CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 117

PROTOZOA
ORDER: TINTINNIDA
Family: Tintinnidiidae
Genus: Tintinnidium
Family: Codonellidae (1)
Genus: Tintinnopsis

(By S. M. MARSHALL)

1969

Introduction to Plankton Sheets 117–127

Sheets 117–127 are based, as must be any study of the Tintinnida, on the work of KOFOID and CAMPBELL (1929, 1939, 1942). These authors not only described the tintinnids from various expeditions but also reviewed the literature and assigned all published figures to their species.

The taxonomy is founded entirely on the lorica and although this may not be the ideal (FAURÉ-FREMIET, 1924; HOFKER, 1931) it is at present the only practicable method.

More recent workers, studying large populations in one area, have found a great deal of individual variation, and many forms transitional between one species and another (HOFKER, 1931; HALME, 1958; HALME and LUKKARINEN 1960–61; MARGALEF and DURAN, 1953). However, until more is known about reproduction, variation, and the effect of external factors such as temperature and salinity, it seems best to keep separate KOFOID and CAMPBELL's species; this has been done, with notes on the variability where necessary.

Sizes and proportions are as given by the authors or calculated from their figures, but these may cover a wide geographical range. Since ranges in length are often given without corresponding widths, or illustrations, the ratio length/oral diameter does not always fit for the extreme sizes. As a rule, species are larger in the colder parts of their range and length varies more than width.

Many tintinnids are cosmopolitan and it therefore seemed advisable to include in the area covered, the North Atlantic generally, and the Arctic, as well as the European areas usually covered by the Plankton Sheets. The tropical Atlantic (Sargasso Sea southwards) and the Mediterranean have been excluded.

Two magnifications have been used, one (x 300) for most families and the second (x 150) for those families and subfamilies (and one genus) which contain exceptionally long species, namely *Favella*, Rhabdonellidae, Xystonellidae, and Salpingellinae. They are marked with an asterisk in the lists. The fine structure of the lorica wall is usually shown on only part of the drawing.

I am glad to thank Mrs. Heather MCBAY and Miss Christine OUTHWAITE for copying many of the drawings.

A full bibliography will be found in KOFOID and CAMPBELL (1929). The present reference list contains only more recent work in the relevant area.

Key to numbers used in the tables for distribution

1. Arctic Seas (Spitsbergen, Barents and Kara Seas).
2. Greenland Coasts.
3. Iceland, Faroes, Shetland.
4. Norwegian Coast and Norwegian Sea.
5. Baltic (incl. Gulfs of Finland and Bothnia).
6. Approaches to Baltic (Skagerak, Kattegat, Belt Seas).
7. North Sea.
8. English Channel.
9. St. Georges Channel, Bristol Channel, Irish Sea.
10. Coasts of N. Europe (to Bay of Biscay),
11. Coasts of S. Europe and N.W. Africa.
12. North Atlantic, North.
13. North Atlantic, Central (Canaries, Azores, Gulf Stream).
14. Irminger Sea, Newfoundland Banks, Nova Scotia.
15. West Atlantic (Florida and Labrador Currents, Woods Hole region).

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family TINTINNIDIIDAE KOFOID & CAMPBELL, 1929						Wall soft and viscous, accumulating foreign particles, sometimes with a faint spiral structure. Tube- or sack-shaped, rarely with a collar. Aboral end open or closed.
Genus *Tintinnidium* KENT, 1882	Plate I					Tube- or sack-formed or irregular, sometimes with a collar. Aboral end open or closed. HOFKER thinks shape of lorica is no guide to identification and that there may be only one species.
T. incertum BRANDT, 1906	1	100–269	27–40	6.1	10	Lorica long, tube-shaped, closed at aboral end.
T. mucicola (CLAPARÈDE & LACHMANN, 1858)	2	100–240	30–63	4.0–6.0	4, 5, 6	Lorica very soft and irregular. Aboral end closed.
Genus *Leprotintinnus* JÖRGENSEN, 1899						Lorica more or less cylindrical, open at aboral end. Sometimes a spiral structure present.
L. bottnicus (NORDQVIST, 1890)	4	90–320	25–40	4.5–7.5	1, 2, 5, 6, 7, 12	Lorica more or less cylindrical, narrowing considerably to open aboral end.
L. pellucidus (CLEVE, 1899)	3	200–240	35–47	3.9–6.4	1, 2, 4, 6, 10, 11	Lorica more or less cylindrical, open aboral end narrower than oral often after a slight constriction. Spiral structure sometimes visible.
Family CODONELLIDAE KENT, 1882						Form very variable, globose to conical or cylindrical, with or without collar; aboral end rounded, pointed, or with pedicel, almost always closed. Collar with or without nuchal constriction, never spiral or hyaline. Wall composed of minute primary alveoli and much coarser uneven secondary structure, thickly or thinly scattered with particles made of wall substance. Inner and outer laminae ill-developed, spiral structure sometimes present. Differs from other families mainly in structure of wall.
Genus *Tintinnopsis* STEIN, 1867	Plate I, II					Mainly neritic and temperate. Form very variable as above. Spiral structure often present especially at oral end. Aboral end almost always closed.
T. acuminata DADAY, 1887	8	54–78	18–21	2.9–3.5	3, 4, 5, 6, 7, 8, 9, 10	Tubular, contracting in lower $^1/_4$ to bluntly pointed aboral end. Few particles.
T. amphora KOFOID & CAMPBELL, 1929	6	130–160	21–32 (53–60)	5–8	6, 11	Fusiform. Oral diameter less than half maximum diameter which is in aboral half.
T. angusta MEUNIER, 1910	9	70	20	3.5	1	Rather fusiform but oral diameter more than half maximum diameter of bowl.


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Plate I.

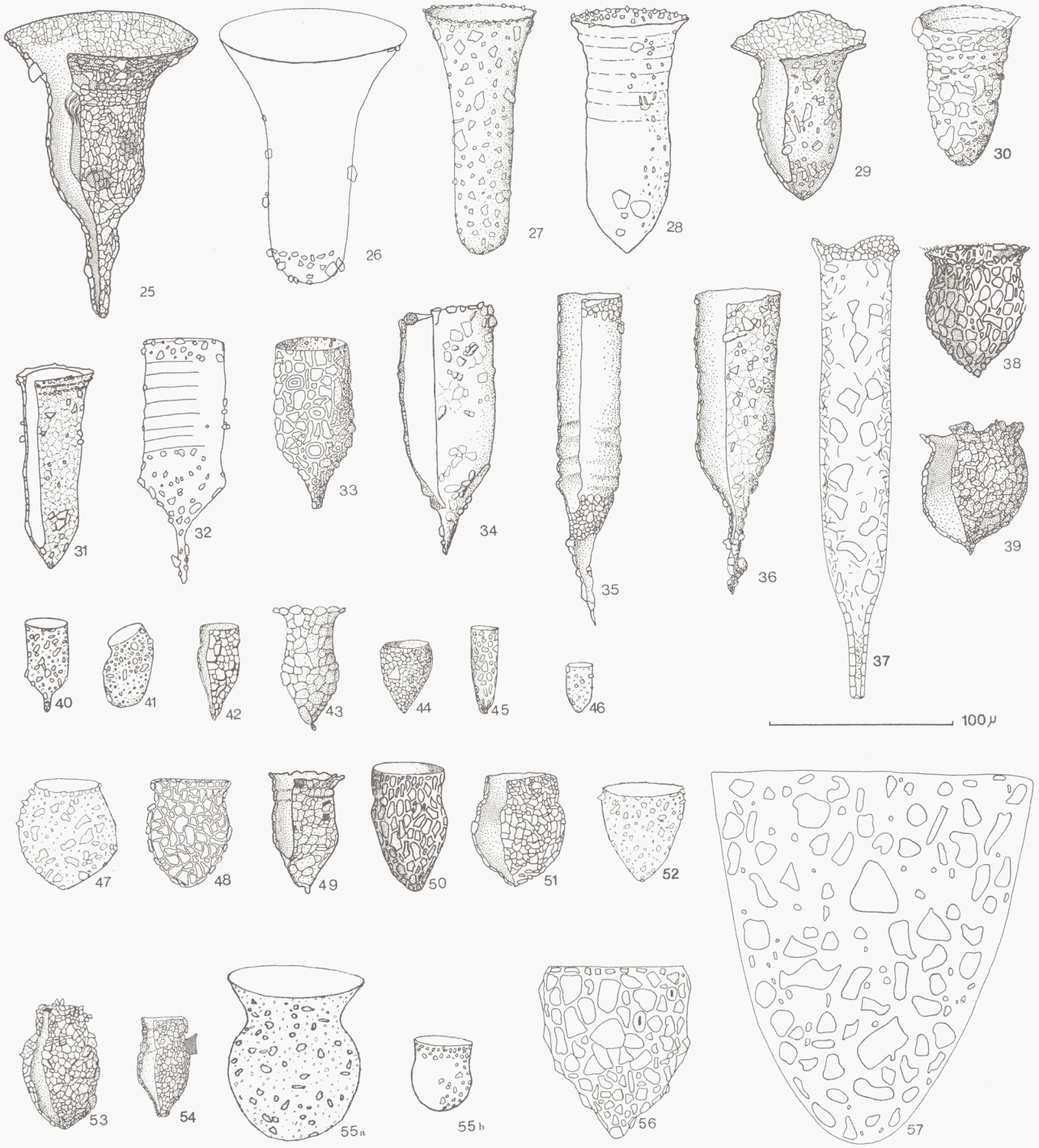
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Plate II.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
T. annulata (Claparède & Lachmann, 1858)	5	270	70	3.8	4	Large but ill-defined species more or less cylindrical anteriorly, inflated in aboral $^3/_4$ bowl. Kofoid and Campbell suggest it is an aberrant *T. subacuta*.
T. baltica Brandt, 1896	49	42–110	30–50 (35–39)	1.2–2.0	5, 6, 7, 11	Small with flaring mouth, slightly inflated bowl and pointed aboral end. Halme and Lukkarinen include it in their *lobiancoi* group in which, with T. *lata* and *T. turbo* it is one of the smaller forms. Hofker includes it with *T. fimbriata* and *T. meunieri*, both wider in proportion to length. Sometimes with one or more annulations below mouth.
T. beroidea Stein, 1867	19	34–100	18–36 (18–36)	1.5–3.0	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15	Small, cylindrical, with bluntly pointed or rounded aboral end, sometimes slight ring or spiral formation below mouth c.f. *T. parvula* which some authors include here but which narrows to the mouth. With this is included *T. angustior* which Hada (1937) separates from *T. beroidea* and *T. acuminata* as being more slender and blunter aborally, both variable characters.
T. brandti (Nordqvist, 1890)	7	65–215	42–50 (66–100)	1.3–4.3	4, 5, 6	Cylindrical, widening aborally to a surface usually flat, occasionally with a small point. Halme and Lukkarinen find forms transitional between this and *T. tubulosa* but distinguish them on width of aboral end: $>66\mu$ = *T. brandti*; $<62\mu$ = *T. tubulosa*.
T. bütschli Daday, 1887	26	80–144	66–92 (39–117)	1.3–1.6	6, 10, 11	Cylindrical with widely flaring mouth and rounded aboral end. See *T. campanula*.
T. campanula (Ehrenberg, 1840)	25	110–200	78–150	1.5	4, 5, 6, 7, 8, 10, 11, 12, 14	Typically cylindrical with a widely flaring mouth and a stout pedicel. Often indication of annulation below flare. Hofker says this species is very variable in flare, presence or absence of pedicel, and encrustation with particles. He includes as forms of same sp. *T. bütschli*, *T. cincta*, *T. cyathus*, *T. lindeni*.
T. cincta (Claparède & Lachmann, 1858)	31	104–147	35–60	2.5–5	4, 5, 6	Cylindrical with slight oral flare bluntly pointed aboral end and ring or spiral structure below mouth. *See T. campanula*.
T. cochleata (Brandt, 1906)	15	146–270	44–90	3.0–6	5, 6	Long, cylindrical, with rounded aboral end. Spiral structure extends almost throughout.
T. compressa Daday, 1887	55a & b	47–90	37–75 (37–65)	1–1.3	11, 15	Small, rounded, with nuchal constriction. Silva's specimen from the Portuguese coast has marked constriction and flaring collar and is perhaps a different species. (a) the Portuguese, (b) the more usual, form.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
T. coronata Kofoid & Campbell, 1929	37	250	50	5	13	Elongated cylinder with slightly flaring oral end and short pedicel. Distinguished from *T. cylindrica* by the flaring mouth.
T. cyathus Daday, 1887	27	100–196	30–87	2–3	4, 5, 7, 8, 11, 12	Cone shaped or cylindrical in lower half with rounded aboral end, gently flaring to mouth. Spiral structure sometimes visible throughout. Differs from *T. bütschli* in having less oral flare and from *T. cincta* by its more rounded aboral end. See *T. campanula.*
T. cylindrica Daday, 1887	36	120–240	37–45	3–5	4, 5, 14	Almost cylindrical for about $^2/_3$ bowl then sometimes very slightly inflated before narrowing to a stout pedicel. Differs from *T. coronata* in relatively greater width and from *T. lindeni* in lack of spiral structure.
T. ecaudata Kofoid & Campbell, 1929	29	100–150	75–90 (45–50)	1–1.6	4	Slightly convex bowl and flaring brim with rounded or slightly pointed aboral end. Differs from *T. bütschli* and *T. everta* in convexity of bowl.
T. everta Kofoid & Campbell, 1929	30	65–150	65–122	1–1.3	5	Like *T. cyathus* but usually shorter. Blunt to rounded aboral end and spiral structure visible.
T. fennica Kofoid & Campbell, 1929	34	120–150	40–60	2.5–3	5, 6	Almost cylindrical, narrowing in lower $^1/_3$–$^2/_3$ to a short pedicel. Spiral structure, if any, faint. Oral rim irregular. Particles thinly scattered on bowl.
T. fimbriata Meunier, 1919	38	68–75	53–55 (53)	1.2–1.4	5, 10, 12	Small rounded bowl with nuchal constriction, slightly flared oral and pointed aboral end. Mouth sometimes surrounded by an irregular fringe. See *T. meunieri.*
T. incurvata Meunier, 1910	41	48–68	22–30 (25)	1.2–2.3	1, 11	Sack-like, with mouth at an angle to main axis. Recorded from Arctic and once off Portuguese coast. Former has annulated oral end, latter has not, and mouth is smaller.
T. karajacensis Brandt, 1896	18	75–172	35–60	2–3.5	1, 2, 4, 5, 6, 7, 12, 14	Cylindrical with rounded aboral end, sometimes slightly expanded at mouth and lower part of bowl. Spiral structure visible suborally. Less expanded suborally, than *T. subacuta*, shorter than *T. tubulosa.* See *T. lobiancoi.*
T. lata Meunier, 1910	17	62–70	38–42	1.5–2	1, 6, 11	Short, bluntly pointed aborally and slightly expanded above this. Differs from *T. nucula* and *T. turbo* by the wider mouth. See however *T. lobiancoi.*
T. levigata Kofoid & Campbell, 1929	40	42–70	18–25	2–3	11	Short cylindrical with a stout pedicel. Much smaller than *T. cylindrica* or *T. fennica.*

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
T. lindeni DADAY, 1887	32	116–192	43–55 (46)	2.7–3.5	11	Cylindrical for most part widening slightly before narrowing to a pedicel. Wall thick, indistinctly separated into two layers. Annulated over most of bowl. Like *Coxliella helix* in many ways.
T. lobiancoi DADAY, 1887	11a, b	93–409	36–62	2–7	1, 5, 7, 10, 11, 14	Long, cylindrical, occasionally slightly dilated aborally (b) aboral end usually rounded sometimes slightly pointed. (a) is the more usual form. HALME and LUKKARINEN have studied large populations in the Baltic and found transition stages between this and many of the listed spp. They would include here *T. baltica*, *T. karajacensis*, *T. lata*, *T. pistillum*, *T. rotundata*, *T. strigosa*, *T. subacuta*, *T. tubulosa*, *T. turbo*, while admitting that some may be sub-spp.or var. *T. baltica*, *T. lata* and *T. turbo* are usually shorter than the rest. *T. strigosa* has a more developed pedicel.
T. magna MERKLE, 1909	57	170–204	150–180	1.2	4, 6	Large, wide, conical with rounded aboral end (possibly flattened by pressure).
T. major MEUNIER, 1910	28	130	65	2	1, 4, 5	Cylindrical with rather flaring mouth and pointed aboral end, annulated in upper half. Like *T. cyathus* except for pointed aboral end and perhaps belongs to *T. campanula* group.
T. meunieri KOFOID & CAMPBELL, 1929	39	69–76	57–62 (53–60)	1.3–1.5	1, 5, 6, 7	Short, round with nuchal constriction below flaring mouth; short point at aboral end. Oral rim ragged. Differs little from *T. fimbriata* with which HOFKER unites it.
T. minuta WAILES, 1925	46	25–45	11–15	2–2.5	11	Very small cylinder with rounded aboral end. Very similar to *T. nana* with which HOFKER suggests it may be united.
T. nana LOHMANN, 1908	45	30–47	12–19	2.5–3.5	5, 7, 11	Very small cylinder with slightly pointed aboral end. Differs from *T. minuta* only in shape of aboral end and ratio of length to oral diameter, both rather variable characters.
T. nitida BRANDT, 1896	43	67–105	41–70	1.5–2	1, 2, 4, 5	Small, vase-shaped with slightly inflated lower bowl, flaring mouth with flattened rim and bluntly rounded aboral end. Less pointed aborally than *T. baltica* narrower than *T. fimbriata*, relatively wider than *T. sinuata*.
T. nucula (FOL, 1884)	53	48–111	22–62	1.3–3.3	4, 5, 6, 7	Small, oval, of very variable shape according to KOFOID and CAMPBELL's attributions. Sometimes with narrower cylindrical collar set off from bowl or sometimes widening or narrowing to mouth. Thickly encrusted with particles. With this HOFKER includes *T. turbo*.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
T. parva MERKLE, 1909	44	30–49	20–23 (15–31)	1.2–2.5	5, 6, 10, 11	Small, widest in middle, narrowing slightly to mouth, more sharply to pointed aboral end.
T. parvula JÖRGENSEN, 1912	54	51–70	20–37	1.8–3.4	1, 2, 4, 5, 6, 11	Small, slightly expanded below a cylindrical anterior region, pointed aborally. More pointed aborally than *T. nucula* and more expanded than *T. beroidea* with which HOFKER unites it.
T. patula MEUNIER, 1910	23	78	58 (40)	1.6	1	Oval bowl with flaring oral and rounded aboral end. The nuchal constriction separates it from *T. bütschli* and it is relatively longer than *T. compressa*.
T. pistillum KOFOID & CAMPBELL, 1929	13	144–175	36–50	3.6–4.7	5, 6	Long, cylindrical with expanded aboral end. Spiral structure visible. See *T. lobiancoi*.
T. plagiostoma DADAY, 1887	52	50–60	46–60	1–1.1	11	More or less open cone bluntly pointed aborally. Much smaller than *T. magna*.
T. radix IMHOF, 1886	35	182–524	30–53	3.5–11.0	15	Cylindrical or almost so, narrowing gradually to pedicel which has often an opening near tip, possibly an artefact. Variable spiral structure in bowl.
T. rapa MEUNIER, 1910	42	50–65	20–25	2.2–2.7	1, 4, 5, 10	Like *T. parvula* and only slightly narrower.
T. rara KOFOID & CAMPBELL, 1939	47	48–56	32–37 (45–54)	1.4–1.6	11	Rotund, narrowing to a short upright collar bluntly pointed aborally. Collar barely visible in SILVA's Portuguese specimen to which this record and figure belong.
T. rotundata JÖRGENSEN, 1899	16	45–90	24–47	2.0	5, 11	Cylindrical with hemispherical aboral end. Thickly encrusted with particles. See *T. lobiancoi*.
T. sacculus BRANDT, 1896	21	60–105	44–58	1.5–2.0	1, 2, 5, 6, 12	Short, cylindrical, with rounded aboral end. Particles smaller and less numerous than on *T. rotundata*.
T. sinuata BRANDT, 1896	24	104–140	45–60	2.1–2.4	1, 2, 4	Vase-shaped, widest above middle, nuchal constriction and suddenly flaring flattened brim. Bluntly pointed aborally. See *T. nitida*.
T. spiralis KOFOID & CAMPBELL, 1929	20	82–100	37–45	2.2–3	1	Cylindrical with flaring mouth, bluntly pointed aboral end. 10–12 indistinct spiral turns. Oral rim with adherent spicules.
T. strigosa MEUNIER, 1919	33	55–85	29–40	2.4	5, 7, 10	Cylindrical, narrowing aborally to short wide pedicel. See *T. lobiancoi*.
T. subacuta JÖRGENSEN, 1899	14	81–227	42–64 (46–56)	3–7	1, 5, 6, 7	Irregular cylinder with slightly expanded aboral end and aboral point. Variable in form but KOFOID and CAMPBELL separate it from *T. tubulosa* by the aboral point, from *T. tubulosoides* by the aboral expansion. See however *T. lobiancoi*.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
T. tubulosa LEVANDER, 1900	10a, b	125–450	40–49 (42–57)	3.3–7.5	4, 5, 6, 7, 11	Cylindrical with a slightly expanded and rounded aboral end. See *T. lobiancoi*. (a) after LEVANDER (b) after MERKLE.
T. tubulosoides MEUNIER, 1910	12	83–200	34–56	2.3–4.5	1, 5, 8	Cylindrical with well marked spiral structure, ending aborally in a wide and not always well marked point. Possibly in the *T. lobiancoi* group.
T. turbo MEUNIER, 1919	51	54–63	37–38	1.6–1.7	5, 6, 7, 10	Small, rounded with a bluntly pointed aboral end. Widest in middle narrowing to oral end which may have short cylindrical section. Relatively wider than *T. nucula* and *T. parva*.
T. undella MEUNIER, 1910	22	75–94	20–38 (42)	2.6	1, 10, 11	Vase shaped, slightly expanded in lower $^2/_3$ widening slightly to mouth.
T. urnula MEUNIER, 1910	48	54–60	37–43	1.5	1	Small and oval, bluntly rounded aborally, nuchal constriction below a slightly flaring mouth. Smoother oral rim than *T. fimbriata*.
T. vasculum MEUNIER, 1919	50	73–100	40–51 (64)	1.8	7, 10, 11	Lower half a blunt cone, narrowing above to a more or less cylindrical collar about 0.28 total length. More nuchal constriction than in *T. angusta*. Less pointed aborally than *T. rapa*.
T. ventricosoides MEUNIER, 1910	56	64–105	43–75 (59–83)	1.3–1.6	1, 12	Widest in middle narrowing slightly towards mouth, aboral end a blunt triangle. Very similar to *Stenosemella ventricosa* with which it has often been confused, but it lacks the hyaline collar.

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The illustrations are copied from a number of publications, which I am glad to acknowledge in the following list.

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6, 9, 11, 12, 13, 14, 17, 18, 19, 21, 24, 29. X: 2, 5, 6, 8, 9, 11, 14, 16, 17. XI: 4, 5, 6, 7, 9, 12, 15, 16, 19, 20. XII: 2, 4, 7, 8, 15, 16, 17, 19, 25, 28, 29.

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CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 118

ORDER: TINTINNIDA

Family: Codonellidae (2)

Genera:
Codonella, Codonaria

Family: Cyttarocylididae

Genus: Cyttarocylis

(By S. M. MARSHALL)

1969

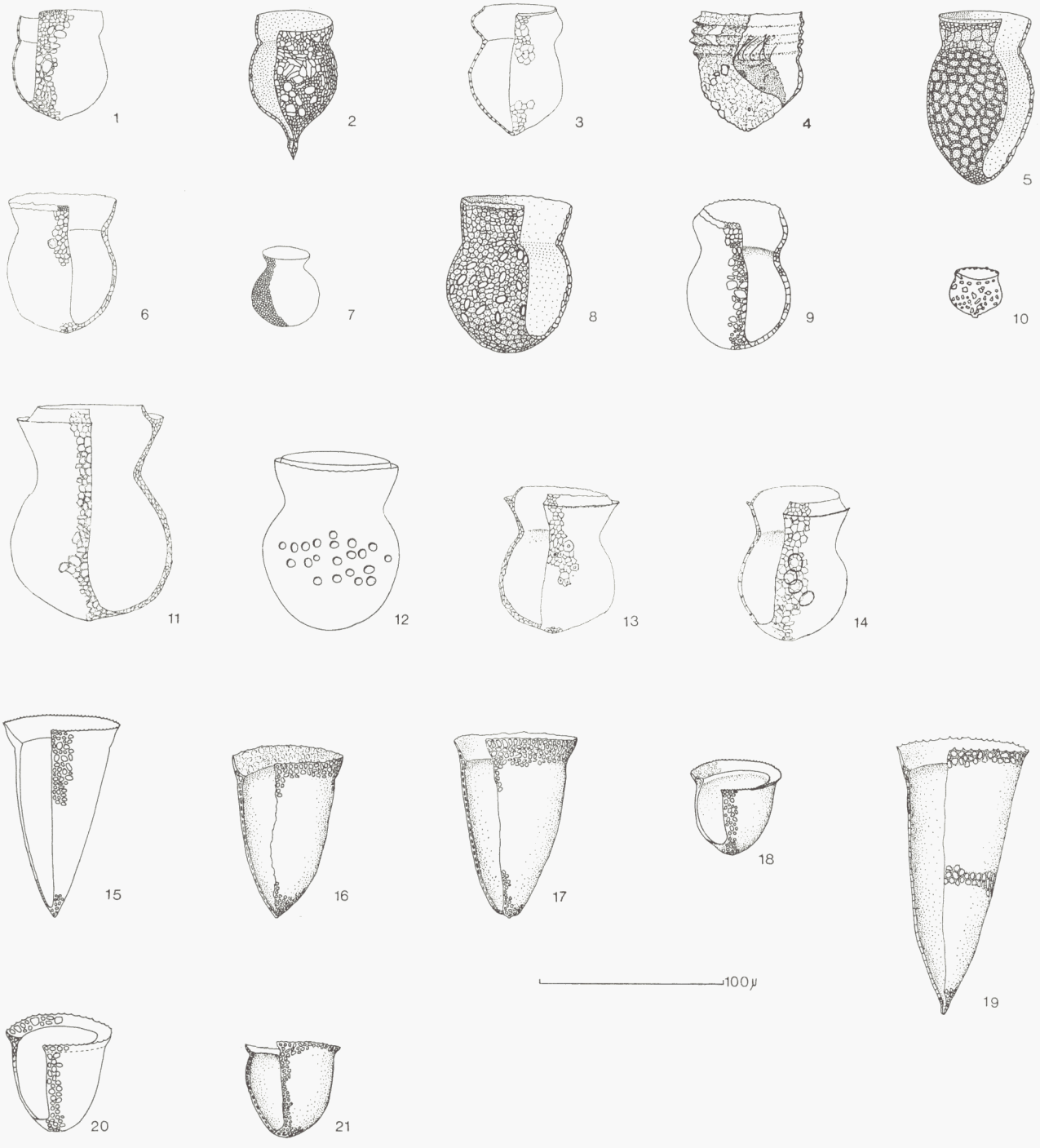

Plate III.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Genus *Codonella* HAECKEL, 1873	Plate III					Short wide lorica divided by constriction into rounded bowl and upper collar, often with inner ledge corresponding to outer constriction. Sometimes a border on rim of collar. Collar never longer than bowl, never hyaline, annulate or spiralled (except in *Codonella cratera*) Fenestrae, if present, are scattered irregularly or round middle of bowl. Wall with few or no agglomerated particles but often with coccoliths. Wall with two layers, with coarse secondary reticulation and fine primary alveoli. Distinguished from *Tintinnopsis* by structure and covering of wall and by more marked separation of collar and bowl. Characters varying within the genus are presence or absence of fenestrae; of oral border; of denticulation on collar and oral border; shape of aboral end.
C. acerca JÖRGENSEN, 1924	1	60–74	31–46 (46–54)	1.4–2.0	11	Collar nearly $^1/_4$ total length; inner shelf almost absent, aboral end rounded with a minute point.
C. amphorella BIEDERMANN, 1893	2	77–100	39–49 (46–59)	1.8–2.2	7, 13, 14	Collar $^1/_7$–$^1/_5$ total length, slight inner shelf, aboral end with short pedicel walled off from bowl.
C. apicata KOFOID & CAMPBELL, 1929	3	52–94	30–53 (41–72)	1.4–1.8	13	Collar bulging then narrowing to mouth with oral border. Little marked oral shelf. Aboral end rounded or faintly pointed. Fenestrae may be present.
C. cratera (LEIDY, 1877)	4	56–85	28–46 (36–56)	1.2–2.1	5	Fresh or brackish water sp. Collar usually markedly annulate and sometimes more than half total length. Aboral end rounded to slightly pointed.
C. elongata KOFOID & CAMPBELL, 1929	5	85–117	42–78 (42–60)	1.6–2.0	10, 11, 12, 13	Collar about $^1/_5$–$^1/_4$ total length, flaring with hyaline border, little inner shelf. Bowl oval, clearly reticulate. Fenestrae may be present. Longer and slenderer than *C. galea*.
C. galea HAECKEL, 1873	6	54–120	40–76 (43–74)	1.3–1.8	11, 13	Collar about $^1/_4$ total length, flaring, with hyaline border on oral rim, slight inner ledge, aboral end rounded sometimes with minute point.
C. lagenula (CLAPARÈDE & LACHMANN, 1858)	7	39	30 (38)	1.3	4, 10	A doubtful species. Flaring collar and globular reticulated bowl, sometimes covered with coccoliths. See *Codonellopsis contracta*.
C. nationalis BRANDT, 1906	8	73–117	42–80 (44–66)	1.4–1.7	11, 13	Collar cylindrical or slightly flaring with hyaline border. Bowl almost globular.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
C. perforata ENTZ, 1884	9	75	38 (54)	1.8–2.2	11, 13	Collar bulging or angled then narrowing to oral rim with denticulate hyaline border. Deep nuchal constriction. Bowl almost globular sometimes pointed.
C. relicta MINKIEWITSCH, 1905	10	70	60	1.2	5, 6	Almost globular with very short stumpy pedicel. A fresh and brackish-water form.
Genus *Codonaria* KOFOID & CAMPBELL, 1939						Like *Codonella* except for presence of an inner collar or suboral cone, set inside and above main collar and often edged by hyaline border. Nuchal constriction more marked.
C. cistellula (FOL, 1884)	11	90–125	45–63 (70–87)	1.5–2.1	11	Large, with collars together about $^1/_3$ total length, outer flaring, inner narrowing to a hyaline border. Bowl widest in middle aboral end widely rounded or pointed.
C. lata (KOFOID & CAMPBELL, 1929)	12	78–90	47–58 (57–71)	1.6–1.7	11	Collars about $^1/_3$ total length, outer flaring, inner narrowing, with denticulate border. Bowl globose or flattened aborally. Fenestrae sometimes present equatorially.
C. mucronata (KOFOID & CAMPBELL, 1929)	13	75–108	44–63 (54–84)	1.6–2.0	13	Collars about $^1/_3$ total length, outer flaring, inner narrowing without oral border. Bowl widest in lower half, rather flattened aborally with small point.
C. oceanica (BRANDT, 1906)	14	70–95	44–57 (59–69)	1.7–1.9	10, 11, 12, 13	Collars about $^1/_3$ total length, outer flaring, inner narrowing to mouth which may or may not have an oral border. Bowl widest at middle, aboral end almost hemispherical.
Family CYTTAROCYLIDIDAE KOFOID & CAMPBELL, 1929						The position of this family is rather isolated and it is more usually put immediately after the Coxliellidae. Cone or cup shaped lorica with well marked flaring collar set off by nuchal constriction extending inwards as suboral shelf. Never with spiral lamina. Wall trilaminate, coarse meshwork between laminae, mesh with thick outlines enclosing primary alveoli. Mainly pelagic and warm water. Distinguished from *Codonella* by structure of wall.
Genus *Cyttarocylis* (FOL, 1881)						Large, conical or cup shaped, oral margin with or without denticulation; collar flaring as short inverted truncate cone; aboral end rounded, pointed, or blunt, sometimes with minute canal opening to exterior. Wall structure as above.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
C. acutiformis KOFOID & CAMPBELL, 1929	15	200–326	110–131	1.5–2.5	13	Long, conical, with slightly convex sides, pointed aboral end open by minute canal. Oral rim denticulate. Flaring collar and marked nuchal shelf. Reticulation in wall smaller in collar and aborally.
C. brandti KOFOID & CAMPBELL, 1929	18	89–122	86–100	0.9–1.2	11	Bowl-shaped with widely flaring collar and baggy aboral end. Nuchal shelf sometimes a thin upturned ridge, making a gutter between it and denticulate oral rim. Wall thickest near shelf. Reticulations largest below collar.
C. cassis (HAECKEL, 1873)	16	90–215	78–112	1.2–2.2	11, 13	Conical, with sides of bowl slightly convex, aboral end pointed, sometimes with terminal pimple open or closed. Collar slightly to widely flaring, oral rim ragged and denticulate. Reticulation larger near oral than aboral end.
C. conica (BRANDT, 1906)	17	170–210	120–143	1.3–2.0	13	Conical with slightly flaring collar. Oral rim uneven. Aboral end flattened with terminal pimple. Reticulations decrease in size aborally.
C. eucecryphalus (HAECKEL, 1887)	20	111–140	115–140	0.8–1.1	13	Small, cup shaped, low collar slightly or widely flaring, oral rim denticulate, well marked nuchal shelf. Aboral end rounded or (usually) flattened. Reticulations largest in collar, smallest aborally.
C. longa KOFOID & CAMPBELL, 1929	21	84–120	99–132	0.8–1.1	11, 12, 13	Small, cup shaped, low widely flaring collar oral rim irregular and denticulate. Aboral end rounded or obtusely pointed. Well marked nuchal shelf. Reticulations decrease in size aborally.
C. magna (BRANDT, 1906)	19	170–400	119–149	1.5–3.2	11, 13	Tall, conical, narrowing aborally to short pedicel usually open. Collar scarcely flaring, nuchal shelf projects little, oral rim denticulate, size of reticulation much the same all over.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables for distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 119

ORDER: TINTINNIDA

Family: Codonellopsidae

Genera:
Stenosemella, Codonellopsis

Family: Dictyocystidae

Genera:
Dictyocysta, Luminella

(By S. M. MARSHALL)

1969

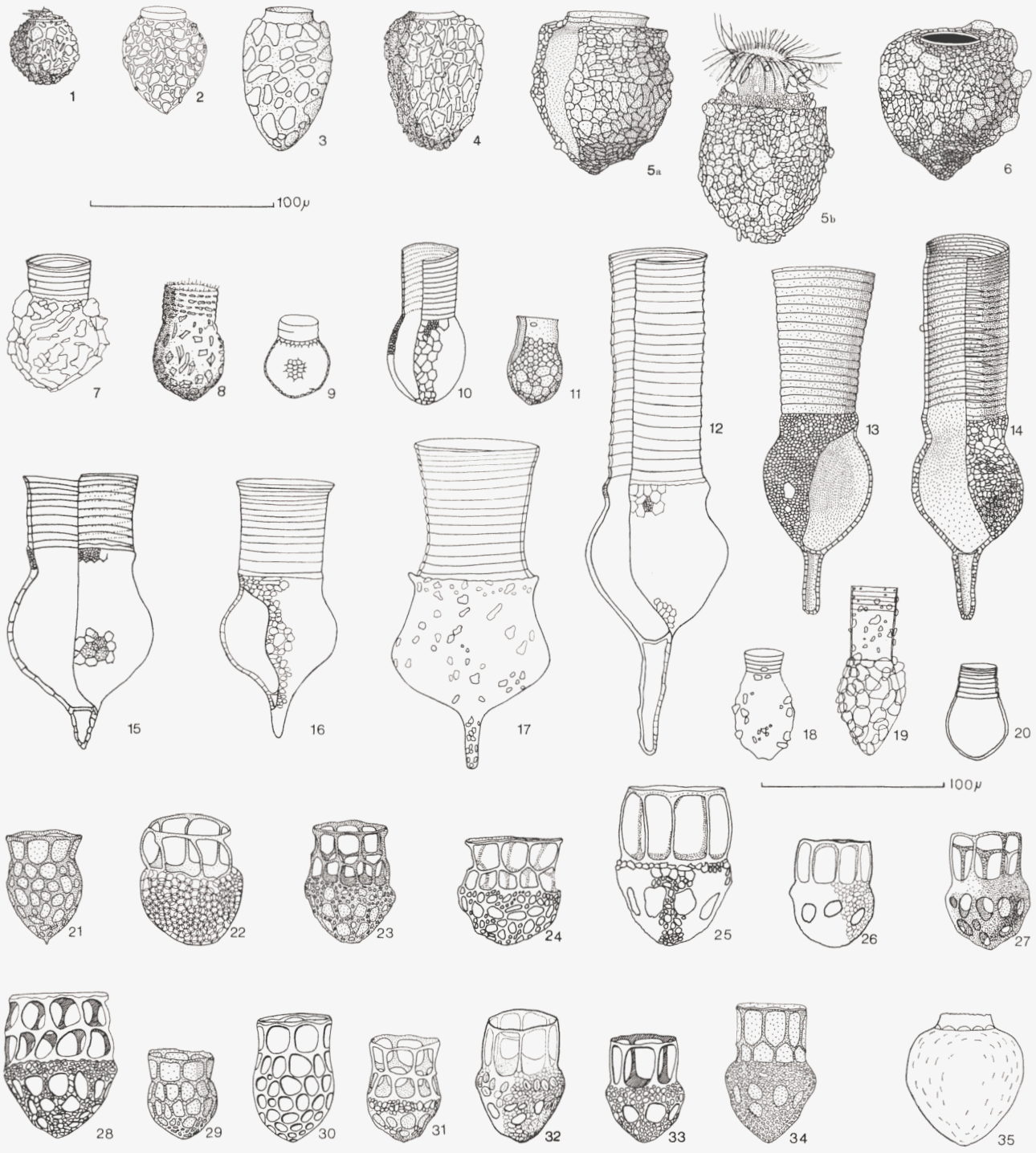
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Plate IV.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family CODONELLOPSIDAE KOFOID & CAMPBELL, 1929						Divided into rounded bowl and hyaline collar, collar with spiral or annular structure. Oral edge smooth or, rarely, toothed. Bowl short, rounded or pointed or with pedicel. Aboral end closed except in *Laackmanniella* (Antarctic genus).
Sub-family Stenosemellinae CAMPBELL & MOORE, 1954						Wall in bowl with coarse secondary and on top of that, tertiary structure. Wall of collar with primary structure only, without fenestrae.
Genus *Stenosemella* JÖRGENSEN, 1924	Plate IV					Short, wide, mouth always narrower than bowl which never has spiral structure. Collar low, sometimes with 1 or 2 spiral turns, hyaline and usually without particles. No pedicel. Wall occasionally a coarse reticulum, usually densely covered with agglomerated particles, sometimes forming a wide shoulder below collar. Shape of individual variable. Collar may be missing but not in living specimens.
S. avellana (MEUNIER, 1919)	1	38–43	17–18 (33–34)	2.3	7, 10	Small, oval, with greatest width of bowl at or below middle. Low collar.
S. nivalis (MEUNIER, 1910)	2	32–58	16–21 (20–34)	1.5–3.4 (usually 1.8–1.9)	1, 4, 7, 10, 11, 12, 13, 14	Small bowl, widest in top half, low collar. Bowl with polygonal reticulation, also encrusting particles.
S. oliva (MEUNIER, 1910)	3	30–54	18–25 (28–30)	1.7–3	1, 10, 13	Bowl a long oval with upstanding collar nearly $^1/_4$ oral diameter in height. Widest near mouth or about middle. HOFKER thinks *S. avellana* and *S. oliva* are synonyms but KOFOID & CAMPBELL do not agree.
S. producta (MEUNIER, 1919)	4	77	27 (52–53)	2.9	7, 10	Bowl a long oval with greatest diameter just below collar. Collar narrows to mouth. In this and in greater length it differs from *S. oliva*.
S. steini (JÖRGENSEN, 1912)	5 a, b	50–95	30–59 (45–80)	1.6–1.9	5, 6	Bowl, bluntly pointed aborally, is widest in the middle and towards the mouth has a constriction and a slight flare just below collar. Well marked gutter between edge of bowl and upright, slightly flaring collar which may have one or two spiral turns (5 a). In one of BRANDT's figures (5 b) collar is not hyaline but covered with particles like the bowl. Larger than the first 3 spp. and wider than *S. producta*.
S. ventricosa (CLAPARÈDE and LACHMANN, 1858)	6	60–110	35–39 (62–80)	2.1–2.4 (3.0)	1, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13	Rotund bowl, tapering below middle to rounded aboral end. Low hyaline collar set on wide shoulders but no gutter. Bowl heavily encrusted with particles. HOFKER unites this sp. and *S. steini*.
Sub-family Codonellopsinae CAMPBELL & MOORE, 1954						Collar much longer than in Stenosemellinae, with well marked spiral fenestrae and pedicel frequent.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Genus *Codonellopsis*, JÖRGENSEN, 1924						Lorica sharply divided into collar and bowl. Collar narrower, often longer than bowl, hyaline, fine primary structure only, always with spiral or annular structure of one to many turns. Bowl round or ovoid with or without aboral point or pedicel, with primary secondary and tertiary structure, sometimes with agglomerated particles or coccoliths. Fenestrae may be present in collar or bowl. Pedicel hollow cut off from the cavity of the bowl by a cross wall. Mainly a warm water genus.
C. americana KOFOID & CAMPBELL, 1929	7	76–112	35–52 (48–54)	2.2–3.4	13	Collar shorter or longer than bowl, with fenestrae. Bowl round or ovoid, widest at or below middle, thickly encrusted.
C. bulbulus (MEUNIER, 1919)	8	52–64	30 (38–40)	1.7–2.1	10	Collar ill-defined, shorter than bowl. Bowl round to ovoid with rounded or bluntly pointed aboral end. A brackish water species.
C. contracta KOFOID & CAMPBELL, 1929	9	37–49	16–21 (30–31)	1.6–2.8	4, 10, 12, 13	Small, collar shorter than bowl with 4-12 spiral turns, widening towards bowl. Bowl round or ovoid. Secondary reticulations sometimes covered with coccoliths. Variable in form.
C. ecaudata (BRANDT, 1906)	10	95–110	35–47 (47–55)	2.8–3.1	7, 8	Collar slightly longer than bowl, cylindrical with 11-13 spiral turns and sometimes 1 or 2 fenestrae. Bowl ovate, blunt aborally. thick walled, sometimes with fenestrae.
C. inornata (BRANDT, 1906)	11	47–49	21 (27–28)	2.2–2.4	2, 14	Collar hyaline, no visible spiral structure, merges with ovoid bowl. Bowl with secondary reticulations.
C. longa KOFOID & CAMPBELL, 1929	12	235–294	55–62 (73–80)	4.3–5.1	13	Collar slightly flaring orally, longer than bowl with many spiral turns. Bowl with neck and slight contraction below collar, then pear-shaped narrowing below middle to stout pedicel, as long or longer than oral diameter. Secondary and tertiary structure well marked in bowl. Fenestrae and coccoliths may be present.
C. lusitanica JÖRGENSEN, 1924	19	94	23 (34)	4.1	11	Collar a little longer than bowl with a few spiral turns at oral end. Bowl narrow, bluntly pointed aborally. Particles scattered thickly on bowl, thinly on collar.
C. minor (BRANDT, 1906)	15	122–207	53–59 (67–80)	2.4–2.8	13	Collar a little shorter or longer than bowl, cylindrical or widening towards mouth, spiral visible throughout. Bowl with a short neck, slight nuchal constriction, then rounded, ending aborally in short, blunt, pedicel. Bowl reticulate, no particles.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
C. orthoceros (HAECKEL, 1873)	13	167–250	54–62 (62–75)	2.9–3.3	5, 11, 13, 14, 15	Collar varies much in length, widens to mouth. Bowl ovoid or globular with neck below collar and stout pedicel of variable length. Bowl often covered with coccoliths.
C. ovata JÖRGENSEN, 1924	18	46–68	15 (35)	3.0	4	Small ovoid. Collar short with few spiral turns. Bowl widest below middle, covered with particles.
C. parva KOFOID & CAMPBELL, 1929	16	145–187	56–76 (74–88)	2.7–3.1	13	Collar rather shorter than bowl, mouth slightly everted. Bowl with short neck below collar, globose, tapering below to short stout pedicel.
C. pusilla (CLEVE, 1900)	20	48–59	15–19 (33–34)	2.6–3.2	1, 7, 10, 12, 13, 14	Small. Collar shorter than bowl with 5-13 spiral turns. Bowl ovoid, rounded or pointed aborally with regular hexagonal reticulation. Occasional fenestrae.
C. silvae n. sp. (SILVA, 1950)	17	207	71 (85)	2.8	11	Collar about $^1/_2$ total length, narrowed towards lower end. Bowl almost pentagonal, very short neck and nuchal constriction, greatest width aborally, then narrowing sharply to short pedicel. Described from one specimen (SILVA, 1950). Resembles *C.gaussi* except for the latter's, longer collar and lack of nuchal constriction.
C. tessellata (BRANDT, 1906)	14	215–315	55–75 (63–77)	3.9–4.5	15	Collar long, sometimes narrowest in middle, mouth often slightly everted. Bowl ovoid with or without nuchal constriction. Short neck and stout pedicel. Collar longer than in *C. orthoceros*.
Family DICTYOCYSTIDAE HAECKEL, 1873						This family is sometimes considered to be close to the Tintinnidae. Lorica divided into collar and bowl. Bowl cup-shaped or ovoid, rounded or pointed aborally. Collar cylindrical, usually with one or more sets of vertical beams enclosing oval or squarish windows, open, or closed by hyaline pane. Distinction between open and closed windows not specific. Collar may have small semi-circular windows (*Luminella*). Collar hyaline, bowl reticulated, with or without fenestrae, often with coccoliths.
Genus *Dictyocysta* EHRENBERG, 1854						Collar cylindrical with beams surrounding large windows in one to several rows. Bowl cup-shaped or conical, aboral end rounded or pointed. Wall with primary, secondary and tertiary reticulation, sometimes with included coccoliths, often with fenestrae.
D. dilatata BRANDT, 1906	21	58–70	41–50	1.4–1.7	10, 11, 12, 13, 14	Collar slightly flaring about $^1/_4$ total length with 8 squarish windows. Bowl a truncated oval, ending aborally in small point, covered with fenestrae in 7 rows, decreasing in size aborally.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
D. duplex BRANDT, 1906	22	53–75	32–42	1.6–2.3	10, 11, 13, 15	Collar $^1/_3$-$^1/_2$ total length, 7-9 tall rectangular windows, beams sometimes bowed outwards. Bowl short, almost globose, contracting to collar. Wall with peculiar duplex structure of overlapping rings, probably caused by coccoliths. Fenestrae sometimes present, variable in pattern.
D. elegans EHRENBERG, 1854	23	63–72	40–50	1.5–1.8	3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14	Collar tall, more than $^1/_2$ total length, with 2 rows of windows, upper 8 larger than lower 10, squarish to pentagonal. Bowl short, contracting to collar, rounded aborally with 3 rings of fenestrae.
D. fundlandica EHRENBERG, 1854	24	56–60	40–53	1.1–1.4	14	Collar as long as bowl, with two rows of windows, 7 squarish above and 9 polygonal below. Bowl hemispherical without shoulder, with one row of fenestrae about middle and irregular rows above and below.
D. grandis BRANDT, 1906	25	88–95	53–58	1.6–1.7	8	Collar as long or longer than bowl, with 8 windows longer than broad, sometimes with cross beams. Bowl wider than long with 1, sometimes 2 rows of fenestrae round middle. Surface reticulated.
D. lata KOFOID & CAMPBELL, 1929	26	57–73	38–54	1.2–1.6	11	Collar less than $^1/_2$ total length with 8 tall rectangular windows. Vertical beams and oral rim delicate and hyaline. Bowl more or less hemispherical with bulge below collar, 1 ring of 6-9 large fenestrae and a few smaller scattered in reticulation of bowl.
D. lepida EHRENBERG, 1854	27	52–71	39–45	1.3–1.8	7, 8, 11, 12, 14	Collar less than $^1/_2$ total length, with 5-8 tall rectangular windows. Oral margin undulating. Bowl short, almost globose, bluntly pointed aborally. Equatorial ring of large fenestrae and one or more rings of small below. Surface of bowl reticulated.
D. magna KOFOID & CAMPBELL, 1929	28	75–95	47–88	1.4–1.7	13, 15	Collar less than $^1/_2$ total length, contracting slightly to mouth which has a distinct hyaline rim and 2 rows of windows, upper 7-8 rounded quadrangular, lower 8-9 similar but smaller. Bowl a wide convex cone, bluntly pointed aborally. Wall has 12 large equatorial fenestrae and 2 or more rows of smaller below.
D. minor JÖRGENSEN, 1924	29	45–53	30–35	1.4–1.7	7, 11, 12, 13	Collar slightly flaring with 6-8 squarish windows, often broader than high. Oral margin undulating often with short spines. Bowl rather globose, bluntly pointed aborally. Fenestrae covering whole bowl, large and fairly regular in upper rows, small and irregular aborally.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
D. mitra HAECKEL, 1873	30	62–68	36–39	1.3–2.0	8, 12, 13, 15	Collar cylindrical or slightly flaring with 1 row of 6-7 squarish rounded windows. Oral margin has a hyaline rim. Little distinction between collar and bowl. Bowl a truncated ovoid, pointed aborally, wholly covered by rings of fenestrae, large and most regular in ring next collar, decreasing in size aborally.
D. mülleri IMHOF, 1886	31	52–61	34–40	1.5–1.7	11, 13	Collar longer than bowl with slight constriction between 2 rows of windows, 6 squarish in upper and 8-10 smaller more rounded in lower row. Bowl more or less hemispherical, bluntly pointed aborally. One sub-equatorial ring of 9-12 large fenestrae, sometimes 1 or more rings of smaller above this, and a row or scattered fenestrae aborally. Bowl reticulated.
D. nidulus KOFOID & CAMPBELL, 1929	32	66–75	39–45	1.6–1.7	10, 11, 12, 15	Collar cylindrical, less than $^1/_2$ total length, one row of tall rectangular windows, sometimes with cross bar. Bowl short, conical, contracting to collar, bluntly pointed aborally, with irregular ring of coccoliths about middle, zone of 10-12 fenestrae below.
D. reticulata KOFOID & CAMPBELL, 1929	33	55–80	36–46	1.3–1.6	10, 11, 12, 13	Collar cylindrical nearly $^1/_2$ total length, 1 row 6-7 tall rectangular windows. Bowl convex-conical, contracting to collar, bluntly pointed aborally. One sub-equatorial ring 6-7 large fenestrae, otherwise bowl reticulated often with included coccoliths.
D. speciosa KOFOID & CAMPBELL, 1929	34	66–80	41–51	1.3–1.8	3, 5, 7, 10, 11, 12, 13, 14	Collar cylindrical, about $^1/_2$ total length, with 2 rows of windows, 8 more or less rectangular in upper, 9 pentagonal or irregular in lower row. Bowl contracting to collar, otherwise convex-conical, bluntly pointed aborally, with 1 zone of 8 large fenestrae about middle and another of smaller below. Bowl very uniformly reticulated.
Genus *Luminella* KOFOID & CAMPBELL, 1939						Collar very short, hyaline, with no beams, but with small semi-circular windows at base. Bowl globose or cup-shaped, contracting to collar, bluntly pointed or hemispherical aborally. Surface covered with particles.
L. punctata (WAILES, 1925)	35	60–75	29–32 (55–61)	2.6	11	Collar low, hyaline, with 12 semi-circular windows at base. Bowl globose strongly contracting to collar and bluntly pointed aborally. Bowl with fine concentric striae.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables for distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 120

ORDER: TINTINNIDA
Family: Coxliellidae
Genera: Coxliella, Climacocylis, Metacylis, Helicostomella

(By S. M. MARSHALL)

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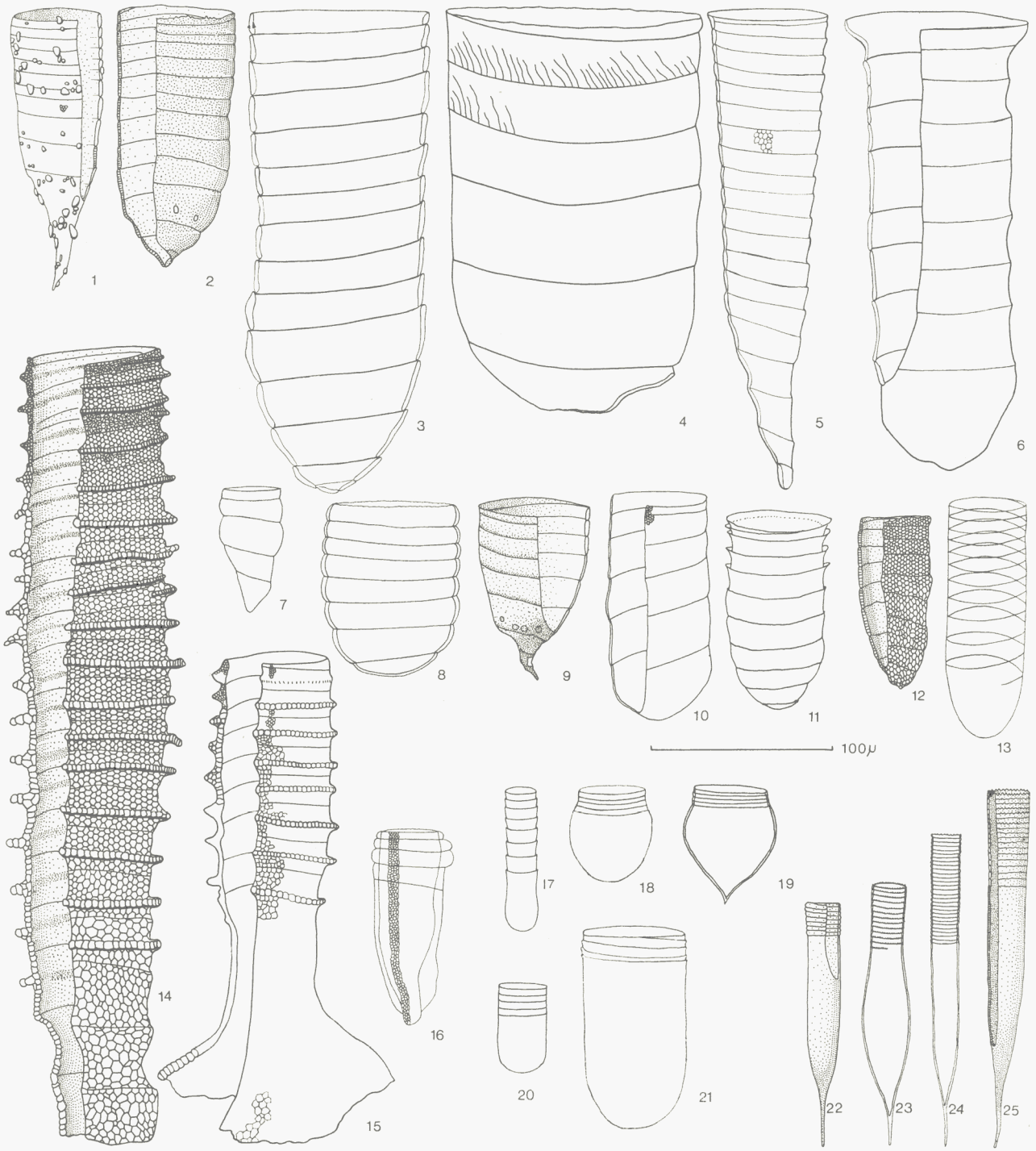

Plate V.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family COXLIELLIDAE KOFOID & CAMPBELL,1929						Spirally coiled band forms all or part of lorica. Oral edge smooth or irregular, never regularly denticulate. No collar except in *Metacylis*. Aboral end open or closed. Wall trilaminate with well marked alveoli (except in *C. ampla*) No agglomerated particles except in *C. helix*.
Sub-family Coxliellinae KOFOID & CAMPBELL, 1939						Spiral extending to aboral end, always when this is closed, sometimes when it is open.
Genus *Coxliella* BRANDT, 1907	Plate V					Spiral band forms whole of lorica which is more or less cylindrical or cup-shaped. No collar. Aboral end closed. Spiral band widens gradually from mouth to aboral end. Trilaminate wall has intermediate layer of coarse or fine alveoli.
C. ampla (JÖRGENSEN, 1899)	8	(36) 81–197	62–97	1.4–2.0	1, 4, 6, 7, 10, 11, 13	Short, wide, hemispherical aboral end. Two small specimens (36 μ) near Azores had oral edge of 2 top turns of spiral band everted. Wall structure indistinct.
C. annulata (DADAY, 1886)	3	269–332	100–128 (120–129)	2.7–3.0	11	Tubular but very slightly wider towards aboral end, bluntly pointed aborally. Spiral turns slightly overlapping. Wall structure indistinct.
C. calyptra (CLEVE, 1899)	7	70	33	2.1	1, 2, 12	A doubtful form seen only in Arctic. Irregular cone with 4 or 5 spiral turns. Possibly a radiolarian.
C. cymatiocoides KOFOID & CAMPBELL, 1929	4	195–220	130–147	1.5	11	Wide tube, oral rim irregular, 6-7 spiral turns. Wall with close-set striae from lower edge of spiral band extending leftwards over half its width.
C. fasciata (KOFOID, 1905)	5	260–312	68–86	3.8–5	13	Long cone, narrowing more abruptly in lower third to blunt point. Oral rim smooth sometimes everted. Spiral turns slightly overlapping. Wall structure irregularly polygonal.
C. frigida (LAACKMANN, 1907)	6	245–290	90–105	2.4–3.4	11	Long, cylindrical, top spiral turn flaring to mouth with irregular hemispherical aboral end.
C. helix (CLAPARÈDE & LACHMANN, 1858)	1	115–400	42–58	2.1–8.1 (usually 3.4)	4, 5, 6, 7, 12, 14	More or less cylindrical or acutely angled cone, lower third narrowing gradually to stout irregular pedicel, sometimes widening a little above pedicel. Wall has scattered agglomerated particles, thicker near aboral end. Species very like *Tintinnopsis lindeni* but structure is finer with several layers of alveoli between inner and outer laminae of wall.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
C. intermedia (LAACKMANN, 1907)	10	120–167	58–62	2.1–2.7	1	Tube shaped with 6-8 spiral turns extending to rounded aboral end and getting wider aborally.
C. laciniosa (BRANDT, 1907)	9	75–140	50–91	1.4–2.3	11, 13, 15	Short cup-shaped, ending aborally in point or short pedicel. Spiral band varies much in width between individuals. Fenestrae often present especially towards aboral end.
C. longa (BRANDT, 1906)	2	130–144	62–70	2.1	13	Cylindrical, narrowing aborally to blunt point. Oral rim irregular. Fenestrae may be present.
C. meunieri KOFOID & CAMPBELL, 1929	11	103	60	1.7	1	Tube shaped with about 10 spiral turns, the oral edge everted in first three or four. Spiral continues to rounded aboral end.
C. pseudannulata (JÖRGENSEN, 1899)	12	97–153	40–60	2.5–3.4	1, 2, 3, 4, 7, 11, 12, 14, 15	Narrow cylinder in top half, blunt-ended cone in lower half, oral rim irregular. About 9-10 spiral turns. One layer coarse alveoli between laminae of wall.
C. tubularis (MEUNIER, 1910)	13	125	43	3.0	1	Tubular, with regular spiral band reaching almost to rounded aboral end. Not enough detail in drawing to be sure that it is valid species.
Genus *Climacocylis* JÖRGENSEN, 1924	Plate V					Very delicate, flaccid, translucent, tubular lorica. Spiral band extending over at least the upper third, sometimes over whole. Spiral shelf usually projecting from middle of band. Aboral end usually open often wide and irregular. Wall trilaminate, middle layer of large alveoli. Mainly tropical.
C. elongata KOFOID & CAMPBELL, 1929	14	355–460	50–69	6.3–6.8	13	Cylindrical, tapering a little towards open aboral end, but not expanded. Spiral band with 17-21 turns, has well developed shelf disappearing in last 3 turns. Shelf may bifurcate or be interrupted. Alveoli in wall increase in size from oral to aboral end. Lorica very difficult to see because of its transparency.
C. scalaria (BRANDT, 1906)	15	246–449	46–63	6.9–10	13	Form very variable especially at aboral end. Spiral band, about 3-13 turns, occupies anterior part and bears spiral shelf, lowest shelf often widest. Aboral end usually open, flaring into wide skirt or irregular flaps which may even close it. Alveoli in wall increasing in size from oral to aboral end. Transparency as in *C. elongata*.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
C. scalaroides KOFOID & CAMPBELL, 1929	16	90–271	21–42	2.6–6	10, 15	Short, finger shaped, tapering to aboral end. Spiral band has 3-17 turns and shelf is reduced to a bulge in top 2 or 3. Aboral end ragged or closed by local thickening. Wall very thick at aboral end, size of alveoli much the same throughout. Transparency as in previous 2 species.
Sub-family Metacylidinae KOFOID & CAMPBELL, 1929						Spiral (or annuli) limited to anterior part. Aboral end closed, sometimes with point or pedicel.
Genus *Metacylis* JÖRGENSEN, 1924						Short, wide, tubular or ovoid, divided into collar and bowl. Oral rim smooth and simple. Some doubt whether collar is spiral or annular in form but in most spp. it appears annular. Aboral end rounded, pointed, or with short pedicel. Wall trilaminate with indistinct structure, simple alveoli, or hyaline. Usually pelagic.
M. annulata (MEUNIER, 1910)	17	55	11	5.0	1	Tubular with rounded aboral end. About 7 annuli in collar, their upper edges slightly overlapping the one above.
M. corbula KOFOID & CAMPBELL, 1929	18	50	36	1.4–1.5	11	Short, cup-shaped, collar narrowing slightly to cylinder below mouth. Rounded aborally. 4 annuli. Wall hyaline.
M. jörgensenii (CLEVE, 1902)	19	50–61	44–50	1.3–1.9	4, 6, 7, 10, 11	Short, ovoid, with slightly, or sharply, pointed aboral end. Collar short with 2-5 annuli, cylindrical or slightly flaring, narrower than bowl. Wall hyaline.
M. lucasensis KOFOID & CAMPBELL, 1929	20	47	27	1.8	13	Small, tubular, with hemispherical aboral end. Collar same width as bowl, with 4 annuli. Wall thin, hyaline.
M. mereschkowskii KOFOID & CAMPBELL, 1929		50–53	45–48	1.1	11	Small, bowl-shaped. Low-erect collar with two annuli.
M. vitreoides KOFOID & CAMPBELL, 1929	21	123–200	57–66	2.0–3.5	1, 2	Wide, tubular with hemispherical aboral end, with or without low point. Collar same width as bowl with 5-14 spiral turns slightly overlapping.
Genus *Helicostomella* JÖRGENSEN, 1924						Lorica cylindrical, elongated and narrow. Upper part formed of 3-60 spiral turns. Mouth and upper edge of band sometimes denticulate. Aboral end narrowing to a pedicel, closed. Wall thin, trilaminate with fine uniform primary structure. Mainly neritic. MARGALEF & DURAN have studied large populations off

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
						Vigo and find great variability of form and transitions between *H. edentata*, *H. kiliensis*, *H. longa* and *H. subulata* which they would unite as *H. subulata*. Their figures also cover forms like *H. annura* (SILVA, 1952) which is therefore omitted. Denticulation of oral rim variable and not a good systematic character.
H. edentata (FAURÉ-FREMIET, 1908)	22	140–213	19–24	6.9–10.9	5, 7, 10, 11	Narrow, cylindrical, tapering to slender pedicel, 5–12 spiral turns in upper part. Oral rim smooth. Differs from *H. subulata* in absence of teeth, fewer spiral turns and less taper of bowl.
H. fusiformis (MEUNIER, 1919)	23	124–180	20–29	5.2–7	1, 7, 10	Cylindrical in top (spiral) part, swelling below to about 1.3 oral diameter and decreasing to slender pedicel. Shorter, and with maximum width nearer middle of bowl, than *H. subulata*.
H. kiliensis (LAACKMANN, 1906)	25	97–240	15–19	6.2–15.2	4, 5, 7, 11	Long narrow cylinder contracting to slender pedicel. Oral rim sinuous or denticulate. 5–32 spiral turns of equal width below mouth. Aboral end contracts more rapidly than in *H. subulata* or *H. edentata*.
H. subulata (EHRENBERG, 1833)	24	200–516	21–26	8–16	1, 3, 4, 5, 6, 7, 8, 10, 11, 14	Long narrow cylinder contracting gradually to slender, often slightly curved, pedicel. 5–30 spiral turns in upper part. Oral rim denticulate and sometimes upper edge of spiral band.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables for distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 121

ORDER: TINTINNIDA

Family: Favellidae

Genera: Poroecus, Cymatocylis, Favella

Family: Ptychocylididae

Genus: Ptychocylis

(By S. M. MARSHALL)

1969

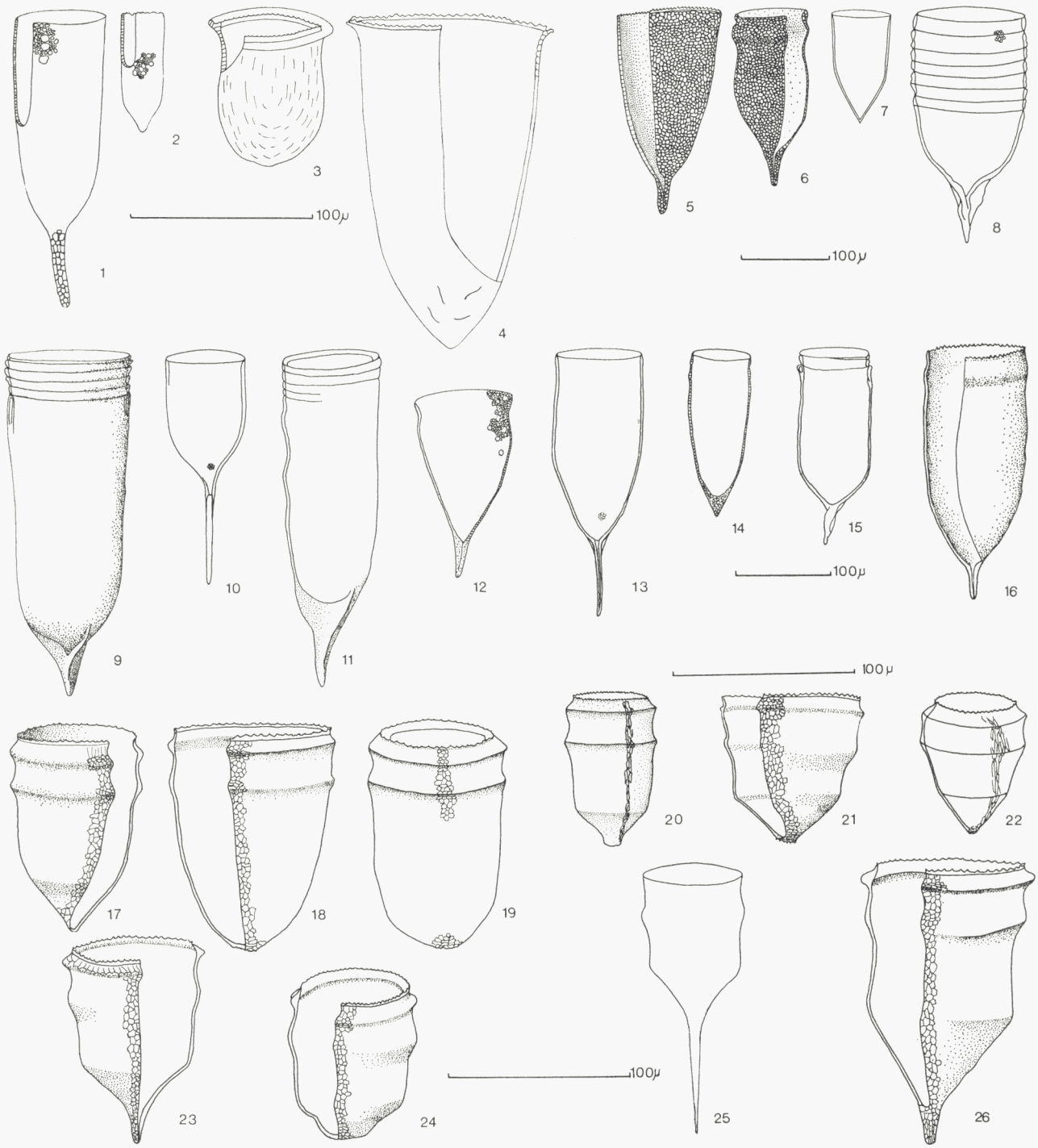
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Plate VI.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family FAVELLIDAE KOFOID & CAMPBELL, 1929						CAMPBELL (1942) raised this to family rank although he subsequently (CAMPBELL and MOORE, 1954) reduced it again. Lorica usually tall, cylindrical with pedicel, sometimes short, bag shaped; spiral structure occasional. Oral end often modified, entire, irregular, channelled, or denticulate. Wall usually trilaminate, intermediate layer alveolar. Coccoliths present in *Poroecus*.
Genus *Poroecus* CLEVE, 1902	Plate VI					Cylindrical with aboral end hemispherical or contracted into long or short pedicel. Mouth undifferentiated, oral rim smooth or irregular, sometimes weakly developed spiral suborally. Coccoliths often present, in intermediate layer according to KOFOID and CAMPBELL, on outside according to JÖRGENSEN.
P. apiculatus (CLEVE, 1900)	1	85–275	33–58	3.2–4.7	12, 13	Cylindrical, sometimes irregularly bulging, contracting gradually to narrow pedicel. Oral rim entire or ragged. Coccoliths present.
P. curtus KOFOID & CAMPBELL, 1929	2	52–70	25	2.0–2.9	12, 13	Short, cylindrical, contracting to blunt point aborally. Oral rim entire or irregularly denticulate. Wall with polygonal mesh usually filled with coccoliths. (Not clear in the figure).
Genus *Cymatocylis* LAACKMANN, 1909						Usually tall, cylindrical, conical, or vase-shaped, with or without pedicel. Mouth differentiated with everted, channelled, or reflexed oral rim, usually with a denticulate border. Wall with inner and outer lamellae and primary alveolar structure between. Outer wall with short striae locally or all over. Mainly a cold water Antarctic form.
C. kerguelensis LAACKMANN, 1909	3	80	56	1.5	3	Short, with rounded bowl. Mouth flaring with gutter between edge and denticulate oral rim. Striae all over bowl.
C. subconica KOFOID & CAMPBELL, 1929	4	180–185	112–115	1.6	11	Cylindrical-conical with bluntly pointed aboral end. Mouth sharply everted, not channelled, oral rim erect, denticulate. Wall striate all over.
Genus *Favella** JÖRGENSEN, 1924						Cylindrical, tall or short, usually with pedicel, sometimes a few spiral turns suborally. Oral rim entire or with a border, sometimes denticulate. Sometimes with wings from base of bowl to pedicel. Wall with inner and outer lamellae, primary and secondary alveoli between.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
F. adriatica (IMHOF, 1886)		170–336	112–128	1.6–2.6	11	Cylindrical, bell-shaped vith pedicel $^1/_4$-$^2/_3$ total length. Wings sometimes visible.
F. arcuata (BRANDT, 1906)	6	160–218	80–144	1.9–2.8	11	More or less cylindrical with slightly expanded bowl and short to medium pedicel. Sometimes thickened and bulging at oral edge, always with a bulge below this. Narrow canal in pedicel sometimes open to exterior.
F. attingata KOFOID & CAMPBELL, 1929	5	222–300	116–150	1.8–2.0	4, 11	Cylindrical-conical, narrowing gradually to a short pedicel, whose canal may open to exterior. Oral rim with denticulate border.
F. azorica (CLEVE, 1900)	7	94–96	59–63	1.5–1.9	13	Short, cylindrical in upper $^2/_3$ then tapering to a point. Oral margin thin smooth. Alveolar structure visible in wall.
F. brevis KOFOID & CAMPBELL, 1929	8	164–310	81–153	2.0–2.1	6, 11	Cylindrical in upper half of bowl, lower part almost hemispherical with short pedicel. Pedicel solid, slightly twisted with wings attaching it to bowl. Spiral lamina present suborally for 4-7 turns.
F. ehrenbergii (CLAPARÈDE & LACHMANN, 1858)	9	145–400 (1045)	54–124	2.4–4.2	4, 5, 6, 7, 8, 10, 11	Long, cylindrical, bowl sometimes slightly expanded below middle, rounded below and joined by wings to a short, blunt, pedicel. Spiral turns sometimes present suborally. Wall thick.
F. fistulicauda JÖRGENSEN, 1924	10	249–309	89	2.9–3.1	11	Cylindrical in upper part narrowing below into a slender pedicel, mostly solid, nearly half total length. Single indistinct annulus suborally.
F. helgolandica (BRANDT, 1906)	11	250–384	74–138	2.1–3.5	4, 7, 8, 10, 11	Cylindrical, narrowing gradually into a short pedicel joined by 4 broad wings to base of bowl. Spiral band suborally.
F. infundibulum KOFOID & CAMPBELL, 1929	12	210	111	1.9	4	Short, conical, with suboral constriction. Ends aborally in short thickwalled pedicel with fine central cavity. Wall with meshwork and numerous fenestrae.
F. markusovszkyi (DADAY, 1887)	13	277–391	94–97	2.9–4.0	7, 11	Cylindrical for half total length, conical in next $^1/_4$ ending aborally in slender pedicel, hollow but cut off by membrane from cavity of bowl. 3 short wings join pedicel to bowl. Occasionally with a suboral spiral.
F. meunieri KOFOID & CAMPBELL, 1929	14	182–188	63–66	2.8–2.9	7, 10	Cylindrical in top half, narrowing gradually to solid sharp point. No spiral structure.
F. panamensis KOFOID & CAMPBELL, 1929	15	136–232	60–100	2.0–2.3 (2.9)	4, 7	Cylindrical for $^3/_4$ total length narrowing abruptly to short pedicel with oblique wings. 1 (usually) to 4 spiral turns suborally, slightly overlapping. Meshwork largest aborally.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
F. serrata (Möbius, 1887)	16	180–348	87–145	1.6–3.5	1, 3, 4, 5, 6, 7, 8, 10, 11, 12, 14	Cylindrical in top $^2/_3$ then convex-conical to end in short narrow pedicel with fine canal extending part or all way. Oral rim hyaline and denticulate, sometimes contracted just below this, usually with suboral annular bulge.
Family PTYCHOCYLIDIDAE Kofoid & Campbell, 1929						Lorica an inverted bell with annular bulges, the first, suboral, bulge usually the most marked, sometimes forming projecting ledge. Aboral end bluntly pointed (usually) or with short or long pedicel. No collar or spiral structure. Oral rim usually denticulate. Lamellae of wall scarcely separate; outer surface covered with meshwork of delicate folds sometimes becoming ridges at aboral end.
Genus *Ptychocylis* Brandt, 1896	Plate VI					As family. A northern, cold-water genus.
P. acuta Brandt, 1896	17	110–145	63–82	1.7–2.1	1, 2, 4, 6, 7, 12, 14	Cylindrical in top $^2/_3$, then contracting to blunt point. Two bulges, one suboral, another below it. Oral rim hyaline, denticulate.
P. arctica Brandt, 1896	18	120–140	75–100	1.4–1.5	1, 2, 4, 6, 7, 12, 14	Wide, convex-conical, slightly flattened aborally. Two bulges, one suboral, another below it. Oral rim hyaline, denticulate.
P. basicurvata Meunier, 1910	19	116	67	1.9–2.0	1, 4, 6, 7, 14	Cylindrical, with hemispherical aboral end. Two bulges, one suboral, the other a little below. Oral rim denticulate.
P. cylindrica Meunier, 1910	20	83	42	2.0	1	Almost cylindrical for $^4/_5$ then contracting to a short blunt, wide pedicel. One suboral bulge, one below it in anterior half. Oral rim denticulate.
P. drygalskii Brandt, 1896	21	65–105 most 80–95	65–100 (most 70–85)	1.0–1.4	1, 2, 4, 6, 7, 14, 15	Short, wide, more or less conical, narrowing abruptly in aboral third to slightly or greatly flattened end. One suboral bulge, one just above middle, and often suggestion of a third at narrowing. Oral rim hyaline, denticulate. Wall thin.
P. glacialis Meunier, 1910	22	78	40	1.9	1	Short, top $^2/_5$ cylindrical, lower part contracting in two stages to a blunt point. Two bulges and suggestion of third at last contraction. Oral rim denticulate. Wall thickest in bulges.
P. minor Jörgensen, 1899	23	90–135	78–90	1.1–1.7	2, 3, 4, 5, 6, 7, 12, 13, 15	Almost cylindrical in upper $^2/_3$, contracting rapidly to short pedicel. Suboral bulge forms projecting shelf, second above middle of lorica. Oral rim hyaline, denticulate.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
P. obtusa BRANDT, 1896	24	83–135	60–90	1.3–1.6	1, 2, 3, 4, 6, 7, 12, 14, 15	Short, cylindrical, with suboral shelf and second bulge above middle. Aboral end contracting to a flattened squarish end of variable size. Oral rim hyaline, denticulate.
P. ostenfeldi KOFOID & CAMPBELL, 1929	25	130–180	40–65	2.8	12	Cylindrical, narrowing abruptly to slender pedicel nearly half total length. One bulge above middle of bowl. Oral rim smooth.
P. urnula (CLAPARÈDE and LACHMANN, 1858)	26	140–190	75–100	1.4–2.8	1, 3, 4, 5, 6, 7, 8, 9, 12, 13, 14	Cylindrical then narrowing to short pedicel. Suboral shelf, bulge above middle and a third at narrowing. Oral rim hyaline, denticulate. Wall thickest in suboral bulge.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables for distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 122

ORDER: TINTINNIDA

Family: Petalotrichidae

Genera: Ascampbelliella, Acanthostomella, Petalotricha

Family: Rhabdonellidae

Genera: Protorhabdonella, Rhabdonella, Rhabdonellopsis

Family: Epiplocylididae

Genera: Epiplocylis, Epiplocyloides, Epicancella

(By S. M. MARSHALL)

1969


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Plate VII.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family PETALOTRICHIDAE Kofoid & Campbell, 1929						Short, tubular or cup-shaped bowl with rounded or pointed end or, rarely, pedicel. Mouth region differentiated with collars, circumoral lip and, in *Petalotricha*, suboral cone. Aboral end closed. Wall trilaminate with intermediate layer hyaline or weakly alveolar.
Sub-family Ascampbelliellinae Corliss, 1964						Very small forms, cup or tube shaped with rounded or pointed aboral end. Circumoral region differentiated into inner collar and outer collar or flaring lip with gutter or slope between. No spiral or annular structure except in *A. armilla*.
Genus *Ascampbelliella* Corliss, 1964	Plate VII					Very small tubular or cup-shaped bowls. Circumoral region always with two rims an inner collar and flaring lip. Outer rim sometimes repeated. No teeth.
A. acuta (Kofoid & Campbell, 1929)	1	39–43	30–33 (40)	1.3	11, 13	Small, cup-shaped, with pointed aboral end. Inner collar erect, lip slopes downwards to scarcely projecting outer rim.
A. armilla (Kofoid & Campbell, 1929)	2	27–35	19–20	1.1–1.8	13	Small, tubular, with rounded aboral end, inner collar low, erect separated by gutter from slightly flaring outer collar. Collar and trough sometimes repeated below. Alveolar structure visible in wall. Surface rugose.
A. obscura (Brandt, 1906)	3	70	42	1.6–1.7	12, 14	Cone-shaped, narrowing more abruptly in aboral $^1/_4$ to a sharp point. Inner collar erect, outer slightly flaring with gutter between. Well marked alveolar structure in wall.
A. urceolata (Ostenfeld, 1899)	4	45–56	40–42	1.1–1.3	2, 11, 12, 13	Small, wide, conical or sack-shaped bowl with aboral point. Inner collar contracts to mouth, outer flaring, gutter between shallow or absent. Wall almost hyaline.
Genus *Acanthostomella* Jörgensen, 1927						Small, cup-shaped or tubular, usually with pointed aboral end. Inner and outer collars separated by a trough, outer denticulate. Well defined alveolar structure between inner and outer laminae of wall.
A. elongata Kofoid & Campbell, 1929	5	70	23	3.0	1	Long, tube shaped, aboral end hemispherical with small point. Inner collar erect, outer with about 25 low teeth.
A. gracilis (Brandt, 1896)	6	45–60	30 (34–35)	1.6–1.7	2, 14	Small, cylindrical, with bluntly pointed aboral end. Inner collar erect, separated by deep groove from flaring denticulate outer collar.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
A. lata KOFOID & CAMPBELL, 1929	7	37–46	30–33	1.3–1.6	11	Cup-shaped, bowl about as wide as long, aboral end a thin pedicel. Collars separated by deep narrow gutter, outer with 20–25 teeth.
A. minutissima KOFOID & CAMPBELL, 1929	9	29–36	22–25	1.3–1.7	11	Cup-shaped with hemispherical or bluntly pointed aboral end. Low inner, slightly flaring outer, collar, outer with 16–30 teeth. Wall with coarse mesh and sometimes with coccoliths.
A. norvegica (DADAY, 1887)	8	36–50	23–25	1.1–2.0	1, 2, 3, 4, 6, 7, 8, 12, 13, 14	Form variable, cup–shaped to rounded. Aboral end rounded or with short solid point. Inner collar low, erect, outer flaring with 20–36 incurved teeth. Wall thin.
A. obtusa KOFOID & CAMPBELL, 1929		26–36	16–24	1.6–1.7	11	Short, cylindrical-conical, narrowing to a short blunt point. Inner collar relatively high, outer with 10–20 stout teeth.
Sub-family Petalotrichinae KOFOID & CAMPBELL, 1929						Bowl shaped lorica with round or pointed aboral end and collar in two parts, suboral cone and flaring lip. Nuchal constriction usually present. Suboral and subnuchal fenestrae.
Genus *Petalotricha* KENT, 1882						Sack-shaped, conical or globose bowl with nuchal constriction. At junction of two parts of collar often a row of oval fenestrae set horizontally; on bowl long axes of fenestrae vertical. Internal nuchal ridge, and sometimes ridge where cone meets lip. Outer rim of lip sometimes denticulate.
P. ampulla (FOL, 1881)	10	116–165	135	1.1–1.6	8, 11, 12, 13, 14	Globose or ovoid bowl with rounded or pointed aboral end. Suboral cone nearly cylindrical, lip flaring. Edge of lip often irregularly denticulate. Ring of small oval fenestrae at top of cone and a double row on shoulder of bowl.
P. major JÖRGENSEN, 1924	11	84–134	76–137	0.8–1.1	8, 11, 13	Globose with rounded aboral end and marked nuchal constriction. Outer margin minutely serrate. Suboral cone slightly flaring, oral ridge with a row of small fenestrae, outer lip separated by slight gutter, horizontal or nearly so. Fenestrae on upper half of bowl.
P. serrata KOFOID & CAMPBELL, 1929	12	105–120	95–122	1.1	15	Ovoid with slightly pointed aboral end, sometimes with nipple. Suboral cone slightly flaring and lip more so, a row of small fenestrae at the junction and larger ones scattered on top half of bowl. Margin of lip with 48 teeth.
Family RHABDONELLIDAE KOFOID & CAMPBELL, 1929						Long, usually conical or vase shaped, usually with a pedicel, or pedicel knob and lance. Mouth simple or often with gutter between laminae of wall, never denticulate. Aboral end usually closed, sometimes with minute aperture. Ribs simple, branched or anastomosed, vertical

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
						or spiral, reaching from lip to tip of pedicel, often with fenestrae between them. Wall trilaminate with intermediate secondary structure visible.
Genus *Protorhabdonella** JÖRGENSEN, 1924						Short relatively wide and pointed, or slender with pedicel. Mouth always thin, simple. Wall usually hyaline. 8–28 vertical or spiral ribs or fins.
P. curta (CLEVE, 1901)	13	39–52	22–29	1.4–1.8	11	More or less conical bowl slightly dilated above middle, aboral end pointed, closed. Oral rim simple with only slight thickening of wall below. Ribs 18–24, vertical or slightly spiral; no branching. No fenestrae. Wall thin hyaline.
P. simplex (CLEVE, 1900)	14	47–98	26–39	1.5–2.2	13	Short, convex-conical with low collar and pointed aboral end. 6–10 vertical ribs. Wall thick just below collar.
Genus *Rhabdonella** BRANDT, 1906						Long, conical or vase shaped gradually contracting to pedicel. Oral margin entire with gutter between laminae, inner usually a little higher than outer lip. Ribs numerous (20–64) simple, branched or anastomosed. Fenestrae none to many, especially suborally.
R. amor (CLEVE, 1900)	15	58–107	35–60	1.9–2.9	2, 10, 11, 12, 13	Wide cone narrowing gradually to pointed aboral end or short pedicel. Oral rim hardly emergent, gutter shallow. Wall thickest suborally. 24–36 ribs well defined, slight spiral from under lip right-handed to aboral end, bifurcating and anastomosing especially in middle. Fenestrae numerous and inconspicuous.
R. brandti KOFOID & CAMPBELL, 1929	16	95–134	43–53	2.7–3.5	2, 13	Convex-conical bowl, narrowing to pedicel about $^1/_3$ total length. Oral rim higher than in *R. amor*, gutter shallow. 36-48 almost vertical ribs. Little flare at lip. Fenestrae numerous.
R. chavesi BRANDT, 1906	17	190–255	51–58	3.7–4.4	11, 12, 13	Medium tall, vase-shaped, slender pedicel nearly half total length with knob or swelling near aboral end. Inner collar stands above flaring lip, gutter between shallow. Ribs 36–48 in right-handed spiral from lip. No fenestrae.
R. conica KOFOID & CAMPBELL, 1929	18	290–470	37–102	4.8–7.9	11, 12, 13, 15	Tall, slender cone-shaped bowl merging gradually into pedicel $^1/_2$ total length, open at tip. Oral rim no higher than lip. 32–48 ribs almost vertical on top half, curving slightly right to near aboral end. Fenestrae numerous. Jelly like curtain sometimes on upper part.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
R. elegans JÖRGENSEN, 1924	19	110–124	39–54	2.8–4.1	13	Vase-shaped with slender pedicel, closed at tip. Low oral rim and deep gutter. Lip not thickened but flaring slightly. Nuchal constriction above slight expansion in bowl. Ribs almost vertical turning left abruptly on underside of lip. Fenestrae small.
R. hebe (CLEVE, 1900)	20	200–330	47–56	4.1–5.1	11, 12, 13, 14	Medium tall, conical, narrowing gradually to pedicel, about $^1/_3$ total length, which has fusiform swelling (or at least some differentiation in wall thickness) above minutely open tip. Oral rim low, thickened lip. Ribs 30-42, nearly vertical or with slight twist to R. from lip. Fenestrae present. Jelly-like curtain in oral region.
R. henseni BRANDT, 1906	21	153–354	62–86	2.5–5.8	11, 13, 15	Medium, cylindrical-conical, narrowing to thickish pedicel, $^1/_3$–$^1/_2$ total length, with sometimes a fusiform swelling near tip. Oral rim higher than lip which flares little. 18-48 vertical ribs, numerous fenestrae. Jellylike film envelops upper part.
R. hydria JÖRGENSEN, 1924	22	104–143	54–63	1.7–2.5	11	This squat, flat bottomed form may be an abnormality, possibly of *R. spiralis*. yet occurs frequently. Low oral rim and deep gutter, flaring oral lip. Ribs run obliquely to R. from oral end, but may or may not reach aboral end.
R. spiralis (FOL, 1881)	24	252–337	47–67	4.7–6.1	11, 13	Tall, cylindrical in upper part narrowing to thick pedicel which contracts to fine, open (sometimes closed) tip. Oral rim barely higher than lip, lip flaring. Ribs 36-60, vertical throughout, or in upper half, but turning right on lower bowl. Fenestrae numerous, small, circular.
R. striata (BIEDERMANN, 1893)	23	200–410	40–57	3.3–4.6	15	Cylindrical-conical with slender pedicel more than $^1/_3$ total length. Oral rim hardly emergent, lip flaring. Wall with very distinct laminae, thick in pedicel. Ribs 24-54, vertical or slightly spiral. Fenestrae small, numerous. Shorter and stouter than *R. spiralis*, longer than *R. brandti*.
Genus *Rhabdonellopsis** KOFOID & CAMPBELL, 1929						Long, more or less conical with long pedicel ending in knob and lance. Mouth as in *Rhabdonella* with inner and outer lamellae separated by gutter. Ribs 10–32 vertical or slightly spiral sometimes extending to knob. Fenestrae usually present. Wall with well marked lamellae, primary and coarse secondary structure.
R. apophysata (CLEVE, 1900)	25	284–350	51–62	5.5–8.0	12, 13	Long, vase-shaped with pedicel nearly $^1/_2$ total length bearing stout ribbed knob. Oral rim higher than flaring lip. 20-28 vertical or slightly spiral ribs. No fenestrae.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
R. composita (BRANDT, 1906)	26	279–353	46–58	4.7–6.6	13	Tall, cone or vase-shaped, pedicel nearly $^1/_2$ total length with wide knob and thick lance. Oral rim higher than flaring lip. 12 vertical unbranched ribs not extending to pedicel. A few or no fenestrae.
R. longicaulis KOFOID & CAMPBELL, 1929	27	350–468	50–54	7.0–8.7	11, 13	Long, almost conical, slender bowl, stout tapering pedicel about $^1/_2$ total length with stout knob and thin lance. Oral rim above flaring lip. 16-32 ribs, nearly vertical, running to pedicel and knob. Fenestrae few and very small.
Family EPIPLOCYLIDIDAE KOFOID & CAMPBELL, 1939						Short, wide, cylindrical or cup-shaped ending aborally in point or short pedicel. Oral rim simple or with inner collar and suboral shelf. Wall with deep polygonal surface reticulations, bounded by raised ridges. Sometimes free lines extending towards mouth.
Genus *Epiplocylis*, JÖRGENSEN, 1924						Cylindrical or cup-shaped with well-marked pedicel; simple oral rim sometimes thickened suborally. Reticulated zone and free lines never reach mouth. Fenestrae sometimes present in reticulations. Warm or temperate water genus.
E. acuminata (DADAY, 1887)	28	63–97	40–63 (52–79)	1.6–2.1	7, 8, 11, 12, 13, 14, 15	Most of bowl cylindrical or convex-conical, suboral region narrower and free from reticulations. Greatest width about $^1/_3$ length from mouth. Aboral end with short point or pedicel often more marked than shown. Reticulation over most of bowl. Wall thick in widest part of bowl.
E. blanda JÖRGENSEN, 1924	29	102–158	55–71 (52–65)	1.8–2.2	11, 12, 13	Cylindrical upper part, convex-conical below with short pedicel. Reticulations over lower $^1/_3$–$^1/_2$ length with short, almost vertical, free lines. Wall slightly thicker suborally.
E. carnegiei CAMPBELL, 1942	30	113	56 (81)	2.5	13	Squat, squarish, with suboral bulge, decreasing abruptly aborally to short solid pedicel. Coarse reticulations cover bowl to top of bulge. Wall thickest suborally and in bulge.
E. constricta KOFOID & CAMPBELL, 1929	31	95–120	55–66 (53–59)	1.2–1.9	13	Short, rounded, contracting orally, narrowing below to pedicel. Reticulation covers lower $^1/_3$ with free lines usually running to left. Wall thickened suborally.
E. undella (OSTENFELD & SCHMIDT, 1901)	32	103–180	50–79	1.7–2.4	13	Large, almost cylindrical in upper part (sometimes angular), conical aboral end and stout tapering pedicel. Reticulations with short free lines on lower $^1/_3$. Wall only slightly thickened aborally. HADA (1938) includes in this species *E. blanda* and *E. constricta*.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Genus *Epiplocyloides* HADA, 1938						Cylindrical or cup shaped, aboral end baggy or conical with point or short pedicel. Oral end differentiated into upright hyaline collar and projecting suboral lip, with gutter between. Coarse reticulations over lower part, or most, of bowl, free lines reaching to, or almost to, lip. Differs from *Epiplocylis* in oral differentiation, smaller size, shorter pedicel, and greater area of surface covered with reticulation and ribs.
E. acuta (KOFOID & CAMPBELL, 1929)	34	66–70	41–50	1.2–2.1	13	Almost cylindrical in upper half, conical in lower, narrowing to a sharp point. Collar erect, separated from flaring lip by a deep cleft. Strong reticulations on lower half, free lines running vertically on to lip.
E. brandti (KOFOID & CAMPBELL, 1929)	35	59–87	45–67	1.3	13	Short, wide, coming more abruptly than last sp. to a sharp point. Collar separated from flaring lip by a shallow gutter. Reticulations cover $^2/_3$ bowl and free lines run to just below lip.
E. duplicata BUSCH, 1948					14	Much flattened with mouth in shape of figure of eight. No measurements given. Possibly a deformed specimen.
E. reticulata (OSTENFELD & SCHMIDT, 1901)	33	58–65	47–50	1.2–1.3	8	Short and wide. Bowl almost cylindrical with slightly flaring lip and erect collar. Aboral end baggy with very short pedicel. Reticulations over more than half bowl and free lines almost to lip. HADA unites this sp. with *E. brandti*.
Genus *Epicancella* KOFOID & CAMPBELL, 1929						Convex-conical, aboral end bluntly or acutely pointed. Oral end differentiated as in *Epiplocyloides* but suboral lip is rounded and scarcely projects. Whole surface below lip raised into lattice work made of vertical ribs running all the way and lighter crossribs joining them. Ribs end on lip in fine network. Wall has very thin inner and outer lamellae with primary alveoli between. One species only.
E. nervosa (CLEVE, 1900)	36	79–84	49–59	1.3–1.9	13	As above. Slight constriction below lip and widest just below this. Aboral end acutely or bluntly pointed or truncated. Lorica very transparent.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables for distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).

BIANCO LUNO A/S. KBH

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 123

ORDER: TINTINNIDA
Family: Xystonellidae (1)
Genus: Parafavella

(By S. M. MARSHALL)

1969

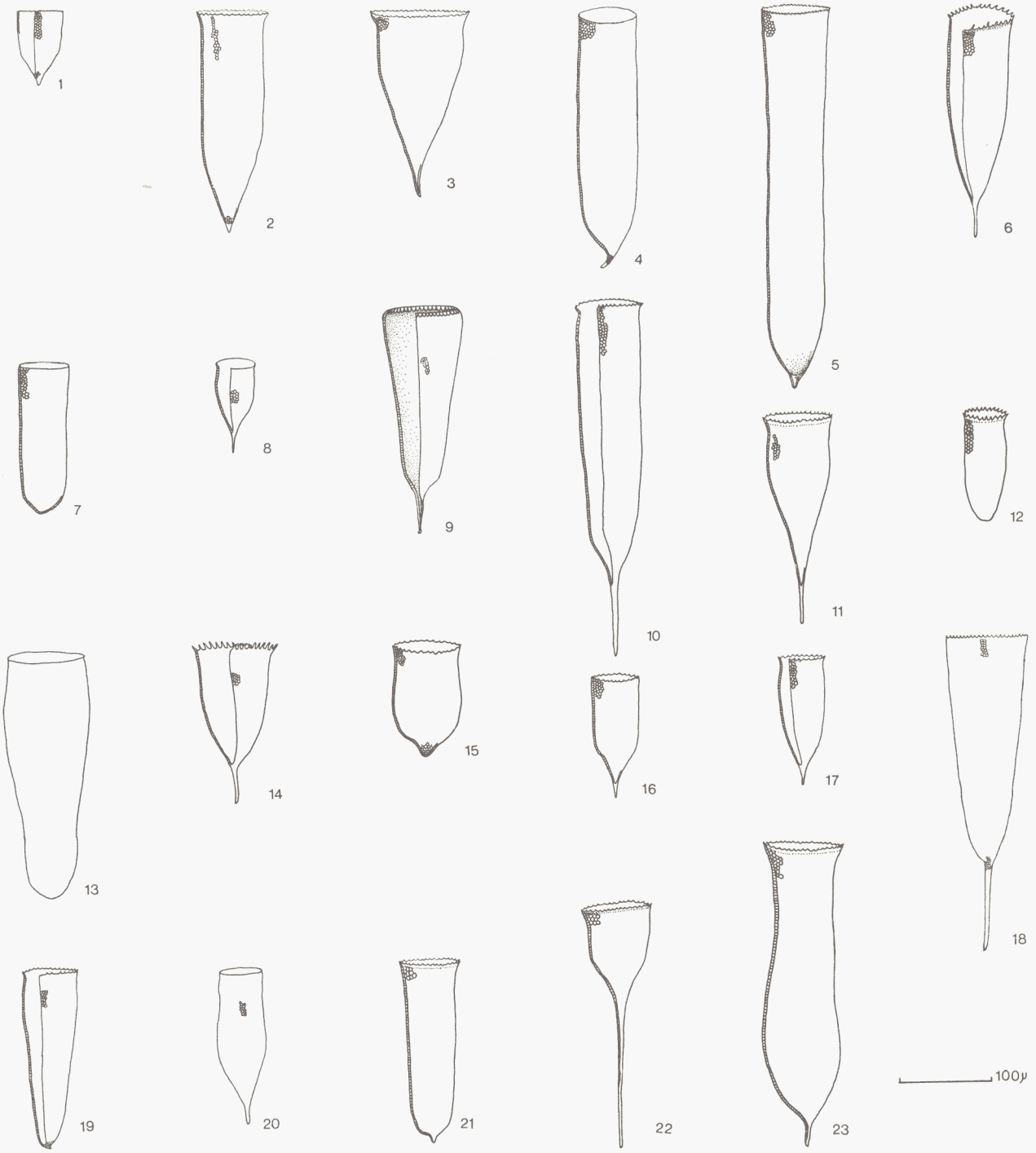

Plate VIII.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family XYSTONELLIDAE Kofoid & Campbell, 1929						Usually long, more or less cylindrical, often with pedicel which in some genera is elaborated. Oral region simple, or denticulate, or channelled. Suboral bulges or shelves sometimes present. Wall trilaminate, with double contoured inner and outer lamellae and large polygonal structure between.
Genus *Parafavella** Kofoid & Campbell, 1929	Plate VIII					Cylindrical or conical with rounded or pointed aboral end or pedicel. Oral rim often denticulate. In at least *P. gigantea* denticulate rim can be easily lost so denticulation is not a reliable specific characteristic. Wall showing uniform polygonal structure. Cold-water genus.
P. acuminata (Ehrenberg, 1854)	1	60–80	40–48	1.3–2	2, 11, 14	Small, almost cylindrical for $^5/_8$ length, then tapering to a blunt point. Oral rim faintly denticulate. Meshwork smaller just aborally. This sp. includes *Parafavella greenlandica* (Kofoid and Campbell, 1929).
P. acuta (Jörgensen, 1901)	2	160–260	70–75	2.3–3.5	1, 2, 4, 7, 12	Cylindrical for $^2/_3$ length, narrowing to a sharp point. Oral rim denticulate.
P. calycina (Jörgensen, 1901)	3	130–190	65–76	2.0–2.5	1, 4, 7	Cylindrical in upper $^1/_3$ length then conical with a short pedicel. Flaring oral rim denticulate. Slight constriction below mouth.
P. curvata Kofoid & Campbell, 1929	4	277	64	4.3	1, 4	Long, cylindrical for about $^3/_4$ length, then convex-conical with a short blunt pedicel. Oral rim not denticulate.
P. cylindrica (Jörgensen, 1899)	5	150–500	62–84	3.4–5.8	1, 2, 3, 4, 5, 6, 7, 14	Long, cylindrical almost to rounded aboral end with short blunt point. Oral rim denticulate and sometimes a constriction below mouth.
P. denticulata (Ehrenberg, 1840)	6	150–327	49–62	3.1–4.1	1, 2, 3, 4, 5, 6, 7, 8, 10, 11, 14	Cylindrical, sometimes with oral flare, for about $^1/_2$ length, then conical to thin pedicel. Oral rim strongly denticulate.
P. digitalis Kofoid & Campbell, 1929	7	167	54	3.1	4, 7	Cylindrical for $^5/_6$ length narrowing rapidly to blunt point. Oral rim not denticulate.
P. dilatata (Jörgensen, 1899)	9	247–390	66–82	3.0–6.0	1, 4, 7, 14	Tapering for most of length, sometimes with oral flare, sometimes contracted. Aboral end with short point or pedicel. Oral rim denticulate.
P. edentata (Brandt, 1896)	8	80–430	40–50	2.2–2.8	1, 2, 3, 4, 7, 12, 13, 14, 15	Cylindrical to about $^1/_2$ length, tapering then to thin pedicel. Oral rim not denticulate. Sometimes with slight oral flare.
P. elegans (Ostenfeld, 1899)	11	130–230	40–70	3–3.5	1, 7, 13	Cylindrical, sometimes with suboral constriction, for less than $^1/_3$ length then tapering to a thin pedicel. Oral rim denticulate.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
P. gigantea (BRANDT, 1896)	10	200–750	63–87	5.1–6.9	1, 2, 3, 4, 6, 7, 8, 10, 12, 13, 14	Elongated, cylindrical sometimes with slightly flaring mouth. Pedicel up to $^1/_4$ total length. Oral rim denticulate. No reticulation on pedicel and meshes smaller just below mouth.
P. hemifusus (MEUNIER, 1910)	12	110	36	2.8	1	Rather short, tubular with truncated flattened aboral end. Oral region has slight nuchal constriction and oral flare. Oral rim strongly denticulate.
P. inflata KOFOID & CAMPBELL, 1929	13	255	74	3.4	1	Long, tube-shaped, contracted very slightly at mouth and narrower in aboral half. Oral rim denticulate.
P. media (BRANDT, 1896)	14	133–257	80–85	1.8–3.0	1, 2, 4, 5, 12, 14	Conical with slender pedicel $^1/_5$ to $^1/_3$ total length. Oral rim flaring, strongly denticulate, with smaller reticulations on teeth and for a row or two below.
P. obtusa (AURIVILLIUS, 1899)	15	120–150	79–80	1.5–1.9	1, 7	Short, squat, contracting slightly a little below mouth and rapidly at aboral end to a blunt point. Oral rim denticulate.
P. obtusangula (OSTENFELD, 1899)	16	140	55	2.8	1, 7, 12	Cylindrical for about $^2/_3$ length, tapering gradually to short pedicel which is usually hyaline. Oral rim denticulate.
P. parumdentata (BRANDT, 1906)	17	88–200	44–66	1.7–3.0	1, 2, 3, 4, 12, 14, 15	Cylindrical or convex-conical, with slight constriction below mouth. Contracts aborally to point or short pedicel. Oral rim denticulate with wide strong teeth. Reticulations small just suborally.
P. robusta (JÖRGENSEN, 1901)	18	270–350	61–88	3.6–4.9	1, 2, 4, 7, 14	Long, conical, contracting to pedicel $^1/_4$–$^1/_3$ length. Oral rim denticulate. Rather shorter and stouter than *P. gigantea*.
P. rotundata (JÖRGENSEN, 1899)	19	190–327	58–71	2.8–4.6	1, 4, 6, 7, 14, 15	Long, tubular, usually tapering gradually to rounded aboral end, sometimes with a minute point. Oral rim denticulate, sometimes flaring slightly.
P. subedentata (JÖRGENSEN, 1905)	20	145	42	3.4–3.6	4	More or less cylindrical for $^2/_3$ length, then narrowing to short pedicel. Oral rim not denticulate. BRANDT's Pl. 38.2, cited by KOFOID & CAMPBELL (1929) does not seem to belong here.
P. subrotundata (JÖRGENSEN, 1899)	21	191–271	58–70	3.0–3.3	1, 4, 6, 7	Cylindrical with slightly flaring mouth. Aboral end hemispherical with short point. Oral rim denticulate.
P. subula KOFOID & CAMPBELL, 1929	22	265	70	3.5–3.8	1, 7, 10	Long with short cup shaped bowl and pedicel more than $^1/_2$ total length, gradually tapering to slender hyaline tip. Oral rim denticulate.
P. ventricosa (JÖRGENSEN, 1899)	23	272–544	55–67	5.2	4	Long, vase shaped, with flaring mouth and slightly inflated lower bowl. Short pedicel. Oral rim denticulate.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables for distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 124

ORDER: TINTINNIDA
Family: Xystonellidae (2)
Genera: Xystonellopsis, Xystonella, Parundella

(By S. M. MARSHALL)

1969

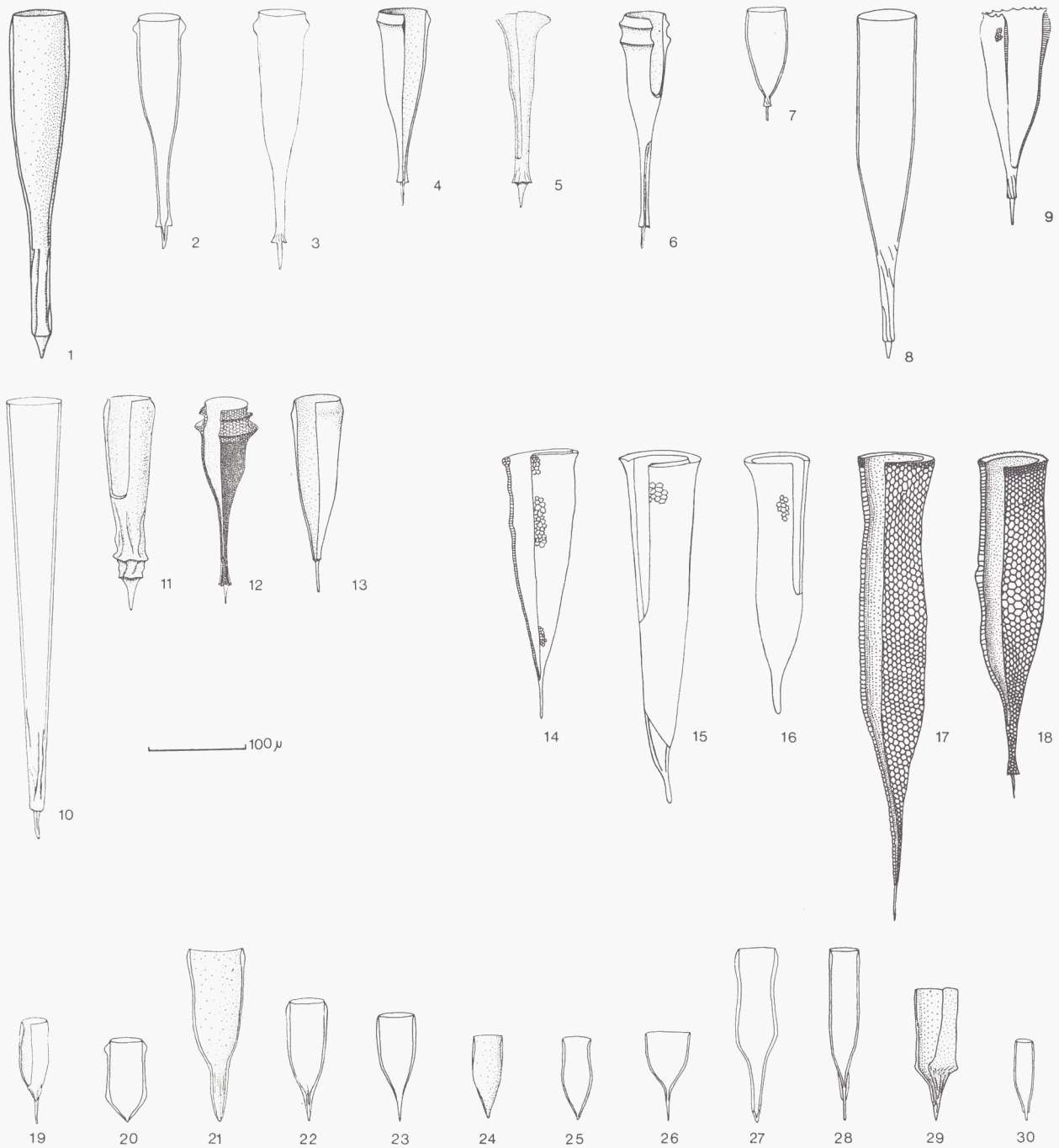
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Plate IX.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family XYSTONELLIDAE						
Genus *Xystonellopsis** JÖRGENSEN, 1924	Plate IX					Elongated, cylindrical, conical, or vase shaped, usually with pedicel. This may be differentiated into a flaring skirt or knob at aboral end, below which is pointed lance. Aboral end of pedicel may have striae or fins. Oral rim simple, rarely denticulate, sometimes with suboral thickening, annular bulges, or fenestration. Wall trilaminate, lamellae feebly double-contoured with one or more layers primary alveoli. Divided into 8 sub-genera. Mainly a warm and warm-temperate water genus.
X. armata (BRANDT, 1906)	1	167–410	30–90	4.8–6.7	13	Cylindrical upper part, contracting with or without a shoulder to a thick pedicel. This widens slightly aborally, has no definite skirt but has 6–8 fins, going half way up pedicel. Lance a short cone, bluntly pointed. Oral rim thin. Cavity of bowl reduced to narrow canal in lower part of pedicel. Secondary meshwork finest near mouth, coarser on pedicel aborally.
X. crassispinosa KOFOID & CAMPBELL, 1929	2	244–265	46–47	4.7–5.3	13	Long, cylindrical in top half, contracting to thick pedicel which ends in slightly flaring skirt, with 8 points and short fins. Lance stout. Oral rim thin, well marked suboral bulge. Wall thickest in bulge and skirt.
X. cyclas KOFOID & CAMPBELL, 1929	3	210–278	43–50	5.0–5.9	13	Long, cylindrical-conical with thick pedicel, flaring skirt with short striae, and slender lance. Oral rim thin, suboral bulge. Lance more slender than in *X. crassispinosa*.
X. cymatica (BRANDT, 1906)	4	182–251	50–62	3.8–5.8	11, 13	Cylindrical-conical with thickish pedicel, little skirt and slender lance. Oral rim thin, suboral bulge or shelf, sometimes two, the second less marked. Some variations in width of bulges also in width of pedicel and skirt.
X. dicymatica (BRANDT, 1906)	6	231–300	44–47	4.9–5.9	13, 15	Cylindrical-conical, long slender pedicel with slightly flaring skirt and sometimes striae. Lance slender. Oral rim thin, two suboral, equal, bulges separated by vertical space of about $^1/_2$ oral diameter. Secondary reticulation coarsest on upper part of bowl, finest on pedicel and skirt.
X. dilatata (BRANDT, 1906)	5	204–220	57	3.6	13	Cylindrical, bowl with widely flaring mouth, contracting sligthly to wide pedicel about $^1/_2$ total length. Slightly flaring skirt with striae. Stout lance. Reticulation fine over whole lorica.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
X. epigrus KOFOID & CAMPBELL, 1929	7	123–130	43–44	2.9–3.7	11, 13	Short, conical, with greatest diameter a little below mouth. Contracts to short, skirt-like, striated pedicel and slender lance.
X. gaussi (LAACKMANN, 1909)	8	371–470	60–70	5.6–6.6	13	Long, cylindrical, tapering gradually into stout, spirally striated pedicel. Short stout lance.
X. hastata (BIEDERMANN, 1893)	9	198–280	60–80	3.6–4.2	11, 13	Conical, contracting more sharply at $^1/_2$ length to a stout pedicel with sometimes spiral fins. Slender lance. Oral rim simple, denticulate, teeth varying in number 12–40. Suboral ledge or thickening of wall. Reticulation coarsest where wall is thickest.
X. heros (CLEVE, 1900)	10	450–475	58–60	7.9–8.3	12, 13	Very long, conical, no alteration in shape between bowl and pedicel which is striated and has no skirt. Slender lance sometimes curved. Oral rim flattened.
X. inaequalis KOFOID & CAMPBELL, 1929	12	216–350	47–60	4.6–7.0	11, 13	Cylindrical in upper $^1/_3$ contracting gradually to long slender pedicel ending in flaring skirt with 4–6 fins. Slender lance. Oral rim erect or slightly flaring. Two suboral bulges as in *X. dicymatica* but lower is the larger and projects like a shelf. Wall thickest in these regions and at foot of pedicel. Reticulation coarsest suborally.
X. paradoxa (CLEVE, 1900)	11	180–240	39–50	4.0–5.3	12, 13	Stout, conical, hardly separable into bowl and pedicel. Pedicel with two skirts, sometimes flaring and usually with spiral fins on both. Lance wide at base tapering to aboral point. Wall thick suborally sometimes with one, or two, incipient bulges. Wall thick also in lower pedicel.
X. spicata (BRANDT, 1906)	13	206–220	47–51	4.0–4.6	13	Conical, with taper increasing at about $^1/_2$ total length. Pedicel not marked off, end truncated without skirt. Long, slender lance. Oral rim erect, wall bulging suborally to a varying extent.
Genus *Xystonella** BRANDT, 1907						Elongated, cylindrical, conical, or vase shaped, divided into bowl and pedicel which may be simple or differentiated with knob, skirt, or lance. Oral rim thickened and channelled between lamellae, which distinguishes it from other genera of family. Wall as in family.
X. acus (BRANDT, 1906)	14	255–400	58–87	3.6–5.1	8, 15	Conical, sometimes with slight expansion near foot of bowl and slender pedicel sometimes widening above tip. Inner collar slightly higher than outer everted lip, gutter shallow.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
X. curticauda CAMPBELL, 1942	15	360	59	6.1	13	Long, conical, narrowing to short pedicel. Inner collar slightly contracted, lip slightly flaring and higher than inner collar. Wall thick throughout most of length. Coccoliths may be adherent.
X. flemingi CAMPBELL, 1942	16	229	42	5.5	13	Long, cylindrical-conical with short, stout pedicel. Inner collar hardly apparent, lip flaring asymmetrically and shallow gutter. Hexagonal reticulation visible, coarsest on bowl, finest suborally and on pedicel. Tip of pedicel hyaline.
X. lohmanni (BRANDT, 1906)	17	330–580	60–80	4.1–8.1	11, 12, 13	Long, vase shaped, contracting below mouth at about $^1/_5$ length, then expanding slightly. Slender pedicel about $^1/_4$ length. Inner collar low, gutter shallow. Coarse reticulation except suborally and on pedicel.
X. treforti (DADAY, 1887)	18	276–500	40–96	4.4–9.1	11, 12, 13, 15	Long, cylindrical to vase shaped, with pedicel ending in skirt which has 6-8 folds and points. Slender lance, varying in width. Inner collar low, lip slightly flaring and may be denticulate.
Genus *Parundella** JÖRGENSEN, 1924						Upper part cylindrical, lower conical, ending in point, spine or pedicel. Oral rim sharp, entire. Wall trilaminate, the lamellae fusing aborally. Intermediate layer hyaline or with primary structure. Genus of small forms, tropical and temperate water.
P. aculeata JÖRGENSEN, 1924	19	110–135	27–47	3.6–4.7	3, 10, 11, 12, 13, 15	Cylindrical, with very slight expansion in lower bowl, contracting to pedicel which is solid at tip and may carry 4 or more short fins joining upper pedicel to foot of bowl. Sometimes covered with acid-soluble particles.
P. acuta KOFOID & CAMPBELL, 1929	20	80–90	34–35	2.3–2.6	11	Short, cylindrical, contracting to sharp point aborally. Wall bulges and is thickened suborally and again where bowl contracts.
P. attenuata KOFOID & CAMPBELL, 1929	21	155–205	42–67	2.9–5.3	10, 11, 12	Long, cylindrical, with stout, striated, pointed pedicel. Oral rim rounded. Wall bulges and is thickened suborally. Surface covered with little pimples like fenestrae.
P. caudata (OSTENFELD, 1899)	22	120–150	30–40	2.9–4.2	3, 4, 7, 10, 11, 12	Cylindrical, then conical, ending in short pedicel. Wall thickens just suborally and thins gradually; lamellae fuse in aboral part of pedicel. 4–5 short fins between bowl and top of pedicel.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
P. difficilis KOFOID & CAMPBELL, 1929	23	96–133	26–39	2.9–3.5	10, 11	Cylindrical, then conical, contracting gradually to short fine pedicel. No fins. Suboral thickening slight or absent. Wall lamellae fuse in tip of pedicel. Sometimes covered with acid-soluble particles.
P. grandis KOFOID & CAMPBELL, 1929	24	89–90	20–29	3.5–4.5	12, 15	Cylindrical, then conical, contracting to blunt point without definite pedicel. Wall thickest suborally and in lower conical part, thins out on lower part of bowl.
P. lachmanni (DADAY, 1887)	25	96–115	27	3.0–4.2	4, 5, 13, 15	Cylindrical but with slight suboral contraction and expansion below this to width of mouth. Pointed aborally with no pedicel. Wall hyaline.
P. lata RINGDAL GAARDER, 1946	26	90–92	47–49	1.9	10	Wide, conical, slightly dilated below mouth, contracting to a slender pointed pedicel more than $^1/_3$ length. Wall set with acid soluble particles.
P. lohmanni JÖRGENSEN, 1924	27	151–183	38–43	3.9–4.3	3, 10, 11, 12, 13, 14	More or less cylindrical but dilated just below mouth, contracted in middle of bowl, and expanding again slightly before thick pedicel. Wall thick, lamellae well separated except where they fuse in tip of pedicel.
P. longa JÖRGENSEN, 1924	28	169–191	31–41	6.0	7, 11, 12, 13	Long narrow cylinder, contracting in lower half to slender pedicel with fins joining it to foot of bowl. Wall only slightly thicker suborally and at foot of bowl. Lamellae fuse in lower part of pedicel.
P. messinensis (BRANDT, 1906)	29	142–155	42–49	3.0–3.5	11	Stout, cylindrical, bowl contracting abruptly to wide pedicel. Wall with very slight suboral bulge and thickening and another, more marked, where bowl contracts. Lamellae fuse in tip of pedicel. Lower part of bowl and pedicel striated.
P. pellucida (JÖRGENSEN, 1899)	30	85–109	25	4.0	4, 7, 14	Small, cylindrical, contracting in lower half to narrow pedicel. Wall lamellae fuse in lower part of pedicel.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables for distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 125

ORDER: TINTINNIDA
Family: Undellidae
Genera: Undella, Amplectella, Undellopsis, Proplectella

(By S. M. MARSHALL)

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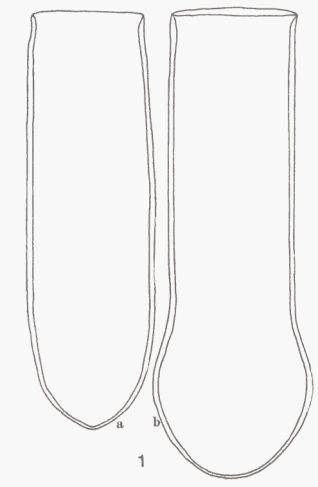

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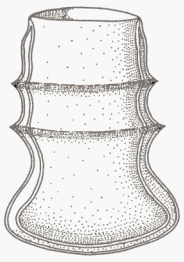

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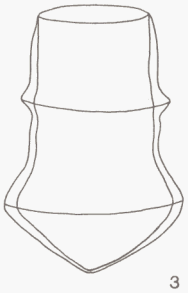

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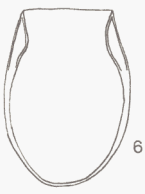

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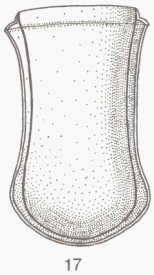

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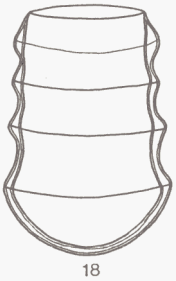

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Plate X.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family UNDELLIDAE KOFOID & CAMPBELL, 1929						Cylindrical, conical, bowl-or flask-shaped with aboral end pointed, flattened, or hemispherical. Mouth simple, sometimes with suboral thickening. Bowl often with rings, never with spiral structure. Wall trilaminate with thick lamellae and only primary structure in intermediate layer. Tropical and warm-temperate family.
Sub-family Undellinae CAMPBELL, 1942						No sub-oral ledge or inner collar.
Genus *Undella* DADAY, 1887	Plate X					Usually cylindrical, sometimes bowl-shaped. Oral rim thin, entire, with no marked suboral thickening of wall. Aboral end angular, pointed, rounded or flattened. No rings.
U. hyalina DADAY, 1887	1a, b	170–280	53–63	3.2–4.1	7, 11, 13, 15	Upper part cylindrical lower part sometimes cylindrical, rounded or slightly angled aborally (1 a), or expanded into bulbous aboral end(1 b). RINGDAL GAARDER (1946) includes in this sp. *U. attenuata U. dilata* and *U. parva*.
Genus *Amplectella* KOFOID & CAMPBELL, 1929						Anterior part cylindrical, with rings, and expanded aboral bowl. Oral rim thin, entire, 1–4 rings on cylinder sometimes one on bowl. Aboral end broad, rounded or faintly pointed.
A. collaria (BRANDT, 1906)	2	107–129	49–57 (75–103)	2.1–2.4	13	Anterior cylinder about $^3/_4$ length with two rings. Bowl angled or rounded in middle, rather short, aboral end hemispherical or flattened.
A. occidentalis KOFOID & CAMPBELL, 1929	3	101–119	43–68 (55–78)	2.2–2.5	13	Anterior cylinder about $^1/_2$–$^2/_3$ length with one ring. Bowl widest a little above middle, broadly pointed aborally. Wall thickest in ring, thinnest in aboral end.
Sub-family Undellopsinae CAMPBELL, 1942						
Genus *Undellopsis* KOFOID & CAMPBELL, 1929						Cylindrical, with suboral ledge and often a more or less distinct collar above it, with or without rings and with or without expansion into bowl. Aboral end rounded, flattened or bluntly pointed.
U. marsupialis (BRANDT, 1906)	17	100–138	47–63	1.5–2.5	11, 13	Cylindrical in general with slightly concave sides, and rounded or flattened aboral end, marked suboral ledge and upright collar. Wall thinner in aboral end. RINGDAL GAARDER includes in this sp. *U. lineata* and *U. pacifica*.
U. tricollaria (LAACKMANN, 1909)	18	108–120	50–54	2.2–2.3	13	Anterior cylinder about $^2/_3$–$^3/_4$ length, expanded angular bowl, aboral end broadly rounded. 3 rings on cylinder and a fourth, rather variable, on bowl, uppermost being the suboral ledge. Wall thickest in rings, thinnest aborally in bowl.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Sub-family Proplectellinae Campbell, 1942						Inner collar present.
Genus *Proplectella* Kofoid & Campbell, 1929						Short, bowl-, flask-, or vase-shaped, with angular, pointed, or rounded aboral end. Distinguished by suboral thickening of wall internally but not externally so that cavity of lorica has nuchal constriction and flaring mouth. Oral rim thin, entire. No rings, no suboral ledge. Wall trilaminate with structureless intermediate layer. Genus of small forms in tropical and temperate seas.
P. acuta (Jörgensen, 1924)	4	56–63	27–29 (34)	2.1	11, 12, 13	Convex-conical externally with pointed aboral end. Mouth little contracted. Suboral thickening slight, narrowing gradually to thin aboral end.
P. angustior (Jörgensen, 1924)	5	50–64	30–40 (42–50)	1.4–2.2	11	Truncated ovoid contracting to mouth, with broadly pointed aboral end. Suboral thickening well marked.
P. claparèdei. (Entz, 1885)	6	57–85	33–43 (54–66)	1.3–2.3	10, 11, 12, 13 14	Truncated ovoid, sometimes scarcely contracting to mouth, rounded aboral end. Suboral thickening marked at neck gradually thinning to aboral end.
P. ellipsoida Kofoid & Campbell, 1929	7	55–66	25–36 (36–53)	1.8–2.2	11, 12, 13	Much like *P. acuta* but slightly wider and less pointed aborally.
P. fastigata (Jörgensen, 1924)	8	64–82	39–44 (54–77)	1.7–2.3	11, 12, 13, 14	Truncated ovoid, mouth slightly contracted. Suboral thickening well marked. Wall thinning rapidly in rest of bowl. Shoulder sometimes angular.
P. globosa (Brandt, 1906)	9	58–70	33–43 (53–59)	1.5–2.3	13, 15	Like *P. fastigata* but more globose. Usually more rotund and less angular than *P. claparèdei* and *P. ovata* but form is variable.
P. merriami Campbell, 1942	10	65	17 (23)	3.8	13	Narrow, convex-conical, widest at about $^1/_3$ length, contracting to pointed aboral end. Suboral thickening not well defined and gradually thins aborally.
P. ovata (Jörgensen, 1924)	11	61–86	35–45 (47–70)	1.5–2.0	13	Truncated ovoid, wide, baggy, sometimes with angular shoulder, widest below middle. Aboral end broadly rounded, or flattened, or sometimes with minute point. Suboral thickening well marked.
P. parva Kofoid & Campbell, 1929	12	44–63	25–27 (28–33)	1.6–2.5	13	Convex-conical, contracting slightly towards mouth and to a point aborally. Widest a little below middle. Suboral thickening thins out gradually.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
P. praelonga KOFOID & CAMPBELL, 1929	13	56–76	29–33 (34–46)	1.7–2.6	13	Bag-shaped, widest below middle. Aboral end rounded. Suboral thickening slight and thins gradually.
P. subacuta (CLEVE, 1901)	14	50–60	21–25 (28–39)	2.4	13	Truncated ovoid, contracting slightly towards mouth, with broadly rounded or rather pointed aboral end. Widest about, or below, middle. Suboral thickening marked and thins gradually.
P. subcaudata (JÖRGENSEN, 1924)	15	60–94	26–49 (34–61)	1.9–2.3	11, 12, 13	Small, vase-shaped, contracting slightly towards mouth, ending aborally in pointed cone. Widest below middle. Suboral thickening slight and wall thins to a membrane in aboral cone.
P. tenuis KOFOID & CAMPBELL, 1929	16	63–70	33–51 (42–57)	1.3–2.3	11	Truncated ovoid, usually wide-mouthed. Aboral end rounded or sometimes bluntly pointed. Widest above middle. Suboral thickening thins out gradually, lamellae approaching aborally and sometimes fusing.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables for distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 126

ORDER: TINTINNIDA

Family: Tintinnidae (1)

Genera: Tintinnus, Steenstrupiella, Amphorides, Albatrossiella, Dadayiella, Ormosella, Brandtiella, Stelidiella

(By S. M. MARSHALL)

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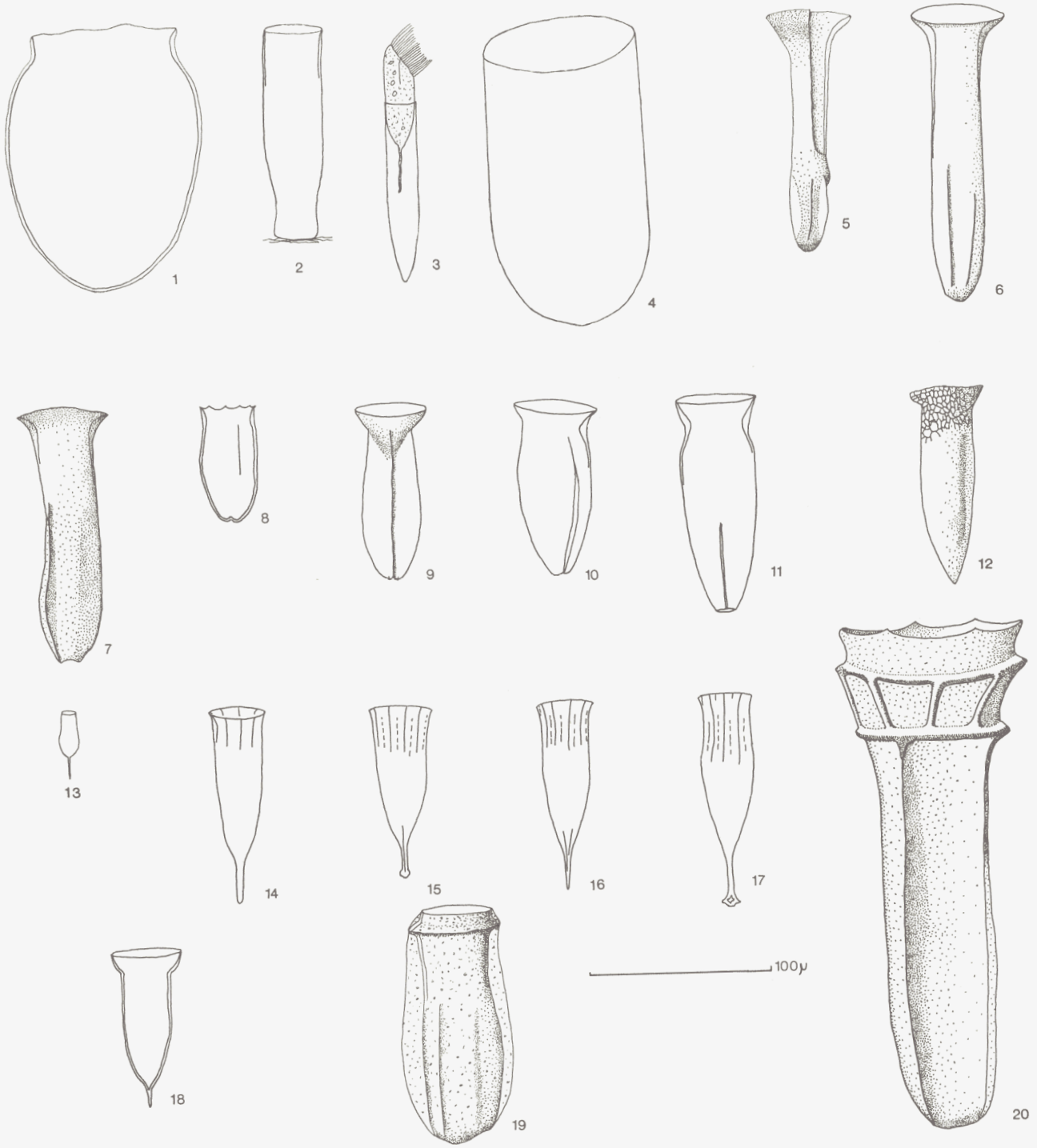

Plate XI.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family TINTINNIDAE Claparède & Lachmann, 1858						Lorica usually elongated, tube-, vase-, or trumpet-shaped, suboral region often flaring, oral rim with or without teeth, aboral end open or closed. Wall without rings or spiral structure, often with striae or fins, hyaline, bilaminate.
Sub-family Tintinninae Kofoid & Campbell, 1929						Small and short, tube-, vase,- or trumpet-shaped, oral region usually flaring aboral end closed. Fins usually present.
Genus *Tintinnus* Schrank, 1803	Plate XI					Tubular or bag-shaped, no flaring mouth, oral rim entire, aboral end closed and rounded. Wall hyaline with no striae or fins.
T. bursa (Cleve, 1900)	1	70–145	67–80	1.6–1.9	13	Tubular or oval with slightly inflated bowl, sometimes with slight constriction below mouth.
T. inquilinum (O. F. Müller, 1776)	2	115	30	3.2–3.9	4, 5, 6, 7, 8, 10 11	Tubular, contracting in lower $^1/_3$ to diameter $^1/_2$ that of mouth. Usually sessile, attached to algae.
T. obliqua Claparède & Lachmann, 1858	3	90	13	7.0	4, 7, 10, 14	Tubular, narrow, contracting gradually to bluntly rounded aboral end.
T. vitreus Brandt, 1896	4	140–155	82	1.7–2.0	2	Tubular, wide, aboral end hemispherical.
Genus *Steenstrupiella* Kofoid & Campbell, 1929						Elongated, trumpet-shaped with flaring mouth, tubular shaft and usually slightly inflated aboral end with 4–6 vertical fins or striae.
S. robusta Kofoid & Campbell., 1929	5	107–133	38–48	2.7–4.4	13	Trumpet–shaped with flaring mouth, tubular shaft and slightly inflated aboral end. Hexagonal in cross section aborally, with 6 low fins. Wall thickest just at oral flare, thin at oral rim and elsewhere.
S. steenstrupii (Claparède & Lachmann, 1858)	6	120–161	37–50	3.2–6.3	4, 6, 7, 11, 12, 13, 14, 15	Elongated, narrow, with flaring mouth and slightly inflated aboral end with 6 short low fins. Wall thickest just at oral flare, thin at mouth and below.
Genus *Amphorides* Strand, 1926						Tubular- or vase-shaped, usually with flaring collar. Oral rim entire (or toothed), aboral end closed, often truncated. Bowl with 3, 4, or 8 longitudinal ridges or fins. Wall hyaline, structureless.
A. amphora (Claparède & Lachmann, 1858)	7	100–220	55	2.5–4.0	4, 7, 13	Vase-shaped with flaring collar, greatest width in lower part of bowl, with truncated aboral end. 3 low vertical fins. Wall thickened at neck

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
A. gaarderae nom. nov. (RINGDAL GAARDER, 1946)	8	65–66	30	2.2	11	Short, rather tubular with slightly flaring mouth and toothed oral rim. Only one specimen seen and it was perhaps a deformed *A. quadrilineata*. The toothed oral rim would bring it near *Odontophorella*.
A. infundibulum (KOFOID & CAMPBELL, 1929)	9	99–100	40–48	1.9–2.9	4, 13	Vase-shaped with flaring collar and truncated aboral end, greatest width about middle of bowl. Three blade-like fins, sometimes running up on to collar.
A. minor (JÖRGENSEN, 1924)	10	83–94	34–48	1.7–3.3	13	Short, vase-shaped with flaring collar and truncated or rounded aboral end. 4 fins, variable in length.
A. quadrilineata (CLAPARÈDE & LACHMANN, 1858)	11	92–182	38–66	2.4–3.6	4, 6, 7, 10, 11, 12, 13	Vase-shaped, with flaring collar and truncated aboral end. Variable in form, greatest width above or below middle of bowl, 3-4 fins running $^1/_3$ to $^1/_2$ way up bowl.
Genus *Amphorellopsis* KOFOID & CAMPBELL, 1929						Resembles *Amphorides* except that aboral end is pointed. 3–6 longitudinal fins. Wall hyaline, structureless except in *A. acuta*.
A. acuta (SCHMIDT, 1901)	12	91–150	31–45	2.6–3.9	13	Bowl fusiform, flaring mouth, sometimes with undulating oral rim. Aboral end acutely pointed. Reticulation visible in oral region.
Genus *Albatrossiella* KOFOID & CAMPBELL, 1929						Small, more or less cylindrical with or without flaring mouth. Bowl ends aborally in aciculate spine sometimes longer than bowl.
A. minutissima (MEUNIER, 1910)	13	37	5	7.4	1, 2	Minute, inflated at base of bowl, with spine about half length of bowl.
Genus *Dadayiella* KOFOID & CAMPBELL, 1929						Bowl slightly fusiform or tubular, oral region flaring slightly if at all, with 9–18 ribs or facets extending partly, or rarely wholly, over bowl. Bowl ends in short pedicel sometimes with terminal knob. Aboral end closed. Wall hyaline, structureless except in thickened wall of pedicel.
D. acutiformis KOFOID & CAMPBELL, 1939	14	75–106	21–31	3.5	13	Bowl mostly cylindrical, oral region slightly flaring with 9 facets extending a short way below rim. Pedicel about $^1/_3$ total length, aboral tip pointed. (= *D. acuta*, see: KOFOID & CAMPBELL, 1929 (Fig. 609)).
D. bulbosa (BRANDT, 1906)	15	90–125	31–35	2.9–4.0	12, 13, 15	Bowl almost tubular with slightly flaring oral region, facetted, with 9–18 ribs sometimes projecting slightly above oral rim (? incomplete lorica). Short pedicel about $^1/_4$ total length ending in knob, or knob with minute point.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
D. ganymedes (ENTZ, Sr., 1884)	16	90–120	29–30	3.0–4.2	11, 12, 13, 15	Almost tubular or with slightly flaring oral region, tapering from about $^1/_2$ total length to slender pedicel, about $^1/_4$ total length, pointed or obtuse, at aboral tip. Pedicel often has 9–12 low longitudinal fins throughout its length. Oral region facetted with 9–18 ribs, sometimes sticking up above oral rim. 9 secondary ribs sometimes appear between 9 stronger primary ribs. HADA (1938) includes in this sp. *D. acutiformis*, *D. bulbosa* and *D. jörgenseni*.
D. jörgenseni KOFOID & CAMPBELL, 1929	17	80–119	31	3.8	8	Bowl fusiform with slight constriction below mouth and slight inflation about middle of bowl. Oral region facetted with both primary and secondary ribs. Short slender pedicel ending in knob with lateral spikes. Ribs also on pedicel.
Sub-family Stelidiellinae KOFOID & CAMPBELL, 1929						Short and stout, collar highly developed, bowl-, sack-, vase- or tube-shaped, or conical, aboral end closed. Longitudinal structure, part or full length, usually present.
Genus *Ormosella* KOFOID & CAMPBELL, 1929						Conical or vase-shaped, collar large, well set off from bowl with inner nuchal ledge. Bowl ending in sharp or blunt point or fine pedicel. Bowl and pedicel facetted with 7–12 longitudinal equal facets. Wall hyaline.
O. bresslaui KOFOID & CAMPBELL, 1929	18	56–85	28–33	2.0–2.6	13	Small, vase-shaped with large collar about $^1/_5$ total length, nuchal constriction and inner ledge. Bowl ending aborally in spine or short pedicel. 12 faint facets on bowl from neck to tip of spine.
Genus *Brandtiella* KOFOID & CAMPBELL, 1929						Collar divided into suboral ring and projecting angular portion below. Bowl sack-shaped with 3 or 4 longitudinal ridges aborally. Wall with fine prismatic structure. Lorica enveloped in gelatinous sheath, thickest in middle, structureless, with inclusions of coccoliths, diatoms, and other particles. One species only.
B. palliata (BRANDT, 1906)	19	128–203	29–53	2.6–4.1	13, 15	As genus.
Genus *Stelidiella* KOFOID & CAMPBELL, 1929						Stout, tubular or bag shaped with large collar divided into suboral ring and fenestrated band. Bowl ridged, 4-angled. Wall hyaline structureless.
S. stelidium (BIEDERMANN, 1893)	20	280–290	100	2.8–3	11, 13	Tubular with collar nearly $^1/_4$ total length. Oral rim with 6 blunt teeth, lower band with thick rings and uprights enclosing 8 squarish closed fenestrae. Bowl 4-angled, ridges extending from lower collar to aboral end.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables and distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).

CONSEIL INTERNATIONAL POUR L'EXPLORATION DE LA MER

Zooplankton
Sheet 127

ORDER: TINTINNIDA
Family: Tintinnidae (2)
Genera: Eutintinnus, Daturella, Salpingella, Salpingelloides, Salpingacantha

(By S. M. MARSHALL)

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Plate XII.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
Family TINTINNIDAE (2) Sub-family Salpingellinae KOFOID & CAMPBELL, 1939						Elongated, cylindrical or tubular, oral rim entire or toothed, with or without a brim, oral region sometimes flaring. Middle region sometimes slightly expanded, aboral end flaring or contracted, always open. Longitudinal structures, when present may be oral or aboral only, or full length. Wall hyaline usually structureless. Mostly warm-water forms.
Genus *Eutintinnus** KOFOID & CAMPBELL, 1939	Plate XII					Cylindrical or nearly so, widely open at both ends, oral and aboral regions sometimes flaring with, or without, thickened brim; oral rim with or without teeth. Wall hyaline, usually structureless sometimes wrinkled.
E. apertus (KOFOID & CAMPBELL, 1929)	1	85–112	28–39	2.2–3.2	10, 11, 13	Slightly tapering cylinder, narrowing abruptly near aboral end to a width about half that of mouth. Oral region slightly, if at all, flaring. Often with laterally attached diatoms, especially *Chaetoceros spp.*
E. brandti (KOFOID & CAMPBELL, 1929)	2	205–339	53–66	3.7–5.6	11	Tubular with median expansion and slightly flaring oral and aboral ends, both of which have brims, the first more marked, the second sometimes lacking.
E. elongatus (JÖRGENSEN, 1924)	3	390–509	66–69	4.5–7.5	11, 12, 13	Elongated, slender, slightly flaring both orally and aborally, oral margin with brim. Aboral diameter about $^1/_2$ that of oral.
E. fraknoi (DADAY, 1887)	4	278–475	40–80	4.5–6.5	4, 7, 10, 11, 12, 13, 15	Large, tapering, gently flaring both orally and aborally. Aboral diameter about $^2/_3$ that of oral. Oral brim present. Occasionally with polygonal prisms and included particles in wall. Sometimes with attached *Chaetoceros*.
E. inflatus nom. nov. SILVA, 1952	5	100	21 (24)	4.8	11	Like *E. apertus* except that lorica widens slightly to just above aboral contraction. Possibly includes CANDEIS' *E.elegans*.
E. latus (JÖRGENSEN, 1924)	6	320–404	67–83	4.9	11, 12, 13	Large, almost cylindrical with oral end flaring more gradually than aboral. Aboral diameter about $^3/_4$ that of oral. Oral brim present. Sometimes slightly expanded in middle.
E. lusus undae (ENTZ, 1885)	7	169–290	38–54	3.2–4.9	11, 12, 13	Almost cylindrical with slightly flaring oral end and low brim. No flare or brim aborally. Aboral diameter little more than $^1/_2$ oral. Wall sometimes with prisms, sometimes with attached *Chaetoceros*.
E. macilentus (JÖRGENSEN, 1924)	8	136–329	37–58	3.6–5.0	7, 11	Small, tapering, with rather concave sides. Tapers from oral brim to slightly flaring aboral brimless opening, diameter $^1/_2$–$^2/_3$ oral.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
E. medius (Kofoid & Campbell, 1929)	9	192–254	44–58	3.7–4.8	13	Almost cylindrical, with flaring oral and aboral ends, usually slightly expanded in middle. Oral brim present. Aboral diameter $^2/_3$ that of oral. Smaller than *E. latus*.
E. pinguis (Kofoid & Campbell, 1929)	10	114–161	30–42	2.6–3.8	10, 12	Cylindrical in top $^2/_3$, contracting aborally to opening, $^2/_3$ as wide as mouth, very slightly flaring orally sometimes with slight median expansion. Indefinite oral brim.
E. tubulosus (Ostenfeld, 1899)	11	94–210	23–32	2.7–3.8	4, 6, 10, 11, 12, 15	Tapers uniformly from oral end with slight brim to aboral end more than $^2/_3$ as wide as oral. Wall very thin.
E. turgescens (Kofoid & Campbell, 1929)	12	155–193	39–48	3.2–4.4	13	Almost cylindrical with flaring oral end, median expansion and straight aboral end from $^1/_2$–$^2/_3$ diameter of oral. Like *E. lusus undae* apart from median expansion.
Genus *Daturella** Kofoid & Campbell, 1929						Elongated tapering cylinder with longitudinal fins or striae over whole or most of length. Wall soft and flaccid with more or less distinct alveolar structure. Warm-water genus.
D. angusta Kofoid & Campbell, 1929	15	150–270	36–71	3.8–4.0	13, 15	Spool shaped with widely flaring oral and slightly flaring aboral end. Striae indistinct.
D. gaussi Kofoid & Campbell, 1929	14	400	106	3.8	12	Tapering with flaring mouth, median expansion and very slight aboral flare. Aboral margin irregular, oblique. About 8 nearly vertical striae.
D. magna Kofoid & Campbell, 1929	13	540	104	5.2	13	Large, tapering, with everted oral rim. Aboral diameter about $^1/_3$ that of oral. 10–11 fins, twisting leftwards under oral rim.
*Salpingella** Jörgensen, 1924						Elongated, narrow with flaring oral and contracted aboral end, latter sometimes with short cylinder and always open. Vertical or spiral fins or striae aborally only or, rarely, both orally and aborally but not full length (except sometimes in *S. laminata*). Wall hyaline, structureless. Mainly warm-water forms.
S. acuminata (Claparède & Lachmann, 1858)	16	200–370	29–47	5.5–11.6	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14	Long, tubular, with widely flaring mouth and narrow aboral end without cylinder. 6–9 fins below middle, slightly curved. Middle region sometimes with a band of coccoliths.
S. alata Kofoid & Campbell, 1929	17	283–290	40–41	7.0	15	Long, tubular with widely flaring mouth and narrow aboral end. 6 fins extend over posterior $^1/_3$, each widening into small angular wing just above aboral end.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
S. attenuata JÖRGENSEN, 1924	19	248–433	35–43	7.4–15.3	13	Long, tubular, widely flaring mouth has thickened rim. Lorica narrower in posterior $^1/_3$, with 5–7 fins sometimes giving appearance of aboral expansion.
S. curta KOFOID & CAMPBELL, 1929	18	69–93	12–14	5.3–7.7	5, 10	Small, tubular, with scarcely flaring oral end and very short narrow aboral cylinder. 6-7 blade-like fins on posterior $^1/_3$.
S. decurtata JÖRGENSEN, 1924	20	128–150	16–23	8.5	12, 13	Small, tubular, with everted oral rim and very narrow aboral opening on short cylinder. 6–8 fins on posterior $^1/_4$–$^1/_3$.
S. gracilis KOFOID & CAMPBELL, 1929	21	320–434	31–33	8.9–13.6	10, 11, 12, 13, 15	Elongated, narrow, widely flaring mouth with thickened rim, slightly incurved. Narrow aboral opening. 7–9 low fins posteriorly, sometimes indistinct. Sometimes faint suboral striae.
S. laminata KOFOID & CAMPBELL, 1939	22	73–125	15	4.9	11	Short, tubular, oral region scarcely flaring, lorica narrowest in middle, short aboral cylinder below fins. 4 vertical fins on lower part of bowl, disappearing or not, in middle, visible suborally. MARGALEF & DURAN record their specimens as this sp. but think they may be too long. Increased length may be a temperature effect.
S. minutissima KOFOID & CAMPBELL, 1929	23	78–133	3.4	3.3	10, 11, 12	Short, tubular, widely flaring mouth with thickened rim. Short narrow aboral cylinder, above it 6 fins.
S. secata (BRANDT, 1896)	25	260–408	39–47	6.8–14.8	1, 2, 6, 12, 15	Long, narrow, widely flaring mouth without thickened rim. Short, very narrow aboral cylinder, above this 7-8 fins about $^1/_3$ total length. Differs from *S. acuminata* in having an aboral cylinder to which fins do not extend.
S. stenostoma nom. nov. SILVA, 1950	24	130	7	18.6	11	Small mouth with oral region dilated just below it. Lorica narrowest a little suborally, widest near aboral end. About 6 fins. Resembles *S. subconica* apart from mouth.
Genus *Salpingelloides** CAMPBELL, 1942						Elongated, almost cylindrical with flaring mouth and narrowed aboral end. No facets, but ridges or fins running throughout length or nearly so.
S. altiplicata (MERKLE, 1909)	26	150–177	31–35	4.8	4	Almost cylindrical, with widely flaring mouth and short narrow aboral cylinder. 8 fins running spirally right down lorica.
Genus *Salpingacantha** KOFOID & CAMPBELL, 1929						Elongated, narrow, cylindrical upper part with bowl-shaped oral region and narrowing posterior part with or without aboral cylinder. Oral margin with 3–12 large teeth. 5–8 low fins posteriorly. Resembles *Salpingella* except for oral teeth.

	Fig.	Length in μ	Oral diam. in μ (Max. width in brackets)	Approx. ratio L/oral diam.	Distribution	Notes on lorica
S. ampla KOFOID & CAMPBELL, 1929	27	306–358	27–28	10.7–13.2	13	Oral region slightly flaring with 6–8 vertical folds. Oral margin with 7–8 curved teeth. Short aboral cylinder, 5 vertical fins on posterior part.
S. undata (JÖRGENSEN, 1899)	28	320–400	23–50	8.0–13.8	1, 3, 4, 12, 14, 15	Oral region bowl-shaped with 2–6 large claw-like teeth. Margin between teeth flattened and rolled inwards. Aboral end narrow, with or without cylinder. 7–8 ridge-like fins on posterior $^1/_4$–$^1/_2$.
S. unguiculata (BRANDT, 1906)	29	130–290	11–20	10.4–14.5	14	Slender tapering tube, oral region bowl-shaped but little expanded. Oral margin with 5-8 strong incurved teeth, margin between flattened and rolled inwards. Shaft sometimes slightly dilated in middle, contracting to narrow aboral end, with or without aboral cylinder. 7–8 low fins posteriorly.

(For introduction to Plankton Sheets 117–127, Key to numbers used in the tables and distribution, and Sources of illustrations, please refer to Sheet No. 117, pp. 2 and 11–12).