

Sinensia 7.

(1936) 7: 353-370.

NOTES ON TINTINNOINEA FROM THE GULF
OF PÊ-HAI

CHIA CHI WANG

The present study is based upon the plankton collections made by Messrs. L. T. Chong and S. F. Tang with a surface tow net during the months of November, 1934 and June to October, 1935. In the following sections, fifteen species belonging to six genera and four families are reported and most of them have not been previously recorded from the coastal regions of the country. Five of them, *Stenosemella epunctata*, *Codonellopsis mobilis*, *C. pêhaiensis*, *Favella cylindrica* and *Parafavella elongata* are described as new to science.

Family Codonellidae

Tintinnopsis beroidea Stein 1867

(Fig. 1)

Codonella beroidea, partim Entz, Sr. 1884.

Tintinnus conicus Dixon & Joly 1898.

Tintinnus beroidea Ostenfeld 1909.

Tintinnopsis acuminata Meunier 1919.

Tintinnopsis karajacensis Merkel 1909.

Lorica cylindro-conical, about 2.01 oral diameters in length; oral rim somewhat irregular, never flaring; bowl tubular or cylindrical, of the oral diameter in transdiameter; aboral region more or less sharply conical; aboral end tapered and acuminate; wall rather coarsely agglomerated with foreign particles.

Length: 113μ in average; transdiameter: 56μ in average.

This species is characterized by its lorica which is cylindrical throughout above the conical aboral end. It differs from

Tintinnopsis brasiliensis Kofoid and Campbell in its more tapered aboral end. Individuals were frequently observed in the samples collected from various stations of the Gulf, especially abundant in those from Chinwangtao (秦皇島).

The specimens presently recorded seem to be extremely large in size. As indicated out by Fauré-Fremiet ('08), the dimensions of lorica given by different authors are greatly variable. They are $72-78\mu \times 45-50\mu$ by Daday, $55-60\mu$ in length by Brandt, 54μ in length by Levander, $64-77\mu \times 30-42\mu$ by Jörgensen and $90\mu \times 50\mu$ by Fauré-Fremiet. It is apparently shown that none of them exceeds the specimens from the Gulf of Pê-Hai in size. Such a difference is probably due to the local variation.

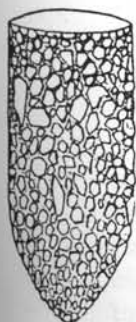


Fig. 1. *Tintinnopsis beroidea* Stein, $\times 354$.

The foreign particles or grains agglutinated on the wall of the lorica are variable in size and shape. Diatom shells are not present on the wall as reported by Fauré-Fremiet. The aboral region occupies about the posterior third of the lorica. It is conical, from 72° to 78° distally. The aboral end is usually pointed.

Tintinnopsis lohmanni (Jörgensen) Laackmann 1906

(Fig. 2)

Tintinnopsis tubulosa var. *lohmanni* Jörgensen 1927.

Lorica more or less flask-shaped, about 2.21 oral diameters in length, cylindrical anteriorly, enlarged or bulging out aborally; oral rim somewhat irregular, not flaring; tubular part about 0.45 of the total length in length, of transdiameter throughout, provided with 2 or 3 spiral turns; aboral region more or less oval, widest at the middle portion, about 1.21 oral diameters in transdiameter; aboral end usually convex conical; wall rather coarsely agglomerated with foreign bodies.

Length: 113μ in average; transdiameter of tubular part: 51μ in average; transdiameter of enlarged aboral region: 62μ in average.

This species has been considered by Kofoid and Campbell as synonymous to *Tintinnopsis subacuta* Jörgensen in their monograph ('29). As pointed out by Hada ('32), *Tps. lohmanni* may be distinguished from the latter in the shortened anterior tubular part and in the shape of the aboral end. In *Tps. subacuta*, the tubular part is more than three times longer than the enlarged aboral region and the aboral region is broadly expanded and furnished with a nipple-like process at its posterior extremity.

The species also differs from *Tps. turgida* Kofoid and Campbell in its shorter suboral region and in the presence of the coiled bands in the same portion. The foreign particles attached on the wall of the tubular part are much smaller in size and less densely agglomerated than those on the wall of the aboral region. As a consequence, the tubular part appears semi-transparent in contrast with the darker aboral region and the spiral turns could be distinctly observed.

The specimens, here reported with, are much larger in size than those recorded by Hada from Mutsu Bay, Japan, since the latter are only 60μ in length and 30μ in oral diameter. The shape of the aboral region also tends to vary. While in the all presently observed individuals, the posterior half of the enlarged part is tapered or rather sharply conical, those found by Hada are subspherical or broad-conical aborally.

The occurrence of this species is rather rare and only several individuals were found in the samples collected from Wei-Hai-Wei (威海衛).

Tintinnopsis bütschlii Dady 1887

Tintinnopsis campanula var. *b. bütschlii* Brandt 1907.

Only a single specimen was observed from the collections made at Chinwangtao. The dimension of the lorica is 56μ in



Fig. 2. *Tintinnopsis lohmanni* (Jörgensen), $\times 442$.

length, 73μ in oral diameter and 37μ in the greatest trans-diameter of the bowl. Like the individuals recorded from Amoy by Nie ('34), the oral region is more broadly expanded than that of Daday's typical form and its diameter greatly exceeds the length of the lorica.

Tintinnopsis aperta Brandt 1906

(Fig. 3)

Tintinnopsis tubulosa, partim, Brandt 1906.

Lorica elongate, sub-cylindrical, usually a little constricted at the middle portion, sometimes slightly expanded at the beginning of the aboral region; about 3.81 oral diameters in length, tapering distally into a stout aboral horn; expanded posterior part provided with distinct spiral structure, equaling or a little exceeding the oral diameter in transdiameter; aboral horn rather stout, conical, about an oral diameter in length, obliquely or irregularly opened at the tip; wall rather thick and coarsely agglomerated with foreign particles.

Length: 146μ in average; oral diameter: 38μ in average.

The species is characterized by the subcylindrical lorica which is slightly constricted at the middle or at the suboral region a little below the oral rim and a little dilated at the aboral part just above the tapered and conical aboral horn. The dilated portion is not so expanded and prominent as that in the case of *Tps. tocaninensis* Kofoid and Campbell. The spiral turns are distinctly indicated on the external surface of that particular region.

The oral rim is smooth, entire and scarcely flaring. The aboral horn is tapered, sharply pointed and either straight or slightly curved. The foreign particles on the wall of the lorica are of medium size and rather approximately or crowdedly agglutinated. The distal opening is obliquely directed from the tip upward at one side of the horn. It is variable in dimension and of irregular shape.

Several specimens have been observed from the samples collected from Lungkou (龍口).

Tintinnopsis tocantinensis Kofoid and Campbell 1929

(Fig. 4)

Tintinnopsis aperta var. *a* Brandt 1906.

Lorica elongate, cylindrical in the upper half, expanding in the lower half, about 3.29 oral diameters in length, tapering distally into a stout aboral horn; dilated part without spiral structure, about 1.29 of the oral diameters in transdiameter; aboral horn rather stout, conical, about an oral diameter in length, obliquely or irregularly opened at the tip; wall thick and coarsely agglutinated with foreign particles.

Length: 86μ in average; oral diameter: 25μ in average; transdiameter of dilated part: 33μ in average.

The occurrence of this species along coastal regions of the country has been recorded by Wang and Nie ('32) from Amoy. The present specimens are, however, more resembling the typical form originally described by Kofoid and Campbell, while those from Amoy are much larger in size and their bulbous enlargement is exceedingly greater in transdiameter in



Fig. 3. *Tintinnopsis aperta* Brandt, $\times 376$.



Fig. 4. *Tintinnopsis tocantinensis* Kofoid and Campbell, $\times 640$.



Fig. 5. *Tintinnopsis gracilis* Kofoid and Campbell, $\times 579$.

proportion to the cylindrical oral part. Further description of the species was, therefore, made.

The species differs from *Tintinnopsis aperta* Brandt in its longer bulbous enlargement and in lack of spiral structure in that part. The bulbous enlargement is subequal in length to the oral cylindrical part. The foreign particles or grains on the wall of the bulbous enlargement are much larger in size and more densely agglutinated than those on the oral cylindrical part. The aboral region is conical and not distinctly delimited from its posterior horn by any constriction. The horn is rather long and more or less pointed. The distal opening is obliquely directed from the tip upward at one side of the horn. It is of irregular shape and varies in dimension.

Specimens were frequently found in the samples collected from various stations of the Gulf, especially Chinwangtao.

Tintinnopsis gracilis Kofoid and Campbell 1929

(Fig. 5)

Tintinnopsis karajacensis var. *a* Brandt 1906.

Lorica slender, cylindrical, about 3.33 oral diameters in length; oral rim rather smooth, not flaring; bowl of the oral diameter in transdiameter; aboral region distinctly conical, about 55° distally; aboral end bluntly pointed; wall not spiraled, agglutinated with foreign particles of medium size.

Length: 95 μ ; transdiameter: 25 μ .

Only one specimen of the species was observed from the collection made at Punglai (蓬萊). This differs from the individuals recorded from Amoy (Wang & Nie, '32) in that the aboral region is more conical and bluntly pointed at the extremity and the bowl is more cylindrical and longer in proportion to the oral diameter. It is more comparable to the figure of the typical form originally sketched by Brandt as cited by Kofoid and Campbell.

It is also the case that the wall of the lorica is not so thick as those specimens found from Borneo and Amoy. On the other hand, the wall appears semitransparent and rather

loosely agglomerated with foreign particles. The dimension of the lorica of the present individual is relatively small.

Tintinnopsis radix (Imhof) Brandt 1907

Codonella radix Imhof 1886.

Tintinnopsis davidoffi Daday 1887.

Tintinnopsis cylindrica (Wang & Nie 1932).

This species is mostly commonly found in the samples collected from all the surveyed stations of the Gulf. It varies from 174 to 435 μ in length and from 37 to 53 μ in oral diameter. *Tintinnopsis cylindrica* (Daday) reported by Wang and Nie ('32) from Amoy should be referred to the present species.

Family Codonellopsidae

Stenosemella pacifica Kofoid & Campbell 1929

(Fig. 6)

Tintinnopsis punctata forma *minor* Wailes 1925.

Tintinnopsis nucula, *partim* Campbell 1926.

Lorica somewhat ovoidal, 1.05 transdiameters or 2.40 oral diameters in length; collar somewhat slightly convex conical, 0.43 greatest transdiameter of bowl in oral diameter, about 0.09 of the total length or 0.22 of the oral diameter in height, with 10 to 12 subsemicircular openings or fenestrae around its base; bowl widest a little above the middle of the lorica, 2.30 oral diameters in transdiameter, with squarrose shoulder; aboral region subacute; aboral end tapered, blunt or subrounded, but not distinctly pointed; wall of bowl with rather coarse agglomerated material.¹

Length of bowl: 56 μ in average; transdiameter of bowl: 59 μ in average; length of collar: 5.6 μ in average; oral diameter: 25 μ in average.

Individuals of the species were occasionally found in the samples collected from Lungkou and Wei-Hai-Wei. They are much larger in dimension than the Californian forms, since,

according to Kofoid and Campbell's original descriptions, the latter vary from 35 to 40 μ in total length.

The collar is comparatively small in transdiameter and in height. It is slightly enlarged at the basal portion and becomes narrowed towards the oral margin. The wall of the collar appears very thin and hyaline and is perforated around its base with 10 to 12 subsemicircular fenestrae. The latter are very low and may be observed only under high magnification.

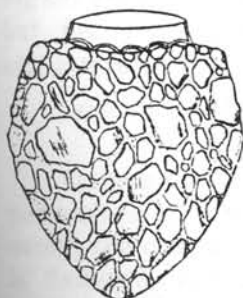


Fig. 6. *Stenosemella pacifica* Kofoid and Campbell, $\times 650$.

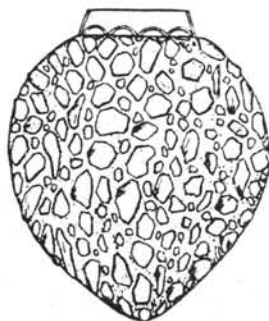


Fig. 7. *Stenosemella epunctata* sp. nov., $\times 626$.

The anterior end of the bowl is flattened and more or less depressed at the middle portion which is covered by the collar. Surrounding the collar, the bowl is slightly raised to form a prominent shoulder. Below the shoulder, the bowl inclines downward gradually until it approaches the greatest transdiameter a little above the middle of its long axis. The aboral region is convex conical, forming 70°-80° distally. The aboral end is usually bluntly tapered, but not distinctly pointed. The foreign bodies agglomerated on the wall of the bowl are rather large in size, especially those on the middle region.

The species differs from *Stenosemella nivalis* (Meunier) and *S. ventricosa* in the presence of fenestrae at the base of the collar.

Stenosemella epunctata sp. nov.

(Fig. 7)

Lorica more or less broadly ovoid, 1.18 to 1.21 transdiameters or 2.07 to 2.58 oral diameters in length; collar very slightly convex conical, 0.46 to 0.59 greatest transdiameter of the bowl in oral diameter, 0.09 to 0.11 of the total length or 0.13 to 0.23 of the oral diameter in height, with 10 to 12 subsemicircular openings or fenestrae around its base; bowl widest at the middle, 1.71 to 2.18 oral diameter in transdiameter; aboral region distinctly conical, about 90° distally; aboral end tapered, but not sharply pointed; wall of bowl with rather coarse agglomerated material.

Length of bowl: 55-60 μ ; transdiameter of bowl: 52-54 μ ; length of collar: 6.0-6.6 μ ; oral diameter: 24-32 μ .

Stenosemella epunctata differs from the preceding species particularly in the form of its bowl which is almost globular except the conical aboral region. The anterior end of the bowl is flattened, but never depressed centrally. The shoulder is never raised above the base of the collar as in the case of *S. pacifica*. It curves gradually and regularly downward from the flattened anterior end to the posterior third or fourth or the beginning of the aboral region. Thus, the lateral side is evenly rounded in appearance.

The bowl somewhat resembles that of *S. punctata* (Wailes) in shape. The wall is, however, not punctuated, but agglomerated with coarse and fine foreign bodies. The greatest transdiameter is always recorded at the middle instead of the anterior region as in the case of the latter species.

As shown by the record of measurements, the collar varies greatly in transdiameter. It occupies the entire flattened surface of the bowl and the larger the flattened surface, the broader is the transdiameter of the collar. The wall of the collar is thin and appears very transparent. The basal fenestrae are relatively large, in the form of broad and prominent semicircles.

Individuals were frequently observed in the samples collected from Lungkou, Wei-Hai-Wei and Chinwangtao.

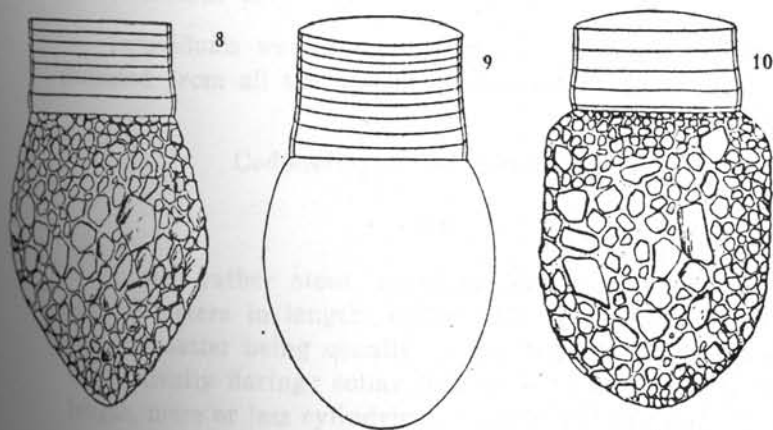
Codonellopsis mobilis sp. nov.

(Figs. 8-10)

Lorica stout, 2.00-2.32 oral diameters in length; collar always shorter than bowl, 0.27-0.34 of the total length in length, comparatively broad, not flaring at the oral margin, usually bulging out at the basal portion, with 4 to 10 spiral turns increasing in width towards the bowl; bowl variable in shape, generally ovoid or oblong, always longer than wide, widest at the middle, sometimes with a distinct sloping shoulder immediately below the base of the collar; aboral region more or less conical, 82° - 105° distally; aboral end tapering or sometimes evenly rounded; wall of bowl agglomerated with coarse foreign particles.

Length of bowl: 105 - 110μ ; transdiameter of bowl: 84 - 92μ ; length of collar: 30 - 48μ ; transdiameter of collar: 66 - 68μ .

The new species differs from *Codonellopsis morchella* (Cleve) and *C. orientalis* Hada in its greater transdiameter of the collar. The latter is also comparatively short, not flaring at the oral margin and always enlarged at the basal portion. Fenestrae are not present. The number of spiral turns increases with the length of the collar. The collar is always



Figs. 8-10. *Codonellopsis mobilis* sp. nov., all about $\times 465$.

wider than long and its length varies from 0.44 to 0.70 of the oral diameter.

The bowl varies very greatly in shape among different observed individuals. Usually they are oval or oblong, widest at the middle portion and contracted posteriorly (Fig. 8). Deviations from such a general type are, however, frequently seen. An extreme case of variation of the bowl is represented in figure 10. The middle portion appears cylindrical, with one lateral side being straightly parallel to the other. A sloping shoulder is well defined between its junction with collar and the cylindrical middle portion. There are also intermediate forms between this extreme case and the general oval type.

In the general types, the aboral region is convex conical, with more or less tapered aboral end. The latter is variable in degrees of angles and, as shown in the figures, the aboral end of the individual with cylindrical bowl is much less tapered than that of the general type. Individuals with evenly rounded aboral end (Fig. 9) have been also observed.

Notwithstanding the great variation of shape, the bowl is very slightly diverged in size. The proportions between its length and transdiameter and between the oral diameter and its dimensions are rather constant.

Individuals were found in great abundance in the samples collected from all the surveyed stations of the Gulf.

Codonellopsis pêhaiensis sp. nov.

(Fig. 11)

Lorica rather stout, more or less club-shaped, 3.1 to 3.3 oral diameters in length, collar and bowl subequal in length, with the latter being usually longer than the former; oral rim not distinctly flaring; collar 0.42 to 0.48 of the total length in length, more or less cylindrical, usually bulging out at the basal portion, with 10 to 19 spiral turns increasing in width towards the bowl, attached with numerous scattered fine foreign parti-

cles of various size and shape; bowl broadly ovate or rather pyriform, always longer than wide, widest at the middle; aboral region moderately convex conical, 85° - 90° distally; aboral end acuminate into a nipple-like process, wall of bowl agglomerated with coarse foreign particles.

Total length: 121 - 183μ ; length of collar: 51 - 88μ ; oral diameter: 37 - 62μ ; length of bowl: 70 - 95μ ; transdiameter of bowl: 59 - 88μ .

The new species may be distinguished from *Codonellopsis rotunda* Wang and Nie by the ovoid or pyriform bowl and from other known species of the genus by the attachment of fine foreign particles on the wall of the collar. The bowl is always longer than the collar and its transdiameter is 0.84 to 0.92 of its length or 1.41 to 1.60 of the oral diameter. The aboral region is convex conical and terminates into a nipple-like process which is more or less bluntly pointed.

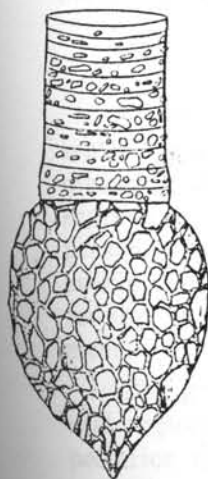


Fig. 11. *Codonellopsis pehaiensis* sp. nov., $\times 353$.

The collar is almost cylindrical, being enlarged at its basal portion and scarcely flaring at the oral rim. The foreign particles scattered on the wall of the collar are much smaller and finer than those agglomerated on the wall of the bowl. The spiral structure is well defined and its turns are variable in number according to the length of the collar. The longer the collar, the more are the coiled bands.

As shown by the above measurement, the lorica is very variable in size. The proportions between the size of collar and of bowl and between the oral diameter and length and transdiameter of collar and of bowl are, however, quite constant.

Individuals are frequently observed in the sample collected from Lungkou and Wei-Hai-Wei during the later part of November, 1934.

Family Cyttarocylidae

Subfamily Favellinae

Favella arcuata (Brandt) Jörgensen 1924

(Fig. 12)

Cyttarocylis arcuata Brandt 1906.*Cyttarocylis armata* Entz. 1908.

Lorica elongate campanulate, rather stout, 3.3-4.0 oral diameter in length; oral rim entire, with a more or less well developed flaring ring, slightly constricted below the ring; bowl cylindrical or subcylindrical for about 0.50 its length, slightly enlarged just below the suboral ring and at the beginning of the aboral region; aboral region tapering and more or less convex conical; aboral horn usually stout, but variable in thickness and length, 0.76 to 1.11 oral diameter in length, conical or tapering and with bluntly pointed extremity; wall with evenly distributed prismatic alveoli.

Length of bowl: 216-225 μ ; greatest transdiameter: 73-76 μ ; oral diameter 66-69 μ ; length of aboral horn: 50-83 μ .

It should be noted that the individuals of the species presently recorded appear more elongate in proportion to the oral diameter as compared with the original figure of Brandt as reproduced by Kofoed and Campbell in their monograph. The presence of an annular ring below the oral margin and the evenly distributed areoles on the wall, considered to be characteristic to the species, is well indicated in all observed specimens.

The greatest transdiameter is usually recorded at the suboral region. At the beginning of the aboral region or of the posterior third, the bowl is also enlarged and, sometimes, the transdiameter of this region is even greater than that of the suboral. The aboral region becomes gradually tapered downward from its greatest diameter to the aboral horn and appears conical in shape. The middle part of the bowl is more or less narrowed and, usually, there is a slight concavity perceptible below the enlarged suboral region.

In the most observed individuals, the aboral horn is very stout, conical in shape and never exceeding the oral diameter in length. In one specimen, the horn is, however, rather slender and very long, being 1.11 oral diameter in length. It is not evident whether this is an individual variation or an abnormal case.

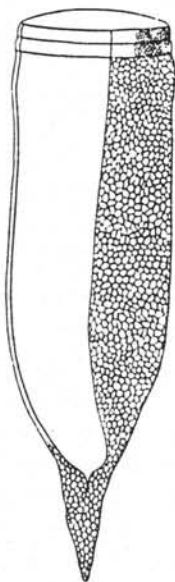


Fig. 12. *Favella arcuata* (Brandt),
×280.

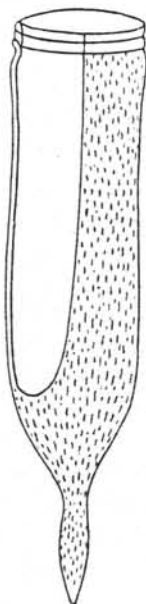


Fig. 13. *Favella cylindrica* sp. nov.,
×230.

The wall of lorica is marked with evenly distributed prismatic secondary alveoli. They are very fine and minute and never regularly polygonal in structure. The aboral horn is also adorned with alveoles.

Individuals were frequently found in the samples collected from various places of the Gulf.

Favella cylindrica sp. nov.

(Fig. 13)

Lorica elongate-campanulate or rather cylindrical chalice shaped, 4.5 oral diameter in length; oral rim entire, with a

thin but prominent and flaring ring; bowl cylindrical in the oral 0.65 of its length, with a well defined nuchal constriction and a very slight premedian lateral concavity; aboral region more or less tapering or slightly convex conical; aboral horn 0.93 oral diameter in length, enlarged basally, tapering and pointed distally, separated from the bowl by a slight constriction; wall with feebly developed longitudinal and irregular furrowings.

Length of bowl: 256μ ; greatest transdiameter: 75μ ; oral diameter: 71μ ; length of aboral horn: 67μ .

The new species is very rare in occurrence. The above description is based upon a single individual observed from a sample collected from Lungkou on November 20th, 1934.

The lorica appears more elongate and cylindrical than all other known species of the genus as judged from the proportion between the length and the oral diameter. It somewhat resembles *Favella franciscana* Kofoed and Campbell due to the presence of a flaring ring just below the oral margin and the feebly developed longitudinal and irregular furrowings on the wall of bowl. However, the latter species is much stouter in appearance and its oral margin is irregularly denticulated instead of smooth.

The greatest transdiameter is recorded at the suboral region and, between this and the flaring ring, there is a well defined nuchal constriction. The middle region of the bowl is usually slightly narrower than both anterior and posterior portions. Immediately after attaining its greatest width, the aboral region becomes gradually tapering downward until it approaches the junction with the aboral horn. The junction is well defined by a prominent constriction. The aboral horn is enlarged just below the junction, then becomes gradually tapered downward, and finally terminates into a pointed extremity.

Longitudinal and irregular furrowings on the wall of the bowl are fine and feeble as compared with those of *F. franciscana*. The aboral horn is not marked with stronger vertical ridges.

Parafavella elongata sp. nov.

(Fig. 14)

Lorica elongated tubular, about 5 oral diameters in length; oral margin denticulated with 20 to 24 comparatively large teeth; bowl almost cylindrical, slightly narrowed at the middle portion, widest at the point a little posterior to the oral extremity; aboral end evenly rounded or slightly flattened; aboral horn 0.04 or 0.05 of the total length in length, with pointed tip, obliquely directed; wall uniformly polygonate, 40 to 48 rows in the suboral circumference.

Length of bowl: 311-388 μ ; greatest transdiameter: 62-64 μ ; smallest transdiameter: 51-55 μ ; length of aboral horn; 14.6 μ in average.

The new species differs from *Parafavella rotundata* (Jørgensen) in the presence of an aboral horn and from *P. cylindrica* (Jørgensen) and *P. ventricosa* (Jørgensen) in the wider suboral region and the possession of comparatively fewer teeth. The aboral horn is rather short in proportion to the length of the bowl, developed from the middle of the aboral end and often obliquely directed toward one side of the lorica.

The greatest transdiameter is recorded at the suboral region and there is usually a slight constriction between the latter and the oral rim. Below the suboral region, the bowl is more or less cylindrical, with the posterior fifth or fourth being very slightly enlarged. The aboral end is evenly rounded in the most observed individuals, while, in others, it appears almost flattened.

The teeth on the oral margin are extremely few as compared with those in

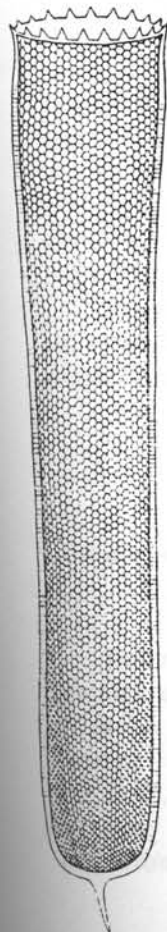


Fig. 14. *Parafavella elongata* sp. nov., $\times 315$.

other denticulated species of the genus. They are rather large and very prominent and their bases are seen to be distinctly separated one from another. *P. ventricosa* (Jørgensen) has been generally considered as also characterized by possessing few teeth on the oral margin. However, as shown in the figures sketched by Hada ('32) and by Kofoid and Campbell in their monograph ('29), the teeth of the latter species are usually over thirty in number and they are comparatively smaller and approximately set.

The lorica varies very much in length but not so in trans-diameter. Throughout its entire length, the bowl is uniformly marked with minute polygonal (hexagonal) areas. Each area is about 3μ in diameter. At the suboral region, the hexagons are counted to be consisted of forty to forty eight longitudinal rows around the circumference. The wall is very transparent.

Many individuals of the species were observed in samples collected from the eastern part of the Gulf, about thirty miles south from Port Author, during the middle part of June, 1935.

Family Tintinnidae

Subfamily Amphorellinae

Amphorellopsis acuta (Schmidt) Kofoid and Campbell 1929

Amphorella acuta Schmidt 1901.

Individuals of this species were frequently found in the samples collected from all the surveyed stations of the Gulf. It varies from 135 to 165μ in length, from 41 to 45μ in oral diameter and from 30 to 34μ in the greatest transdiameter of the bowl. The present specimens appear much larger in dimension, especially the length, than those recorded by Nie ('4) from Amoy.

Literature cited

- Fauré-Fremiet E. 1908. Étude descriptive des Péridiniens et des Infusoires Ciliés du plakton de la Baie de la Hougne. Ann. Sc. Nat. Zool., 9 Series, T. VII, 14.

- Hada, Y. 1932. Report of the Biological Survey of Mutsu Bay 26. The Pelagic Ciliata, Suborder Tintinnoinea. Sci. Rep. Tôhoku Imp. Univ., 4th Ser., Biol. Vol. 7, no. 4.
- Kofoed, C. A. and Campbell, A. S. 1929. A conspectus of the marine and fresh-water ciliata belonging to the suborder Tintinnoinea, with descriptions of new species principally from the Agassiz expedition to the Eastern tropical Pacific 1904-1905. Univ. Calif. Publ. Zool., Vol. 34.
- Nie, Dashu 1934. Notes on Tintinnoinea from the Bay of Amoy. Marine Biol. Assoc. China, 3rd Annual Report.
- Wang, C. C. and Nie, D. 1932. A survey of the Marine Protozoa of Amoy. Cont. Biol. Lab. Sci. Soc. China, Vol. 8.