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THE PELAGIC COPEPODA OF EASTERN VENEZUELA
1. THE CARIACO TRENCH

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ABSTRACT

This report is an account of the copepods collected during 13 cruises to the trench of Cariaco in 1960 and 1961. A total of 102 species have been identified none new to science. The monthly abundance of each species is described.

RESUMEN

1. El presente trabajo está basado en el estudio de las muestras planctónicas recogidas en trece expediciones realizadas a bordo del buque "Guaiquerí" del Instituto Oceanográfico de la Universidad de Oriente a la región oriental del Golfo de Cariaco (Lat. 10° 30' 15" N; Long. 64° 20' 22" W). Estas expediciones fueron realizadas mensualmente en el período comprendido entre mayo de 1960 y octubre de 1961. Las muestras se tomaron verticalmente desde una profundidad de 500 metros hasta la superficie en la misma estación precisada arriba.

2. Se han identificado un total de 102 especies, ninguna de ellas nueva para la ciencia.

3. Sólo unas 50 de las especies identificadas fueron localizadas en forma constante en las muestras planctónicas analizadas. Muchas de las otras especies que se mencionan en el trabajo sólo pueden ser consideradas raros "visitantes" de la región.

4. Se observó una máxima en el número de especies durante el mes de junio mientras que se capturaba un mínimo en marzo.

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5. En muchas de las especies representadas, los individuos capturados resultaron ser todos de uno u otro sexo.

6. De la captura total, un 62% estaba formado por sólo cuatro géneros: *Clausocalanus, Paracalanus, Oithona* y *Temora.*

7. La máxima de individuos para una especie en determinada época del año estuvo presente en raras ocasiones en el año siguiente.

8. Se observó escasa variación mensual en la abundancia de especies (Ver Tabla 1).

9. Muchas de las especies pululan en la superficie del Golfo en distintas épocas del año.

10. De las 102 especies identificadas para el Golfo de Cariaco, sólo 29 han sido localizadas en aguas de las Bermudas (Moore, 1949) y 52 en la corriente de la Florida (Jones, 1952). La mayoría de los géneros representados aqui fueron identificados por Wilson (1950) en latitudes similares del Océano Pacifico.

11. La fauna copépoda del Golfo de Cariaco está integrada por una mezcla de formas litorales y de mar abierto, pelágicas y de aguas profundas. Todas las especies son marinas y la mayoría de ellas son exclusivamente tropicales.

INTRODUCTION

The present paper is based on plankton collections gathered from May 1960 to October 1961 by the vessel Guaiquerí of the Instituto Oceanográfico, Cumaná, at the eastern end of the Cariaco Trench (Lat. 10° 30' 15" N; long. 64° 20' 22" W). The Cariaco Trench is a depression in the continental shelf off the Venezuelan coast and is approximately 1350 meters deep (Kato, 1961).

The study has been limited to the upper 500 meters. Between that depth and the bottom the trench water is anaerobic (Richards and Vaccaro, 1956) and no copepods are found (Zoppi, 1961).

Notes on abundance, sex and seasonal distribution of the copepod species found in the collections are given.

MATERIALS AND METHODS

One station was visited monthly from May 1960 to October 1961. It is located at about one and a half hour sailing time from the city of Cumaná, in eastern Venezuela. A total of 13 trips were made at the station (in August and December 1960; February, April and June 1961 the station was not visited).

A vertical plankton haul was taken from 500 meters to the surface in all months except May 1960 when the haul was made from 300 meters to the surface. This was followed by a 15 minute horizontal haul at surface.

All plankton tows were made with a 1|2-meter (diameter) nylon net. The following types of meshes were used:

Cariaco Cruise Number	*Types of Meshes*	
	Vertical tows	*Horizontal tows*
1	Nº 0	Nº 10
2	Nº 20	Nº 10
3, 5, 6, ...	Nº 20	Nº 0
7, 8, 10, 11, ...	Nº 20	Nº 3
12, 13, 14, 15	Nº 3	Nº 3

Counts of common species were made on an aliquot (10 cc.) of each vertical sample and total numbers were approximated. The entire sample was then surveyed for rarer species not found in the aliquot. Horizontal tows were analysed in the same way but counts of each copepod species were not taken.

I wish to express my indebtedness to Dr. T. K. S. Bjornberg of the Sao Paulo Oceanographic Institute who identified and verified many species.

OBSERVATIONS

The number of species caugth during each month of the survey was as follows: January 47, March 39, May 56, June

64, July 56, August 56, September 54, October 50, November 50. Maximum diversity ocurred in June and minimum in March.

A total of 102 species were identified (Table I). Fifteen specimens were not determined. Many species were represented in small numbers or by only one individual, in many instances only one sex was present in the tows. Four genera made up 62% of the total catch of copepods, they were: *Clausocalanus, Paracalanus, Oithona* and *Temora*. Large concentrations of these same genera ocurred in many of the horizontal tows.

A comparison of our data with those of Wilson (1950) shows that the number and types of species found in the Cariaco Trench is quite similar to those given for similar latitudes he studied mainly in the Pacific Ocean. Most genera represented there are also found in the Trench and the total number of species taken is comparable. The copepod fauna of the Cariaco Trench is quite dissimilar to that of the Florida and the Bermuda regions of the North Atlantic. Of the 102 species found in the Trench only 29 were included by Moore (1949) in his list of copepods from Bermuda and 52 by Jones (1952) in his list from the Florida Current. Jones (1952) identified 105 species of copepods from the Florida Current, thus its copepods fauna was as diversified as that of the Trench, however Moore (1952) found only 69 species of copepods around Bermuda which showed a much poorer diversity there than in the Cariaco Trench.

The copepod fauna of the Cariaco Trench was a mixture of littoral and open ocean forms from both surface and deep waters, and all species were marine.

Little variation appeared in total number of copepods taken from month to month. A much larger catch was taken in October 1960 than in the other months and this was due to very large concentrations of *Clausocalanus, Paracalanus* and *Oithona*. This maximum was not repeated in October 1961. This was true for most species i.e. a maximum of abundance in 1960 was seldom repeated in 1961. No season of maximum abundance could be detected and a uniform concentration was found troughout the year.

TABLE I Monthly abundance of copepod species in the vertical tows taken from May 1960 to October 1961 at the Cariaco Trench.
Numbers are based on counts of each species in a 10c.c. aliquot.

SPECIES	1960								1961					
	May	June	July	Sept	Oct	Nov	Jan	Mar	May	July	Aug	Sept	Oct	Total
Acartia clausii	—	—	—	—	—	—	—	2	—	—	20	2	—	24
A. danae; A. lilljeborghii	1	20	10	40	400	75	30	—	10	200	200	10	20	1016
Acrocalanus longicornis	1	1	—	25	20	—	—	10	10	10	5	10	—	92
Aetideus acutus	—	1	—	—	1	—	—	20	10	—	5	—	—	37
A. armatus	—	—	15	—	—	—	1	2	1	1	5	10	—	35
Bradyidius sp	1	—	—	—	—	—	—	—	—	—	—	—	—	1
Calanopia americana	—	—	—	—	—	10	1	—	3	—	—	2	2	18
Calanus tenuicornis	—	—	—	—	—	—	1	—	—	—	—	—	—	1
Caligus sp.	—	—	—	1	—	—	—	—	—	—	—	—	—	1
Calocalanus pavo	1	10	—	30	10	10	—	—	—	10	10	—	—	81
C. pavoninus	—	—	—	—	—	—	—	—	—	—	1	—	—	1
C. plumulosus	—	20	5	20	60	5	—	—	1	—	10	—	—	121
Candacia bipinnata	—	—	10	—	—	—	—	—	—	—	—	—	—	10
C. curta	2	15	45	10	20	30	2	—	11	30	20	10	2	197
C. pachydactyla	2	—	15	6	40	30	5	—	2	1	—	25	7	133
C. simplex	—	1	—	—	—	—	—	—	1	—	—	1	—	3
C. varicans	—	4	—	—	—	—	—	—	—	—	1	—	—	5
Centropages furcatus	25	2	40	1	24	60	300	30	10	—	55	20	20	587
C. violaceus	—	—	—	1	—	—	—	—	—	—	—	—	1	2
Clausocalanus arcuicornis; C. furcatus	1	—	900	1000	7000	700	600	500	500	700	300	2000	500	14701
Clytemnestra rostrata; C. scutellata	—	10	5	10	25	10	10	—	—	—	10	—	—	80
Copilia mirabilis; C. vitrea	—	6	5	—	5	—	—	—	—	11	1	—	—	28
Corycaeus (Agetus) flaccus; C. typicus	5	8	10	5	25	20	10	2	7	20	2	15	2	131
C. clausi; C. crassiusculus	—	1	—	10	20	40	1	—	5	10	10	—	3	100

	May	June	July	Sept	Oct	Nov	Jan	Mar	May	July	Aug	Sept	Oct	Total
C. speciosus	25	25	—	50	21	10	4	—	11	90	10	12	7	265
C. (Corycella) gracilis	1	41	5	75	28	2	25	—	1	720	30	2	10	940
C. (Corycella) rostratus	2	1	—	—	40	30	—	—	1	150	1	10	—	235
C. (Ditrichocorycaeus) africanus	—	—	1	—	—	—	—	1	10	—	—	1	1	14
C. (Onychocorycaeus) agilis; C. pacificus	—	1	—	—	8	5	—	1	10	40	—	5	—	70
C. (Onychocorycaeus) giesbrechti	1	300	150	100	300	90	60	80	20	200	300	10	—	1611
*C. (Urocorycaeus) furcifer; C. lautus*s *C. longistylis*	8	2	—	—	10	—	—	—	11	10	1	—	—	42
Euaetideus giesbrechti	10	6	25	60	225	30	10	40	100	10	50	40	—	606
Euaugaptilus hecticus	—	1	—	—	—	—	—	—	—	—	—	—	—	1
Eucalanus attenuatus	105	300	100	350	200	40	50	30	70	500	250	13	30	2038
E. crassus	10	—	—	5	—	40	20	200	80	75	200	20	35	685
E. monachus	500	220	100	1000	700	700	400	500	500	500	700	700	500	7020
E. pileatus; E. subtenuis	—	—	—	—	—	—	20	20	—	—	160	30	—	230
Euchaeta marina	10	23	5	5	5	—	—	—	10	20	10	10	3	101
E. paraconcinna	15	6	27	24	65	180	120	110	225	90	65	11	25	963
Euchirella brevis	—	1	—	—	—	—	—	—	—	—	—	—	—	1
Euterpina acutifrons	—	—	—	—	—	—	10	10	2	—	—	—	—	22
Haloptilus acutifrons	12	10	15	8	15	30	10	40	10	300	95	5	7	557
H. longicornis	15	4	15	20	10	20	1	60	60	10	25	10	5	255
Heterorhabdus papilliger	—	—	—	—	—	—	—	1	—	—	—	—	—	1
H. spinifrons	—	—	—	—	—	—	—	1	—	—	—	—	—	1
Labidocera acutifrons	—	2	5	12	—	1	—	—	—	35	—	1	—	56
L. scotti	2	—	5	—	—	1	6	1	1	—	2	1	1	20
L. nerii	—	—	5	—	—	—	—	—	—	—	—	—	—	5
Lophothrix latipes	—	—	—	—	—	—	—	—	—	—	1	—	—	1
Lubbockia squillimana	—	4	10	—	40	10	15	2	20	10	10	1	2	124
Lucicutia clausii	2	15	40	50	30	5	5	—	60	60	50	13	10	340
L. flavicornis	—	25	35	75	40	10	2	100	15	20	50	10	10	392

	May	June	July	Sept	Oct	Nov	Jan	Mar	May	July	Aug	Sept	Oct	Total
Macrosetella gracilis	1	35	1	30	—	—	—	—	—	—	5	—	—	72
Mecynocera clausi	—	6	5	15	25	30	10	—	20	20	10	10	—	151
Microsetella norvegica	—	—	1	—	—	—	—	—	—	—	—	—	—	1
M. rosea	1	400	25	50	300	100	100	20	75	—	—	—	—	1071
Miracia efferata	—	2	5	—	—	—	—	—	—	—	—	—	—	7
Nannocalanus (Calanus) minor	200	150	20	15	80	10	16	2	85	80	50	25	100	833
Neocalanus gracilis	—	3	1	5	—	5	10	20	30	20	—	6	5	105
Oithona atlantica; O. plumifera; O. spinirostris	2	500	100	300	7000	500	80	200	150	700	300	500	40	10372
Oncaea conifera	1	150	100	100	700	900	200	100	125	700	270	360	500	4206
O. media	—	5	—	—	—	—	—	—	—	—	—	—	—	5
O. mediterranea	—	75	5	25	15	10	—	—	20	20	25	2	10	207
O. minuta	—	5	—	5	—	—	—	—	10	—	—	—	—	20
O. venusta	—	15	—	10	30	20	—	20	—	10	50	10	10	175
Paracalanus aculeatus; P. parvus	1	500	100	1000	7000	700	500	500	500	700	300	2000	500	14301
Parundinella spinodenticula	—	2	10	10	—	—	—	—	—	2	20	—	—	44
Pleuromamma abdominalis	—	—	—	—	—	—	—	—	10	—	—	—	—	10
P. gracilis var. *piseki*	—	1	8	—	—	—	20	4	20	—	5	—	1	59
Pontellina plumata	—	1	—	10	—	—	—	1	1	10	—	—	—	23
Pontellopsis brevis	—	15	10	3	12	1	1	—	2	10	2	2	1	59
Rhincalanus cornutus	5	40	75	15	55	50	—	30	5	10	50	5	30	370
Sapphirina angusta	—	1	—	—	—	—	—	—	1	—	—	—	1	3
S. auronitens	—	2	—	—	—	—	—	—	—	—	—	—	—	2
S. gemma	—	—	—	7	5	—	—	—	—	—	—	—	1	13
S. intestinata	1	—	—	4	15	—	3	—	—	—	5	—	—	28
S. metallina	—	—	—	—	—	—	—	—	—	—	5	—	—	5
S. nigromaculata	—	10	10	4	—	40	1	—	5	10	5	—	1	86
S. opalina - darwinii	—	—	—	—	—	—	—	—	—	10	5	—	1	16
S. scarlata	—	—	—	—	—	—	—	—	—	—	—	—	1	1
S. sinuicauda	—	—	10	—	—	5	3	—	10	10	—	—	—	38

	May	June	July	Sept	Oct	Nov	Jan	Mar	May	July	Aug	Sept	Oct	Total
Scolecithrix ctenopus	—	1	40	5	36	15	20	70	100	—	—	20	—	307
S. danae	1	220	5	10	100	80	10	—	20	90	30	3	30	599
Spinocalanus longipes	—	—	—	—	—	—	—	—	—	—	—	1	—	1
Temora stylifera	5	550	200	300	300	100	100	500	100	110	50	12	70	2397
T. turbinata	6	50	5000	375	300	300	400	500	—	1	100	1000	—	8032
Temoropia mayumbaensis	—	2	2	25	—	20	20	10	10	20	70	40	—	219
Undinula vulgaris	—	6	20	10	5	—	10	—	45	65	—	—	100	261
Xanthocalanus sp.	—	—	—	—	—	—	1	—	—	—	—	—	—	1
Undetermined	—	—	12	—	—	2	1	—	—	—	—	—	—	15
TOTAL:	981	3833	7368	5326	25365	5082	3225	3740	3132	6431	4022	7006	2605	78116

The surface tows have shown that various genera present in large concentrations at various times of the year. The following species were present in great numbers in the following months:

January: *Labidocera scotti, Centropages furcatus, Clausocalanus spp.*

May: *Temora turbinata, T. stylifera, Labidocera acutifrons, Clausocalanus spp.*

June: *Clausocalanus spp., Oithona spp.*

July: *Pontellopsis brevis, Oncaea conifera.*

August: *Corycaeus giesbrechti, Corycaeus gracilis, Oncaea conifera.*

September: *Arcatia clausii, Clausocalanus spp., Paracalanus spp.*

October: *Eucalanus monachus, Paracalanus spp., Clausocalanus spp.*

November: *Centropages furcatus, Temora turbinata.*

In march there were fewer copepods at the same time the dinoflagellate *Noctiluca* was taken in extremely high numbers. It is possible that *Noctiluca* was responsible for this diminution of copepod concentrations from the surface.

SYSTEMATIC REFERENCES

Since this paper is essentially a record of the copepod species found in the tows and not a systematic treatise, the species were arranged in alphabetical order without reference to families and synonymy.

Genus *Arcatia* Dana, 1846

Arcatia clausii Giesbrecht
Plate 11, Figures 1, 1a, 2, 2a

One male and 23 females were taken. The species was only common in August at the surface.

Arcatia danae Giesbrecht
Plate 11, Figures 3, 3a

This species was taken throughout the year. A period

of abundance ocurred from July to October when the catch was made up of females only. In other months the species was found in small numbers.

Arcatia lilljeborghii Giesbrecht

Counts of this species were included with those of *A. danae* in Table I. Small numbers were taken throughout the year.

Genus *Acrocalanus* Giesbrecht, 1888.

Acrocalanus longicornis Giesbrecht
Plate 2, Figures 3, 3a

This species was consistently present in small numbers. Fifteen males ande 77 females were counted. It appeared in slightly greater numbers in late September and October. A few members of the same genus were present but their identification being uncertain, they were included with *A. longicornis* in Table I.

Genus *Aetideus* Brady, 1883

Aetideus acutus Farran

Two males and 35 females of this species which resembles closely *Euaetideus giesbrechti* were taken in this survey. It was present most of the time in small numbers.

Aetideus armatus (Boeck)
Plate 14, Figures 10, 10a

The species was found sporadically. A maximum occurred in July 1960. Thirty-three males, one female and one juvenile were taken.

Genus *Bradyidius* Giesbrech,1897

One individual of a species unidentified was taken in May 1960.

Genus *Calanopia* Dana, 1853

Calanopia americana F. Dahl
Plate 11, Figures 8, 8a

Six males and 12 females of this species were taken. A small maximum occurred in November.

Genus *Calanus* Leach, 1819

Calanus tenuicornis Dana
Plate 12, Figure 6

One female was taken in January 1961.

Genus *Caligus* Müller, 1785

Caligus sp.

This genus was seen occasionally in the plankton samples of the Cariaco region. One such specimen was taken in September. Species identification was not carried out.

Genus *Calocalanus* Giesbrecht,1888

Calocalanus pavo (Dana)
Plate 2, Figures 2, 2a; Plate 3, Figures 1, 1a

The species was present in 7 out of 13 hauls and was common from June to November.

Calocalanus pavoninus Farran
Plate 4, Figures 6, 6a

One female of this species was taken in August 1961.

Calocalanus plumulosus (Claus)
Plate 4, Figures 5, 5a

C. plumulosus was the most abundant species of the genus. Only females were caught and largest numbers were taken in October 1960.

Genus *Candacia* Dana, 1846

Candacia bipinnata (Giesbrecht)
Plate 9, Figures 4, 4a

Ten females were taken in July 1960.

Candacia curta (Claus)
Plate 9, Figures 1, 1a, 2, 2a, 2b, 2c

The most common species of the genus. Specimens were taken in almost each tow. Males were twice as common as females. The largest number of specimens was taken in July 1960.

Candacia pachydactyla (Dana)
Plate 9, Figures 3, 3a, 3b, 5, 5a, 5b; Plate 10, Figures 1, 1a, 2, 2a, 3, 3a

This was the second most abundant species of the genus in the tows. Largest numbers were taken from September to November.

Candacia simplex (Giesbrecht)
Plate 12, Figures 1, 1a

Three males of that species were found in the tows.

Candacia varicans (Giesbrecht)
Plate 10, Figures 4, 4 a, 4 b, 5, 5 a

Five individuals of this species were found in the tows.

Genus *Centropages* Kroyer, 1849

Centropages furcatus (Dana)
Plate 6, Figures 5, 5 a, 6, 6 a

This species appeared consistently in the tows. Maximum abundance occurred in January. Large concentrations were encountered at surface in November 1960 and January 1961.

Centropages violaceus (Claus)

One male and one female were taken in the tows.

Genus *Clausocalanus* Giesbrecht, 1888

Clausocalanus spp.

This genus was the most common of all the copepods taken in the tows. An attempt to count males, females and juveniles of each species was abandoned because of the difficulties involved. Identification of *Clausocalanus arcuicornis* (Dana) (Plate 3, Figures 7, 7 a, 8, 8 a) and *Clausocalanus*

furcatus (Brady) Plate 3, Figures 6, 6 a, 10, 10 a, 10 b) were made. Both species ocurred in large numbers. Very large catches were also taken at surface in May 1960, January, May, July, August, September and October 1961.

Genus *Clytemnestra* Dana, 1847

Clytemnestra rostrata (Brady)
Plate 13, Figures 1, 1 a, 1 b, 1 c.

Five specimens of this species were taken in one tow in July.

Clytemnestra scutellata Dana
Plate 13, Figures 6, 6 a, 6 b, 6 c, 7, 7 a, 7 b, 7 c.

Generally common in 1960, the species was taken only once in 1961.

Genus *Copilia* Dana, 1849

The genus *Copilia* was represented by 3 species in the region; *Copilia mirabilis* Dana, *Copilia quadrata* Dana and *Copilia vitrea* (Haeckel). *C. mirabilis and C. vitrea* were taken in the Cariaco Trench, *C. quadrata* in the Gulf of Cariaco.

Copilia mirabilis Dana
Plate 15, Figures 1, 1 a, 2, 2 a.

The species was taken in small numbers in 5 out 13 tows and a small maximum of occurrence appeared in July 1961. The catch was made up of 3 males and 24 females.

Copilia vitrea (Haeckel)
Plate 12, Figure 2

One female was taken in the tows.

Genus *Corycaeus*, Dana, 1845

Many individuals were dissected and identified to species but when dealing with total count of each species in an aliquot it has proved difficult to ascertain the exact number or proportion of closely related forms. Dealing with subge-

nera has been simpler so in the case of closely related forms counts of the subgenus type were made and identification to species taken whenever possible.

Subgenus *Agetus*

Two species were always present in the tows, *Corycaeus* (*Agetus*) *flaccus* Giesbrecht and *Corycaeus* (*Agetus*) *typicus* (Kroyer) (Plate 16, Figures 8, 8a, 8b; Plate 17, Figures 8, 8a, 8 b). Males and females were identified. They never occurred in large numbers.

Subgenus *Corycaeus*

Three species were identified: *Corycaeus clausi* Dahl (Plate 17, Figures 5, 5 a, 5 b), *Corycaeus crassiusculus* Dana and *Corycaeus speciosus* Dana (Plate 16, Figures 5, 5a, 5b; Plate 17, Figure 4). The first two species were counted together. Only females were taken and always in small numbers. They were present in 5 out of 13 tows.

Subgenus *Corycella*

This type of corycaeid was very common in the tows. Two species were identified: *Corycaeus* (*Corycella*) *gracilis* (Plate 16, Figures 4, 4 a, 4 b; Plate 17, Figures 1, 1 a, 1 b) and *Corycaeus rostratus* Claus (Plate 17, Figures 6, 6a, 6b). *C. gracilis* was ubiquitous and maximum abundance was registered in July 1961. Females of that species were more than 5 times as abundant as males. *C. rostratus* Claus was taken commonly and highest numbers were found in July 1691.

Subgenus *Ditrichocorycaeus*

One species, taken occasionally, was identied as *Corycaeus africanus*. A total of 14 specimens were found.

Subgenus *Onychocorycaeus*

Three species belonging to this subgenus were found in the tows: *Corycaeus* (*Onychocorycaeus*) *agilis* Dana (Plate 16, Figures 6, 6 a, 6 b), *Corycaeus* (*Onychocorycaeus*) *giesbrechti* Dahl (Plate 16, Figures 2, 2 a), and *Corycaeus* (*Onychocorycaeus*) *pacificus* Dahl (Plate 17, Figures 2, 2a, 2b).

C. agilis and *C. pacificus* were taken in small numbers in 7 out of 13 tows and all specimens were females. *C. giesbrechti* was very abundant in the region in most tows. It was, by far, the most common of the corycaeids taken and it was among the 10 most abundant copepod species found in the region. Both males and females were common. Large concentrations were found in horizontal surface tows in May 1960, July and August 1961.

Subgenus *Urocorycaeus*

The large size of this subgenus and the long furcal rami of the species permitted an easy differentiation of these forms from other corycaeids. Three species are present in the region: *Corycaeus* (*Urocorycaeus*) *furcifer* Claus, (Plate 16, Figures 3, 3 a, 3 b; Plate 17, Figures 3, 3 a, 3 b) and *Corycaeus* (*Urocorycaeus*) *longistylis* Dana (Plate 16, Figures 7, 7 a, 7 b; Plate 17, Figures 7, 7a, 7b). This subgenus was present in small numbers in 6 out of 13 tows with males being twice as abundant as females.

Genus Euaetideus Sars, 1925

Euaetideus giesbrechti (Cleve)
Plate 5, Figures 4,4 a, 5, 5 a.

Specimens of this species were common in most months. A maximum of abundance was registered in October 1960. Females were far more numerous than males.

Genus *Euaugaptilus* Sars, 1920

Euaugaptilus hecticus (Giesbrecht)
Plate 12, Figure 3

A single female was taken in June 1960.

Genus *Eucalanus* Dana, 1853

Eucalanus attenuatus (Dana)
Plate 1, Figure 2

This large species was generally present in the tows

in large numbers. Males and females were found and the species was the eighth most common copepod taken in the tows.

Eucalanus crassus Giesbrecht
Plate 14, Figure 11

This stubby species was also common in the tows but 1|3 less abundant than *E. attenuatus*. At times, such as March and August 1961 high concentrations were found. Males were ten times more abundant than females.

Eucalanus monachus Giesbrecht
Plate 1, Figure 1

The most abundant of the eucalanids and the 5 th most common copepod in the region. *E. monachus* was always abundant and very large numbers were taken at surface in October 1960.

Eucalanus pileatus Giesbrecht
Plate 1, Figures 4, 4 a.

This species was taken sporadically, it was common in August.

Eucalanus subtenuis Giesbrecht
Plate 1, Figures 3, 5.

Due to difficulties in identification, this species was counted wih the preceding one until late in the survey. It was never abundant.

Genus *Euchaeta* Philippi, 1843

Euchaeta marina (Prestandrea)
Plate 8, Figures 1, 1 a, 2, 2 a.

A large copepod usually found in small numbers. Fifteen males and 86 females were taken in the tows.

Euchaeta paraconcinna Fleminger

This copepod was ubiquitous in the tows. A total of 347 males, 522 females and 94 juveniles were counted. It was the 12 th most common copepod species taken in the trench and its large size makes it one of the prominent constituents of the plankton community.

Genus *Euchirella* Giesbrecht, 1888

Euchirella brevis Sars
Plate 5, Figures 8, 8 a

One female of this species was taken in June 1960.

Genus *Euterpina* (Euterpe Claus, 1863) Norman.

Euterpina acutifrons Dana
Plate 13, Figures 2, 2 a, 3, 3 a.

Small numbers of this species were taken in January, March and May 1961.

Genus *Haloptilus* Giesbrecht, 1898

Haloptilus acutifrons (Giesbrecht)
Plate 8, Figures 4, 4 a, 4 b, 4 c.

A large, transparent species always taken in the tows. Ninety-seven males, 455 females and 5 juveniles were caught. Maximum abundance occurred in July 1961.

Haloptilus longicornis (Claus)
Plate 8, Figures 3, 3 a.

This species was always found in the tows and it was half as abundant os *H. acutifrons*. Mostly females were taken.

Genus *Heterorhabdus* Giesbrecht, 1898

Heterorhabdus papilliger (Claus)
Plate 12, Figures 4, 4 a, 4 b, 5, 5 a.

One female was taken in March 1961.

Heterorhabdus spinifrons (Claus)

One female was taken in March 1961.

Genus *Labidocera Lubbock*, 1853

Labidocera acutifrons (Dana)
Plate 7, Figures 1, 1 a, 3, 3 a, 5, 5 a, 6, 6 a.

Small numbers were taken in the vertical tows but in September 1960, May, July and October 1961 large numbers were taken in horizontal surface tows.

Labidocera scotti
Plate 7, Figures 2, 2 a, 4, 4 a.

Twenty specimens were taken in 9 out of 13 tows. In January 1961 large numbers were caught in a horizontal surface tow. Some variation occurred in the size and location of eye lenses of that species.

Labidocera nerii (Kroyer)
Five specimens of that species were taken in July 1960.

Genus *Lophothrix* Giesbrecht, 1895

Lophothrix latipes (T. Scott)
Plate 11, Figures 6, 6 a.

One female was taken in August 1961.

Genus *Lubbockia* Claus, 1863

Lubbockia squillimana Claus
Plate 15, Figures 3, 4, 4 a.

Males and females were common and largest numbers were taken in October 1960.

Genus *Lucicutia* Giesbrecht, 1898

Lucicutia clausii (Giesbrecht)
Plate 5, Figures 1, 1 a, 2, 2 a, 2 b.

L. clausii was taken in all tows except one. Both males and females were fairly abundant.

Lucicutia flavicornis (Claus)
Plate 5, Figures 3, 3 a.

This other species of *Lucicutia* was slightly more numerous than the preceding one. Several males and females were taken each month and highest catches were made in March 1961.

Genus *Macrosetella* A. Scott, 1909.

Macrosetella gracilis (Dana)
Plate 14, Figures 5, 5 a, 6, 6 a.

A total of 72 specimens were taken in 5 tows. In June and September 1960 the especies was common but it was rare at other times.

Genus *Mecynocera* I. C. Thompson, 1888

Mecynocera clausi I. C. Thompson
Plate 2, Figures 1, 1 a.

Individuals of this species were taken in 10 out of 13 tows. Catches were uniformly small and most specimens caught were females.

Genus *Microsetella* Brady and Robertson, 1873

Microsetella norvegica (Boeck)

One specimen of this species was taken in July 1960.

Microsetella rosea (Dana)
Plate 14, Figures 4, 7, 7 a.

This was one of the common species taken in the first 9 months of the survey but for some unknown reason it was not found in the tows in the last 4 months. Greatest numbers were taken in June 1960.

Genus *Miracia* Dana, 1846

Miracia efferata Dana
Plate 14, Figures 8, 8 a.

Two specimens were taken in June and 5 in July 1960.

Genus *Nannocalanus* Sars, 1925

Nannocalanus minor (Claus)
Plate 2, Figures 6, 6 a, 7, 7 a.

Many specimens of this species were taken in all tows. Numbers fluctuated from month to month and it was the 13th most common copepod found.

Genus *Neocalanus* Sars, 1925

Neocalanus gracilis (Dana)
Plate 4, Figures 1, 1 a, 2, 2 a, 2 b.

This large calanid was usually presente in small numbers. Fourteen males, 8 females and 83 juveniles were counted. Best catch was made in May 1961.

Genus *Oithona* Baird, 1843
Plate 14, Figures 1, 1 a.

Species identification of this genus were often doubtful and since they were always common counts were made of the genus only. The following species were determined: *Oithona atlantica* Pesta, *Oithona plumifera* Baird (Plate 14, Figures 2, 2 a, 3), *Oithona spinirostris* Claus, other species were probably present. *Oithona* were the third most common copepods in the Trench and at times many thousands were taken in a single tow. Males were rare.

Genus *Oncaea* Philippi, 1843

Oncaea conifera Giesbrecht

This species was always found in large numbers. It was the 6th most abundant copepod and large concentrations were found in horizontal surface tows in May, July, August and September 1961.

Oncaea media Giesbrecht

Five individuals were taken in June 1960.

Oncaea mediterranea (Claus)

This species was quite common in most tows. Largest numbers were taken in June 1960. Males and females were

determined but not always separated, females exceeded males in abundance.

Oncaea minuta Giesbrecht

Small numbers were taken in June, September 1960 and May 1961.

Oncaea venusta Philippi

Small numbers were taken in 9 tows. Largest catches were made in August 1961. Females exceeded males 4 to 1.

Genus *Paracalanus* Boeck, 1865

Paracalanus was the second most important copepod genus. It was abundant in the vertical an horizontal surface tows. Two species were identified: *Paracalanus aculeatus* Giesbrecht (Plate 3, Figures 2, 2 a, 5, 5 a, 5 b) and *Paracalanus parvus* (Claus) (Plate 3, Figures 3, 3 a, 4, 4 a, 4 b). Counts were made of the genus only.

Genus *Parundinella* Fleminger

Parundinella spinodenticula Fleminger

Small numbers of this copepod were taken in five tows.

Genus *Pleuromamma* Giesbrecht, 1898

Pleuromamma abdominalis (Lubbock)

In May 1961, ten females were taken in the vertical tow.

Pleuromamma gracilis var. *piseki* (Farran)
Plate 11, Figures 4, 4 a, 5, 5 a, 5 b.

Twenty-three males and 36 females were taken in 7 of the tows.

Genus *Pontellina* Dana, 1853

Pontellina plumata (Dana)

Small numbers of females and juveniles of this species were taken in 5 tows.

Genus *Pontellopsis* Brady, 1883

Pontellopsis brevis (Giesbrecht)
Plate 5, Figures 6, 6 a, 7, 7 a, 7 b, 7 c, 7 d.

This copepod was present in small numbers in the vertical tows but large numbers were taken in horizontal surface tows.

Genus *Rhincalanus,* Dana 1853

Rhincalanus cornutus Dana
Plate 2, Figures 4, 4 a, 5, 5 a.

This species was taken in small numbers and females were 5 times more abundant than males.

Genus *Sapphirina* J. V. Thompson, 1830

Sapphirina angusta Dana
Plate 19, Figures 2, 2 a.

Three females were taken in the tows.

Sapphirina auronitens Claus
Plate 18, Figures 1, 1 a, 5, 5 a.

Two males were caught in June 1960.

Sapphirina gemma Dana

Thirteen females were found in September and October.

Sapphirina intestinata Giesbrecht
Plate 18, Figures 2, 2 a; Plate 19, Figures 4, 4 a.

One male and 27 females were found in 5 of the vertical tows.

Sapphirina metallina Dana
Plate 19, Figures 5, 5 a.

Four females and one male were taken in August 1961.

Sapphirina nigromaculata Claus
Plate 19, Figures 1, 1 a.

This was the most common species of *Sapphirina* found

in the Trench. All specimens were females and maximum abundance occurred in November 1960.

Sapphirina opalina - darwinii Dana
Plate 19, Figures 3, 3 a.

Sixteen males of this large species were taken in 3 of the tows.

Sapphirina scarlata Giesbrecht

One female was taken in October 1961.

Sapphirina sinuicauda Brady
Plate 18, Figures 4, 4 a.

Thirty - eight males were taken in 5 tows.

Genus *Scolecithrix* Brady, 1883

Scolecithrix ctenopus Giesbrecht
Plate 3, Figures 9, 9 a; Plate 11, Figures 7, 7 a.

A common species present in most of the tows. It occurred in highest numbers in March and May 1961. Females were more than twice as males.

Scolecithrix danae (Lubbock)
Plate 6, Figures 7, 8, 8 a; Plate 11, Figure 9

This species was more than twice as common as the preceeding one. Males, females and juveniles were caught and largest numbers were taken in June 1960.

Genus *Spinocalanus* Giesbrecht, 1888

Spinocalanus longipes Tanaka
Plate 3, Figures 11, 11 a.

One male specimen was taken in September 1961. Identification is doubtful and this species could belong to the genus *Chiridius*.

Genus *Temora* Baird, 1850

Temora stylifera (Dana)
Plate 6, Figures 3, 3 a, 4, 4 a.

One of the most consistently abundant species found. At surface, in May 1960 very large concentrations were found. It was 7th in abundance in the vertical tows.

Temora turbinata (Dana)
Plate 6, Figures 1, 1 a, 1 b, 2, 2 a.

This was the 4th most common copepod species taken in the tows. At surface, large numbers were found in May, July and November 1960.

Genus *Temoropia* Scott

Temoropia mayumbaensis Scott
Plate 3, Figures 12, 12 a, 12 b, 12 c, 12 d.

This copepod was caught in small numbers. Females were more than 3 times as common as males. Maximum concentrations occurred in August 1961.

Genus *Undinula* Scott, 1909

Undinula vulgaris (Dana)
Plate 4, Figures 3, 3 a, 4, 4 a.

This species was taken in small numbers in 8 out of 13 tows. Largest catch was made in October 1961. Both males and females were common.

Genus *Xanthocalanus* Giesbrecht, 1892

Xanthocalanus sp.
Plate 12, Figure 7

One juvenile specimen of that genus was taken in January 1961. It was not identified to species.

Undetermined

A few copepods have not been determined. They belong

mostly to the suborder *Harpacticoida*. Illustrations appear on Plate 13, Figures 4, 4 a, 4 b, 5, 5 a and on Plate 14, Figures 9, 9 a, 9 b. Some individuals of the suborder *Calanoida* were believed to belong to the genera *Amallophora, Disseta,* and *Undeuchaeta* but the bad state of preservation did not permit identifications.

SUMMARY

This paper gives the species abundance of the copepods taken in monthly cruises at the Trench of Cariaco of Eastern Venezuela.

Data are based on 13 plankton collections taken vertically from 500 meters to surface from May 1960 to October 1961.

A total of 102 species were identified. Not included were 15 individuals which were not determined.

Some 50 species were always found in the plankton samples, many others were only rare "visitors" to the region.

The largest number of species was taken in June and the smallest in March.

In many species all individuals caught were either all males or all females.

Four genera made up 62% of the total catch, they were: *Clausocalanus, Paracalanus, Oithona* and *Temora.*

A maximum of abundance for a species at a particular time during one year was seldom repeated at the same time in the following year.

Little monthly variation in abundance was detected (Refer to Table I).

Many species swarmed at surface at various time.

Of the 102 species identified from the Cariaco Trench, 29 were found by Moore (1949) in Bermuda waters and 52 by Jones (1952) in the Florida current. Most genera represented in the Trench were found by Wilson (1950) in similar latitudes in the Pacific Ocean.

The copepod community of the Cariaco Trench being close of shore was found to be made of littoral, open ocean, pelagic surface and deep water forms. Most species were exclusively tropical in distribution.

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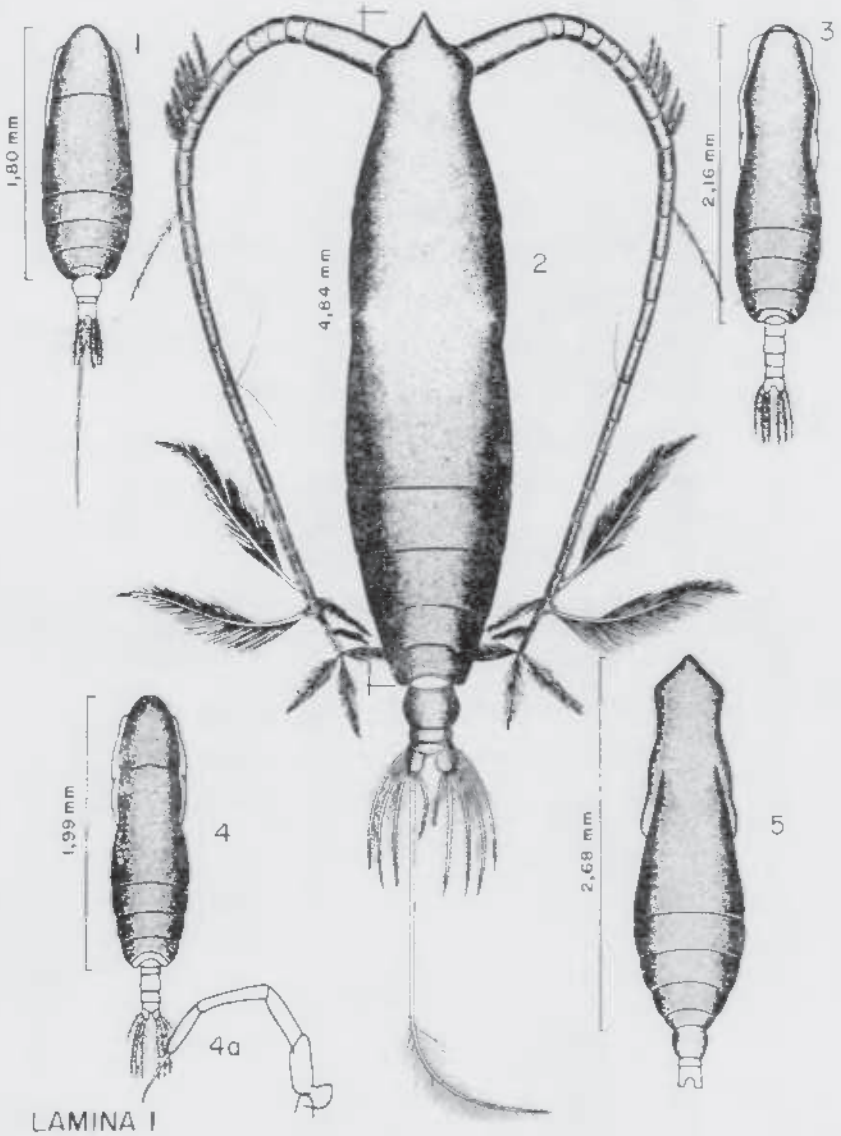
Nota del Editor: El resumen en español que aparece en este trabajo fué preparado por el Dr. Rafael A. Curra. Las láminas que lo ilustran fueron dibujadas por el Sr. Jaime Ramírez. El texto de la lámina 12 fué rehecho por el Editor basado en el texto del trabajo, debido a que se extraviaron los originales.

Plate 1.

1. *Eucalanus monachus;* (female), dorsal view
2. *Eucalanus attenuatus;* (female), dorsal view
3. *Eucalanus subtenuis;* (male), dorsal view
4. *Eucalanus pileatus;* (male), dorsal view

4a. *Eucalanus pileatus;* (male), 5th leg

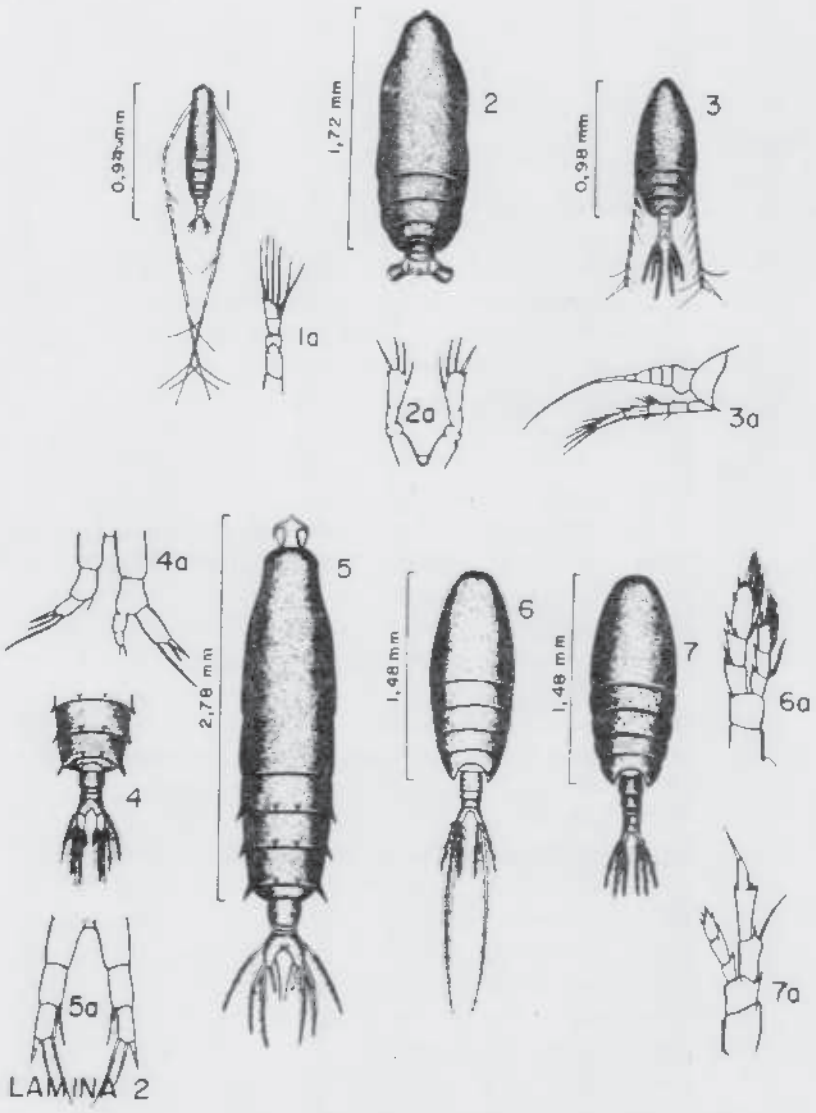
5. *Eucalanus subtenuis;* (female), dorsal view



LAMINA I

Plate 2.

1. *Mecynocera clausi;* (female), dorsal view
1a. *Mecynocera clausi;* (female), left 5th leg
2. *Calocalanus pavo;* (female), dorsal view
2a. *Calocalanus pavo;* (female), 5th legs
3. *Acrocalanus longicornis;* (female), dorsal view
3a. *Acrocalanus longicornis;* (female), urosome; lateral view
4. *Rhincalanus cornutus;* (male) posterior end of metasome and urosome
4a. *Rhincalanus cornutus;* (male), 5th legs
5. *Rhincalanus cornutus;* (female), dorsal view
5a. *Rhincalanus cornutus;* (female), 5th legs
6. *Nannocalanus minor;* (female), dorsal view
6a. *Nannocalanus minor;* (female), left 5th leg
7. *Nannocalanus minor;* (male), dorsal view
7a. *Nannocalanus minor;* (male), right 5th leg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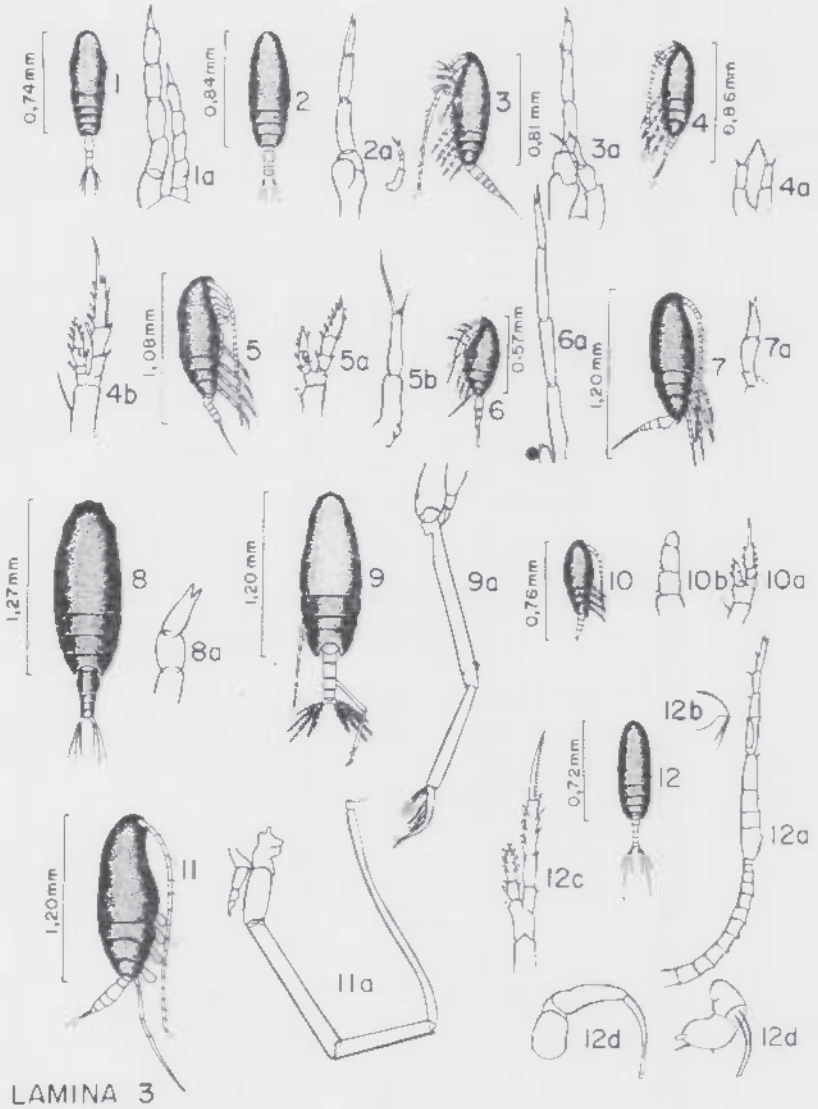
LAMINA 2

Plate 3.

1. *Calocalanus pavo;* (male), dorsal view
1a. *Calocalanus pavo;* (male), 5th legs
2. *Paracalanus aculeatus;* (male), dorsal view
2a. *Paracalanus aculeatus;* (male), 5th legs
3. *Paracalanus parvus;* (male), lateral view
3a. *Paracalanus parvus;* (male), 5th legs
4. *Paracalanus parvus;* (female), lateral view
4a. *Paracalanus parvus;* (female), 5th legs
4b. *Paracalanus parvus;* (female), right 2nd leg
5. *Paracalanus aculeatus;* (female), lateral view
5a. *Paracalanus aculeatus;* (female), rigth 2nd leg
5b. *Paracalanus aculeatus;* (female), right 5th leg
6. *Clausocalanus furcatus;* (male), lateral view
6a. *Clausocalanus furcatus;* (male), 5th legs
7. *Clausocalanus arcuicornis;* (female), lateral view
7a. *Clausocalanus arcuicornis;* (female), left 5th leg
8. *Clausocalanus arcuicornis;* (female), dorsal view
8a. *Clausocalanus arcuicornis;* (female), right 5th leg
9. *Scolecithrix ctenopus;* (male), dorsal view
9a. *Scolecithrix ctenopus;* (male), 5th legs
10. *Clausocalanus furcatus;* juvenile, lateral view
10a. *Clausocalanus furcatus;* juvenile, left 5th leg
10b. *Clausocalanus furcatus;* juvenile, right 2nd leg
11. *Spinocalanus* sp.; (male), dorsal view
11a. *Spinocalanus* sp.; (male), 5th legs
12. *Temoropia mayumbaensis;* (male), dorsal view
12a. *Temoropia mayumbaensis;* (male), right 1st antenna
12b. *Temoropia mayumbaensis;* (male), rostrum; lateral view
12c. *Temoropia mayumbaensis;* (male), right 4th leg
12d. *Temoropia mayumbaensis*; (male), 5th legs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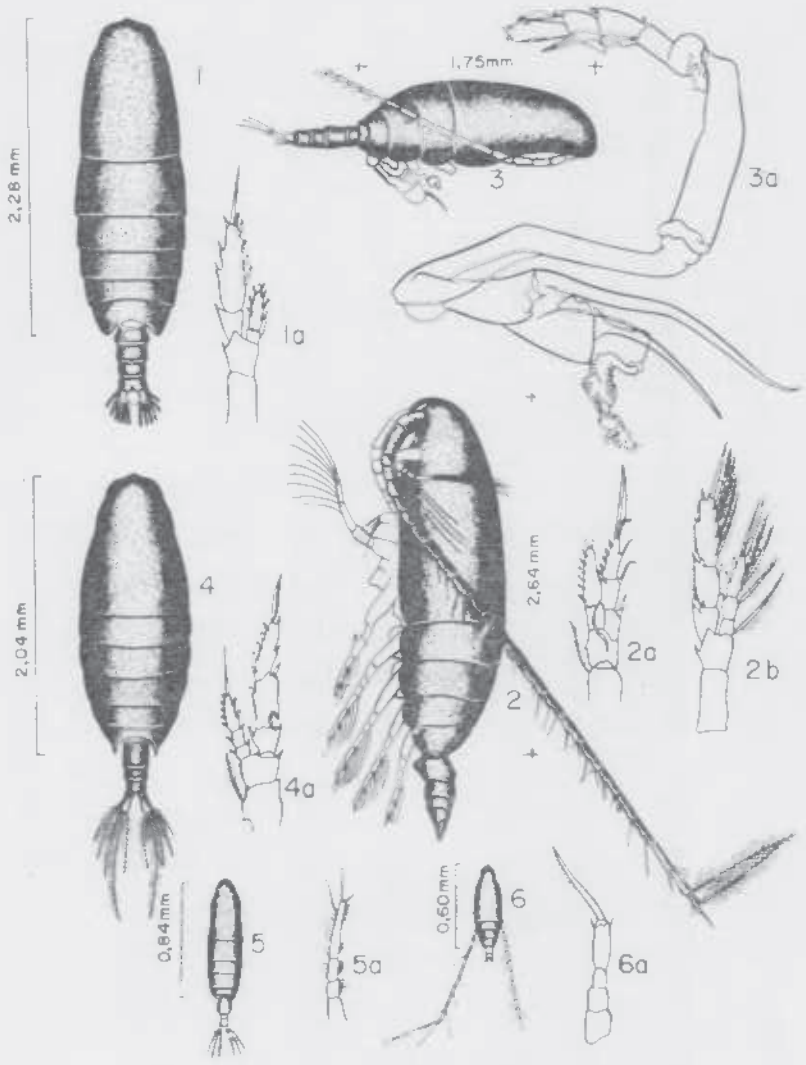
LAMINA 3

Plate 4.

1. *Neocalanus gracilis;* (male), dorsal view
1a. *Neocalanus gracilis;* (male), left 5th leg
2. *Neocalanus gracilis;* (female), lateral view
2a. *Neocalanus gracilis;* (female), right lst leg
2b. *Neocalanus gracilis;* (female), left 5th leg
3. *Undinula vulgaris;* (male), lateral view
3a. *Undinula vulgaris;* (male), 5th legs
4. *Undinula vulgaris;* (female), dorsal view
4a. *Undinula vulgaris;* (female), right 2nd leg
5. *Calocalanus plumulosus;* (female), dorsal view
5a. *Calocalanus plumulosus;* (female), left 5th leg
6. *Calocalanus pavoninus;* (female), dorsal view
6a. *Calocalanus pavoninus;* (female), left 5th leg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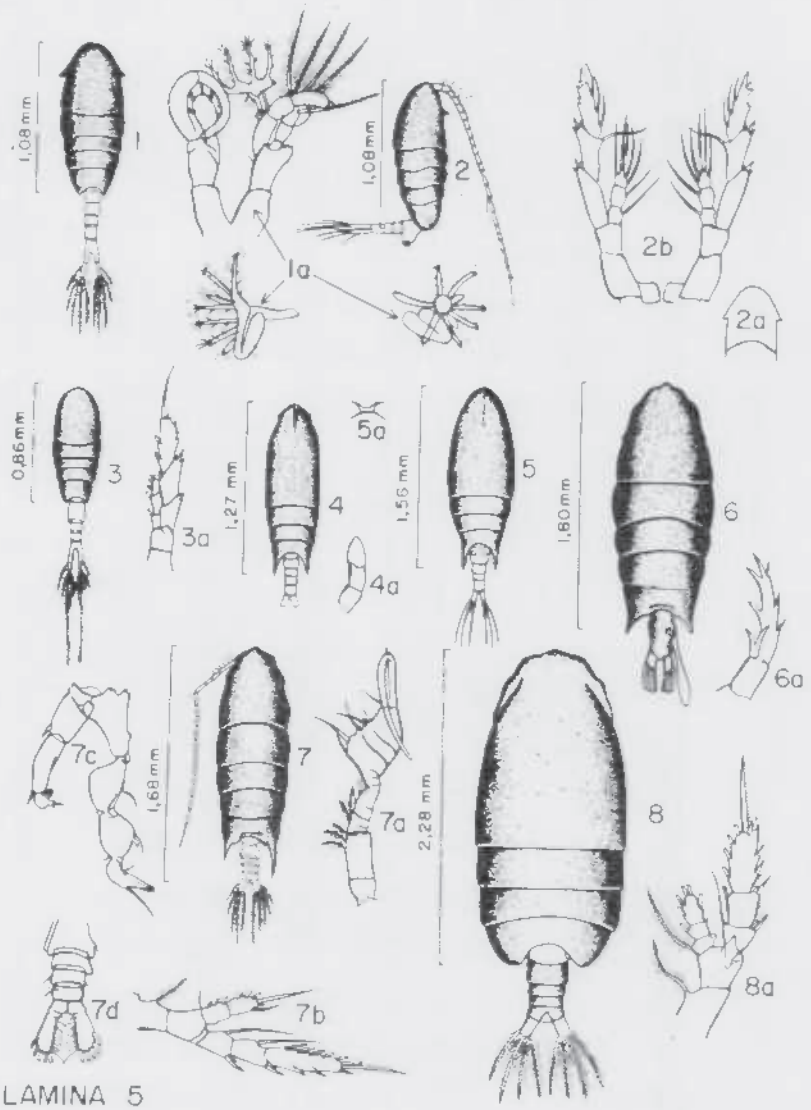
LAMINA 4

Plate 5.

1. *Lucicutia clausii;* (male), dorsal view
1a. *Lucicutia clausii;* (male), 5th legs
2. *Lucicutia clausii;* (female), lateral view
2a. *Lucicutia clausii;* (female), anterior part of metasome
2b. *Lucicutia clausii;* (female), 5th legs
3. *Lucicutia flavicornis;* (female), dorsal view
3a. *Lucicutia flavicornis;* (female), right 5th leg
4. *Euaetideus giesbrechti;* (male), dorsal view
4a. *Euaetideus giesbrechti;* juvenile (male), 5th leg
5. *Euaetideus giesbrechti;* (male), dorsal view
5a. *Euaetideus giesbrechti;* (female), ventral view of rostrum
6. *Pontellopsis brevis;* (female), dorsal view
6a. *Pontellopsis brevis;* (female), right 5th leg
7. *Pontellopsis brevis;* (male), dorsal view
7a. *Pontellopsis brevis;* (male), right lst antenna
7b. *Pontellopsis brevis;* (male), right 4th leg
7c. *Pontellopsis brevis;* (male), 5th legs
7d. *Pontellopsis brevis;* (male), dorsal view of urosome
8. *Euchirella brevis;* (female), dorsal view
8a. *Euchirella brevis;* (female), right 4th leg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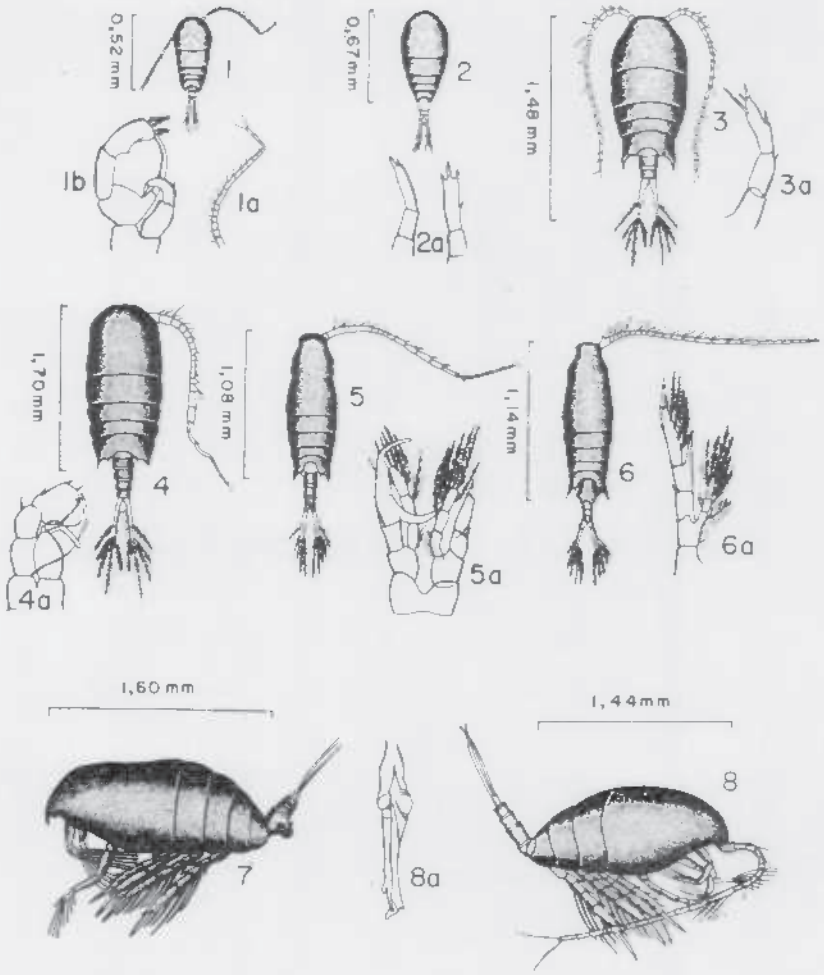
LAMINA 5

Plate 6.

1. *Temora turbinata;* (male), dorsal view
1a. *Temora turbinata;* (male), lst antenna
1b. *Temora turbinata;* (male), 5th legs
2. *Temora turbinata;* (female), dorsal view
2a. *Temora turbinata;* (female), 5th legs
3. *Temora stylifera;* (female), dorsal view
3a. *Temora stylifera;* (female), right 5th leg
4. *Temora stylifera;* (male), dorsal view
4a. *Temora stylifera;* (male), 5th legs
5. *Centropages furcatus;* (male), dorsal view
5a. *Centropages furcatus;* (male), 5th legs
6. *Centropages furcatus;* (female), dorsal view
6a. *Centropages furcatus;* (female), left 5th leg
7. *Scolecithrix danae;* (female), lateral view
8. *Scolecithrix danae;* (male), lateral view
8a. *Scolecithrix danae;* (male), 5th legs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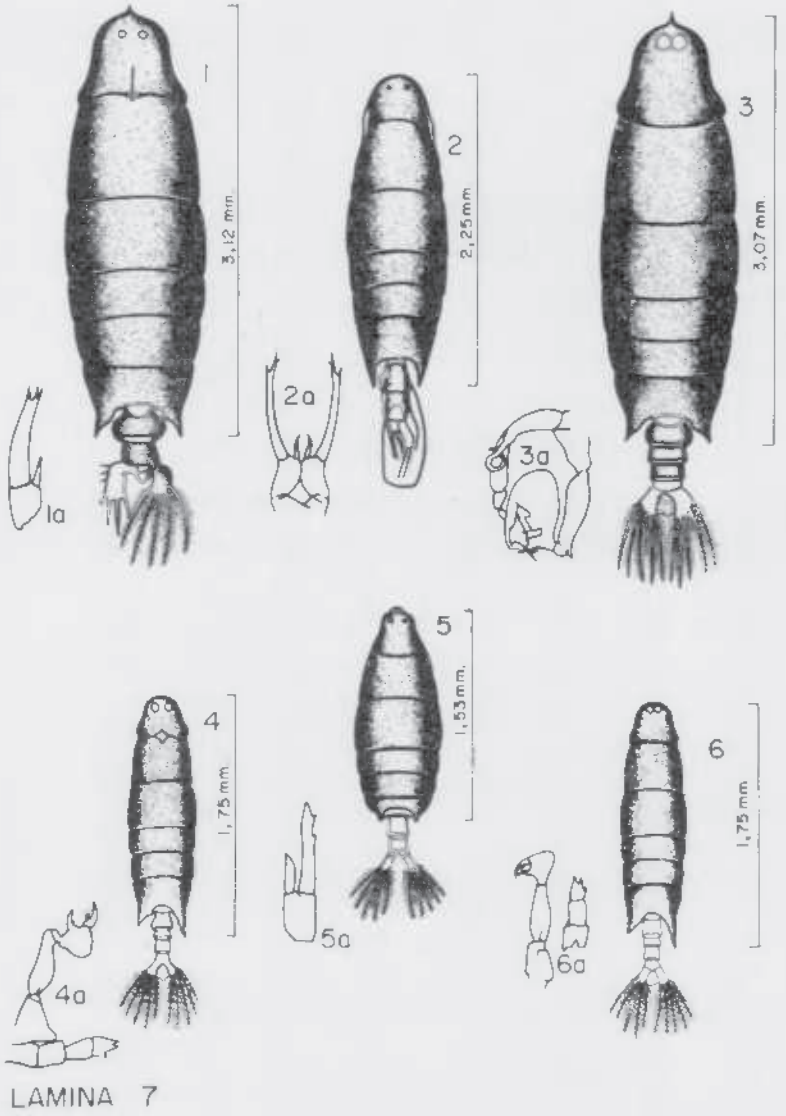
LAMINA 6

Plate 7.

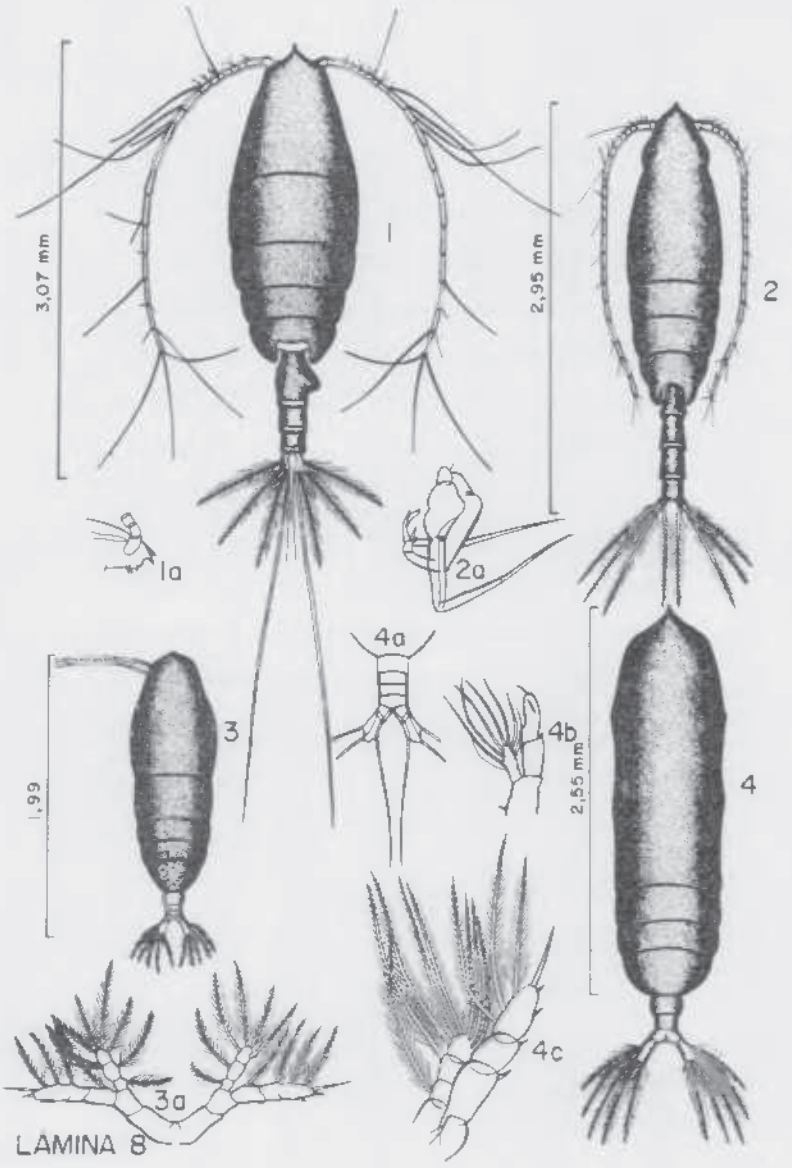
1. *Labidocera acutifrons;* (female), dorsal view
1a. *Labidocera acutifrons;* (female), left 5th leg
2. *Labidocera scotti;* (female), dorsal view
2a. *Labidocera scotti;* (female), 5th legs
3. *Labidocera acutifrons;* (male), dorsal view
3a. *Labidocera acutifrons;* (male), 5th legs
4. *Labidocera scotti;* (male), dorsal view
4a. *Labidocera scotti;* (male), 5th legs
5. *Labidocera* sp.; juvenile, dorsal view
5a. *Labidocera* sp.; juvenile, right 5th leg
6. *Labidocera scotti;* (male), dorsal view
6a. *Labidocera scotti;* (male), 5th legs



LAMINA 7

Plate 8.

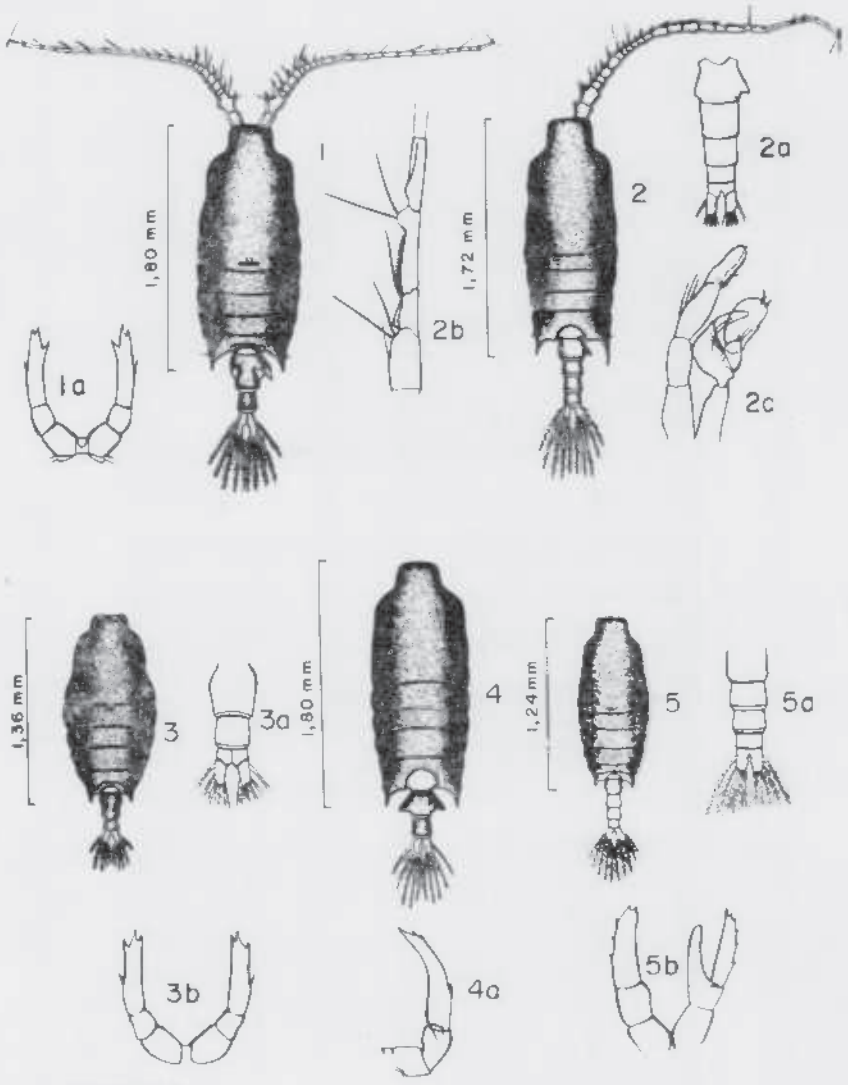
1. *Euchaeta marina;* (female), dorsal view
1a. *Euchaeta marina;* (female), lateral view of rostrum
2. *Euchaeta marina;* (male), dorsal view
2a. *Euchaeta marina;* (male), 5th legs
3. *Haloptilus longicornis;* (female), dorsal view
3a. *Haloptilus longicornis;* (female), 5th legs
4. *Haloptilus acutifrons;* (female), dorsal view
4a. *Haloptilus acutifrons;* (male), dorsal view of urosome
4b. *Haloptilus acutifrons;* (male), right 5th leg
4c. *Haloptilus acutifrons;* (female), right 5th leg



LAMINA 8

Plate 9.

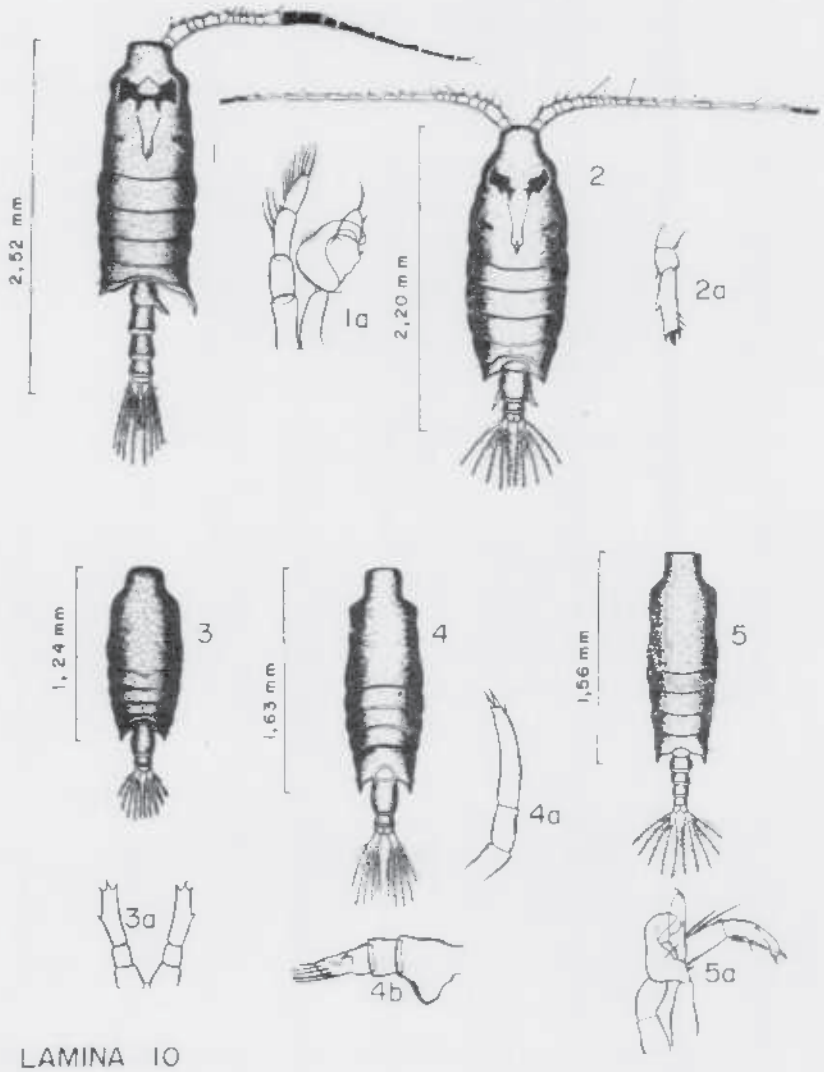
1. *Candacia curta;* (female), dorsal view
1a. *Candacia curta;* (female), 5th legs
2. *Candacia curta;* (male), dorsal view
2a. *Candacia curta;* (male), urosome
2b. *Candacia curta;* (male), anterior end of rigth lst antenna
2c. *Candacia curta;* (male), 5th legs
3. *Candacia pachydactyla;* juvenile, dorsal view
3a. *Candacia pachydactyla;* juvenile, urosome
3b. *Candacia Pachydactyla;* juvenile, 5th legs
4. *Candacia bipinnata;* (female), dorsal view
4a. *Candacia bipinnata;* (female), right 5th leg
5. *Candacia pachydactyla;* juvenile, dorsal view
5a. *Candacia pachydactyla;* juvenile, urosome
5b. *Candacia pachydactyla;* juvenile, 5th legs



LAMINA 9

Plate 10.

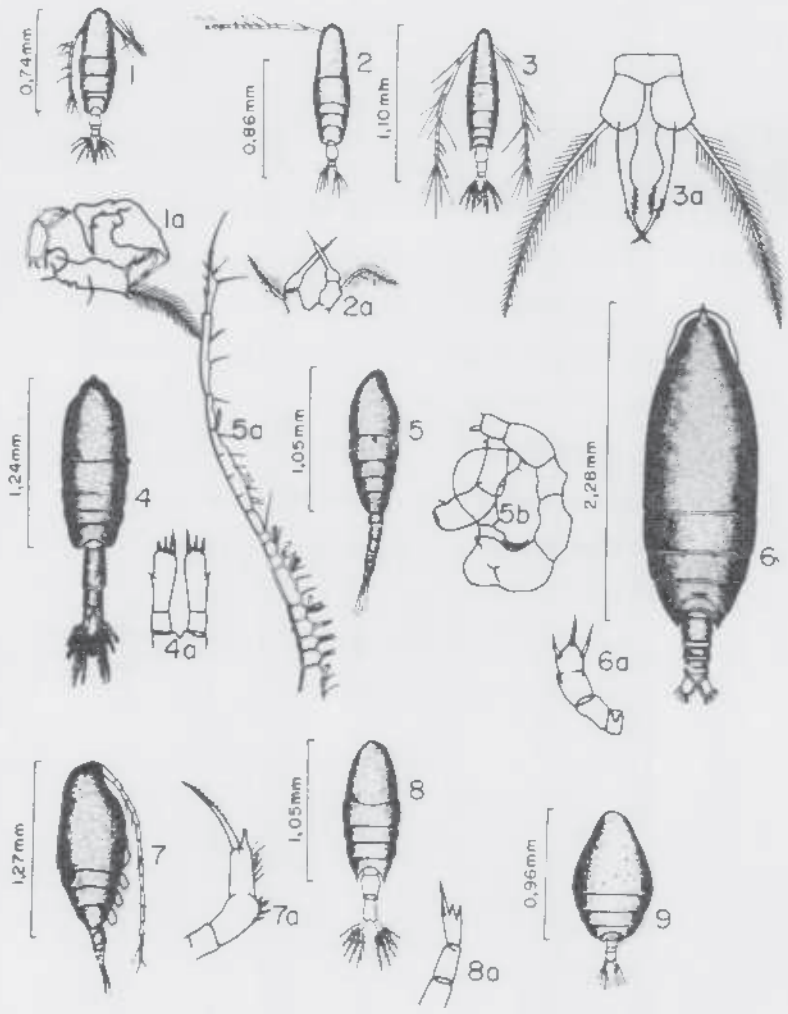
1. *Candacia pachydactyla;* (male), dorsal view
1a. *Candacia pachydactyla;* (male), 5th legs
2. *Candacia pachydactyla;* (female), dorsal view
2a. *Candacia pachydactyla;* (female), left 5th leg
3. *Candacia pachydactyla;* juvenile, dorsal view
3a. *Candacia pachydactyla;* juvenile, 5th legs
4. *Candacia varicans;* (female), dorsal view
4a. *Candacia varicans;* (female), right 5th leg
4b. *Candacia varicans;* (female), urosome, lateral view
5. *Candacia varicans;* (male), dorsal view
5a. *Candacia varicans;* (male), 5th legs



LAMINA 10

Plate 11.

1. *Acartia clausi;* (male), dorsal view
1a. *Acartia clausi;* (male), 5th legs
2. *Acartia clausi;* (female), dorsal view
2a. *Acartia clausi;* (female), 5th legs
3. *Acartia danae;* (female), dorsal view
3a. *Acartia danae;* (female), 5th legs
4. *Pleuromamma gracilis* var. *piseki;* (female), dorsal view
4a. *Pleuromamma gracilis* var. *piseki;* (female), 5th legs
5. *Pleuromamma gracilis* var. *piseki;* (male), lateral view
5a. *Pleuromamma gracilis* var. *piseki;* (male), 1st antenna
5b. *Pleuromamma gracilis* var. *piseki;* (male), 5th legs
6. *Lophothrix latipes;* (female), dorsal view
6a. *Lophothrix latipes;* (female), left 5th leg
7. *Scolecithrix ctenopus;* (female), lateral view
7a. *Scolecithrix ctenopus;* (female), right 5th leg
8. *Calanopia americana;* (female), dorsal view
8a. *Calanopia americana;* (female), right 5th leg
9. *Scolecithrix danae;* juvenile, dorsal view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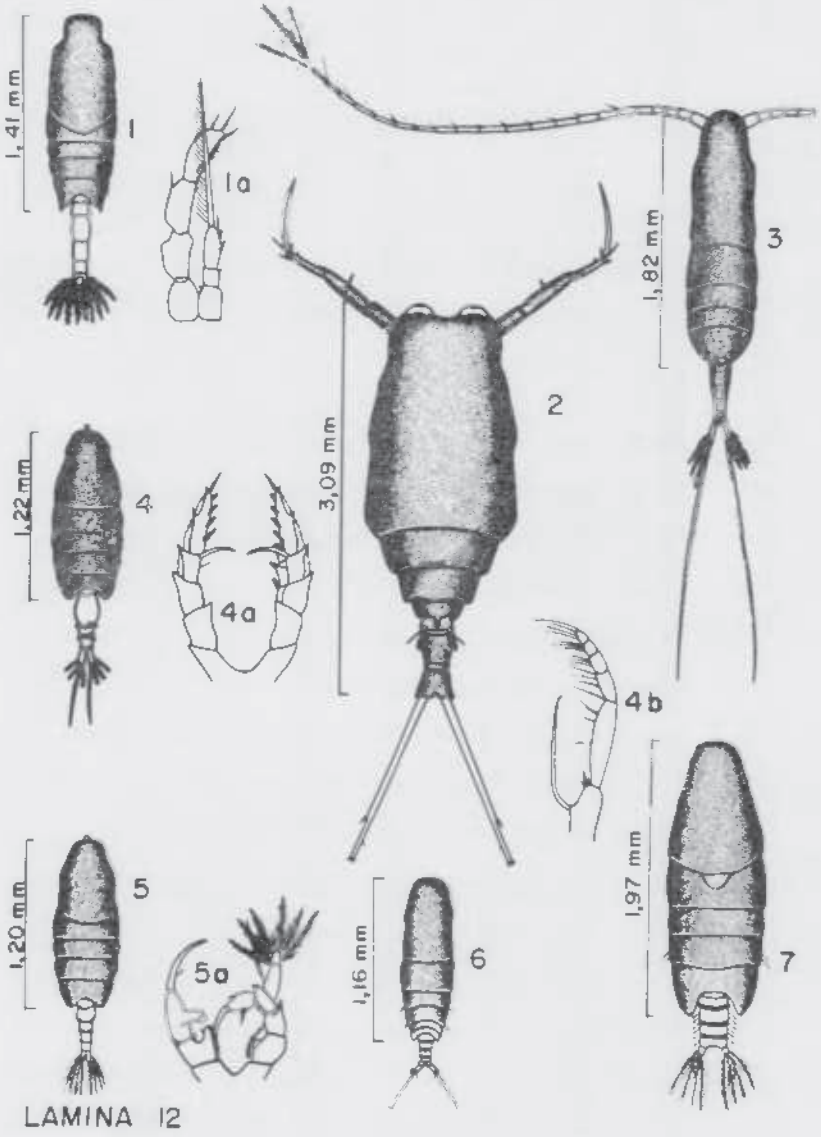
LAMINA II

Plate 12

1. *Candacia simplex;* (male), dorsal view.
1a. *Candacia simplex;* (male).
2. *Copilia vitrea;* (female), dorsal view.
3. *Euaugaptilus hecticus;* (female), dorsal view.
4. Heterorhabdus papilliger; (female), dorsal view.
4a. Heterorhabdus papilliger; (female).
4b. Heterorhabdus papilliger; (female).
5. Heterorhabdus papilliger; (female).
5a. Heterorhabdus papilliger; (female).
6. Calanus tenuicornis; (female), dorsal view.
7. Xanthocalanus sp.; (juvenile), dorsal view.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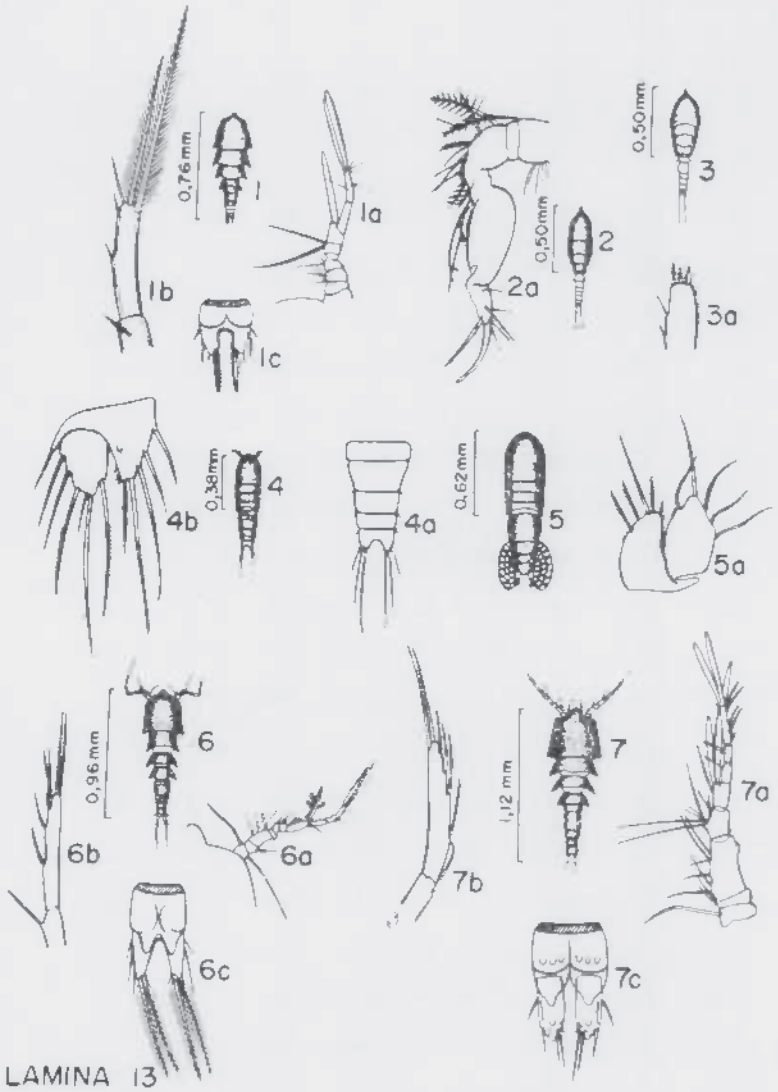
LAMINA 12

Plate 13

1. *Clytemnestra rostrata;* (female), dorsal view
1a. *Clytemnestra rostrata;* (female), right lst antenna
1b. *Clytemnestra rostrata;* (female), 5th leg
1c. *Clytemnestra rostrata;* (female), urosome
2. *Euterpina acutifrons;* (male), dorsal view
2a. *Euterpina acutifrons;* (male), lst antenna
3. *Euterpina acutifrons;* (female), dorsal view
3a. *Euterpina acutifrons;* (female), left 5th leg
4. Harpacticoid *copePod;* dorsal view
4a. Harpacticoid copepod; dorsal view of urosome
4b. Harpacticoid copepod; 5th leg
5. Harpacticoid copepod; (female), dorsal view
5a. Harpacticoid copepod; (female), 5th leg
6. *Clytemnestra scutellata;* (male), dorsal view
6a. *Clytemnestra scutellata;* (male), right lst antenna
6b. *Clytemnestra scutellata;* (male), 5th leg
6c. *Clytemnestra scutellata;* (male), urosome
7. *Clytemnestra scutellata;* (female), dorsal view
7a. *Clytemnestra scutellata;* (female), right lst antenna
7b. *Clytemnestra scutellata;* (female), 5th leg
7c. *Clytemnestra scutellata;* (female), urosome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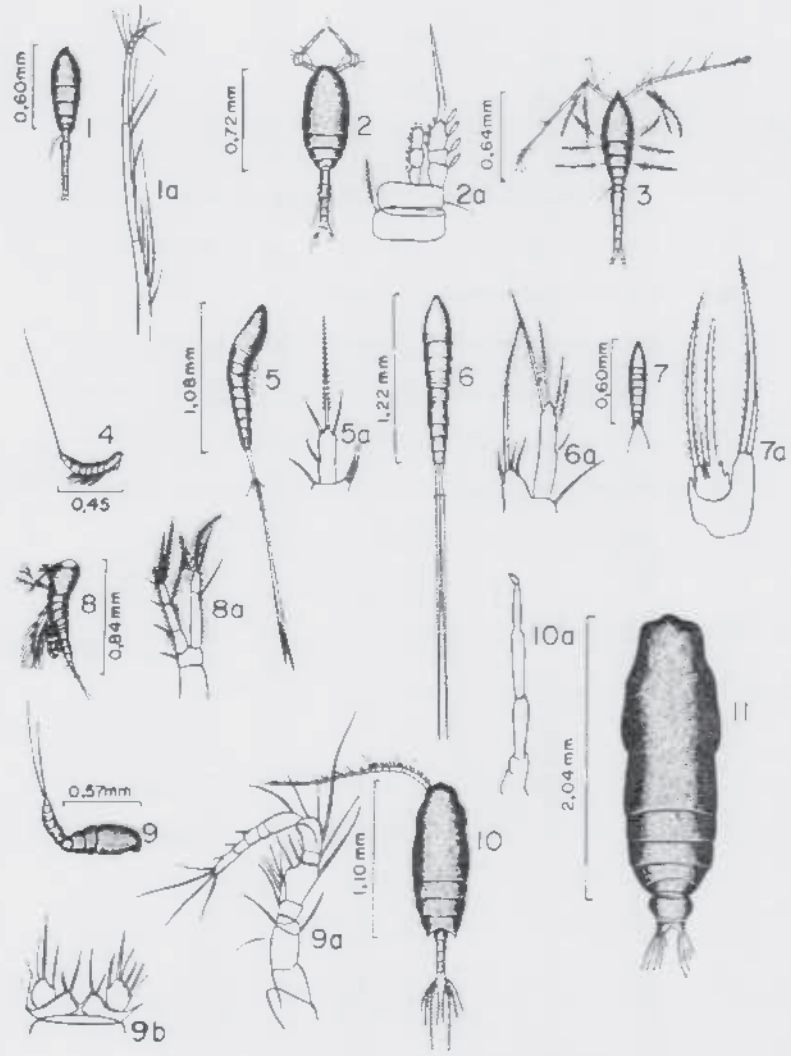
LAMINA 13

Plate 14.

1. *Oithona sp.;* (female), dorsal view
1a. *Oithona sp.;* (female), lst antenna
2. *Oithona plumifera;* (male), dorsal view
2a. *Oithona plumifera;* (male), right 4th leg
2. *Oithona plumifera;* (female), dorsal view
4. *Microsetella rosea;* lateral view
5. *Macrosetella gracilis;* (male), lateral view
5a. *Macrosetella gracilis;* (male), 5th leg
6. *Macrosetella gracilis;* (female), dorsal view
6a. *Macrosetella gracilis;* (female), left 5th leg
7. *Microsetella rosea;* dorsal view
7a. *Microsetella rosea;* 5th leg
8. *Miracia efferata;* (female), lateral view
8a. *Miracia efferata;* (female), left lst leg
9. Harpacticoid copepod; lateral view
9a. Harpacticoid popepod; lst antenna
9b. Harpacticoid copepod; 5th legs
10. *Aetideus armatus;* (male), dorsal view
10a. *Aetideus armatus;* (male), 5th leg
11. *Eucalanus crassus;* (female), dorsal view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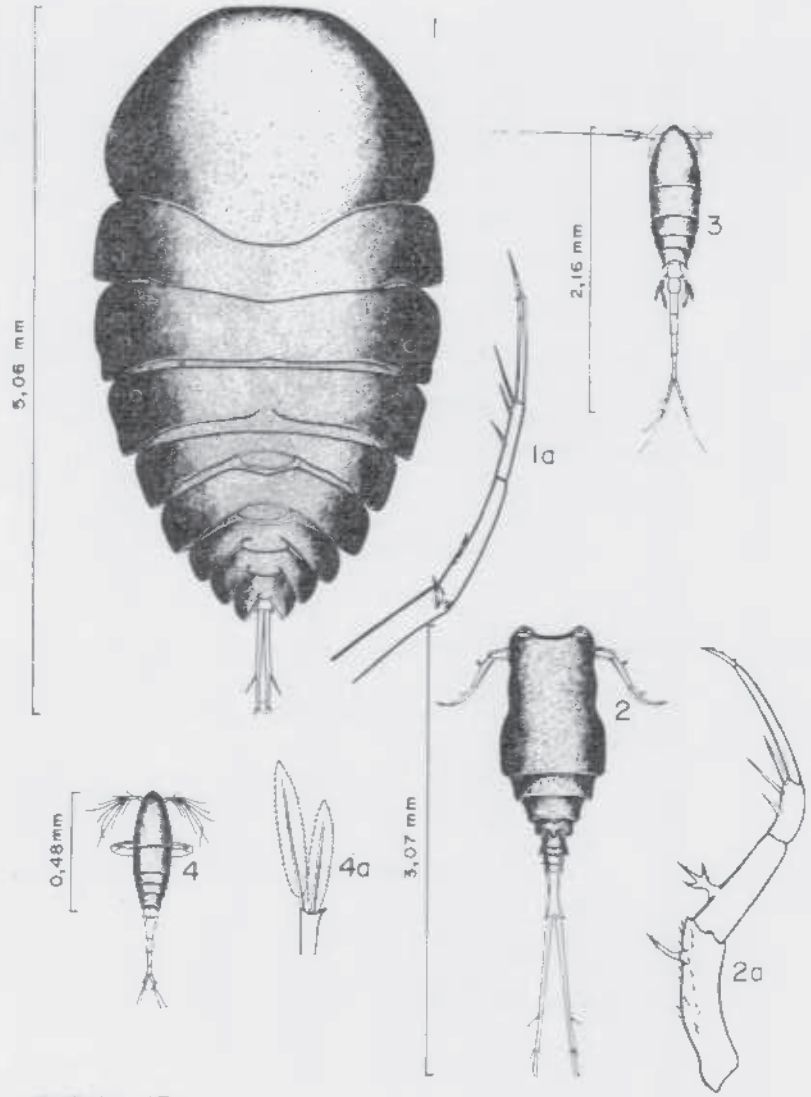
LAMINA 14

Plate 15.

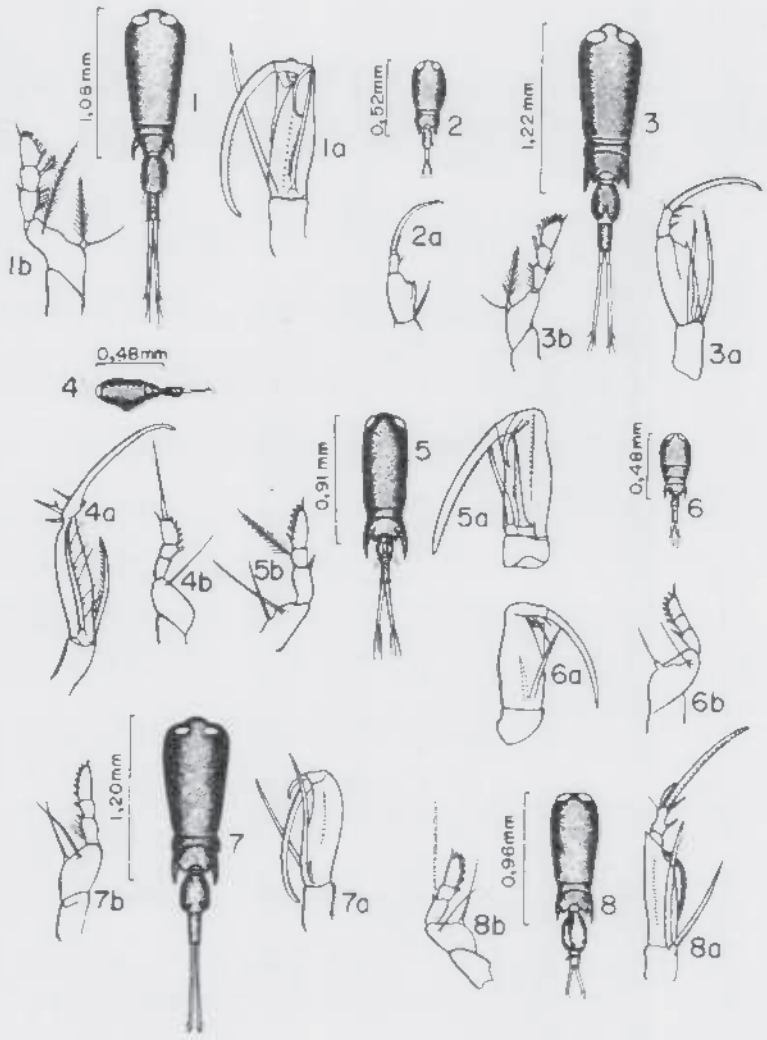
1. *Copilia mirabilis;* (male), dorsal view
1a. *Copilia mirabilis;* (male), 2nd antenna
2. *Copilia mirabilis;* (female), dorsal view
2a. *Copilia mirabilis;* (female), 2nd antenna
3. *Lubboquia squillimana;* (male), dorsal view
4. *Lubbockia squillimana;* (female), dorsal view
4a. *Lubbockia squillimana;* (female), left 5th leg



LAMINA 15

Plate 16.

1. *Corycaeus* (*Urocorycaeus*) *furcifer;* (male), dorsal view
1a. *Corycaeus* (*Urocorycaeus*) *furcifer;* (male), 2nd antenna
1b. *Corycaeus* (*Urocorycaeus*) furcifer; (male), 4th leg
2. *Corycaeus* (*Onychocorycaeus*) *giesbrechti;* (male), dorsal view
2a. *Corycaeus* (*Onychocorycaeus*) *giesbrechti;* (male), 2nd antenna
3. *Corycaeus* (*Urocorycaeus*) *lautus;* (male), dorsal view
3a. *Corycaeus* (*Urocorycaeus*) *lautus;* (male), 2nd antenna
3b. *Corycaeus* (*Urocorycaeus*) *lautus;* (male), 4th leg
4. *Corycaeus* (*Corycella*) *gracilis;* (male), dorsal view
4a. *Corycaeus* (*Corycella*) *gracilis;* (male), 2nd antenna
4b. *Corycaeus* (*Corycella*) *gracilis;* (male), 4th leg
5. *Corycaeus* (*Corycaeus*) *speciosus;* (male), dorsal view
5a. *Corycaeus* (*Corycaeus*) *speciosus;* (male), 2nd antenna
5b. *Corycaeus* (*Corycaeus*) *speciosus;* (male), 4th leg
6. *Corycaeus* (*Onychocorycaeus*) *agilis;* (male), dorsal view
6a. *Corycaeus* (*Onychocorycaeus*) *agilis;* (male), 2nd antenna
6b. *Corycaeus* (*Onychocorycaeus*) *agilis;* (male), 4th leg
7. *Corycaeus* (*Urocorycaeus*) *longistylis;* (male), dorsal view
7a. *Corycaeus* (*Urocorycaeus*) *longistylis;* (male), 2nd antenna
7b. *Corycaeus* (*Urocorycaeus*) *longistylis;* (male), 4th leg
8. *Corycaeus* (*Agetus*) *typicus;* (male), dorsal view
8a. *Corycaeus* (*Agetus*) *typicus;* (male), 2nd antenna
8b. *Corycaeus* (*Agetus*) *typicus;* (male), 4th leg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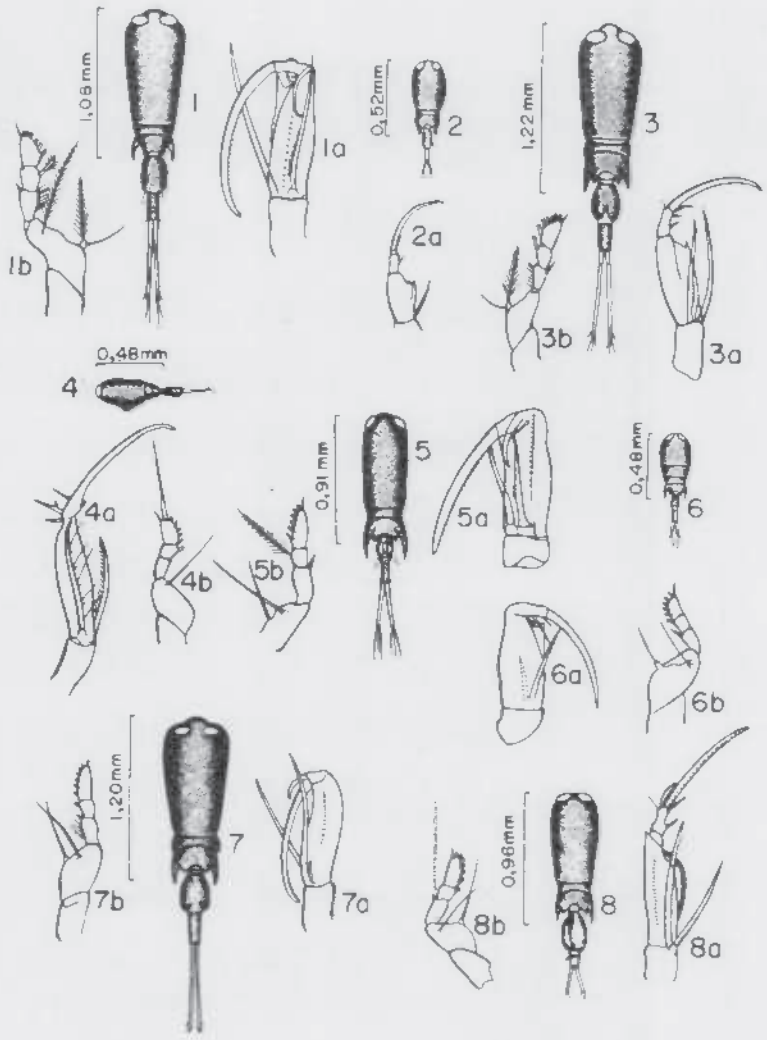
LAMINA 16

Plate 16.

1. *Corycaeus* (*Urocorycaeus*) *furcifer;* (male), dorsal view
1a. *Corycaeus* (*Urocorycaeus*) *furcifer;* (male), 2nd antenna
1b. *Corycaeus* (*Urocorycaeus*) furcifer; (male), 4th leg
2. *Corycaeus* (*Onychocorycaeus*) *giesbrechti;* (male), dorsal view
2a. *Corycaeus* (*Onychocorycaeus*) *giesbrechti;* (male), 2nd antenna
3. *Corycaeus* (*Urocorycaeus*) *lautus;* (male), dorsal view
3a. *Corycaeus* (*Urocorycaeus*) *lautus;* (male), 2nd antenna
3b. *Corycaeus* (*Urocorycaeus*) *lautus;* (male), 4th leg
4. *Corycaeus* (*Corycella*) *gracilis;* (male), dorsal view
4a. *Corycaeus* (*Corycella*) *gracilis;* (male), 2nd antenna
4b. *Corycaeus* (*Corycella*) *gracilis;* (male), 4th leg
5. *Corycaeus* (*Corycaeus*) *speciosus;* (male), dorsal view
5a. *Corycaeus* (*Corycaeus*) *speciosus;* (male), 2nd antenna
5b. *Corycaeus* (*Corycaeus*) *speciosus;* (male), 4th leg
6. *Corycaeus* (*Onychocorycaeus*) *agilis;* (male), dorsal view
6a. *Corycaeus* (*Onychocorycaeus*) *agilis;* (male), 2nd antenna
6b. *Corycaeus* (*Onychocorycaeus*) *agilis;* (male), 4th leg
7. *Corycaeus* (*Urocorycaeus*) *longistylis;* (male), dorsal view
7a. *Corycaeus* (*Urocorycaeus*) *longistylis;* (male), 2nd antenna
7b. *Corycaeus* (*Urocorycaeus*) *longistylis;* (male), 4th leg
8. *Corycaeus* (*Agetus*) *typicus;* (male), dorsal view
8a. *Corycaeus* (*Agetus*) *typicus;* (male), 2nd antenna
8b. *Corycaeus* (*Agetus*) *typicus;* (male), 4th leg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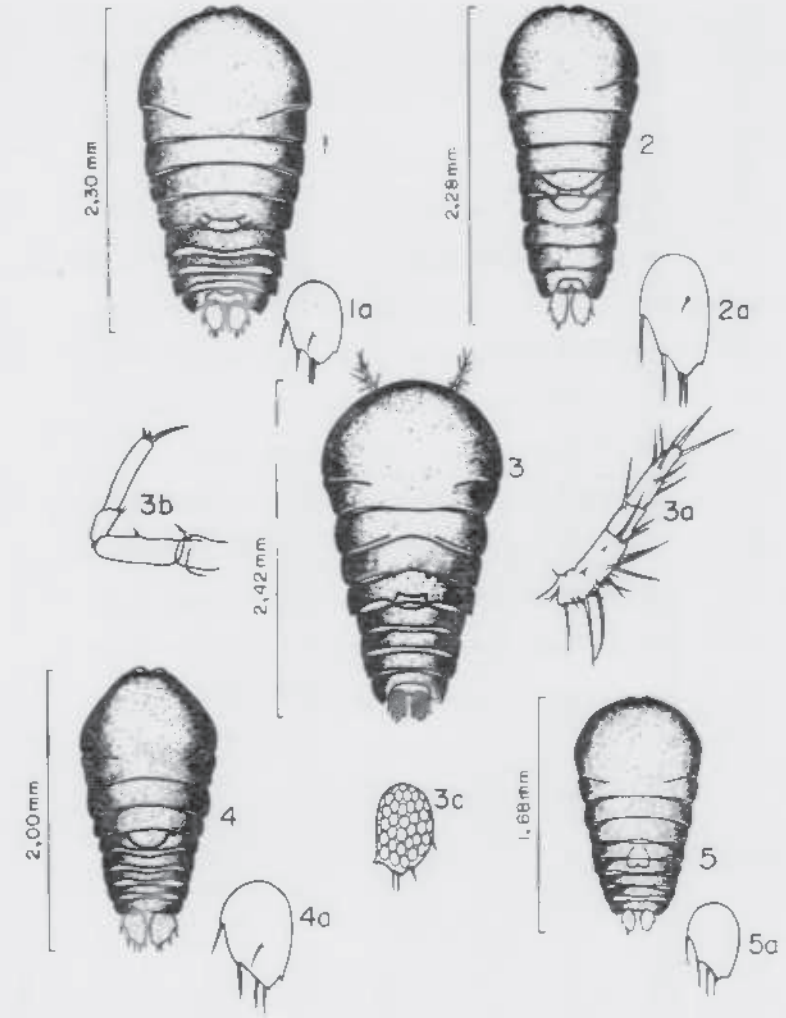
LAMINA 16

Plate 18

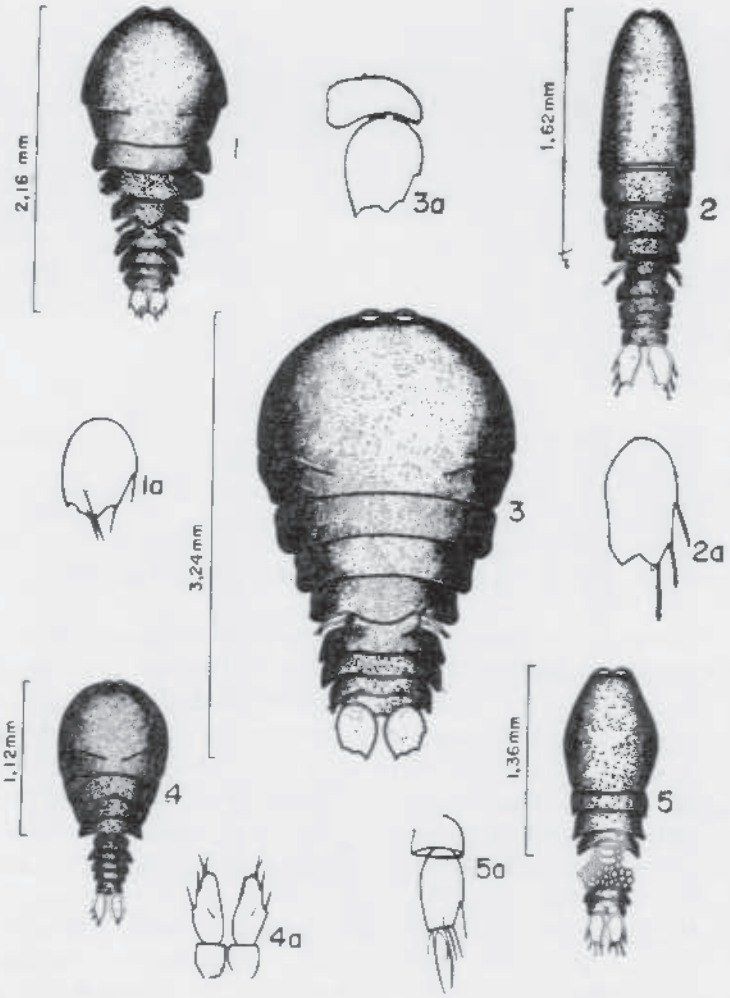
1. *Sapphirina auronitens;* (male), dorsal view
1a. *Sapphirina auronitens;* (male), left furcal ramus
2. *Sapphirina intestinata;* (male), dorsal view
2a. *Sapphirina intestinata;* (male), left furcal ramus
3. *Sapphirina opalina;* (male), dorsal view
3a. *Sapphirina opalina;* (male), lst antenna
3b. *Sapphirina opalina;* (male), 2nd antenna
3c. *Sapphirina opalina;* (male), right furcal ramus
4. *Sapphirina sinuicauda;* (male), dorsal view
4a. *Sapphirina sinuicauda;* (male), left furcal ramus
5. *Sapphirina auronitens;* (male), dorsal view
5a. *Sapphirina auronitens;* (male), left furcal ramus



LAMINA 18

Plate 19.

1. *Sapphirina nigromaculata;* (female), dorsal view
1a. *Sapphirina nigromaculata;* (female), right furca
2. *Sapphirina angusta;* (female), dorsal view
2a. *Sapphirina angusta;* (female, right furca
3. *Sapphirina opalina - darwinii;* (male), dorsal view
3a. *Sapphirina opalina - darwinii;* (male), right furca
4. *Sapphirina intestinata;* (female), dorsal view
4a. *Sapphirina intestinata;* (female), right furca
5. *Sapphirina metallina;* (female), dorsal view
5a. *Sapphirina metallina;* (female), right furca



LAMINA 19