at the Station No. 119.

e. columbrae
=
***Candacia pacifica* sp. nov.**

Pl. 59, figs. 6-12.

Female; The genital segment is asymmetrical, when viewed from above. The right side is swelled. The furcal style is twice as long as its width.

The anterior antennae consist of 24 segments, among which, the proximal 7 segments are thickened. The 1st marginal spine of the 3rd segment of the anterior maxillipede is nearly as long as the 2nd spine. The endopodite of the 1st foot is 2-segmented. The terminal spine of the 3rd segment of exopodite of the 3rd foot is bent, and longer than the interval between 2 distal marginal spines.

The 5th pair of feet is symmetrical. Each foot consists of 3 segments. The 3rd segment has 2 outer marginal spines, and 3 inner marginal setae. The apex is furnished with 2 very stout spines.

Length; Female about 4.1 mm.

Locality; I have taken 2 individuals of female of this species, at the Station No. 125, that is in the cold current, off SE by S from Kushiro City.

Fam. Pontellidae (Dana).

Subfam. Pontellidae, Dana, 1852.

The head with a bifurcated rostrum, is separated from the thorax. There are sometimes 1 or 2 pairs of dorsal lenses and rarely a ventral eye on the head.

The 4th and 5th thoracic segments are usually fused. The lateral angles of the last thoracic segment are often produced into the pointed ends. In the male, that segment is usually asymmetrical, the right angle is more prominent than the left.

The abdomen is composed of from 1 to 3 segments in the female, 5 segments in the male.

The anterior antennae of the female consist of 16-24 segments. The right anterior antenna of the male constitutes a grasping organ.

The exopodites of 4 anterior feet with 3 segments. The endopodites of from the 2nd to 4th feet generally with 2 segments. The endopodites of the 1st pair of feet with 2 or 3 segments.

The exopodites of the 5th pair of feet of the female is 1 or 2-jointed. The endopodites of those feet with 1 segment or lacking. The 5th pair of feet of the male rarely with

the endopodites; the right foot is composed of a grasping organ.

Key to the Genera of the Pontellidae.

- (0) { The endopodite of the 4th foot with 3 segments. *Bathypontia*
 { The endopodite of the 4th foot with 2 segments. (1)
- (1) { The endopodite of the 1st foot with 3 segments. (2)
 { The endopodite of the 1st foot with 2 segments. (8)
- (2) { The head without dorsal lenses and lateral hooks. (3)
 { The head with 1 or 2 pairs of lenses, often has the lateral hooks. (6)
- (3) { The exopodites and endopodites of the 2nd antennae are about equal in length.
 { *Parapontella*
 { The exopodites are longer than the endopodites. (4)
- (4) { The abdomen with 3 segments in the female, 4 segments in the male; the
 { endopodites of the 5th feet of the female are absent. *Neopontella*
 { The abdomen with 1 or 2 segments in the female, 5 segments in the male;
 { the endopodites of the 5th feet of the female with 1 segment. (5)
- (5) { The abdomen with an asymmetrical dilatation. *Pontellopsis*
 { The abdomen are symmetrical. *Pontellina*
- (6) { The head with 2 pairs of lenses. *Anomalocera*
 { The head with 1 pair of lenses. (7)
- (7) { The 4th thoracic segment is fused with the 5th. *Ivellopsis*
 { The 4th thoracic segment is distinctly separated from the 5th. *Pontella*
- (8) { The head with a pair of lenses. *Labidocera*
 { The head without dorsal lenses. (9)
- (9) { The exopodite of the 2nd antenna is shorter than half length of the endopodite.
 { *Acartia*
 { The exopodite of the 2nd antenna is longer than half of the endopodite. (10)
- (10) { The posterior maxillipede with at least 6 segments; the furca is distinctly separated
 { from the last abdominal segment. *Calanopia*
 { The posterior maxillipede with 3 segments; the furca is fused with the last
 { abdominal segment. *Tortanus*

Gen. *Calanopia* Dana 1852.

Calanopia, Dana, 1852, p. 1131.

Female; The head with or without lateral hooks, and is separated from the 1st thoracic segment. The 4th and 5th thoracic segments are fused. The lateral angles of the last thoracic segment are pointed.

The abdomen consists of 2 segments. The furca is symmetrical, and separated from the anal segment. The dorsal and rostral eyes are absent. The rostrum is bifurcate.

The exopodite of the 2nd antenna is longer than half of the endopodite. The posterior maxillipede with at least 6 segments. The exopodites of the first 4 pairs of feet are

3-segmented. The endopodites of the 1st to 4th pairs of feet are 2-segmented.

The 5th pair of feet is symmetrical or slightly asymmetrical. Each foot is uniramous, it consists of 3 or 4 segments.

Male; The abdomen consists of 5 segments. The right anterior antenna are composed of a grasping organ; the terminal section with 4 segments.

The 5th pair of feet is asymmetrical. Both feet are uniramous. The right foot consists of a grasping organ.

Calanopia elliptica (Dana) 1849.

Pl. 40, figs. 3-8.

Calanopia elliptica, Dana, 1852, p. 1132, Pl. 79.

„ , Brady, 1883, p. 85, Pl. XXXIV, figs. 1-9.

„ , Giesbrecht, 1892, p. 441, Taf. 31, f. 23-26, 31, 32; Taf. 38, f. 42, 47.

„ , Giesbrecht u. Schmeil, 1898, p. 132.

„ , Scott A. 1909, p. 176, Pl. XLVIII, figs. 1-5.

Female; The cephalothorax is nearly twice as long as the combined length of the abdomen and furca. The genital segment is as long as the succeeding one. The furcal styles are about 3 times as long as the width.

The 5th pair of feet is asymmetrical. Each foot is uniramous, it consists of 4 segments. The left foot is longer than the right.

Male; The abdomen consists of 5 segments. The distal end of the right side of the 2nd abdominal segment is produced into a spine.

The 5th pair of feet is asymmetrical. The 2nd segment of exopodite of the left foot is pointed at the terminal end; and has 3 setae on the outer margin, and a seta on the posterior side.

The 1st segment of exopodite of the right foot is furnished with 3 stout blunt teeth. The outer margin of the 2nd segment of exopodite has 3 small pointed teeth.

Length; Female about 1.8 mm, male about 1.6 mm.

Distribution; *C. elliptica* has been recorded that it is in the warm regions of the Pacific and Indian Oceans. It has also been found in the Red Sea. Near Japan, this species appears to be in the warm currents. I have taken at the following Stations. St. 25, 26 and 47.

Calanopia thompsoni Scott 1909.

Pl. 40, figs. 9-13.

C. thompsoni, Scott A. 1909, p. 178, Pl. XLIX, figs. 1-8.

Male; The head has the lateral hooks. The forehead is angular in outline. The lateral angles of the last thoracic segment are pointed sharply.

The abdomen consists of 5 segments. The 2nd abdominal segment has no spine on the right side. The right anterior antenna are modified into the grasping organ.

The 5th pair of feet is asymmetrical. The exopodite of the left foot is moderately broad. The apex of the 2nd segment is furnished with 2 spines, and a broad, flat, finely denticulated process.

The terminal segment of the right exopodite is spoon-like.

In the case of a specimen which I show in the Plate, the shape of the 5th pair of feet is slightly different from the Scott's figure (Scott, 1909, Pl. XLIX, fig. 8).

Length; Male about 1.9 mm, in a specimen which I taken.

Distribution; *C. thompsoni* has been recorded from the Java Sea, and near Obi-Island. I have taken 2 individuals of male at the Stations 82 and 83, which is in the Ki-Channel.

Gen. Labidocera Lubbock 1853.

Female; The head is separated from the 1st thoracic segment, and with or without lateral hooks. The 2 last thoracic segments are fused. The lateral angles of the last thoracic segment usually are pointed.

The abdomen has 2 or 3 segments. The abdomen and the furca sometimes are asymmetrical. There is a pair of dorsal cuticular lenses on the head.

The anterior antennae have 23 segments. The first 4 pairs of feet have 3-segmented exopodites, and 2-segmented endopodites. The 5th pair of feet is symmetrical. Each foot is biramous. The rami of foot are 1-segmented.

Male; The abdomen consists of 4 or 5 segments. The furca is symmetrical. The right anterior antenna are modified into the grasping organ. The middle section is swelled. The terminal section consists of 4 segments.

The 5th pair of feet is asymmetrical. The right foot is composed of a grasping organ. The exopodite makes a forceps.

Key to the species.

Female;

- | | | | |
|-----|---|---|----------------------|
| (0) | { | Forehead with a curved hook..... | <i>L. acuta</i> |
| | | Forehead without curved hook..... | (1) |
| (1) | { | Head without lateral hooks..... | (2) |
| | | Head with lateral hooks..... | (4) |
| (2) | { | Abdomen with 3 segments..... | (3) |
| | | Abdomen with 2 segments..... | <i>L. pavo</i> |
| (3) | { | Furca is nearly symmetrical; the 2nd terminal seta is slightly longer than the other setae..... | <i>L. detruicata</i> |
| | | Furca is asymmetrical; the 2nd terminal seta is twice as long as the 3rd..... | <i>L. euchaeta</i> |
| (4) | { | Exopodite of the 5th foot without outer marginal spines..... | <i>L. kröyeri</i> |
| | | Exopodite of the 5th foot with outer marginal spines..... | (5) |
| (5) | { | 2nd abdominal segment with a process on the right side..... | <i>L. bipinnata</i> |
| | | 2nd abdominal segment without process..... | <i>L. japonica</i> |

Male;

- (0) {Forehead with a median hook. *L. acuta*
 {Forehead without median hook..... (1)
- (1) {Head without lateral hooks. (2)
 {Head with lateral hooks..... (4)
- (2) {Lateral angles of the last thoracic segment are rounded..... *L. detruncata*
 {Lateral angles of the last thoracic segment are pointed..... (3)
- (3) {Lateral angles of the last thoracic segment are symmetrical..... *L. pavo*
 {Lateral angles of the last thoracic segment are asymmetrical..... *L. rotunda*
- (4) {Right side lateral angle of the last thoracic segment is bifurcate..... (5)
 {Right lateral angle of the last thoracic segment is not bifurcated. *L. japonica*
- (5) {Succeeding segment of the knee-like articulation of the grasping antenna is shorter
 than 3 times as long as the next segment..... *L. bipinnata*
 {The same segment is about 4 times as long as the next segment..... *L. kröyeri*

Labidocera acuta (Dana) 1849.**Pl. 41, figs. 1-5.**

Pontellina acuta, Dana, 1852, p. 1150, Pl. 80.

Pontella acuta, Brady, 1883, p. 89, Pl. XXXVI, figs. 1-12.

Labidocera acutum, Giesbrecht, 1892, p. 445, Taf. 23, f. 15, 44, 46; Taf. 25, f. 31, 33; Taf. 41, f. 10, 19, 20, 28, 29, 40.

Labidocera acuta, Scott T. 1894, p. 85.

„ , Giesbrecht u. Schmeil, 1898, p. 134.

„ , Bremen, 1906, p. 150, fig. 186 a-f.

„ , Scott A. 1909, p. 146.

„ , Mori, 1929, p. 176, Pl. VI, figs. 24-26; Pl. VII, figs. 5-10.

Female; *L. acuta* can readily be recognised by the presence of a median crest, and a hook on the forehead.

The head has no lateral hooks. The lateral angles of the last thoracic segment are sharply pointed. The abdomen consists of 3 segments. The genital segment has a spine on the distal portion of the right side. The furca is symmetrical.

The 5th pair of feet is symmetrical. The exopodite with 3 outer marginal spines, and terminates into 3 spines.

Male; The lateral angles of the last thoracic segment is asymmetrical. The abdomen consists of 5 segments. The 1st abdominal segment has a spine on the right side. The furca is slightly asymmetrical. The right anterior antenna is modified into a grasping organ.

The 5th pair of feet is asymmetrical. The right foot makes a grasping organ. The 1st segment of exopodite has a blunt large tooth on the outer margin. The outer margin of the 2nd segment of exopodite is smooth.

Length; Female about 3.2 mm, male about 3.0 mm.

Distribution; This species is distributed in the Pacific, Atlantic and Indian Oceans,

and also in the Red Sea. Near Japan, this species appears to be in the warm currents—the Kuroshio and the Tsushima current. I have taken at the St. 20, 22, 47, 49, 55–57, 59–61, 64, 65, 69, 83, 84.

Labidocera pavo Giesbrecht 1889.

Pl. 41, figs. 6–12.

- L. pavo* (female only), Giesbrecht, 1892, p. 446, Taf. 25, f. 34; Taf. 41, f. 18, 38.
 „ (female), Giesbrecht u. Schmeil, 1898, p. 138.
 „ (male), Mori, 1932, p. 171 and 175, Pl. IV, figs. 1–6.

Female; The head has no lateral hooks. The lateral angles of the last thoracic segment are pointed and symmetrical. The abdomen is 2-segmented. The right side of the genital segment has a process which with a spine on the apex. The 2nd segment of the abdomen is very short. The furca is nearly symmetrical; the furcal style is broad.

The 5th pair of feet is symmetrical. The exopodite has 2 outer marginal spines, and terminates into 3 spines. The endopodite is short and spine-like.

Male; The lateral angles of the last thoracic segment are symmetrical. The abdomen consists of 5 segments. The abdomen and the furca are symmetrical. The right anterior antenna is modified into the grasping organ. The succeeding segment of the knee-like articulation is slightly longer than the next segment.

The 5th pair of feet is asymmetrical. The right foot consists of a forceps. The middle portion of the outer margin of the 1st segment of exopodite is smooth.

Length; Female about 2.25 mm, male about 1.94 mm.

Distribution; The female of this species has been recorded from the Red Sea, by Giesbrecht. I described the male from the East China Sea, in 1932. I have also found a female in the samples which are collected by Yamada, a friend of mine, in the Yellow Sea near the Korea Strait. St. 32 one female and one male.

Labidocera detruncata (Dana) 1849.

Pl. 42, figs. 1–6.

Pontellina detruncata, Dana, 1852, p. 1143, Pl. 80.

Pontella detruncata, Brady, 1883, p. 90, Pl. XXVI, figs. 8–15; XLV, fig. 20.

Labidocera detruncata, Giesbrecht, 1892, p. 445, Taf. 23, f. 14, 34; Taf. 25, f. 28; Taf. 41, f. 9, 30, 31.

„ „ „ Giesbrecht u. Schmeil, 1898, p. 135.

„ „ „ Scott A. 1909, p. 165.

Female; The forehead is round. The head has no lateral hooks. The lateral angles of the last thoracic segment are pointed, and somewhat asymmetrical. The abdomen consists of 3 segments. The furca is symmetrical. Each style is broad.

The 5th pair of feet is symmetrical. The exopodite has 3 outer marginal spine, and terminates into bifurcate end.

Male; The lateral angles of the last thoracic segment are rounded. The abdomen

consists of 5 segments. The right anterior antenna makes a grasping organ. The succeeding segment of the knee-like articulation is more than 3 times as long as the next segment.

The 5th pair of feet is asymmetrical. The right foot is composed of a forceps. The thumb is short. The outer margin of the 1st segment of exopodite is smooth. The terminal claw is nearly as long as the preceding segment.

Length; Female 2.5 mm, male 2.2 mm.

Distribution; This species has been recorded from the Pacific and Indian Oceans. Near Japan, this species appears to be in the warm currents. I have taken at the following Stations. St. 36, 38, 42, 49-51, 117, 118.

Labidocera kröyeri (Brady) 1883.

Pl. 42, figs. 7-10.

Pontella kröyeri, Brady, 1883, p. 93, Pl. XXXIX, figs. 1-19.

Labidocera kröyeri, Giesbrecht, 1892, p. 446, Taf. 23, f. 13, 38; Taf. 25, f. 30; Taf. 41, f. 6, 11, 39.

„, Giesbrecht u. Schmeil, 1898, p. 135.

„, Breemen, 1906, p. 151.

„, Scott A. 1909, p. 165.

Male; The head has the lateral hooks. The lateral angles of the last thoracic segment are asymmetrical. The left side is one pointed, but the right is bifurcate. The abdomen has 5 segments. The genital segment is swelled at the left side.

The right anterior antenna are modified into the grasping organ. The succeeding segment of the knee-like articulation is nearly 4 times as long as the next segment.

The right 5th foot consists of a forceps. The thumb is curved. The middle portion of the external margin of the 1st segment of exopodite has 2 process.

Length; Male 2.14 mm, a specimen of mine.

Distribution; *L. kröyeri* has been recorded from the Pacific Ocean, near Philippin, and off Hongkong. I have taken a male only at the St. No. 81, in the Ki-Channel.

Labidocera euchaeta Giesbrecht, 1889.

Pl. 42, figs. 11-13.

L. euchaeta, Giesbrecht, 1892, p. 446, Taf. 23, f. 31; Taf. 41, f. 7, 36.

„, Giesbrecht u. Schmeil, 1898, p. 135.

Female; The head without lateral hooks. The lateral angles of the last thoracic segment are pointed. The abdomen consists of 3 segments. The furca is asymmetrical. The right side furcal style is oval in form. The 2nd terminal seta of the furca is about twice as long as the posterior division of body.

The anterior antennae, when reflexed, reach to the end of the 2nd abdominal segment. The rami of the 2nd antenna are about equal in length.

The exopodites of the 5th pair of feet have 3 outer marginal spines, and terminates

into a spine. The endopodites are rudimentary or absent.

Length; Female 2.0-2.4 mm.

Distribution; *L. euchaeta* has been recorded from the Formosan Strait. I have found the female only in the Plankton samples which are taken by Yamada, in the Yellow Sea.

Labidocera japonica Mori 1935.

Pl. 43, figs. 9-12; Pl. 44, figs. 1-2.

L. japonica, Mori, 1935, p. 103 and 105, Pl. I, figs. 1-11.

Female; The head has the lateral hooks. The rostrum is symmetrical. The last thoracic segment is symmetrical; the posterior angles are produced into pointed projections. The abdomen consists of 3 segments. The genital segment is swelled at the right side. The anal segment is very short, and fused with the furca. The furca is symmetrical.

The 5th pair of feet is nearly symmetrical. The exopodite is curved and furnished with 3 outer marginal spines; the apex terminates into a simple spine. The apex of the endopodite is furnished with many spinules.

Male; The lateral angles of the last thoracic segment are pointed, and asymmetrical. The right angle is longer than the left. The abdomen has 5 segments. The 1st abdominal segment has a spine on the right ventral side.

The grasping antenna resembles that of *L. minuta*, but the spine on the 22nd segment is more slender than that of the latter.

The 5th pair of feet is asymmetrical. The terminal segment of the left foot has 3 spines and 2 setae. The thumb and terminal claw of the forceps are relatively slender. The 1st segment of exopodite of the right foot has a broad tooth-like process on the external margin.

Length; Female about 1.93 mm, male about 1.86 mm.

Distribution; This species has been taken off the Cape Kinkazan, by the author. And also in the Japan Sea, by Yamada. St. 85, 93-96.

Labidocera bipinnata Tanaka 1936.

Pl. 43, figs. 1-8.

L. bipinnata, Tanaka, 1936, p. 31, Pl. II, figs. 1-10; Pl. III, figs. 1-7.

Female; The head has the lateral hooks, but has neither crest nor median hook. The rostrum is symmetrical. The lateral angles of the last thoracic segment are pointed.

The abdomen is asymmetrical. The genital segment are produced into process on the right side, and has 2 spine-like projections on the ventral side. The 2nd abdominal segment has a large pointed projection on the right side. The anal segment is short. The furca is asymmetrical. The left furcal style has a blunt process on the inner margin.

The 5th pair of feet is symmetrical. The exopodite of the fully matured individual has 2 outer marginal spines, and terminates into the trifurcate end; often has 2 spines on the middle portion of the inner margin. The endopodite is furnished with many spinules

on the terminal and external margins.

Male; The lateral angles of the last thoracic segment are pointed and asymmetrical. The right side is bifurcate. The abdomen consists of 5 segments. The genital segment has a spine on the ventral side.

The succeeding segment of the knee-like articulation of the grasping antenna is nearly as long as the next segment.

The 5th pair of feet is asymmetrical. The thumb of the forceps is curved and pointed. The outer margin of the 1st segment of exopodite of the right foot is nearly straight, and has a small blunt tooth.

Length; Female about 2.25 mm, male about 2.0 mm.

Locality; I have found this species, in the Plankton samples which were taken by Yamada, Lat. 34°18' N, Long. 126°25' E in the Yellow Sea, on the 2nd Aug. 1935.

Labidocera rotunda Mori 1929.

L. rotunda, Mori, 1929, p. 177 and 209, Pl. X, figs. 1-8.

Male; The head has neither crest nor median hook and lateral hooks. The lateral angles of the last thoracic segment are pointed and asymmetrical. The right side is bifurcate, but the left terminates into the simple end. The genital segment has a dilatation on the right side.

The immediately following segment of the knee-like articulation of the grasping antenna is longer than 2 times as long as the following one.

The right 5th foot is composed of a forceps. The outer margin of the 1st segment of exopodite has a blunt tooth and a spine. The terminal claw has 2 spines on the outer margin, and terminates into bifurcate end.

Female; Anknow.

Length; 1.8 mm.

Locality; St. 10 and 11, only 1 male respectively.

Gen. Pontella Dana 1846.

Female; The head with lateral hooks, and separated from the 1st thoracic segment. There are one pair of dorsal cuticular lenses, a single rostral lens and a ventral eye on the head. The last 2 thoracic segments are separated. The lateral angles of the last thoracic segment are pointed. The abdomen consists of 2 or 3 segments, and are usually asymmetrical.

The anterior antennae consist of 24 segments. The endopodite of the 2nd antenna is longer than the exopodite. The masticatory edge of the mandible has 7 teeth.

The exopodites of the first 4 pairs of feet are 3-segmented; the endopodites of the 1st pair are 3-segmented, of the 2nd, 3rd and 4th pairs are 2-segmented.

The 5th pair of feet is biramous. The rami of each foot are 1-segmented.

Male; The abdomen consists of 4 or 5 segments. The right anterior antenna is modified into a grasping organ. The middle section usually is largely swelled.

The 5th pair of feet is uniramous, and asymmetrical. The right foot makes a forceps.

Pontella spinicauda sp. nov.

Pl. 44, figs. 3-11.

Female; The lateral angles of the last thoracic segment are produced into the wing-like, pointed projections. The abdomen has 3 segments, and is asymmetrical. Both side of the genital segment, and the right side of the following segment are furnished with many spines. The anal segment is very short. The furca is symmetrical.

The 5th pair of feet is somewhat asymmetrical. The exopodite has 2 outer marginal spines; the terminal portion is furnished with 4 spines.

Male; The abdomen consists of 5 segments. The right 1st antenna is composed of a grasping organ. The middle section is largely swelled. The anterior margin of 2 preceding segments of the knee-like articulation are denticulated. The anterior margin of the immediately following segment of the knee-like articulation is waved, and finely denticulated.

The 5th pair of feet is peculiar; each foot consists of 4 segments. The last segment of the left foot has 3 appendages on the apex, a stout seta on the outer margin, and a seta on the posterior side.

The right foot consists of a forceps. The terminal claw is bent, and has a small process. The outer margin of the 1st segment of exopodite has a long process on the adjacent portion of the terminal claw.

Length; Female about 4.5 mm, male about 4.2 mm.

Locality; 4 mature females, 3 mature and 2 immature males of this species were taken by Yamada, Lat. 34°18' N, Long. 126°25' E, in the Saishu-Strait near the Yellow Sea, on the 2nd Aug. 1935.

Pontella longipedata Sato 1913.

Pl. 45, figs. 1-4.

P. longipedata, Sato, 1913, p. 41, Pl. VII, figs. 110-112; Pl. VIII, figs. 113-117.

Male; The lateral angles of the last thoracic segment are asymmetrical. The right side is more produced than the left. The abdomen consists of 5 segments. The distal portion of the right side of the genital segment are produced into a process.

The right anterior antenna is modified into the grasping organ, of which the middle section is fusi-form.

The 5th pair of feet is elongated. The right foot is 5-segmented. The left is 4-segmented. The terminal 2 segments of exopodite of the right foot consists of a forceps, that is oval in form. The thumb is short and stout. The terminal claw is also short, and has 2 spines on it.

Length; Male about 3.25 mm.

Distribution; This species has been recorded that it is in the cold waters near Hokkaido. I have taken a male only, at the St. No. 140.

Gen. *Pontellopsis* Brady 1883.

Pontellopsis, Brady, 1883, p. 85.

Female; The head without lateral hooks, and is separated from the 1st thoracic segment. The head has a ventral eye; but the dorsal and rostral lenses are absent. The 5th thoracic segment is fused with the 4th one. The abdomen usually is asymmetrical, and consists of 1 or 2 segments.

The anterior antennae are 16-segmented. The endopodite of the 2nd antenna is longer than the exopodite. The feet are resemble those of *Pontella*.

Male; The lateral angles of the last thoracic segment are asymmetrical. The abdomen is usually asymmetrical, and consists of 5 segments. The right anterior antenna is modified into grasping organ, of which the terminal section is 2-segmented.

The 5th pair of feet is asymmetrical. The right foot makes a forceps.

Pontellopsis armata (Giesbrecht) 1889.

Pl. 45, figs. 5-8.

Monops armatus, Giesbrecht, 1892, p. 487, Taf. 26, f. 19, 26, 27; Taf. 41, f. 46, 47, 58.

Pontellopsis armata, Giesbrecht u. Schmeil, 1898, p. 148.

„ „, Scott A. 1909, p. 170.

Male; The ventral eye is flat. The lateral angles of the last thoracic segment are asymmetrical. The left side is produced into the the pointed, straight process. The right side is produced into the pointed, curved projection which is longer than the left.

The abdomen consists of 5 segments. The genital segment has a spine on the right side. The right side of the 3rd abdominal segment is produced into a prominent protuberance which with the spinules.

The right anterior antenna consists of a grasping organ. The endopodite of the posterior antenna is much longer than the exopodite.

The 5th pair of feet is asymmetrical. The right foot makes a forceps. The 2nd segment of basipodite has 2 spines on the middle portion of the outer margin. The terminal claw is much longer than the thumb, and furnished with the marginal membrane.

Length; Male about 2 mm.

Distribution; *P. armata* has been recorded from the tropical zone of the Pacific and Indian Oceans. I have taken 1 male and 2 immature females at the St. No. 29, in the East China Sea.

Pontellopsis perspicax (Dana) 1849.

Pl. 45, fig. 9; Pl. 46, figs. 1-5.

Pontellina perspicax, Dana, 1852, p. 1155, Pl. 81.

Monops perspicax, Giesbrecht, 1892, p. 486, Taf. 26, f. 15, 30; Taf. 41, f. 44, 49, 55, 59.

Pontellopsis perspicax, Giesbrecht u. Schmeil, 1898, p. 147.

Pontellopsis perspicax, Scott A. 1909, p. 171.

Female; The ventral lens is produced into the ball-like knob, between the rostral filaments. The lateral angles of the last thoracic segment are pointed and nearly symmetrical.

The abdomen consists of 2 segments. The anal segment is short and has a flap on the posterior end. The furca is nearly symmetrical.

The 5th pair of feet is symmetrical. The endopodite is 1-segmented, and terminates into bifurcate end. The exopodite is about 4 times as long as the endopodite, and has 4 outer marginal and 1 inner marginal spines.

Length; Female 3.7 mm.

Distribution; This species has been recorded from the tropical zone of the Atlantic and Indian Oceans. I have found a female of this species in the Plankton samples which has been taken by Yamada, in the Saishu-Strait, near the Yellow Sea.

***Pontellopsis tenuicauda* (Giesbrecht) 1889.**

Pl. 46, figs. 6-12.

Monops tenuicauda, Giesbrecht, 1892, p. 487, Taf. 26, f. 31; Taf. 41, f. 43, 61.

Pontellopsis tenuicauda, Giesbrecht u. Schmeil, 1898, p. 148.

Female; The lateral angles of the last thoracic segment are produced into the bluntly rounded processes which are symmetrical. The abdomen consists of 2 segments. The genital segment has a small, and a large spines on the right side. The anal segment has a flap on the posterior end. The furca is symmetrical.

The 5th pair of feet is asymmetrical. The endopodites are 1-segmented, and terminate into the bifurcate end. The left exopodite without inner marginal spine, but the right exopodite has a very large inner marginal spine.

Male; The lateral angles of the last thoracic segment are asymmetrical. The left side resembles that of the female. The right side is produced into a long vermi-form process.

The abdomen consists of 5 segments. The 1st segment has a spine on the right side; the 2nd and 3rd segments have a knob on the right side.

The right anterior antenna is modified into the grasping organ. The middle section is swelled.

The 5th pair of feet is asymmetrical. The right foot consists of a forceps. The thumb reaches to the end of the terminal claw, and has a long seta on the base. The terminal claw has a blunt tooth which with a seta, on the outer margin.

Length; Female 1.55-2.1 mm, male about 1.65 mm.

Distribution; Only the female of this species has been recorded from the Formosan Strait, near Amoy, by Giesbrecht. I have found this species in the Plankton samples which has been taken in the Saishu Strait, near the Yellow Sea, by Yamada.

***Pontellopsis yamadae* sp. nov.**

Pl. 47, figs. 1-6; Pl. 48, fig. 13.

Female; Allied to *P. regalis*, but the lateral angles of the last thoracic segment are

rounded.

The ventral lens is flat. The lateral angles of the last thoracic segment are produced into the bluntly rounded process. The abdomen consists of 2 segments. The genital segment is somewhat asymmetrical, and furnished with a pair of small spines on the proximal sides, and a pair of stout spines on the distal portion of the dorsal surface. The anal segment is short, and has a flap on the posterior end. The furca is nearly symmetrical.

The 5th pair of feet often is asymmetrical in the fully matured individual. The endopodites are 1-segmented, and terminate into the bifurcate end. The exopodites have 4 outer marginal spines. The right exopodite has a stout inner marginal spine; but the left side often has 2 inner marginal spines.

Male; Allied to *P. regalis*, but the left angle of the last thoracic segment is round. The process of the right angle not reaches to the end of the anal segment.

The abdomen consists of 5 segments. The 1st segment has a spine on the right side. The 2nd and 3rd segments have a knob on the right side.

The right anterior antenna is modified into the grasping organ. The middle section is swelled. The terminal section consists of 2 segments.

The 5th pair of feet resembles that of *P. regalis*. The thumb is nearly as long as the terminal claw.

Length; Female about 2.8 mm, male about 2.5 mm.

Locality; 4 females and 1 male were taken by Yamada, on the 2nd Aug. 1935, Lat. 34°18' N, Long. 126°25' E, in the Saishu Strait, near the Yellow Sea.

Gen. *Pontellina* Dana 1852.

Pontellina, Dana, 1852, p. 1046.

Female; The head is separated from the thorax. The ventral lens is very flat. The last 2 thoracic segments are fused. The lateral angles of the last thoracic segment are pointed, and symmetrical. The abdomen consists of 2 segments. The left furcal style is separated from the anal segment; but the right style is fused with the anal segment.

The endopodite of the 2nd antenna is longer than the exopodite. The exopodites of the first 4 pairs of feet are 3-segmented. The endopodites of the 1st pair of feet are 3-segmented; of the 2nd, 3rd and 4th pairs are 2-segmented.

The 5th pair of feet is symmetrical. The rami of foot are 1-segmented. The endopodite terminates into the bifurcate end.

Male; The lateral angles of the last thoracic segment are rounded, often are furnished with a spinule in fully matured individuals. The abdomen consists of 5 segments, and is nearly symmetrical.

The right anterior antenna is modified into a grasping organ, that resembles of *Pontellopsis*.

The 5th pair of feet resembles that of *Pontellopsis*. There are many variations of that feet, according to the individuals, and the stages of maturity.

Pontellina plumata (Dana) 1849.
Pl. 47, figs. 7-11; Pl. 48, figs. 1-12.

Pontellina plumata, Dana, 1852, p. 1136, Pl. 79.

Pontellina turgida, Dana, 1852, p. 1136, Pl. 79.

Calanops messinensis, Claus, 1863, p. 212, Taf. II, fig. 11; Taf. XXXVI, f. 13-16;
 Taf. XXXVII, f. 10.

Pontella plumata, Brady, 1883, p. 92, Pl. XXXVII, figs. 1-11.

Pontellina plumata, Giesbrecht, 1892, p. 497, Taf. 4, f. 11; Taf. 25, f. 4, 18, 26, 36;
 Taf. 40, f. 49-53.

„, Scott T. 1894, p. 88.

„, Giesbrecht u. Schmeil, 1898, p. 149.

„, Scott A. 1909, p. 175.

Pontellopsis aequalis, (male only), Mori, 1932, p. 172, Pl. IV, figs. 7-13.

Pontellina plumata, Wilson, 1932, p. 156, fig. 106 a-c.

Characters are identical with the general descriptions. The shape of the 5th pair of feet of fully matured male is shown in Pl. 48, fig. 11. Many author's figures of that feet show only the cases of the individuals which are not yet fully matured.

Length; Female 1.6-1.75 mm, male 1.5-1.65 mm.

Distribution; This species appears to be commonly distributed in the warm regions of the great oceans. I have taken at the following Stations.

St. 29, 47, 67, 76, 83, 84, 109, 110, 115.

Gen. Acartia Dana 1846.

Female; The head without lateral hooks, and separated from the 1st thoracic segment. The last 2 thoracic segments are fused. The lateral angles of the last thoracic segment are symmetrical. The abdomen consists of 3 segments.

The endopodite of the 2nd antenna is longer than the exopodite. The proximal segment of the endopodite is fused with the 2nd segment of basipodite. The masticatory edge of the mandible has 7 teeth. The posterior maxillipede has 3 inner marginal setae on the 3rd segment, 1 inner marginal seta on the 2nd segment.

The exopodites of the first 4 pairs of feet are 3-segmented. The endopodites of the first 4 pairs of feet are 2-segmented.

The 5th pair of feet is symmetrical. Each foot is uniramous, and consists of 2 or 3 segments. The terminal segment (exopodite) is claw-like. The distal portion of the outer margin of the basipodite has a long seta.

Male; The abdomen consists of 5 segments. The 4th segment is very short. The right anterior antenna consists of a grasping organ.

The 5th pair of feet is asymmetrical, and is modified into the grasping organ. Both feet are uniramous. The right foot consists of 4 segments. The left consists of 3 segments.

Key to the species.

Female;

- (0) { Lateral angles of the last thoracic segment are rounded, often with spinules. ... (1)
 { Lateral angles of the last thoracic segment are pointed. (4)
- (1) { Genital segment is as long as the 2nd segment which is longer than 4 times as
 { long as the anal segment. *A. negligens*
 { Genital segment is longer than 2 following segments together. (2)
- (2) { Rostral filaments are present. *A. hamata*
 { Rostral filaments are absent. (3)
- (3) { Claw-like end segment of the 5th foot is gradually curved, and shorter than
 { the marginal seta. *A. clausi*
 { Claw-like end segment of the 5th foot is bent at the middle portion, and longer
 { than the marginal seta. *A. longiremis*
- (4) { Terminal segment of the 5th foot with spinules. *A. danae*
 { Terminal segment of the 5th foot without spinules. (5)
- (5) { 2 spines of the dorsal surface of genital segment are larger than those of the
 { 2nd segment. *A. erythraea*
 { 2 spines of the genital segment are smaller than those of the 2nd segment.
 { *A. spinicauda*

Acartia negligens* Dana 1849.*Pl. 49, figs. 1-4.**

A. negligens, Giesbrecht, 1892, p. 508, Taf. 30, f. 22; Taf. 43, f. 18.

„ , Giesbrecht u. Schmeil, 1898, p. 154.

„ , Pesta, 1908, p. 27.

„ , Scott A. 1909, p. 188.

„ , Pesta, 1911, p. 26, Taf. II, fig. 4-6.

„ , Sars, 1925, p. 362.

Female; The rostral filaments are present. The lateral angles of the last thoracic segment are rounded, and furnished with a spinule. The genital segment is about as long as the following segment which is more than 4 times as long as the anal segment. The first 2 abdominal segments have many spinules on the distal margin of the dorsal surface. The anterior antennae, when reflexed, reach to the end of the furca.

The terminal segment of the 5th foot is furnished with the spinules. The marginal seta is nearly 5 times as long as the terminal segment.

Male; The abdomen with 5 segments. The furcal style is as long as its width. The anterior antennae, when reflexed, extend beyond the end of the 2nd thoracic segment.

The 5th pair of feet is asymmetrical. The right foot consists of 4 segments. The 2nd segment has a pointed process on the proximal, a spine and a blunt process on the distal portion of the inner margin.

Length; Female about 1.1 mm, male about 0.9 mm.

Distribution; This species has been recorded from the Mediterranean, Arabian and Red Seas, and also from the Pacific and Indian Oceans. I have taken at the following Stations. St. No. 25-28, 31, 34, 38-41, 47, 70, 109-119.

Acartia danae Giesbrecht 1889.

Pl. 49, figs. 5-15.

- A. danae*, Giesbrecht, 1892, p. 508, Taf. 30, f. 1, 23; Taf. 43, f. 8.
 „ , Giesbrecht u. Schmeil, 1898, p. 154.
 „ , Bremen, 1906, p. 195, fig. 176 a-b.
 „ , Scott A. 1909, p. 187.
 „ , Sato, 1913, p. 46, Pl. VIII, figs. 126-127.
 „ , Sars, 1925, p. 362.
 „ , Wilson, 1932, p. 160, fig. 108 a-b.

Female; The lateral angles of the last thoracic segment are sharply pointed. The first 2 abdominal segments have the spinules on the distal margin of the dorsal surface. The anterior antenna has a spine on the 1st segment. The 5th pair of feet resembles that of *A. negligens*.

Male; The male of this species has been reported that it is discovered by Steuer, but not yet described.

Length; Female about 1.16 mm.

Distribution; *A. danae* has been recorded from the Pacific and Atlantic Oceans, and also from the Mediterranean Sea. I have taken at the following Stations. St. 45, 70, 76, 78, 80, 86.

Acartia erythraea Giesbrecht 1889.

Pl. 50, figs. 1-4.

- A. erythraea*, Giesbrecht, 1892, p. 508, Taf. 30, f. 5, 19, 32; Taf. 43, f. 12, 13.
 „ , Giesbrecht u. Schmeil, 1898, p. 155.
 „ , Scott A. 1909, p. 187.

Female; The rostral filaments are very stout. The lateral angles of the last thoracic segment are produced into the pointed processes, and with an accessory spine. The genital segment is twice as long as the following segment, and has 2 dorsal spines which are longer than those of the latter. The furcal style is hairy, and about as long as its width.

The anterior antennae reach to the end of the furca, and have the spines on the proximal segments.

The middle segment of the 5th foot is longer than 2 times as long as its width. The terminal claw is curved.

Length; Female about 1.4 mm.

Distribution; This species has been recorded from the Red Sea, the Pacific and Indian Oceans. I have taken the females only, at the Station No. 45.

Acartia spinicauda Giesbrecht 1889.**Pl. 50, figs. 5-7.**

A. spinicauda, Giesbrecht, 1892, p. 508, Taf. 30, f. 16, 21, 35; Taf. 43, f. 4, 11.

„ , Giesbrecht u. Schmeil, 1898, p. 155.

„ , Scott A. 1909, p. 188.

Female; The rostral filaments are present. The lateral angles of the last thoracic segment are produced into the pointed processes. The genital segment with 2 spines which are smaller than those of the following segment. The furcal style is about 3 times as long as its width.

The anterior antennae have the spinules on the proximal segments. The terminal segment of the 5th foot is filamentous, and swelled at the base.

Length; Female about 1.25 mm.

Distribution; *A. spinicauda* has been recorded from the Chinese Coast, the Arabian Sea, and the Malay Archipelago. I have taken the females only, at the following Stations. St. 81-83.

Acartia clausi Giesbrecht 1889.**Pl. 50, figs. 8-13.**

Dias longiremis, Claus, 1863, p. 193, Taf. XXXIII.

A. clausi, Giesbrecht, 1892, p. 507, Taf. 30, f. 2, 4, 13-15, 17, 28, 36, 37; Taf. 42, f. 32; Taf. 43, f. 3, 5, 14.

„ , Giesbrecht u. Schmeil, 1898, p. 152, fig. 30, 31.

„ , Sars, 1903, p. 150, Pl. CI,

„ , Sars, 1925, p. 361.

„ , Wilson, 1932, p. 146, fig. 112 a-c.

Female; The rostral filaments are absent. The lateral angles of the last thoracic segment are round. The abdominal segments have the fine spinules on the posterior margins. The anterior antennae have no spines on the proximal segments, and extend about the end of the genital segment.

The middle segment of the 5th foot is nearly as long as its width. The claw-like terminal segment is stout. The marginal seta is much longer than the terminal segment.

Male; The 5th pair of feet is asymmetrical. The right foot consists of 4 segments. The inner margin of the 2nd segment has a blunt process on the distal portion. The 3rd segment also has a blunt process on the inner margin. The left foot consists of 3 segments. The terminal segment has a vermi-form appendage and a spine.

Length; Female 1.17-1.22 mm, male 1-1.07 mm.

Distribution; This species has been recorded from the Pacific and Atlantic Oceans, and also from the Mediterranean Sea. Near Japan, this species appears to be near Hokkaido, and in the Japan Sea and the Korea Strait, near Korea. I have taken at the following Stations. St. 85, 86, 93-96, 98, 106, 122-124, 136.

Acartia longiremis Lilljeborg 1853.**Pl. 51, figs. 6-10.**

- A. longiremis*, Giesbrecht, 1892, p. 507, Taf. 43, f. 17, 25.
 " , Giesbrecht u. Schmeil, 1898, p. 153.
 " , Sars, 1903, p. 149, Pls. XCIX and C.
 " , Sato, 1913, p. 45, Pl. VIII, figs. 122-123; Pl. VII, figs. 124-125.
 " , Sars, 1925, p. 361.
 " , Wilson, 1932, p. 165, fig. 113 a-c.

Female; The rostral filaments are absent. The lateral angles of the last thoracic segment are rounded, and furnished with a slender spine. The posterior margins of the abdominal segments are furnished with fine spinules. The furcal style is nearly 3 times as long as its width. The anterior antennae have no spines on the proximal segments, and extend beyond the end of the anterior division of body.

The middle segment of the 5th foot is straight. The terminal segment is curved at the middle portion, and longer than the marginal seta.

Male; The 5th pair of feet is asymmetrical. The left foot consists of 3 segments. The inner margin of the 1st segment is straight. The terminal segment has a vermi-form appendage and a slender spine.

The right foot consists of 4 segments. The 3rd segment has a large dilatation on the inner margin. The apical spine of the terminal segment is more slender than that of *A. clausi*.

Length; Female 0.95-1.33 mm, male 0.9-1.1 mm.

Distribution; This species has been recorded from the Pacific and Atlantic Oceans. And also from the Red Sea, and the Mediterranean Sea. I have found this species at the St. 140, near Hokkaido.

Acartia hamata sp. nov.**Pl. 51, figs. 1-5.**

Female; The rostral filaments are present. The lateral angles of the last thoracic segment are rounded, and furnished with fine spinules. The genital segment is as long as the combined length of the 2 following segments. The furcal style is slightly longer than its width. The furcal setae are equal in these thickness. The anterior antennae have no spines on the proximal segments.

The 5th pair of feet is symmetrical. The claw-like terminal segment without spinules, is stout and curved gradually. The middle segment is nearly as long as its width. The marginal seta is about $2\frac{1}{2}$ times as long as the terminal claw.

Length; Female about 1.06 mm.

Locality; 6 females of this species has been obtained at the Station No. 26, in the East China Sea, near Amamioshima.

Gen. *Tortanus* Giesbrecht u. Schmeil 1898.

Tortanus, Giesbrecht u. Schmeil, 1898, p. 157.

The head is separated from the 1st thoracic segment, and processes an eye. The lateral hooks and the cuticular lenses are absent. The last 2 thoracic segments are fused or separated. The abdomen consists of 2 or 3 segments in the female, 5 segments in the male.

The right anterior antenna of the male is modified into the grasping organ, of which the middle section is swelled. The rami of the 2nd antenna are about equal in length. The 1st segment of endopodite is fused with the basipodite. The exopodite and endopodite of the mandible are articulated to the end of the 2nd segment of basipodite which is long and straight.

The exopodites of the first 4 pairs of feet are 3-segmented; the endopodites are 2-segmented, but the 1st pair of the male often is 3-segmented.

The 5th pair of feet is uniramous in both sexes. The right foot of the male consists of a forceps.

Tortanus forcipatus (Giesbrecht) 1899.

Pl. 51, figs. 11-14.

Corynura forcipata, Giesbrecht, 1892, p. 525, Taf. 31, f. 7, 9, 10, 12, 15; Taf. 42, f. 34, 38.

Tortanus forcipatus, Giesbrecht u. Schmeil, 1898, p. 158.

„, Sato, 1913, p. 49, Pl. II, figs. 132-135.

Female; The last 2 thoracic segments usually are separated. The lateral angles of the last thoracic segment are knob-like. The abdomen is asymmetrical, and consists of 3 segments. The furca is fused with the anal segment. The masticatory edge of the mandible has 3 stout teeth.

The 5th pair of feet is asymmetrical; one side is longer than the other. Each foot is uniramous, and consists of 3 segments.

The female of this species is regarded to be distinct from *T. gracilis*, on the structure of the 5th pair of feet. But I think, there is room for doubt on this fact. For example, a specimen which I show in Pl. 51, the 5th pair of feet is asymmetrical, but the shape of the abdomen, and the size of the body rather resemble those of *T. gracilis*.

Length; Female 1.2-2.0 mm.

Distribution; This species has been recorded from the Formosan Strait, by Giesbrecht. I have taken the females at the following Stations. St. No. 81, 82, 122.

Tortanus discaudatus (Thompson and Scott) 1897.

Pl. 52, figs. 1-14.

T. discaudatus, Giesbrecht u. Schmeil, 1898, p. 158.

„, Breemen, 1906, p. 162, fig. 180 a-c.

- (4) { The furcal setae are shorter than the body. *Euterpe*
 { The furca with the 2 usually long setae those are longer than the body, and fused in the median line. *Aegisthus*
- (5) { The exopodite of the 1st foot with 1 segment. *Clytemnestra*
 { The exopodite of the 1st foot with 3 segments. (6)
- (6) { The head with a pair of lenses. (7)
 { The head without the lenses. (10)
- (7) { The endopodite of the 4th foot with 2 or 3 segments. (8)
 { The endopodite of the 4th foot is 1-jointed, or degenerated knob. (9)
- (8) { The abdomen with 4 or 5 segments. *Sapphirina*
 { The abdomen with 2 segments. *Corina*
- (9) { The lenses are situated with an interval that is at least as long as the diameter of a lens; the lateral angles of the last 2 segments of the anterior division are not produced into spine. *Copilia* ♀
 { The lenses are situated close together; the lateral angles of the last 2 segments of the anterior division are produced into spines. *Corycaeus*
- (10) { The exopodite of the 2nd antenna with 1 segment. *Aegisthus*
 { The exopodite of the 2nd antenna with 3 segments. *Microsetella*
 { The exopodite of the 2nd antenna is absent. (11)
- (11) { The furcal style is very long, and at least 10 times as long as its width; the anterior division is not distinct from the posterior one. *Copilia* ♂
 { The furcal style is shorter than 10 times of its width; the anterior division is distinct from the posterior. (12)
- (12) { The terminal segment of the posterior maxillipede with the spinous setae, is not modified into a hook. *Oithona*
 { The terminal segment of the posterior maxillipede with few or no setae, is modified into a hook. (13)
- (13) { The 5th foot consists of 1 segment, and with 2 lancet-like appendages which have the denticulated borders; the posterior division is slender. *Lubbockia*
 { The 5th foot consists of 1 or 2 segments, and with naked or plumose setae; the posterior division is relatively broad. (14)
- (14) { The 1st antenna with very long and thick sensory hairs on the terminal segments; 5th feet with 2 segments. *Ratania*
 { The 1st antenna with numerous pencillated sensory hairs on the proximal segments; the 5th feet are knob-like. *Pachysoma*
 { The 1st antenna with few and very delicate sensory hairs; the 5th feet are degenerated to a knob, or often to a setae. (15)
- (15) { The endopodites of the feet are at least as long as the exopodites. *Oncaea*
 { The endopodites of the feet are shorter than the exopodites. *Conea*

Fam. Cyclopidae Baird.

The anterior division of the body is clearly separated from the posterior. The

anterior antennae of the female do not stretch beyond the end of the body, in the male, both of them are modified to form the grasping organs. The posterior antennae without the exopodites. The 5th pair of feet is rudimentary.

Gen. *Oithona* Baird 1843.

Female; The anterior division of the body is clearly separated from the posterior. The anterior division is fusiform. The head is separated from the 1st thoracic segment. The forehead is sometimes curved ventrally. So the forehead often shows the truncate shape, when viewed from above. The rostrum terminates into simple end.

The posterior division consists of 5 segments, among which, the 2nd segment with the genital pores. The furca is symmetrical.

The anterior antennae not reach to the end of the body. The posterior antennae without the exopodites. The 2nd segment of the mandible has 1 or 2 setae on the apex, and 1 seta on the opposite side of the endopodite. The endopodite is small, often is knob-like, fused with the 2nd segment of basipodite, and furnished with 2-5 setae. The exopodite usually has 5 setae.

The rami of the first 4 pairs of feet have 3 segments. The 5th pair of feet is degenerate.

Male; The posterior division of the body consists of 6 segments. Both sides of the anterior antennae are modified to form the grasping organs.

Key to the species.

Female;

- (0) { Forehead can be seen at the dorsal view. (1)
 { Forehead is bent ventrally; that is invisible at the dorsal view. (3)
- (1) { Anterior antennae are not beyond the end of the anterior division. *O. robusta*
 { Anterior antennae extend beyond the end of the 3rd segment of the posterior
 division. (2)
- (2) { Outer marginal seta of the 2nd segment of basipodite of each foot is swelled.
 *O. setigera*
 { Outer marginal seta of the 2nd segment of basipodite of each foot is slender.
 *O. plumifera*
- (3) { Anterior antennae extend beyond the end of the 1st segment of the posterior
 division. (4)
 { Anterior antennae not reach to the end of the anterior division. (6)
- (4) { The 2nd segment of exopodite of the 1st foot without outer marginal spine....
 *O. decipiens*
 { The 2nd segment of exopodite of the 1st foot with an outer marginal spine. (5)
- (5) { The 3rd segment of exopodite of the 2nd foot with 1 outer marginal spine....
 *O. similis*
 { The 3rd segment of exopodite of the 2nd foot with 2 outer marginal spines....
 *O. fallax*

- (6) { Forehead is narrow; the 1st antennae reach to the end of the 3rd thoracic segment. *O. nana*
 { Forehead is broad; the 1st antennae hardly reach to the end of the 2nd thoracic segment, *O. rigida*

Male;

- (0) { The 3rd segment of exopodite of the 1st foot with 2 outer marginal spines.....(1)
 { The 3rd segment of exopodite of the 1st foot with 3 outer marginal spines.(2)
 (1) { The 3rd segment of exopodite of the 2nd foot with 3 outer marginal spines....
 *O. plumifera*
 { The 3rd segment of exopodite of the 2nd foot with 2 outer marginal spines....
 *O. similis*
 (2) { The truncate edge of the forehead is longer than the width of the genital segment. *O. rigida*
 { The truncate edge of the forehead is shorter than the width of the genital segment. *O. nana*

***Oithona plumifera* Baird 1843.**

Pl. 60, figs. 3-15.

- O. plumifera*, Dana, 1852, p. 1099, Pl. 76, fig. 4.
O. spinirostris, Claus, 1863, p. 105, Taf. XI, fig. 4-9.
O. plumifera, Giesbrecht, 1892, p. 537-548, Taf. 4, f. 10; Taf. 34, f. 12, 13, 22, 25, 27-29, 32, 33, 44-47; Taf. 44, f. 1, 7, 12-15.
 „ , Esterly, 1905, p. 207, fig. 50 a-d.
 „ , Breemen, 1906, p. 167, fig. 183 a-d.
 „ , Scott A. 1909, p. 194.
O. spinirostris, Sars, 1913, p. 6, Pls. I-II.
O. plumifera, Rosendorn, 1917, p. 10, fig. 1 a-d.
 „ , Mori, 1929, p. 200, Pl. VII, figs. 13-16.
 „ , Wilson, 1932, p. 311, fig. 178 a-b.
O. spinirostris, Wilson, 1932, p. 312, fig. 188 a-b.

Female; The apex of the forehead is visible at the dorsal view. The genital segment is about as long as the combined length of the 2 following segments. The furca is longer than 3 times as long as its width.

The anterior antennae, when reflexed, extend beyond the end of the 3rd segment of posterior division. The apex of the 2nd segment of basipodite of the mandible is furnished with 2 spine-like setae. The endopodite with 4 setae (Rosendorn describes the number of setae of the endopodite as 3, but the figure by Claus—Claus, 1863, Taf. XI, f. 5—shows 4 setae on the endopodite, too).

The exopodites of the first 4 pairs of feet have the outer marginal spines and the inner marginal setae on each segment, respectively as the following description.

Exop. of 1st foot; 1, 1, 2, outer; 1, 1, 4, inner.

Exop. of 2nd foot; 1, 0, 2, outer; 0, 1, 5, inner.

Exop. of 3rd foot; 1, 0, 1, outer; 0, 1, 5, inner.

Exop. of 4th foot; 0, 0, 1, outer; 0, 1, 5, inner.

The outer marginal seta of the 2nd segment of basipodite of each foot is slender.

Male; The apex of the forehead invisible at the dorsal view. The posterior division consists of 6 segments.

The genital segment is swelled. Both sides of the anterior antennae consist of the grasping organs.

The outer marginal spines of exopodites of the feet are as following descriptions.

Exop. of 1st foot; 1, 1, 2, outer.

Exop. of 2nd foot; 1, 1, 3, outer.

Exop. of 3rd foot; 1, 1, 3, outer.

Exop. of 4th foot; 1, 1, 2, outer.

Length; Female 1.0-1.4 mm, male 0.6-1.0 mm.

Distribution; *O. plumifera* is widely distributed in the Pacific, Atlantic and Indian Oceans, and also the Mediterranean Sea and the Red Sea.

I have taken at the following Stations. St. 3-5, 16-19, 23, 24-29, 31, 34, 36, 40, 45, 47, 49, 53, 76, 78, 82, 83, 85, 86, 94, 96, 97, 100, 102, 106, 107, 109-119, 125, 140.

***Oithona setigera* Dana 1849.**

Pl. 60, figs. 1-2.

Oithona challengeri, Brady, 1883, p. 79, Pl. XL, figs. 1-10.

Oithona setigera, Giesbrecht, 1892, p. 538-548, Taf. 34, f. 3, 14, 15, 41.

„, Rosendorn, 1917, p. 20, fig. 10 a-c, fig. 11 a-h.

Female; Allied to *O. plumifera*, but the outer marginal seta of the 2nd segment of basipodite of each foot is swelled at the terminal portion; especially of the 2nd and 3rd pairs of feet. The size of the body is somewhat larger than that of *O. plumifera*. The anterior antennae are relatively shorter.

The exopodites of the first 4 pairs of feet have the outer marginal spines and the inner marginal setae on each segment, respectively as the following table.

Exop. of 1st foot; 1, 1, 3, outer; 1, 1, 4, inner.

Exop. of 2nd foot; 1, 0, 2, outer; 1, 1, 5, inner.

Exop. of 3rd foot; 1, 0, 1, outer; 1, 1, 5, inner.

Exop. of 4th foot; 0, 0, 1, outer; 1, 1, 5, inner.

Length; Female about 1.6 mm.

Distribution; *O. setigera* has been recorded from the Pacific, Atlantic and Indian Oceans, and also from the Mediterranean Sea and the Red Sea. I have taken the females only, at the following Stations. St. 36, 67, 70, 80, 100, 113.

***Oithona robusta* Giesbrecht 1892.**

Pl. 61, figs. 1-8.

O. robusta, Giesbrecht, 1892, p. 538, 549, Taf. 34, f. 4, 5, 1c, 17, 23, 30, 31, 43.

O. robusta, Rosendorn, 1917, p. 29, fig. 16 a-c; fig. 17 a-e.

Female; The apex of the forehead is visible at the dorsal view. The genital segment is longer than the 2 succeeding segments together. The furcal style is about 3 times as long as its width.

The anterior antennae, when reflexed, extend beyond the end of the 3rd thoracic segment.

The apex of the mandible has 2 stout setae. The endopodite is furnished with 5 setae. The exopodite is clearly segmented, and has 5 long setae. The masticatory edge has 6 teeth.

The exopodites of the first 4 pairs of feet have the outer marginal spines and the inner marginal setae on each segment, respectively as the following table.

Exop. of 1st foot; 1, 1, 3, outer; 1, 1, 4, inner.

Exop. of 2nd foot; 1, 1, 3, outer; 1, 1, 5, inner.

Exop. of 3rd foot; 1, 1, 3, outer; 1, 1, 5, inner.

Exop. of 4th foot; 1, 1, 2, outer; 1, 1, 5, inner.

Length; Female about 1.6 mm.

Distribution; *O. robusta* has been recorded from the warm regions of the Atlantic, Pacific and Indian Oceans. I have taken the females, at the following Stations. St. 45-47, 50, 85.

***Oithona decipiens* Farran 1913.**

Pl, 61, figs. 9-14.

O. decipiens, Rosendorn, 1917, p. 26.

Female; The rostrum is bent ventrally, and invisible at the dorsal view. The genital segment is longer than the combined length of succeeding 2 segments. The anterior antennae, when reflexed, extend about the genital pores.

The mandible has 2 spine-like setae on the apex of the 2nd segment of basipodite. The endopodite has 3 setae (2 setae, by Rosendorn's description).

The exopodites of the first 4 pairs of feet have the outer marginal spines and the inner marginal setae on each segment, respectively as the following table.

Exop. of 1st foot; 1, 0, 2, outer; 0, 1, 4, inner.

Exop. of 2nd foot; 1, 1, 2, outer; 0, 1, 5, inner.

Exop. of 3rd foot; 1, 0, 1, outer; 0, 1, 5, inner.

Exop. of 4th foot; 0, 0, 1, outer; 0, 1, 5, inner.

Length; Female about 0.75 mm in figured specimen, 0.56-0.62 mm by Rosendorn's description.

Distribution; This species has been recorded from the Indian and Atlantic Oceans. I have taken a female only, at the Station No. 108.

Remarks; A specimen which I show as above, differs from the description by Rosendorn, at the size and the number of setae of the endopodite of mandible. But except those respects, characters agree with the description of *O. decipiens*. So I identify this *Oithona* as *O. decipiens*.

Oithona similis Claus 1866.**Pl. 62, figs. 1-12.**

O. helgolandica, Claus, 1863, p. 105, Taf. XI, fig. 10-12.

O. similis, Giesbrecht, 1892, p. 537-548, Taf. 34, f. 18, 19, 21, 36-39; Taf. 44, f. 3, 5, 8-11.

„ , Breemen, 1906, p. 169, f. 185 a-b.

„ , Giesbrecht, 1902, p. 28.

„ , Wolfenden, 1910, p. 363.

„ , Rosendorn, 1917, p. 24, fig. 13 a-e.

„ , Mori, 1929, p. 199, Pl. VII, fig. 19.

Female; The forehead is bent ventrally; and the rostrum is invisible at the dorsal view. The furcal style is longer than 2 times as long as its width. The 2nd furcal seta is longer than the posterior division of body.

The anterior antennae, when reflexed, reach to the genital pores. The endopodite of the mandible is knob-like, and furnished with 3 setae. The exopodite is small, and furnished with 5 setae.

The exopodites of the first 4 pairs of feet have the outer marginal spines and the inner marginal setae on each segment, respectively as the following table.

Exop. of 1st foot; 1, 1, 2, outer; 0, 1, 4, inner.

Exop. of 2nd foot; 1, 0, 1, outer; 0, 1, 5, inner.

Exop. of 3rd foot; 1, 0, 1, outer; 0, 1, 5, inner.

Exop. of 4th foot; 0, 0, 1, outer; 0, 1, 5, inner.

Male; The posterior division of the body consists of 6 segments. The furcal style is about as long as its width. Both sides of the anterior antennae are modified into the grasping organs.

The exopodites of the feet have the outer marginal spines and the inner marginal setae on each segment, respectively as the following table.

Exop. of 1st foot; 1, 1, 2, outer; 0, 1, 5, inner.

Exop. of 2nd foot; 1, 1, 2, outer; 0, 1, 5, inner.

Exop. of 3rd foot; 1, 1, 2, outer; 0, 1, 5, inner.

Exop. of 4th foot; 1, 1, 2, outer; 0, 1, 5, inner.

Length; Female about 0.8 mm, male about 0.65 mm.

Distribution; This species is widely distributed in the waters of the world, and adapted to somewhat low temperature. I have found this species, at the following Stations.

St. 1, 2, 4, 6, 8-25, 31, 35, 39, 47-49, 52, 56, 59, 60, 62, 85-88, 91-96, 98-100, 102, 104, 122-125, 126-133, 135, 136, 138-140, 142-145.

Oithona fallax Farran 1913.**Pl. 62, figs. 13-18.**

O. fallax, Rosendorn, 1917, p. 27, fig. 14 a-b; fig. 15 a-h.

Female; Allied to *O. similis*, but the 3rd segment of exopodite of the 2nd foot has 2 outer marginal spines, instead of 1 spine of *O. similis*. The 2nd furcal seta is relatively shorter than that of *O. similis*.

Length; Female about 0.86 mm.

Distribution; *O. fallax* has been recorded from the Atlantic and Indian Oceans, and also from the Red Sea. I have taken the females, at the following Stations.
St. 67, 82, 83.

***Oithona nana* Giesbrecht 1892.**

Pl. 63, figs. 1-8.

O. nana, Giesbrecht, 1892, p. 538-549, Taf. 34, f. 10, 11, 20, 24, 26, 34, 35, 42;
Taf. 44, f. 2, 4, 6; Taf. 4, f. 8.

„, Esterly, 1905, p. 209, fig. 51 a-c.

„, Breemen, 1906, p. 170, fig. 186 a-d.

„, Rosendorn, 1917, p. 40, fig. 24 a-d.

„, Mori, 1929, p. 199, Pl. VII, figs. 11-12.

Female; The apex of the forehead is curved ventrally, and invisible at the dorsal view. The truncate line of the forehead is more narrow than the width of the genital segment. The genital segment is nearly as long as the 2 following segments together.

The anterior antennae, when reflexed, reach to the end of the 3rd thoracic segment.

The apex of the 2nd segment of basipodite of the mandible is furnished with a stout, hairy seta, and a slender smooth seta. The endopodite has 4 setae. The exopodite has 5 setae.

The outer marginal spines and the inner marginal setae of each segment of the first 4 pairs of feet are shown as the following table.

Exop. of 1st foot; 1, 1, 3, outer; 1, 1, 4, inner.

Exop. of 2nd foot; 1, 1, 3, outer; 1, 1, 5, inner.

Exop. of 3rd foot; 1, 1, 3, outer; 1, 1, 5, inner.

Exop. of 4th foot; 1, 1, 2, outer; 1, 1, 5, inner.

Male; The posterior division consists of 6 segments. Both sides of the anterior antennae are modified to form the grasping organs. The mouth parts and the anterior 4 pairs of feet resemble those of the female.

Length; Female about 0.62 mm, male about 0.54 mm.

Distribution; *O. nana* has been recorded from the Atlantic, Pacific and Indian Oceans, and also from the Mediterranean Sea and the Red Sea. This species seems to be neritic. I have taken at the following Stations. St. 1, 9, 12, 15, 17, 20, 23, 24, 58, 59, 65, 85, 86, 89, 107, 125, 126.

***Oithona rigida* Giesbrecht 1898.**

Pl. 63, figs. 9-12.

O. rigida, Scott A. 1909, p. 194.

O. rigida, Rosendorn, 1917, p. 39.

Characters resemble those of *O. nana*, but the truncate line of the forehead is much wider than that of the latter. The endopodite of the mandible is furnished with 5 setae. The apex of the 2nd segment of basipodite of the mandible has 2 stout setae which with the spinules.

The anterior antennae of the female, reach to the end of the 2nd thoracic segment. The genital segment is shorter than the combined length of 2 following segments.

Length; Female about 0.76 mm, male about 0.68 mm.

Distribution; *O. rigida* has been recorded from the Indian Ocean, and also from the Red Sea.

I have taken at the following Stations. St. 69, 70, 76, 82, 83.

Fam. Harpacticidae Claus.

Harpacticidae, Claus, 1863, p. 106.

The boundary between the anterior and posterior divisions of the body is not distinct.

The anterior antennae are usually short in both sexes, both of them make the grasping organ in the male. There are the rudimentary exopodites on the 2nd antennae. The 2nd maxillipede usually terminates into a hook.

The 5th feet are rudimentary and plate-like. The heart is absent.

Gen. *Setella* Dana 1846.

Female; The body is slender. The anterior division of body consists of 4 segments. The head is fused with the 1st thoracic segment. The forehead is rounded, when viewed from the side. The rostrum is uniramous. The posterior division of the body consists of 5 segments. The furcal styles are slender, and furnished with a short, and a very long seta.

The anterior antennae have 8 segments. The posterior antenna has 2 segments; the exopodite is absent. The mandible and the maxilla have 1 segment, and have no exopodite and endopodite.

The exopodites of the feet, from the 1st to 4th pairs, are 3-segmented. The endopodites of the 1st pair of feet are 2-segmented, of the 2nd, 3rd and 4th pairs, are 3-segmented.

The 5th pair of feet is symmetrical. Each foot consists of 2 segments. The 1st segment has 4 setae on the inner corner, and a seta on the outer margin. The 2nd segment has 6 setae.

Male; The posterior division of body consists of 6 segments. Both sides of the anterior antennae are modified into the grasping organs. The knee-like articulation is between the 5th and 6th segments.

The endopodites of the 1st and 2nd pairs of feet are 2-segmented.

The 5th pair of feet is symmetrical. Each foot consists of 2 segments. The 1st segment has 2 setae on the inner corner, and a seta on the outer margin. The 2nd segment has 2 setae on the outer margin, a very long seta on the apex, and a somewhat

long, and 2 very short setae on the inner margin.

***Setella gracilis* Dana 1847.**

Pl. 64, figs. 1-5.

S. gracilis, Dana, 1852, p. 1198, Pl. 48, fig. 3 a-g.

S. messinensis, Claus, 1863, p. 137, Taf. XXI, f. 15-16.

S. gracilis, Brady, 1883, p. 108, Pl. L, figs. 1-10.

„ , Giesbrecht, 1892, p. 559, Taf. 1, f. 12; Taf. 45, f. 11-15.

„ , Scott T. 1894, p. 109.

„ , Breemen, 1906, p. 178, fig. 192 a-d.

Macrosetella gracilis, Scott A. 1909, p. 230.

S. gracilis, Mori, 1929, p. 201, Pl. VIII, figs. 8-10.

M. gracilis, Wilson, 1932, p. 281, fig. 174 a-d.

M. gracilis, Steuer, 1935, p. 393, fig. 1 c.

The only species of the Genus. Character agree with the general description.

Length; Female 1.2-1.5 mm, male 1.15-1.30 mm.

Distributio n; *S. gracilis* is widely distributed in the warm waters of the world, and recorded from the Atlantic, Pacific and Indian Oceans, and also from the Mediterranean Sea. Near Japan, this species commonly appears in the warm currents. I have taken at the following Stations.

St. 3, 21, 23, 25-27, 29-36, 38-45, 47, 48, 50, 51, 53-59, 62-64, 66, 72, 76, 78, 80-83, 85, 100, 109-119, 126.

Gen. *Microsetella* Brady and Robertson 1873.

Female; The body is fusiform, at the dorsal view. The anterior division of body consists of 4 segments. The head is fused with the 1st thoracic segment. The posterior division consists of 5 segments. The furcal style is short, and furnished with a very long seta.

The anterior antennae are 5-segmented. The posterior antenna is biramous, and with 3-segmented exopodite. The mandible is biramous.

The rami of the first 4 pairs of feet have 3 segments. The endopodites are longer than the exopodites.

The 5th pair of feet is symmetrical. Each foot consists of 2 segments. The 1st segment has 2 setae on the inner corner, and a seta on the outer corner. The 2nd segment has 2 long, and 2 short setae.

Male; The posterior division of body consists of 6 segments. Both sides of the anterior antennae are modified into the grasping organs. The 5th pair of feet is rudimentary and symmetrical.

Microsetella rosea (Dana) 1847.**Pl. 64, figs. 6-8.***Canthocamptus roseus*, Dana, 1852, p. 1189, Pl. 183, figs. 1-10.*M. rosea*, Giesbrecht, 1892, p. 550, Taf. 44, f. 32, 35, 37, 38, 41, 43, 46, 48, 49.

,, , Esterly, 1905, p. 211, fig. 52 a-c.

,, , Breemen, 1906, p. 174, fig. 189 a-b.

,, , Scott A. 1909, p. 199.

,, , Wilson, 1932, p. 177, fig. 122 a-c.

Female; Characters as the general description. The longest seta of the furca is almost twice as long as the body. The inner most seta of the 5th foot is nearly as long as the other setae.

Male; Unknown.**Length**; Female 0.64-0.85 mm.

Distribution; *M. rosea* has been recorded from the warm regions of the Atlantic, Pacific and Indian Oceans, and also from the Mediterranean Sea and the Red Sea. I have taken at the following Stations.

St. 26, 36, 38-41, 43-45, 47-49, 53, 66, 85, 96, 109, 112, 115.

Microsetella norvegica (Boeck) 1846.**Pl. 64, figs. 9-10.***Ectinosoma atlanticum*, Brady, 1876, vol. II, p. 13, Pl. XXXVIII, figs. 11-19.

,, , Brady, 1883, p. 100, Pl. IV, figs. 10-14.

M. atlantica, Giesbrecht, 1892, p. 550, Taf. 44, f. 33, 34, 36, 39, 40, 42, 44, 45.

,, , Scott T. 1894, p. 91.

M. norvegica, Sars, 1904, p. 44, Pl. XXIV.

,, , Breemen, 1906, p. 173, fig. 188 a-c.

,, , Scott A. 1909, p. 199.

M. atlantica, Mori, 1929, p. 200, Pl. VIII, figs. 6-7.*M. norvegica*, Wilson, 1932, p. 176, fig. 121 a-c.

Female; Characters as the general description. The longest furcal seta is nearly as long as the body. The inner most seta of the 5th foot is nearly $\frac{1}{2}$ times as long as the neighbouring seta.

Length; Female about 4.0 mm.

Distribution; *M. norvegica* has been recorded from the Pacific, Atlantic, Indian, Arctic and Antarctic Oceans. This species is adapted to somewhat low temperature. I have found at the following Stations.

St. 1, 2, 4, 5, 8, 9, 15-24, 44, 45, 53, 62, 63, 68, 70, 75, 97, 114, 116, 117, 120, 126, 128, 132-134, 137, 139, 141, 144, 145.

Gen. *Euterpe* Claus 1863.

Euterpe, Claus, 1863, p. 109.

Female; The head is fused with the 1st thoracic segment. The anterior division of body consists of 4 segments. The rostrum is uniramous and stout. The posterior division of body consists of 6 segments.

The anterior antennae are 7-segmented. The posterior antenna is 3-segmented. The mandible is biramous; the exopodite and endopodite with 1 segment.

The rami of the feet, are 2-segmented in the 1st pair, 3-segmented in the 2nd to 4th pairs.

The 5th pair of feet is symmetrical. Each foot has 1 segment. The apex is furnished with 4 setae.

Male; Both sides of the anterior antennae are modified to form the grasping organs. The 4th and 5th segments are fused and much thickened. The 6th and 7th segments also are fused, and composed of the terminal section.

The 5th pair of feet is symmetrical and rudimentary. Each foot is furnished with 2 setae on the apex, and 2 setae on the outer margin.

Euterpe acutifrons (Dana) 1847.

Pl. 64, figs. 11-13; Pl. 65, figs. 1-3.

Harpacticus acutifrons, Dana, 1852, p. 1192, Pl. 83, fig. 11 a-b.

Euterpe gracilis, Claus, 1863, p. 110, Taf. XIV, fig. 1-13.

E. gracilis, Brady, 1880, vol. II, p. 22, Pl. XL, figs. 1-16.

E. acutifrons, Giesbrecht, 1892, p. 555, Taf. 44, f. 16-31.

E. acutifrons v. armata, Scott T. 1894, p. 93, Pl. XII, figs. 14-23.

E. acutifrons, Esterly, 1905, p. 212, fig. 53 a-e.

„ , Breemen, 1906, p. 176, fig. 191 a-d.

Euterpina acutifrons, Scott A. 1909, p. 229.

Euterpe acutifrons, Mori, 1929, p. 200, Pl. VII, figs. 17-18.

Only species of the genus.

Length; Female about 0.71 mm, male about 0.5 mm.

Distribution; *E. acutifrons* has been recorded from the tropical and subtropical zones of the Atlantic and Pacific Oceans, and also from the Red Sea and the Mediterranean Sea. This species seems to be the neritic Copepod. I have taken at the following Stations. St. 1-3, 15-17, 23, 24-26, 29, 32, 35, 50, 52, 59, 60, 65, 114.

Gen. *Clytemnestra* Dana 1847.

Female; The anterior division of the body consists of 4 segments. The head is fused with the 1st thoracic segment. The posterior division of body consists of 5 segments.

The anterior antennae are composed of 7 or 8 segments. The exopodite of the 2nd antenna is degenerated, and replaced by setae. The posterior maxillipede is 2-segmented,

slender and elongated, and furnished with short hooks at the end.

The exopodites of the 1st pair of feet are 1-segmented, of the 2nd, 3rd and 4th pairs are 3-segmented. The endopodites of the first 4 pairs of feet are 3-segmented, and longer than the exopodites.

The 5th pair of feet is rudimentary and symmetrical. Each foot consists of 2 segments.

Male; The posterior division of body consists of 6 segments. Both sides of the anterior antennae are modified into the grasping organs. The knee-like articulation is between the last 2 segments. The terminal fooks of the posterior maxillipede is long.

Clytemnestra rostrata (Brady) 1883.

Pl. 65, figs. 10-14.

Goniopsyllus rostratus, Brady, 1883, p. 107, Pl. XLII, figs. 9-16.

Clytemnestra rostrata, Giesbrecht, 1892, p. 566, Taf. 45, f. 19, 20, 22, 25, 26, 31, 33.

„, Esterly, 1905, p. 214, fig. 54 a-b.

„, Breemen, 1906, p. 180, fig. 194 a-c.

„, Scott A. 1909, p. 232.

„, Wilson, 1932, p. 293, fig. 179 a-c.

Female; The lateral angles of each segment of the anterior division are prominent. The genital segment is as long as its width. The furcal styles are about as long as the width. The furcal setae are not plumose.

The anterior antenna consists of 7 segments. The last segment is nearly 5 times as long as the preceding one.

The 5th pair of feet is uniramous and symmetrical. Each foot is composed of 2 segments. The 1st segment has an outer marginal seta. The 2nd segment has 2 long setae on the apex, 3 short setae on the outer margin.

Length; Female about 0.86 mm.

Distribution; *C. rostrata* has been recorded from the Pacific, Atlantic and Indian Oceans, and also from the Mediterranean Sea and the Red Sea. Near Japan, Kokubo and Kamada have recorded this species, from the Tsugaru Strait. I have taken the females at the following Stations. St. 69, 85, 96.

Clytemnestra scutellata Dana 1847.

Pl. 65, figs. 4-9.

C. scutellata, Dana, 1852, p. 1194, Pl. 83, fig. 12 a-f.

„, Giesbrecht, 1892, p. 566, Taf. I, f. 9; Taf. 45, f. 16-18, 21, 23, 24, 27, 29, 30, 32, 34-38.

„, Breemen, 1903, p. 179, fig. 193 a-c.

„, Mori, 1929, p. 201, Pl. VIII, figs. 1-5.

Female; The posterior corners of each segment of the anterior division are prominent. The genital segment is as long as its width. The furcal style is 2 times as long as its

width. The 2 longest setae of the furcal style are plumose.

The anterior antennae consist of 8 segments, among which the 4th, 5th and 8th segments with long sensory hairs. The terminal segment is 2 times as long as the preceding one.

The 5th pair of feet is uniramous and symmetrical. Each foot consists of 2 segments. The 2nd segment has 6 setae.

Male; The posterior division of body consists of 6 segments. The longest furcal setae are longer than those of the female. Both sides of the anterior antennae are modified into grasping organs. The 6th segment of the anterior antenna is short, and has a spine.

Length; Both sexes about 1.06 mm.

Distribution; *C. scutellata* has been recorded from the tropical and subtropical zones of the Pacific, Atlantic and Indian Oceans, and also from the Mediterranean Sea. I have taken at the St. 21, 23, 26, 27, 31, 44, 50, 52, 66, 76, 78, 79, 83, 109, 110, 113-115.

Fam. Oncaeiidae Giesbrecht.

Oncaeiidae, Giesbrecht, 1892, p. 81.

The boundary between the anterior and posterior divisions is usually distinct. The head without the cuticular lenses.

The anterior antennae have from 4 to 6 segments. The exopodites of the posterior antennae are absent. The posterior maxillipedes with 4 or 3 segments, terminates into the strong hooks those are composed of the grasping organs of the male.

The rami of the feet, from the 1st to the 4th pairs are 3-jointed.

Gen. *Oncaea* Philippi 1843.

Female; The boundary between the anterior and posterior divisions of the body is distinct. The genital pores open on the dorsal surface of the genital segment.

The anterior antennae are 6-segmented. The posterior antennae are uniramous, and composed of 3 segments. The posterior maxillipede has 4 segments. The inner margin of the 2nd segment of basipodite has stout setae. The terminal segment is claw-like.

The endopodites and exopodites of the first 4 pairs of feet are 3-segmented. The endopodites are longer than the exopodites.

Male; The posterior division consists of 6 segments. The terminal 3 segments of the anterior antenna are fused together. The genital pores open under the envelopes of the ventral surface of the genital segment. The terminal claw of the posterior maxillipede is smooth, and longer than the 2nd segment of basipodite.

Oncaea venusta Philippi 1843.

Pl. 66, figs. 1-9.

O. venusta, Giesbrecht, 1892, p. 590, Taf. 47, f. 2, 5, 13, 19, 20, 39, 44, 48, 50, 54, 58.

„, Breemen, 1906, p. 186, fig. 198 a-c.

O. venusta, Marukawa, 1908, p. 14, Pl. V, figs. 164-172.

„ , Scott A. 1909, p. 243.

„ , Mori, 1929, p. 202, Pl. VIII, figs. 19-21.

„ , Wilson, 1932, p. 353, fig. 213 a-d.

Female; The greatest width is in front of the end of head. The genital segment is longer than the succeeding 3 segments together. The furcal styles are longer than the anal segment, and nearly 4 times as long as the width.

Male; There are 3 segments between the genital and anal segments. The genital segment is very long, and more than 3 times as long as the rest segments of the abdomen. The furcal styles are shorter than 3 times as long as the width.

Length; Female 1.0-1.28 mm, male 0.8-1.0 mm.

Distribution; *O. venusta* has been recorded from the Pacific, Atlantic and Indian Oceans, and also from the Mediterranean Sea. Near Japan, this species appears commonly in the warm waters. I have taken at the following Stations.

St. 4-7, 9, 16-27, 32, 35, 36, 39-44, 46, 48, 49, 54-56, 60, 64, 67-69, 76-78, 80, 82-84, 85, 94-101, 103-120, 126, 137.

***Oncaea conifera* Giesbrecht 1891.**

Pl. 66, figs. 10-13.

O. conifera, Giesbrecht, 1892, p. 591, Taf. 2, f. 10; Taf. 47, f. 4, 16, 21, 28, 34, 38, 42, 55, 56.

„ , Giesbrecht, 1902, p. 41, Taf. 13, fig. 7-11.

„ , Esterly, 1905, p. 216, fig. 55 a-b.

„ , Breemen, 1906, p. 189, fig. 202 a-d.

„ , Farran, 1929, p. 285.

„ , Wilson, 1932, p. 350, fig. 210 a-c.

Female; The median portion of the 2nd thoracic segment is protruding from the dorsal surface of the anterior division of body, when viewed from the side. The genital segment is nearly 2 times as long as the rest abdominal segments together.

The furca is about as long as the anal segment. The distal spine on the 2nd segment of basipodite of the posterior maxillipede is thicker and longer than the proximal. The terminal claw is furnished with the spinules on the inner margin.

The apex of the 3rd segment of endopodite of each swimming foot has a blunt process, which is prominent even in the 4th foot. The 5th pair of feet is elongated.

Length; Female about 1.12 mm.

Distribution; *O. conifera* has been recorded from the Arctic, Pacific, Atlantic and Indian Oceans; and also from the Mediterranean Sea and the Red Sea. I have taken the females only, at the following Stations. St. 44, 45, 49, 92.

***Oncaea media* Giesbrecht 1891.**

Pl. 66, figs. 14-18.

O. media, Giesbrecht, 1892, p. 591, Taf. 2, f. 12; Taf. 47, f. 1, 11, 29-33, 40.

O. media, Breemen, 1906, p. 178, fig. 200 a-b.

„ , Scott A. 1909, p. 242.

„ , Wolfenden, 1910, p. 362.

„ , Farran, 1926, p. 297.

Female; The greatest width of the body is on the end of the head. The genital pores are situated in front of the middle portion of the genital segment. The genital segment is $1\frac{1}{2}$ times as long as the 3 following segments together. The furca is slightly longer than the anal segment. The furcal styles are nearly 2 times as long as these width.

Male; The furcal styles are hardly 2 times as long as the width. The apex of the 3rd segment of endopodite of the 4th foot is not protruded.

Length; Female 0.5–0.92 mm, male 0.6–0.8 mm.

Distribution; *O. media* has been recorded from the Atlantic, Pacific and Indian Oceans; and also from the Red Sea and the Mediterranean Sea.

I have taken at the Station No. 44.

Remarks; The specimens of female which I have obtained at the St. No. 44. The posterior corners of the 3rd and 4th thoracic segments are prominent. But the other characters are identical with the description of *O. media*.

Gen. *Lubbockia* Claus 1863.

Lubbockia, Claus, 1863, p. 163.

Female; The anterior division of body is fusiform, and composed of 5 segments. The posterior division is slender, elongated, and composed of 5 segments. The boundary between the anterior and posterior divisions of the body is distinct.

The anterior antennae is short, and consist of 4–7 segments. The posterior antennae are uniramous, and 3-segmented. The posterior maxillipede is composed of 4 segments. The inner margin of the 2nd segment often has the spines. The terminal segment is claw-like.

The rami of the first 4 pairs of feet consist of 3 segments. The exopodites of the 1st and 2nd pairs of feet have an outer marginal spine on the 1st segment, also an outer marginal spine on the 2nd, and 2 or 3 outer marginal spines on the 3rd. The exopodites of the 3rd and 4th pairs of feet have 1, 1, 2, spines on each segment. The terminal spines are long.

The 5th pair of feet is 1-segmented and symmetrical. Each foot has 2 spines which with foliaceous membranes.

Male; The posterior division of body consists of 6 segments. The terminal claw of the posterior maxillipede is relatively shorter than that of the female.

Lubbockia squillimana Claus 1863.

Pl. 67, figs. 1–9.

L. squillimana, Claus, 1863, p. 164, Taf. XXV, fig. 1–5.

- L. squillimana*, Brady, 1883, p. 118, Pl. LIII, figs. 12-16; Pl. LIV, figs. 1-7.
 ,, , Giesbrecht, 1892, p. 606, Taf. 4, f. 6; Taf. 48, f. 1, 2, 4-8, 10, 12, 14, 15, 17-19, 21.
 ,, , Scott T. 1894, p. 115.
 ,, , Scott A. 1909, p. 245.

Female; The genital segment is much longer than the immediately following segment. The furca is slightly longer than the anal segment. The furcal styles are nearly 5 times as long as the width.

The anterior antennae consist of 6 segments. The 2nd antenna has a very short proximal setae, and a long distal one on the anterior margin. The apex is furnished with 6 setae, of which the 5 setae are curved. The anterior margin of the 2nd segment of the posterior maxillipede has spines.

The 3rd segment of exopodites of the 1st and 2nd pairs of feet have 2 outer marginal spines. The inner spine of the 5th foot somewhat is longer than the outer.

Male; The anterior antennae are symmetrical. The terminal seta is very long. The anterior margin of the 2nd segment of the posterior maxillipede without spines. The terminal claw is shorter than the 2nd segment. The apex of the posterior antenna has 5 short, and a long setae.

Length; Female about 1.6 mm, male about 1.9 mm.

Distribution; This species has been recorded from the Atlantic, Pacific and Indian Oceans, and also from the Mediterranean Sea. I have taken at the following Stations, which are off the Shiono-Misaki. St. 76-79.

Lubbockia marukawai sp. nov.

Pl. 67, figs. 10-13.

Female; The genital segment is nearly as long as the immediately following segment. The furca is nearly as long as the anal segment.

The anterior antennae consist of 5 segments. The anterior margin of the 2nd antenna possesses a short proximal seta, and a long distal one.

The anterior margin of the 2nd segment of the posterior maxillipede has the spines. The terminal claw is longer than the 2nd segment.

The 3rd segment of exopodites of the 1st and 2nd pairs of feet have 2 outer marginal spines. On that fact, this species is clearly different from *L. minuta*.

The inner spine of the 5th pair of feet is slightly longer than the outer.

Marukawa has described *L. minuta*, on the Nippon Dobutsu-Zukan (p. 1237, fig. 2384). But his figures are different from the description of *L. minuta*, and identical with this *Lubbockia*.

Male; Unknown.

Length; Female about 1.25 mm.

Distribution; This species appears to be in the warm currents, near Japan. I have found at the following Stations. St. 26, 27, 32, 40, 45, 47, 48.

Remarks; There is room for doubt, on the maturity of this species; on the fact

that the genital segment of this species is relatively short. But the females often are carrying the eggs. This fact shows the maturity of these females.

Fam. Corycaeidae (Dana).

Sub-fam. Corycaeidae Dana, 1852.

The boundary between the anterior and posterior division of the body is distinct only in the female. The head generally bears a pair of lenses in both sexes or in female. The anterior division of the body may be triangular, cubical or oval and depressed in the shape.

The anterior antennae with 3-6 segments. The posterior antennae are uniramous and terminate into the hooks. The posterior maxillipede with the strong terminal hook, is 3-segmented.

The rami of the feet from the 1st to the 3rd with 3 segments. The endopodites of the 4th feet are sometimes degenerate to the knobs or setae.

Gen. Sapphirina Thompson 1829.

Female; The body is depressed. The anterior division of body consists of 5 segments. The head is separated from the 1st thoracic segment, and has a pair of cuticular lenses on the forehead.

The posterior division consists of 5 or 6 segments. The furca is leaf-like, it has a superficial seta, and 4 marginal ones.

The anterior antennae have 3-6 segments. The posterior antennae are 4-segmented; the terminal segment with a hook-like spine.

The exopodites and the endopodites of the first 4 pairs of feet are composed of 3 segments. The endopodites of the 4th pair often are smaller than the exopodites. The 5th pair of feet is rudimentary, and consists of 1 segment.

Male; The posterior division of body consists of 6 segments. The 1st segment (5th thoracic) is very small, but the 2nd (genital) segment is nearly as wide as the 4th thoracic segment. The anal segment is small.

Key to the species.

Female;

- (0) { 1st segment of the 2nd antenna with 2 spines.....*S. metallina*
 { 1st segment of the 2nd antenna with 1 spine. (1)
- (1) { Endopodite of the 4th foot at least is $\frac{2}{3}$ times as long as the exopodite..... (2)
 { Endopodite of the 4th foot is shorter than $\frac{1}{2}$ times as long as the exopodite.... (4)
- (2) { Head is longer than its width; furca with a wide process on the inner corner.
 {*S. angusta*
 { Head is shorter than its width; furca with a small process on the inner corner. (3)

- (3) { Endopodite of the 4th foot is as long as the exopodite.....*S. gemma*
 { Endopodite of the 4th foot is shorter than the exopodite.....*S. gastrica*
- (4) { 1st antenna with 3 segments.....(5)
 { 1st antenna with 5 segments.....(6)
- (5) { Furcal style is longer than the width. 2nd antenna is nearly as long as the 1st
 antenna; the terminal segment is twice as long as the terminal claw....*S. darwini*
 { Furcal style is as long as the width. 2nd antenna is longer than the 1st
 antenna; the terminal segment is somewhat longer than the terminal claw....*S. opalina*
- (6) { The 3rd and 4th segments of the 1st antenna with spine.....*S. stellata*
 { The 3rd and 4th segments of the 1st antenna with setae.....(7)
- (7) { Apex of the endopodite of the 4th foot with 1 seta.....*S. intestinata*
 { Apex of the endopodite of the 4th foot with 2 setae.....(8)
- (8) { Anterior division is broadly ovate; and $1\frac{1}{3}$ times as long as the width....*S. scarlata*
 { Anterior division is elongate ovate; and $1\frac{1}{2}$ times as long as the width.....
 *S. nigromaculata*

Male;

- (0) { Endopodite of the 4th foot at least is $\frac{2}{3}$ times as long as the exopodite.....(1)
 { Endopodite of the 4th foot is shorter than $\frac{1}{2}$ times as long as the exopodite....(3)
- (1) { Endopodite of the 4th foot is slightly longer than the exopodite.....*S. gemma*
 { Endopodite of the 4th foot is shorter than the exopodite.....(2)
- (2) { Furcal style is $1\frac{1}{2}$ times as long as its width.....*S. auronitens*
 { Furcal style is more than 2 times as long as its width.....*S. gastrica*
- (3) { Apex of the endopodite of the 4th foot with 2 setae.....*S. nigromaculata*
 { Apex of the endopodite of the 4th foot with 1 seta.....*S. scellata*

Sapphirina metallina Dana 1849.**Pl. 67, figs. 14-18.**

- S. metallina*, Dana, 1852, p. 1242, Pl. 78.
 „ , Brady, 1883, p. 128, Pl. L, figs. 11-17.
 „ , Giesbrecht, 1892, p. 620, Taf. 54, f. 47-56. (male)
 „ , Scott T. 1894, p. 125, Pl. XII.
 „ , Scott A. 1909, p. 255.
 „ , Farran, 1929, p. 290.

Female; The anterior division is somewhat elongate. The head is nearly as long as its width. The cuticular lenses are adjacent. The posterior division consists of 5 segments. The furcal styles are truncate at the end, and furnished with 2 foliaceous terminal setae. The superficial seta is behind the 1st marginal seta.

The 2nd antenna has 2 spines on the 1st segment. The 3rd segment of endopodite of the 2nd foot has 3 foliaceous spines. The endopodite of the 4th foot is $\frac{2}{3}$ times as long as the exopodite. The apex is furnished with 2 spines, of which a spine is foliaceous.

Length; Female about 1.2 mm.

Distribution; *S. metallina* is distributed in the tropical and subtropical zones of the Pacific, Atlantic and Indian Oceans. I have taken the females, at the following Stations. St. 79, 110, 114.

Sapphirina angusta Dana 1849.

Pl. 68, figs. 1-5.

S. angusta, Dana, 1852, p. 1240, Pl. 78.

„ , Giesbrecht, 1892, p. 619, Taf. 52, f. 5, 6, 20, 53, 55, 58, 66; Taf. 53, f. 6, 17, 26, 27, 55; Taf. 54, f. 2, 8, 17, 20, 60, 61.

„ , Esterly, 1905, p. 221, fig. 58 a-d.

„ , Scott A. 1909, p. 253.

„ , Farran, 1929, p. 288.

„ , Wilson, 1932, p. 365, fig. 221 a-c.

Female; The anterior division is elongate. The head is longer than the width. The cuticular lenses are adjacent. The posterior division is nearly $\frac{1}{3}$ times as long as the anterior division, and composed of 6 segments. The furcal styles are nearly 2 times as long as the width, and have a broad process on the inner distal corner.

The 1st antennae consist of 5 segments. The 2nd segment is at least as long as the 3 following segments together. The combined length of the terminal 2 segments of the 2nd antenna is shorter than the 2nd segment.

The endopodite of the 4th foot is shorter than the exopodite. The apex has 2 foliaceous spines. The 3rd segment of endopodite of the 2nd foot has 3 foliaceous spines.

Length; Female 3-4 mm.

Distribution; *S. angusta* has been recorded from the Atlantic, Pacific and Indian Oceans, and also from the Mediterranean Sea. I have taken a female that is not fully mature, at the Station No. 47.

Sapphirina gemma Dana 1894.

Pl. 68, figs. 6-11.

S. gemma, Dana, 1852, p. 1252, Pl. 88.

„ , Brady, 1883, p. 127, Pl. XLVIII, figs. 6-8; Pl. L, fig. 18.

„ , Giesbrecht, 1892, p. 168, Taf. 52, f. 3, 4, 22, 62, 64; Taf. 53, f. 19, 31, 32, 61; Taf. 54, f. 10, 12, 46.

„ , Wolfenden, 1910, p. 360.

„ , Farran, 1929, p. 287.

„ , Mori, 1929, p. 204, Pl. IX, figs. 4-5.

„ , Wilson, 1932, p. 368, fig. 224 a-d.

Female; The head is somewhat wider than the length. The cuticular lenses are situated ventrally on the forehead. The posterior division consists of 6 segments. The posterior corners of the segments are prominent. The furcal style is twice as long as the width. The superficial seta is behind the 1st marginal seta.

The anterior antennae consist of 5 segments. The combined length of the 3rd and 4th segments of the 2nd antenna is much shorter than the 2nd segment. The terminal claw is short.

The apex of the endopodite of the 2nd foot has 3 foliaceous spines. The endopodite of the 4th foot is longer than the exopodite. The apex has 2 foliaceous spines. The 5th foot is relatively long.

Male; The head is somewhat wider than the length. The cuticular lenses are invisible when viewed from above. The posterior division is wider than that of the female.

Length; Female 1.85–3.15 mm, male 2.10–3.2 mm.

Distribution; *S. gemma* has been recorded from the Pacific and Atlantic Oceans, and also from the Mediterranean Sea. I have taken at the following Stations. St. 2, 25, 42.

Sapphirina darwinii Haeckel 1864.

Pl. 68, figs. 12–16.

S. darwinii, Giesbrecht, 1892, p. 619, Taf. 52, f. 59, 63; Taf. 53, f. 3, 33, 57; Taf. 54, f. 35, 67.

„ , Scott A. 1909, p. 254.

Female; The head is wider than the length. There is a little interval between 2 cuticular lenses. The 1st thoracic segment is more narrow than the head. The posterior division consists of 6 segments. The anal segment is very small. The furcal styles are somewhat longer than the width, and have a small process on the inner corner. The superficial seta is behind the 1st marginal seta.

The anterior antennae consist of 3 segments, and are nearly as long as the posterior antennae. The 4th segment of the 2nd antenna is twice as long as the terminal claw.

The endopodite of the 4th foot is shorter than $\frac{1}{2}$ times as long as the exopodite. The apex is furnished with 2 foliaceous spines.

Length; Female about 2.4 mm.

Distribution; *S. darwinii* has been recorded from the Mediterranean Sea and the Pacific Ocean, and near the Malay Archipelago. I have taken the females only, at the following Stations. St. 77, 107.

Sapphirina opalina Dana 1849.

Pl. 69, figs. 1–5.

S. opalina, Dana, 1852, p. 1254, Pl. 88, fig. 4 a–e.

„ , Brady, 1883, p. 126, Pl. XLIX, figs. 3–6.

„ , Giesbrecht, 1892, p. 620, Taf. 52, f. 44, 46, 52, 54; Taf. 53, f. 4, 23, 34, 56; Taf. 54, f. 3, 32, 33, 64.

„ , Scott T. 1894, p. 123.

„ , Scott A. 1909, p. 275.

S. opalina, Mori, 1929, p. 203, Pl. IX, figs. 2, 10-12.

„, Farran, 1929, p. 290.

Female; The head is wider than the length. The anterior margin of the head is rounded. The posterior division consists of 5 segments. The furcal styles are as long as the width.

The anterior antennae are composed of 3-segments. The posterior antenna is longer than the anterior. The 4th segment somewhat is longer than the terminal claw. The 3rd segment of endopodite of the 2nd foot has 3 foliaceous spines.

The endopodite of the 4th foot is shorter than $\frac{1}{2}$ times as long as the exopodite. The apex is furnished with 2 foliaceous spines.

Length; Female about 3 mm.

Distribution; *S. opalina* is distributed in the tropical and subtropical zones of the Atlantic, Pacific and Indian Oceans, and also in the Mediterranean Sea. I have taken at the following Stations. St. 17, 50, 109, 114.

Sapphirina stellata Giesbrecht 1891.

Pl. 69, figs. 6-12.

S. stellata, Giesbrecht, 1892, p. 620, Taf. 52, f. 7, 8, 9; Taf. 53, f. 15, 35, 59; Taf. 54, f. 22, 27, 69.

„, Scott A. 1909, p. 259.

Female; The anterior division of body is oval. The proximal end of the 3rd thoracic segment is more narrow than the 2nd. The cuticular lenses are adjacent. The posterior division consists of 6 segments.

The furcal style is elongate oval. The superficial seta is in front of the 1st marginal seta.

The anterior antennae consist of 5 segments. The 3rd and 4th segments have a stout spines. The combined length of the 2 terminal segments of the posterior antenna is shorter than the 2nd segment. The terminal segment is more than twice as long as the terminal claw.

The endopodite of the 4th foot is shorter than $\frac{1}{2}$ times as long as the exopodite. The apex have a foliaceous spine.

Male; The shape of the body is oval, when viewed from above. The 3rd segment of exopodite of the 2nd foot has 3 foliaceous spines. This segment has a claw-like process on the inner distal margin.

Length; Female 1.9-3.5 mm, male 2.0-3.5 mm.

Distribution; *S. stellata* is distributed in the tropical and subtropical zones of the Atlantic, Indian and Pacific Oceans. Near Japan, this species often appears in the warm currents. I have taken at the following Stations. St. 27, 31, 33, 42, 76, 109, 112-116.

Sapphirina auronitens Claus 1863.

Pl. 70, figs. 1-5.

S. auronitens, Claus, 1863, p. 153.

- S. auronitens*, Giesbrecht, 1892, p. 642, Taf. 52, f. 48, 50, 57; Taf. 53, f. 5, 40, 52;
Taf. 54, f. 4, 14, 28, 43.
,, , Scott A. 1909, p. 254.
,, , Wilson, 1932, p. 365, fig. 222 a-c.

Male; The head is wider than the length. The cuticular lenses are adjacent, and visible at the dorsal view. The furcal styles are ovate. The inner distal corner has a small spine. The superficial seta is behind the 1st marginal seta.

The anterior antennae are nearly $\frac{1}{2}$ times as long as the posterior. The 2nd segment is longer than the 3 following segments together. The endododite of the posterior antenna is somewhat shorter than the 2nd segment. The last segment is about 2 times as long as the terminal claw.

The 3rd segment of endopodite of the 2nd foot has a hook-like process on the inner distal corner, a straight process on the apex; a spine which with a membrane on outer side only, near the basis of hook-like process; a foliaceous, coarsely denticulate spine on the apex, and a large foliaceous spine on the outer distal corner.

The endopodite of the 4th foot is $\frac{2}{3}$ times as long as the exopodite. The apex has 2 foliaceous spines.

Length; Male 1.4-2.3 mm.

Distribution; This species has been recorded from the Mediterranean Sea and the Indian Ocean, and also from the Malay Archipelago. I have taken the males at the following Stations. St. 42, 77, 117.

Sapphirina intestinata Giesbrecht 1891.

Pl. 69, figs. 13-17.

- S. intestinata*, Giesbrecht, 1892, p. 619, 643, Taf. 52, f. 10, 11, 36; Taf. 53, f. 11, 47; Taf. 54, f. 7, 29, 62.
,, , Scott A. 1909, p. 255.
,, , Farran, 1929, p. 290.

Female; The anterior division of body is oval. The head is somewhat wider than the length. The cuticular lenses are adjacent. The posterior division of body consists of 6 segments.

The furcal styles are somewhat elongate oval in shape, and are fully twice as long as the width. The superficial seta is in front of the 1st marginal seta.

The anterior antennae are composed of 5 segments. The 2nd segment is longer than the 3 following segments together. The combined length of 2 terminal segments of the 2nd antenna at least is as long as the 2nd segment. The terminal segment is nearly 3 times as long as the terminal claw. The 3rd segment of exopodite of the 2nd foot has 3 foliaceous spines. (in the male, 2).

The endopodite of the 4th foot is shorter than $\frac{1}{2}$ times as long as the exopodite. The apex has a spine.

Length; Female 1.9-2.3 mm.

Distribution; *S. intestinata* has been recorded from the Indian and Pacific Oceans.

I have taken the females, at the following Stations. St. 48, 68.

Sapphirina nigromaculata Claus 1863.

Pl. 70, figs. 6-14.

S. nigromaculata, Claus, 1863, p. 152, Taf. VIII, fig. 5, 6.

S. inaequalis, Brady, 1883, p. 124, Pl. XLVIII, figs. 1-5.

S. nigromaculata, Giesbrecht, 1892, p. 619, 643, Taf. 52, f. 32, 35, 43; Taf. 53, f. 13, 26, 36, 48; Taf. 54, f. 6, 37, 40, 68.

„, Breemen, 1906, p. 192, fig. 209.

„, Scott A. 1909, p. 256.

„, Wolfenden, 1910, p. 361.

„, Mori, 1929, p. 204, Pl. IX, figs. 13-16.

„, Wilson, 1932, p. 372, fig. 228 a-d.

Female; The head is wider than the length. The cuticular lenses are visible at the dorsal view. The 3rd and 4th thoracic segments are tapered regularly backward. The posterior division consists of 5 segments.

The furcal style is ovate in form, and twice as long as the width. The dorsal seta is in front of the 1st marginal seta, (the left side is abnormal, in the case of the figured specimen).

The anterior antennae consist of 5 segments. The combined length of 2 last segments of the 2nd antenna is as long as the 2nd segment.

The endopodite of the 4th foot is shorter than $\frac{1}{2}$ times as long as the exopodite. The apex is furnished with 2 foliaceous spines.

Male; The body is somewhat concave on both sides, at the boundary between the anterior and posterior divisions. The posterior end of the body is truncate shape. The 2nd segment of the 2nd antenna has a stout marginal spine.

The 3rd segment of endopodite of the 2nd foot has 2 foliaceous spines, and a spine which with denticulate margin on the outer side only. The shape of the 4th pair of feet is as like as the female.

Length; Female 1.2-2.0 mm, male 2.0-2.45 mm.

Distribution; *S. nigromaculata* has been recorded from the Atlantic, Indian and Pacific Oceans, and also from the Mediterranean Sea and the Red Sea. I have taken at the following Stations. St. 19, 27, 47, 95, 97.

Sapphirina gastrica Giesbrecht 1891.

Pl. 71, figs. 1-9.

S. gastrica, Giesbrecht, 1892, p. 620, 642, Taf. 52, f. 24, 29; Taf. 53, f. 14, 46, 49; Taf. 54, f. 23, 71.

„, Rose, 1933, p. 312, fig. 405.

Female; The shape of body resembles that of the *S. nigromaculata*, but the dorsal seta of the furca is behind the 1st marginal seta.

The anterior antennae are composed of 5 segments, and $\frac{5}{9}$ times as long as the

posterior. The 2nd segment is shorter than the combined length of the 3 following segments. The endopodite of the posterior antenna is nearly $\frac{3}{4}$ times as long as the 2nd segment. The terminal claw is $\frac{3}{4}$ times as long as the last segment. The spine of the 1st segment is much longer than the same of the 2nd segment.

The endopodite of the 4th foot is longer than $\frac{2}{3}$ times as long as the exopodite. The apex is furnished with 2 foliaceous spines.

Male; The head is wider than the length. The body is gradually tapered backwardly, from the 3rd thoracic segment.

The anterior antennae consist of 6 segments, of which the 1st and 2nd segments are obscurely separated. The 3rd segment of endopodite of the 2nd foot has 3 foliaceous spines.

The 2nd antennae and the 4th pairs of feet resemble those of the female.

Length; Both sexes about 2.35 mm.

Distribution; Only the female of this species has been recorded from the Pacific Ocean, 175° W, 19° N -by Giesbrecht. The male is newly found by Lehnhofer. I have taken at the following Stations. St. 77, 112.

Sapphirina scarlata Giesbrecht 1891.

Pl. 71, figs. 10-14.

S. scarlata, Giesbrecht, 1892, p. 620, 642, Taf. 52, f. 42, 60, 61; Taf. 53, f. 12, 39, 62; Taf. 54, f. 25, 31, 72.

„ , Esterly, 1905, p. 222, fig. 59 a-b.

„ , Scott A. 1909, p. 258.

„ , Mori, 1929, p. 204, Pl. IX, figs. 1, 6-9.

„ , Wilson, 1932, p. 371, fig. 227 a-c.

Female; Allied to *S. nigromaculata*, but the posterior end of the 4th thoracic segment is nearly straight. The spine of the 2nd segment of the 2nd antenna is relatively shorter than that of *S. nigromaculata*.

Length; Female 1.5-3.5 mm.

Distribution; *S. scarlata* has been recorded from the Atlantic, Pacific and Indian Oceans, and also from the Mediterranean Sea. I have taken the females at the following Stations. St. 17, 33, 40, 53, 118.

Gen. Corycaeus Dana 1845.

Female; The boundary between the anterior and posterior divisions is distinct. The lateral angles of the 3rd thoracic segment are prominent. The head is furnished with a pair of cuticular lenses.

The posterior division consists of 1 or 2 segments. The genital pores open on the dorsal surface of the genital segment.

The anterior antennae are 6-segmented. The 1st segment of the basipodite of the

2nd antenna is short, and has a stout seta. The 2nd segment is large, and also has a stout seta. The endopodite has the claw-like branches.

The rami of the first 3 pairs of feet are 3-segmented. The exopodite of the 4th foot consists of 3 segments. The endopodite is degenerate or absent.

Male; The genital pores open on the ventral side, under the flap-like valves of the genital segment. The endopodite of the 2nd antenna without branches, and terminates a large claw.

Key to the species.

Female;

- (0) { Ventral keel is protruded; the endopodite of the 4th foot is absent. (1)
 { Ventral keel is not protruded; the endopodite of the 4th foot is knob-like, and
 has 1 or 2 setae. (2)
- (1) { Posterior division of body is elongated. *C. concinnus*
 { Posterior division of body is onion-like. *C. gibbulus*
- (2) { Posterior division of body consists of 1 segment. *C. flaccus*
 { Posterior division of body consists of 2 segment. (3)
- (3) { Furca is longer than the posterior division of body. (4)
 { Furca is shorter than the posterior division of body. (5)
- (4) { Endopodite of the 4th foot with 2 long setae. *C. lautus*
 { Endopodite with a long, and a very short setae. *C. longistylis*
- (5) { Endopodite of the 4th foot with 2 setae. (6)
 { Endopodite of the 4th foot with 1 seta. (8)
- (6) { Furca is longer than the anal segment. *C. japonicus*
 { Furca is shorter than the anal segment. (7)
- (7) { Anterior division consists of 4 segments. *C. asiaticus*
 { Anterior division consists of 5 segments. *C. trukicus*
- (8) { Furca is longer than twice as long as the anal segment. (9)
 { Furca is shorter than twice as long as the anal segment. (10)
- (9) { Wing-like angles of the anterior division reach to the end of genital segment.
 *C. speciosus*
 { Wing-like angles of the anterior division not reach to the end of the genital
 segment. *C. crassiusculus*
- (10) { Genital segment is shorter than the combined length of the anal segment and
 furca. *C. agilis*
 { Genital segment is longer than the combined length of the anal segment and
 furca. (11)
- (11) { Forehead is narrowly rounded at the dorsal view. *C. catus*
 { Forehead is broadly rounded at the dorsal view. (12)
- (12) { Last 2 segments of the anterior division are completely fused. *C. latus*
 { Last 2 segments of the anterior division are separated. *C. ovalis*

Male ;

- (0) { Furca is longer than the posterior division. (1)
 { Furca is shorter than the posterior division. (2)
- (1) { Endopodite of the 4th foot with 2 setae. *C. lautus*
 { Endopodite of the 4th foot with 1 seta. *C. longistylis*
- (2) { Posterior division consists of 1 segment. (3)
 { Posterior division consists of 2 segments. (4)
- (3) { The end of the valve of the genital pore is notched ; the dorsal side of the
 cephalothorax is convex, at the lateral view. *C. concinnus*
 { The end of the valve of the genital pore is rounded ; the dorsal side of the
 cephalothorax is gradually curved, at the lateral view. *C. gibbulus*
- (4) { Endopodite of the 4th foot with 2 setae. (5)
 { Endopodite of the 4th foot with 1 seta. (6)
- (5) { Forehead is quadrate at the dorsal view. *C. trukicus*
 { Forehead is rounded at the dorsal view. *C. japonicus*
- (6) { Furca is more than twice as long as the anal segment. (7)
 { Furca is shorter than twice as long as the anal segment. (8)
- (7) { Genital segment is ellipsoidal, at the dorsal view. *C. crassiusculus*
 { Genital segment is oval, at the dorsal view. *C. speciosus*
- (8) { Genital segment is nearly as long as the combined length of the anal segment
 and furca. *C. flaccus*
 { Genital segment is longer than the combined length of the anal segment and
 furca. (9)
- (9) { Genital segment without a hook-like median process on the ventral side. *C. ovalis*
 { Genital segment with a hook-like median process on the ventral side. (10)
- (10) { The last 2 segments of the anterior division are separated. *C. catus*
 { The last 2 segments of the anterior division are completely fused. *C. latus*

Corycaeus lautus Dana 1849.**Pl. 72, figs. 1-8.**

C. lautus, Dahl M. 1912, p. 45, Taf. VII, fig. 4-14.

Female ; The head is fused with the 1st thoracic segment. There is a little interval between 2 cuticular lenses. The 4th thoracic segment is incompletely fused with the 3rd. The lateral angles of the 3rd thoracic segment not reach to the middle of the genital segment.

The posterior division consists of 2 segments. The genital segment is nearly as long as the anal segment. The furca is somewhat longer than the combined length of the genital and anal segments. The longest furcal seta is foliaceous.

The endopodite of the 4th foot has 2 setae which are about equal in length.

Male ; The head is fused with the 1st thoracic segment. The 3rd and 4th thoracic segments also are fused. The furca is longer than the posterior division of the body.

The endopodite of the 4th foot has 2 setae, of which one is long, and the other is

very short.

Length; Female about 2.7 mm, male about 2.2 mm.

Distribution; *C. lautus* is distributed in the Pacific, Indian and Atlantic Oceans. Near Japan, this species seems to be distributed in the southern waters. I have taken at the following Stations. St. 26, 35.

Corycaeus speciosus Dana 1849.

Pl. 72, figs. 9-15.

- C. speciosus*, Dana, 1852, p. 1220, Pl. 86, fig. 1 a-d.
 „ , Brady, 1883, p. 115, Pl. XLV, figs. 5-6.
 „ , Giesbrecht, 1892, p. 660, Taf. 51, f. 29, 39, 40.
 „ , Scott T. 1894, p. 112.
 „ , Breemen, 1906, p. 199, fig. 212 a-b.
 „ , Scott A. 1909, p. 251.
 „ , Dahl M. 1912, p. 13, Taf. 1, fig. 1-13; Taf. 2, fig. 1-4.
 „ , Mori, 1929, p. 203, Pl. VIII, figs. 13-18.
 „ , Wilson, 1932, p. 358, fig. 216 a-b.

Female; The head is fused with the 1st thoracic segment, or sometimes is separated. The 3rd and 4th thoracic segments are fused.

The lateral angles of the 3rd thoracic segment extend beyond the end of the genital segment. The posterior division consists of 2 segments. The genital segment is nearly 2 times as long as the anal segment. The furcal styles are divergent; and longer than 2 times as long as the anal segment, but shorter than the posterior division of the body.

The keel-like projection that is in front of the 1st pair of feet, is flatly rounded. The endopodite of the 4th foot has a seta.

Male; Characters resemble those of the female, but the furcal styles are not divergent. The genital segment is oval in from, when viewed from above. The genital pores open on the ventral side, under the valves.

Length; Female about 2.0 mm, male about 1.7 mm.

Distribution; *C. speciosus* has been recorded from the warm regions of the Pacific, Atlantic and Indian Oceans. I have taken at the following Stations. St. 20, 21, 23, 25-29, 31, 32, 44, 76, 77, 81-84, 94, 109, 110, 112-114, 117, 126, 128.

Corycaeus crassiusculus Dana 1849.

Pl. 75, figs. 1-5.

- C. crassiusculus*, Dana, 1852, p. 1214, Pl. 85, fig. 7.
C. danae, Giesbrecht, 1892, p. 660, Taf. 51, fig. 59, 60.
C. crassiusculus, Dahl M. 1912, p. 21, Taf. III, fig. 1-7.

Female; Allied to *C. speciosus*, but the wing-like processes of the 3rd thoracic segment not reach to the end of the genital segment. The furcal styles not divergent as like as the case of *C. speciosus*.

The forehead is rounded narrowly. The endopodite of the 4th foot has a seta.

Male; Allied to *C. speciosus*, but the genital segment is oval in form. The 3rd thoracic segment is distinct from the 4th.

Length; Female about 1.9 mm, male about 1.5 mm.

Distribution; *C. crassiusculus* has been recorded from the Pacific, Indian and Atlantic Oceans. I have taken at the following Stations. St. 41, 51, 52.

Corycaeus agilis Dana 1849.

Pl. 72, fig. 16; Pl. 73, figs. 1-2.

C. agilis, Dahl M. 1912, p. 84, Taf. XII, fig. 10-20.

C. gracilicaudatus, Ciesbrecht, 1892, p. 674, Taf. 51, fig. 15, 30.

Female; The head and the 1st thoracic segment are fused or separated. The 3rd and the 4th thoracic segments also are fused or separated. The lateral angles of the 3rd thoracic segment hardly reach to the genital pores.

The posterior division consists of 2 segments. The genital segment is shorter than twice as long as the anal segment. The furca is nearly as long as the anal segment.

The ventral keel is flatly rounded. The endopodite of the 4th foot has a seta.

Length; Female about 1.4 mm.

Distribution; *C. agilis* has been recorded from the Atlantic, Pacific and Indian Oceans. I have taken the females only, at the following Stations. St. 25-28, 32, 45, 50.

Corycaeus longistylis Dana 1849.

Pl. 73, figs. 3-8.

C. longistylis, Dana, 1852, p. 1212, Pl. 85.

„, Giesbrecht, 1892, p. 674, Taf. 51, fig. 36, 37.

„, Scott A. 1909, p. 249.

„, Dahl M. 1912, p. 42, Taf. VI, fig. 6-13; Taf. VII, fig. 1-3.

Female; The head is fused with the 1st thoracic segment. The 3rd and 4th thoracic segments also are fused. The wing-like angles of the 3rd thoracic segment extend beyond the end of the genital segment. There is a little interval between 2 cuticular lenses.

The posterior division consists of 2 segments. The genital segment is swelled. The furca is longer than the posterior division. The endopodite of the 4th foot has a long, and a very short setae.

Male; The head and the 1st thoracic segment are fused. The 3rd and 4th thoracic segments also are fused. The posterior division consists of 1 segment. The furca is longer than the posterior division. The endopodite of the 4th foot has a seta.

Length; Female about 2.65 mm, male about 2.28 mm.

Distribution; *C. longistylis* is distributed in the Indian, Pacific and Atlantic Oceans. I have taken at the following Stations. St. 25, 41, 43.

Corycaeus flaccus Giesbrecht 1891.**Pl. 73, figs. 9-15.**

C. flaccus, Giesbrecht, 1892, p. 674, Taf. 51, figs. 10, 11.

„, Scott A. 1909, p. 247.

„, Dahl M. 1912, p. 35, Taf. V, fig. 4-11.

Female; The head is obscurely separated from the 1st thoracic segment. The 3rd and 4th thoracic segments are incompletely fused. The lateral angles of the 4th thoracic segment are vertically twisted.

The genital and anal segments are fused or incompletely separated. The furca somewhat is shorter than the posterior division. The longest furcal seta is longer than the furca.

The posterior margin of the 2nd segment of basipodite of the 2nd antenna is smooth. The endopodite of the 4th foot has a seta. The ventral keel is flatly rounded.

Male; The posterior division of the body consists of 2 segments. The genital segment is oval in form, when viewed from above, and longer than twice as long as the anal segment. The furca is shorter than twice as long as the anal segment. The anterior margin of the 2nd segment of basipodite of the 2nd antenna is finely denticulated.

Length; Female about 1.8 mm, male about 1.6 mm.

Distribution; *C. flaccus* has been recorded from the Pacific, Atlantic and Indian Oceans, and also from the Mediterranean Sea. I have taken at the following Stations. St. 79, 82, 85.

Corycaeus catus F. Dahl 1894.**Pl. 74, figs. 1-7.**

C. catus, Dahl M. 1912, p. 99, Taf. XIII, fig. 17-24.

C. obtusus (part), Giesbrecht, 1892, p. 673, Taf. 51, fig. 12-14.

Female; The forehead is narrowly rounded. The 3rd thoracic segment is wider than the 2nd. The lateral angles of the 3rd thoracic segment extend beyond the genital pores.

The posterior division of body consists of 2 segments. The genital segment is longer than twice as long as the anal segment.

The ventral keel is flatly rounded. The endopodite of the 4th foot has a seta.

Male; The forehead is quadrate. The 3rd thoracic segment is distinct from the 4th. The posterior division is 2-segmented. The genital segment is large, and has a hook-like process on the proximal portion of the ventral side. The terminal claw of the 2nd antenna is as long as the basipodite. The endopodite of the 4th foot has a seta.

Length; Female about 1.2 mm, male about 0.91 mm.

Distribution; This species has been recorded from the Pacific and Atlantic Oceans. I have taken at the following Stations.

St. 25, 26, 30, 31, 34, 43, 55, 57, 59, 66, 76, 82, 111.

Corycaeus latus Dana 1849.**Pl. 74, figs. 8-10.***C. latus*, Dana, 1852, p. 1221, Pl. 68, fig. 3.

,, , Dahl M. 1912, p. 93, Taf. XIII, fig. 1-8.

Female; Allied to *C. catus*, but the forehead is broadly rounded. The last 2 segments of the anterior division are completely fused.**Male**; Allied to *C. catus*, but the forehead is not quadrate. The last 2 segments of the anterior division are completely fused.**Length**; Female about 1.0 mm, male about 0.81 mm.**Distribution**; This species has been recorded from the Atlantic Ocean. I have taken at the following Stations. St. 77, 79, 80.**Corycaeus ovalis Claus 1863.****Pl. 74, figs. 11-17.***C. ovalis*, Claus, 1863, p. 158.*C. obtusus* (part), Giesbrecht, 1892, p. 673, Taf. 49, fig. 29; Taf. 51, fig. 13, 14.*C. ovalis*, Dahl M. 1912, p. 93, Taf. XIII, fig. 9-16.**Female**; Allied to *C. latus*, but the 3rd and 4th thoracic segments are separated.**Male**; Allied to *C. latus* and *C. catus*, but the hook-like process of the ventral surface of the genital segment is absent.**Length**; Female about 1.1 mm, male about 0.8 mm.**Distribution**; This species is distributed in the Atlantic, Pacific and Indian Oceans, and also in the Mediterranean Sea. I have taken at the following Stations. St. 25-28, 76, 82, 99, 101, 105.**Corycaeus asiaticus F. Dahl 1894.****Pl. 75, figs. 6-8.***C. asiaticus*, Dahl M. 1912, p. 74, Taf. XI, fig. 1-9.**Female**; The head is fused with the 1st thoracic segment. The 3rd and 4th thoracic segments are fused or separated. The 3rd thoracic segment is wider than the 2nd.

The posterior division of body consists of 2 segments. The genital segment is somewhat longer than the anal segment. The furca is nearly as long as the anal segment.

The ventral keel is flatly rounded. The endopodite of the 4th foot has 2 setae.

Length; Female about 1.2 mm.**Distribution**; This species is distributed in the Atlantic, Indian and Pacific Oceans. I have taken the females at the Station No. 29 and 82. The specimens of the female which I have obtained, are different from the Dahl's figure, on the respect that the forehead is broadly rounded.

Corycaeus trukicus sp. nov.

Pl. 75, figs. 9-16.

Female; Characters resemble those of *C. amazonicus* or *C. dubius*, but the head is distinct from the 1st thoracic segment. The interval between 2 cuticular lenses is much shorter. The opposite portion of the mouth is convex, when viewed from the side.

The forehead is broadly rounded. The 3rd and 4th thoracic segments are separated. The posterior division consists of 2 segments. The anal segment is slightly shorter than the genital segment. The furca is nearly as long as the anal segment. The genital segment has a spine on the proximal portion of the ventral side.

The ventral keel is flatly rounded. The endopodite of the 4th foot has 2 setae.

Male; Characters resemble those of *C. amazonicus* or *C. dubius*, but the forehead is quadrate, when viewed from above. Both sides of the 2nd thoracic segment have a small knob. The genital segment is very large, and has a spine on the proximal portion of the ventral side.

The ventral keel is flatly rounded. The endopodite of the 4th foot has 2 setae.

Length; Female 0.65-0.95 mm, male about 0.8 mm.

Locality; St. No. 120 and 121, near the Truk Islands; collected by Okashima.

Corycaeus gibbulus Giesbrecht 1891.

Pl. 76, figs. 12-16; Pl. 77, figs. 1-4.

C. gibbulus, Giesbrecht, 1892, p. 660, Taf. 51, fig. 22, 23.

„ , Scott A. 1909, p. 248.

„ , Dahl M. 1912, p. 115, Taf. XV, fig. 1-4, 9, 10, 25, 35, 36.

Female; The head is fused with the 1st thoracic segment. The 2nd, 3rd and 4th thoracic segments usually fused together into a segment. The lateral angles of the 3rd thoracic segment not reach to the end of the genital segment.

The posterior division consists of 1 segment, and is onion-like, when viewed from above. The furca is shorter than the genital segment.

The ventral keel is protruded. The 1st and 2nd segments of the basipodite of the 2nd antenna have a seta which with the spinules. The endopodite of the 4th foot is absent.

Male; The posterior division of body is 1-segmented, and without a spine on the proximal portion of the ventral side. The valves of the genital pores are not notched. The endopodite of the 4th foot is absent.

Length; Both sexes about 1.0 mm.

Distribution; *C. gibbulus* has been recorded from the Pacific, Atlantic and Indian Oceans. Near Japan, this species appears commonly in the warm currents. I have taken at the following Stations.

St. 26-30, 32-34, 36, 37, 39, 40, 42, 43, 47, 49-52, 54, 59, 66, 68, 69, 75-77, 81-83, 109-118, 126.

Corycaeus concinnus Dana 1849.

Pl. 77, figs. 5-12.

C. concinnus, Dana, 1852, p. 1225, Pl. 86, fig. 7.

,, , Giesbrecht, 1892, p. 661, Taf. 51, fig. 21, 24.

,, , Scott A. 1909, p. 246.

,, , Dahl M. 1912, p. 121, Taf. XV, fig. 5, 6, 11, 12, 23, 24, 33, 34.

Female; Allied to *C. gibbulus*, but the genital segment is elongate.**Male**; Allied to *C. gibbulus*, but the vulves of the genital pores are notched.**Length**; Both sexes about 0.9 mm.**Distribution**; This species has been recorded from the Pacific, Atlantic and Indian Oceans. I have taken at the following Stations.

St. 25-29, 32, 33, 36, 39, 40, 42, 43, 47, 50-52, 76, 93-105.

Corycaeus japonicus sp. nov.

Pl. 76, figs. 1-11.

Female; The head usually is distinct from the 1st thoracic segment. The 3rd and 4th thoracic segments are separated. The wing-like angles of the 3rd thoracic segment not reach to the end of the genital segment.

The posterior division of body consists of 2 segments. The genital segment is onion-like, when viewed from above, and has a median spine on the proximal portion of the ventral side. The anal segment is shorter than the genital segment. The furca is shorter than the posterior division, and twice as long as the anal segment.

The ventral keel is rounded. The endopodite of the 4th foot has 2 setae which are about equal in length.

Male; The head is usually fused with the 1st thoracic segment, but the 3rd and 4th thoracic segments are separated.

The posterior division of body consists of 2 segments. The genital segment is nearly twice as long as the anal segment, and has a median spine on the proximal portion of the ventral side. The furca is nearly as long as the anal segment.

The ventral keel is flatly rounded. The endopodite of the 4th foot has 2 setae.

Length; Female about 1.1 mm, male about 0.9 mm.**Locality**; This species commonly appears in the Inland Sea of Japan, and also has been taken at the Station No. 115.**Gen. Copilia Dana 1849.****Female**; The head is fused with the 1st thoracic segment. The cephalothorax usually is quadrate. The anterior division is tapered backward from the 2nd thoracic segment. The 4th thoracic segment has a median spine which is pointed backward. The head has 2 cuticular lenses.

The posterior division consists of 4 segments. The first 3 abdominal segments usually

are fused. The furcal styles are slender.

The anterior antenna is 6 segmented. The posterior antenna is uniramous, and consists of 4 segments. The rami of the first 3 pairs of feet are 3-segmented. The exopodite of the 4th foot is 3-segmented. The endopodite of the 4th foot is 1-segmented. The 5th pair of feet is degenerate.

Male; The shape of the body resembles that of the *Sapphirina*. The head is distinct from the 1st thoracic segment. The 5th thoracic segment is degenerate. The head has no cuticular lenses.

The abdomen consists of 5 segments. The anal segment is very small. The furcal styles are rod-like.

The posterior antenna is more slender than that of the female, and consists of 4 segments. The posterior maxillipede is 4-segmented. The terminal segment is hook-like.

***Copilia recta* Giesbrecht 1891.**

Pl. 77, figs. 13-16.

C. recta, Giesbrecht, 1892, p. 648, 658, Taf. 50, fig. 4, 32.

Male; The head is quadrate, when viewed from above, and as long as its breadth. The body is longer than twice as long as its breadth. The 3rd segments of the 2nd antenna is longer than the 4th. The 1st segment is shorter than twice as long as the 2nd.

By some authors, this *Corycaeus* is identified with *C. quadrata*. But I should say that the former is different from the latter, by the facts above mentioned.

The endopodite of the 4th foot of this species is shorter than the 1st segment of exopodite, and with 2 setae.

Length; Male about 4.3 mm (without furca).

Distribution; This species has been recorded from the tropical zone of the Pacific Ocean, by Giesbrecht. I have taken 2 males at the Station No. 25.

***Copilia mirabilis* Dana 1852.**

Pl. 78, figs. 1-6.

C. mirabilis, Dana, 1852, p. 1232, Pl. 86, fig. 14.

„ , Brady, 1883, p. 117, Pl. LIII, figs. 1-11.

„ , Giesbrecht, 1892, p. 647, 657, Taf. 50, f. 5, 7, 19, 34, 37, 42.

„ , Scott T. 1894, p. 113.

„ , Scott T. 1909, p. 260.

„ , Lehnhofer, 1926, p. 125, 135, Text-fig. 4, 13.

„ , Mori, 1929, p. 204, Pl. IX, figs. 17-21.

Female; The cephalothorax is quadrate, when viewed from above, and longer than its breadth. The widest portion of the body is in the end of the cephalothorax. The interval between 2 cuticular lenses, is nearly twice as long as the diameter of the lens. The anal segment is longer than the other part of the posterior division. The furca is

longer than the posterior division.

The 1st segment of the 2nd antenna has many spines and a large spine which with the spinules. The 2nd segment has a large spine which with the spinules. The endopodite of the 4th foot is 1-segmented, with 2 setae, and as long as the 3rd segment of the exopodite.

Male; The forehead is rounded. The head is shorter than its width. The 2nd antenna is slender. The 1st segment is longer than the 2nd. The 2nd segment is longer than the 3rd.

The endopodite of the 4th foot is shorter than the 3rd segment of exopodite, and has 2 setae.

Length; Female about 3 mm, male about 4 mm (except furca).

Distribution; *C. mirabilis* is widely distributed in the tropical and subtropical zones of the Atlantic, Indian and Pacific Oceans. I have taken at the following Stations. St. 2, 4, 5, 25-29, 32, 33, 39, 42, 43, 45, 76-78, 80, 82, 84, 97, 109, 110, 112-115.

Copilia quadrata Dana 1852.

Pl. 78, figs. 7-11; Pl. 79, figs. 1-3.

C. quadrata, Dana, 1852, p. 1232, Pl. 86, fig. 15.

„ , Giesbrecht, 1892, p. 647, Taf. 2, fig. 3; Taf. 50, f. 1, 4, 10, 13, 16, 22, 28, 32, 33, 36, 41.

„ , Scott A. 1909, p. 261.

„ , Lehnhofer, 1926, p. 130, 140, Text-fig. 10, 16.

Female; The cephalothorax is quadrate, when viewed from above. The interval between 2 cuticular lenses, is more than 3 times as long as the diameter of the lens.

The anal segment is as long as the other part of the posterior division. The furca is longer than twice as long as the posterior division.

The 1st segment of the 2nd antenna is longer than the 2nd, and has a spine on the distal end. The 2nd segment has a spine on the middle portion. The 3rd segment has 3 spines on the anterior margin. The interval between the middle and distal spines is shorter than the interval between the proximal and middle spines. This segment also has a spine on the distal end of the posterior margin.

The endopodite of the 4th foot is 1-segmented, with 2 setae, and is shorter than the 1st segment of the exopodite.

Male; The head is shorter than its breadth. The anterior margin of the head is straight or slightly concave. The body is shorter than twice as long as its breadth.

The 3rd segment of the 2nd antenna as long as the 4th. The 1st segment is nearly twice as long as the 2nd. The shape of the 4th pair of feet resembles that of the female.

Length; Female 3-4 mm, male about 4 mm (without furca).

Distribution; *C. quadrata* has been recorded from the warm regions of the Pacific, Indian and Atlantic Oceans. I have taken at the following Stations. St. 35, 79.

Copilia longistylis Mori 1932.

Pl. 79, figs. 4-11.

C. longistylis, Mori, 1932, p. 173, 176, Pl. V, figs. 7-10.

Female; The cephalothorax is rectangular, when viewed from above, and longer than the width. The interval between 2 cuticular lenses is $2\frac{1}{2}$ times as long as the diameter of the lens. The anal segment is nearly as long as the other part of the posterior division. The furca is longer than twice as long as the posterior division of body.

The 1st segment of the 2nd antenna is nearly twice as long as the 2nd, and has a spine on the distal end. The 2nd segment is longer than the 3rd, and has a spine on the middle portion of the anterior margin. The anterior margin of the 3rd segment has 3 spines, among which the middle is the longest. The 4th segment is longer than the 3rd. The terminal claw is stout.

The endopodite of the 4th foot is $\frac{1}{2}$ times as long as the 1st segment of exopodite, and has 2 setae.

The shape of this species resembles that of *C. mediterranea*. But the former is different from the latter by the enormously elongated furca and the structure of the 2nd antenna.

Length; Female about 3.46 mm.

Locality; Only the females have been taken at the Stations No. 45 and 112.

Gen. Pachysoma Claus 1863.

Pachysoma, Claus, 1863, p. 162.

Female; The anterior division is elliptical, when viewed from above. The rostrum is protrude. The head is separated from the 1st thoracic segment. The lateral angles of the 4th thoracic segment are prominent.

The first 3 abdominal segments are usually fused. The 4th and 5th abdominal segments are usually separated.

The anterior antennae are 7-segmented. The posterior antennae are uniramous, and consist of 4 segments. The posterior maxillipede consists of 3 or 4 segments. The terminal segment is hook-like.

The rami of the feet, from the 1st to 4th pairs, are 3-segmented. The 3rd segment of endopodite of the 1st pair has 1 foliaceous spine; of the 2nd and 3rd pairs have 3; of the 4th pair has 2.

The 3rd segment of exopodite of the first 3 pairs of feet have 3 outer marginal spines; of the 4th pair has 2 marginal spines.

The 5th pair of feet is very small, and has 2 terminal setae.

Male; The posterior division consists of 5 segments. The 1st and 2nd abdominal segments are fused. But the 3rd, 4th and 5th abdominal segments are distinct. The 1st antennae have the sensory hairs. The posterior maxillipede is more prominent than that of the female.

Pachysoma dentatum Mori 1932.**Pl. 80, figs. 1-13.**

P. dentatum, Mori, 1932, p. 172, 176, Pl. V, figs. 1-6.

This species allied to *P. punctatum*, but differs from the latter, by the fact that is following mentioned.

Female; The 4th abdominal segment is much shorter than the anal segment. The 3rd segment (1st segment of endopodite) of the posterior maxillipede is distinct from the 4th. The spine on the 2nd segment of the posterior maxillipede is more stout than that of *P. punctatum*.

Male; The terminal segment of the 2nd antenna have 1 stout, and 4 slender setae, instead of 5 slender setae of *P. punctatum*. The proximal portion of the inner margin of the 2nd segment of basipodite of the posterior maxillipede is denticulate and has a spine. The 2nd segment of endopodite terminates into the simple claw. The hook-like spine on the proximal portion of this segment is about $\frac{5}{12}$ times as long as the segment itself.

Length; Female about 2.2 mm, male about 2.1 mm.

Locality; St. 44 one male; St. 110, 1 male, 1 female.

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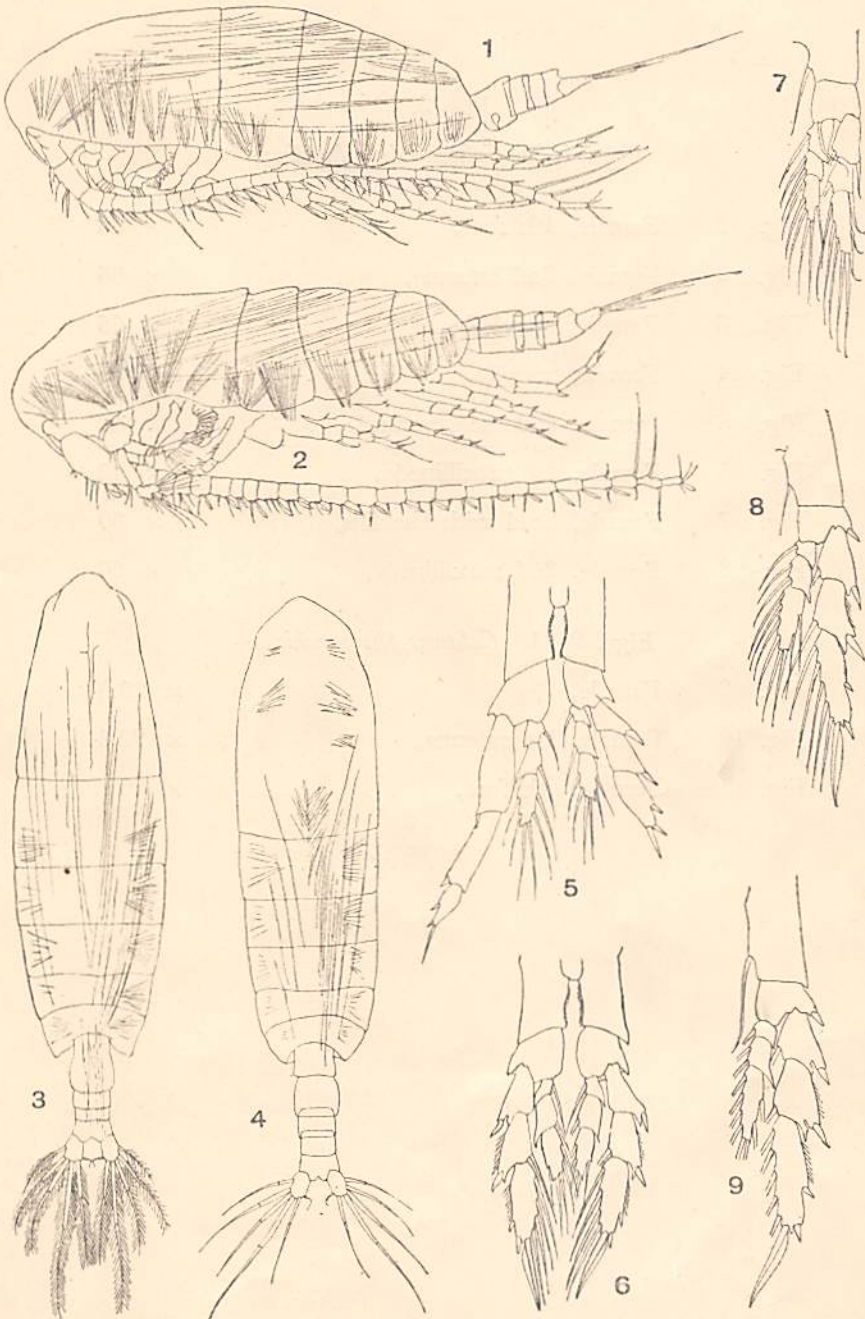
THE PELAGIC COPEPODA

PLATES 1—80

Pl. 1.

Figs. 1-9 *Calanus helgolandicus*

Fig. 1	Female,	× 30
Fig. 2	Male,	× 30
Fig. 3	Female,	× 30
Fig. 4	Male,	× 30
Fig. 5	Male, 5th pair of feet,	× 66
Fig. 6	Female, 5th pair of feet,	× 66
Fig. 7	Female, 1st foot,	× 66
Fig. 8	Female, 2nd foot,	× 66
Fig. 9	Female, 3rd foot,	× 66



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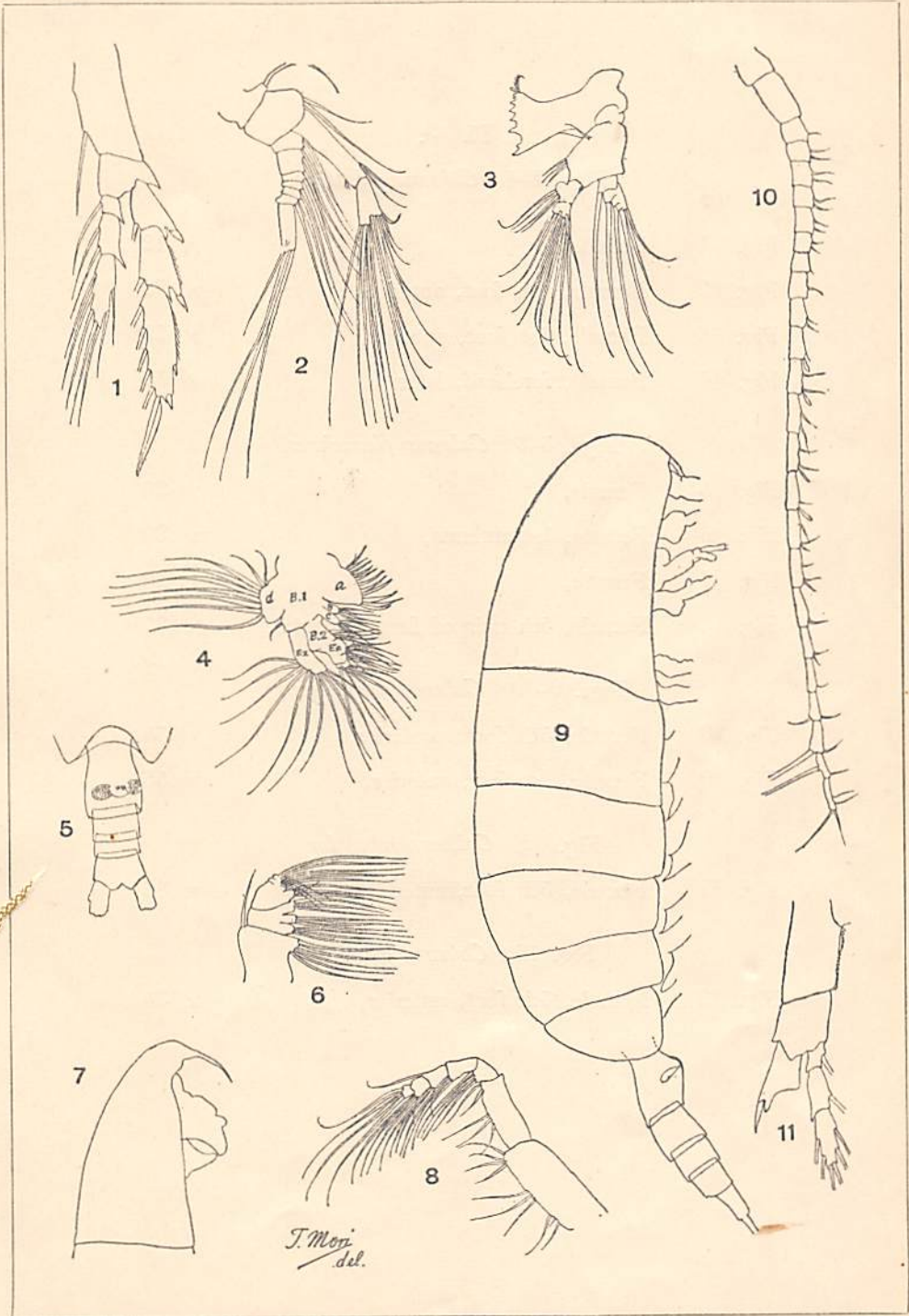
Pl. 2.

Figs. 1-8 *Calanus helgolandicus*

Fig. 1	Female, 4th foot,	× 66
Fig. 2	Female, 2nd antenna,	× 66
Fig. 3	Female, mandible,	× 66
Fig. 4	Female, maxilla,	× 66
Fig. 5	Female, abdomen, ventral,	× 42
Fig. 6	Female, 1st maxillipede,	× 42
Fig. 7	Female, head with the lips,	× 30
Fig. 8	Female, 2nd maxillipede,	× 66

Figs. 9-11 *Calanus finmarchicus*

Fig. 9	Female,	× 22.8
Fig. 10	Female, 1st antenna,	× 22.8
Fig. 11	Female, 5th foot,	× 66



Pl. 3.

Figs. 1-4 *Calanus cristatus*

Fig. 1	Female,	× 12½
Fig. 2	Female, 5th foot, anterior,	× 22½
Fig. 3	Female, 1st foot, anterior,	× 22½
Fig. 4	Female, forehead, lateral,	× 12½

Figs. 5-8 *Calanus plumchrus*

Fig. 5	Female,	× 20
Fig. 6	Female, 1st antenna,	× 20
Fig. 7	Female,	× 20
Fig. 8	Female, 5th pair of feet, posterior,	× 35

Figs. 9-10 *Calanus tenuicornis*

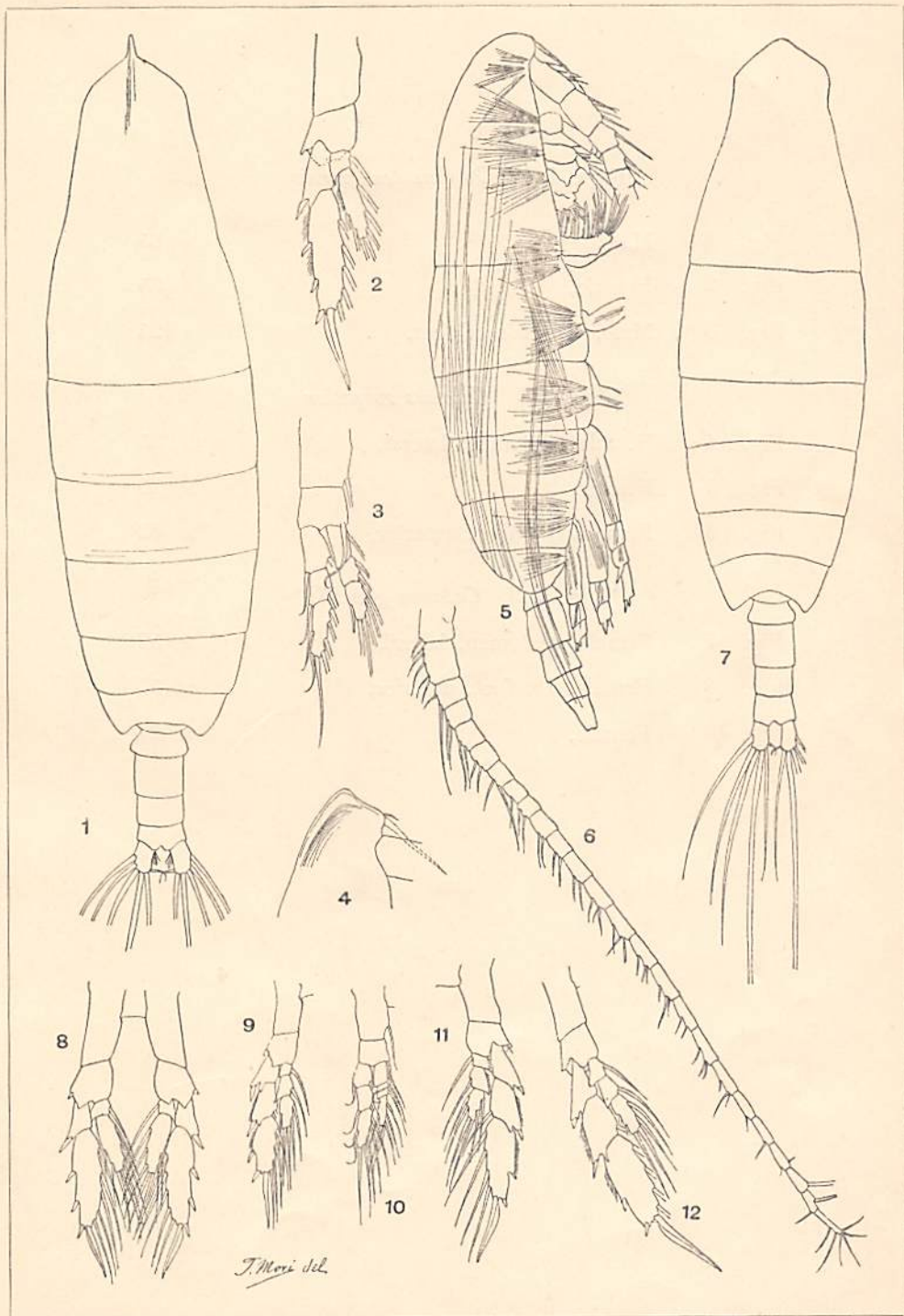
Fig. 9	Female, 5th foot, posterior,	× 55
Fig. 10	Female, 1st foot, anterior,	× 55

Fig. 11 *Calanus robustior*

Fig. 11	Female, 5th foot, anterior,	× 35
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Fig. 12 *Calanus gracilis*

Fig. 12	Female, 5th foot, anterior,	× 35
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Pl. 4.

Figs. 1-3 *Calanus tenuicornis*

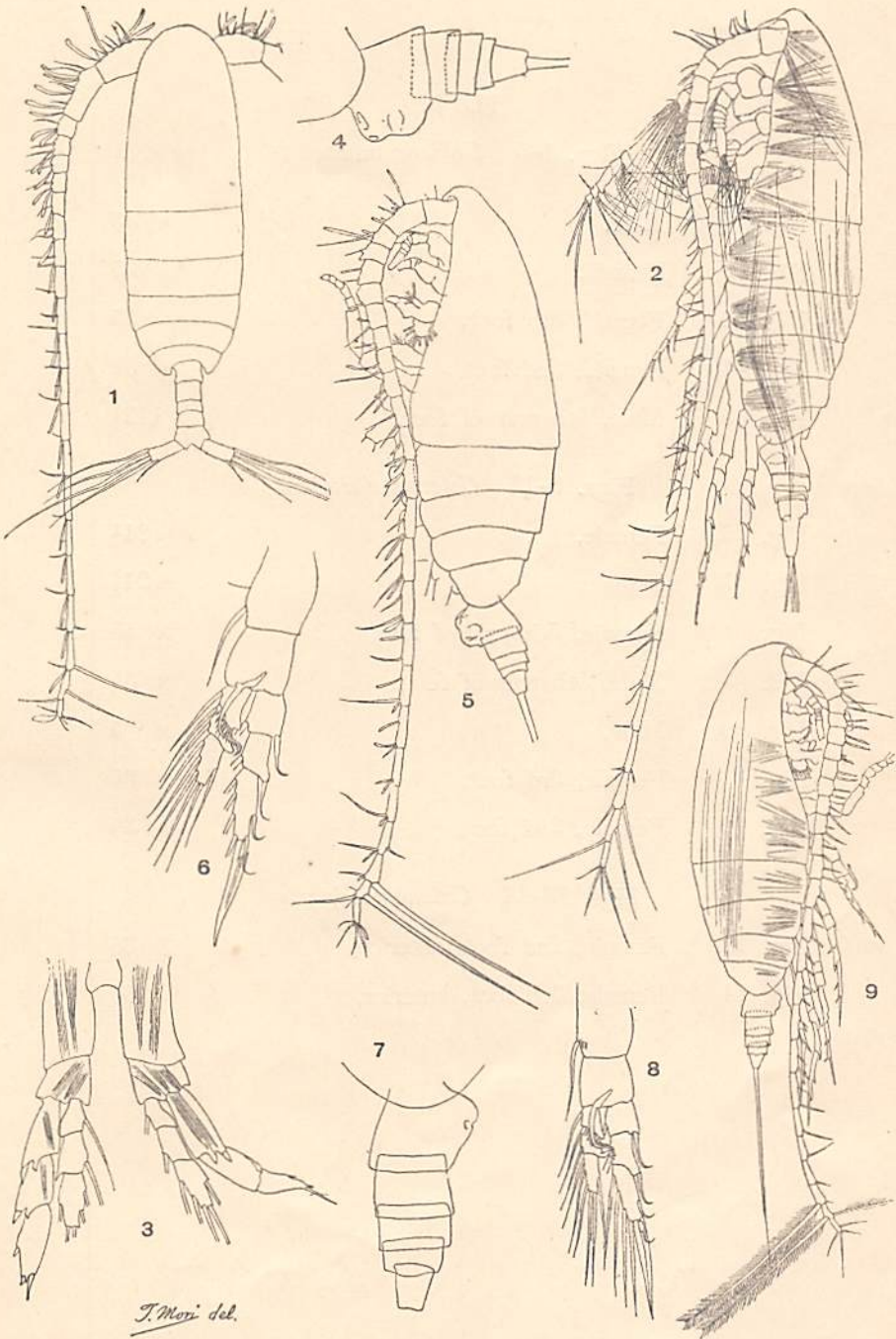
Fig. 1	Male,	× 35
Fig. 2	Female,	× 35
Fig. 3	Male, 5th pair of feet,	× 125

Figs. 4-6 *Calanus robustior*

Fig. 4	Female, abdomen, lateral,	× 35
Fig. 5	Female,	× 20
Fig. 6	Female, 1st foot, anterior,	× 52

Figs. 7-9 *Calanus gracilis*

Fig. 7	Female, abdomen, lateral,	× 52
Fig. 8	Female, 1st foot, anterior,	× 52
Fig. 9	Female,	× 21



Pl. 5.

Figs. 1-5 *Calanus minor*

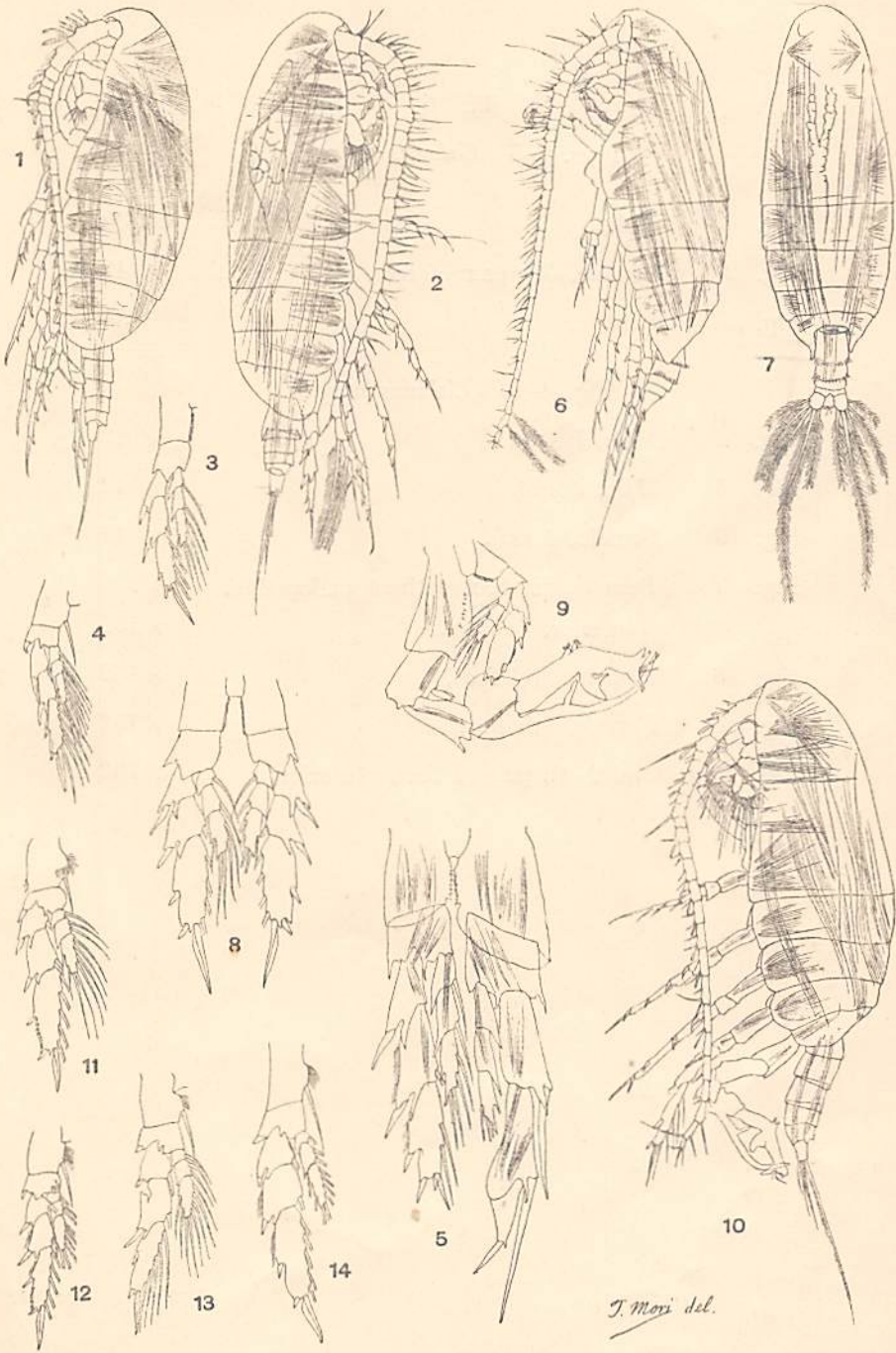
Fig. 1	Male,	× 35
Fig. 2	Female,	× 35
Fig. 3	Female, 5th foot,	× 55
Fig. 4	Female, 2nd foot,	× 52
Fig. 5	Male, 5th pair of feet,	× 112½

Figs. 6-12 *Calanus darwini*

Fig. 6	Female,	× 24½
Fig. 7	Female,	× 24½
Fig. 8	Female, 5th pair of feet,	× 55
Fig. 9	Male, 5th pair of feet,	× 55
Fig. 10	Male,	× 35
Fig. 11	Female, 3rd foot,	× 35
Fig. 12	Female, 2nd foot,	× 35

Figs. 13-14 *Calanus vulgaris*

Fig. 13	Female, 2nd foot, anterior,	× 35
Fig. 14	Female, 3rd foot, anterior,	× 35



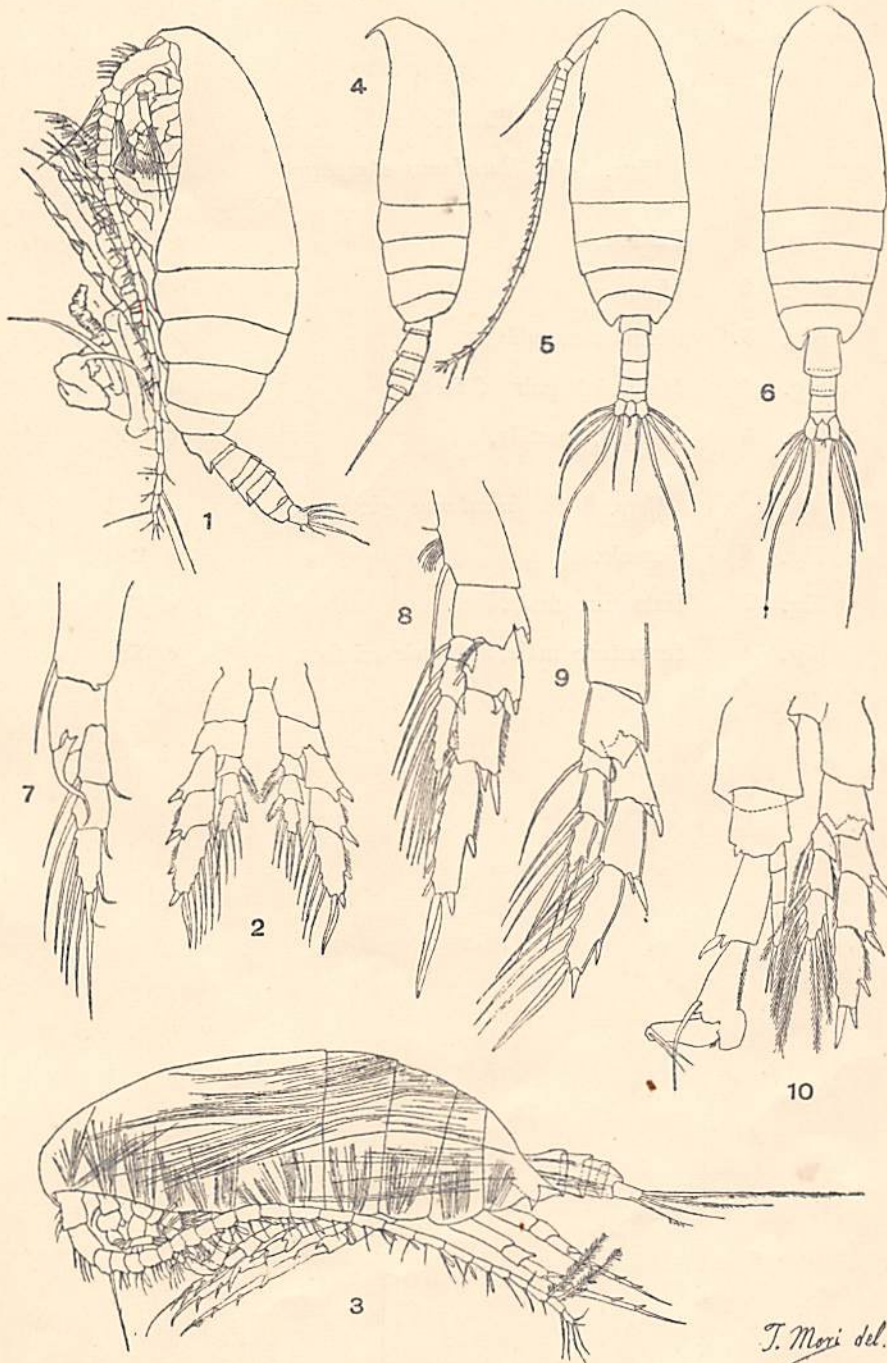
Pl. 6.

Figs. 1-3 *Calanus vulgaris*

Fig. 1	Male,	× 30
Fig. 2	Female, 5th pair of feet,	× 42
Fig. 3	Female,	× 30

Fig. 4-10 *Calanus pauper*

Fig. 4	Male, lateral,	× 42
Fig. 5	Male, dorsal,	× 42
Fig. 6	Female, dorsal,	× 42
Fig. 7	Female, 1st foot without endopodite, anterior,	× 132
Fig. 8	Female, 2nd foot,	× 132
Fig. 9	Female, 5th foot,	× 132
Fig. 10	Male, 5th pair of feet, posterior,	× 132



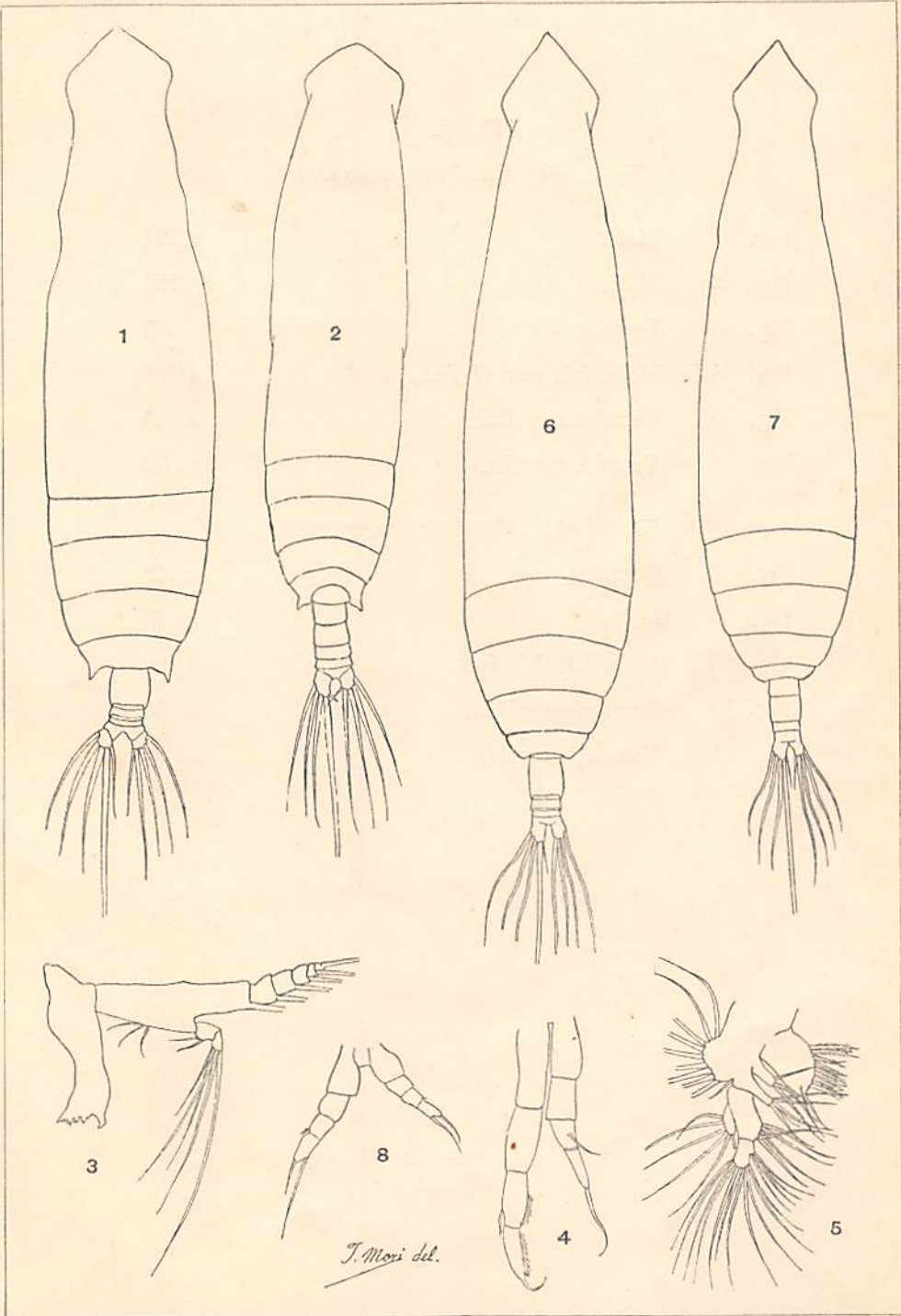
Pl. 7.

Figs. 1-5 *Eucalanus elongatus*

Fig. 1	Female,	$\times 17\frac{1}{2}$
Fig. 2	Male,	$\times 22\frac{1}{2}$
Fig. 3	Female, mandible,	$\times 35$
Fig. 4	Male, 5th pair of feet,	$\times 52$
Fig. 5	Female, maxilla,	$\times 35$

Figs. 6-8 *Eucalanus giesbrechti*

Fig. 6	Female,	$\times 19$
Fig. 7	Immature male,	$\times 19$
Fig. 8	Immature male, 5th pair of feet,	$\times 55$



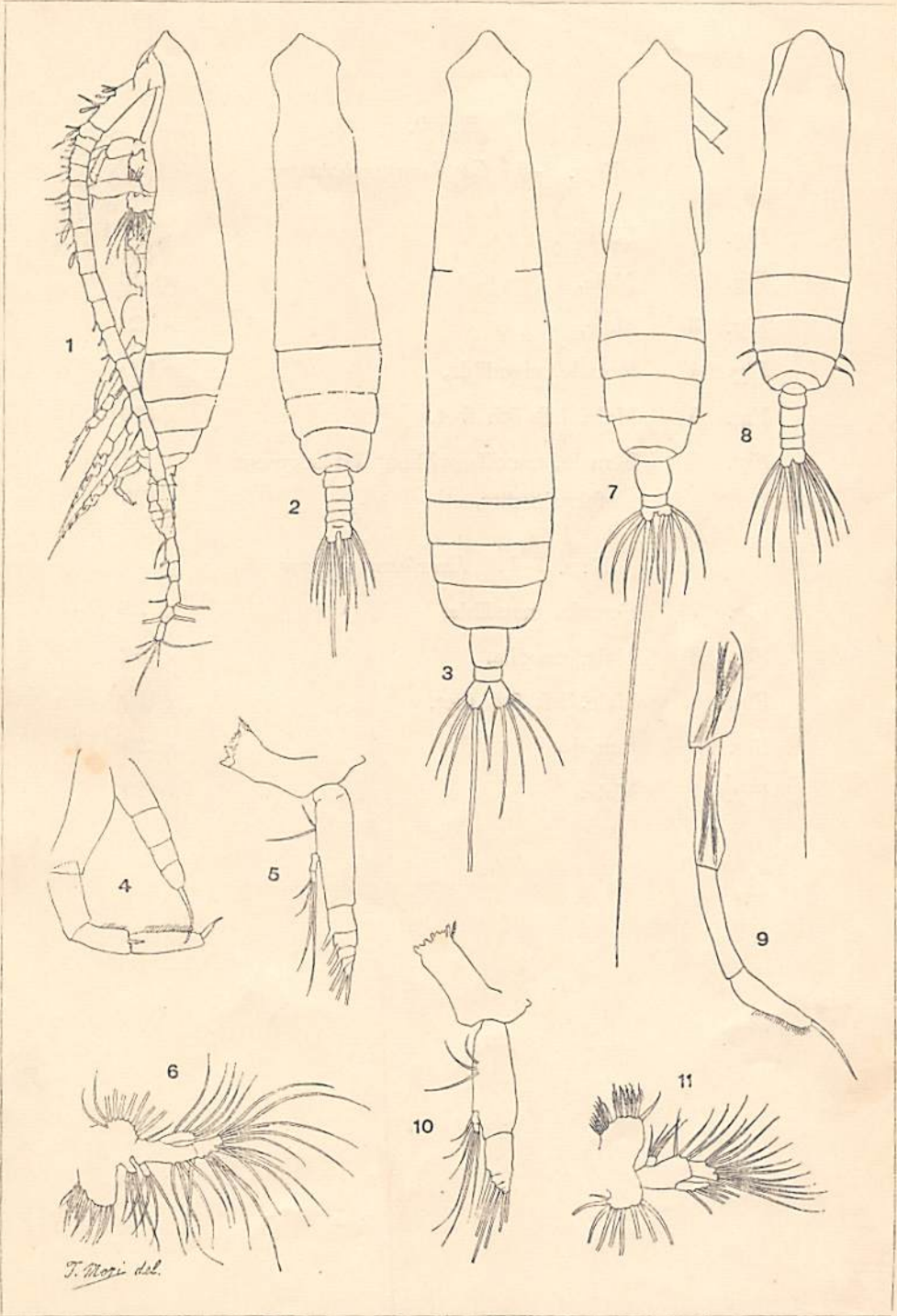
Pl. 8.

Figs. 1-6 *Eucalanus attenuatus*

Fig. 1	Male,	$\times 22\frac{1}{2}$
Fig. 2	Male,	$\times 22\frac{1}{2}$
Fig. 3	Female,	$\times 35$
Fig. 4	Male, 5th pair of feet,	$\times 110$
Fig. 5	Female, mandible,	$\times 35$
Fig. 6	Female, maxilla,	$\times 35$

Figs. 7-11 *Eucalanus mucronatus*

Fig. 7	Female,	$\times 23$
Fig. 8	Male,	$\times 23$
Fig. 9	Male, left 5th foot,	$\times 120$
Fig. 10	Female, mandible,	$\times 55$
Fig. 11	Female, maxilla,	$\times 55$



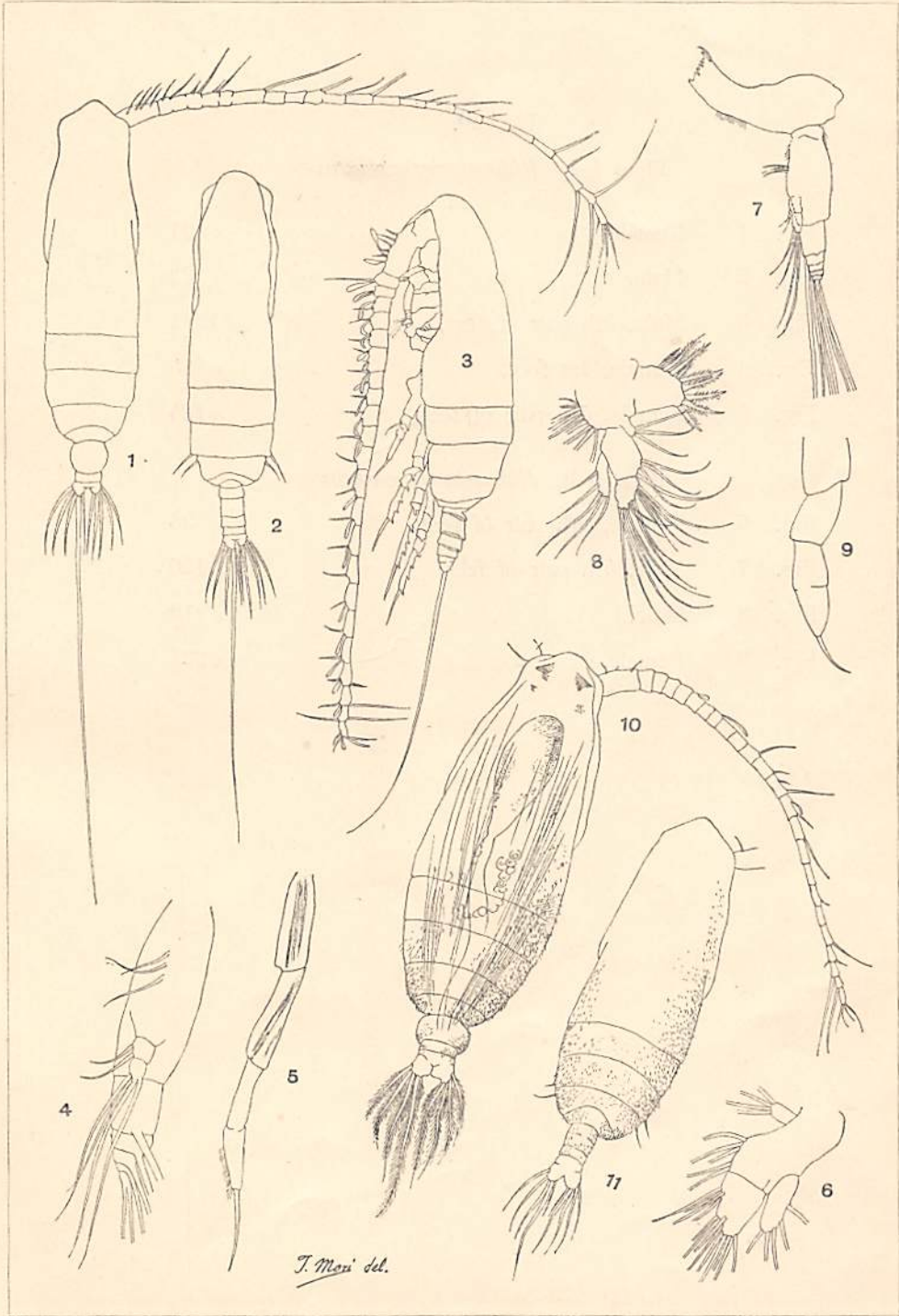
Pl. 9.

Figs. 1-6 *Eucalanus subcrassus*

Fig. 1	Female,	× 23
Fig. 2	Male,	× 23
Fig. 3	Male,	× 23
Fig. 4	Female, mandible,	× 120
Fig. 5	Male, left 5th foot,	× 120
Fig. 6	Female, maxilla without 1st segment of basipodite,	× 120

Figs. 7-11 *Eucalanus crassus*

Fig. 7	Female, mandible,	× 35
Fig. 8	Male, maxilla,	× 52
Fig. 9	Male, left 5th foot,	× 100
Fig. 10	Female,	× 20
Fig. 11	Male,	× 20



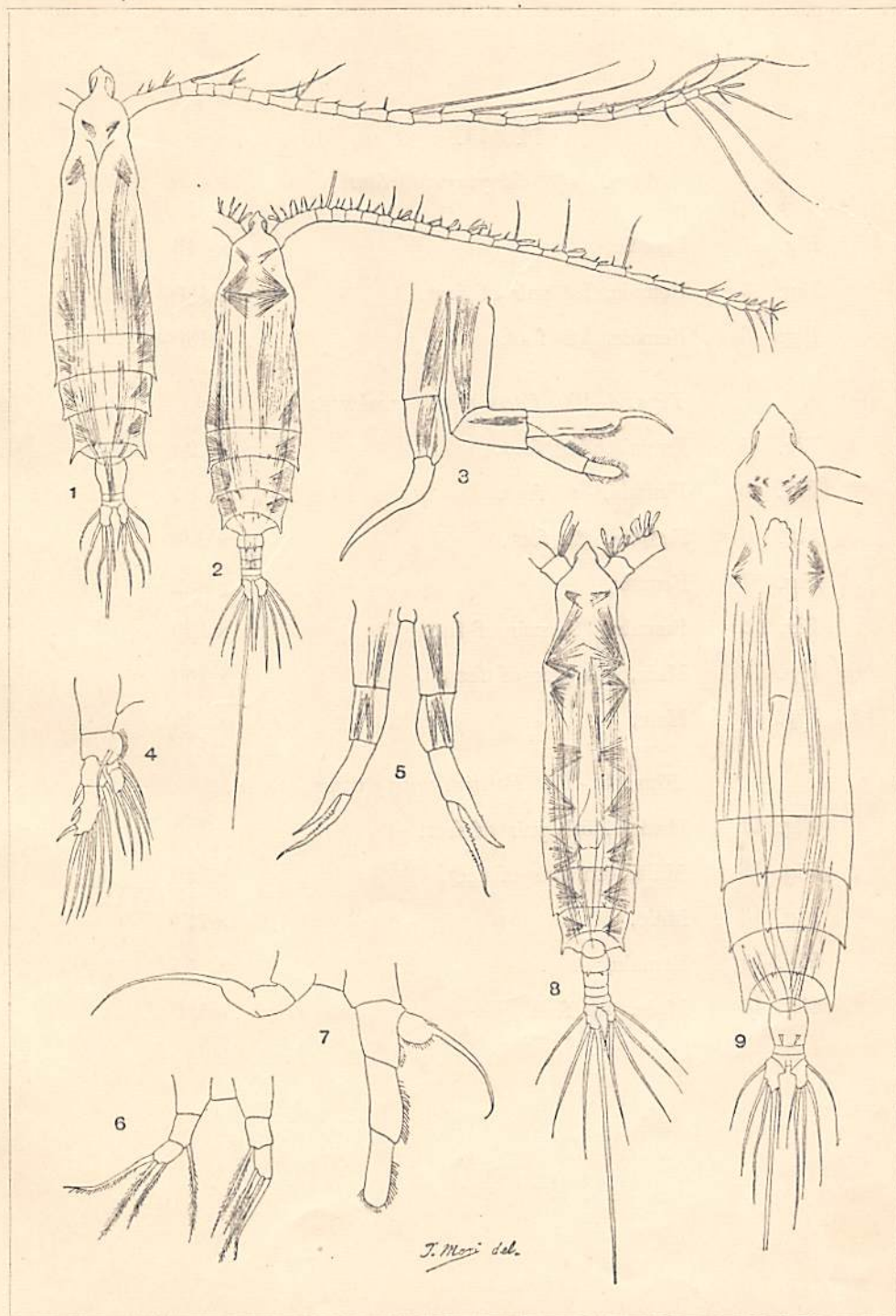
Pl. 10.

Figs. 1-5 *Rhinocalanus cornutus*

Fig. 1	Female,	× 21
Fig. 2	Male,	× 22
Fig. 3	Male, 5th pair of feet,	× 127½
Fig. 4	Female, 1st foot,	× 55
Fig. 5	Female, 5th pair of feet,	× 125

Figs. 6-9 *Rhinocalanus nasutus*

Fig. 6	Female, 5th pair of feet,	× 95
Fig. 7	Male, 5th pair of feet,	× 120
Fig. 8	Male,	× 19
Fig. 9	Female,	× 22½



Pl. 11.

Figs. 1-3 *Mecynocera clausi*

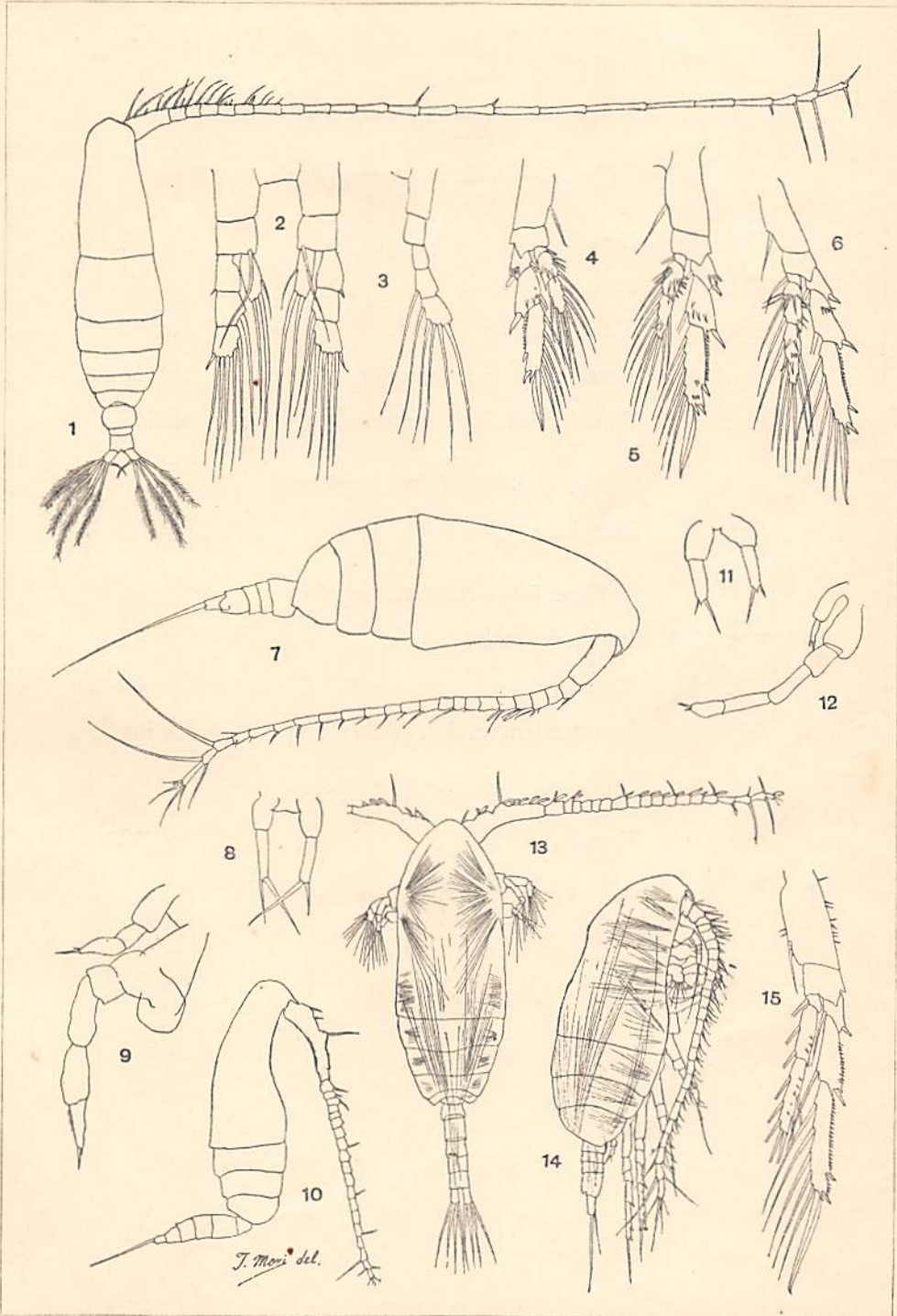
Fig. 1	Female,	× 49
Fig. 2	Female, 1st pair of feet,	× 180
Fig. 3	Female, 5th foot,	× 180

Figs. 4-10 *Paracalanus aculeatus*

Fig. 4	Female, 2nd foot,	× 95
Fig. 5	Female, 3rd foot,	× 95
Fig. 6	Female, 4th foot,	× 95
Fig. 7	Female,	× 52
Fig. 8	Female, 5th pair of feet,	× 180
Fig. 9	Male, 5th pair of feet,	× 180
Fig. 10	Male,	× 35

Figs. 11-15 *Paracalanus parvus*

Fig. 11	Female, 5th pair of feet,	× 180
Fig. 12	Male, 5th pair of feet,	× 180
Fig. 13	Male,	× 72½
Fig. 14	Female,	× 55
Fig. 15	Male, 4th foot,	× 180



Pl. 12.

Figs. 1-5 *Acrocalanus gracilis*

Fig. 1	Female,	× 35
Fig. 2	Male,	× 55
Fig. 3	Male, 5th pair of feet,	× 180
Fig. 4	Female, 1st foot, anterior,	× 112½
Fig. 5	Female, 4th foot, posterior,	× 112½

Fig. 6 *Acrocalanus longicornis*

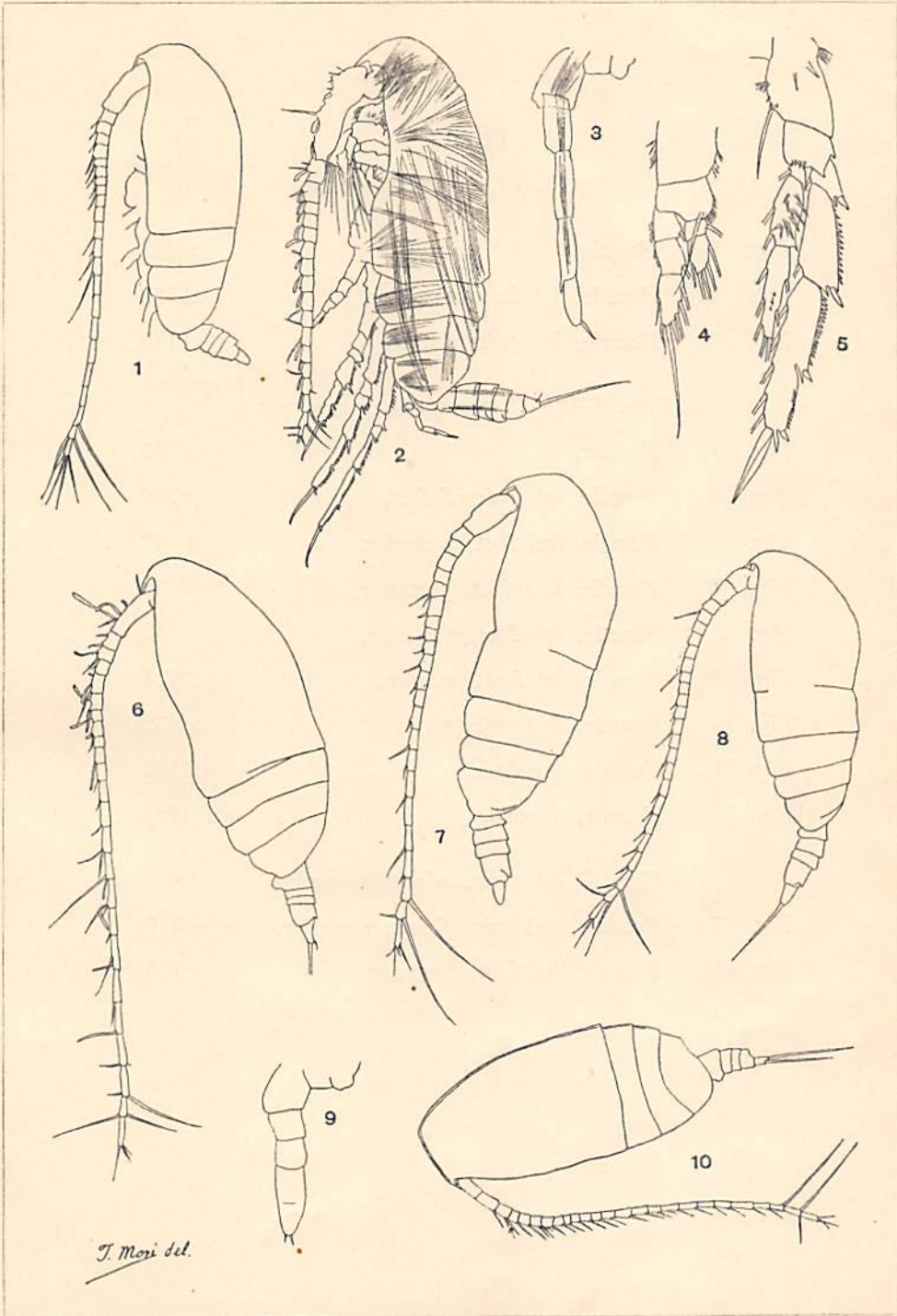
Fig. 6	Female,	× 52
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Figs. 7-9 *Acrocalanus gibber*

Fig. 7	Immature male,	× 52
Fig. 8	Female,	× 52
Fig. 9	Immature male, 5th pair of feet,	× 180

Fig. 10 *Acrocalanus monachus*

Fig. 10	Female,	× 52
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Pl. 13.

Figs. 1-3 *Calocalanus pavo*

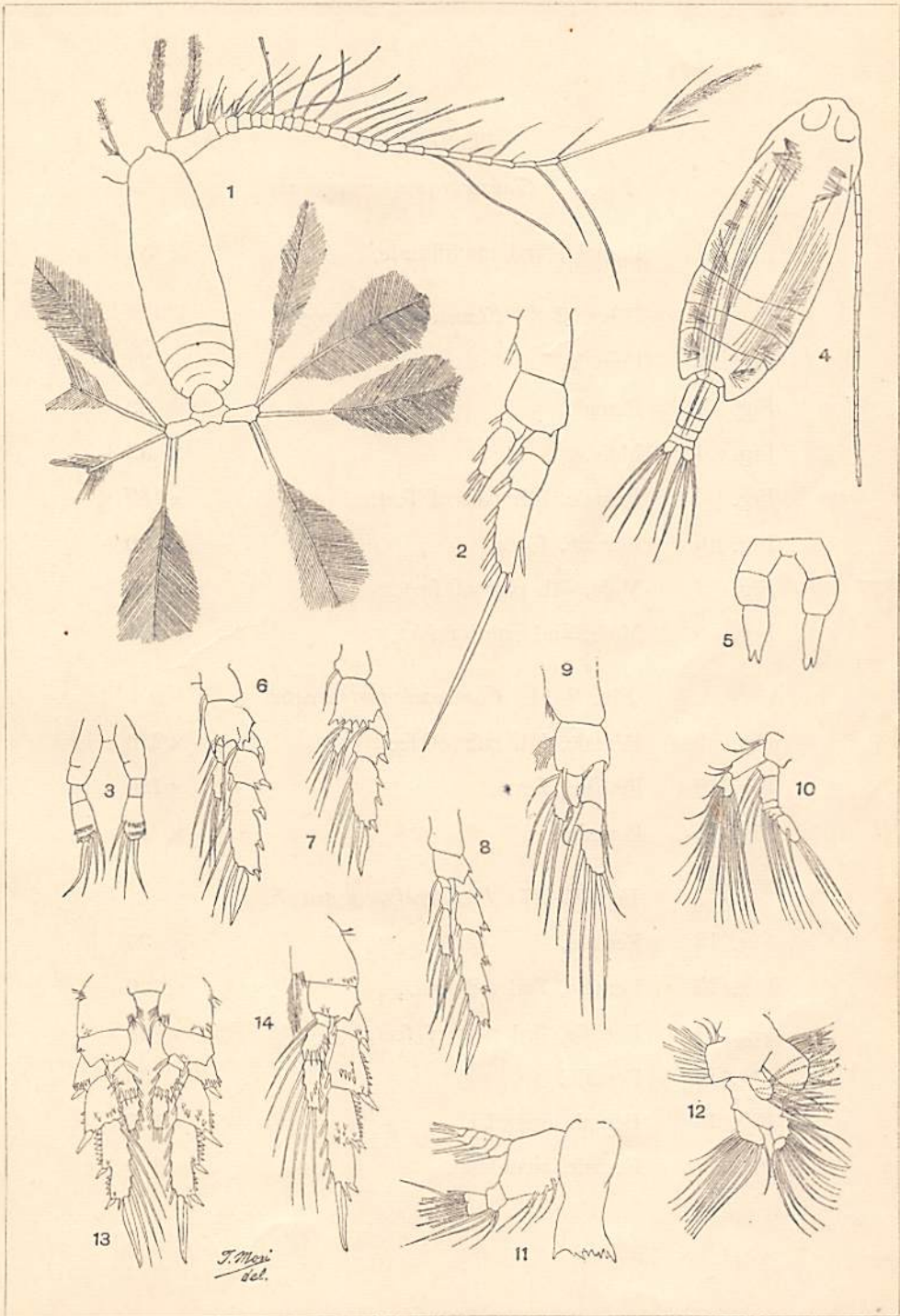
Fig. 1	Female,	$\times 42\frac{1}{2}$
Fig. 2	Female, 1st foot, posterior,	$\times 180$
Fig. 3	Female, 5th pair of feet,	$\times 180$

Figs. 4-12 *Clausocalanus arcuicornis*

Fig. 4	Female,	$\times 35$
Fig. 5	Female, 5th pair of feet,	$\times 180$
Fig. 6	Female, 3rd foot, posterior,	$\times 52$
Fig. 7	Female, 2nd foot, posterior,	$\times 52$
Fig. 8	Female, 4th foot, posterior,	$\times 52$
Fig. 9	Female, 1st foot, anterior,	$\times 112\frac{1}{2}$
Fig. 10	Female, 2nd antenna,	$\times 52$
Fig. 11	Female, mandible,	$\times 112\frac{1}{2}$
Fig. 12	Female, maxilla,	$\times 112\frac{1}{2}$

Figs. 13-14 *Acrocalanus monachus*

Fig. 13	Female, 2nd pair of feet, posterior,	$\times 110$
Fig. 14	Female, 3rd foot, posterior,	$\times 110$



Pl. 14.

Fig. 1 *Clausocalanus arcuicornis*

Fig. 1 Female, 2nd maxillipede, × 52

Figs. 2-8 *Clausocalanus pergens*

Fig. 2 Female, × 39

Fig. 3 Female, × 39

Fig. 4 Male, × 52

Fig. 5 Female, 5th pair of feet, × 180

Fig. 6 Female, furca, × 180

Fig. 7 Male, 5th pair of feet, × 180

Fig. 8 Male, 2nd pair of feet, × 121

Fig. 9-11 *Clausocalanus furcatus*

Fig. 9 Female, 5th pair of feet, × 210

Fig. 10 Female, furca, × 180

Fig. 11 Female, × 46

Fig. 12-17 *Pseudocalanus gracilis*

Fig. 12 Female, × 35

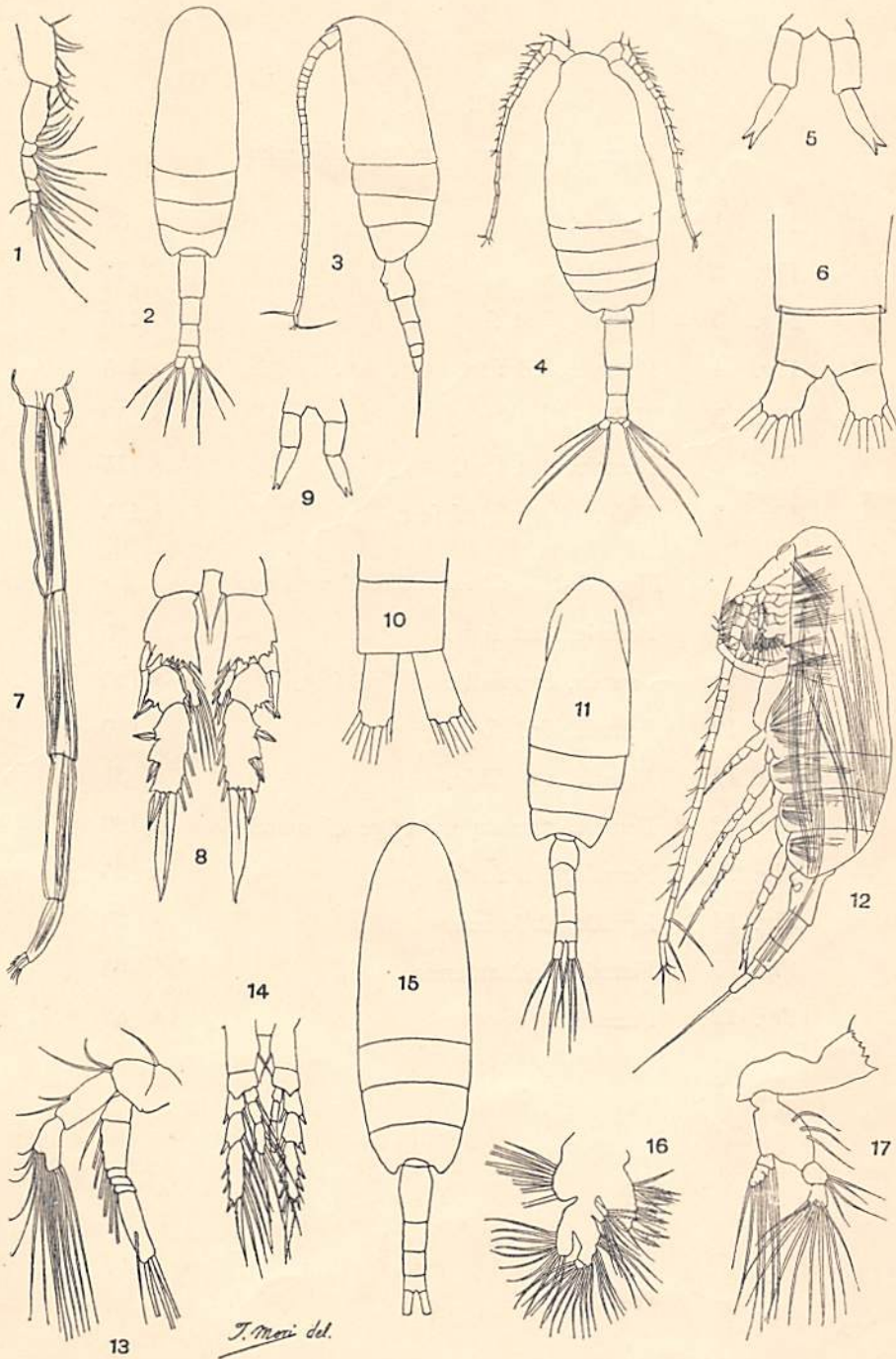
Fig. 13 Female, 2nd antenna, × 120

Fig. 14 Female, 3rd pair of feet, × 55

Fig. 15 Female, × 35

Fig. 16 Female, maxilla, × 120

Fig. 17 Female, mandible, × 120



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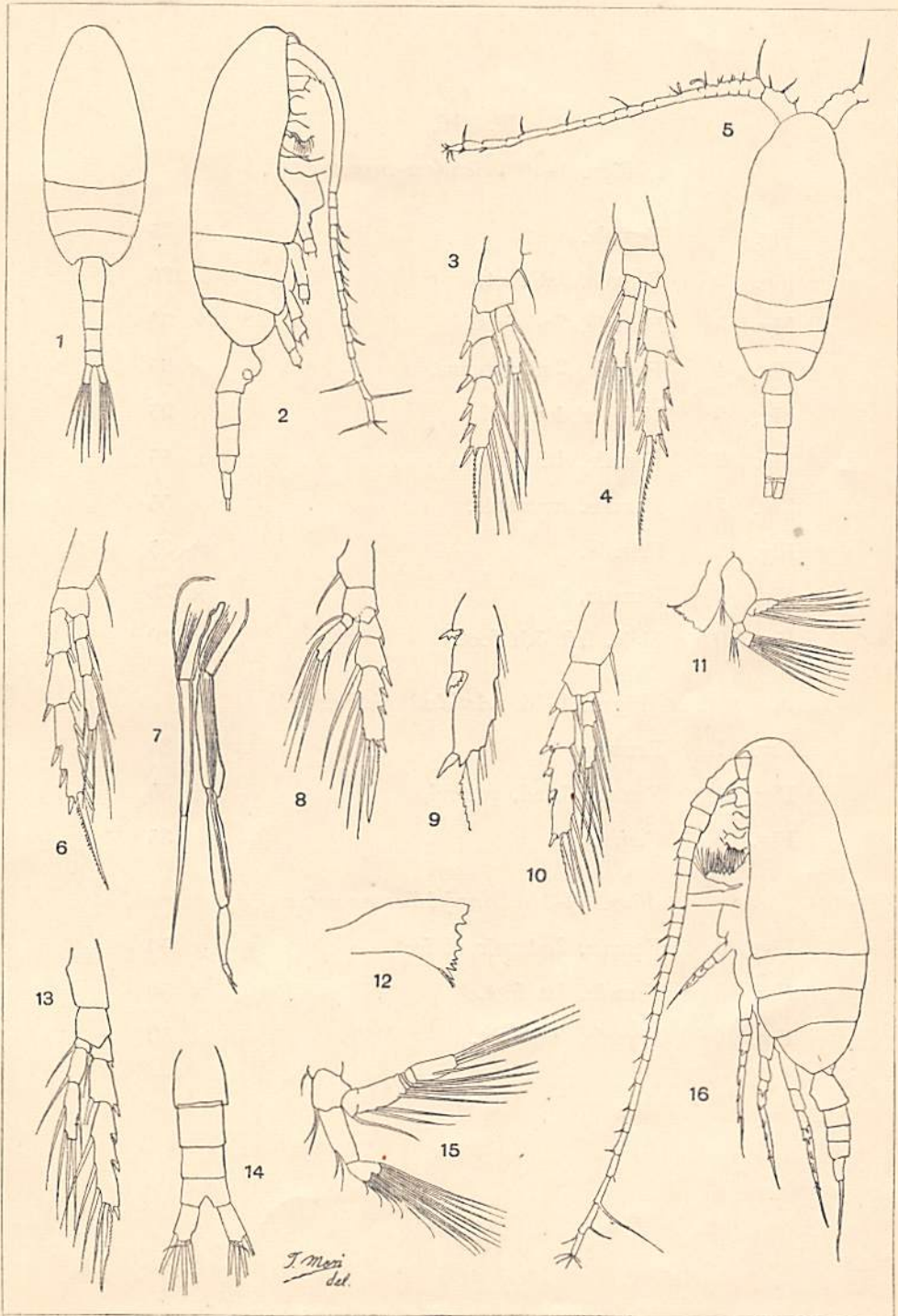
Pl. 15.

Figs. 1-7 *Pseudocalanus elongatus*

Fig. 1	Female,	× 35
Fig. 2	Female,	× 35
Fig. 3	Female, 2nd foot,	× 115
Fig. 4	Female, 3rd foot,	× 115
Fig. 5	Male,	× 50
Fig. 6	Female, 4th foot,	× 115
Fig. 7	Male, 5th pair of feet,	× 115

Figs. 8-16 *Ctenocalanus longicornis*

Fig. 8	Female, 2nd foot,	× 95
Fig. 9	Female, exopodite of 3rd foot,	× 180
Fig. 10	Female, 3rd foot,	× 180
Fig. 11	Female, mandible,	× 95
Fig. 12	Female, masticatory edge of mandible,	× 180
Fig. 13	Female, 4th foot,	× 95
Fig. 14	Female, abdomen,	× 95
Fig. 15	Female, 2nd antenna,	× 95
Fig. 16	Female,	× 52



Pl. 16.

Figs. 1-10 *Actideus armatus*

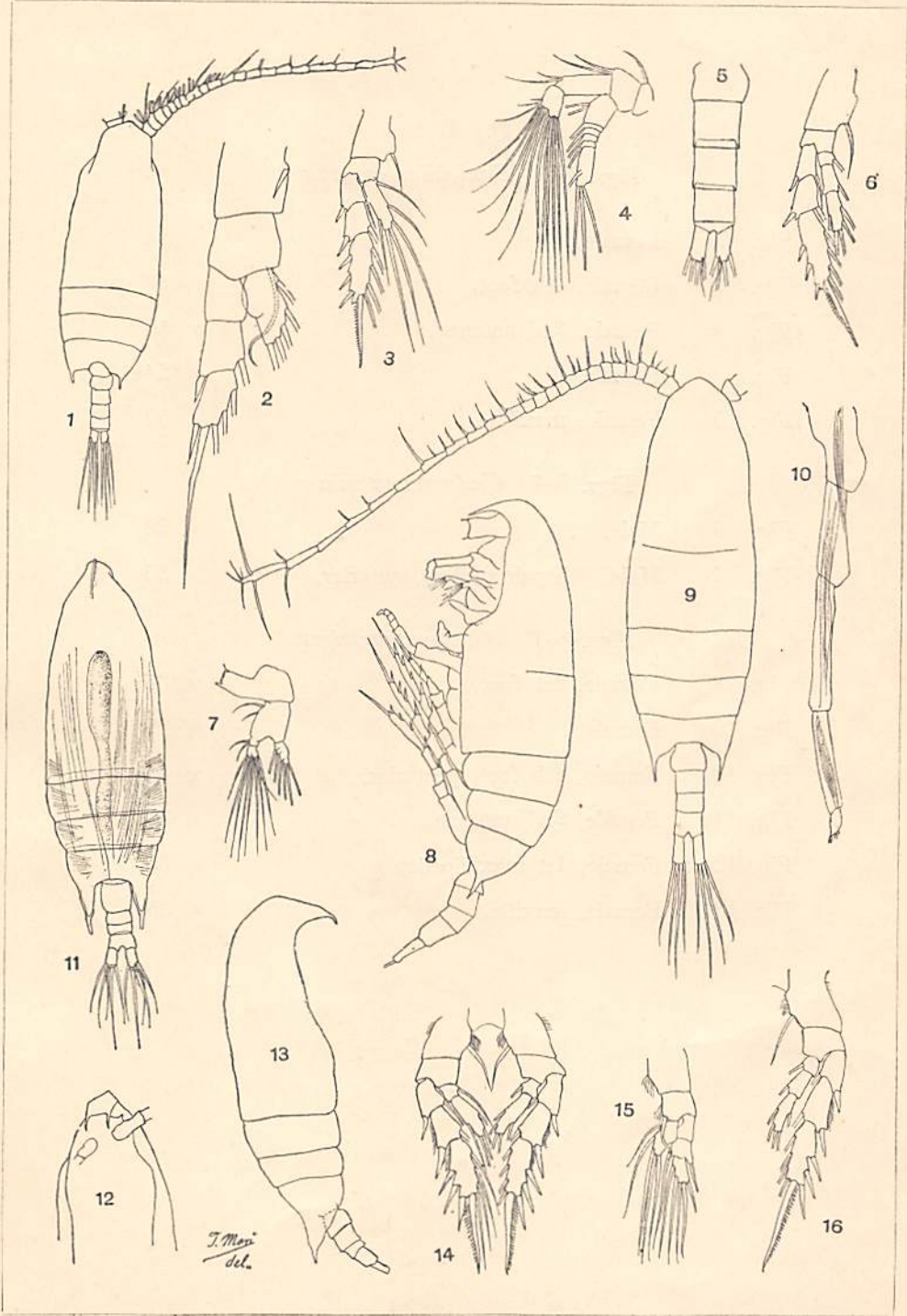
Fig. 1	Female,	× 35
Fig. 2	Female, 1st foot,	× 125
Fig. 3	Female, 2nd foot,	× 55
Fig. 4	Female, 2nd antenna,	× 55
Fig. 5	Male, abdomen,	× 95
Fig. 6	Female, 4th foot,	× 55
Fig. 7	Female, mandible,	× 55
Fig. 8	Female,	× 35
Fig. 9	Female,	× 35
Fig. 10	Male, left 5th foot,	× 180

Figs. 11-13 *Actideus giesbrechti*

Fig. 11	Female,	× 35
Fig. 12	Female, head, ventral,	× 35
Fig. 13	Female,	× 35

Figs. 14-15 *Bradyidius armatus*

Fig. 14	Female, 2nd pair of feet,	× 50
Fig. 15	Female, 1st foot,	× 50
Fig. 16	Female, 3rd foot,	× 50



Pl. 17.

Figs. 1-5 *Bradyidius armatus*

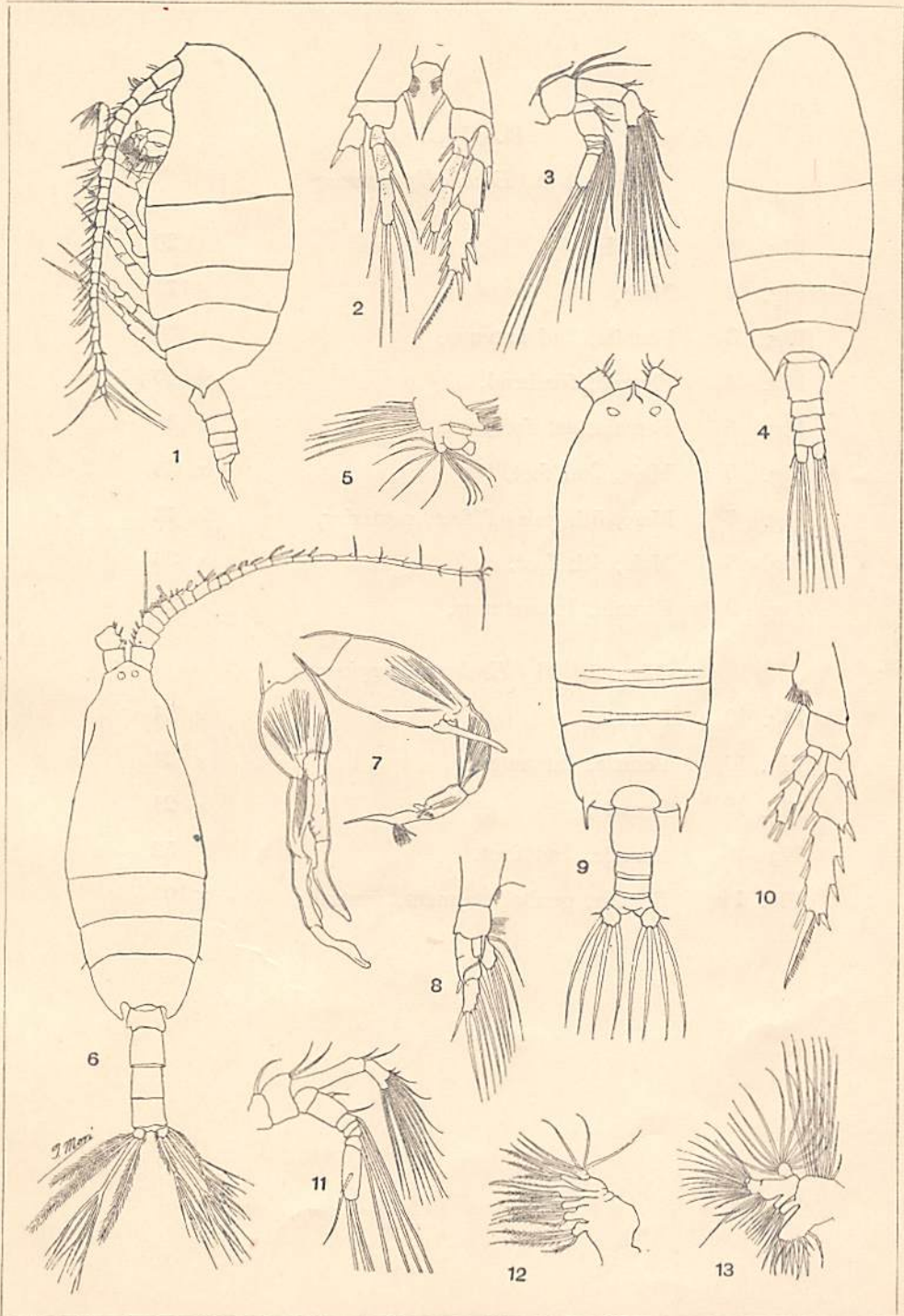
Fig. 1	Female,	× 24
Fig. 2	Female, 4th foot,	× 50
Fig. 3	Female, 2nd antenna,	× 50
Fig. 4	Female,	× 24
Fig. 5	Female, maxilla,	× 50

Figs. 6-7 *Undeuchaeta minor*

Fig. 6	Male,	× 22
Fig. 7	Male, 5th pair of feet, anterior,	× 35

Figs. 8-13 *Gaetanus armiger*

Fig. 8	Female, 1st foot,	× 35
Fig. 9	Female,	× 22
Fig. 10	Female, 4th foot, posterior,	× 35
Fig. 11	Female, 2nd antenna,	× 35
Fig. 12	Female, 1st maxillipede,	× 35
Fig. 13	Female, maxilla,	× 35



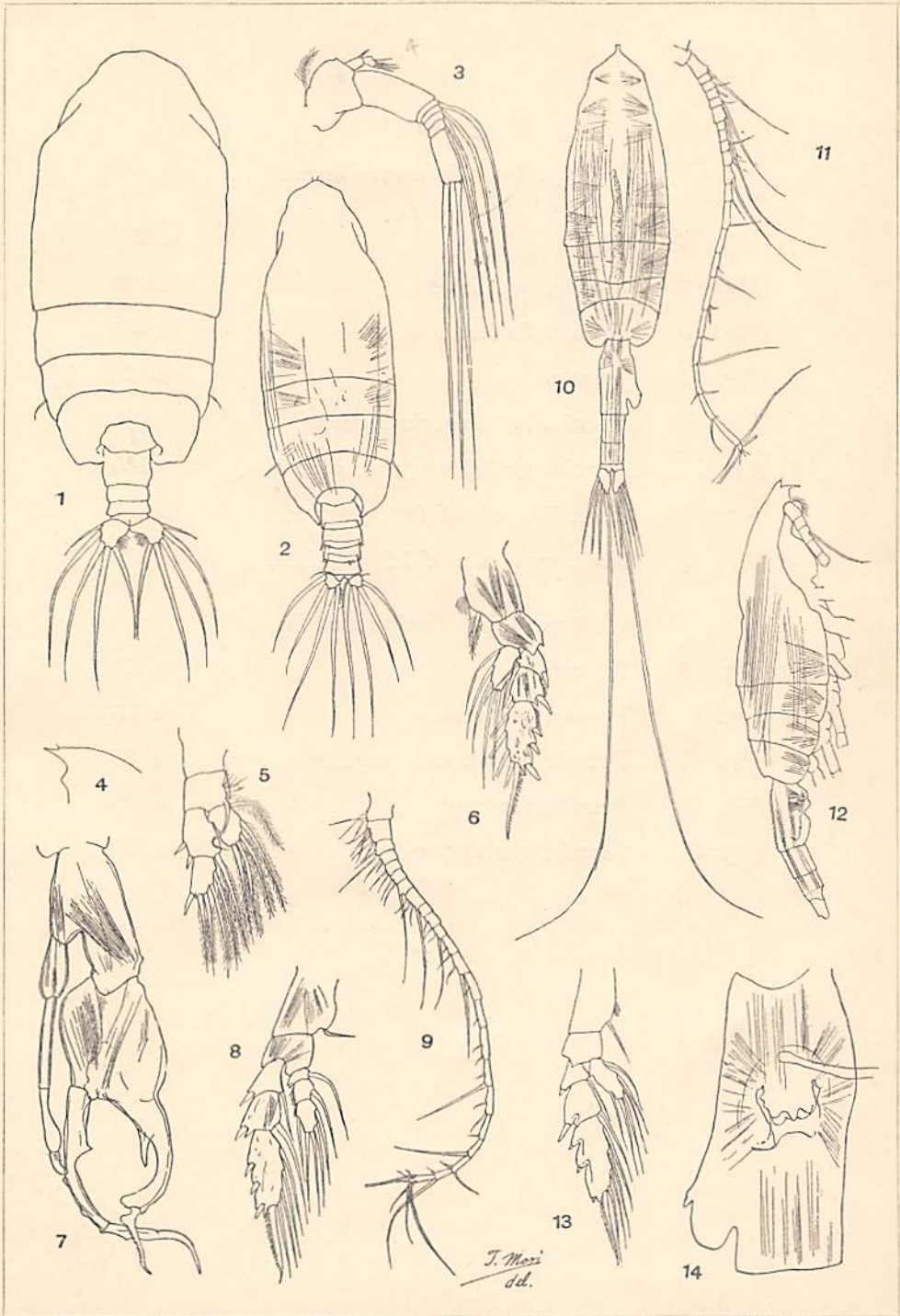
Pl. 18.

Figs. 1-9 *Euchirella amoena*

Fig. 1	Female,	× 20
Fig. 2	Male,	× 17½
Fig. 3	Female, 2nd antenna,	× 35
Fig. 4	Female, forehead,	× 20
Fig. 5	Female, 1st foot,	× 35
Fig. 6	Male, 2nd foot,	× 36
Fig. 7	Male, 5th pair of feet, posterior,	× 43
Fig. 8	Male, 4th foot,	× 36
Fig. 9	Female, 1st antenna,	× 20

Figs. 10-14 *Euchaeta longicornis*

Fig. 10	Female,	× 24
Fig. 11	Female, 1st antenna,	× 24
Fig. 12	Female,	× 24
Fig. 13	Female, 2nd foot,	× 52
Fig. 14	Female, genital segment, ventral,	× 100



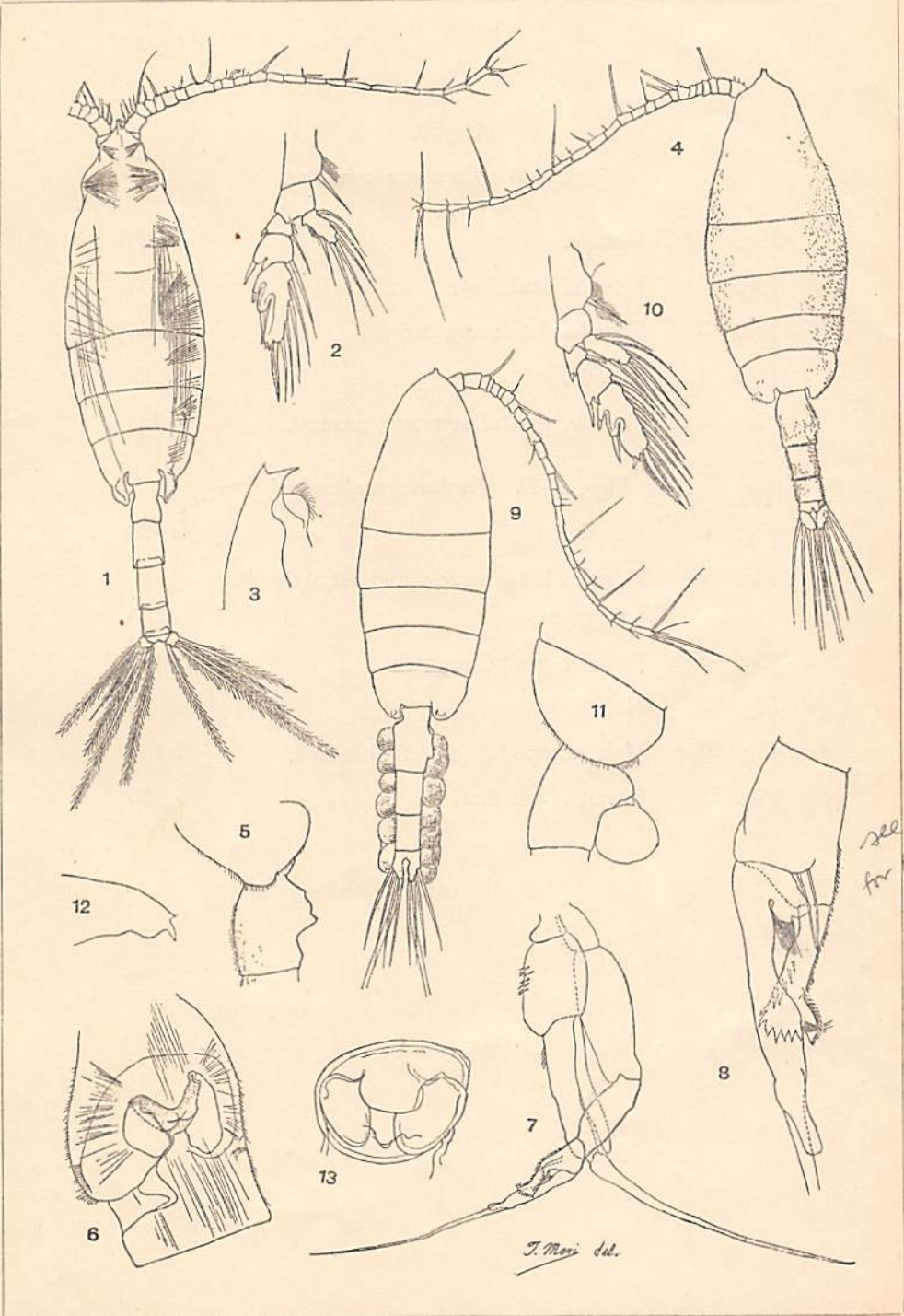
Pl. 19.

Figs. 1-8 *Euchaeta marina*

Fig. 1	Male,	× 23½
Fig. 2	Female, 2nd foot,	× 35
Fig. 3	Female, forehead,	× 35
Fig. 4	Female,	× 20
Fig. 5	Female, last thoracic segment,	× 35
Fig. 6	Female, genital segment, ventral,	× 100
Fig. 7	Male, 5th pair of feet, anterior,	× 35
Fig. 8	Male, exopodite of left 5th foot,	× 120

Figs. 9-13 *Euchaeta media*

Fig. 9	Female,	× 20
Fig. 10	Female, 2nd foot,	× 35
Fig. 11	Female, last thoracic segment,	× 35
Fig. 12	Female, forehead,	× 35
Fig. 13	Female, genital pore,	× 180



see *Hutchinson*
for PS - pl 16 Fig 2

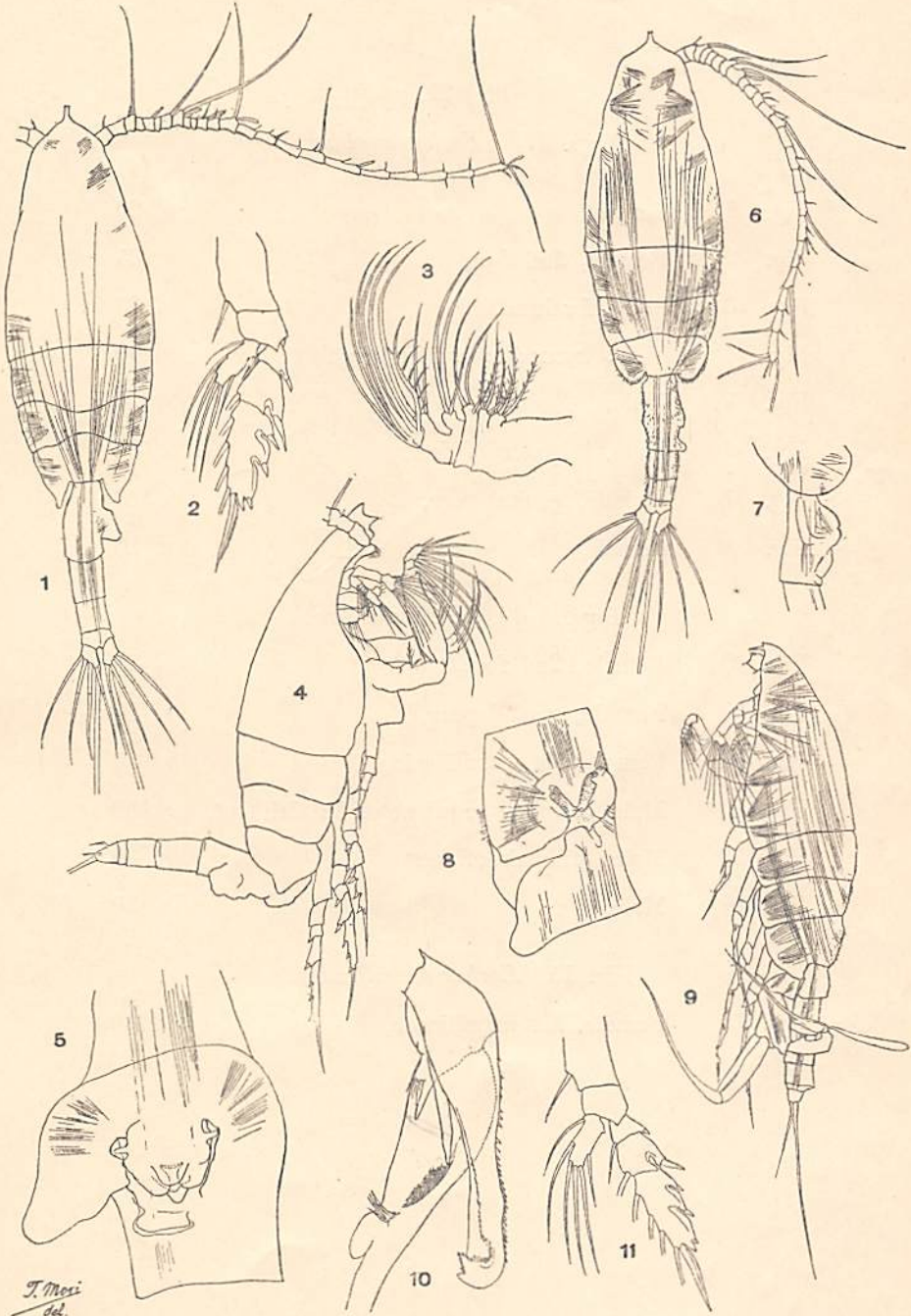
Pl. 20.

Figs. 1-5 *Euchaeta concinna*

Fig. 1	Female,	× 26
Fig. 2	Female, 2nd foot,	× 55
Fig. 3	Female, 1st maxillipede,	× 35
Fig. 4	Female,	× 26
Fig. 5	Female, genital segment, ventral.	× 132½

Figs. 6-11 *Euchaeta wolfendeni*

Fig. 6	Female,	× 26
Fig. 7	Female, last thoracic and 1st abdominal segment,	× 35
Fig. 8	Female, genital segment,	× 100
Fig. 9	Male,	× 26
Fig. 10	Male, exopodite of left 5th foot,	× 180
Fig. 11	Female, 2nd foot,	× 55



Pl. 21.

Figs. 1-8 *Euchaeta plana*

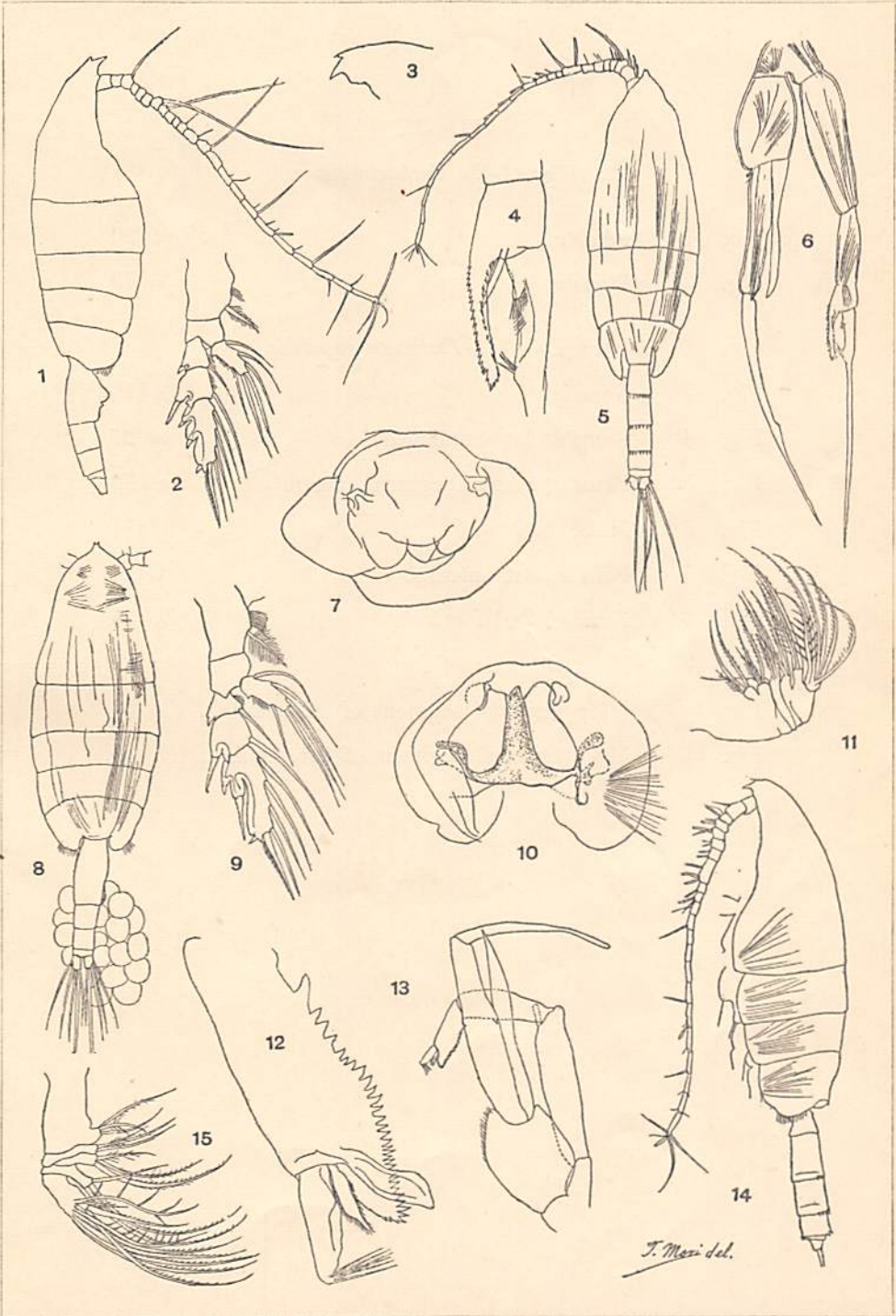
Fig. 1	Female,	× 20
Fig. 2	Female, 2nd foot,	× 35
Fig. 3	Male, forehead,	× 35
Fig. 4	Male, exopodite of left 5th foot,	× 100
Fig. 5	Male,	× 20
Fig. 6	Male, 5th pair of feet,	× 35
Fig. 7	Female, genital pore,	× 180
Fig. 8	Female,	× 20

Figs. 9-14 *Euchaeta flava*

Fig. 9	Female, 2nd foot,	× 35
Fig. 10	Female, genital pore,	× 180
Fig. 11	Female, 1st maxillipede,	× 35
Fig. 12	Male, terminal segment of left 5th foot,	× 180
Fig. 13	Male, 5th pair of feet,	× 35
Fig. 14	Male,	× 20

Fig. 15 *Euchaeta wolfendeni*

Fig. 15	Female, 1st maxillipede,	× 110
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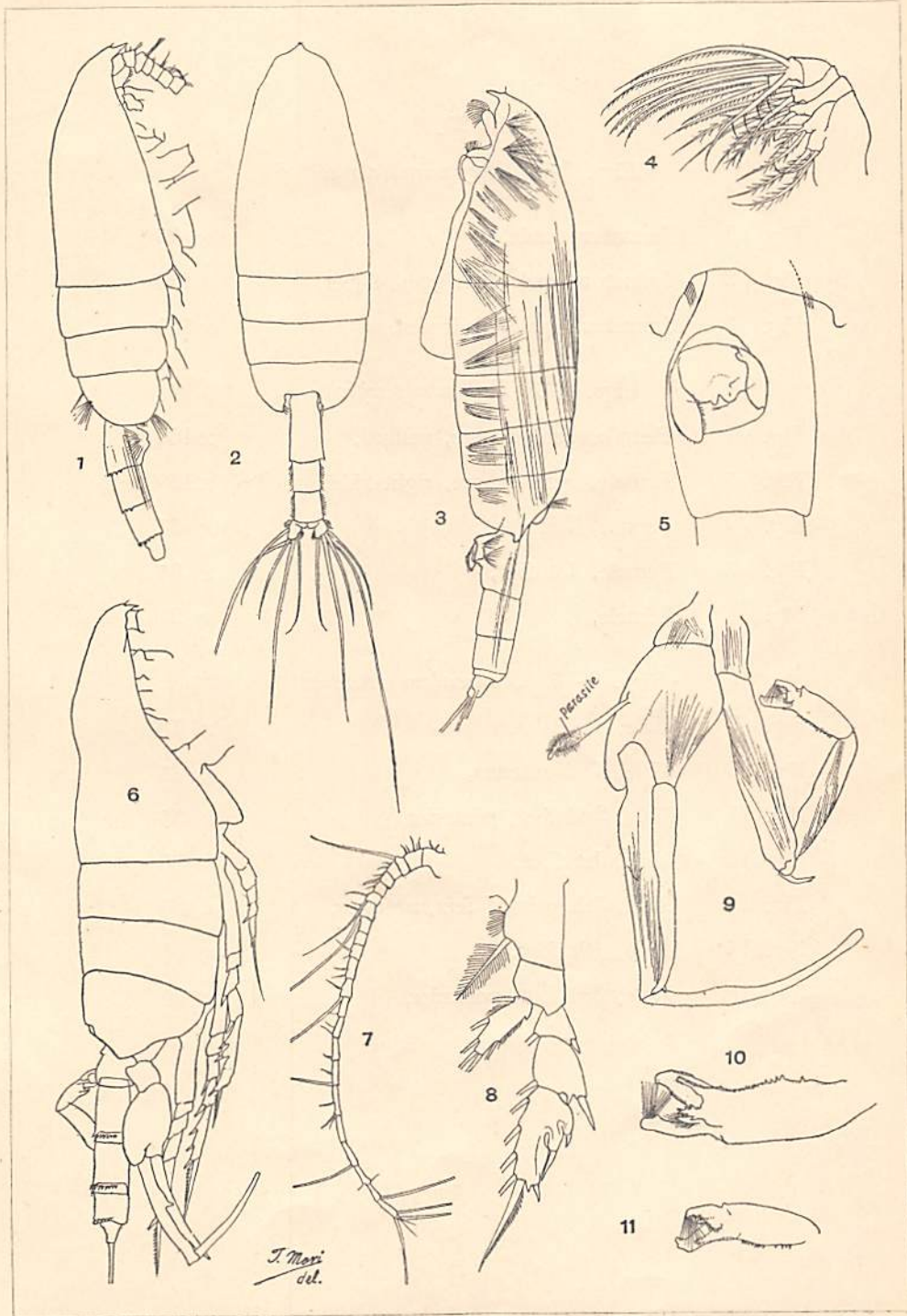
Pl. 22.

Figs. 1-2 *Euchaeta flava*

Fig. 1	Female,	× 20
Fig. 2	Female,	× 19

Figs. 3-11 *Euchaeta japonica*

Fig. 3	Female,	× 11½
Fig. 4	Female, 1st maxillipede,	× 25
Fig. 5	Female, genital segment, ventral,	× 35
Fig. 6	Male,	× 11
Fig. 7	Female, 1st antenna,	× 11½
Fig. 8	Female, 2nd foot,	× 25
Fig. 9	Male, 5th pair of feet,	× 25
Fig. 10	Male, terminal segment of left 5th foot,	× 55
Fig. 11	Male, terminal segment of left 5th foot,	× 35



Pl. 23.

Figs. 1-3 *Mecynocera clausi*

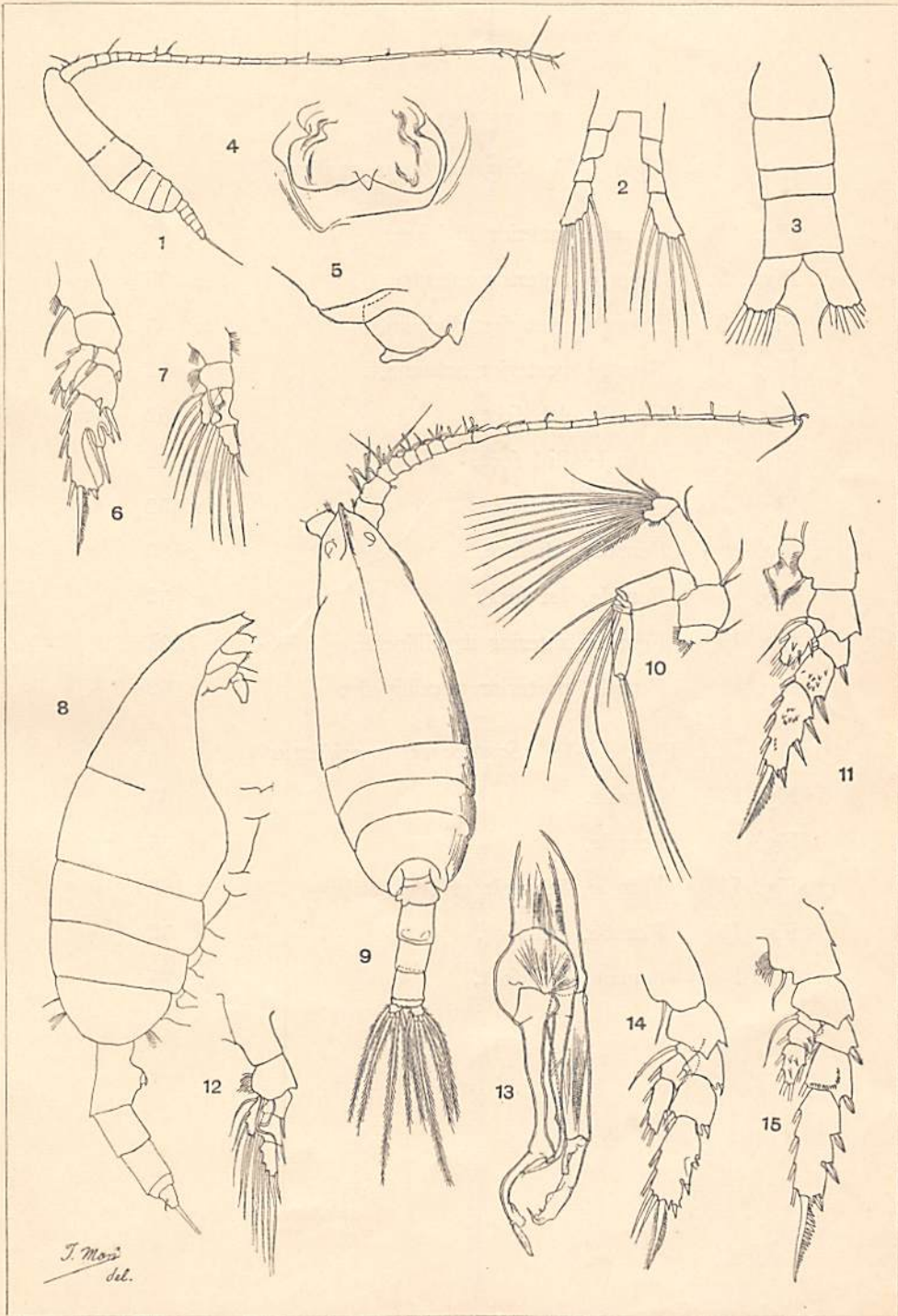
Fig. 1	Immature male,	× 35
Fig. 2	Immature male, 5th pair of feet,	× 180
Fig. 3	Immature male, abdomen,	× 180

Figs. 4-8 *Euchaeta pacifica*

Fig. 4	Female, genital pore, ventral,	× 180
Fig. 5	Female, genital pore, right side,	× 180
Fig. 6	Female, 2nd foot,	× 35
Fig. 7	Female, 1st foot,	× 35
Fig. 8	Female,	× 24

Figs. 9-15 *Scottocalanus helenae*

Fig. 9	Male,	× 18
Fig. 10	Male, 2nd antenna,	× 35
Fig. 11	Male, 2nd foot, posterior,	× 35
Fig. 12	Male, 1st foot,	× 35
Fig. 13	Male, 5th pair of feet, anterior,	× 35
Fig. 14	Male, 4th foot,	× 35
Fig. 15	Male, 3rd foot, posterior,	× 35



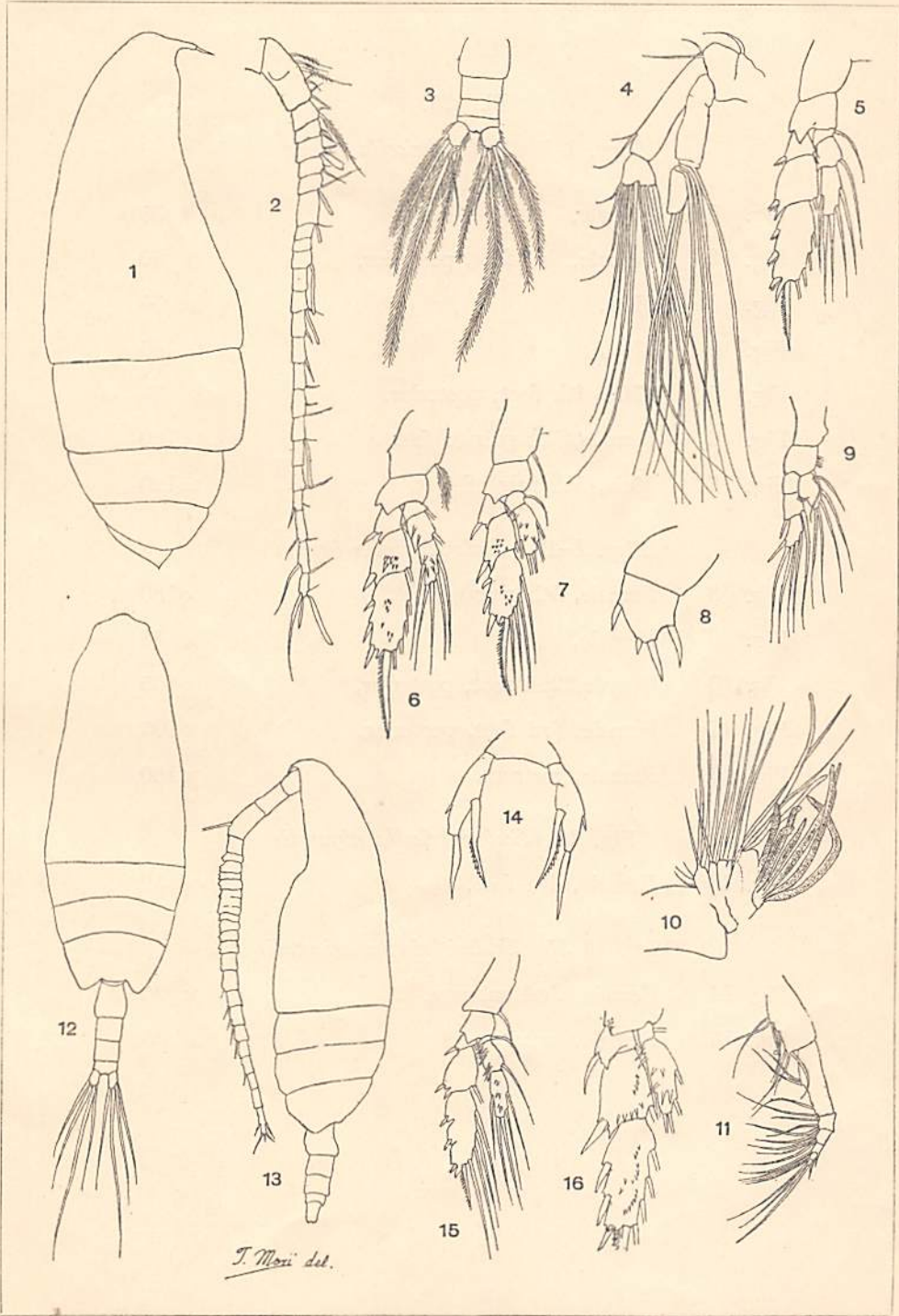
Pl. 24.

Figs. 1-11 *Scaphocalanus pacificus*

Fig. 1	Female, anterior division,	× 35
Fig. 2	Female, anterior antenna,	× 35
Fig. 3	Female, posterior division,	× 35
Fig. 4	Female, posterior antenna,	× 52
Fig. 5	Female, 4th foot,	× 52
Fig. 6	Female, 3rd foot,	× 52
Fig. 7	Female, 2nd foot,	× 52
Fig. 8	Female, 5th foot,	× 180
Fig. 9	Female, 1st foot,	× 52
Fig. 10	Female, anterior maxillipede,	× 122½
Fig. 11	Female, posterior maxillipede,	× 52

Figs. 12-16 *Scaphocalanus echinatus*

Fig. 12	Female,	× 35
Fig. 13	Female,	× 35
Fig. 14	Female, 5th pair of feet,	× 180
Fig. 15	Female, 4th foot,	× 52
Fig. 16	Female, 2nd foot,	× 95



Pl. 25.

Figs. 1-7 *Scolecithricella minor*

Fig. 1	Female,	× 35
Fig. 2	Female, 3rd foot, posterior,	× 55
Fig. 3	Male,	× 35
Fig. 4	Male,	× 35
Fig. 5	Male, 4th foot, posterior,	× 55
Fig. 6	Female, 5th pair of feet,	× 180
Fig. 7	Male, 5th pair of feet,	× 120

Figs. 8-12 *Scolecithricella bradyi*

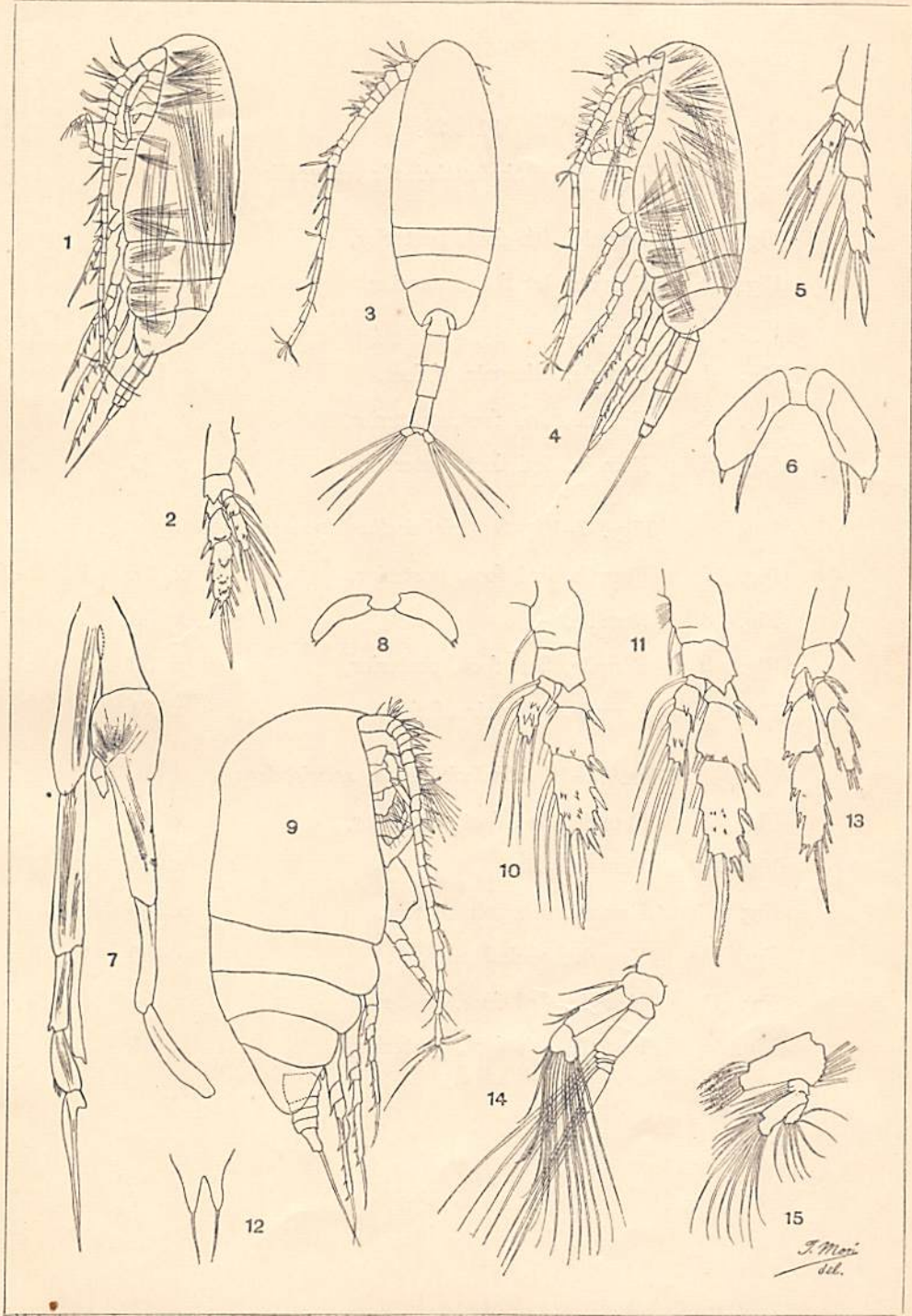
Fig. 8	Female, 5th pair of feet,	× 180
Fig. 9	Female,	× 55
Fig. 10	Female, 2nd foot, posterior,	× 105
Fig. 11	Female, 3rd foot, posterior,	× 105
Fig. 12	Female, rostrum,	× 180

Fig. 13 *Scolecithricella abyssalis*

Fig. 13	Female, 4th foot,	× 52
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Figs. 14-15 *Scolecithricella orientalis*

Fig. 14	Female, 2nd antenna,	× 95
Fig. 15	Female, maxilla,	× 95



Pl. 26.

Figs. 1-6 *Scolecithricella orientalis*

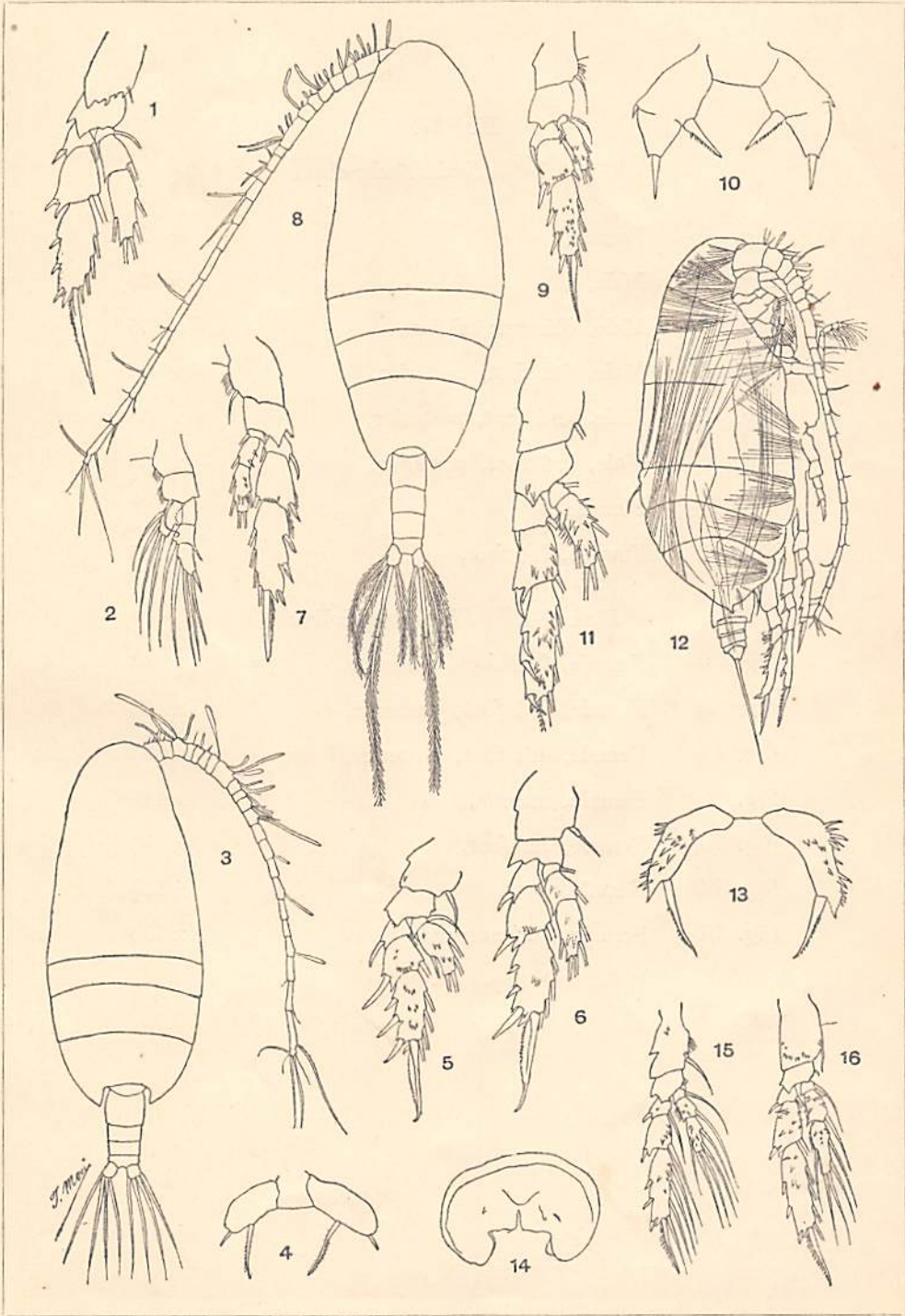
Fig. 1	Female, 4th foot, posterior,	× 95
Fig. 2	Female, 1st foot, anterior,	× 95
Fig. 3	Female,	× 55
Fig. 4	Female, 5th pair of feet,	× 180
Fig. 5	Female, 2nd foot, posterior,	× 95
Fig. 6	Female, 3rd foot, anterior,	× 95

Figs. 7-10 *Scolecithricella abyssalis*

Fig. 7	Female, 3rd foot, posterior,	× 52
Fig. 8	Female,	× 35
Fig. 9	Female, 2nd foot, posterior,	× 52
Fig. 10	Female, 5th pair of feet,	× 121

Figs. 11-16 *Scolecithricella spinipedata*

Fig. 11	Female, 2nd foot, posterior,	× 95
Fig. 12	Female,	× 35
Fig. 13	Female, 5th pair of feet,	× 180
Fig. 14	Female, genital pore,	× 180
Fig. 15	Female, 3rd foot, posterior,	× 55
Fig. 16	Female, 4th foot, posterior,	× 55



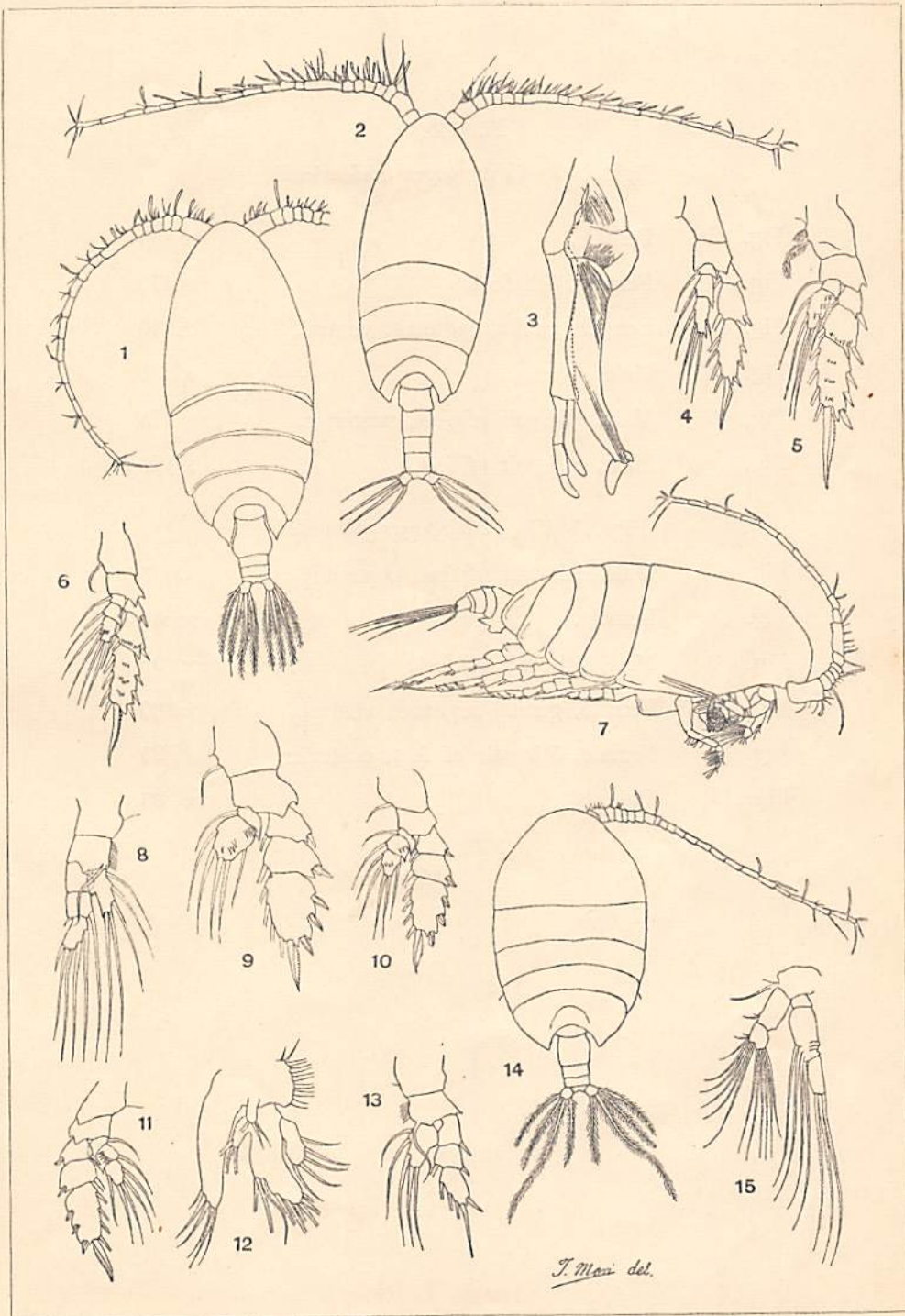
Pl. 27.

Figs. 1-8 *Scolecithrix danae*

Fig. 1	Female,	× 26
Fig. 2	Male,	× 25
Fig. 3	Male, 5th pair of feet,	× 55
Fig. 4	Male, 4th foot, posterior,	× 35
Fig. 5	Male, 2nd foot, posterior,	× 55
Fig. 6	Male, 3rd foot, posterior,	× 35
Fig. 7	Female,	× 26
Fig. 8	Female, 1st foot,	× 105

Figs. 9-15 *Phaenna spinifera*

Fig. 9	Female, 2nd foot, posterior,	× 55
Fig. 10	Female, 3rd foot, posterior,	× 35
Fig. 11	Female, 4th foot, posterior,	× 35
Fig. 12	Female, maxilla,	× 110
Fig. 13	Female, 1st foot,	× 55
Fig. 14	Female,	× 22½
Fig. 15	Female, 2nd antenna,	× 55



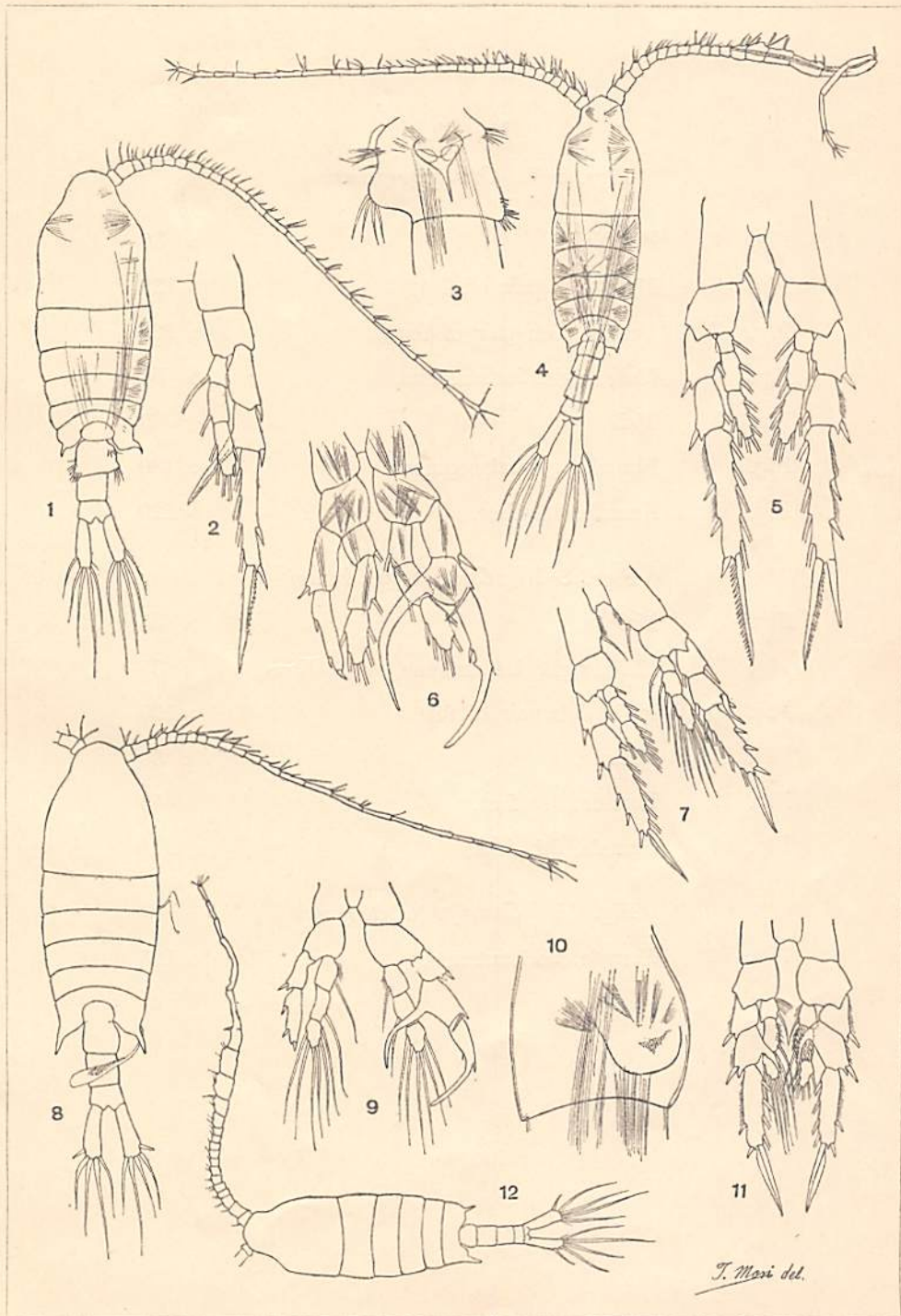
Pl. 28.

Figs. 1-6 *Centropages abdominalis*

Fig. 1	Female,	× 35
Fig. 2	Female, 5th foot,	× 110
Fig. 3	Female, genital segment, ventral,	× 110
Fig. 4	Male,	× 35
Fig. 5	Male, 4th pair of feet, posterior,	× 115
Fig. 6	Male, 5th pair of feet,	× 115

Figs. 7-12 *Centropages yamadai*

Fig. 7	Male, 4th pair of feet, posterior,	× 95
Fig. 8	Female,	× 35
Fig. 9	Male, 5th pair of feet,	× 95
Fig. 10	Female, genital segment, ventral,	× 180
Fig. 11	Female, 5th pair of feet, posterior,	× 95
Fig. 12	Male,	× 35



Pl. 29.

Figs. 1-7 *Centropages orsinii*

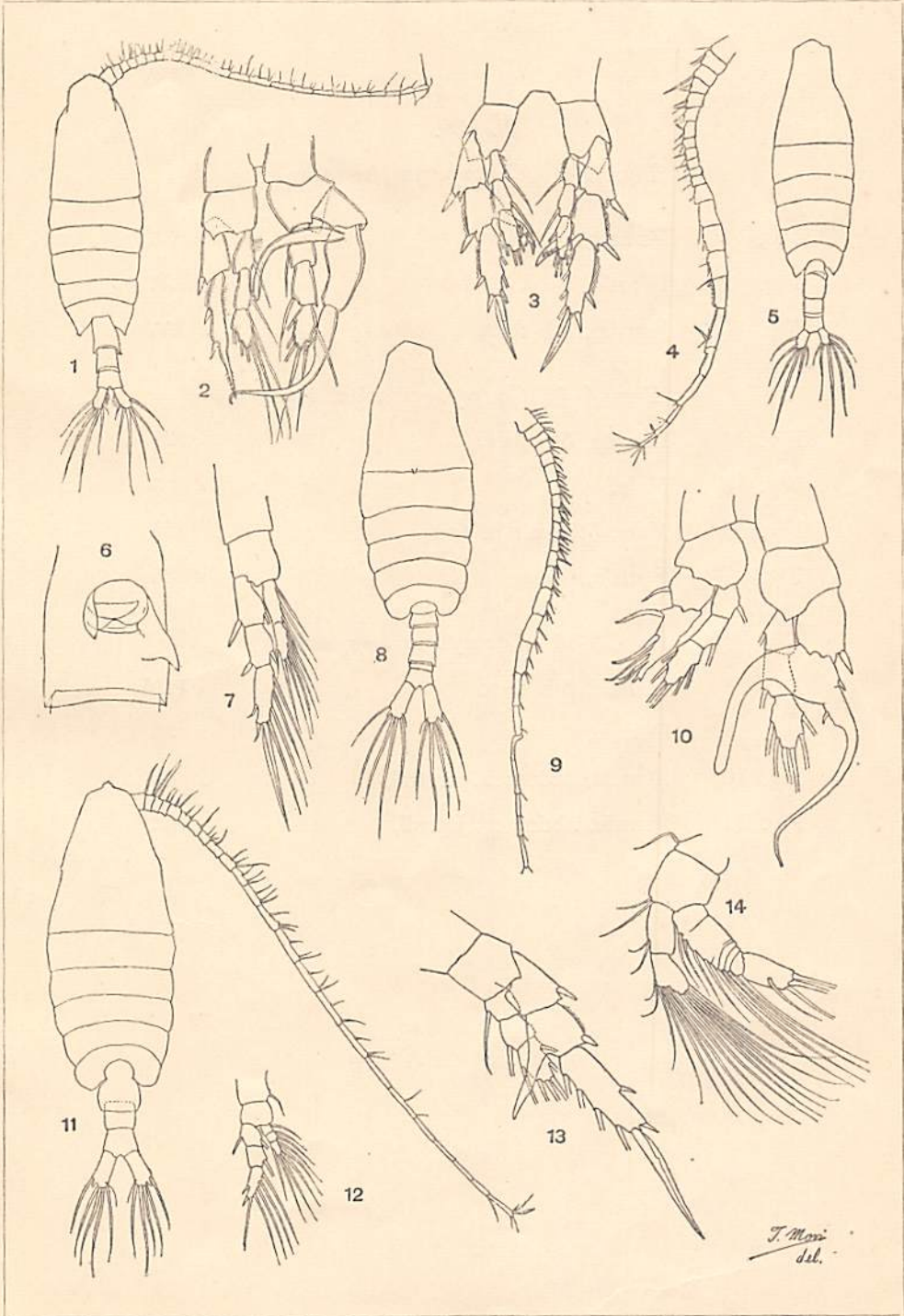
Fig. 1	Female,	× 35
Fig. 2	Male, 5th pair of feet,	× 120
Fig. 3	Female, 5th pair of feet,	× 120
Fig. 4	Male, right 1st antenna,	× 52
Fig. 5	Male,	× 35
Fig. 6	Female, genital segment,	× 180
Fig. 7	Female, 1st foot,	× 120

Figs. 8-13 *Centropages bradyi*

Fig. 8	Male,	× 35
Fig. 9	Male, right 1st antenna,	× 35
Fig. 10	Male, 5th pair of feet,	× 125
Fig. 11	Female,	× 35
Fig. 12	Female, 1st foot,	× 55
Fig. 13	Female, 5th foot,	× 127½

Fig. 14 *Centropages elongatus*

Fig. 14	Female, 2nd antenna,	× 105
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Pl. 30.

Figs. 1-3 *Centropages elongatus*

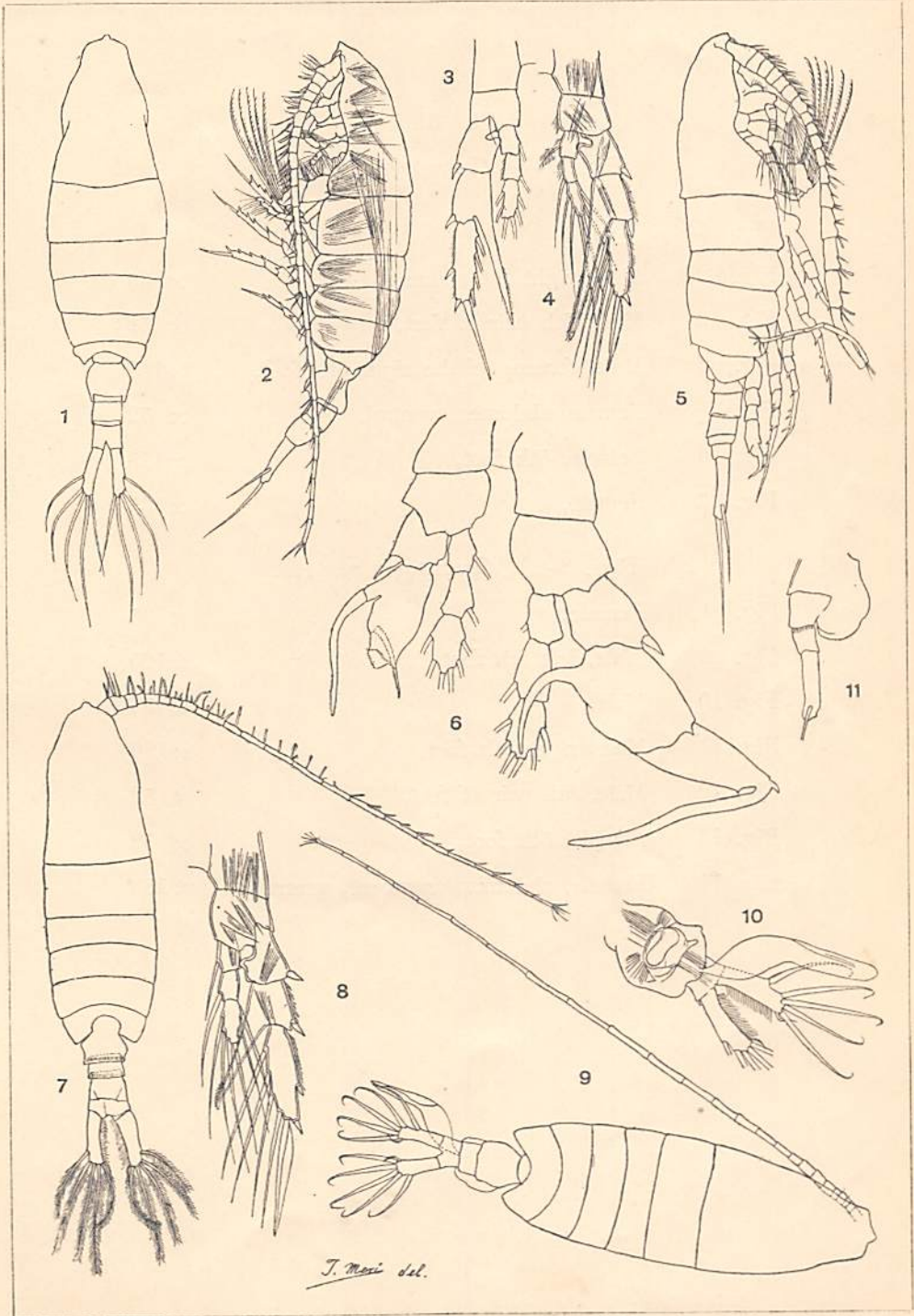
Fig. 1	Female,	× 35
Fig. 2	Female,	× 35
Fig. 3	Female, 5th foot,	× 105

Figs. 4-7 *Centropages calaninus*

Fig. 4	Female, 5th foot,	× 92½
Fig. 5	Male,	× 35
Fig. 6	Male, 5th pair of feet,	× 132½
Fig. 7	Female,	× 35

Figs. 8-11 *Centropages longicornis*

Fig. 8	Female, 5th foot,	× 110
Fig. 9	Female,	× 35
Fig. 10	Female, abdomen, ventral,	× 52
Fig. 11	Female, abdomen, lateral,	× 52



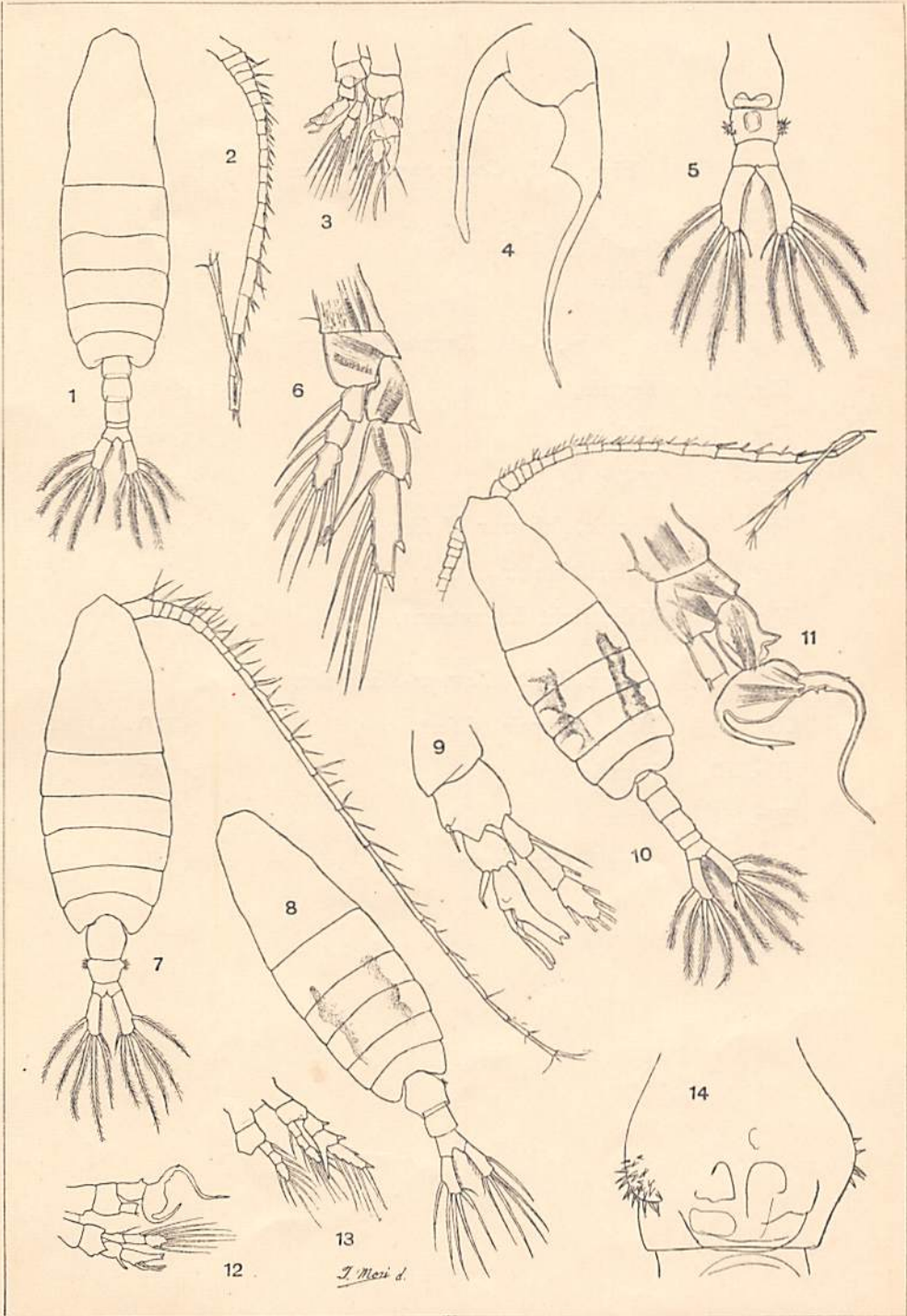
Pl. 31.

Figs. 1-7 *Centropages gracilis*

Fig. 1	Male,	× 35
Fig. 2	Male, right 1st antenna,	× 35
Fig. 3	Male, 5th pair of feet,	× 52
Fig. 4	Male, forceps of the right 5th foot,	× 180
Fig. 5	Female, abdomen, ventral,	× 52
Fig. 6	Female, 5th foot,	× 115
Fig. 7	Female,	× 35

Figs. 8-14 *Centropages violaceus*

Fig. 8	Female,	× 35
Fig. 9	Male, left 5th foot,	× 120
Fig. 10	Male,	× 35
Fig. 11	Male, right 5th foot,	× 120
Fig. 12	Male, 5th pair of feet,	× 52
Fig. 13	Female, 5th foot,	× 52
Fig. 14	Female, abdominal segment, ventral,	× 180



Pl. 32.

Figs. 1-2 *Centropages furcatus*

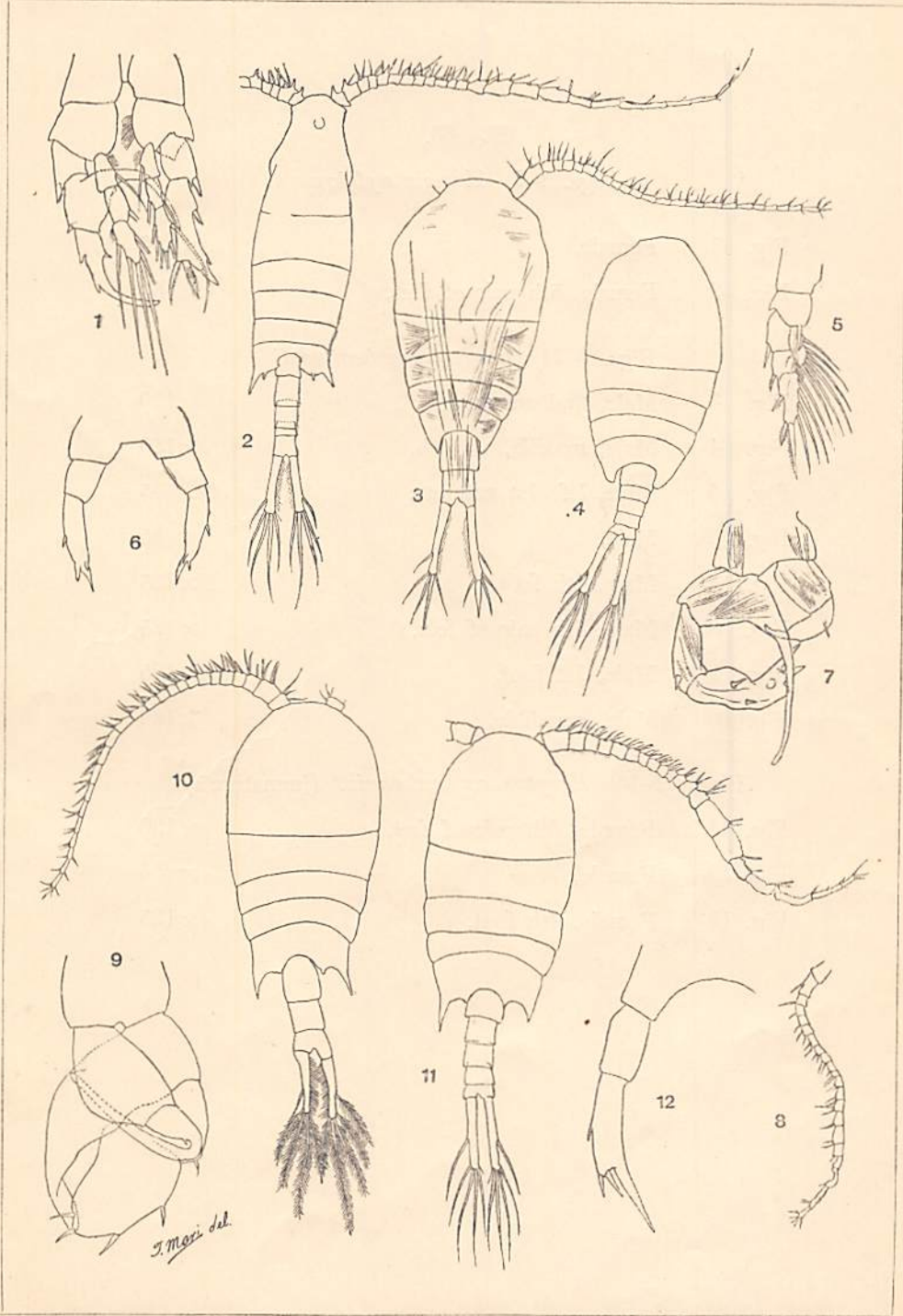
- | | | |
|--------|-------------------------|------|
| Fig. 1 | Male, 5th pair of feet, | × 95 |
| Fig. 2 | Male, | × 35 |

Figs. 3-8 *Temora turbinata*

- | | | |
|--------|---------------------------|-------|
| Fig. 3 | Female, | × 55 |
| Fig. 4 | Male, | × 55 |
| Fig. 5 | Male, 1st foot, | × 95 |
| Fig. 6 | Female, 5th pair of feet, | × 180 |
| Fig. 7 | Male, 5th pair of feet, | × 180 |
| Fig. 8 | Male, right 1st antenna, | × 55 |

Figs. 9-12 *Temora discaudata*

- | | | |
|---------|-------------------------|-------|
| Fig. 9 | Male, 5th pair of feet, | × 110 |
| Fig. 10 | Female, | × 35 |
| Fig. 11 | Male, | × 35 |
| Fig. 12 | Female, 5th foot, | × 180 |



Pl. 33.

Figs. 1-2 *Temora stylifera*

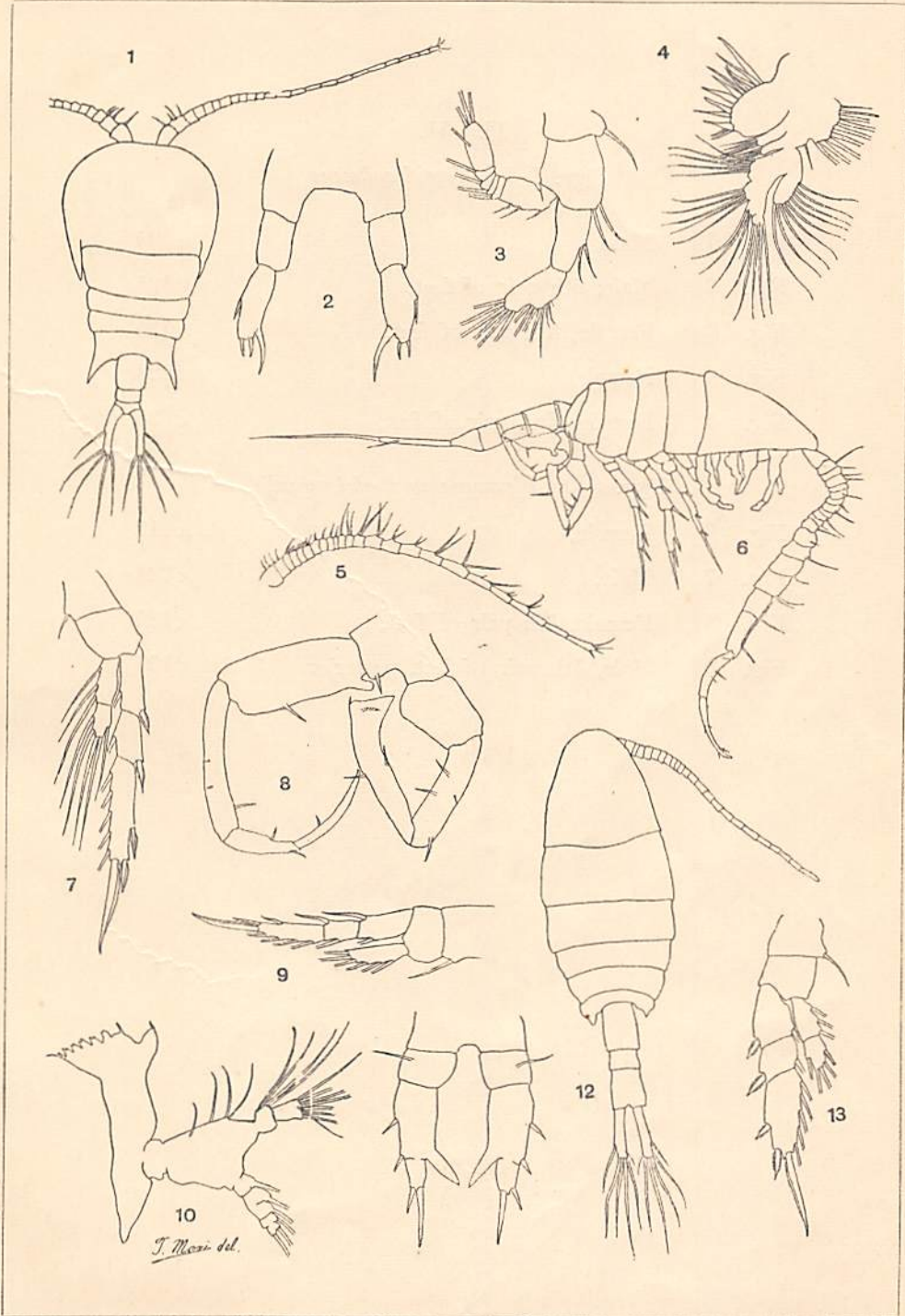
- | | | |
|--------|---------------------------|-------|
| Fig. 1 | Female, | × 36 |
| Fig. 2 | Female, 5th pair of feet, | × 180 |

Figs. 3-11 *Eurytemora herdmanii*

- | | | |
|---------|-------------------------|-------|
| Fig. 3 | Male, 2nd antenna, | × 180 |
| Fig. 4 | Male, maxilla, | × 180 |
| Fig. 5 | Male, left 1st antenna, | × 55 |
| Fig. 6 | Male, | × 55 |
| Fig. 7 | Male, 4th foot, | × 125 |
| Fig. 8 | Male, 5th pair of feet, | × 125 |
| Fig. 9 | Male, 1st foot, | × 125 |
| Fig. 10 | Male, mandible, | × 180 |

Figs. 11-13 *Eurytemora herdmanii*? (immature?)

- | | | |
|---------|---------------------------|-------|
| Fig. 11 | Female, 5th pair of feet, | × 180 |
| Fig. 12 | Female, | × 55 |
| Fig. 13 | Female, 4th foot, | × 125 |



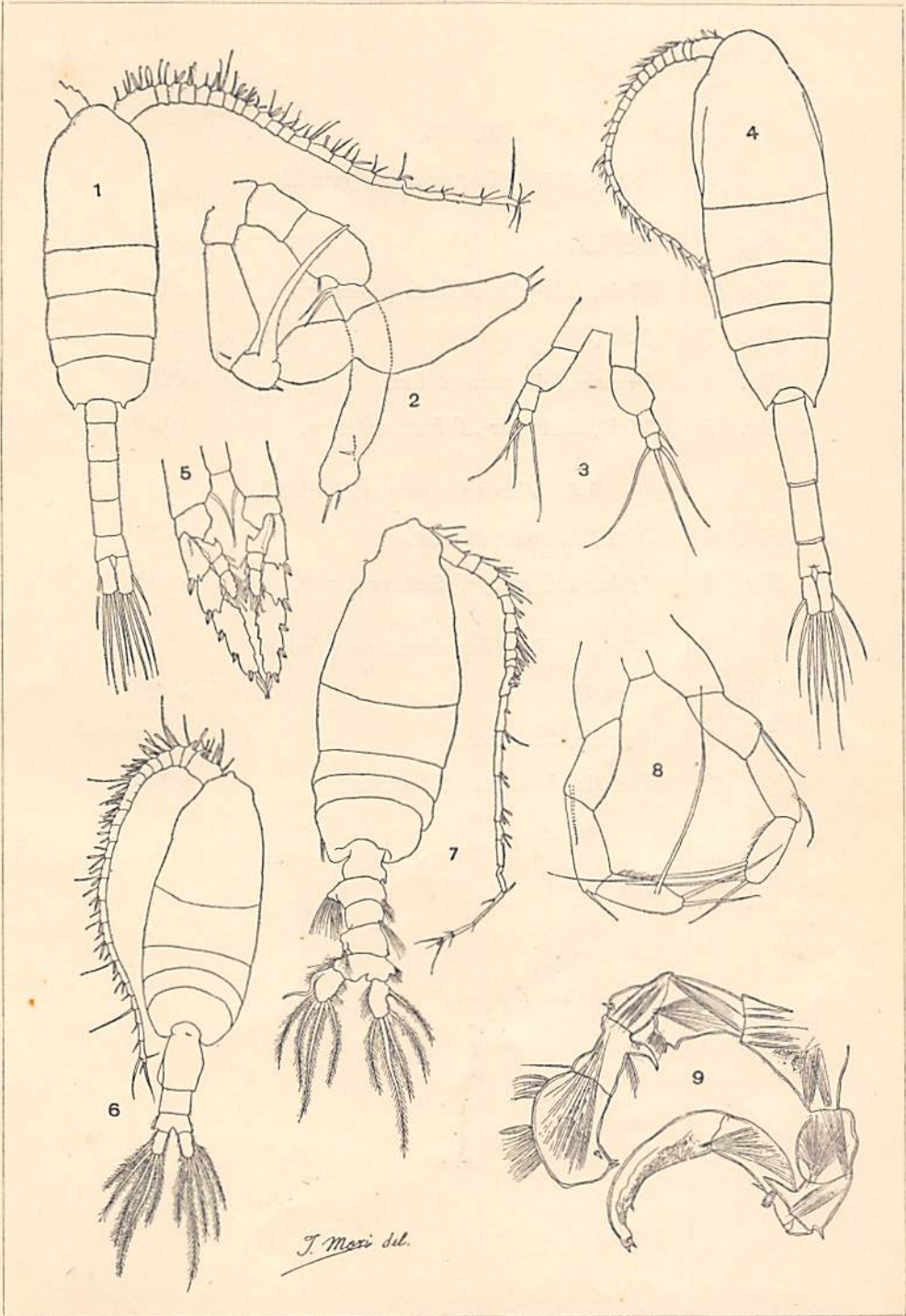
Pl. 34.

Figs. 1-5 *Metridia lucens*

Fig. 1	Male,	× 35
Fig. 2	Male, 5th pair of feet,	× 125
Fig. 3	Female, 5th pair of feet,	× 125
Fig. 4	Female,	× 22½
Fig. 5	Female, 2nd pair of feet,	× 35

Figs. 6-9 *Pleuromamma abdominalis*

Fig. 6	Female,	× 19
Fig. 7	Male,	× 22½
Fig. 8	Female, 5th pair of feet,	× 180
Fig. 9	Male, 5th pair of feet, posterior,	× 105



Pl. 35.

Figs. 1-5 *Pleuromamma gracilis*

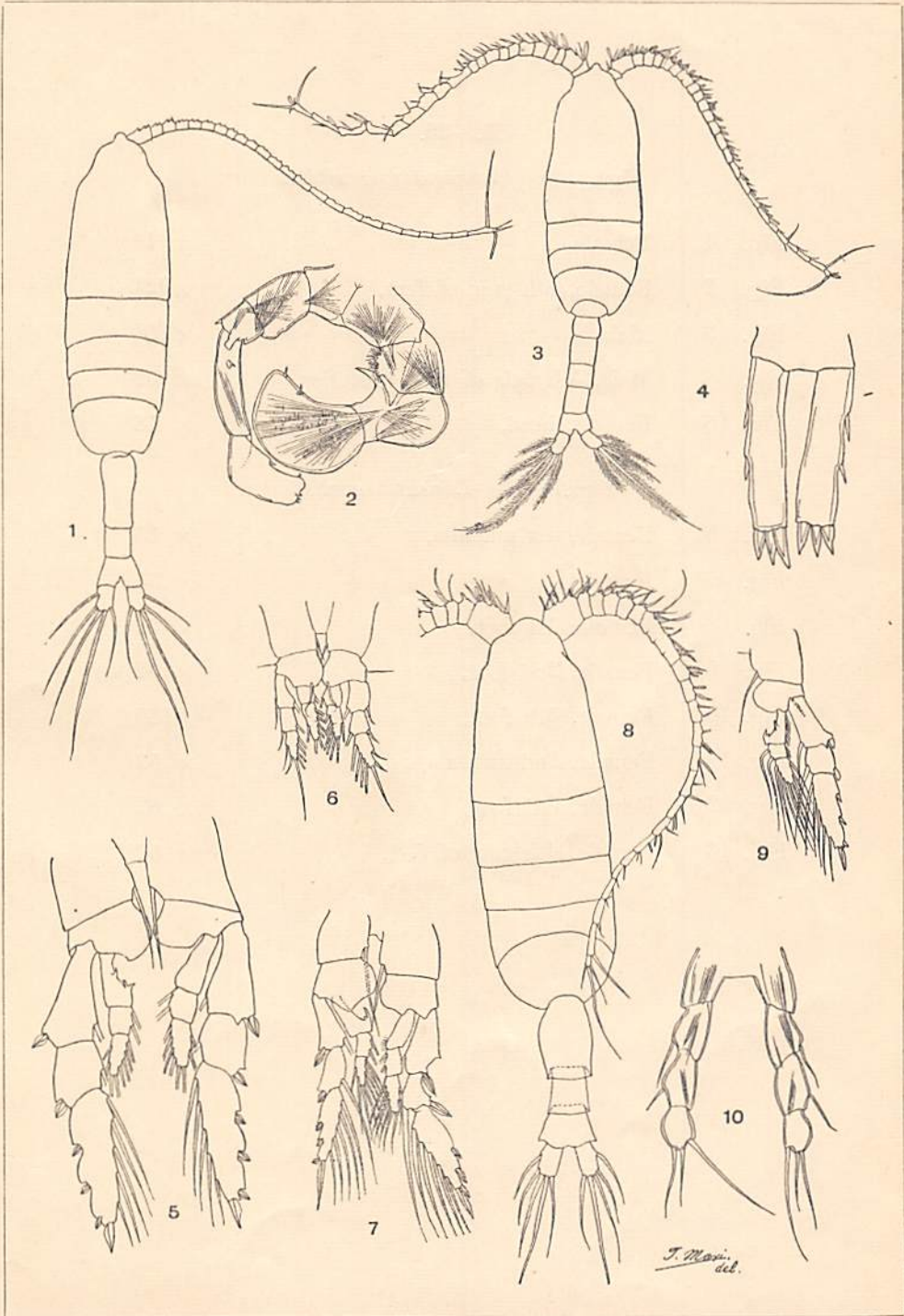
Fig. 1	Female,	× 35
Fig. 2	Male, 5th pair of feet, posterior,	× 115
Fig. 3	Male,	× 35
Fig. 4	Female, 5th pair of feet,	× 180
Fig. 5	Male, 2nd pair of feet, anterior,	× 120

Figs. 6-7 *Pleuromamma abdominalis*

Fig. 6	Male, 1st pair of feet,	× 35
Fig. 7	Male, 2nd pair of feet, posterior,	× 35

Figs. 8-10 *Pleuromamma robusta*

Fig. 8	Female,	× 26
Fig. 9	Female, 2nd foot,	× 36
Fig. 10	Female, 5th pair of feet,	× 130



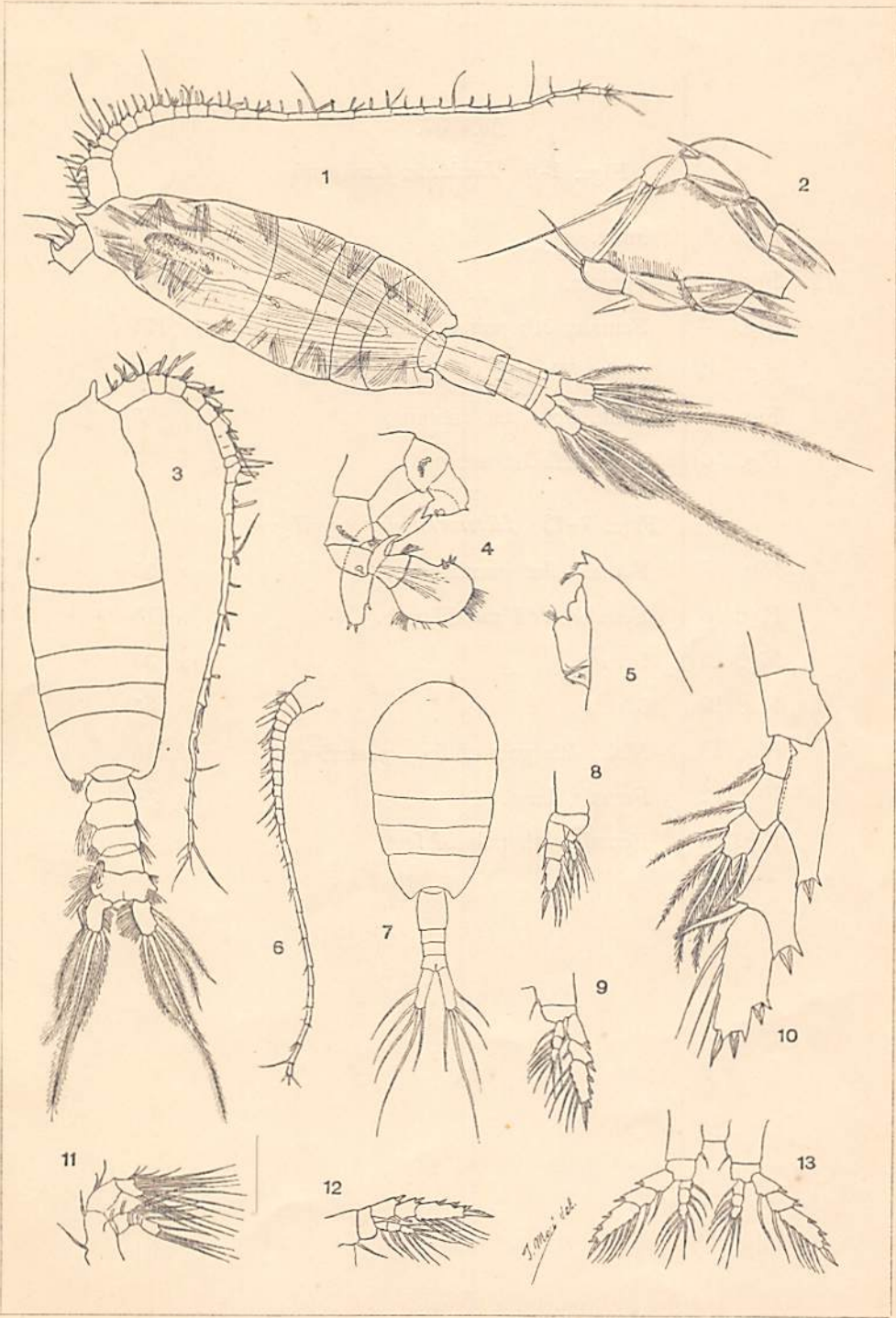
Pl. 36.

Figs. 1-5 *Pleuromamma xiphias*

Fig. 1	Female,	× 18
Fig. 2	Female, 5th pair of feet,	× 92½
Fig. 3	Male,	× 18½
Fig. 4	Male, 5th pair of feet, posterior,	× 52
Fig. 5	Female, head,	× 18

Figs. 6-13 *Lucicutia ovalis*

Fig. 6	Female, 1st antenna,	× 35
Fig. 7	Female,	× 35
Fig. 8	Female, 1st foot,	× 52
Fig. 9	Female, 2nd foot,	× 52
Fig. 10	Female, 5th foot,	× 180
Fig. 11	Female, 2nd antenna,	× 52
Fig. 12	Female, 3rd foot,	× 52
Fig. 13	Female, 4th pair of feet,	× 52



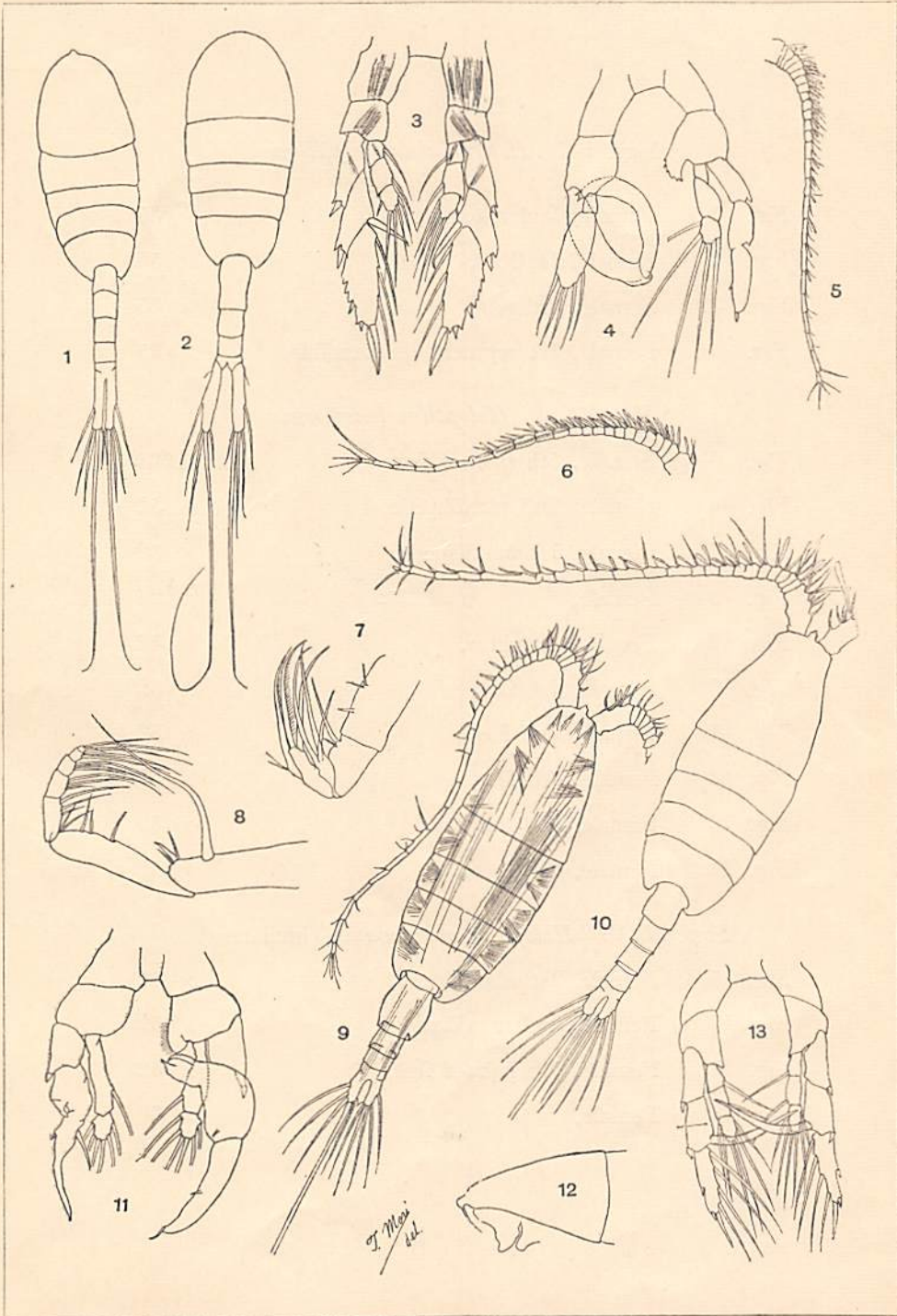
Pl. 37.

Figs. 1-6 *Lucicutia flavicornis*

Fig. 1	Male,	× 35
Fig. 2	Female,	× 35
Fig. 3	Female, 5th pair of feet,	× 121
Fig. 4	Male, 5th pair of feet, anterior,	× 115
Fig. 5	Male, right 1st antenna,	× 35
Fig. 6	Male, left 1st antenna,	× 35

Figs. 7-13 *Heterorhabdus papilliger*

Fig. 7	Female, 1st maxillipede,	× 55
Fig. 8	Female, 2nd maxillipede,	× 115
Fig. 9	Female,	× 35
Fig. 10	Male,	× 35
Fig. 11	Male, 5th pair of feet, posterior,	× 115
Fig. 12	Female, head,	× 35
Fig. 13	Female, 5th pair of feet,	× 95



Pl. 38.

Figs. 1-4 *Heterorhabdus papilliger*

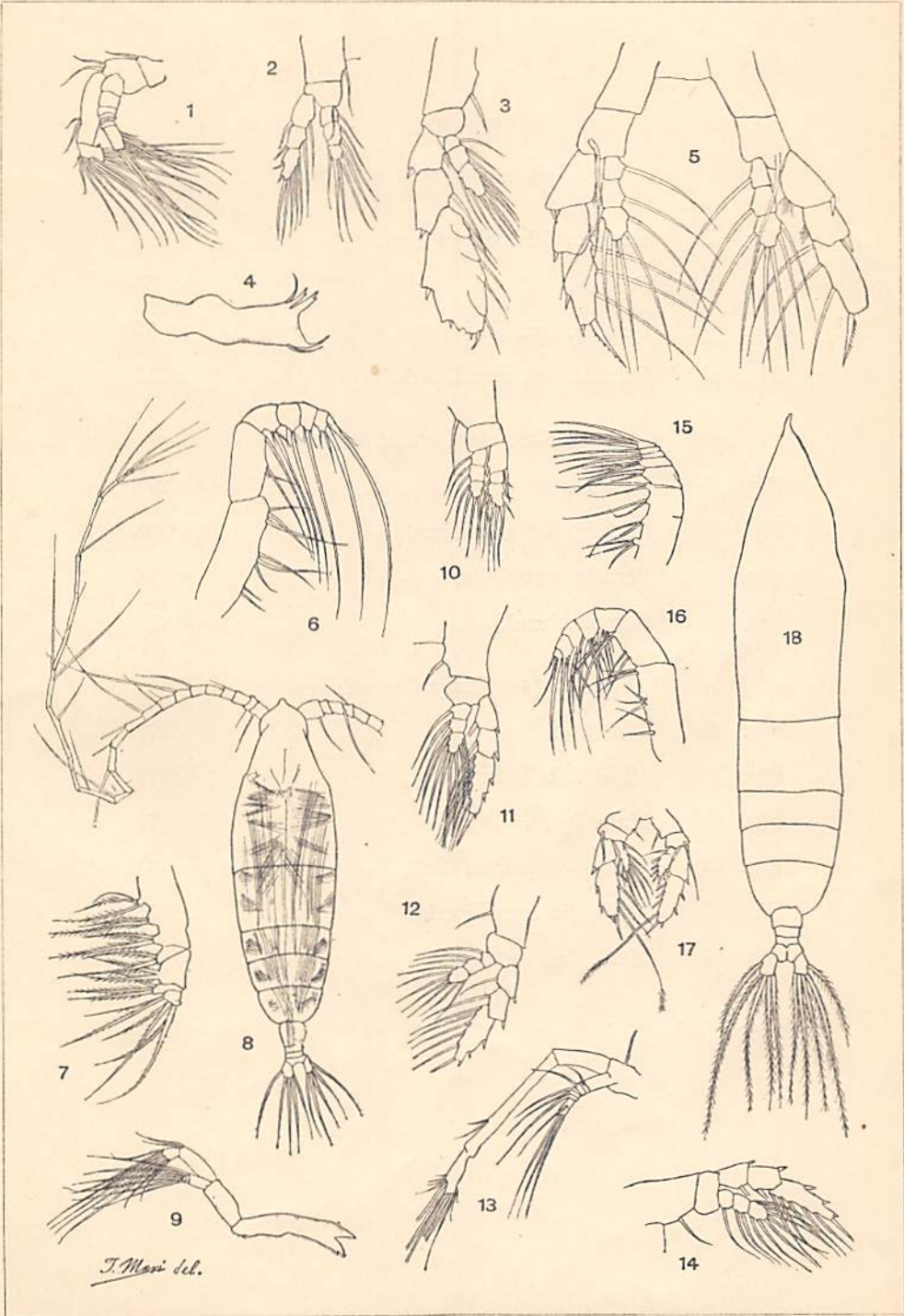
Fig. 1	Female, 2nd antenna,	× 55
Fig. 2	Female, 1st foot,	× 55
Fig. 3	Female, 3rd foot,	× 55
Fig. 4	Female, 1st segment of mandible,	× 95

Figs. 5-14 *Haloptilus longicornis*

Fig. 5	Female, 5th pair of feet,	× 122½
Fig. 6	Female, 2nd maxillipede,	× 52
Fig. 7	Female, 1st maxillipede,	× 52
Fig. 8	Female,	× 24
Fig. 9	Female, mandible,	× 52
Fig. 10	Female, 1st foot,	× 52
Fig. 11	Female, 2nd foot,	× 52
Fig. 12	Female, 4th foot,	× 52
Fig. 13	Female, 2nd antenna,	× 52
Fig. 14	Female, 3rd foot,	× 52

Figs. 15-18 *Haloptilus mucronatus* (immature)

Fig. 15	Female, 1st maxillipede,	× 52
Fig. 16	Female, 2nd maxillipede,	× 52
Fig. 17	Female, 5th pair of feet,	× 52
Fig. 18	Female,	× 36



Pl. 39.

Figs. 1-4 *Haloptilus acutifrons*

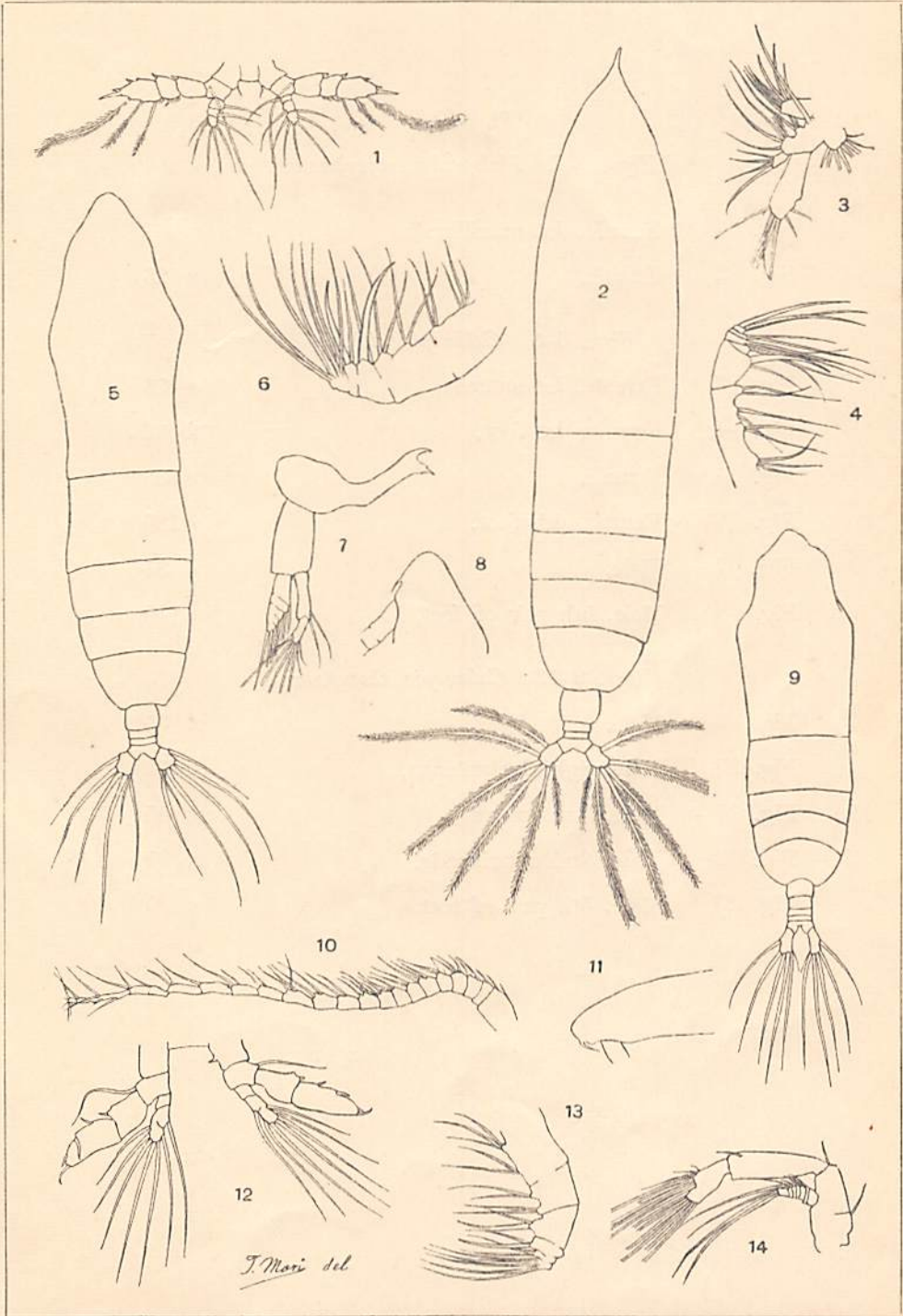
Fig. 1	Female, 5th pair of feet,	$\times 42\frac{1}{2}$
Fig. 2	Female,	$\times 35$
Fig. 3	Female, maxilla,	$\times 52$
Fig. 4	Female, 1st maxillipede,	$\times 52$

Figs. 5-8 *Haloptilus ornatus*

Fig. 5	Female,	$\times 27\frac{1}{2}$
Fig. 6	Female, 1st maxillipede,	$\times 55$
Fig. 7	Female, mandible,	$\times 55$
Fig. 8	Female, head,	$\times 27\frac{1}{2}$

Figs. 9-14 *Haloptilus spiniceps*

Fig. 9	Male,	$\times 27\frac{1}{2}$
Fig. 10	Male, left 1st antenna,	$\times 27\frac{1}{2}$
Fig. 11	Male, head,	$\times 27\frac{1}{2}$
Fig. 12	Male, 5th pair of feet,	$\times 55$
Fig. 13	Male, 1st maxillipede,	$\times 55$
Fig. 14	Male, 2nd antenna,	$\times 35$



Pl. 40.

Figs. 1-2 *Haloptilus oxycephalus*

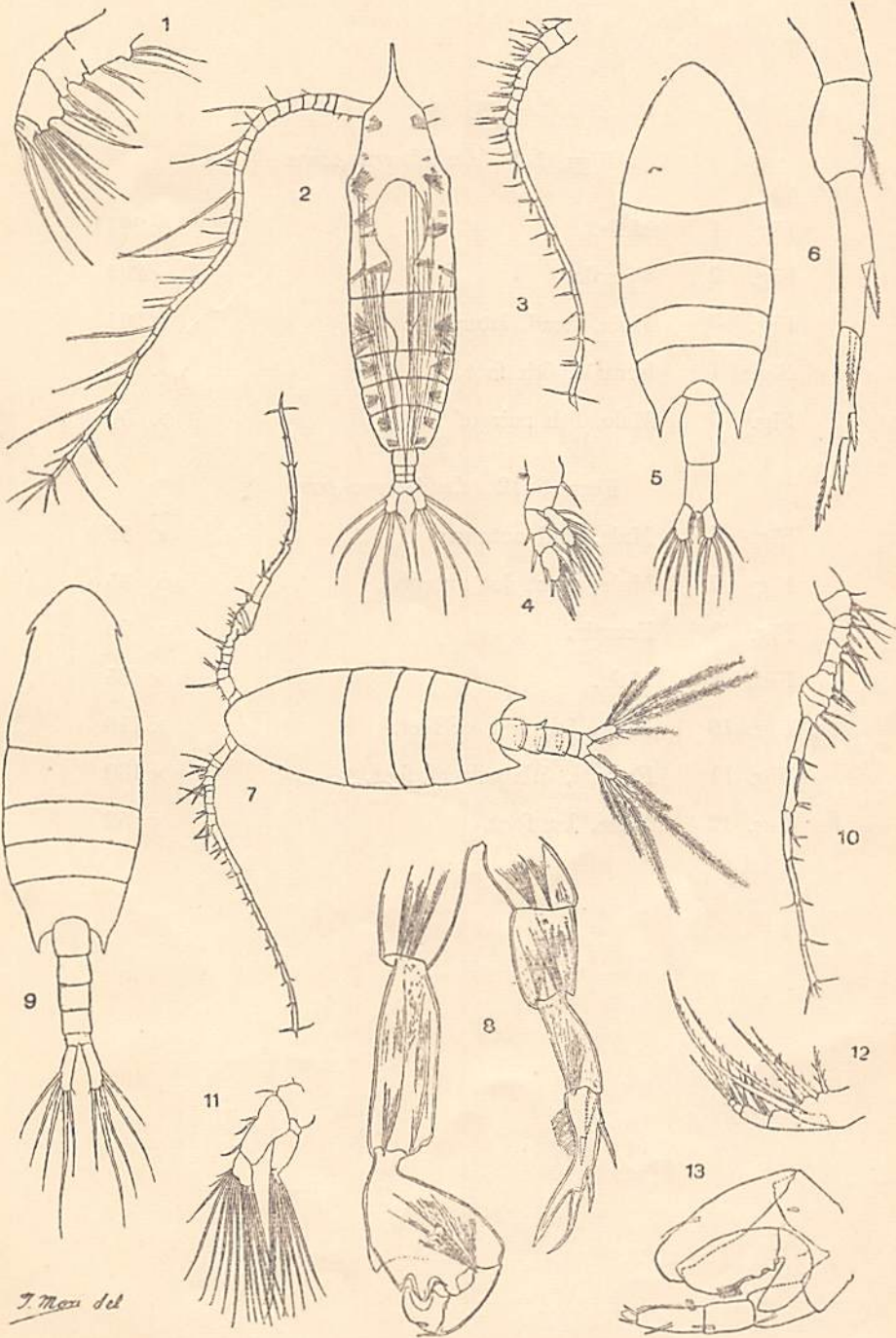
Fig. 1	Female, 1st maxillipede,	× 52
Fig. 2	Female,	× 26

Figs. 3-8 *Calanopia elliptica*

Fig. 3	Female, 1st antenna,	× 35
Fig. 4	Female, 1st foot,	× 52
Fig. 5	Female,	× 35
Fig. 6	Female, 5th foot,	× 180
Fig. 7	Male,	× 35
Fig. 8	Male, 5th pair of feet,	× 180

Figs. 9-13 *Calanopia thompsoni*

Fig. 9	Male,	× 35
Fig. 10	Male, right 1st antenna,	× 55
Fig. 11	Male, 2nd antenna,	× 55
Fig. 12	Male, 2nd maxillipede,	× 95
Fig. 13	Male, 5th pair of feet,	× 95



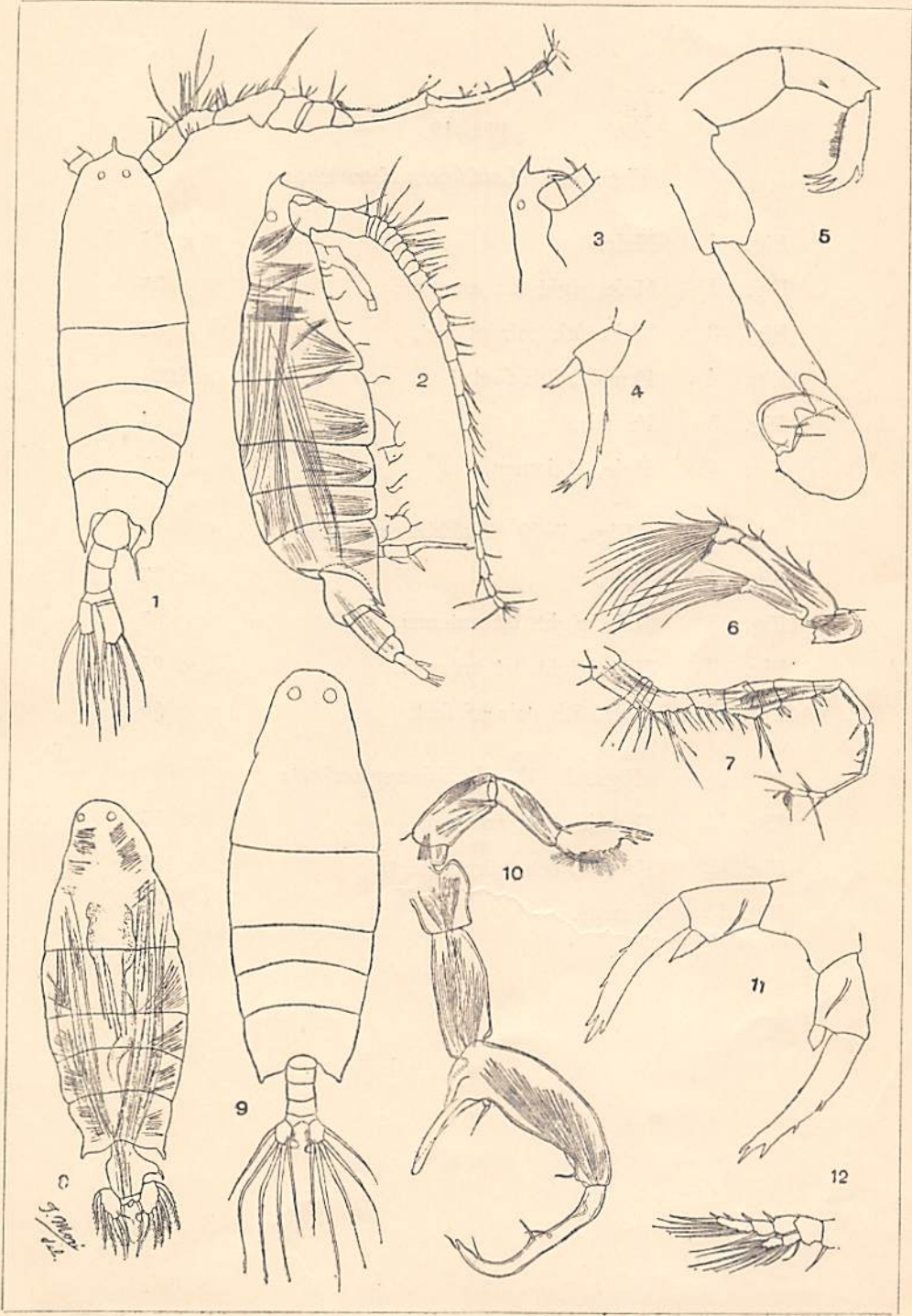
Pl. 41.

Figs. 1-5 *Labidocera acuta*

Fig. 1	Male,	× 26½
Fig. 2	Female,	× 26½
Fig. 3	Male, head, lateral,	× 26½
Fig. 4	Female, 5th foot,	× 55
Fig. 5	Male, 5th pair of feet,	× 55

Figs. 6-12 *Labidocera pavo*

Fig. 6	Male, 2nd antenna,	× 52
Fig. 7	Male, right 1st antenna,	× 35
Fig. 8	Female,	× 26
Fig. 9	Male,	× 35
Fig. 10	Male, 5th pair of feet,	× 110
Fig. 11	Female, 5th pair of feet,	× 130
Fig. 12	Male, 1st foot,	× 52



Pl. 42.

Figs. 1-6 *Labidocera detruncata*

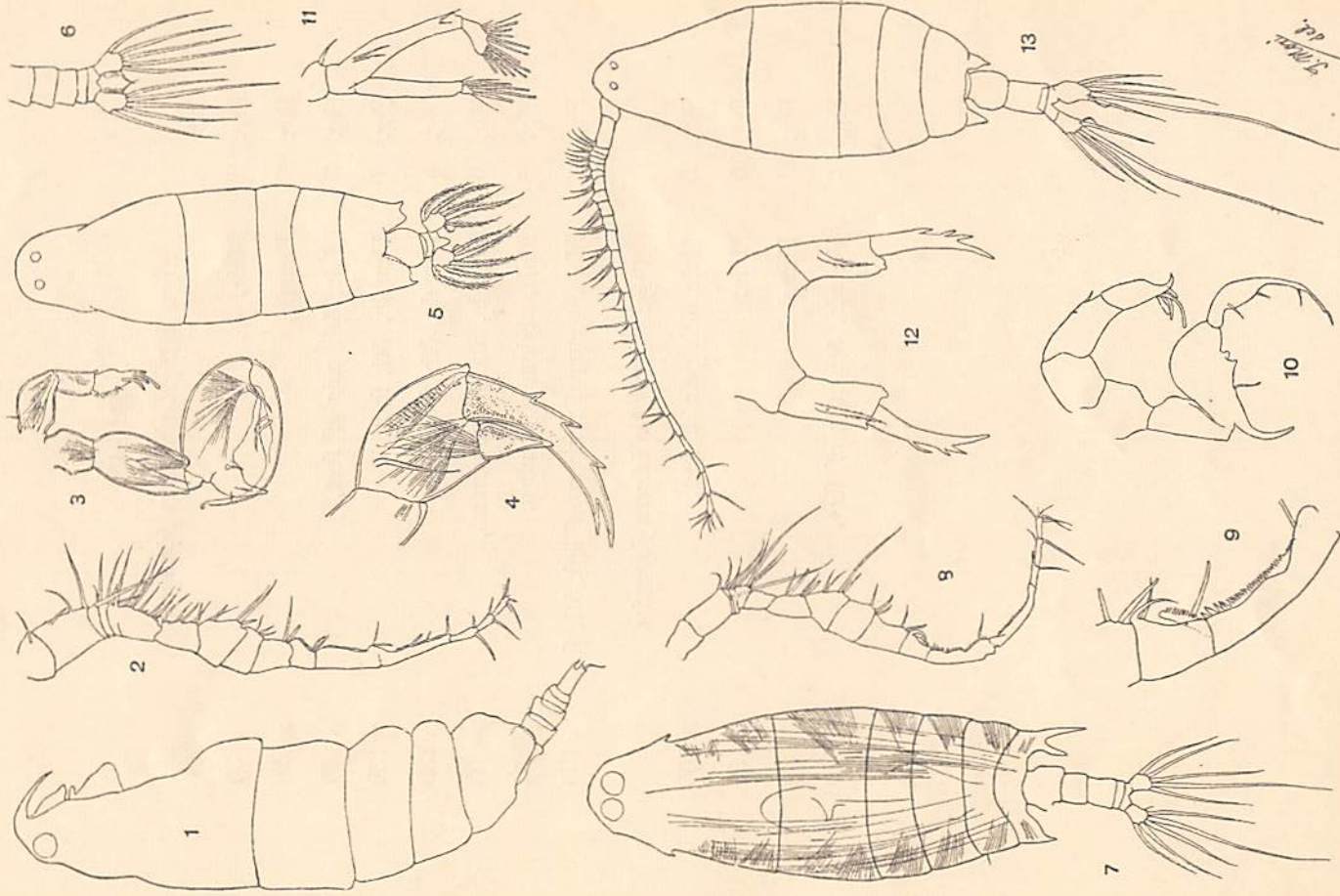
Fig. 1	Male,	× 35
Fig. 2	Male, right 1st antenna,	× 35
Fig. 3	Male, 5th pair of feet,	× 52
Fig. 4	Female, 5th foot,	× 122½
Fig. 5	Female,	× 24
Fig. 6	Male, abdomen,	× 35

Figs. 7-10 *Labidocera kröyeri*

Fig. 7	Male,	× 35
Fig. 8	Male, right 1st antenna,	× 35
Fig. 9	Male, right 1st antenna,	× 95
Fig. 10	Male, 5th pair of feet,	× 55

Figs. 11-13 *Labidocera euchaeta*

Fig. 11	Female, 2nd antenna,	× 55
Fig. 12	Female, 5th pair of feet,	× 130
Fig. 13	Female,	× 25



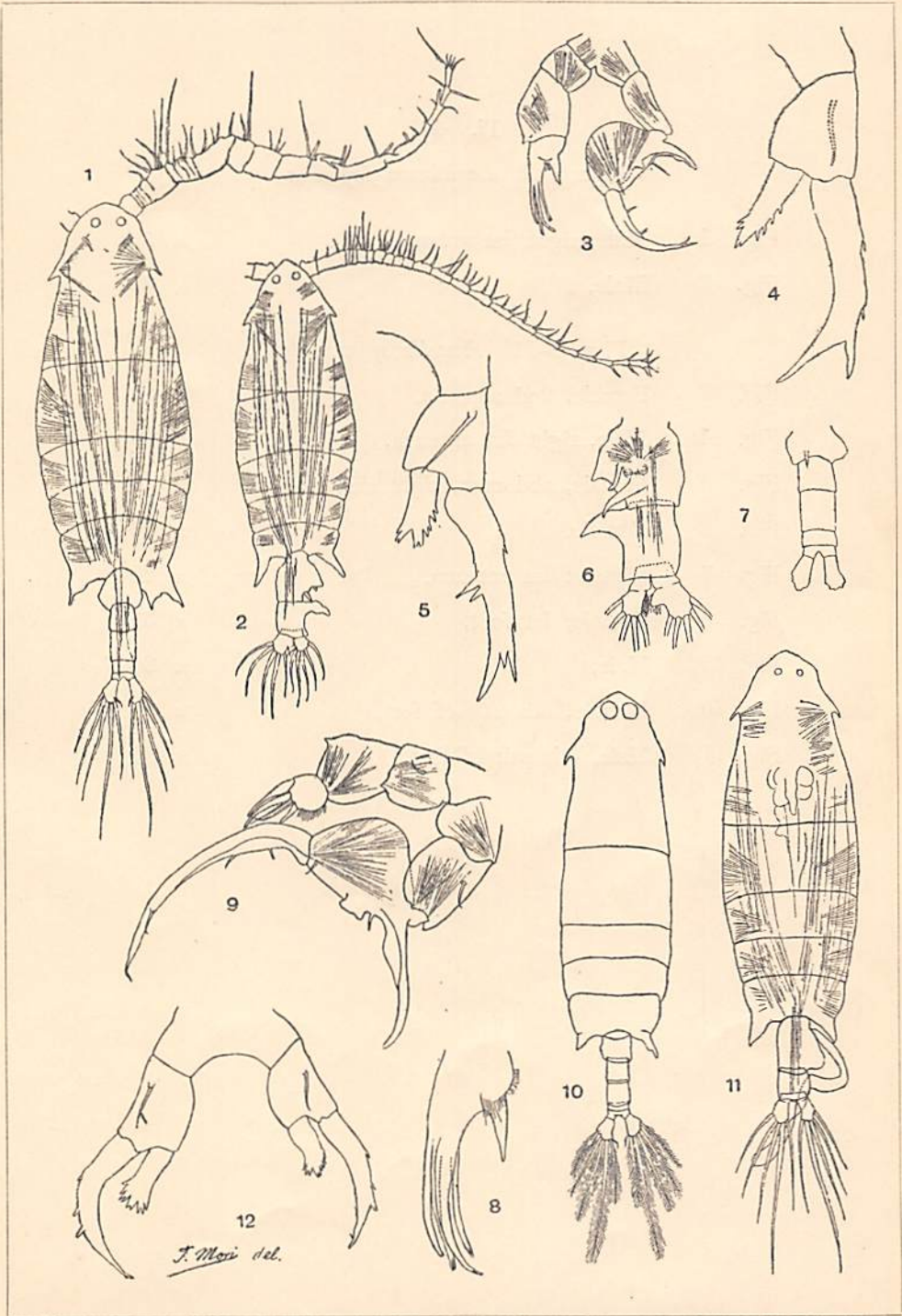
Pl. 43.

Figs. 1-8 *Labidocera bipinnata*

Fig. 1	Male,	× 35
Fig. 2	Female,	× 26
Fig. 3	Male, 5th pair of feet,	× 55
Fig. 4	Female, 5th foot,	× 130
Fig. 5	Female, 5th foot,	× 130
Fig. 6	Female, abdomen, ventral,	× 55
Fig. 7	Male, abdomen, ventral,	× 52
Fig. 8	Male, terminal portion of left 5th foot,	× 130

Figs. 9-12 *Labidocera japonica*

Fig. 9	Male, 5th pair of feet,	× 105
Fig. 10	Male,	× 35
Fig. 11	Female,	× 35
Fig. 12	Female, 5th pair of feet,	× 120



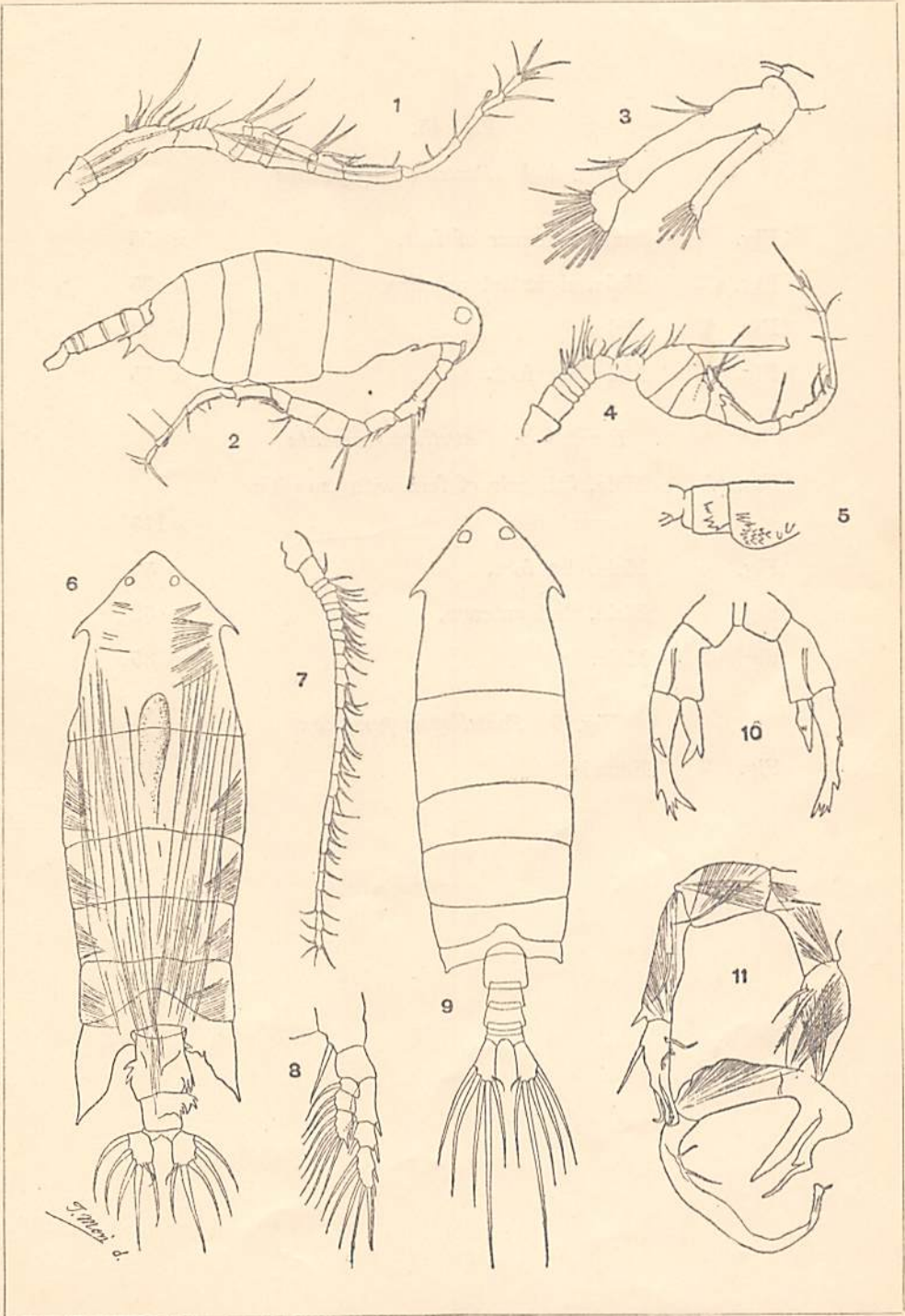
Pl. 44.

Figs. 1-2 *Labidocera japonica*

- | | | |
|--------|--------------------------|------|
| Fig. 1 | Male, right 1st antenna, | × 55 |
| Fig. 2 | Male, | × 35 |

Figs. 3-11 *Pontella spinicauda*

- | | | |
|---------|------------------------------|------|
| Fig. 3 | Female, 2nd antenna, | × 35 |
| Fig. 4 | Male, right 1st antenna, | × 20 |
| Fig. 5 | Female, abdomen, right side, | × 20 |
| Fig. 6 | Female, | × 20 |
| Fig. 7 | Female, 1st antenna, | × 20 |
| Fig. 8 | Female, 1st foot, | × 35 |
| Fig. 9 | Male, | × 20 |
| Fig. 10 | Female, 5th pair of feet, | × 35 |
| Fig. 11 | Male, 5th pair of feet, | × 35 |



Pl. 45.

Figs. 1-4 *Pontella longipedata*

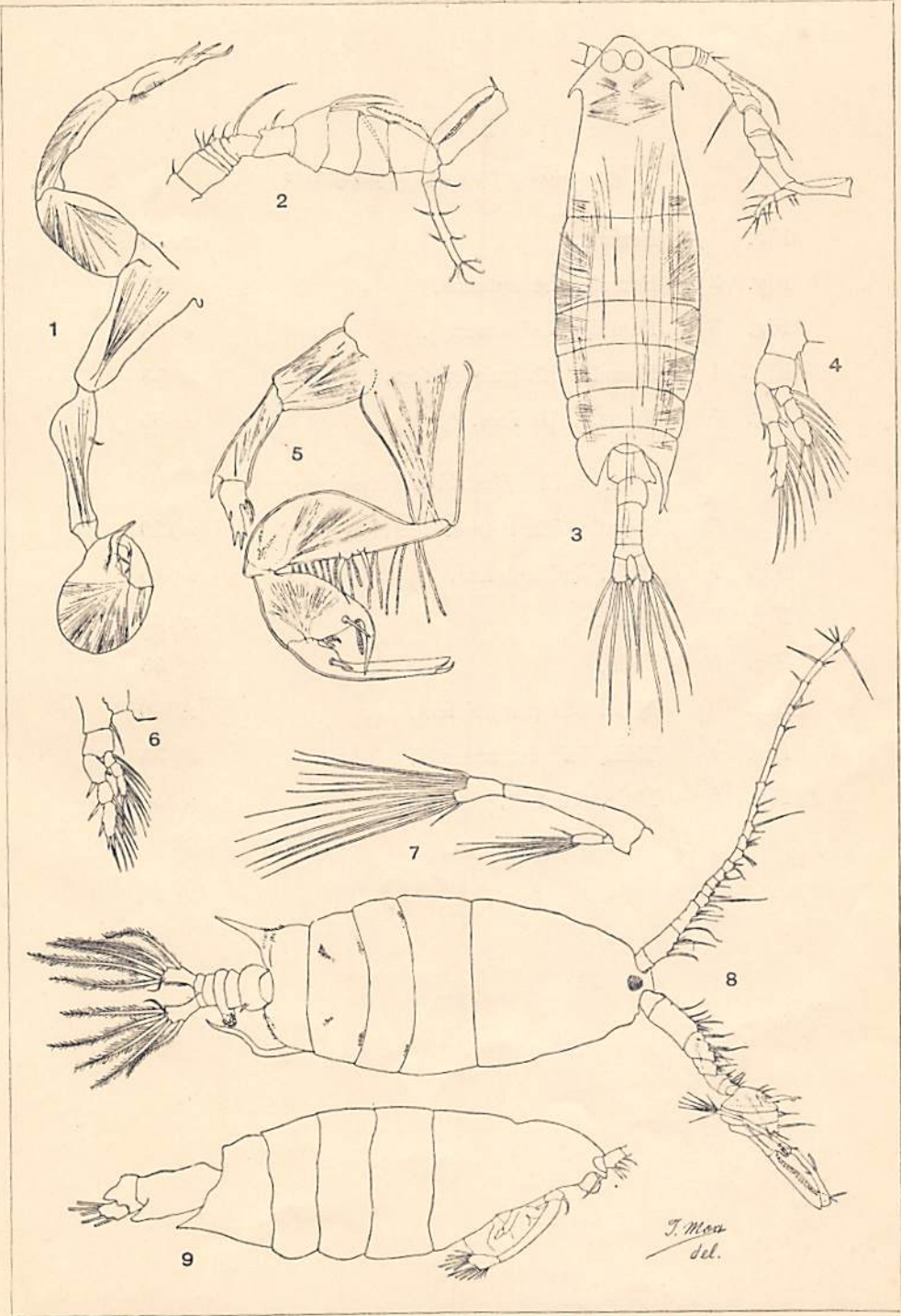
Fig. 1	Male, 5th pair of feet,	× 55
Fig. 2	Male, right 1st antenna,	× 35
Fig. 3	Male,	× 24
Fig. 4	Male, 1st foot,	× 55

Figs. 5-8 *Pontellopsis armata*

Fig. 5	Male, 5th pair of feet with parasitic organisms,	× 115
Fig. 6	Male, 1st foot,	× 52
Fig. 7	Male, 2nd antenna,	× 52
Fig. 8	Male,	× 35

Fig. 9 *Pontellopsis perspicax*

Fig. 9	Female,	× 19
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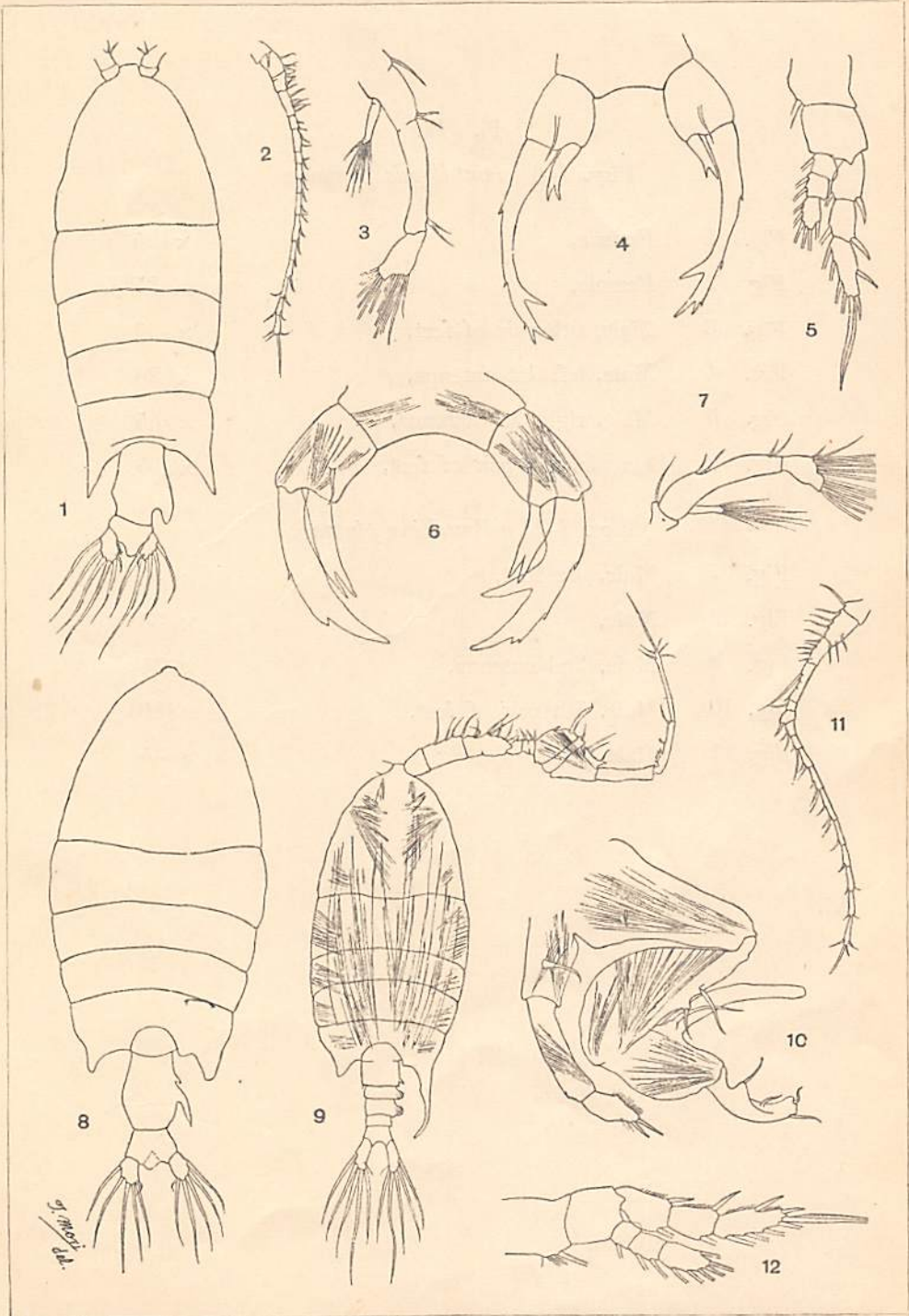
Pl. 46.

Figs. 1-5 *Pontellopsis perspicax*

Fig. 1	Female,	× 19
Fig. 2	Female, 1st antenna,	× 19
Fig. 3	Female, 2nd antenna,	× 35
Fig. 4	Female, 5th pair of feet,	× 55
Fig. 5	Female, 1st foot,	× 55

Figs. 6-12 *Pontellopsis tenuicauda*

Fig. 6	Female, 5th pair of feet,	× 130
Fig. 7	Male, 2nd antenna,	× 55
Fig. 8	Female,	× 35
Fig. 9	Male,	× 35
Fig. 10	Male, 5th pair of feet,	× 130
Fig. 11	Male, left 1st antenna,	× 35
Fig. 12	Male, 1st foot,	× 130



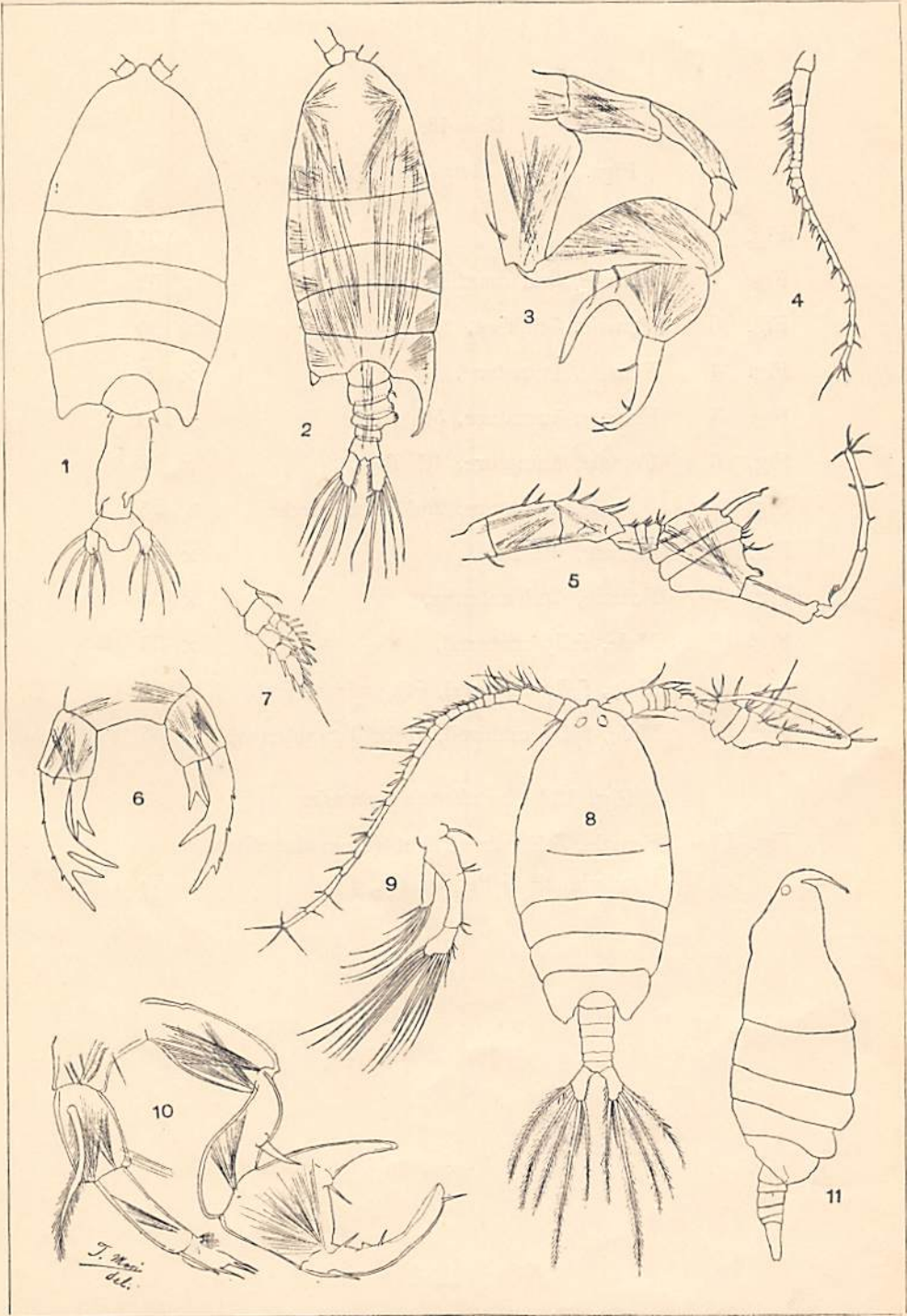
Pl. 47.

Figs. 1-6 *Pontilopsis yamadai*

Fig. 1	Female,	× 25
Fig. 2	Female,	× 25
Fig. 3	Male, 5th pair of feet,	× 55
Fig. 4	Male, left 1st antenna,	× 25
Fig. 5	Male, right 1st antenna,	× 35
Fig. 6	Female, 5th pair of feet,	× 55

Figs. 7-11 *Pontellina plumata*

Fig. 7	Male, 1st foot,	× 55
Fig. 8	Male,	× 35
Fig. 9	Male, 2nd antenna,	× 35
Fig. 10	Male, 5th pair of feet,	× 180
Fig. 11	Male,	× 35



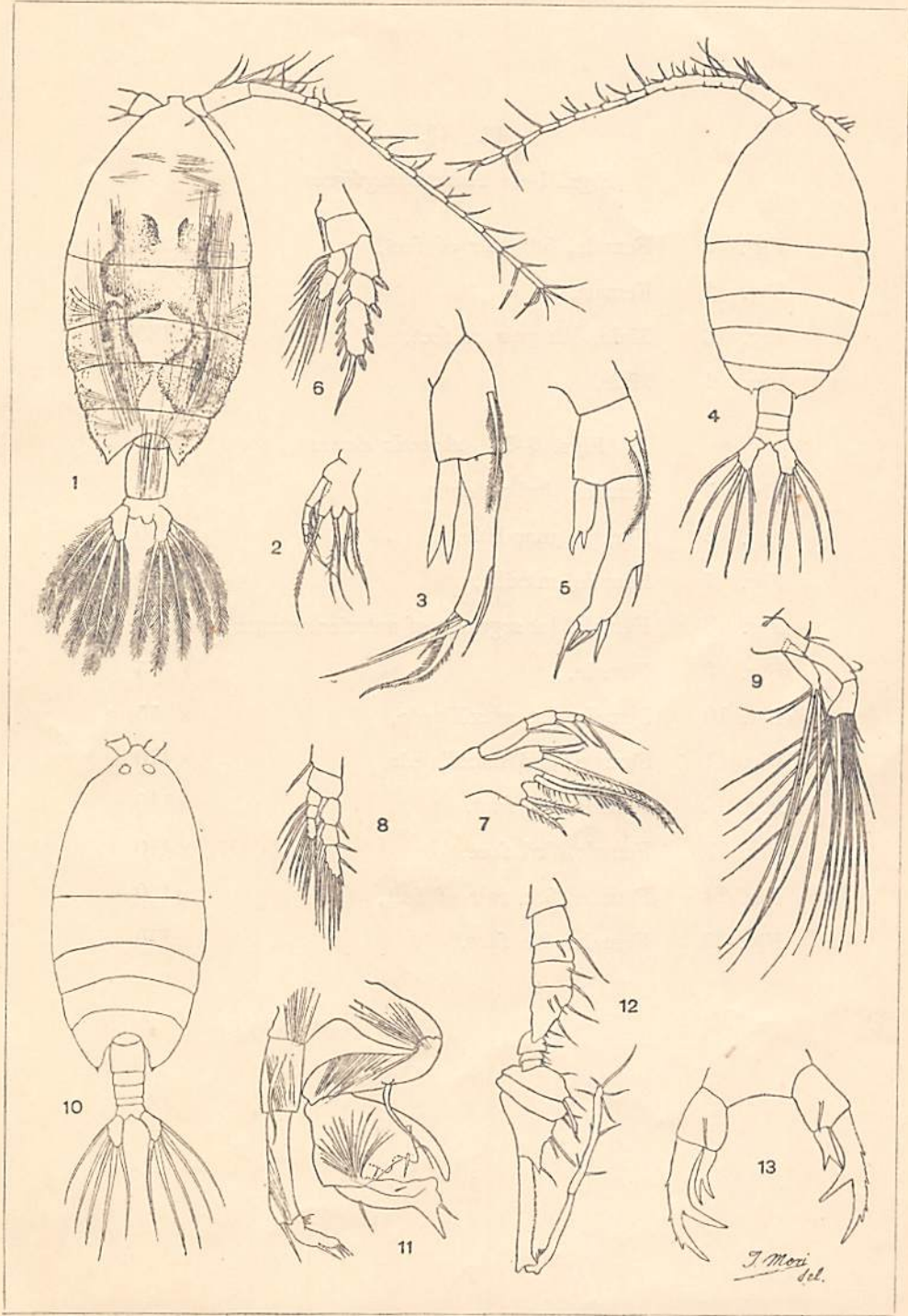
Pl. 48.

Figs. 1-12 *Pontellina plumata*

Fig. 1	Female,	× 35
Fig. 2	Female, 2nd maxillipede,	× 52
Fig. 3	Female, 5th foot,	× 180
Fig. 4	Female, immature,	× 35
Fig. 5	Female, immature, 5th foot,	× 180
Fig. 6	Female, immature, 4th foot,	× 52
Fig. 7	Female, immature, 2nd maxillipede,	× 95
Fig. 8	Female, 1st foot,	× 52
Fig. 9	Female, 2nd antenna,	× 35
Fig. 10	Male, fully matured,	× 35
Fig. 11	Male, fully matured, 5th pair of feet,	× 125
Fig. 12	Male, fully matured, right 1st antenna,	× 55

Fig. 13 *Pontellopsis yamadae*

Fig. 13	Female, 5th pair of feet (from the other individual cf Pl. 47, fig. 1),	× 55
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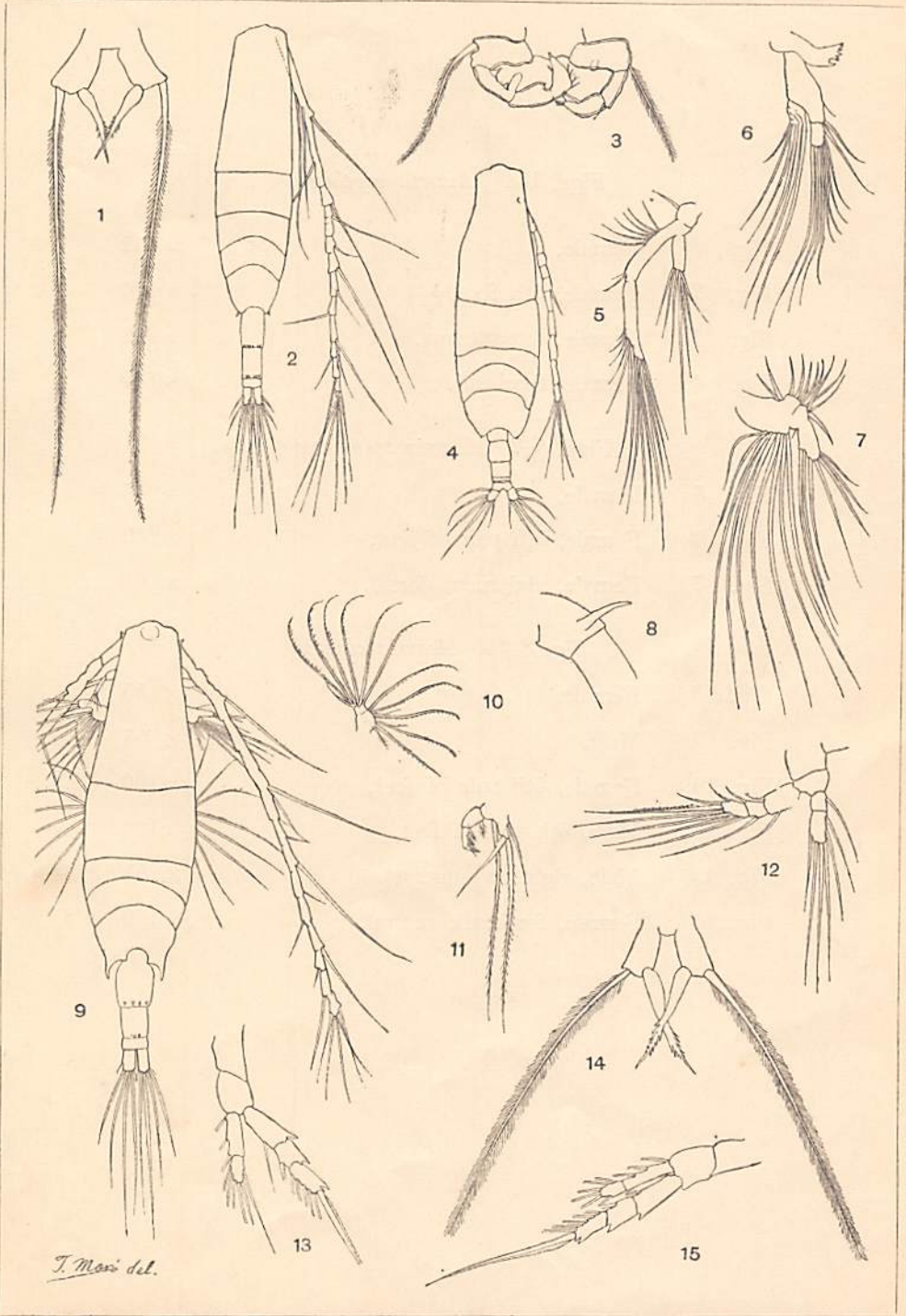
Pl. 49.

Figs. 1-4 *Acartia negligens*

Fig. 1	Female, 5th pair of feet,	× 225
Fig. 2	Female,	× 49
Fig. 3	Male, 5th pair of feet,	× 180
Fig. 4	Male,	× 52

Figs. 6-15 *Acartia danae*

Fig. 5	Female, 2nd antenna,	× 110
Fig. 6	Female, mandible,	× 110
Fig. 7	Female, maxilla,	× 110
Fig. 8	Female, 1st segment of anterior antenna,	× 180
Fig. 9	Female,	× 55
Fig. 10	Female, 1st maxillipede,	× 55
Fig. 11	Female, 2nd maxillipede,	× 110
Fig. 12	Female, 1st foot,	× 110
Fig. 13	Female, 3rd foot,	× 110
Fig. 14	Female, 5th pair of feet,	× 180
Fig. 15	Female, 4th foot,	× 110



J. Mori del.

Pl. 50.

Figs. 1-4 *Acartia erythraea*

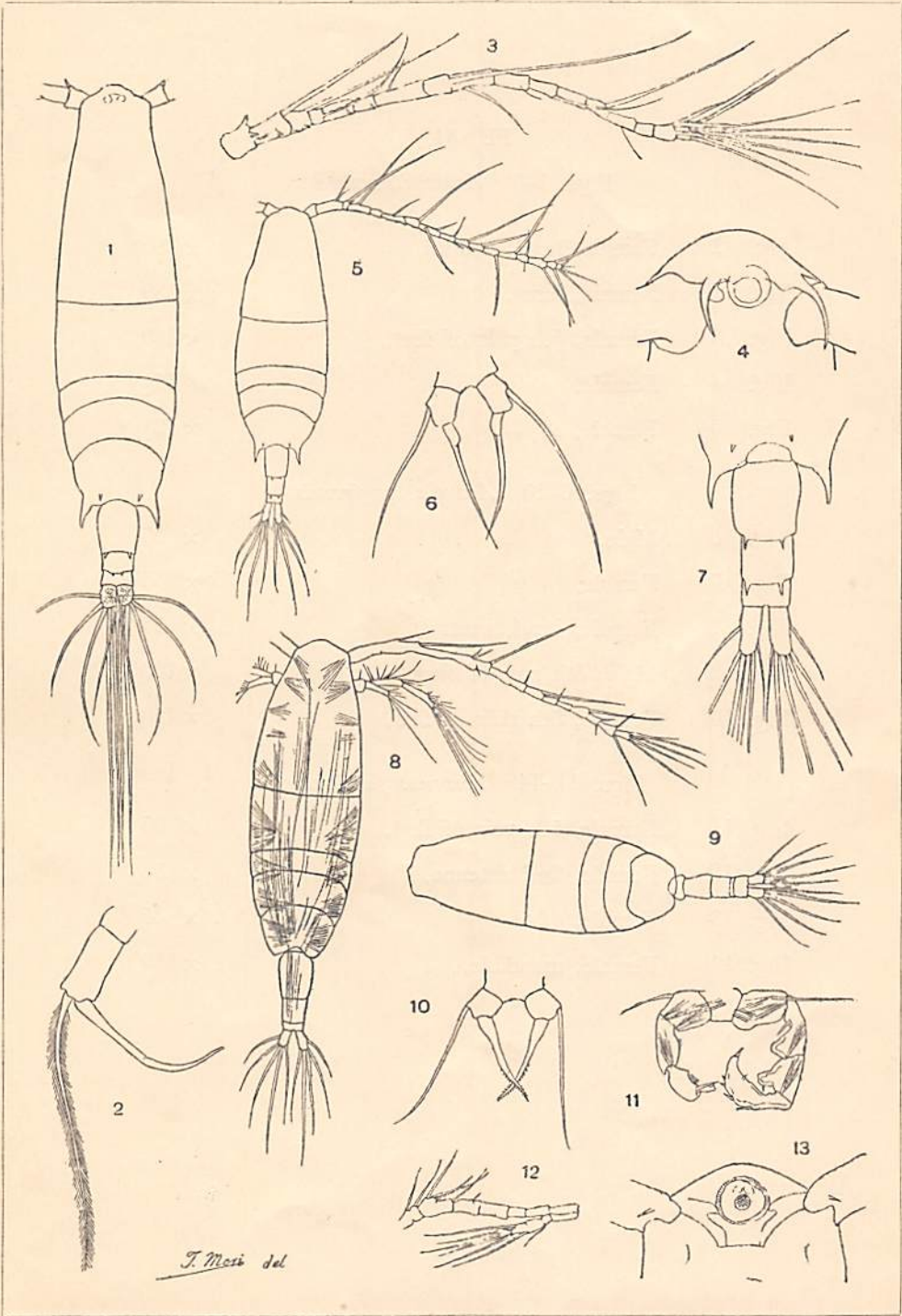
Fig. 1	Female,	× 52
Fig. 2	Female, 5th foot,	× 180
Fig. 3	Female, 1st antenna,	× 52
Fig. 4	Female, forehead,	× 180

Figs. 5-7 *Acartia spinicauda*

Fig. 5	Female,	× 35
Fig. 6	Female, 5th pair of feet,	× 180
Fig. 7	Female, abdomen, dorsal,	× 95

Fig. 8-13 *Acartia clausi*

Fig. 8	Female,	× 55
Fig. 9	Male,	× 55
Fig. 10	Female, 5th pair of feet,	× 180
Fig. 11	Male, 5th pair of feet,	× 180
Fig. 12	Male, right 1st antenna,	× 55
Fig. 13	Female, forehead, ventral,	× 180



Pl. 51.

Figs. 1-5 *Acartia hamata*

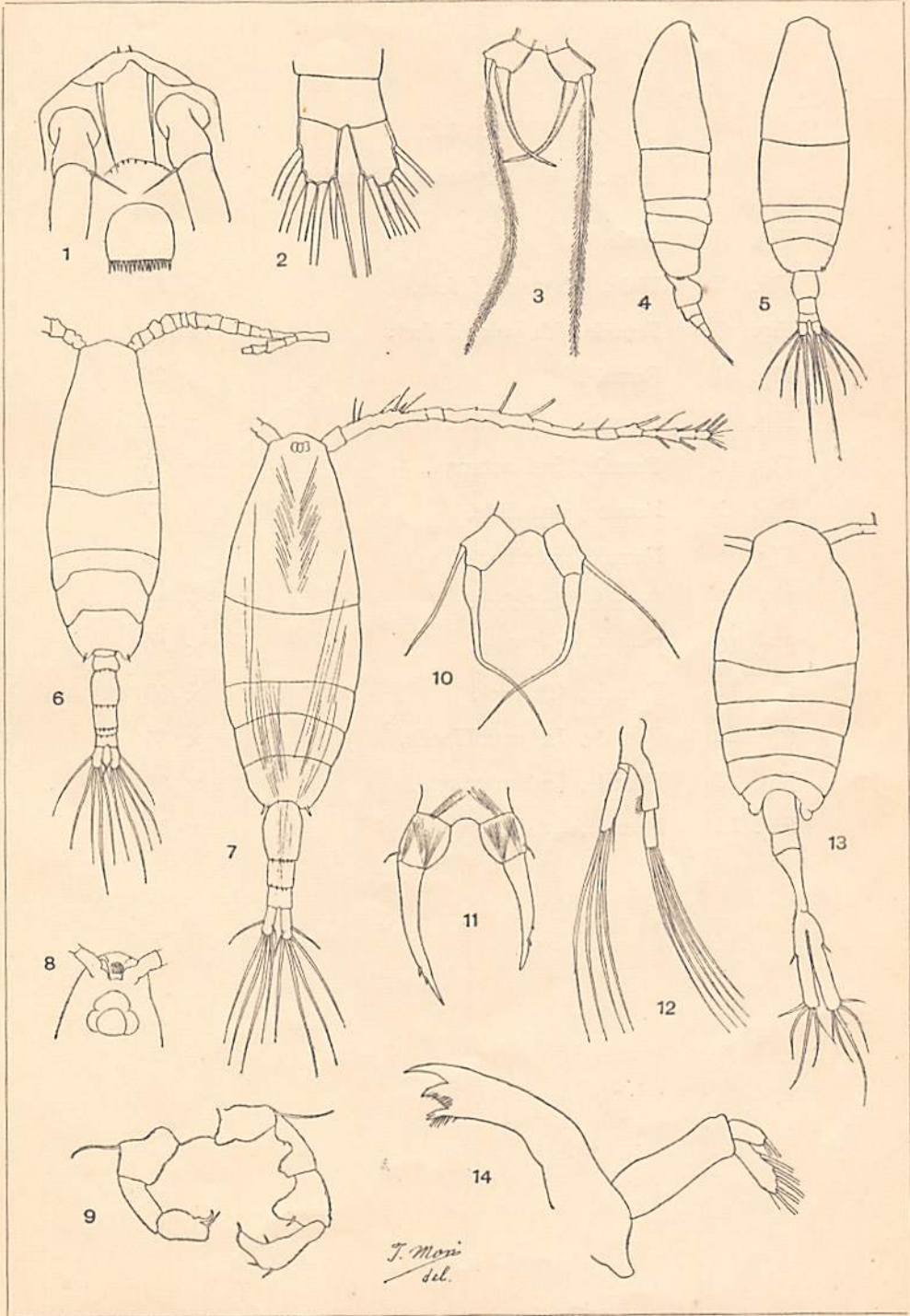
Fig. 1	Female, head, ventral,	× 180
Fig. 2	Female, furca,	× 180
Fig. 3	Female, 5th pair of feet,	× 180
Fig. 4	Female,	× 42½
Fig. 5	Female,	× 42½

Figs. 6-10 *Acartia longiremis*

Fig. 6	Male,	× 55
Fig. 7	Female,	× 55
Fig. 8	Female, head, ventral,	× 55
Fig. 9	Male, 5th pair of feet,	× 180
Fig. 10	Female, 5th pair of feet,	× 180

Figs. 11-14 *Tortanus forcipatus*

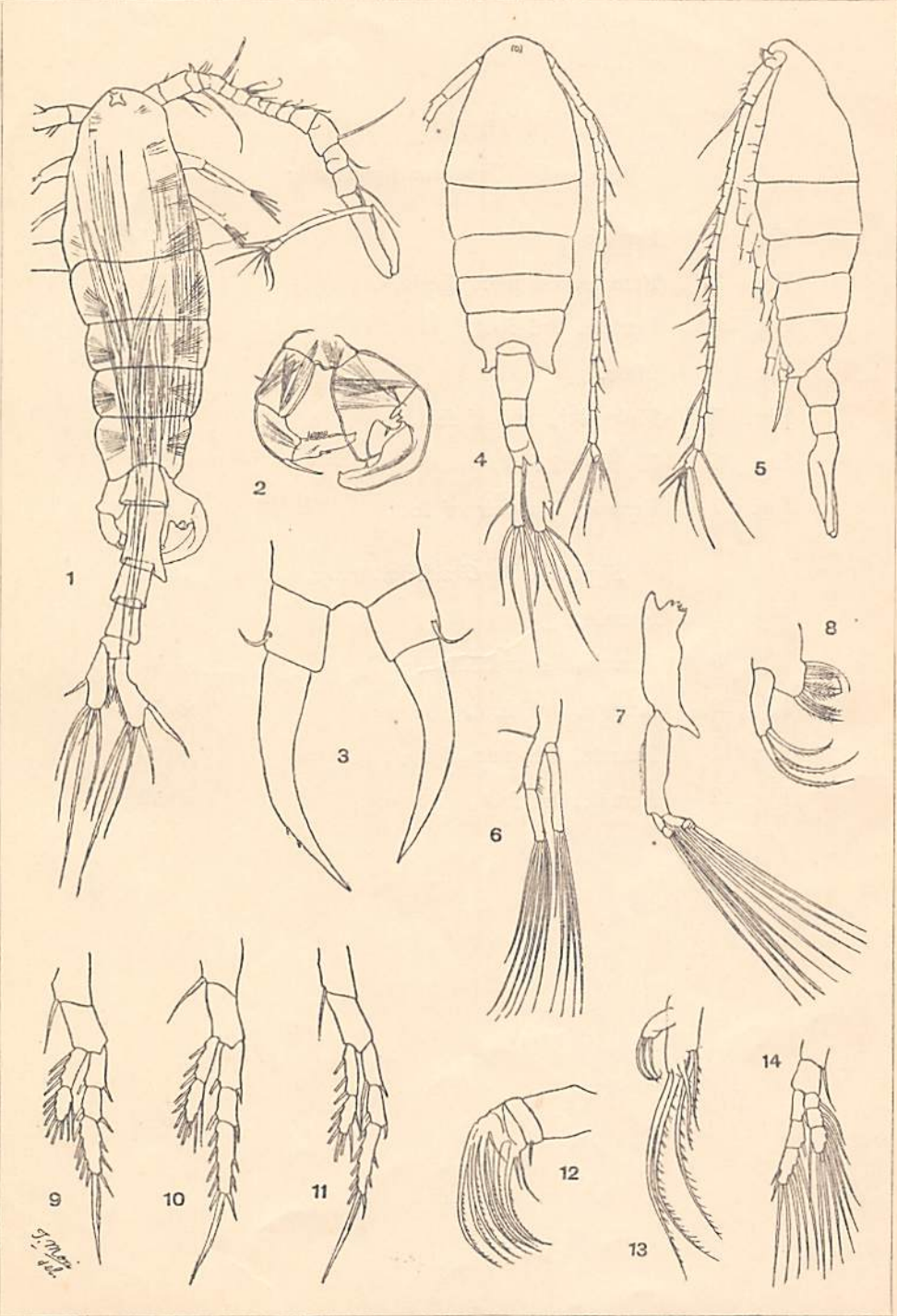
Fig. 11	Female, 5th pair of feet,	× 95
Fig. 12	Female, 2nd antenna,	× 55
Fig. 13	Female,	× 35
Fig. 14	Female, mandible,	× 180



Pl. 52.

Figs. 1-14 *Tortanus discaudatus*

Fig. 1	Male,	× 35
Fig. 2	Male, 5th pair of feet,	× 55
Fig. 3	Female, 5th pair of feet,	× 115
Fig. 4	Female,	× 26
Fig. 5	Female,	× 26
Fig. 6	Female, 2nd antenna,	× 35
Fig. 7	Female, mandible,	× 50
Fig. 8	Female, maxilla,	× 50
Fig. 9	Female, 2nd foot,	× 50
Fig. 10	Female, 3rd foot,	× 50
Fig. 11	Female, 4th foot,	× 50
Fig. 12	Female, 1st maxillipede,	× 35
Fig. 13	Female, 2nd maxillipede,	× 50
Fig. 14	Female, 1st foot,	× 50



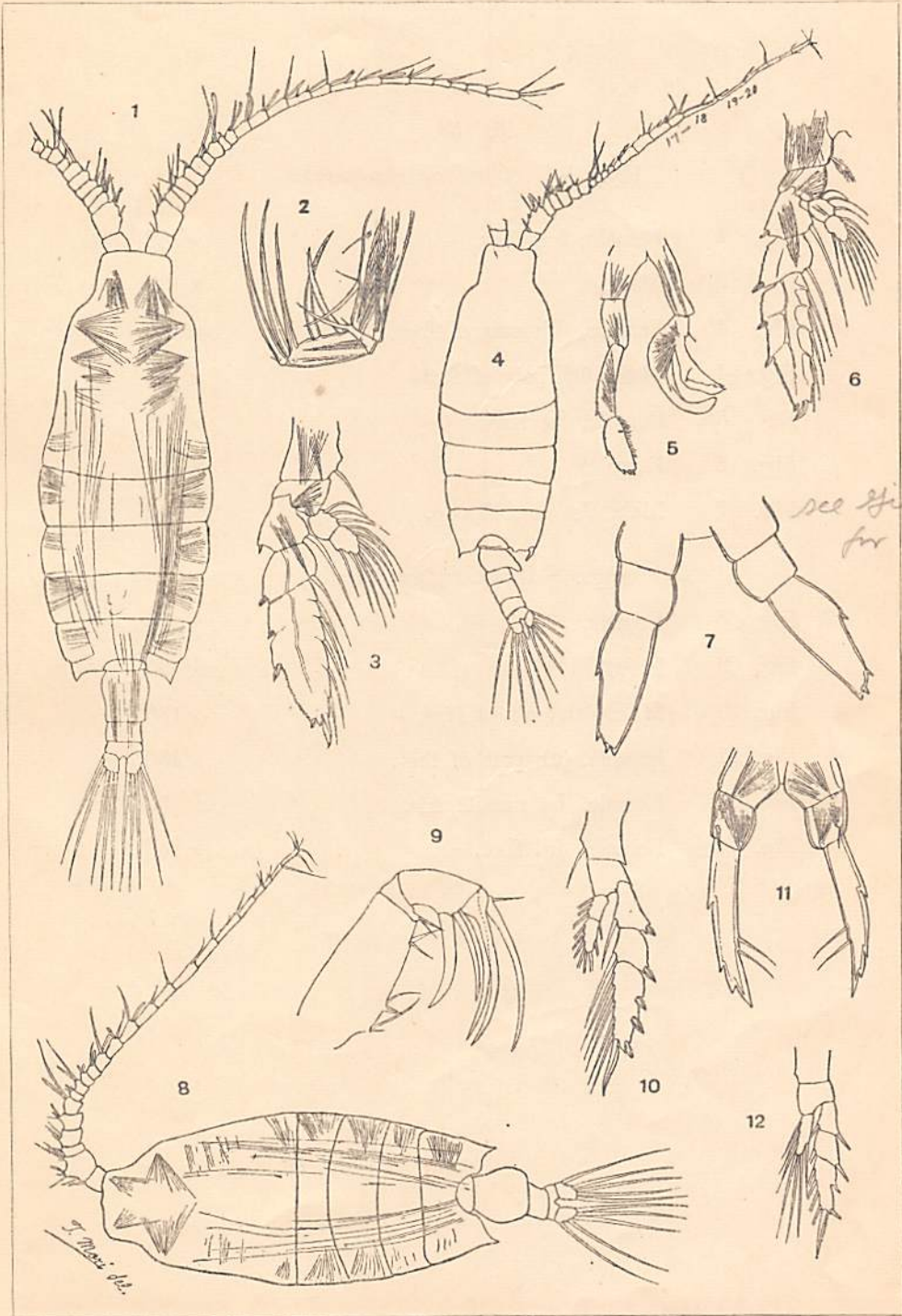
Pl. 53.

Figs. 1-7 *Candacia longimana*

Fig. 1	Female,	× 35
Fig. 2	Female, 1st maxillipede,	× 35
Fig. 3	Female, 3rd foot,	× 52
Fig. 4	Male,	× 18
Fig. 5	Male, 5th pair of feet,	× 52
Fig. 6	Male, 3rd foot,	× 35
Fig. 7	Female, 5th pair of feet,	× 180

Figs. 8-12 *Candacia bradyi*

Fig. 8	Female,	× 35
Fig. 9	Female, 1st maxillipede,	× 52
Fig. 10	Female, 3rd foot,	× 52
Fig. 11	Female, 5th pair of feet,	× 100
Fig. 12	Female, 1st foot,	× 52



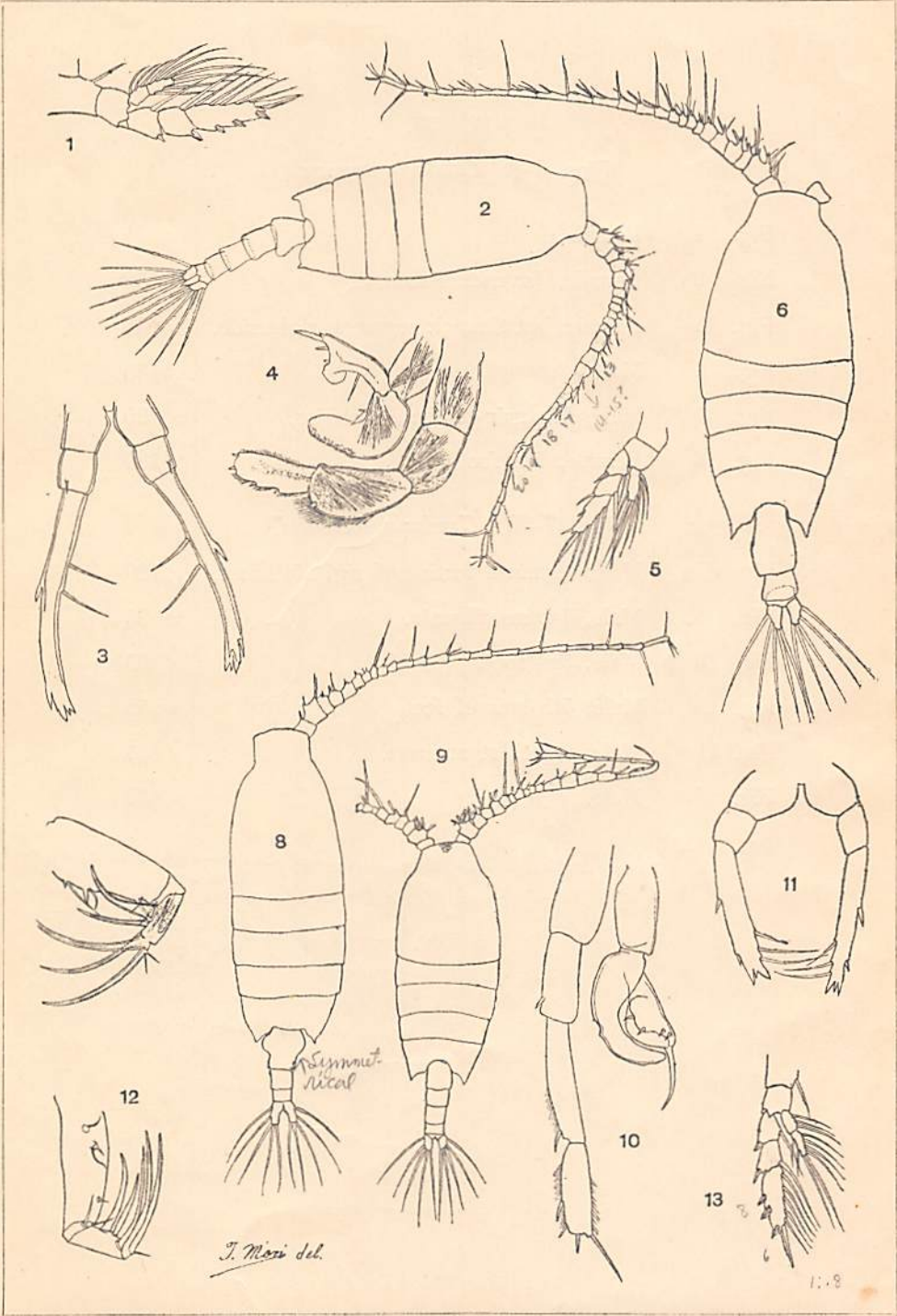
Pl. 54.

Figs. 1-7 *Candacia discandata*

Fig. 1	Female, 3rd foot,	× 52
Fig. 2	Male,	× 35
Fig. 3	Female, 5th pair of feet,	× 95
Fig. 4	Male, 5th pair of feet,	× 110
Fig. 5	Female, 1st foot,	× 52
Fig. 6	Female,	× 35
Fig. 7	Male, 1st maxillipede,	× 52

Figs. 8-13 *Candacia catula*

Fig. 8	Female,	× 35
Fig. 9	Male,	× 35
Fig. 10	Male, 5th pair of feet,	× 180
Fig. 11	Female, 5th pair of feet,	× 180
Fig. 12	Female, 1st maxillipede,	× 52
Fig. 13	Female, 3rd foot,	× 52



Pl. 55.

Figs. 1-6 *Candacia truncata*

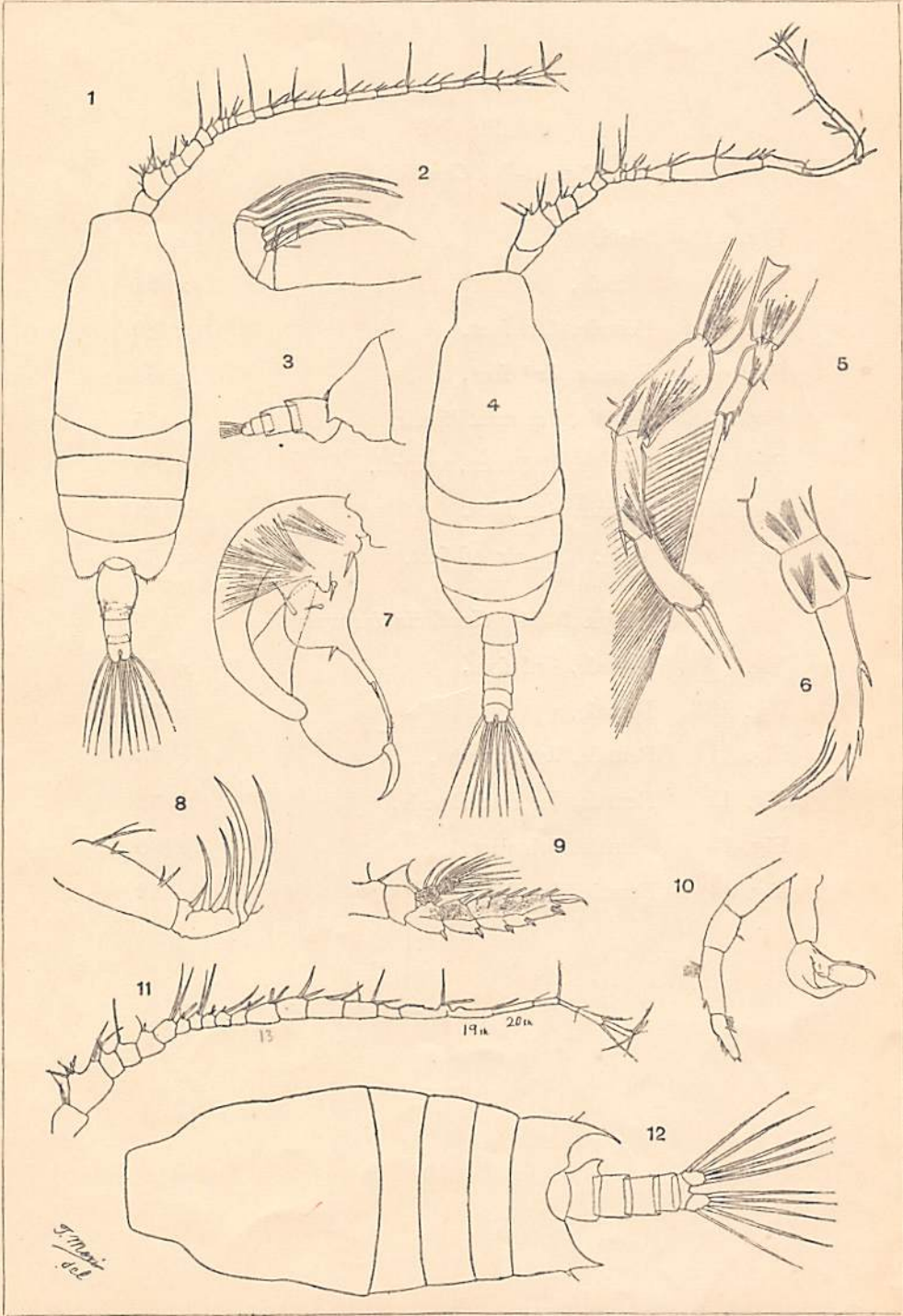
Fig. 1	Female,	× 35
Fig. 2	Female, 1st maxillipede,	× 52
Fig. 3	Female, last thoracic segment, right side,	× 35
Fig. 4	Male,	× 35
Fig. 5	Male, 5th pair of feet, posterior,	× 120
Fig. 6	Female, 5th foot,	× 180

Figs. 7-12 *Candacia pectinata**

Fig. 7	Male, terminal portion of right 5th foot,	× 180
Fig. 8	Male, 1st maxillipede,	× 35
Fig. 9	Male, 3rd foot,	× 35
Fig. 10	Male, 5th pair of feet,	× 55
Fig. 11	Male, right 1st antenna,	× 35
Fig. 12	Male,	× 35

* This is the same as *C. armata*, Sydney variety reported by Dakin & Colefax¹⁹⁴³. Note the long process on the "hand" of the ♂ Right 5th Ft. In Sars 1903 *armata* and in Gies¹⁸⁹² *pectinata*, this process is short. Note also that the right thoracic process reaches well beyond the post. margin of the gen. seg. In Sars *armata* and Gies *pectinata* this process is short.

In Mori's key on page 79, he apparently went by the literature, not by his specimens.



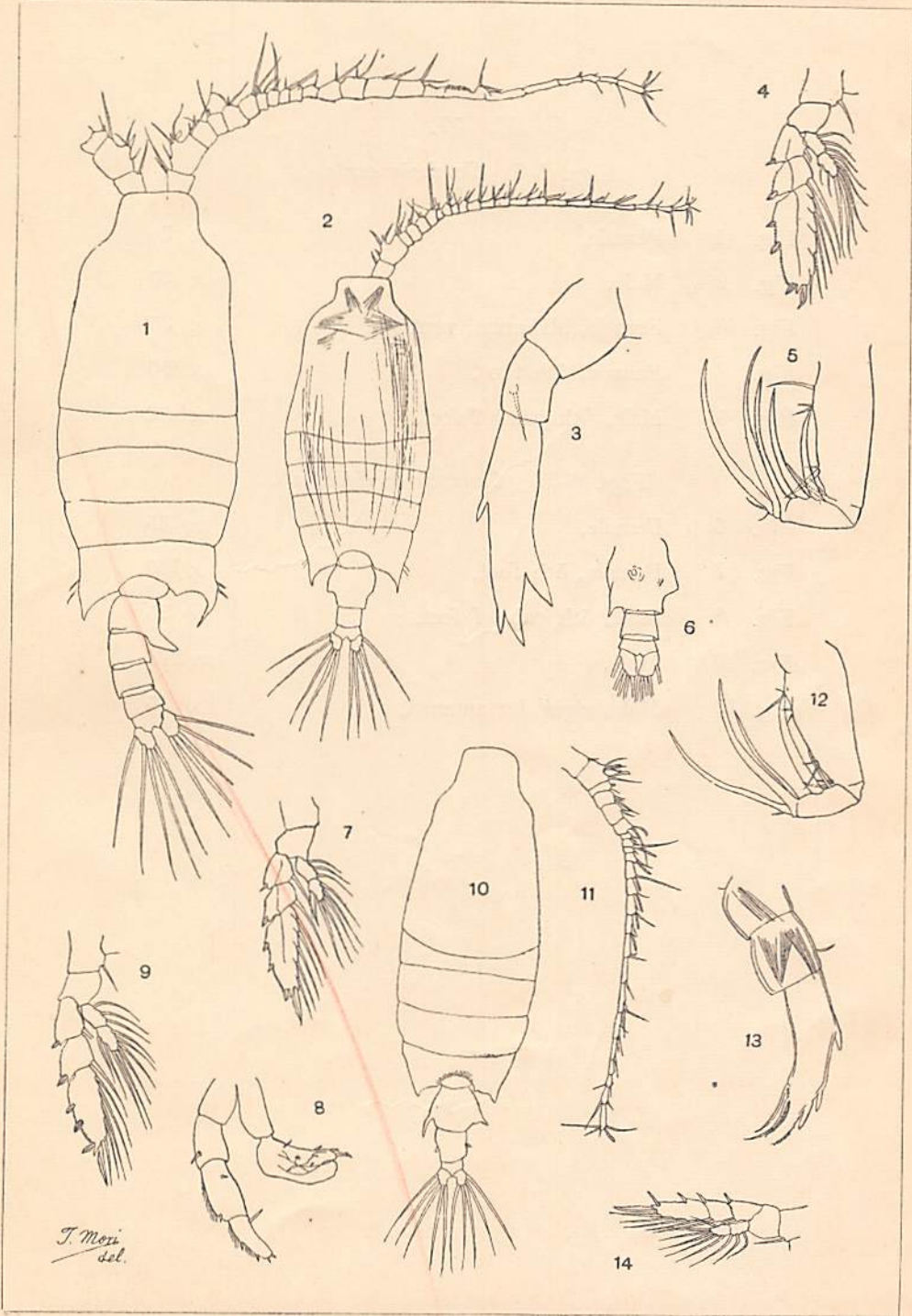
Pl. 56.

Figs. 1-8 *Candacia curta*

Fig. 1	Male,	× 35
Fig. 2	Female,	× 24
Fig. 3	Female, 5th foot,	× 180
Fig. 4	Female, 3rd foot,	× 35
Fig. 5	Female, 1st maxillipede,	× 35
Fig. 6	Female, abdomen, ventral,	× 35
Fig. 7	Female, 4th foot,	× 35
Fig. 8	Male, 5th pair of feet,	× 55

Figs. 9-14 *Candacia bispinosa*

Fig. 9	Female, 3rd foot,	× 52
Fig. 10	Female,	× 35
Fig. 11	Female, 1st antenna,	× 35
Fig. 12	Female, 1st maxillipede,	× 52
Fig. 13	Female, 5th foot,	× 180
Fig. 14	Female, 1st foot,	× 52



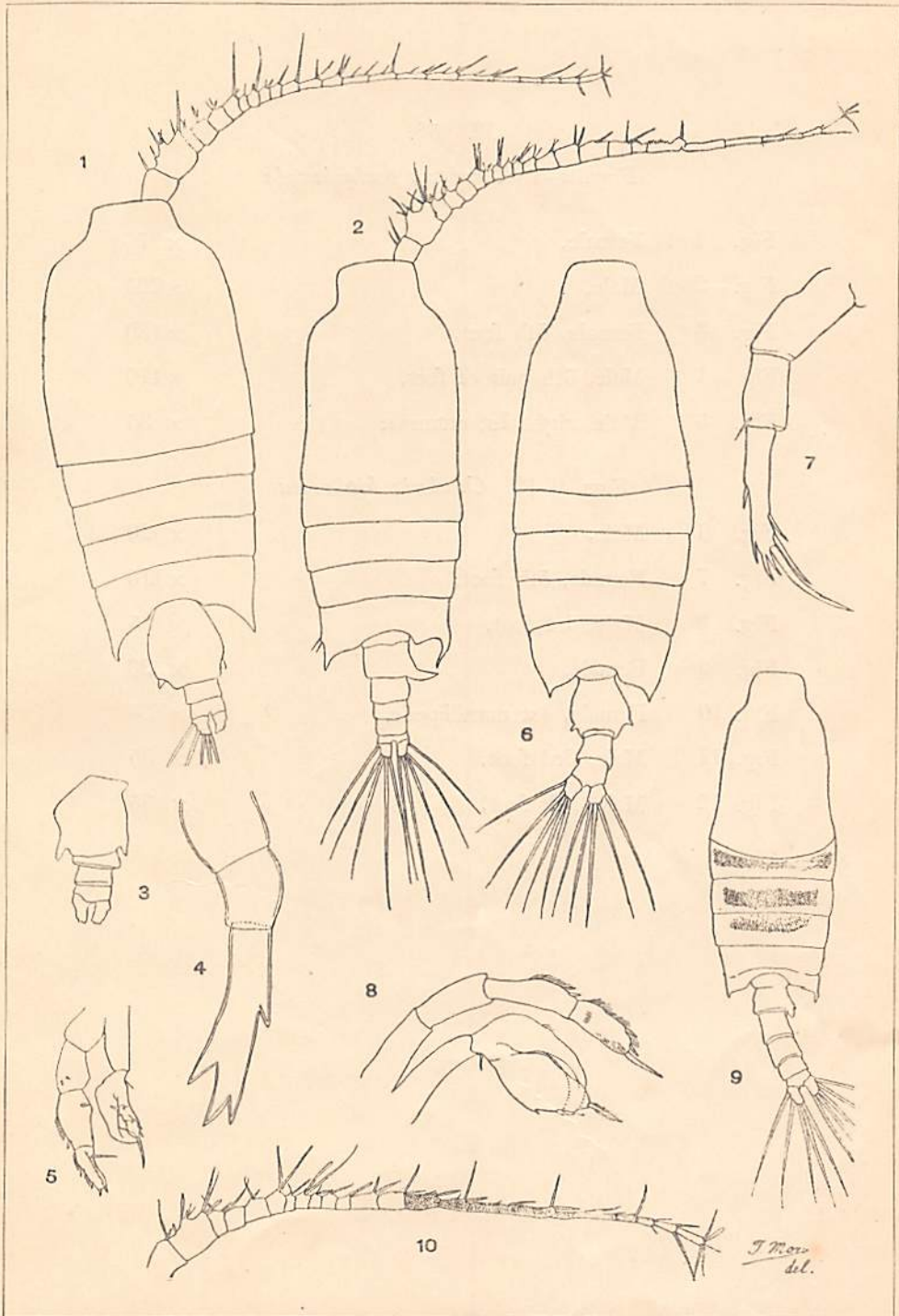
Pl. 57.

Figs. 1-5 *Candacia curta*

Fig. 1	Female,	× 35
Fig. 2	Male,	× 35
Fig. 3	Female, abdomen, ventral,	× 35
Fig. 4	Female, 5th foot,	× 180
Fig. 5	Male, 5th pair of feet,	× 52

Figs. 6-10 *Candacia aethiopica*

Fig. 6	Female,	× 35
Fig. 7	Female, 5th foot,	× 180
Fig. 8	Male, 5th pair of feet,	× 95
Fig. 9	Male,	× 27½
Fig. 10	Male, right 1st antenna,	× 35



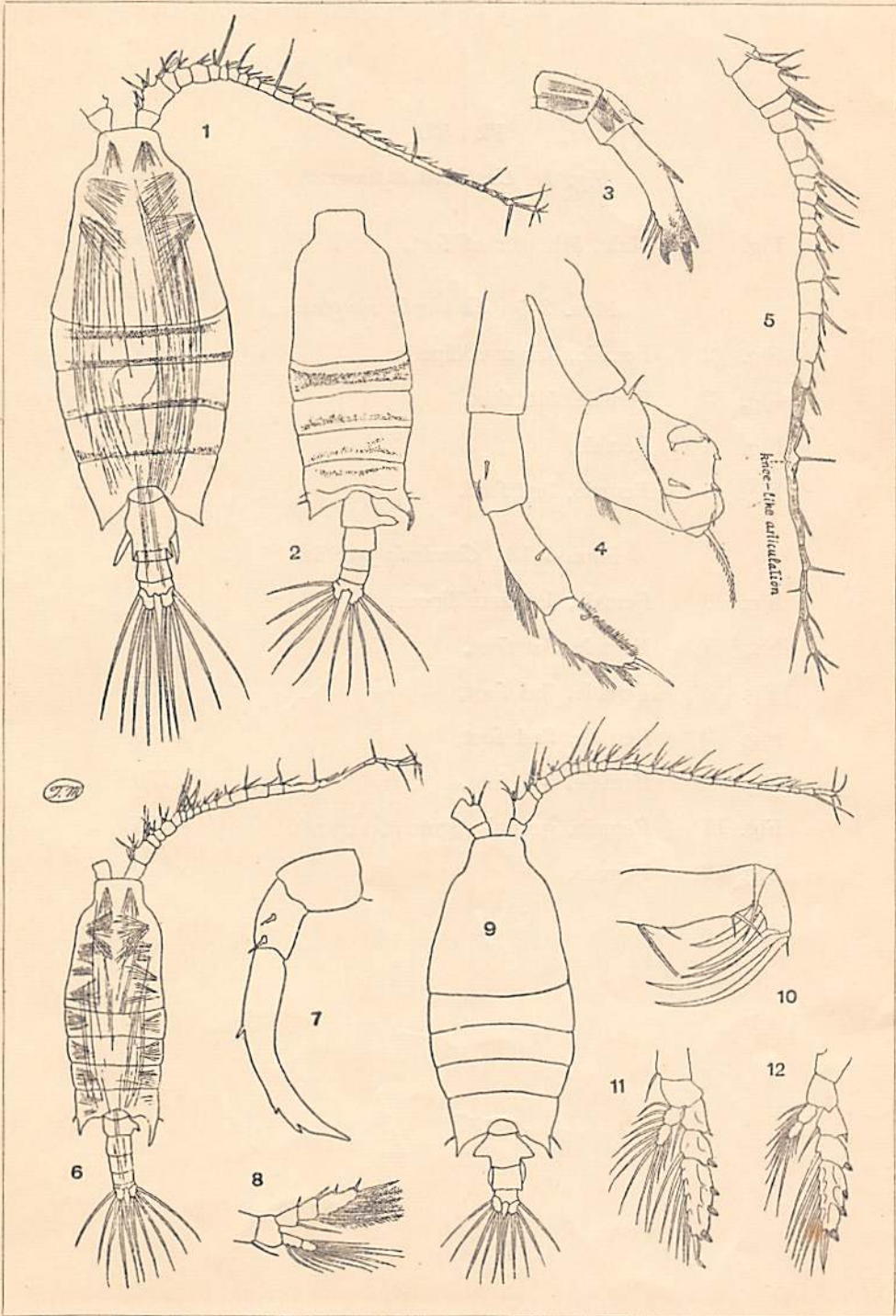
Pl. 58.

Figs. 1-5 *Candacia pachydactyla*

Fig. 1	Female,	× 27½
Fig. 2	Male,	× 22½
Fig. 3	Female, 5th foot,	× 180
Fig. 4	Male, 5th pair of feet,	× 110
Fig. 5	Male, right 1st antenna,	× 35

Figs. 6-12 *Candacia bipinnata*

Fig. 6	Male,	× 20
Fig. 7	Female, 5th foot,	× 115
Fig. 8	Male, 1st foot,	× 35
Fig. 9	Female,	× 23
Fig. 10	Female, 1st maxillipede,	× 35
Fig. 11	Male, 3rd foot,	× 35
Fig. 12	Male, 4th foot,	× 35



Pl. 59.

Fig. 1 *Candacia bipinnata*

Fig. 1 Male, 5th pair of feet, ×110

Figs. 2-5 *Candacia simplex*

Fig. 2 Female, 1st maxillipede, × 35

Fig. 3 Female, 5th foot, ×180

Fig. 4 Female, × 35

Fig. 5 Female, 3rd foot, × 55

Figs. 6-12 *Candacia pacifica*

Fig. 6 Female, 1st maxillipede, × 35

Fig. 7 Female, 1st foot, × 35

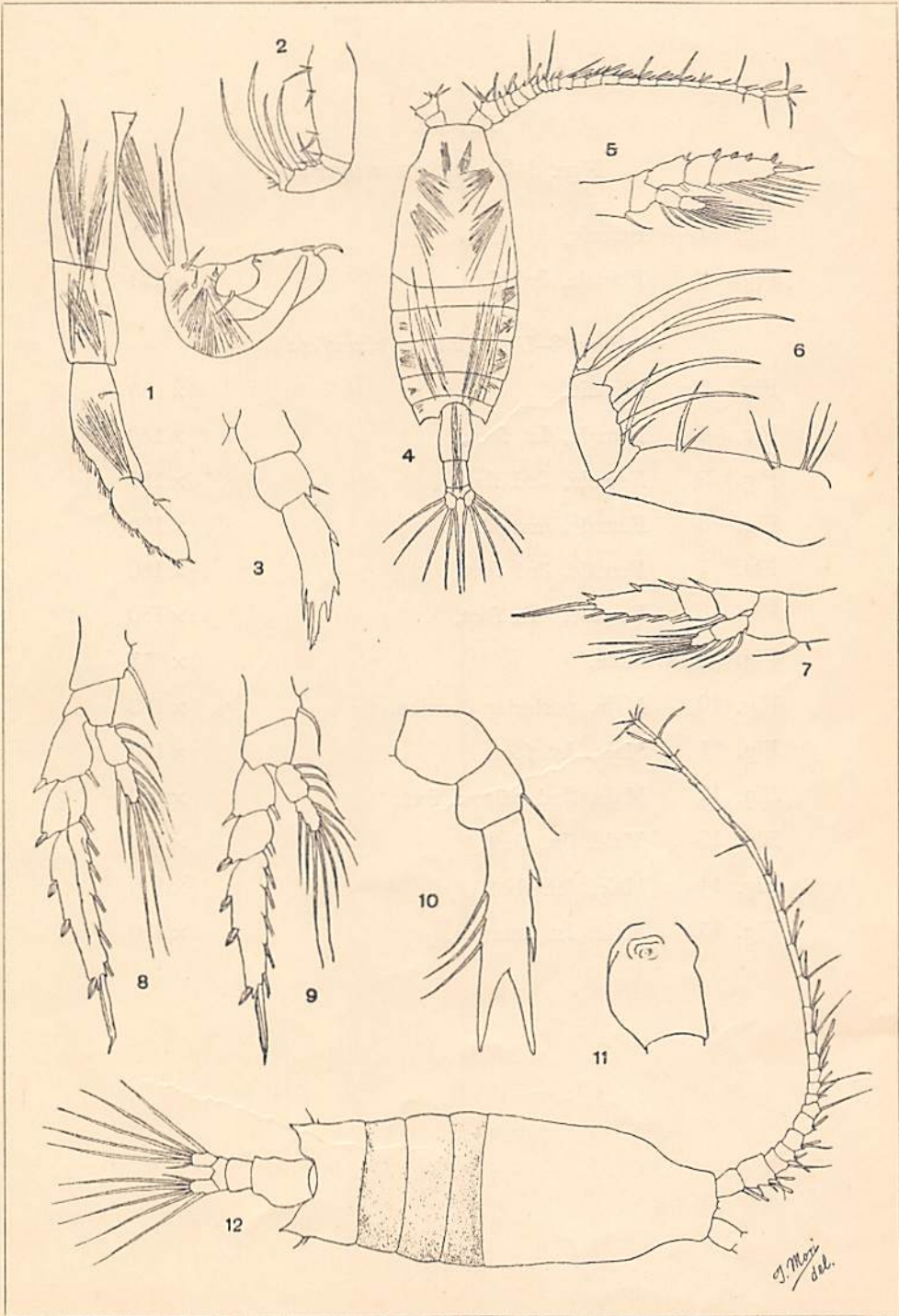
Fig. 8 Female, 3rd foot, × 35

Fig. 9 Female, 2nd foot, × 35

Fig. 10 Female, 5th foot, ×130

Fig. 11 Female, genital segment, ventral, × 35

Fig. 12 Female, × 19



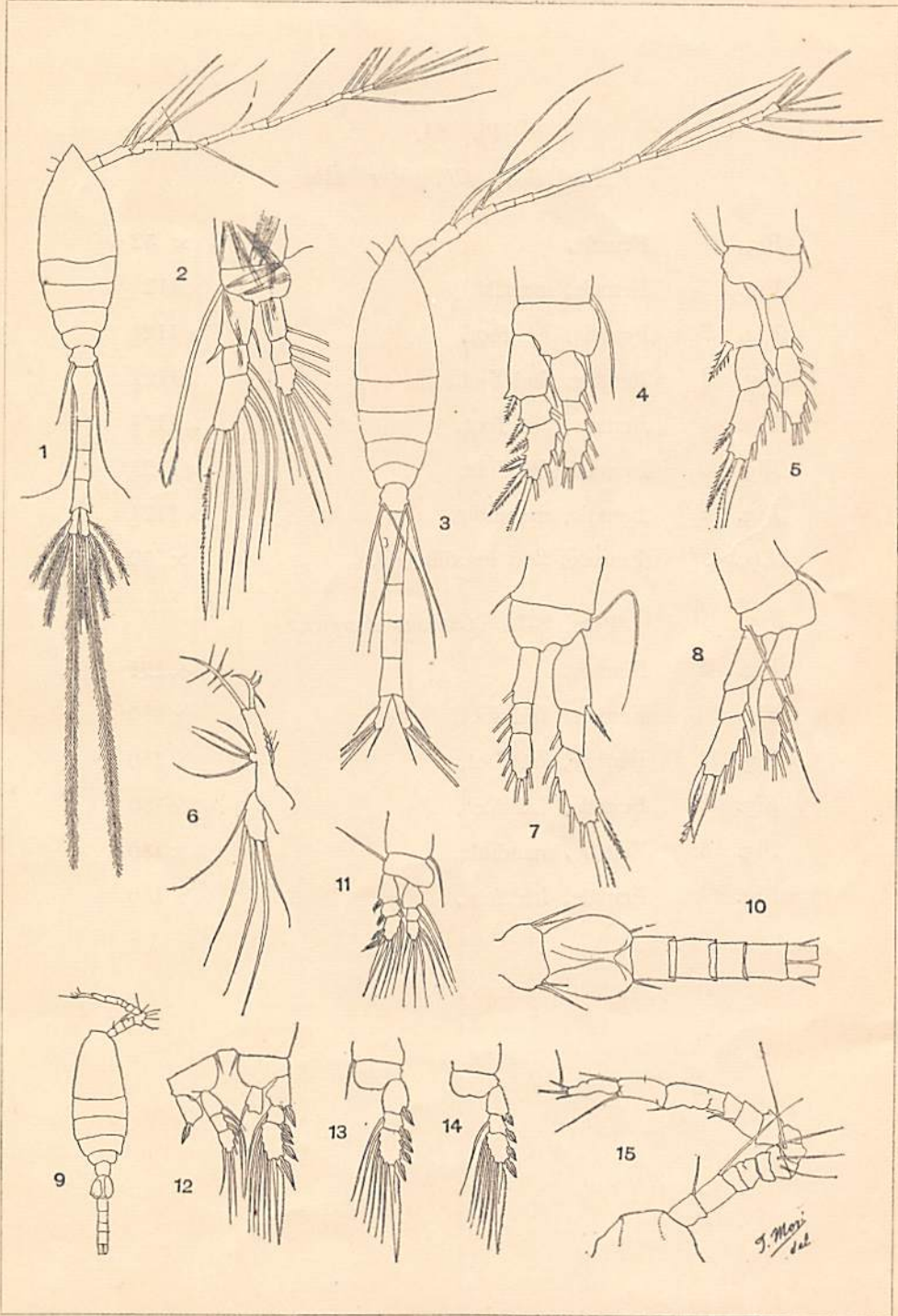
Pl. 60.

Figs. 1-2 *Oithona setigera*

Fig. 1	Female,	× 35
Fig. 2	Female, 3rd foot,	× 121

Figs. 3-15 *Oithona plumifera*

Fig. 3	Female,	× 55
Fig. 4	Female, 1st foot,	× 180
Fig. 5	Female, 2nd foot,	× 180
Fig. 6	Female, mandible,	× 180
Fig. 7	Female, 3rd foot,	× 180
Fig. 8	Female, 4th foot,	× 180
Fig. 9	Male,	× 55
Fig. 10	Male, posterior division,	× 180
Fig. 11	Male, 1st foot,	× 180
Fig. 12	Male, 2nd pair of feet,	× 180
Fig. 13	Male, 3rd foot,	× 180
Fig. 14	Male, 4th foot,	× 180
Fig. 15	Male, 1st antenna,	× 180



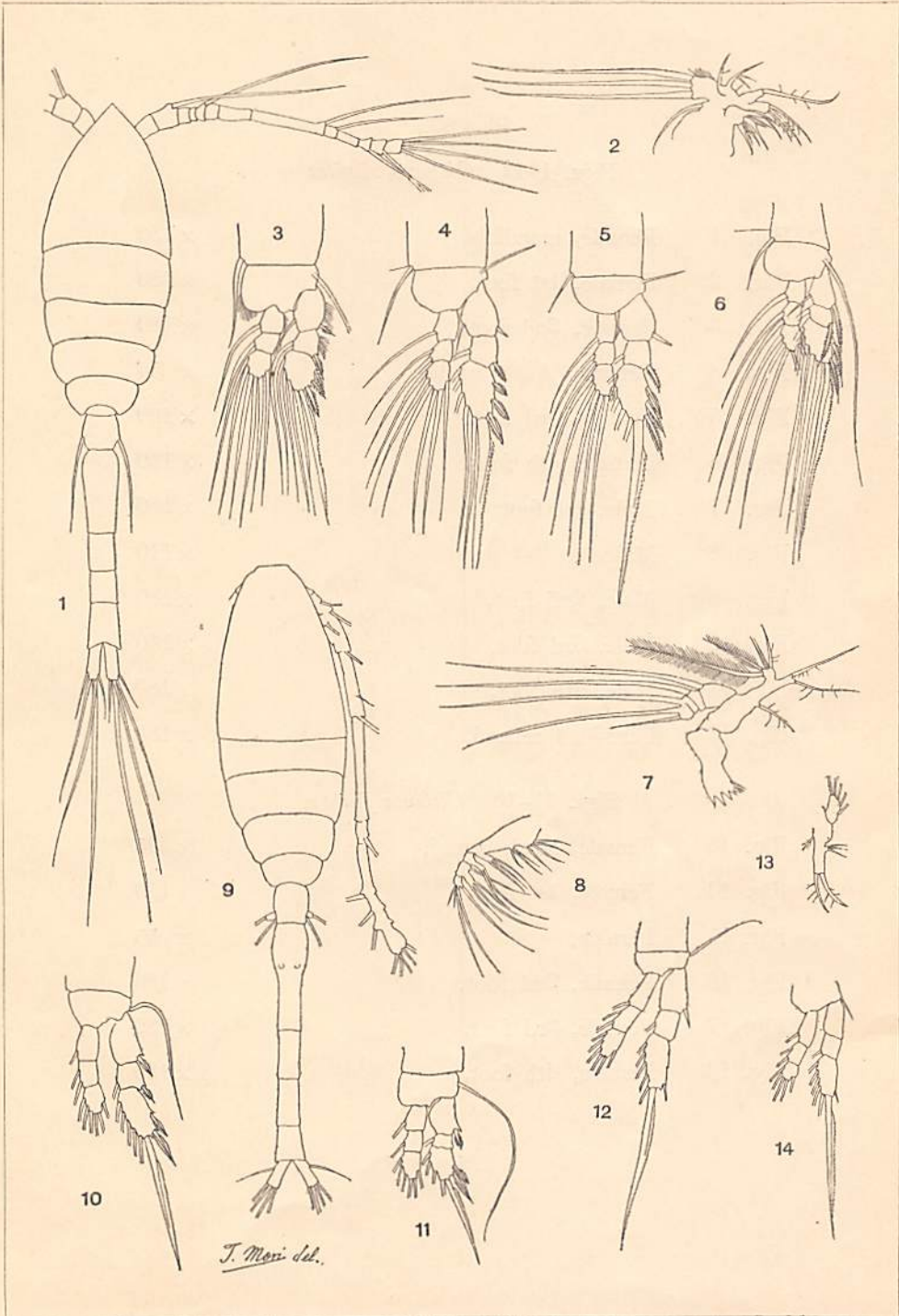
Pl. 61.

Figs. 1-8 *Oithona robusta*

Fig. 1	Female,	× 52
Fig. 2	Female, maxilla,	× 112½
Fig. 3	Female, 1st foot,	× 112½
Fig. 4	Female, 2nd foot,	× 112½
Fig. 5	Female, 3rd foot,	× 112½
Fig. 6	Female, 4th foot,	× 112½
Fig. 7	Female, mandible,	× 112½
Fig. 8	Female, 2nd maxillipede,	× 52

Figs. 9-14 *Oithona decipiens*

Fig. 9	Female,	× 121
Fig. 10	Female, 2nd foot,	× 180
Fig. 11	Female, 1st foot,	× 180
Fig. 12	Female, 3rd foot,	× 180
Fig. 13	Female, mandible,	× 180
Fig. 14	Female, 4th foot,	× 180



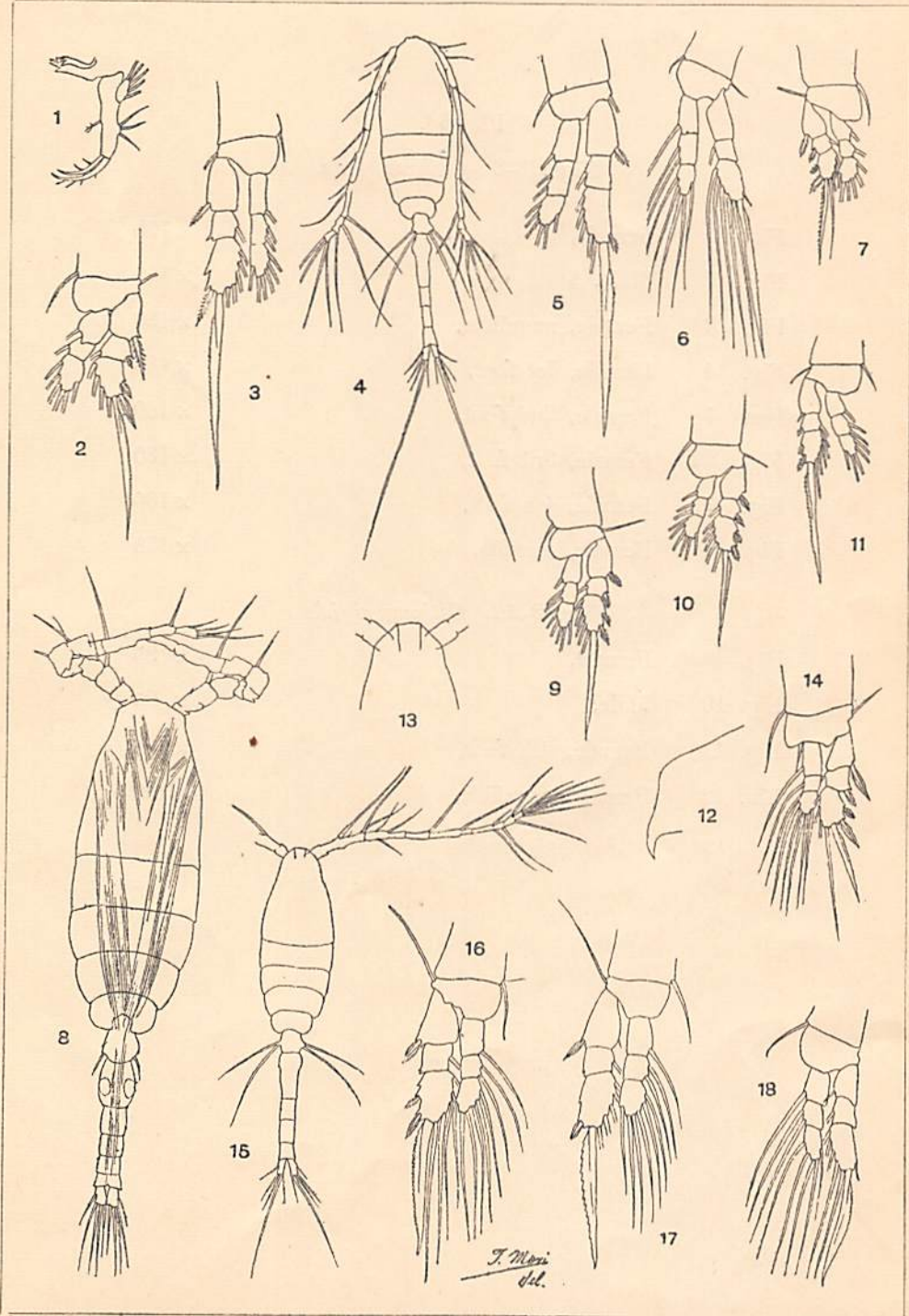
Pl. 62.

Figs. 1-12 *Oithona similis*

Fig. 1	Female, mandible,	× 180
Fig. 2	Female, 1st foot,	× 180
Fig. 3	Female, 2nd foot,	× 180
Fig. 4	Female,	× 55
Fig. 5	Female, 3rd foot,	× 180
Fig. 6	Female, 4th foot,	× 180
Fig. 7	Male, 1st foot,	× 180
Fig. 8	Male,	× 110
Fig. 9	Male, 2nd foot,	× 180
Fig. 10	Male, 3rd foot,	× 180
Fig. 11	Male, 4th foot,	× 180
Fig. 12	Female, forehead,	× 180

Figs. 13-18 *Oithona fallax*

Fig. 13	Female, head, dorsal,	× 95
Fig. 14	Female, 1st foot,	× 180
Fig. 15	Female,	× 55
Fig. 16	Female, 2nd foot,	× 180
Fig. 17	Female, 3rd foot,	× 180
Fig. 18	Female, 4th foot,	× 180



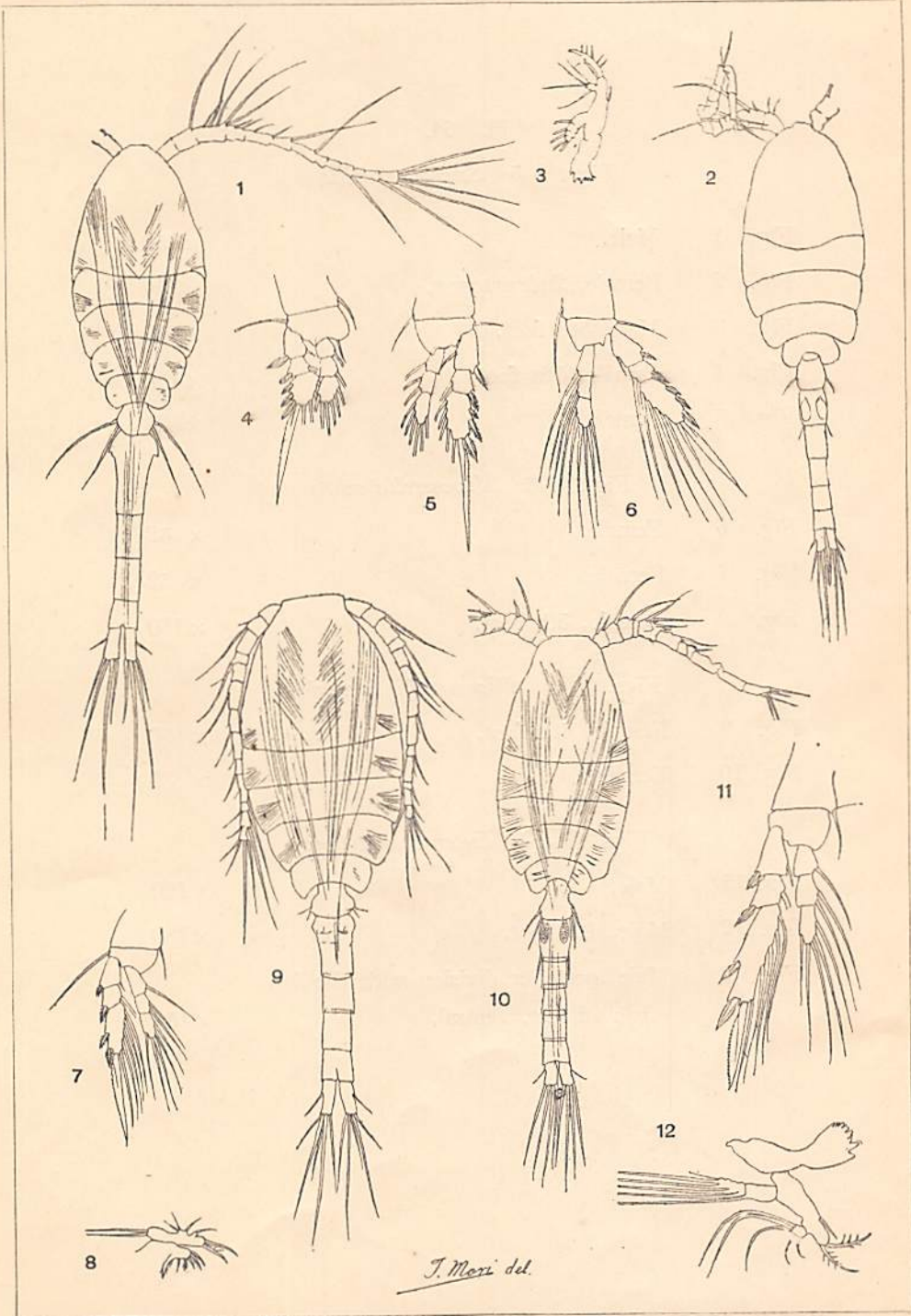
Pl. 63.

Figs. 1-8 *Oithona nana*

Fig. 1	Female,	× 120
Fig. 2	Male,	× 115
Fig. 3	Female, mandible,	× 180
Fig. 4	Female, 1st foot,	× 180
Fig. 5	Female, 2nd foot,	× 180
Fig. 6	Female, 3rd foot,	× 180
Fig. 7	Female, 4th foot,	× 180
Fig. 8	Female, maxilla,	× 180

Figs. 9-12 *Oithona rigida*

Fig. 9	Female,	× 95
Fig. 10	Male,	× 95
Fig. 11	Female, 4th foot,	× 180
Fig. 12	Female, mandible,	× 180



Pl. 64.

Figs. 1-5 *Setella gracilis*

Fig. 1	Male,	× 52
Fig. 2	Female, 2nd antenna,	× 180
Fig. 3	Male, 5th foot,	× 180
Fig. 4	Female, 5th foot,	× 180
Fig. 5	Female,	× 35

Figs. 6-8 *Microsetella rosea*

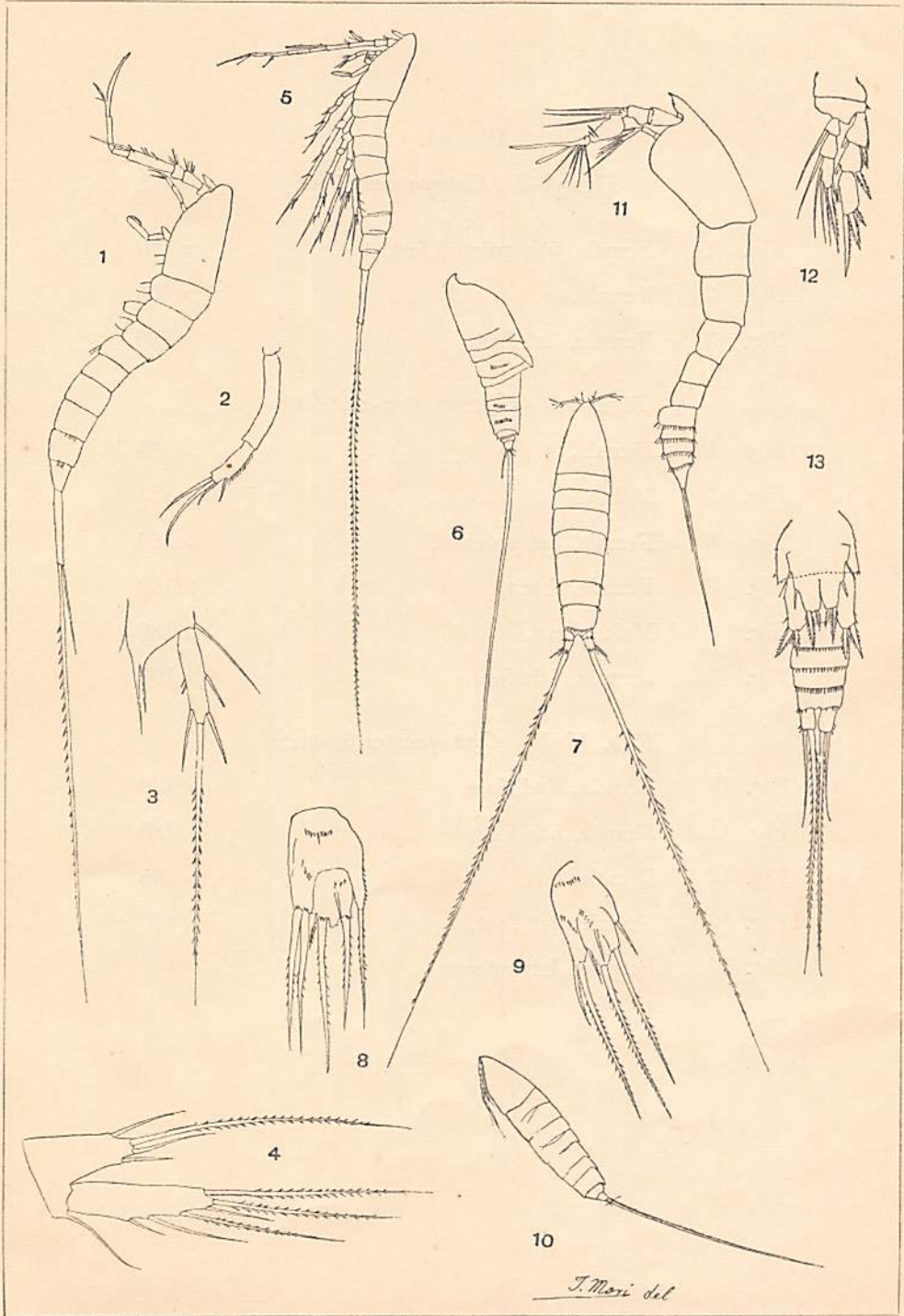
Fig. 6	Female,	× 52
Fig. 7	Female,	× 52
Fig. 8	Female, 5th foot,	× 180

Figs. 9-10 *Microsetella norvegica*

Fig. 9	Female, 5th foot,	× 180
Fig. 10	Female,	× 36

Figs. 11-13 *Euterpe acutifrons*

Fig. 11	Male,	× 120
Fig. 12	Male, 4th foot,	× 180
Fig. 13	Male, posterior division with the 5th pair of feet, ventral,	× 180



Pl. 65.

Figs. 1-3 *Euterpe acutifrons*

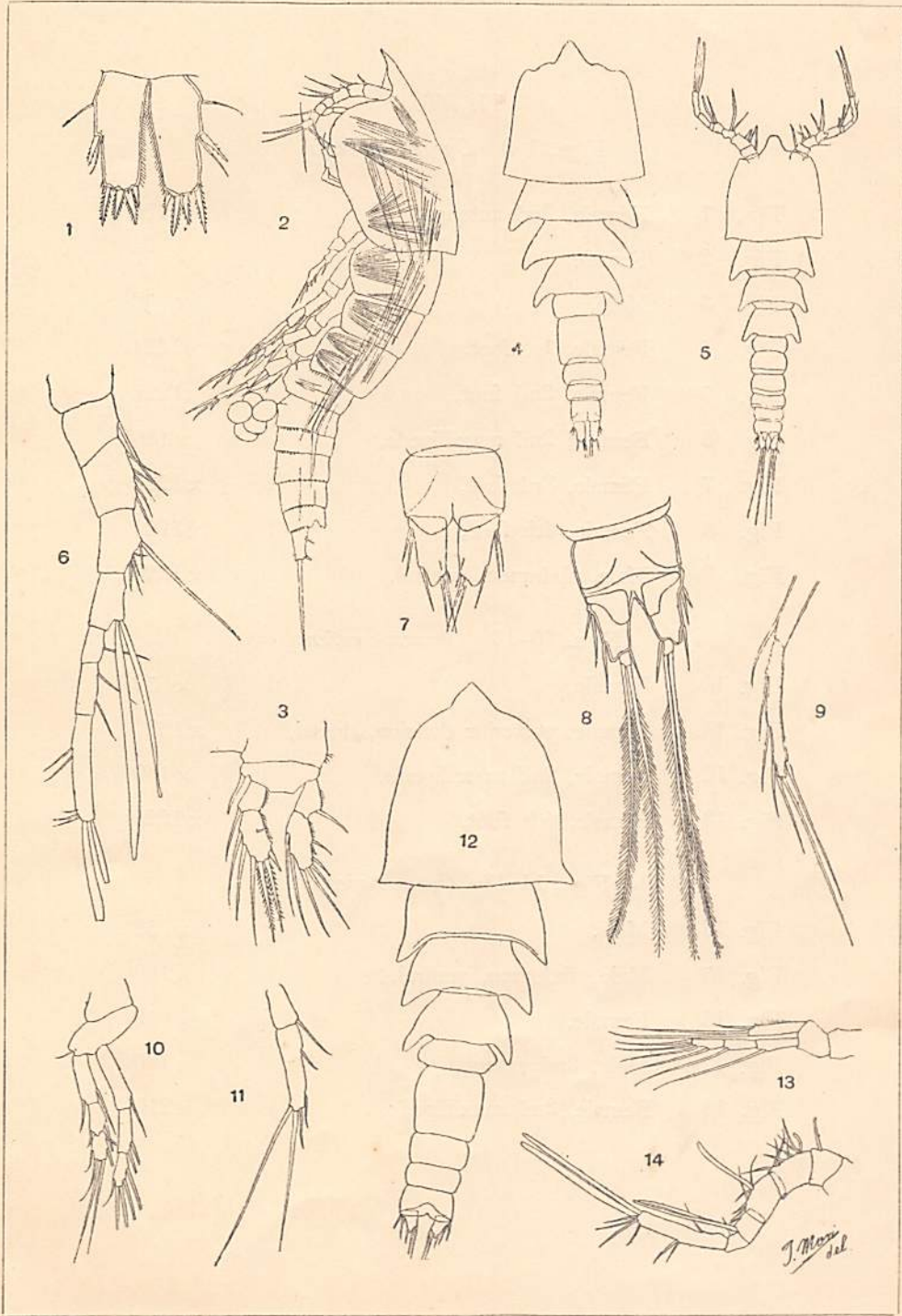
Fig. 1	Female, 5th pair of feet,	× 180
Fig. 2	Female,	× 105
Fig. 3	Female, 1st foot,	× 180

Figs. 4-9 *Clytemnestra scutellata*

Fig. 4	Female,	× 55
Fig. 5	Male,	× 42½
Fig. 6	Female, 1st antenna,	× 180
Fig. 7	Female, furca,	× 180
Fig. 8	Male, furca,	× 180
Fig. 9	Female, 5th foot,	× 190

Figs. 10-14 *Clytemnestra rostrata*

Fig. 10	Female, 2nd foot,	× 130
Fig. 11	Female, 5th foot,	× 180
Fig. 12	Female,	× 95
Fig. 13	Female, 1st foot,	× 130
Fig. 14	Female, 1st antenna,	× 130



Pl. 66.

Figs. 1-9 *Oncaea venusta*

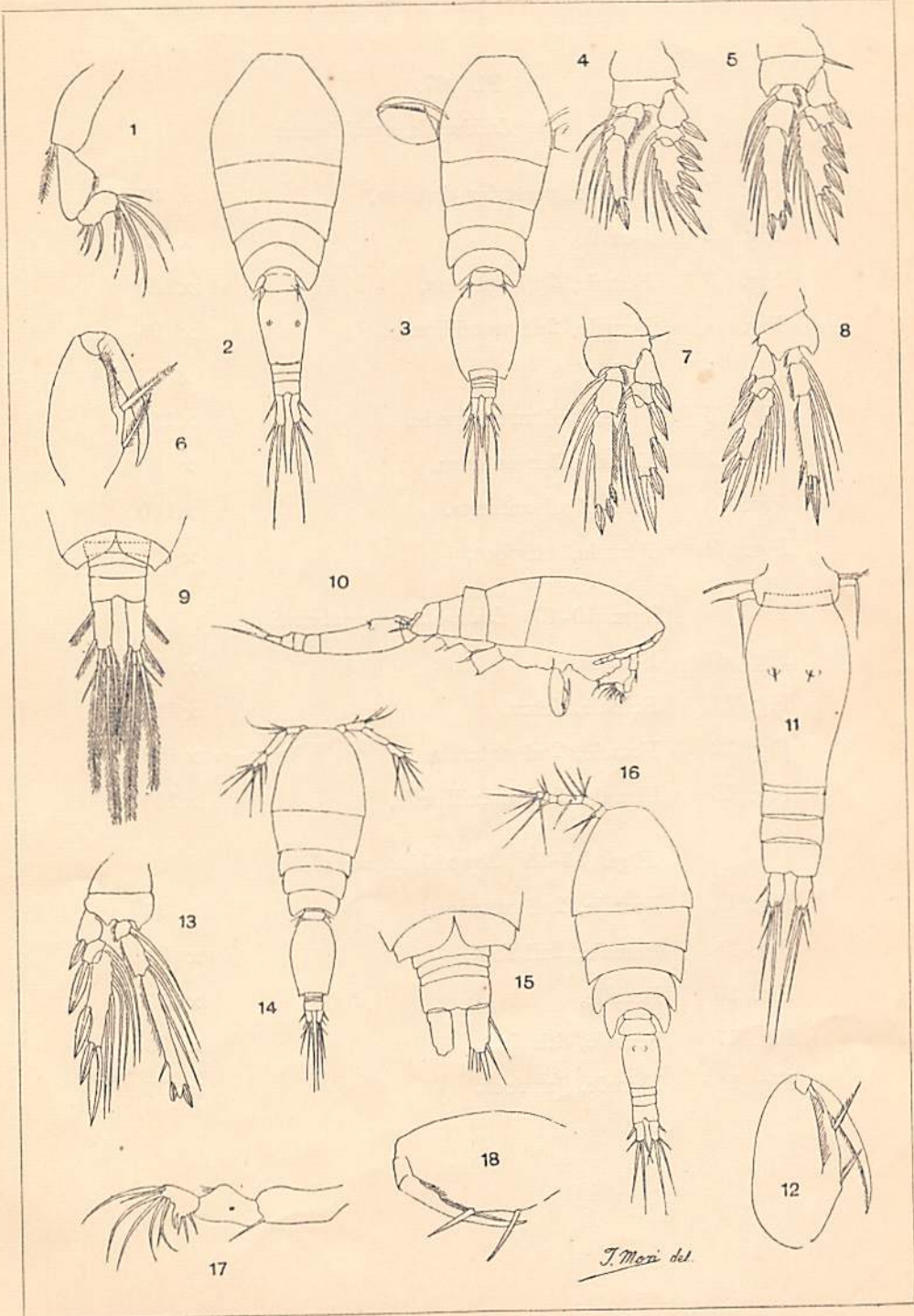
Fig. 1	Female, 2nd antenna,	× 180
Fig. 2	Female,	× 52
Fig. 3	Male,	× 52
Fig. 4	Female, 1st foot,	× 122½
Fig. 5	Female, 2nd foot,	× 122½
Fig. 6	Female, 2nd maxillipede,	× 180
Fig. 7	Female, 3rd foot,	× 122½
Fig. 8	Female, 4th foot,	× 122½
Fig. 9	Male, abdomen, ventral,	× 122½

Figs. 10-13 *Oncaea conifera*

Fig. 10	Female,	× 52
Fig. 11	Female, posterior division, dorsal,	× 122½
Fig. 12	Female, 2nd maxillipede,	× 180
Fig. 13	Female, 4th foot,	× 122½

Figs. 14-18 *Oncaea media*

Fig. 14	Male,	× 52
Fig. 15	Male, abdomen, ventral,	× 180
Fig. 16	Female,	× 52
Fig. 17	Male, 2nd antenna,	× 180
Fig. 18	Female, 2nd maxillipede,	× 210



Pl. 67.

Figs. 1-9 *Lubbockia squillimana*

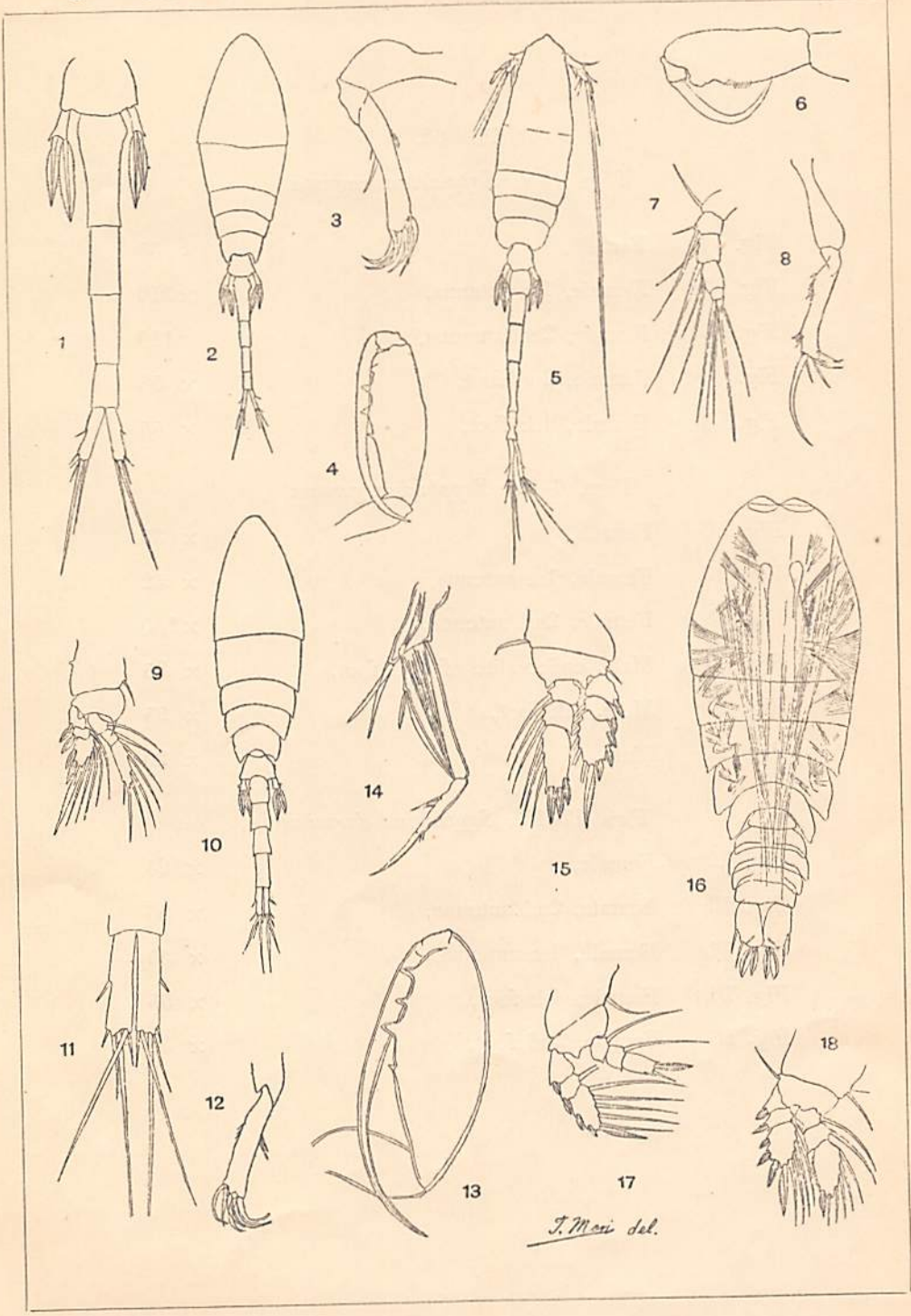
Fig. 1	Female, posterior division,	× 95
Fig. 2	Female,	× 35
Fig. 3	Female, 2nd antenna,	× 180
Fig. 4	Female, 2nd maxillipede,	× 95
Fig. 5	Male,	× 35
Fig. 6	Male, 2nd maxillipede,	× 180
Fig. 7	Female, 1st antenna,	× 95
Fig. 8	Male, 2nd antenna,	× 180
Fig. 9	Female, 1st foot,	× 95

Figs. 10-13 *Lubbockia marukawai*

Fig. 10	Female,	× 46
Fig. 11	Female, furca,	× 180
Fig. 12	Female, 2nd antenna,	× 180
Fig. 13	Female, 2nd maxillipede,	× 180

Figs. 14-18 *Sapphirina metallina*

Fig. 14	Female, 2nd antenna,	× 95
Fig. 15	Female, 2nd foot,	× 95
Fig. 16	Female,	× 55
Fig. 17	Female, 4th foot,	× 95
Fig. 18	Female, 1st foot,	× 95



Pl. 68.

Figs. 1-5 *Sapphirina angusta*

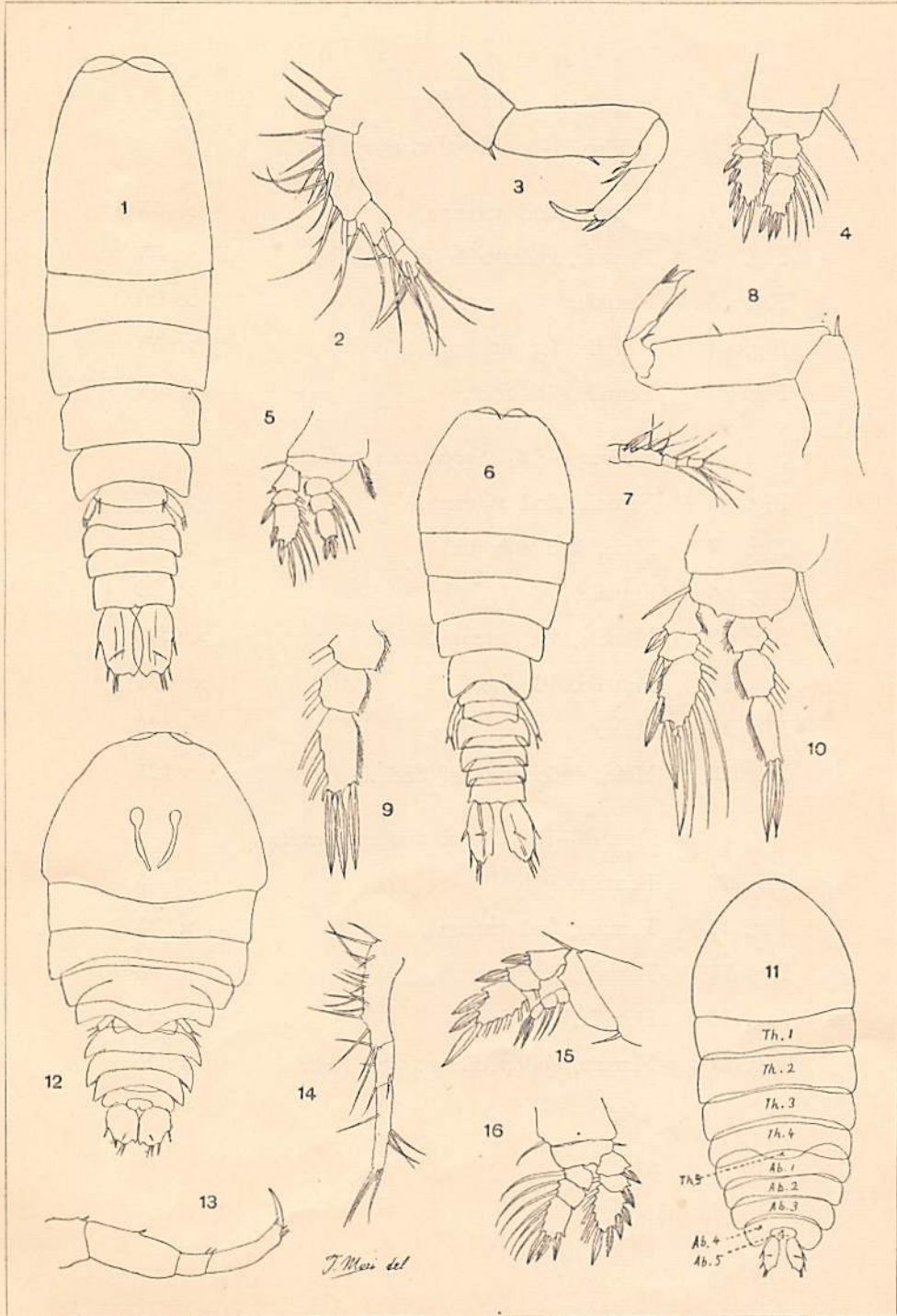
Fig. 1	Female,	× 35
Fig. 2	Female, 1st antenna,	× 110
Fig. 3	Female, 2nd antenna,	× 110
Fig. 4	Female, 2nd foot,	× 55
Fig. 5	Female, 4th foot,	× 55

Figs. 6-11 *Sapphirina gemma*

Fig. 6	Female,	× 35
Fig. 7	Female, 1st antenna,	× 52
Fig. 8	Female, 2nd antenna,	× 180
Fig. 9	Male, endopodite of 2nd foot,	× 95
Fig. 10	Male, 4th foot,	× 95
Fig. 11	Male,	× 20

Figs. 12-16 *Sapphirina darwinii*

Fig. 12	Female,	× 25
Fig. 13	Female, 2nd antenna,	× 55
Fig. 14	Female, 1st antenna,	× 55
Fig. 15	Female, 4th foot,	× 55
Fig. 16	Female, 2nd foot,	× 35



Pl. 69.

Figs. 1-5 *Sapphirina opalina*

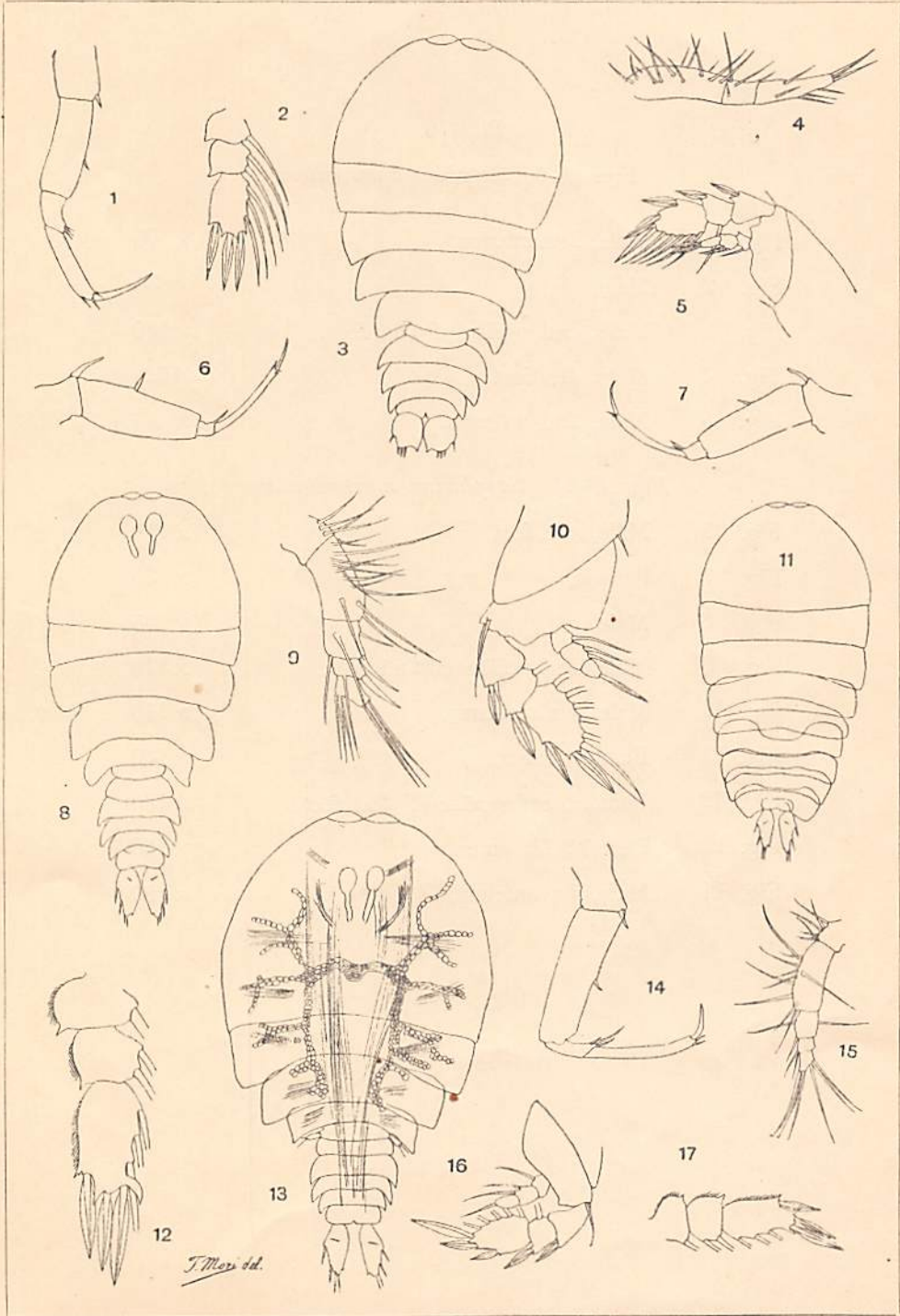
Fig. 1	Female, 2nd antenna,	× 55
Fig. 2	Female, endopodite of 2nd foot,	× 55
Fig. 3	Female,	× 20
Fig. 4	Female, 1st antenna,	× 55
Fig. 5	Female, 4th foot,	× 55

Figs. 6-12 *Sapphirina stellata*

Fig. 6	Female, 2nd antenna,	× 52
Fig. 7	Male, 2nd antenna,	× 52
Fig. 8	Female,	× 26
Fig. 9	Female, 1st antenna,	× 123½
Fig. 10	Female, 4th foot,	× 105
Fig. 11	Male,	× 20
Fig. 12	Male, endopodite of 2nd foot,	× 125

Figs. 13-16 *Sapphirina intestinata*

Fig. 13	Female,	× 35
Fig. 14	Female, 2nd antenna,	× 95
Fig. 15	Female, 1st antenna,	× 95
Fig. 16	Female, 4th foot,	× 95
Fig. 17	Female, endopodite of 2nd foot,	× 95



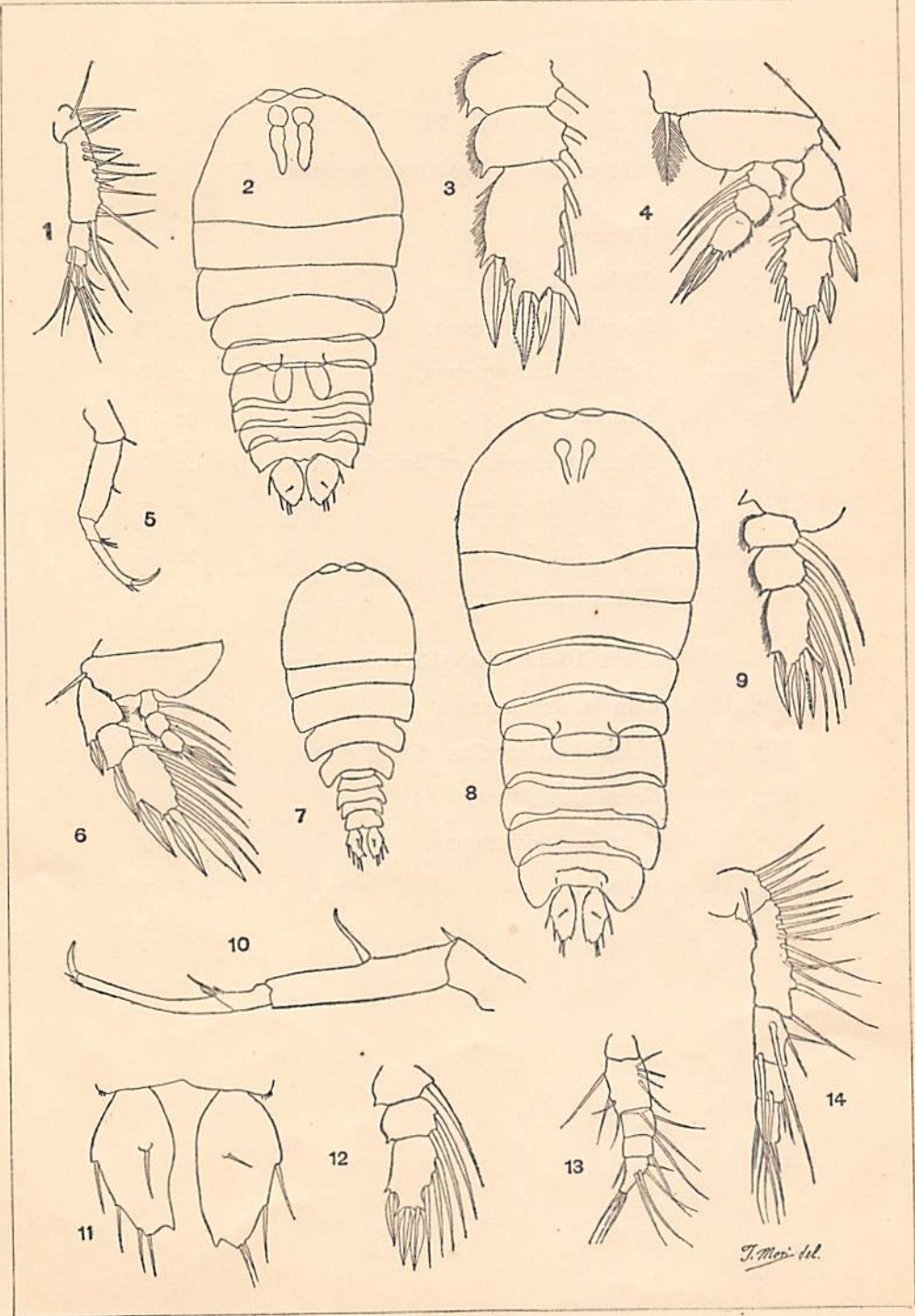
Pl. 70.

Figs. 1-5 *Sapphirina auronitens*

Fig. 1	Male, 1st antenna,	× 95
Fig. 2	Male,	× 35
Fig. 3	Male, endopodite of 2nd foot,	× 180
Fig. 4	Male, 4th foot,	× 132½
Fig. 5	Male, 2nd antenna,	× 55

Figs. 6-14 *Sapphirina nigromaculata*

Fig. 6	Male, 4th foot,	× 110
Fig. 7	Female,	× 35
Fig. 8	Male,	× 35
Fig. 9	Male, endopodite of 2nd foot,	× 110
Fig. 10	Male, 2nd antenna,	× 110
Fig. 11	Female, furca,	× 180
Fig. 12	Female, endopodite of 2nd foot,	× 180
Fig. 13	Female, 1st antenna,	× 180
Fig. 14	Male, 1st antenna,	× 180



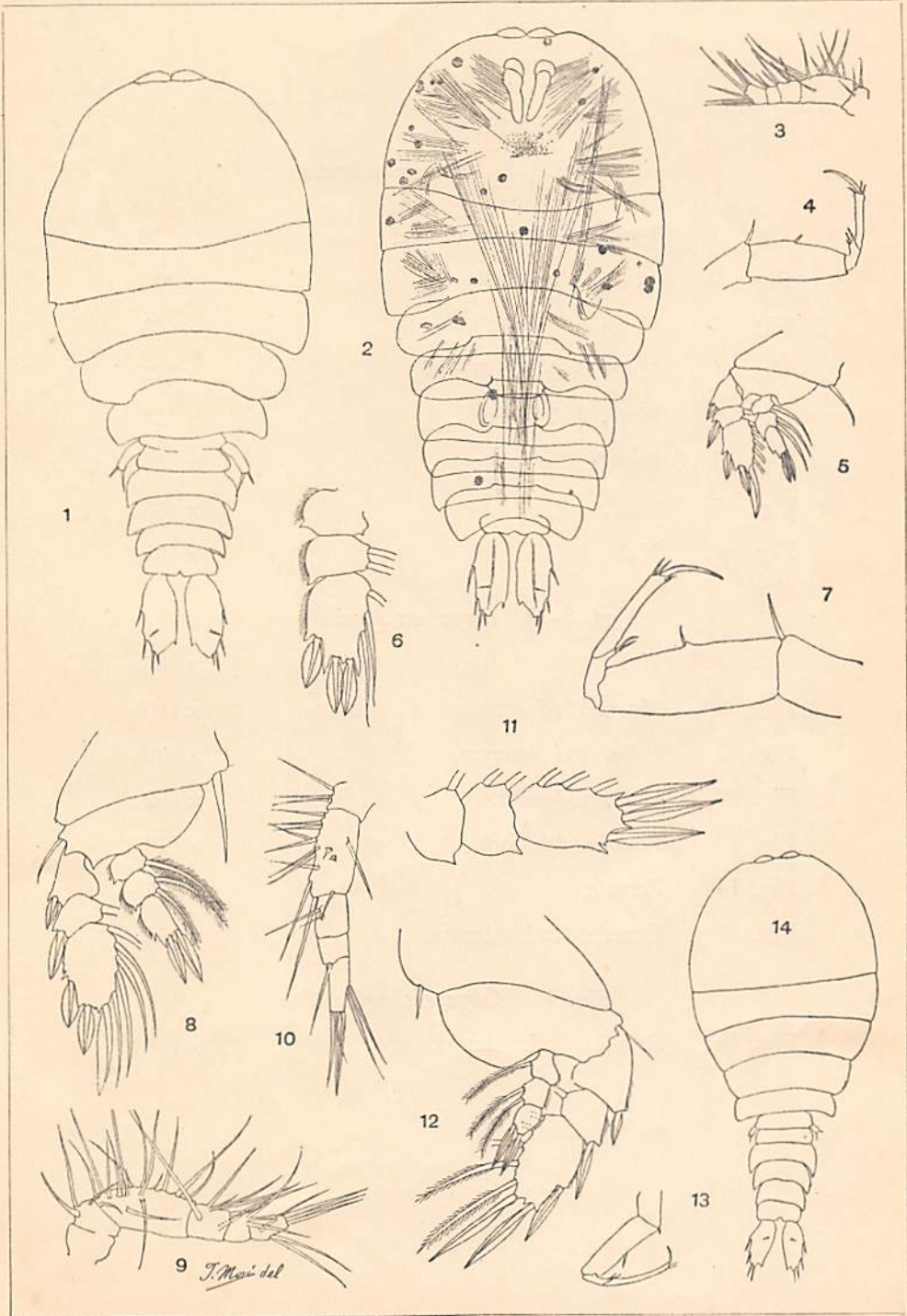
Pl. 71.

Figs. 1-9 *Sapphirina gastrica*

Fig. 1	Female,	× 35
Fig. 2	Male,	× 35
Fig. 3	Female, 1st antenna,	× 55
Fig. 4	Female, 2nd antenna,	× 55
Fig. 5	Female, 4th foot,	× 55
Fig. 6	Male, endopodite of 2nd foot,	× 95
Fig. 7	Male, 2nd antenna,	× 95
Fig. 8	Male, 4th foot,	× 95
Fig. 9	Male, 1st antenna,	× 95

Figs. 10-14 *Sapphirina scarlata*

Fig. 10	Female, 1st antenna,	× 180
Fig. 11	Female, endopodite of 2nd foot,	× 180
Fig. 12	Female, 4th foot,	× 180
Fig. 13	Female, 2nd antenna,	× 52
Fig. 14	Female,	× 35



Pl. 72.

Figs. 1-8 *Corycaeus lautus*

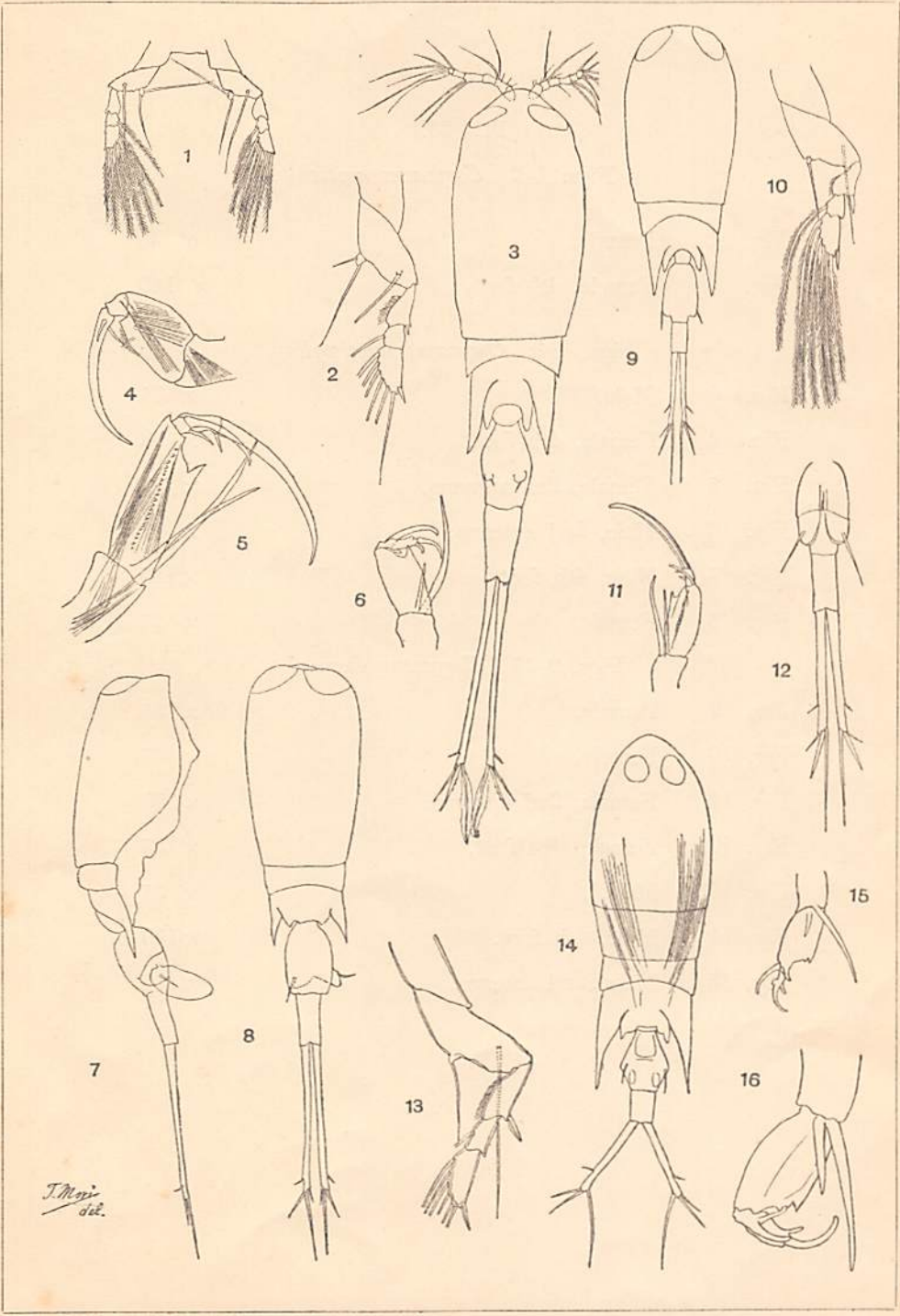
Fig. 1	Female, 4th pair of feet,	× 52
Fig. 2	Male, 4th foot,	× 113
Fig. 3	Female,	× 35
Fig. 4	Male, 2nd maxillipede,	× 113
Fig. 5	Male, 2nd antenna,	× 113
Fig. 6	Female, 2nd antenna,	× 52
Fig. 7	Male,	× 35
Fig. 8	Male,	× 35

Figs. 9-15 *Corycaeus speciosus*

Fig. 9	Male,	× 35
Fig. 10	Male, 4th foot,	× 110
Fig. 11	Male, 2nd antenna,	× 52
Fig. 12	Male, abdomen,	× 52
Fig. 13	Female, 4th foot,	× 110
Fig. 14	Female,	× 35
Fig. 15	Female, 2nd antenna,	× 52

Fig. 16 *Corycaeus agilis*

Fig. 16	Female, 2nd antenna,	× 180
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Pl. 73.

Figs. 1-2 *Corycaeus agilis*

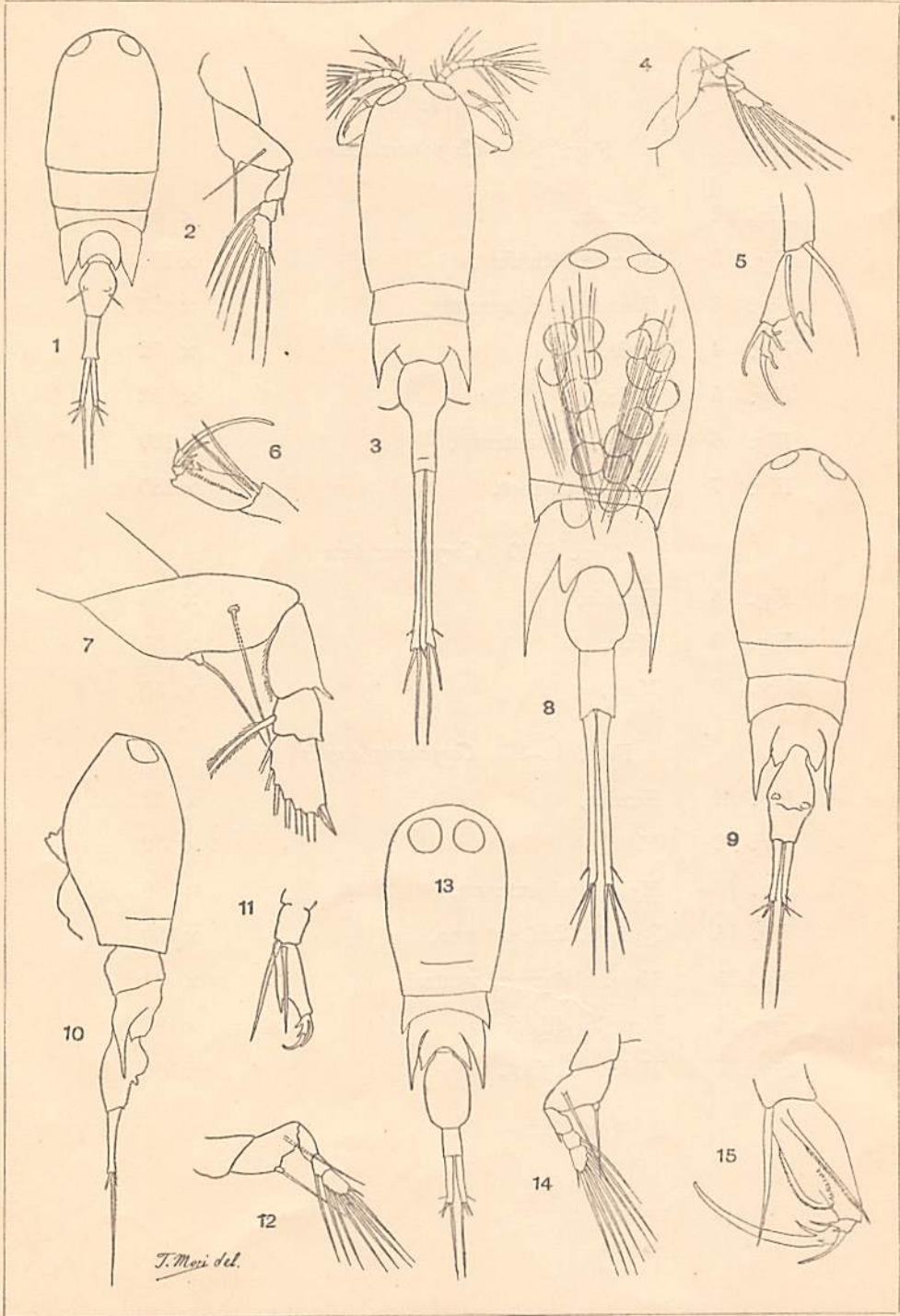
Fig. 1	Female,	× 35
Fig. 2	Female, 4th foot,	× 180

Figs. 3-8 *Corycaeus longistylis*

Fig. 3	Male,	× 35
Fig. 4	Female, 4th foot,	× 52
Fig. 5	Female, 2nd antenna,	× 52
Fig. 6	Male, 2nd antenna,	× 52
Fig. 7	Male, 4th foot,	× 180
Fig. 8	Female,	× 35

Figs. 9-15 *Corycaeus flaccus*

Fig. 9	Female,	× 35
Fig. 10	Female,	× 35
Fig. 11	Female, 2nd antenna,	× 55
Fig. 12	Female, 4th foot,	× 95
Fig. 13	Male,	× 35
Fig. 14	Male, 4th foot,	× 110
Fig. 15	Male, 2nd antenna,	× 110



Pl. 74.

Figs. 1-7 *Corycaeus catus*

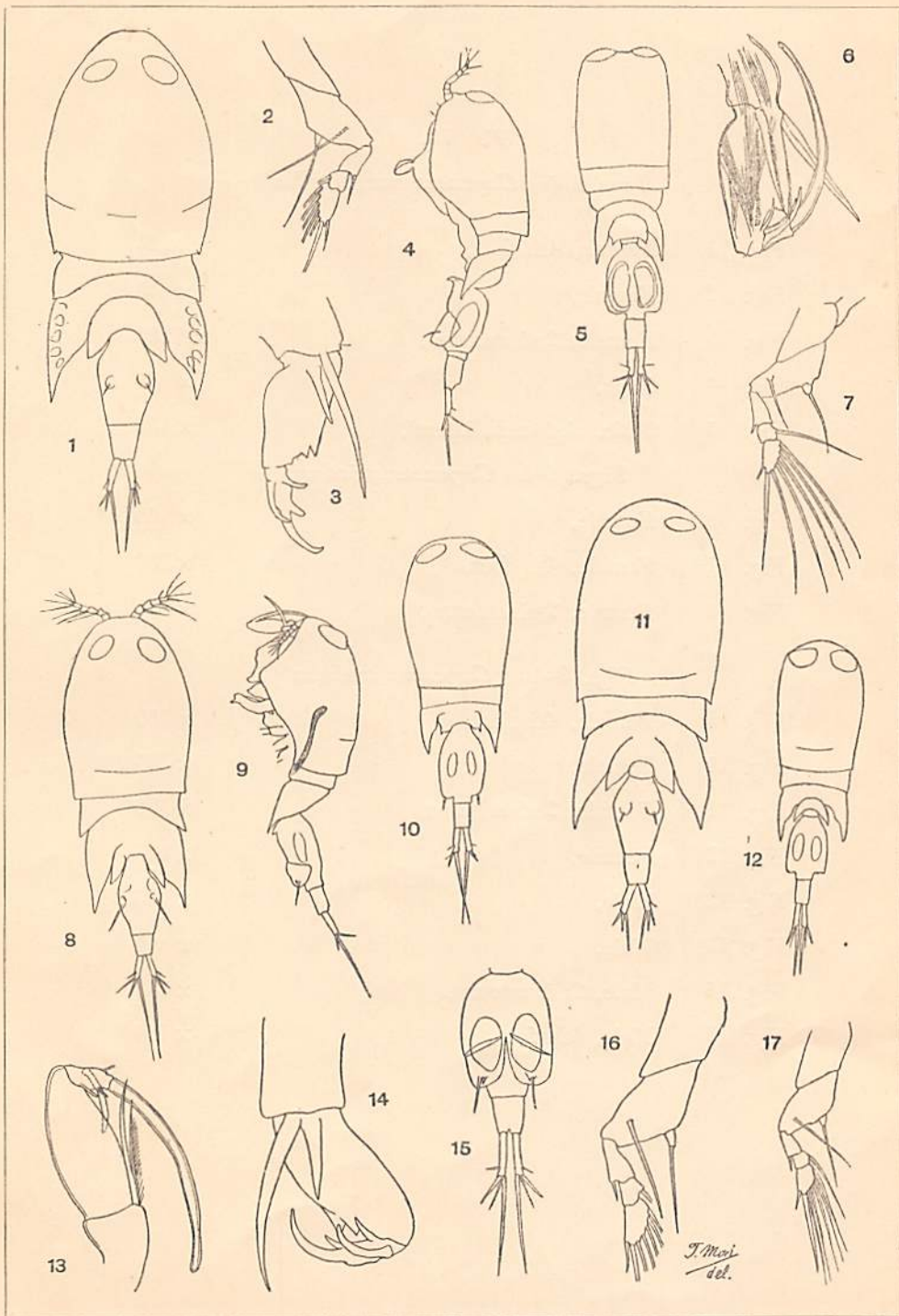
Fig. 1	Female,	× 55
Fig. 2	Female, 4th foot,	× 130
Fig. 3	Female, 2nd antenna,	× 125
Fig. 4	Male,	× 52
Fig. 5	Male,	× 52
Fig. 6	Male, 2nd antenna,	× 180
Fig. 7	Male, 4th foot,	× 180

Figs. 8-10 *Corycaeus latus*

Fig. 8	Female,	× 55
Fig. 9	Male,	× 55
Fig. 10	Male,	× 55

Figs. 11-17 *Corycaeus ovalis*

Fig. 11	Female,	× 52
Fig. 12	Male,	× 52
Fig. 13	Male, 2nd antenna,	× 180
Fig. 14	Female, 2nd antenna,	× 180
Fig. 15	Male, abdomen, ventral,	× 91
Fig. 16	Female, 4th foot,	× 180
Fig. 17	Male, 4th foot,	× 180



Pl. 75.

Figs. 1-5 *Corycaeus crassiusculus*

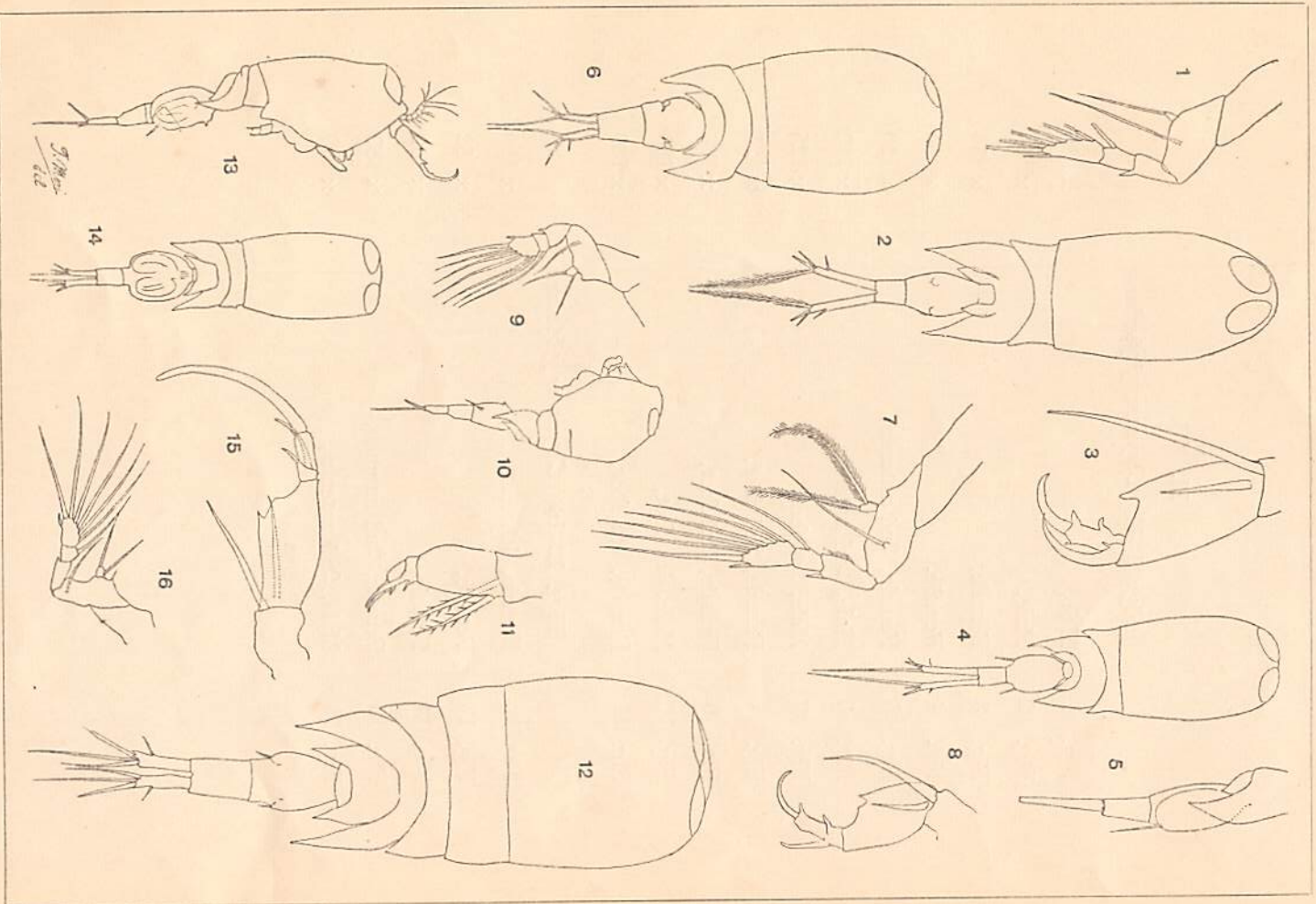
Fig. 1	Female, 4th foot,	$\times 122\frac{1}{2}$
Fig. 2	Female,	$\times 35$
Fig. 3	Female, 2nd antenna,	$\times 122\frac{1}{2}$
Fig. 4	Male,	$\times 35$
Fig. 5	Male, abdomen, lateral,	$\times 52$

Figs. 6-8 *Corycaeus asiaticus*

Fig. 6	Female,	$\times 49$
Fig. 7	Female, 4th foot,	$\times 180$
Fig. 8	Female, 2nd antenna,	$\times 95$

Figs. 9-16 *Corycaeus trukicus*

Fig. 9	Female, 4th foot,	$\times 180$
Fig. 10	Female,	$\times 55$
Fig. 11	Female, 2nd antenna,	$\times 180$
Fig. 12	Female,	$\times 125$
Fig. 13	Male,	$\times 55$
Fig. 14	Male,	$\times 55$
Fig. 15	Male, 2nd antenna,	$\times 180$
Fig. 16	Male, 4th foot,	$\times 180$



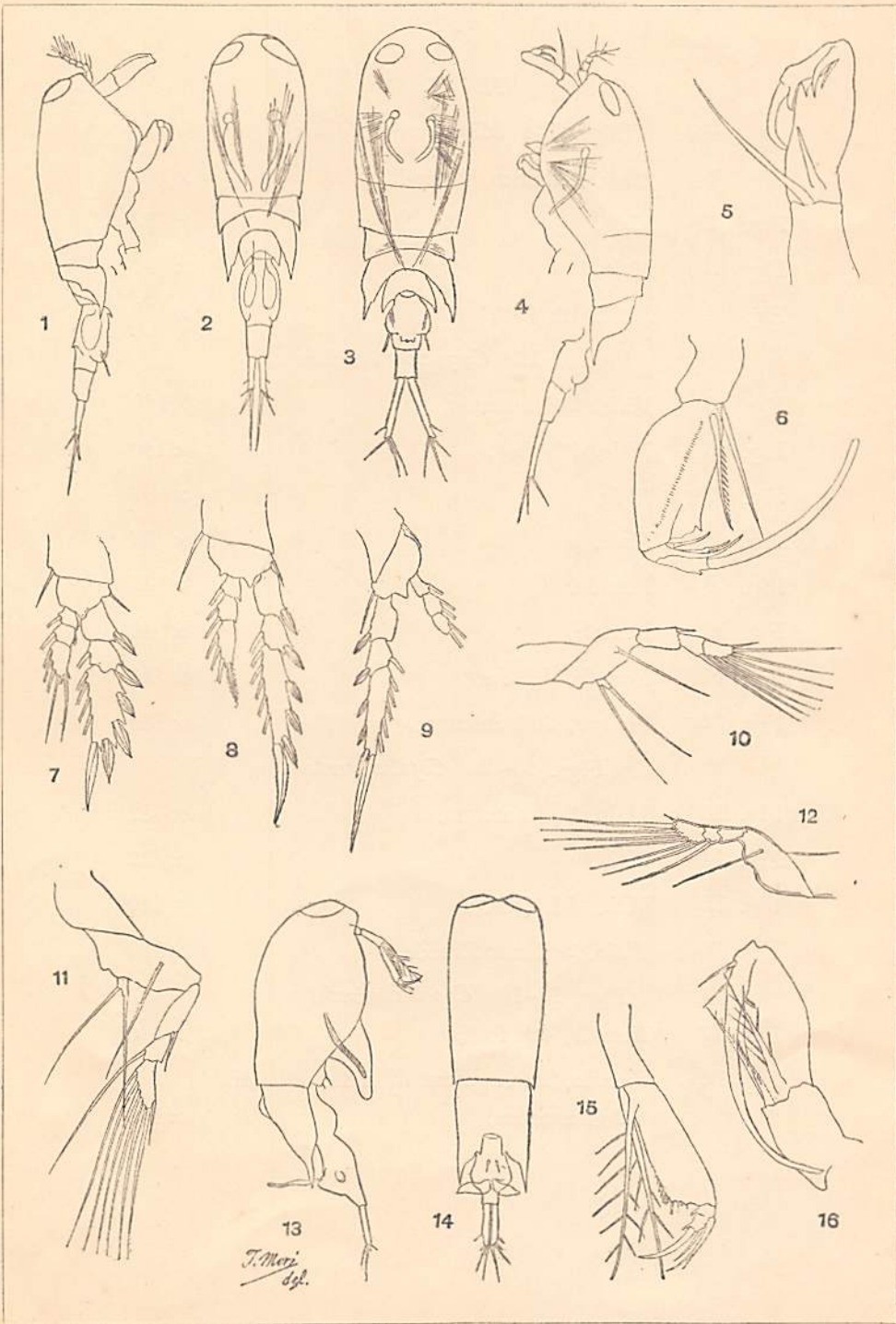
Pl. 76.

Figs. 1-11 *Corycaeus japonicus*

Fig. 1	Male,	× 55
Fig. 2	Male,	× 55
Fig. 3	Female,	× 55
Fig. 4	Female,	× 55
Fig. 5	Female, 2nd antenna,	× 180
Fig. 6	Male, 2nd antenna,	× 180
Fig. 7	Male, 1st foot,	× 125
Fig. 8	Female, 2nd foot,	× 125
Fig. 9	Female, 3rd foot,	× 125
Fig. 10	Male, 4th foot,	× 180
Fig. 11	Female, 4th foot,	× 180

Figs. 12-16 *Corycaeus gibbulus*

Fig. 12	Female, 4th foot,	× 180
Fig. 13	Female,	× 52
Fig. 14	Female,	× 52
Fig. 15	Female, 2nd antenna,	× 180
Fig. 16	Male, 2nd antenna,	× 180



Pl. 77.

Figs. 1-4 *Corycaeus gibbulus*

Fig. 1	Male, abdomen, ventral,	× 110
Fig. 2	Male,	× 52
Fig. 3	Male,	× 52
Fig. 4	Male, 4th foot,	× 180

Figs. 5-12 *Corycaeus concinnus*

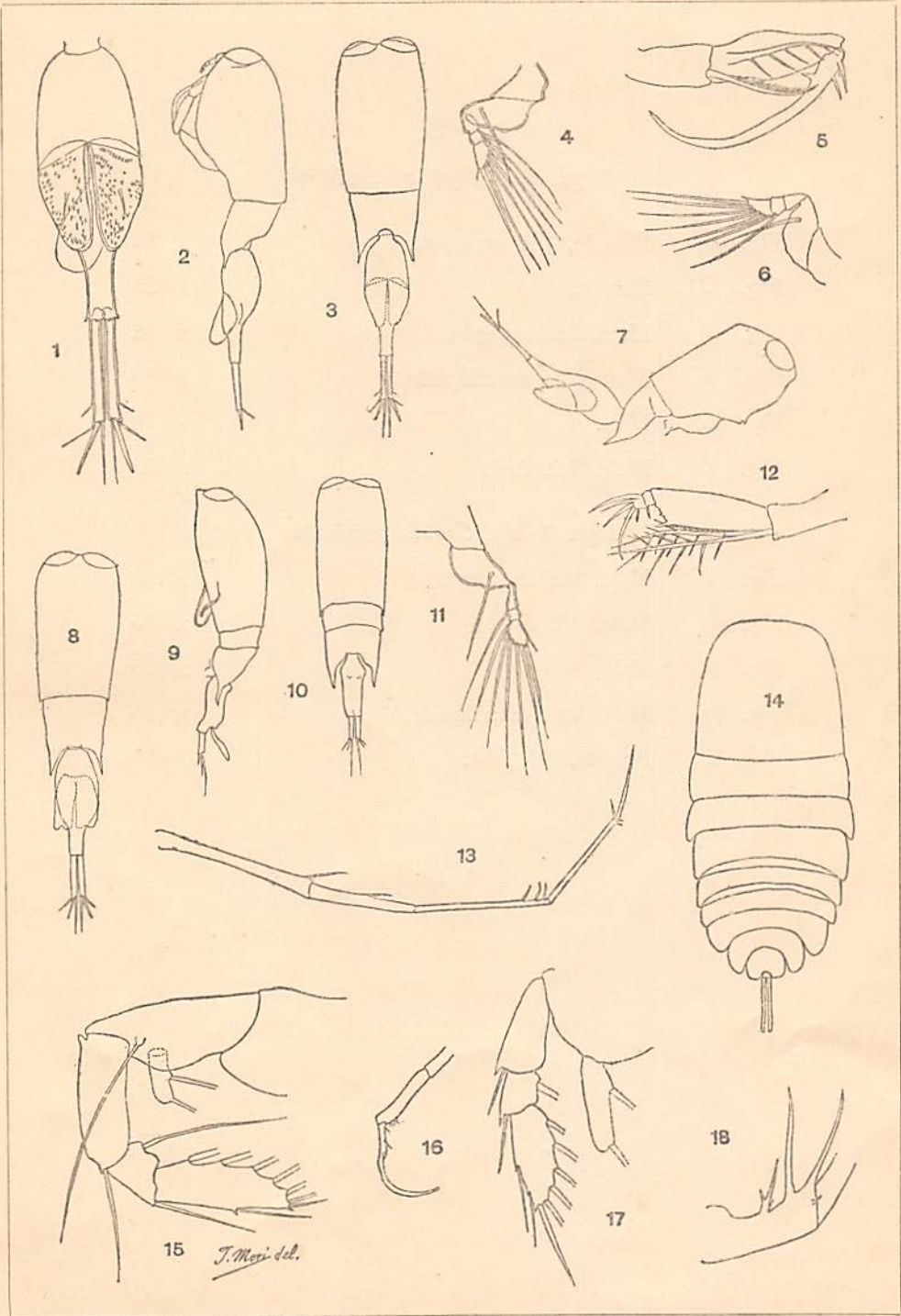
Fig. 5	Male, 2nd antenna,	× 180
Fig. 6	Male, 4th foot,	× 180
Fig. 7	Male,	× 52
Fig. 8	Male,	× 52
Fig. 9	Female,	× 46
Fig. 10	Female,	× 46
Fig. 11	Female, 4th foot,	× 180
Fig. 12	Female, 2nd antenna,	× 180

Figs. 13-16 *Copilia recta*

Fig. 13	Male, 2nd antenna,	× 52
Fig. 14	Male,	× 12
Fig. 15	Male, 4th foot,	× 180
Fig. 16	Male, 2nd maxillipede,	× 180

Figs. 17-18 *Copilia mirabilis*

Fig. 17	Female, 4th foot,	× 140
Fig. 18	Female, 1st segment of endopodite of 2nd antenna,	× 180



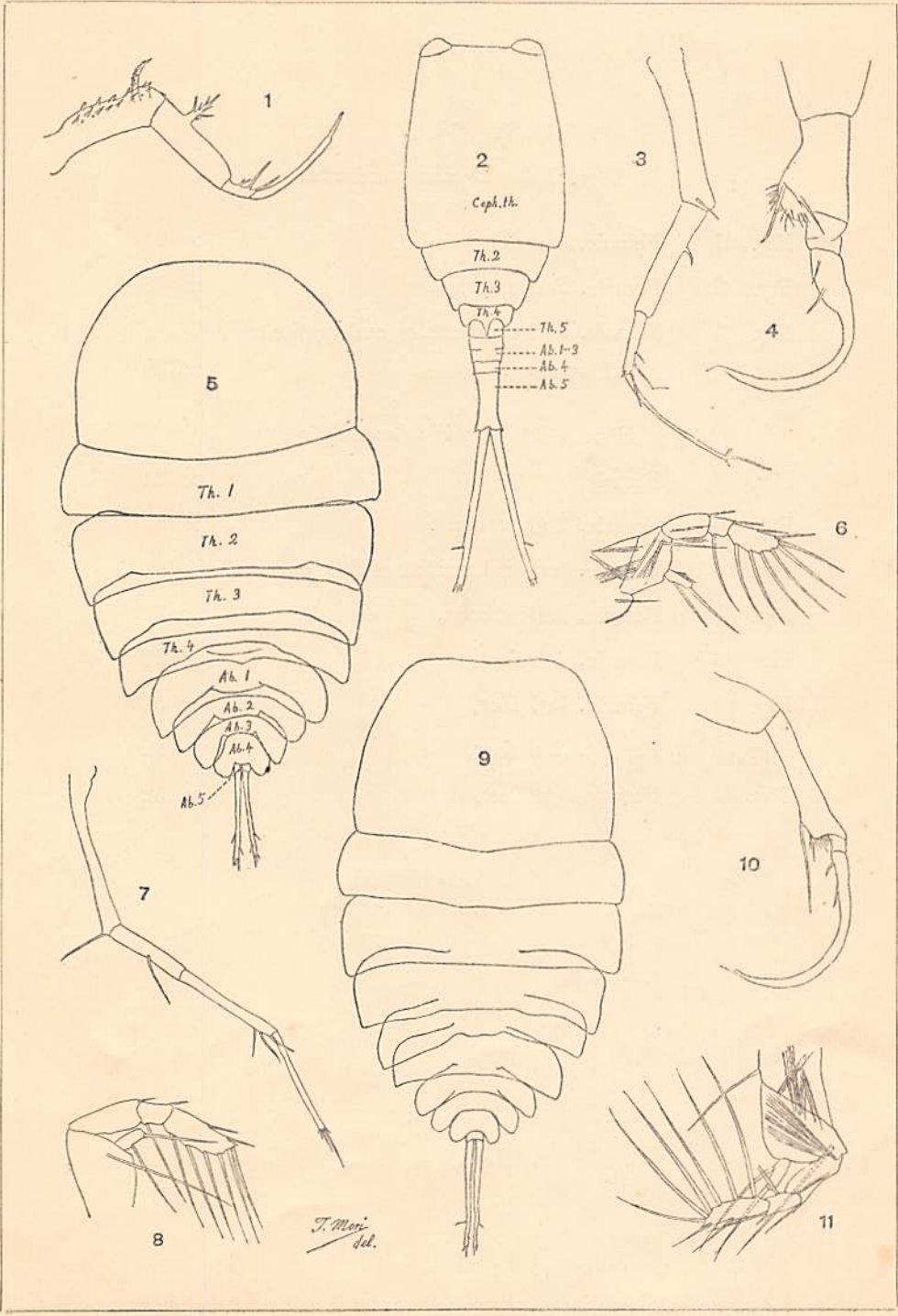
Pl. 78.

Figs. 1-6 *Copilia mirabilis*

Fig. 1	Female, 2nd antenna,	× 55
Fig. 2	Female,	× 28
Fig. 3	Male, 2nd antenna,	× 52
Fig. 4	Male, 2nd maxillipede,	× 110
Fig. 5	Male,	× 18
Fig. 6	Male, 4th foot,	× 52

Figs. 7-11 *Copilia quadrata*

Fig. 7	Male, 2nd antenna,	× 55
Fig. 8	Male, 4th foot,	× 95
Fig. 9	Male,	× 20
Fig. 10	Male, 2nd maxillipede,	× 95
Fig. 11	Female, 4th foot,	× 110



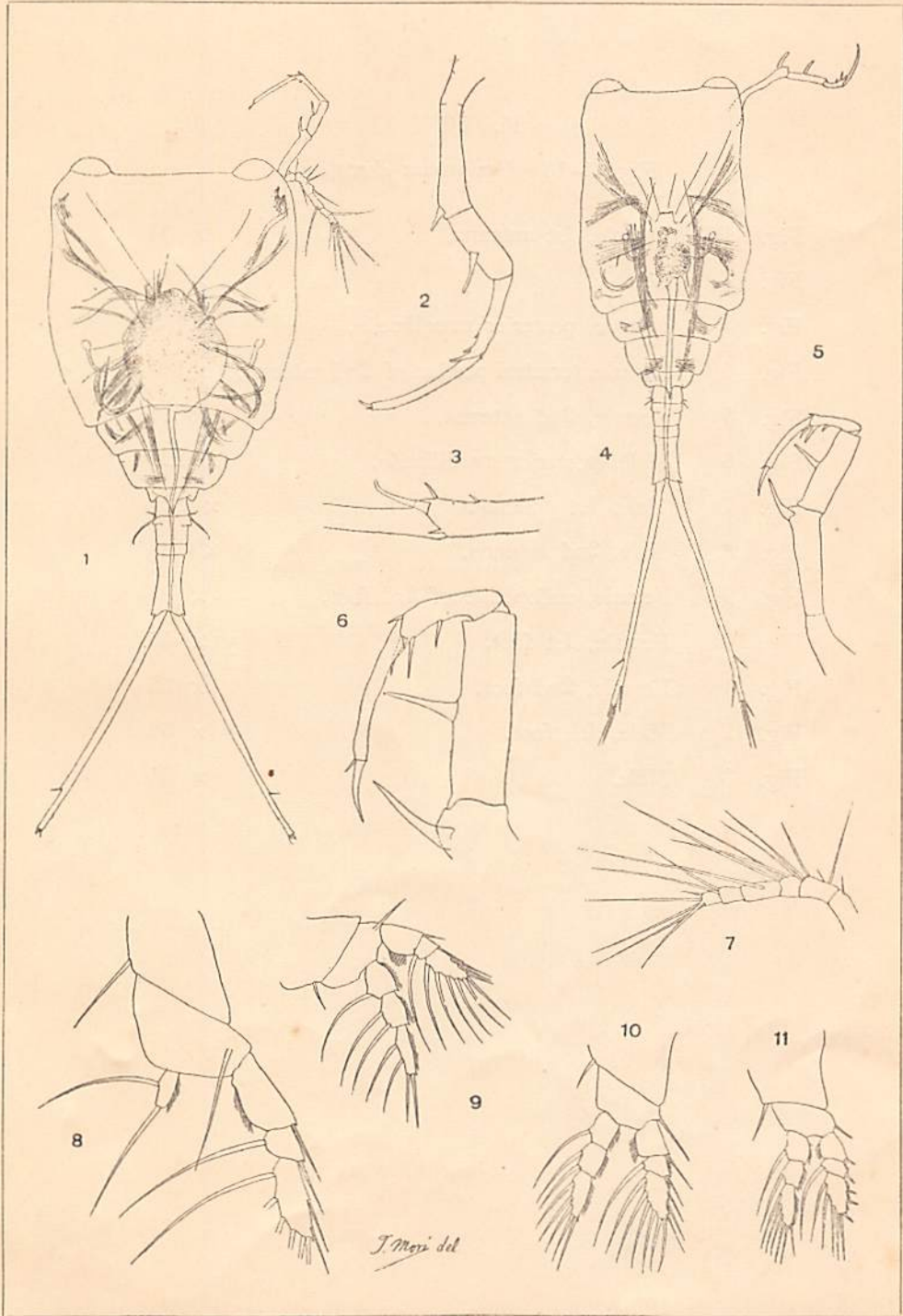
Pl. 79.

Figs. 1-3 *Copilia quadrata*

Fig. 1	Female,	× 28
Fig. 2	Female, 2nd antenna,	× 55
Fig. 3	Female, 2nd segment of endopodite of 2nd antenna,	× 180

Figs. 4-11 *Copilia longistylis*

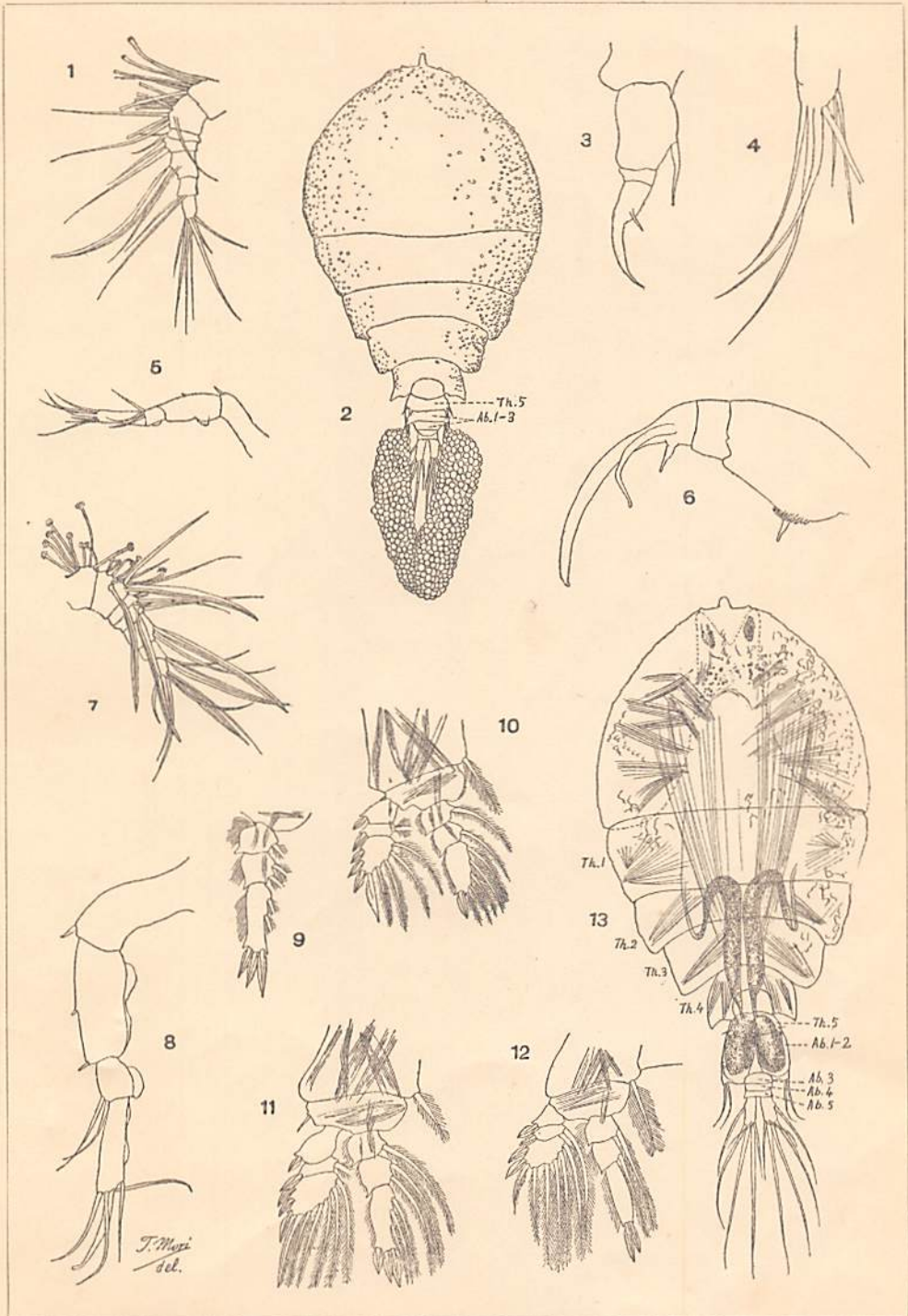
Fig. 4	Female,	× 24
Fig. 5	Female, 2nd antenna,	× 52
Fig. 6	Female, terminal portion of 2nd antenna,	× 121
Fig. 7	Female, 1st antenna,	× 52
Fig. 8	Female, 4th foot,	× 121
Fig. 9	Female, 3rd foot,	× 52
Fig. 10	Female, 2nd foot,	× 52
Fig. 11	Female, 1st foot,	× 52



Pl. 80.

Figs. 1-13 *Pachysoma dentatum*

Fig. 1	Female, 1st antenna,	× 55
Fig. 2	Female,	× 26
Fig. 3	Female, posterior maxillipede,	× 180
Fig. 4	Female, terminal portion of 2nd antenna,	× 180
Fig. 5	Female, 2nd antenna,	× 55
Fig. 6	Male, posterior maxillipede,	× 122½
Fig. 7	Male, 1st antenna,	× 122½
Fig. 8	Male, 2nd antenna,	× 122½
Fig. 9	Female, endopodite of 3rd foot,	× 55
Fig. 10	Female, 1st foot,	× 55
Fig. 11	Female, 2nd foot,	× 55
Fig. 12	Male, 4th foot,	× 52
Fig. 13	Male,	× 35



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東 京 市 京 橋 區 築 地 1 丁 目 14 番 地
印 刷 者 川 橋 源 三 郎

東 京 市 京 橋 區 築 地 1 丁 目 14 番 地
印 刷 所 仁 川 堂 川 橋 印 刷 所
電 話 京 橋 (56) 3282・9092 番

東 京 市 本 郷 區 森 川 町 70 番 地
發 賣 所 株 式 會 社 養 賢 堂
振 替 東 京 25700 番

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A TABLE OF ERRATA

Proofreading by author (T. Mori).

(The number in the brackets means the line from top of the each pages.)

Original	Correction
p. 20 (12) Gen. Eucalanus Dana 1848	1852
(13) <i>Eucalanus</i> , Dana, 1848, p.11.	1852, 1047
p. 26 (14) Gen. Rhincalanus Dana 1848	1852
p. 38 (17) <i>Aetidius armatus</i> , Farran, 1916, ...	1926
p. 41 (1) Undeuchaeta plumosa (Lubbock) 1865.	1856
p. 50 (12) Scaphocalanus echinatus Farran 1909.	1905
p. 59 (6) <i>C. Orsinii</i> , (Female only) Mori T. 1929, p. 147, ...	p. 174
(7) <i>C. Kroyeri</i> , (Male only) Mori T. 1929, p. 147, Pl. VI, Fig. 47	...Pl. 174, Pl. VI, Fig. 4-7.
p. 67 (21) Gen. Metridia Boeck 1868.	1864
p. 91 (24) <i>Labidocera acuta</i> , Scott A. 1909, p. 146.	p. 164
p. 104 (1) Acartia longiremisa Lilljeborg 1853.	...(Lilljeborg)...
(24) <u>And also from the Red sea, and the...</u> (1) (2)	(1) needlessness, (2) and from the
p. 109 (25) <i>O. spirostris</i> , Sars, 1913,...	...1918,...
p. 110 (21) <i>O. thona challengerii</i> , Brady, 1883, p. 79,...	...p. 97,...
p. 113 (37) Oithona rigida Giesbrecht 1898.	1896.
p. 115 (2) Setella gracilis Dana 1847.	1852.
p. 116 (18) <i>Microsetella norvegica</i> (Boeck) 1846.	1864.
(20) <i>Eetinosoma atlanticum</i> , Brady, 1876,...	1880,...
(24) <i>M. norvegica</i> , Sars, 1901,...	1911,...
p. 117 (34) Gen. Clytemnestra Dana 1847.	1852.
p. 121 (1) <i>O. media</i> , Breemen, 1906, p. 178,...	p. 187,...
(3) <i>O. media</i> , Wolfenden, 1910,	1911,
p. 125 (26) Sapphirina gemma Dana, 1894.	1849.
(30) <i>S. gemma</i> , Giesbrecht, 1892, p. 168,...	p. 618,...
p. 126 (39) <i>S. opalina</i> , Scott A. 1909, p. 275.	p. 257
p. 139 (20) By some authors, this <i>Corycaeus</i> <i>Copilia</i> ...
(33) <i>C. mirabilis</i> , Scott T....	...A....