CANADIAN PACIFIC FAUNA

1. PROTOZOA

1f. CILIATA

1g. SUCTORIA

BY

G. H. WAILES

WITH FIGURES

Printed by

THE UNIVERSITY OF TORONTO PRESS

for the

FISHERIES RESEARCH BOARD OF CANADA

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CILIATA ET SUCTORIA

SELECTED LITERATURE

The following list of selected literature includes recent monographs of certain divisions of the Protozoa and other works. Detailed references to the literature and synonomies of species are omitted from the text but will be found in the works indicated by the numbers after the name of each species.

(1) CALKINS, GARY N. Marine Protozoa from Woods Hole. Bull. U.S. Fish Comm., Vol. 21, pp. 415-468, 1902.

(2) CLAPARÈDE, E. ET J. LACHMANN. Etudes sur les Infusoires et les Rhizopodes. Geneve, 1858-1861. Mém. Inst. genèvoise, V, VI, VII.

(3) DONS, C. Neue Marine Ciliaten und Suctorien: Tromsö Mus. Aarsk., 38, 39, 1915.

(4) HAMBURGER, C. ET W. BUDDENBROCK. Nordische Ciliata, Suctoria. Nordisches Plankton, XIII, pp. 1-193, 1911.

(5) KAHL, A. Urtiere oder Protozoa. 1: Wimpertiere oder Ciliata. Die Tierwelt Deutschlands, T. 18, 21, 25 and 30. 1930-1935.

(6) KELLICOTT, D. S. Freshwater Infusoria. Proc. Amer. Soc. Micr. 10, 1888.

(7) KENT, SAVILLE. A Manual of the Infusoria. 2 vols. London, 1881-1882.

(8) KOFOID, CHAS. AND A. G. CAMPBELL. A conspectus of the Marine and Freshwater Ciliates belonging to the Suborder Tintinnoinea. Univ. Cal. Publ. Zool. 35, 1929.

(9) LEEGAARD, C. Untersuchungen über enige Plankton ciliaten des Meeres. Nyt. Mag. for Nat. vid., 53, 1915.

(10) LEEGAARD, C. Microplankton from the Finnish waters etc. Acta Soc. Sci. Fenn., 48, 1920.

(11) STEIN, FR. Der Organismus der Infusionsthiere Tiere. Vols. I-III. Leipzig 1859, 1867 and 1878.

(12) WAILES, G. H. Some new or rare Protozoa from British Columbia. Ann. Mag. Nat. Hist., Ser. 9, Vol. XVI, pp. 40-48, 1925.

(13) WAILES, G. H. Tintinnidae from the Strait of Georgia, B.C. Contr. Canadian Biol. N.S. Vol. II, no. 22, pp. 531-544, 1925.

(14) WAILES, G. H. Freshwater and Marine Protozoa from British Columbia. Vancouver Mus. and Art Notes, Vol. IV, Nos. 3, 4, 1928.

(15) WAILES, G. H. Marine Ciliates of the Genus Laboea. Ann. Protistol. 2, 1929.

(16) WAILES, G. H. Tintinnidae from the Strait of Georgia, B.C. Vancouver Mus. and Art Notes, Vol. IV, No. 3, 1929 with addendum, Vol. V, No. 1, 1930.

(17) WAILES, G. H. Description of new species of Protozoa from British Columbia. Contr. Canadian Biol. and Fish., Vol. 7, pp. 213-219, 1932.

INFUSORIA (seu CILIOPHORA)

The members of this class are characterized by the possession of cilia. Those of the subclass Ciliata have these structures well developed for locomotion and food-getting, while those of the subclass Suctoria have cilia only in the young stages and lose them upon attachment. They possess macro- and micronuclei. Sexual reproduction is mainly by conjugation and asexual by binary fission or budding.

KEY TO SUBCLASSES

1. (2) With cilia. CILIATA (p. 2)
2. (1) Without cilia in the adult stage; tentacles present. SUCTORIA (seu TENTACULIFERA) (p. 37)

CILIATA

Cilia present, in some forms replaced by cirri; pellicle usually very thin; macronucleus large, micronucleus very small; cytostome usually present.

KEY TO ORDERS

1. (2) Without a specialized fringe of large cilia (adoral zone). HOLOTRICHIDA (p. 2)
2. (1) Adoral zone present.
3. (4) With a general covering of cilia. HETEROTRICHIDA (p. 9)
4. (3) Without a general covering of cilia.
5. (6) With cilia on the ventral side only. HYPOTRICHIDA (p. 27)
6. (5) With cilia in region of adoral zone and about mouth only. PERITRICHIDA (p. 29)

HOLOTRICHIDA

KEY TO SUBORDERS

1. (2) Mouth closed except during food ingestion; no undulating membrane. GYMNOSTOMOINEA (p. 2)
2. (1) Mouth always open; with undulating membrane. TRICHOSTOMOINEA (p. 7)

GYMNOSTOMOINEA

KEY TO FAMILIES

1. (4) Mouth terminal or subterminal.
2. (3) Mouth terminal and conspicuous. ENCHELINIDAE (p. 3)
3. (2) Mouth subterminal, inconspicuous. TRACHELINIDAE (p. 5)
4. (1) Mouth central or posterior. CHLAMYDODONTIDAE (p. 6)

ENCHELINIDAE

KEY TO GENERA

1. (10) Body without shell.
2. (7) No tentacles or bristles.
3. (4) Body elongate, flexible and elastic. **CHAENIA** (p. 3)
4. (3) "Neck" only highly flexible and elastic.
5. (6) "Head" conical, body flask shaped. **LACRYMARIA** (p. 3)
6. (5) "Head" truncate, body elongate. **TRACHELOCERA** (p. 4)
7. (2) Tentacles present.
8. (9) Body asymmetrical; four small tentacles from mouth; cilia and cirri in girdles. **MESODINIUM** (p. 4)
9. (8) Body symmetrical; no tentacles; cilia and cirri in girdles. **DIDINIUM** (p. 5)
10. (1) Body with shell composed of small sculptured pieces; cilia long, uniform. **TIARINA** (p. 5)

Genus **CHAENIA**

C. teres Dujardin, 7 (Fig. 1).

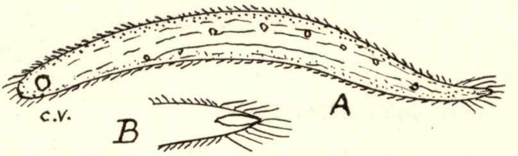

Fig. 1. *Chaenia teres* Duj. A, animal partially extended; B, mouth, enlarged. x 400.

Hinder end of body somewhat abruptly pointed; oral cirri pointing forwards.

Length variable up to about 200 to 250μ when extended.

Strait of Georgia; among decayed algae; freshwater and marine.

Similar to *C. elongata* but in that species the long oral cilia point backwards.

Genus **LACRYMARIA**

KEY TO SPECIES

1. (2) Body flask shaped without long "neck". **lagenula** (p. 3)
2. (1) Body pointed posteriorly, with long "neck". **olor** (p. 4)

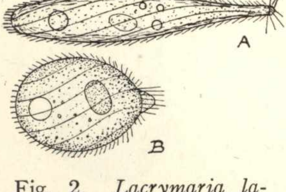

Fig. 2. *Lacrymaria lagenula* C. & L. A, animal extended; B, animal contracted. x 300.

L. lagenula Claparède and Lachmann, 2, 5 (Fig. 2).

Body when extended flask-like in shape with spiral markings.

Length of body when extended from 60 to 120μ or more.

Strait of Georgia among decayed algae.

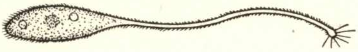

Fig. 3. *Lacrymaria olor* O.F.M. x 200.

L. olor O. F. Müller 5, 7 (Fig. 3).

When alive is characterized by the snake-like movements of its long "neck"; body with spiral markings and hinder end bluntly pointed.

Length when extended 200 to 400μ or more.

Strait of Georgia among algae; freshwater and marine.

Genus **TRACHELOCERA**

T. phoenicopterus Cohn 5, 7 (Fig. 4).

Body with longitudinal markings and posterior end rounded.

Length 200 to 400μ; stated to reach 1000μ or more.

Strait of Georgia among algae and in infusions.

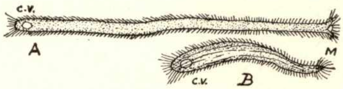

Fig. 4. *Trachelocera phoenicopterus* Cohn. A, animal extended; B, animal contracted; M, mouth; c.v. contractile vacuole. x 200.

Genus **MESODINIUM**

KEY TO SPECIES

1.	(2)	Mouth with 4 to 8 tentacles.	**pulex**	(p. 4)
2.	(1)	Mouth destitute of tentacles.	**rubrum**	(p. 4)

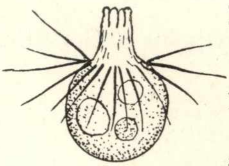

Fig. 5. *Mesodinium pulex* C. & L. x 600.

M. pulex Claparède and Lachmann, 2, 5 (Fig. 5).

Cilia and cirri in a double girdle; body colourless or yellowish.

Movements rapid and sudden; when stationary has the appearance of a heliozoon.

Length about 30μ.

Among algae and decayed vegetation in beach pools; brackish and freshwater.

M. rubrum (Lohmann) 5, 7 (Fig. 6).

Body dark red in colour but otherwise very similar to *M. pulex*.

Length 30 to 36μ; breadth two-thirds the length.

Departure bay, in plankton off float; numerous at times; marine and brackish water.

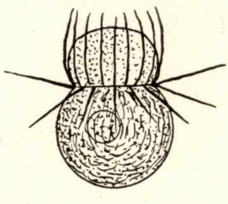

Fig. 6. *Mesodinium rubrum* (Lohm.). x 600.

Genus **DIDINIUM**

KEY TO SPECIES

1. (2)	Mouth broad and not prominent.	**balbiani**	(p. 5)
2. (1)	Mouth narrow and prominent.	**nasutum**	(p. 5)

D. balbiani Bütschli 5, 7 (Fig. 7).

Body with a single ring of membranelles; mouth broad, armed with trichites.

Diameter 40 to 65 μ.

Among algae in beach pools; occasionally in the plankton near shore; fresh and brackish water.

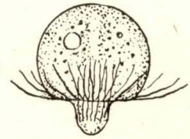

Fig. 7. *Didinium balbiani* Bütschli. x 300.

D. nasutum O. F. Müller 5, 7 (Fig. 8).

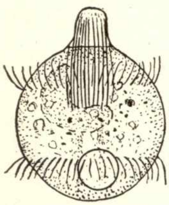

Fig. 8. *Didinium nasutum* O.F.M. x 300.

Body with two rings of membranelles and larger than *D. balbiani* but otherwise similar; mouth narrow.

Diameter 65 to 71μ; length 80 to 90 μ.

Departure bay in plankton off float and among algae; freshwater and marine.

Genus **TIARINA**

T. fusus Claparède and Lachman 2, 5 (Fig. 9).

Body fusiform covered by plates arranged in four transverse rows; aboral end pointed.

Length 80 to 115μ; diameter 30 to 45μ.

Generally distributed in the plankton near shore.

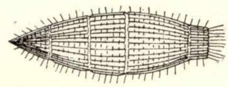

Fig. 9. *Tiarina fusus* C. & L. x 300.

TRACHELINIDAE

KEY TO GENERA

1. (2)	Proboscis not marked off from main body.	**LOXOPHYLLUM**	(p. 5)
2. (1)	Proboscis easily distinguished from the main body.	**LIONOTUS**	(p. 6)

Genus **LOXOPHYLLUM**

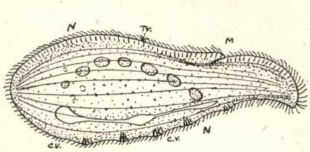

Fig. 10. *Loxophyllum meleagris* O.F.M. x 125.

L. meleagris O. F. Müller 5, 7 (Fig. 10).

Mouth situated some distance from anterior end; nucleus moniliform; contractile vacuole long; trichocysts numerous.

Length about 300 to 350μ.

Amongst algae in beach pools; freshwater and marine.

Genus **LIONOTUS**

KEY TO SPECIES

1. (2) Body with long "neck"; length over 100 μ. **anser** (p. 6)
2. (1) Body without definite "neck"; length not over 100μ. **fasciola** (p. 6)

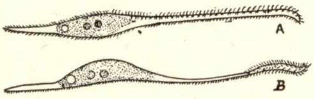

Fig. 11. *Lionotus anser* (Ehrenb.) A, dorsal; B, lateral view. x 100.

L. anser (Ehrenberg) 5, 7 (Fig. 11).

Syn. *Lionotus* (Vibrio) *cygnus* (O. F. M.).

The mouth is situated at the base of the long "neck."

Length up to about 400μ.

Amongst algae; brackish and freshwater.

L. fasciola O. F. Müller 5, 7 (Fig. 12).

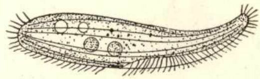

Fig. 12. *Lionotus fasciola* O.F.M. x 350.

Proboscis tapers gradually into body without a definite "neck"; body with longitudinal markings.

Length 80 to 100μ.

Amongst algae; freshwater and marine.

CHLAMYDODONTIDAE

KEY TO GENERA

1. (2) Body cylindrical. **NASSULA** (p. 6)
2. (1) Body flat. **DYSTERIA** (p. 6)

Genus **NASSULA**

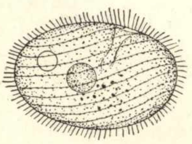

Fig. 13. *Nassula microstoma* Cohn. x 375.

N. microstoma Cohn 5, 7 (Fig. 13).

Syn. *N. notata* (O. F. Müller).

Body ovoid, no transverse row of cilia present; contractile vacuole situated posteriorly or inconspicuous.

Length 55 to 100μ; breadth two-thirds of the length.

Amongst shore algae; freshwater and marine.

Genus **DYSTERIA**

D. monostyla (Ehrenberg) 5, 7 (Fig. 14).

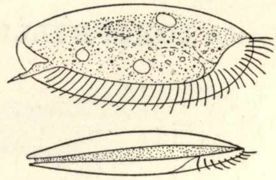

Fig. 14. *Dysteria monostyla* (Ehrenb.). Broad and narrow side views. x 350.

Syn. *Dysteria* (Ervilia) *legumen* Dujardin.

Body oval, compressed; right edge of body only provided with cilia; a prominent style situated posteriorly.

Length about 140μ (80 to 100μ).

Departure bay, among algae and hydrozoa.

TRICHOSTOMOINEA

KEY TO FAMILIES

1. (2) Peristomal depression faint or absent. CHILIFERIDAE (p. 7)
2. (1) Peristome large, prominent.
3. (4) One or more large undulating membranes in long peristome along ventral side. PLEURONEMIDAE (p. 8)
4. (3) Undulating membrane confined to gullet. PARAMAECIDAE (p. 8)

CHILIFERIDAE (**Frontoniidae** Kahl)

Mouth in anterior half of body; pharynx short or absent; peristome small, circular or ellipsoidal.

KEY TO GENERA

1. (4) Body oval.
2. (3) Uniformly ciliated. **FRONTONIA** (p. 7)
3. (2) With caudal bristles. **URONEMA** (p. 7)
4. (1) Body bean- or kidney-shaped.
5. (6) Mouth not terminal. **COLPIDIUM** (p. 8)
6. (5) Mouth terminal. **PLACUS** (p. 8)

Genus **FRONTONIA**

F. marina Fabre-Domergue 5 (Fig. 15).

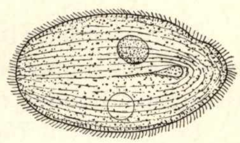

Fig. 15. *Frontonia marina* Fabre-Domergue. x 250.

Syn. *Frontonia leucas* var. *marina* Florentin.

Anterior end of body broadly rounded, tapering gradually to the posterior; concentric longitudinal markings on body.

Length 95 to 300μ or more.

Amongst algae.

Genus **URONEMA**

U. marinum Dujardin 5 (Fig. 16).

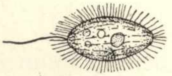

Fig. 16. *Uronema marinum* Duj. x 500.

Posterior end of body broadly rounded tapering to the anterior end which is blunt with a short depression leading to the mouth.

Length 20 to 50μ; breadth 12 to 24μ.

Amongst decaying algae; numerous.

Genus **COLPIDIUM**

C. colpoda Ehrenberg 2, 5 (Fig. 17).

Body bean-shaped with a diagonal (adoral) depression or fold on the dorsal side of the body situated anteriorly.

Length 50 to 120μ.

Amongst algae and in infusions; common.

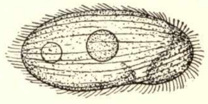

Fig. 17. *Colpidium colpoda* Ehrenb. x 300.

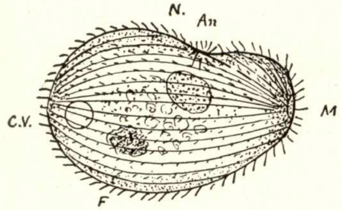

Fig. 18. *Placus socialis* Fabre-Domergue. x 550.

Genus **PLACUS**

P. socialis Fabre-Domergue 2, 5 (Fig. 18).

Body kidney-shaped with 30-34 rows of cilia spirally disposed; mouth situated terminally.

Length 60μ (40-50μ); breadth 40μ.

Departure bay in plankton off the wharf.

PLEURONEMIDAE

Genus **LEMBUS**

L. elongatus Claparède and Lachmann 2, 5 (Fig. 19).

Syn. *Vibrio verminus* O. F. Müller.

Body slender with attenuate anterior portion; the caudal bristle may occasionally be only slightly longer than the adjoining cilia.

Length about 75μ.

In infusions of algae.

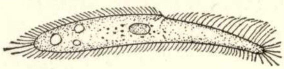

Fig. 19. *Lembus elongatus* C. & L. x 400.

PARAMAECIDAE

Genus **PARAMAECIUM**

P. caudatum Ehrenberg 1, 5, 7 (Fig. 20).

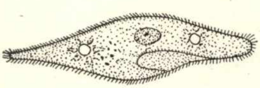

Fig. 20. *Paramaecium caudatum* Ehrenb. x 200.

Syn. *P. aurelia* O. F. Müller
non *P. aurelia* Ehrenberg.

Body elongate ovoid, usually widest behind mouth which is situated pre-medianally; hinder end bluntly rounded; two micronuclei present.

Length 150 to 160μ (70 to 320μ).

Amongst algae; freshwater and marine.

HETEROTRICHIDA

KEY TO SUBORDERS

1. (4) Without a test (lorica).
2. (3) Cilia covering the body. POLYTRICHOINEA (p. 9)
3. (2) Cilia reduced to certain localized areas. OLIGOTRICHOINEA (p. 11)
4. (1) With a test; ring of cilia within adoral zone; body attached by a stalk to test. TINTINNOINEA (p. 13)

POLYTRICHOINEA

KEY TO FAMILIES

1. (2) Peristome narrow and long with an adoral zone along the left edge. PLAGIOTOMIDAE (p. 9)
2. (1) Peristome depression short, limited to anterior end; its plane at right angles to the long axis of the body. STENTORIDAE (p. 9)

PLAGIOTOMIDAE

Genus **METOPUS**

M. es O. F. Müller 2, 5 (Fig. 21).

Syn. *M. sigmoides* C. & L.

Body of medium size, sigmoidal in shape, tapering to the hinder end which is bluntly rounded; peristome about half length of body; undulating membrane small; nucleus ellipsoidal.

Length 80 to 150μ.

Amongst marine algae and in infusions; generally distributed.

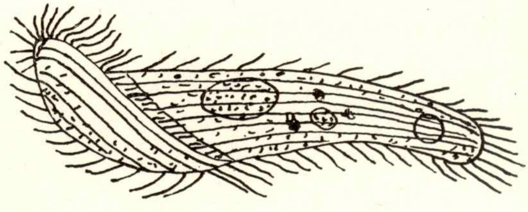

Fig. 21. *Metopus es* O. F. Müller. x 500.

STENTORIDAE

KEY TO GENERA

1. (2) Peristome circular in outline; limited to the anterior end. **STENTOR** (p. 9)
2. (1) Peristome drawn out into two wing-like processes; tube-dwelling. **FOLLICULINA** (p. 10)

Genus **STENTOR**

KEY TO SPECIES

1. (2) Body trumpet-shaped with deeply divided peristome. **auriculatus** (p. 10)
2. (1) Body broadest behind circular peristome. **multiformis** (p. 10)

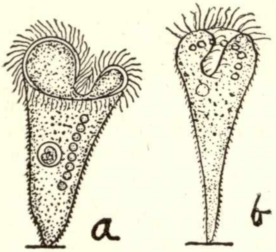

Fig. 22. *Stentor auriculatus* Kahl. a, animal expanded, x 100; b, partially contracted and extended, x 75.

S. auriculatus Kahl 5, 7, 14 (Fig. 22).

Syn. *S. auricula* Grüber 1884, Wailes 14.

Body faintly striated and nearly colourless; nucleus moniliform.

Length 275 to 400μ when extended.

Departure bay on algae; not uncommon.

S. multiformis O. F. Müller 5, 7, 14 (Fig. 23).

The body strongly striated and coloured blue-green; attached or free-swimming.

Length 150 to 200μ.

Gabriola pass on algae; Departure bay in tide pools; brackish water and marine.

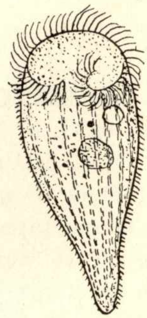

Fig. 23. *Stentor multiformis* O.F.M. x 300.

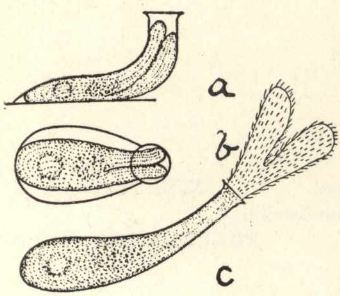

Fig. 24. *Folliculina ampulla* O.F.M. A, side view and B, dorsal view of short-necked form; C, long-necked form with animal extended. x 100.

Genus **FOLLICULINA**

F. ampulla O. F. Müller 5, 7, 14 (Fig. 24).

Occurs in two forms, short-necked (figures a and b) and long-necked (figure c); colour indigo or sea green.

Length of lorica of short-necked form 175 to 200μ; long-necked lorica up to 500μ or more in length.

Strait of Georgia, generally distributed on algae, Bryozoa, etc., also dredged from depths down to 40 metres.

OLIGOTRICHOINEA

HALTERIIDAE

Cilia limited to one or more girdles around body.

KEY TO GENERA

1.	(2)	Central girdle of bristle-like cirri.	**HALTERIA** (p. 11)
2.	(1)	No girdle as above.	**STROMBIDIUM** (p. 11)

Genus **HALTERIA**

H. grandinella Müller 5, 7 (Fig. 25).

Body small, top-shaped with a central girdle of cirri; mouth with circular peristome furnished with stout cirri; nucleus ovoid situated centrally. Its movements are sudden and rapid, similar to those of *Mesodinium pulex* (fig. 5).

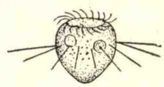

Fig. 25. *Halteria grandinella* Müller. x 350.

Length about 25μ (20-40μ).

Departure bay, in tide pools of brackish water.

Genus **STROMBIDIUM**

Following Kahl (1932) the genus *Laboea* is included in this genus; it i exclusively planktonic.

KEY TO SPECIES

1.	(2)	Lorica extending only over the posterior part of the body.	**sulcatum** (p. 11)
2.	(1)	Lorica extending over major portion of body.	
3.	(4)	Lorica helical.	**strobilus** (p. 12)
4.	(3)	Lorica conical.	
5.	(10)	Cone tapering abruptly to a point.	
6.	(7)	Cone broad.	**conicum** (p. 12)
7.	(6)	Cone more slender.	
8.	(9)	Cone slender, tapering gradually.	**cornucopiae** (p. 12)
9.	(8)	Cone tapering abruptly from midway of its length.	**acuminatum** (p. 12)
10.	(5)	Cone ovoidal, broadly rounded posteriorly.	**ovale** (p. 12)

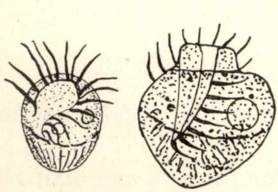

Fig. 26. *Strombidium sulcatum* C. & L. x 300.

S. sulcatum Claparède and Lachmann 2, 5 (Fig. 26).

Lorica conical, more or less fluted, covering only posterior portion of body.

Length 40 to 68μ; diameter 30 to 57μ.

Strait of Georgia among algae and *Zostera;* not found in the plankton.

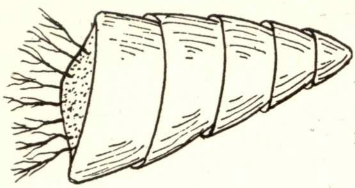

Fig. 27. *Strombidium strobilus* (Lohmann). x 400.

S. (Laboea) strobilus (Lohmann) 5, 7, 9 (Fig. 27)

Syn. *Conocylis helix* Meunier.

Lorica helical with four or five coils; peristome more or less retractile.

Length 80 to 97μ; breadth 55 to 68μ.

Quatsino sound plankton; rare.

S. (Laboea) conicum (Lohmann) 5, 9, 10 (Fig. 28).

Lorica conical with fine longitudinal lines, fundus acutely rounded; body not entirely filling lorica.

Length 40 to 75μ; breadth 35 to 55μ.

West coast of Vancouver island; Departure bay.

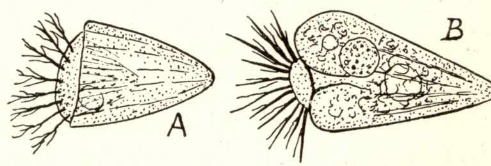

Fig. 28. *Strombidium conicum* (Lohmann). A, from Barkley sound x 400; B, from Departure bay x 550.

S. (Laboea) cornucopiae (Wailes) 5, 9, 15 (Fig. 29).

Lorica long, slender, tapering gradually to an acute point, coarsely striated. Distinguished from *S. acuminatum* by its larger size, uniform taper of its lorica and its prominent striations.

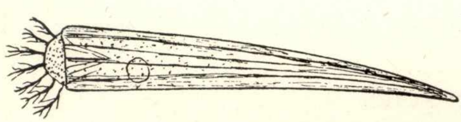

Fig. 29. *Strombidium cornucopiae* (Wailes). x 400.

Length 97 to 200μ; breadth 23 to 35μ.

West coast of Vancouver island plankton; not uncommon.

S. (Laboea) acuminatum (Leegaard) 5, 9, 15 (Fig. 30).

Lorica of uniform diameter for a third of its length, thence tapering in a curve to a point; finely striated.

Length 65 to 85 μ; breadth 17 to 26μ.

Barkley sound; Departure bay.

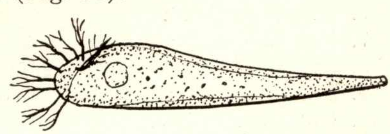

Fig. 30. *Strombodium acuminatum* (Leegaard). x 600.

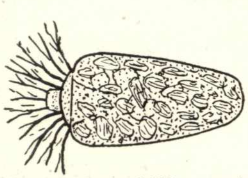

Fig. 31. *Strombidium ovale* (Leegaard). x 400.

S. (Laboea) ovale (Leegaard) 5, 9, 15 (Fig. 31).

Lorica conical, curving gradually to a point; striae absent.

Length 50 to 60μ; breadth one-third to one-half the length.

Departure bay; rare.

TINTINNOINEA

TABLE OF FAMILIES

1. Lorica in species found here, cylindrical or thimble-shaped; aboral end rounded or furnished with a horn; aperture not constricted; wall composed of minute primary alveoli with agglomerated foreign matter; spiral structure rare. CODONELLIDAE (p. 13)
2. Lorica conical or bowl-shaped; aperture contracted with hyaline collar; sometimes fenestrated; sometimes with agglomerated material. CODONELLOPSIDAE (p. 17)
3. Lorica thin, elongate, wholly or largely with spiral structure; aboral end usually closed; wall without agglomerated particles. COXIELLIDAE (p. 19)
4. Lorica usually large and campanulate or cylindrical; aboral end closed; wall with regular secondary structure. CYTTAROCYLIDAE (p. 19)
5. Lorica acorn-shaped or bell-shaped; wall bilaminate, reticulated except in the sub-oral region; aboral region sculptured externally. PTYCHOCYLIDAE (p. 21)
6. Lorica cylindrical with conical aboral end, without ribs or spiral structure; wall with prisms and secondary structure or hyaline. XYSTONELLIDAE (p. 23)
7. Lorica more or less goblet-shaped; aboral end closed; wall trilaminate. UNDELLIDAE (p. 24)
8. Lorica hemispherical or bowl-shaped with prominent collar having a single or double row of fenestrae. DICTYOCYSTIDAE (p. 24)
9. Lorica cylindrical or conical with straight or everted apertures, hyaline. TINTINNIDAE (p. 25)

CODONELLIDAE

Genus **TINTINNOPSIS**

Lorica consisting of a pellicle more or less covered with foreign particles; cylindrical or thimble shaped; aperture not constricted, with or without a collar; aboral end rounded or provided with a more or less prolonged apex; neritic marine plankton and freshwater.

Two freshwater species having cylindrical tests with parallel sides and hemispherical aboral ends are usually included in the genus *Tintinnidium* Stein: the only species recorded from the Canadian Pacific coast conforming to this description are *T. minuta* and *T. sacculus*.

KEY TO SPECIES

1.	(18)	Lorica cylindrical, that is, of uniform diameter except at aboral end.		
2.	(7)	Lorica elongate with a slender aboral extension.		
3.	(4)	Lorica with oral lip.	**coronata**	(p. 14)
4.	(3)	Lorica without oral lip.		
5.	(6)	Lorica 120 to 240μ in length, aboral extension fairly stout.	**cylindrica**	(p. 14)
6.	(5)	Lorica 50 to 70μ in length; aboral extension small and pointed.	**laevigata**	(p. 14)
7.	(2)	Lorica not as above.		
8.	(13)	Lorica rounded at aboral end.		
9.	(10)	Lorica small; diameter 12 to 16 μ.	**minuta**	(p. 15)
10.	(9)	Lorica much larger.		
11.	(12)	Lorica diameter 30 to 60μ; length 1 to 2 times diameter.	**sacculus**	(p. 15)
12.	(11)	Lorica diameter 30 to 65μ; length $2\frac{1}{3}$ to 3 times diameter.	**karajacensis**	(p. 15)

13. (8) Lorica conical and pointed at aboral end.
14. (15) Aboral tip deflected 45°. **wailesi** (p. 15)
15. (14) Aboral tip not deflected.
16. (17) Aboral tip bluntly pointed. **beroidea** (p. 15)
17. (16) Aboral tip sharply pointed. **strigosa** (p. 16)
18. (1) Lorica not cylindrical.
19. (20) Lorica campanulate. **nitida** (p. 16)
20. (19) Lorica not campanulate.
21. (22) Lorica with a bulbous expansion in posterior portion. **subacuta** (p. 16)
22. (21) Lorica with posterior portion not bulbous but somewhat expanded.
23. (24) Lorica with anterior portion somewhat funnel-shaped. **bermudensis** (p. 16)
24. (23) Lorica with anterior portion cylindrical. **parvula** (p. 16)

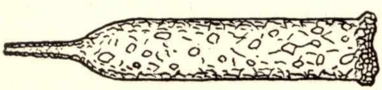

Fig. 32. *Tintinnopsis coronata* K. & C. x 200.

T. coronata Kofoid and Campbell 8, 16 (Fig. 32).

Lorica cylindrical with oral lip and hollow aboral spine.

Length 150 to 250μ; diameter 40μ.

Strait of Georgia; rare.

T. cylindrica Daday 8, 16 (Fig. 33).

Lorica cylindrical with parallel sides; aboral end contracted to a hollow spine or horn; diameter of lorica very constant but length very variable.

Length 120 to 240μ; diameter 38 to 40μ.

Generally distributed, common.

A form of this species larger in diameter, but otherwise similar, also occurs (figure B).

Diameter 45 to 60μ; length 130 to 160μ.

Generally distributed, scarce.

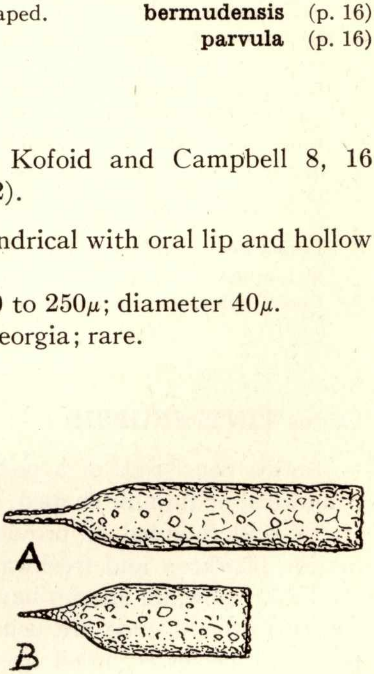

Fig. 33. *Tintinnopsis cylindrica* Daday. A, normal form; B, short form. x 200.

T. laevigata Kofoid and Campbell 8, 16 (Fig. 34).

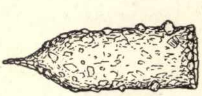

Fig. 34. *Tintinnopsis laevigata* K. & C. x 400.

Lorica similar to that of *T. cylindrica* but smaller, the length equal to about 2½ times the diameter.

Length 50 to 70μ; diameter 20 to 30μ.

Strait of Georgia and west coast of Vancouver island; scarce.

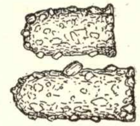

Fig. 35. *Tintinnopsis minuta* Wailes. x 500.

T. minuta Wailes 8, 13, 16 (Fig. 35).

Lorica cylindrical with hemispherical aboral end devoid of any spine; length equal to twice diameter.

Length 22 to 32μ; diameter 12 to 15μ.

Strait of Georgia; scarce.

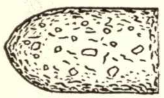

Fig. 36. *Tintinnopsis sacculus* Brandt. x 200.

T. sacculus Brandt 8, 16 (Fig. 36).

Lorica cylindrical; aboral end rounded; length 1 to 2 times diameter. Distinguished from *T. karajacensis* by its shorter proportional length.

Length 50 to 100μ; diameter 30 to 60μ.

Generally distributed.

T. karajacensis Brandt 8, 16 (Fig. 37).

Lorica cylindrical or tapering slightly posteriorly; aboral end rounded; length $2\frac{1}{3}$ to 3 times diameter.

Length 85 to 150μ; oral diameter 30 to 65μ.

Generally distributed; numerous.

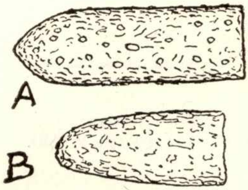

Fig. 37. *Tintinnopsis karajacensis* Brandt, A, typical form; B, slightly conical form not uncommon. x 200.

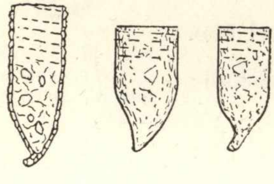

Fig. 38. *Tintinnopsis wailesi* K. & C. x 300.

T. wailesi Kofoid and Campbell 8, 16 (Fig. 38).

Lorica cylindrical with aboral end sharply pointed and deflected 45°.

Length 58 to 75μ; diameter from one-half to one-third the length, 23 to 30μ.

Strait of Georgia; west coast of Vancouver island; rare; also found in a pilchard stomach.

T. beroidea Stein, emend. Entz, emend. Joerg. 8, 16 (Fig. 39).

Lorica cylindrical, aboral end bluntly pointed; length less than $2\frac{1}{2}$ times the diameter. Distinguished from *T. sacculus* by its somewhat conical aboral end.

Length 55 to 100μ; diameter 30 to 40μ.

Generally distributed; not numerous.

Fig. 39. *Tintinnopsis beroidea* Stein emend. x 200.

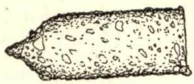

Fig. 40. *Tintinnopsis strigosa* Meunier. x 300.

T. strigosa Meunier 8, 16 (Fig. 40).

Lorica cylindrical with sharply pointed, conical aboral end.

Length 80μ; diameter 30 to 33μ.

Strait of Georgia off Departure bay.

T. nitida Brandt 8, 13, 16 (Fig. 41).

Lorica campanulate with somewhat pointed aboral end.

Length 65 to 75μ; diameter of collar 43 to 50μ.

Generally distributed; not numerous.

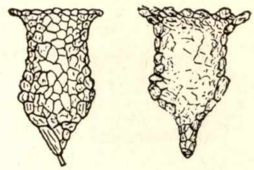

Fig. 41. *Tintinnopsis nitida* Brandt. x 300.

Fig. 42. *Tintinnopsis subacuta* Joerg. x 200.

T. subacuta Joergensen 8, 16 (Fig. 42).

Lorica cylindrical with bulbous posterior expansion.

Length 160μ; diameter 21μ; fundus 30μ diameter.

Strait of Georgia; rare.

T. bermudensis Brandt 8, 16 (Fig. 43).

Lorica with bowl-shaped posterior portion and somewhat funnel-shaped anterior portion; length of neck from one-quarter to one-half total length of lorica.

Length 105μ; diameter of orifice 58μ; diameter of bowl 65μ.

Off cape Beal, January; a southern species occasionally carried north.

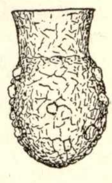

Fig. 43. *Tintinnopsis bermudensis* Brandt. x 200.

T. parvula Joergensen 8, 16 (Fig. 44).

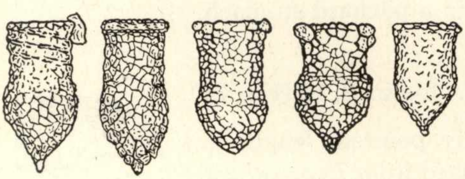

Fig. 44. *Tintinnopsis parvula* Joerg., different forms. x 300.

Anterior part of lorica cylindrical, slightly enlarged posteriorly; aboral end pointed; aperture without a projecting collar but usually thickened externally. This species within certain limits shows a great variety of form.

Length 55 to 100μ; diameter 30 to 55μ.

Generally distributed; numerous.

CODONELLOPSIDAE

Genus **STENOSEMELLA**

Lorica bowl-shaped; aperture contracted and provided with a short hyaline collar; lorica covered with agglomerated material or a coarse reticulum.

KEY TO SPECIES

1. (2) Lorica with a prominent projecting rim at oral end. **expansa** (p. 17)
2. (1) Lorica not as above.
3. (8) Lorica with about 12 basal openings in collar.
4. (5) Lorica bowl-shaped. **inflata** (p. 17)
5. (4) Lorica more or less cordiform.
6. (7) Lorica distinctly cordiform with rounded shoulder; length 60 to 75μ. **punctata** (p. 17)
7. (6) Lorica less distinctly cordiform with squarish shoulder; length 35 to 40μ. **pacifica** (p. 18)
8. (3) Lorica without openings in collar.
9. (10) Lorica with a sharp shoulder and a slight contraction beneath it. **steini** (p. 18)
10. (9) Lorica with rounded shoulder.
11. (12) Lorica cordiform; collar very low; length 60 to 75μ. **ventricosa** (p. 18)
12. (11) Lorica with sloping shoulder; collar high; length 35 to 45μ. **nivalis** (p. 18)

S. expansa (Wailes) K. & C. 8, 16 (Fig. 45).

Lorica bowl-shaped with wide projecting rim, aperture contracted, furnished with a very low collar.

Length 68 to 80μ; diameter of body 60 to 68μ; diameter of rim 77 to 90μ.

Strait of Georgia; scarce.

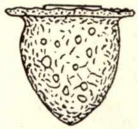

Fig. 45. *Stenosemella expansa* (Wailes). x 200.

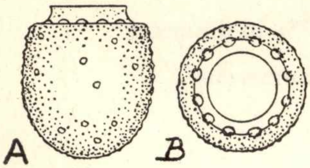

Fig. 46. *Stenosemella inflata* K. & C. A, side view; B, oral view. x 300.

S. inflata Kofoid and Campbell 8, 16 (Fig. 46).

Lorica bowl-shaped, shoulder not rounded; base of collar with twelve elliptical orifices, symmetrically placed.

Length 60 to 77μ; diameter 55 to 68μ; aperture 29 to 32μ.

Generally distributed; occasionally numerous.

S. punctata (Wailes) 8, 16 (Fig. 47).

Lorica cordiform; base of collar with twelve elliptical orifices.

Length 60 to 70μ; diameter 55 to 61μ; aperture 29 to 30μ.

Generally distributed; sometimes numerous.

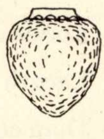

Fig. 47. *Stenosemella punctata* (Wailes). x 200.

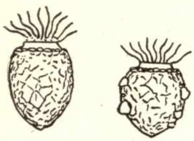

Fig. 48. *Stenosemella pacifica* K. & C. x 300.

S. pacifica Kofoid and Campbell 8, 16 (Fig. 48).

Lorica cordiform with squarish shoulder; orifice with low collar; aboral end bluntly pointed.

Length 32 to 42μ; diameter 30 to 35μ.

Generally distributed; scarce.

S. steini (Joergensen) 8, 13, 16 (Fig. 49).

Lorica bowl-shaped with a suboral contraction, about one-tenth longer than wide; aperture with hyaline collar. Lorica formed of large particles closely arranged and having an uneven surface.

Length 60 to 75μ; diameter 55 to 65μ; aperture 30 to 33μ.

Generally distributed; not common.

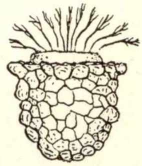

Fig. 49. *Stenosemella steini* (Joerg.). x 250.

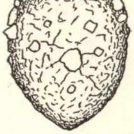

Fig. 50. *Stenosemella ventricosa* (C. & L.). x 300.

S. ventricosa (Claparède and Lachmann) 8, 13, 16 (Fig. 50).

Lorica cordiform; aboral end bluntly pointed; aperture with low hyaline collar.

Length 60 to 75μ; aperture 30 to 38μ in diameter.

Generally distributed; sometimes numerous.

S. nivalis (Meunier) 8, 13, 16 (Fig. 51).

Lorica small, cordiform, with sloping shoulder.

Length 34 to 45μ; diameter 30 to 32μ.

Diameter of aperture about 20μ.

Generally distributed; sometimes numerous.

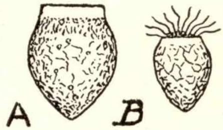

Fig. 51. *Stenosemella nivalis* (Meunier). A x 400; B x 250.

COXIELLIDAE

Genus **HELIOCOSTOMELLA**

Lorica thin, elongate, oral region having a number of spiral bends (3 to 60); aboral region tapering to a point.

KEY TO SPECIES

1. (2) Aboral end gradually tapering. **subulata** (p. 00)
2. (1) Aboral end abruptly tapering. **kieliensis** (p. 00)

H. subulata (Ehrenberg) 8, 16 (Fig. 52).

Rim of aperture finely serrated; aboral end gradually tapering.

Length 100 to 315μ; diameter 20 25μ.

Generally distributed; sometimes numerous.

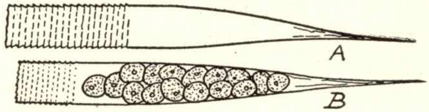

Fig. 52. *Heliocostomella subulata* (Ehrenb.). x 250.

Figure 52B shows lorica containing spores whose further development was not observed.

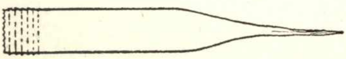

Fig. 53. *Heliocostomella kiliensis* (Laack.). x 250.

H. kiliensis (Laackmann) 8, 16 (Fig. 53).

Similar to *H. subulata* but aboral end tapering abruptly.

Length 100 to 200μ; diameter 23μ.

Off Nootka sound.

CYTTAROCYLIDAE

KEY TO GENERA

1. (2) Lorica campanulate or subconical; aboral horn thick walled; wall bilaminate never with polygonal structure. **FAVELLA** (p. 19)
2. (1) Lorica cylindrical or goblet-shaped, usually more or less prolonged into an aboral spine; wall bilaminate with a regular polygonal structure. **PARAFAVELLA** (p. 20)

Genus **FAVELLA**

Lorica cylindrical to subconical with stout aboral horn. Wall bilamellate without regular polygonal structure.

KEY TO SPECIES

1. (4) Lorica with oral rim denticulate.
2. (3) Lorica cylindrical. **franciscana** (p. 20)
3. (2) Lorica somewhat conical. **serrata** (p. 20)
4. (1) Lorica without denticulations on oral rim. **ehrenbergi** (p. 20)

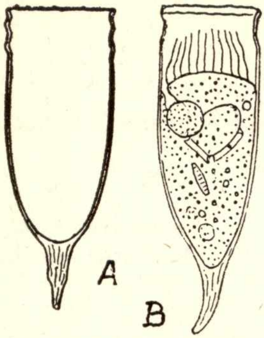

Fig. 54. *Favella franciscana* K. & C. A, Empty lorica. x 160. B, Living animal containing food. x 150.

F. franciscana Kofoid and Campbell 8, 16 (Fig. 54).

Lorica cylindrical; aboral end tapering; oral rim with denticulations.

Length 200 to 300μ; diameter 85 to 100μ.

Generally distributed; frequently abundant especially on the west coast of Vancouver island.

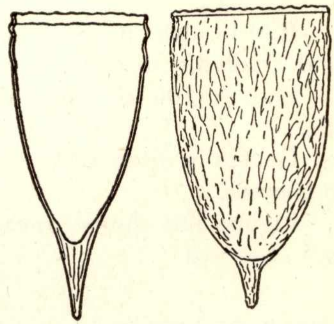

Fig. 55 *Favella serrata* (Moebius). x 200.

F. serrata (Moebius) 8, 16 (Fig. 55).

Lorica conical; aboral end tapering more or less gradually; oral rim with denticulations; aboral horn of variable length.

Length 165 to 260μ; diameter 90 to 110μ.

Generally distributed; scarce.

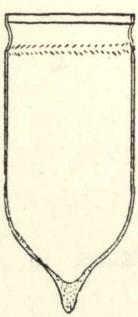

Fig. 56. *Favella ehrenbergi* (C. & L.). x 200.

F. ehrenbergi (Claparède and Lachmann) 8, 16 (Fig. 56).

Lorica cylindrical; oral rim without denticulations.

Length 165 to 215μ (or more); diameter 84 to 105μ.

Generally distributed, but not common.

Genus **PARAFAVELLA**

Lorica cylindrical to subconical, aboral end contracting, usually to a stout horn; wall bilamellate with a very regular polygonal secondary structure.

KEY TO SPECIES

1. (2) Lorica a long cylinder ending in a long horn; length 230 to 575μ. **gigantea** (p. 21)
2. (1) Lorica somewhat goblet-shaped ending in a short conical spine; length 180 to 260μ. **parumdentata** (p. 21)

P. gigantea (Brandt) emended K. and C. 8, 16 (Fig. 57).

Lorica cylindrical, tapering to a long terminal spine; oral rim denticulate; cellular structure of lorica very distinct.

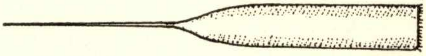

Fig. 57. *Parafavella gigantea* (Brandt). x 100.

Total length 230 to 575μ; diameter 50 to 68μ equalling from one-sixth to one-eleventh of the length; length of horn 70 to 250μ.

West coast of Vancouver island; Bull harbour; numerous at times.

P. parumdentata (Brandt) 8, 16 (Fig. 58).

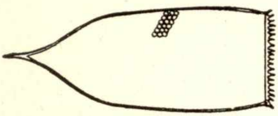

Fig. 58. *Parafavella parumdentata* (Brandt). x 200.

Lorica somewhat goblet-shaped with short terminal horn; oral rim denticulate.

Length (100−) 180 to 260μ; diameter (50−) 55 to 70μ; length of horn 20 to 35 μ.

West coast of Vancouver island usually in association with *P. gigantea;* Bull harbour, Queen Charlotte sound.

PTYCHOCYLIDAE

Genus **PTYCHOCYLIS**

Lorica more or less bell-shaped with one or two annulations; fundus with a conical or blunt point; surface covered with fine plications, orifice with serrated margin.

KEY TO SPECIES

1. (2) Lorica bowl-shaped; short and wide; aboral end more or less rounded, not pointed. **drygalskii** (p. 21)
2. (1) Lorica elongate; aboral end pointed or produced into a spine.
3. (4) Lorica long, conical, without a distinct horn. **wailesi** (p. 22)
4. (3) Lorica not as above.
5. (6) Lorica somewhat oval, contracted toward aperture; horn stout. **repanda** (p. 22)
6. (5) Lorica more cylindrical.
7. (8) Lorica short, wide; length 80 to 96μ; diameter 90 to 96μ. **minor** (p. 22)
8. (7) Lorica more elongate; length 80 to 130μ; diameter 65 to 85μ. **urnula** (p. 22)

P. drygalskii Brandt 8, 16 (Fig. 59).

Lorica with more or less parallel sides with a flattened fundus terminating in a small rounded protuberance; length from 1 to 1½ times the diameter.

Length 85 to 95μ; diameter 65 to 80μ.

Generally distributed; common.

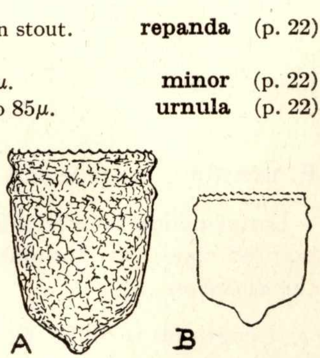

Fig. 59. *Ptychocylis drygalskii* Brandt. A x 300; B x 200.

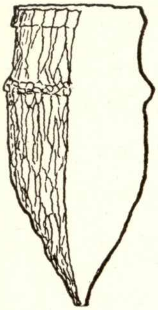

Fig. 60. *Ptychocylis wailesi* K. & C. x 225. (After Kofoid and Campbell).

P. wailesi Kofoid and Campbell 8 (Fig. 60).

Lorica tapering gradually to a point; the oral margin irregularly serrate or denticulate; length from 1½ times to twice the diameter.

Length 130 to 195μ; diameter 85 to 95μ.

Strait of Georgia.

P. repanda Wailes 8, 16 (Fig. 61).

Lorica conical with prolonged apex and two annulations (A).

Forma *conica* (B) has a less prolonged apex and only one annulation of the lorica.

Length 100 to 120μ; diameter 71 to 80μ with aperture about 10μ less.

Strait of Georgia, the type scarce, f. *conica* occasionally numerous in Departure bay.

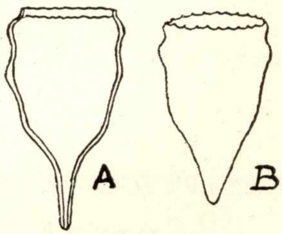

Fig. 61. *Ptychocylis repanda* Wailes. A, the type. x 250; B, forma *conica*. x 200.

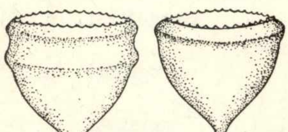

Fig. 62. *Ptychocylis minor* Joerg. x 200.

P. minor Joergensen 8, 16 (Fig. 62).

Lorica conical with either one or two annulations; length equal to or slightly less than the diameter.

Length 80 to 96μ; diameter 90 to 96μ.

Generally distributed.

P. urnula Claparède and Lachmann 8, 16 (Fig. 63).

Lorica cylindrical, terminating in a distinct shoulder and small pointed cone; two annulations present; length 1½ to 1¾ times the diameter.

Length 80 to 130μ; diameter 65 to 85μ.

Generally distributed; common.

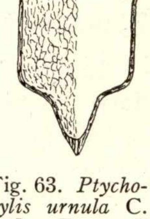

Fig. 63. *Ptychocylis urnula* C. & L. From off Kyuquot. x 200.

XYSTONELLIDAE

Genus **PARUNDELLA**

Lorica hyaline; fundus tapering to a point; oral rim usually smooth.

KEY TO SPECIES

1.	(2)	Lorica with crenulate oral margin and collar.	**lagena**	(p. 23)
2.	(1)	Lorica without crenulate oral margin.		
3.	(4)	Lorica with anterior portion narrowed behind oral rim.	**lachmanni**	(p. 23)
4.	(3)	Lorica not as above.		
5.	(6)	Lorica with oral rim flaring.	**translucens**	(p. 23)
6.	(5)	Lorica not as above.		
7.	(8)	Lorica 132 to 155μ in length.	**major**	(p. 24)
8.	(7)	Lorica 84 to 106μ in length.	**minor**	(p. 24)

P. lagena Kofoid and Campbell 8 (Fig. 64).

Lorica with serrated aperture sometimes slightly everted oral end with collar showing very faintly a plate structure.

Length 80 to 130μ; diameter 22 to 23μ.

Strait of Georgia; Departure bay; occasionally numerous.

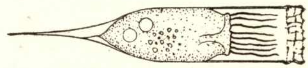

Fig. 64. *Parundella lagena* K. & C. x 300.

P. lachmanni (Daday) 8, 16 (Fig. 65).

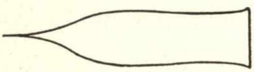

Fig. 65. *Parundella lachmanni* (Daday). x 300.

Anterior portion of lorica slightly reduced in diameter behind the aperture.

Length 100 to 120μ; greatest diameter 24 to 26μ.

Generally distributed; scarce.

P. translucens (Wailes) K. and C. 8, 16 (Fig. 66).

Oral aperture smooth, occasionally slightly everted; final phase of division shown in figure A.

Length 84 to 106μ; diameter 18 to 23μ.

Generally distributed; sometimes numerous.

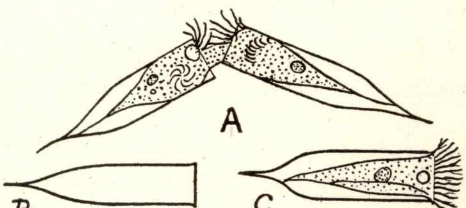

Fig. 66. *Parundella translucens* (Wailes). x 300.

P. major (Wailes) K. & C. 8, 16 (Fig. 67).

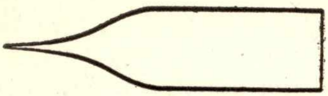

Fig. 67. *Parundella major* (Wailes) K. & C. x 300. The dark lines represent the thickness of the lorica.

Distinguished by the greater thickness of the lorica which is hyaline and colourless.

Length 132 to 155μ; diameter 36 to 40μ.

Generally distributed; not common.

P. minor (Wailes) K. and C. 8, 16 (Fig. 68).

Distinguished by its small size; the length of the lorica equal to about three times its diameter.

Length 45 to 53μ; diameter 16 to 17μ.

Generally distributed; scarce.

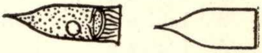

Fig. 68. *Parundella minor* (Wailes) K. & C. x 300.

UNDELLIDAE

Genus **PROPLECTELLA**

Lorica bowl-shaped; wall thickened internally below the aperture.

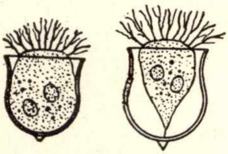

Fig. 69. *Proplectella columbiana* (Wailes) K. & C. x 300.

P. columbiana (Wailes) K. and C. 8, 13 (Fig. 69).

Syn. *Undella columbiana* Wailes.

Lorica translucent, the fundus furnished with a small bead or short spine.

Length 35 to 45μ; diameter 30 to 35μ; spine up to 10μ in length but usually 3 to 4μ.

Generally distributed; not uncommon.

DICTYOCYSTIDAE

Genus **DICTYOCYSTA**

Lorica bowl-shaped with cylindrical perforated collar around aperture; wall reticulated, often with included coccoliths.

KEY TO SPECIES

1. (2) Lorica conical, pointed at aboral end and with eight irregular oval openings. **apiculata** (p. 25)
2. (1) Lorica bowl-shaped, rounded at aboral end.
3. (4) Lorica with one row of openings in anterior portion. **reticulata** (p. 25)
4. (3) Lorica with two rows of openings in anterior portion. **elegans** (p. 25)

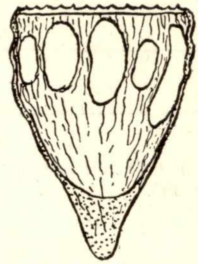

Fig. 70. *Dictyocysta apiculata* Wailes. x 300. Lorica seen in longitudinal section.

D. apiculata Wailes 8, 16 (Fig. 70).

Lorica conical with eight oval openings varying in size, placed suborally.

Length 115μ; diameter 85μ.

Departure bay, only one seen.

No other similar lorica has since been seen and this may be an abnormal individual.

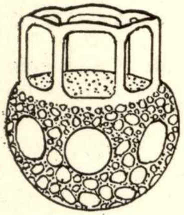

Fig. 71. *Dictyocysta reticulata* K. & C.x 450.

D. reticulata Kofoid and Campbell 8 (Fig. 71).

Collar with height equal to two-thirds of length of bowl, and perforated by six symmetrical rectangular openings separated by narrow bars.

Length 65μ; diameter of bowl 50μ; diameter of collar 43μ; height of collar one-half its diameter.

Barkley sound, June.

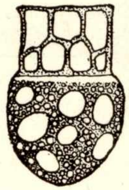

Fig. 72. *Dictyocysta elegans* Ehrenb. x 320.

D. elegans Ehrenberg (emended K. and C.) 8, 16 (Fig. 72).

Collar pierced by a double row of openings of various sizes and shapes, separated by narrow bars.

Length 65 to 77μ; diameter of bowl 50 to 55μ; diameter of collar 40 to 45 μ; height of collar three-quarters of its diameter.

West coast of Vancouver island; scarce.

TINTINNIDAE

KEY TO GENERA

1.	(2) Lorica open at both ends.	**TINTINNUS**	(p. 25)
2.	(1) Lorica nearly closed at aboral end.	**SALPINGELLA**	(p. 27)

Genus **TINTINNUS**

KEY TO SPECIES

1.	(4) Oral aperture of lorica smooth, without teeth.		
2.	(3) Oral end flaring.	**lusus-undae**	(p. 26)
3.	(2) Oral end not flaring.	**tubulosus**	(p. 26)
4.	(1) Oral aperture of lorica with teeth.		
5.	(6) Oral and aboral ends flaring.	**pectinis**	(p. 26)
6.	(5) Oral and aboral ends not flaring.	**rectus**	(p. 26)

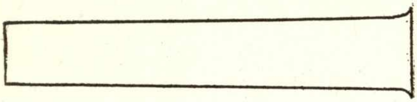

Fig. 73. *Tintinnus lusus-undae* Entz. x 200.

T. lusus-undae Entz 8, 16 (Fig. 73).

Lorica slightly conical; edges of apertures smooth; oral end flaring, aboral end not flaring.

Length 260 to 290μ; oral diameter 54 to 55μ; aboral diameter 35 to 38μ.

Generally distributed.

T. tubulosus Ostenfeld forma *laevis* Wailes 8, 16 (Fig. 74).

Lorica slightly conical, apertures not flaring and smooth.

Length 100 to 110μ; larger diameter 23μ; smaller diameter 16μ.

Considerably smaller than the dimensions given by Joergensen (1924) for type, namely, length 94 to 150μ; larger diameter 32 to 44μ; smaller diameter 21 to 36μ.

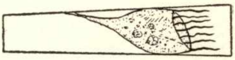

Fig. 74. *Tintinnus tubulosus* Ostenfeld forma *laevis* Wailes. x 300.

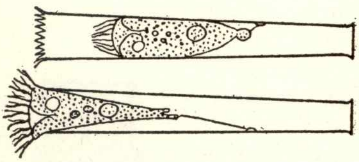

Fig. 75. *Tintinnus pectinis* K. & C. x 300.

T. pectinis Kofoid and Campbell 8 (Fig. 75).

Lorica slightly conical; oral aperture flaring with 20 everted teeth; aboral aperture slightly flaring with smooth edge.

Length 115 to 150μ; oral diameter 25 to 27μ; aboral diameter 16μ.

Strait of Georgia.

T. rectus Wailes (emended K. and C.) 8, 16 (Fig. 76).

Lorica slightly conical or nearly cylindrical; oral and aboral ends not flaring; oral aperture furnished with sharp teeth, aboral aperture smooth.

Length of conical form (A) 180 to 300μ; oral diameter 65 to 75μ (-94); aboral diameter 50 to 61μ (-77). Length of nearly cylindrical form (B) 176 to 225μ; oral diameter 42 to 45μ; aboral diameter 32 to 39 μ.

Generally distributed.

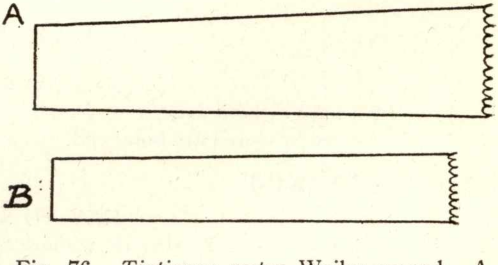

Fig. 76. *Tintinnus rectus* Wailes emend. A, large conical form; B, smaller nearly parallel form. x 225.

Genus **SALPINGELLA**

KEY TO SPECIES

1. (2) Lorica long with prominent oral flare. **acuminata** (p. 27)
2. (1) Lorica small without prominent flare. **curta** (p. 27)

S. acuminata Claparède and Lachmann 8, 16 (Fig. 77).

Lorica long with large oral flare; aboral end tapering gradually.

Length 185 to 252μ; diameter of cylinder 16 to 18μ; diameter of rim of oral aperture about 40 μ.

Strait of Georgia.

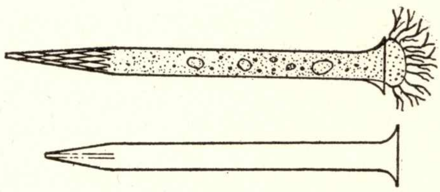

Fig. 77. *Salpingella acuminata* C. & L. x 200.

S. curta Kofoid and Campbell 8 (Fig. 78).

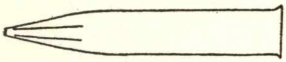

Fig. 78. *Salpingella curta* K. & C. x 500.

Lorica small without prominent flare, more or less test-tube like; aboral end with short taper.

Length 66 to 84μ; diameter 11 to 13μ.

Departure bay, July.

HYPOTRICHIDA

KEY TO FAMILIES

1. (2) Cilia on ventral surface uniform and not differentiated into cirri. PERITROMIDAE (p. 27)
2. (1) Cirri present.
3. (4) Cilia reduced to a few rows on ventral surface; anal and frontal cirri present. OXYTRICHIDAE (p. 28)
4. (3) Cilia entirely reduced; lateral, ventral and anal cirri present. EUPLOTIDAE (p. 28)

PERITROMIDAE

Genus **PERITROMUS**

P. emmae Stein 5, 11 (Fig. 79).

Ventral surface striated and ciliated, dorsal surface smooth; body ovoid, somewhat plastic with labile periphery; two nuclei; one large or several small contractile vacuoles present.

Length about 130μ.

Departure bay at wharf.

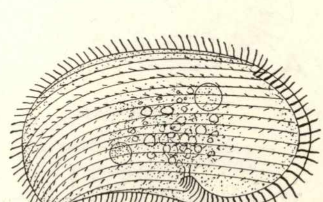

Fig. 79. *Peritromus emmae* Stein. Dorsal view. x 300.

OXYTRICHIDAE

KEY TO GENERA

1. (2) Caudal cirri present. **EPICLINTES** (p. 28)
2. (1) Caudal cirri absent. **AMPHISIA** (p. 28)

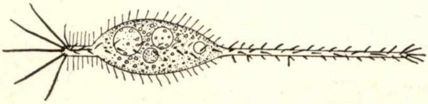

Fig. 80. *Epiclintes radiosa* (Quenn.). x 300.

Genus **EPICLINTES**

E. radiosa (Quennerstedt) 5 (Fig. 80).

Syn. *Mitra* (*Oxytricha*) *retractilis* (C. and L.).
Oxytricha longicauda Wright

Body ovoid with oral prolongation furnished with five large cirri; caudal extremity exceeding the body in length with 5 terminal short cirri; nucleus single; contractile vacuoles two in number.

Total length 150μ, caudal portion 80μ in length; greatest breadth of body 26μ; nucleus 7μ diameter; oral cirri 30μ in length.

Departure bay on *Zostera*.

Genus **AMPHISIA**

A. pernix Wrzesniowski 5 (Fig. 81).

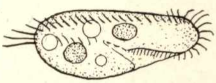

Fig. 81. *Amphisia pernix* Wrzes. x 400.

Syn. *Keronopsis* (*Oxytricha*) *pernix* Wrzes.

Body ovoid; peristome with undulating membrane about one-third of body in length; five caudal cilia present; nuclei two in number; contractile vacuoles situated posteriorly.

Length about 55μ; breadth 22 to 30μ.

Departure bay amongst algae.

EUPLOTIDAE

KEY TO GENERA

1. (2) Frontal cirri present. **EUPLOTES** (p. 28)
2. (1) Frontal cirri absent. **URONYCHIA** (p. 29)

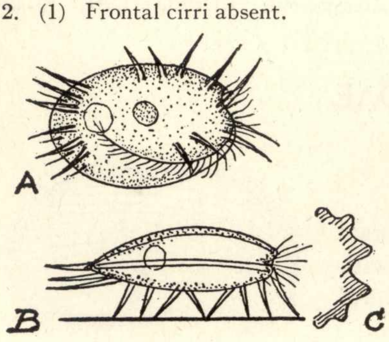

Fig. 82. *Euplotes sexcostatus* sp. nov. A, ventral view; B, right side view; C, section of dorsal surface. x 350.

Genus **EUPLOTES**

E. sexcostatus sp. nov. (Fig. 82).

Body broadly ovoid, compressed; the dorsal side with 6 longitudinal ribs; the ventral side with 9 anterior and 6 posterior cirri.

Length 50 to 80μ; breadth 33 to 58μ; thickness 20 to 30μ.

Generally distributed on algae, hydroids, etc., in the strait of Georgia.

Genus **URONYCHIA**

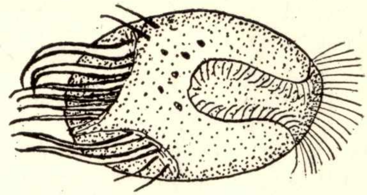

Fig. 83. *Uronychia transfuga* O.F.M. x 300.

U. (**Trichoda**) **transfuga** (O. F. Müller) 5 (Fig. 83).

Body broadly ovoid, furnished with about 8 broad cirri posteriorly; only cilia placed anteriorly; two elongate nuclei present.

Length about 120μ; breadth about two-thirds of length.

Strait of Georgia among algae and hydroids.

PERITRICHIDA

VORTICELLIDAE

KEY TO GENERA

1.	(10)	Lorica absent.		
2.	(3)	Individuals sessile.	**SCYPHIDIA**	(p. 29)
3.	(4)	Individuals stalked.		
4.	(5)	Stalk non-contractile.	**RHABDOSTYLA**	(p. 30)
5.	(4)	Stalk contractile.		
6.	(7)	Individuals solitary.	**VORTICELLA**	(p. 30)
7.	(6)	Individuals colonial.		
8.	(9)	Entire colony contractile.	**ZOOTHAMNIUM**	(p. 32)
9.	(8)	Parts only of colony contractile.	**CARCHESIUM**	(p. 33)
10.	(1)	Lorica present.		
11.	(14)	Lorica without operculum.		
12.	(13)	Lorica upright, stalked.	**COTHURNIA**	(p. 34)
13.	(12)	Lorica decumbent.	**PLATYCOLA**	(p. 36)
14.	(11)	Lorica with operculum.	**THURICOLA**	(p. 36)

Genus **SCYPHIDIA**

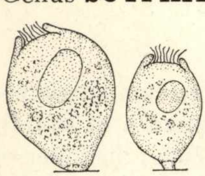

Fig. 84. *Scyphidia variabilis* (Dons). x 300.

S. (**Rhabdostyla**) **variabilis** (Dons) 3, 5 (Fig. 84).

Body in contracted state usually pyriform or rarely ovoid; without striations; nucleus situated anteriorly; sessile or with very short stalk.

Length contracted 40 to 55μ; breadth 30 to 45μ.

Saanich inlet, dredged from 50 fathoms on polychaete worm *Spionophanes cirrata* Sars.

Genus **RHABDOSTYLA**

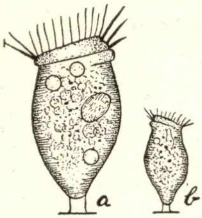

Fig. 85. *Rhabdostyla commensalis* Moebius. A, form found on *Nereis*. B, small form on *Melosira*. x 400.

R. commensalis Moebius 5 (Fig. 85).

Body ovoid; very finely striated with short stalk.

Length about 55 μ; breadth about 35μ; length of stalk 10 to 20μ.

Departure bay on the polychaete worm *Nereis agassizi* (A).

A small form (B) length 33μ, breadth 17μ, was epizooic on the diatom *Melosira moniliformis* found in Departure bay.

Genus **VORTICELLA**

KEY TO SPECIES

1.	(4)	Body bell-shaped.		
2.	(3)	Surface smooth.	**campanula**	(p. 30)
3.	(2)	Surface striated.	**marina**	(p. 30)
4.	(1)	Body not bell-shaped.		
5.	(8)	Body more or less elongate; cuticle striated.		
6.	(7)	Body very elongate, broadest in middle.	**putrina**	(p. 31)
7.	(6)	Body pyriform.	**microstoma**	(p. 31)
8.	(5)	Body not elongate; cuticle smooth.		
9.	(10)	Body conical; length 65μ.	**patellina**	(p. 31)
10.	(9)	Body globular; length about 25μ.	**subsphaerica**	(p .31)

V. campanula Ehrenberg 5, 7 (Fig. 86).

Cuticle smooth; body campanulate.

Length of body 35 to 60μ; breadth 40 to 60μ; length of stype up to 70μ.

Strait of Georgia on worm tubes dredged from 15 fathoms; Departure bay float on algae.

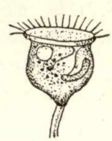

Fig. 86. *Vorticella campanula* Ehrenb. x 200.

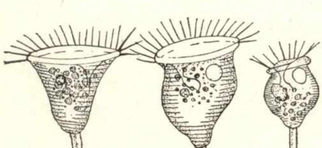

Fig. 87. *Vorticella marina* Greeff. x 250.

V. marina Greeff 5, 7 (Fig. 87).

Cuticle striated; body conical to campanulate.

Length of body 35 to 50 μ; breadth of wreath 48 to 65 μ; length of stype up to 300μ; diameter of stype 4.5 to 5μ.

Strait of Georgia dredged 10 to 20 fathoms; Departure bay float on Bryozoa, algae, etc.

V. putrina O. F. Müller 5, 7 (Fig. 88).

Cuticle striated; body elongate.

Length 40 to 60μ; breadth 18 to 25μ; stype 3μ in diameter up to about 100μ in length.

Strait of Georgia on algae and diatoms.

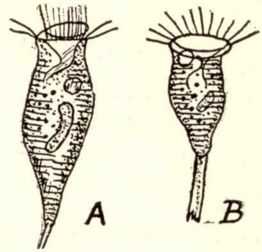

Fig. 88. *Vorticella putrina* O.F.M. A, after Saville Kent; B, from Departure bay. x 300.

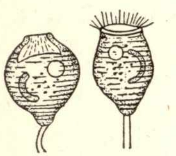

Fig. 89. *Vorticella microstoma* Ehrenb. x 500.

V. microstoma Ehrenberg 5, 7 (Fig. 89).

Cuticle striated; body ovate to pyriform.

Length 21 to 24μ; stype 3μ in diameter, up to about 80μ in length.

Strait of Georgia; numerous.

V. patellina O. F. Müller 5, 7 (Fig. 90).

Cuticle smooth; body with greatly expanded frontal border.

Length 65μ; breadth of wreath 100μ; stype up to 250μ in length, diameter 6μ.

Departure bay.

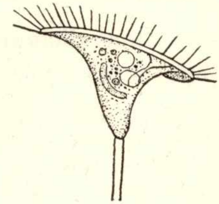

Fig. 90. *Vorticella patellina* O.F.M. x 210.

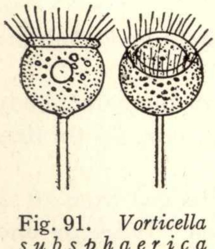

Fig. 91. *Vorticella subsphaerica* (Dons). x 450.

V. subsphaerica (Dons) Kahl 3, 5 (Fig. 91).

for *V. sphaerica* Dons preoccupied.

Cuticle smooth; body small and globular.

Length and breadth subequal; diameter of body 25 to 27μ; length of stype up to 65μ.

Strait of Georgia; often numerous on algae.

Genus **ZOOTHAMNIUM**

KEY TO SPECIES

1.	(2)	Colony consisting of two individuals.	**nutans**	(p. 32)
2.	(1)	Colony of more than two individuals.		
3.	(6)	Branches alternate on main stem.		
4.	(5)	One individual on each branch.	**elegans**	(p. 32)
5.	(4)	Numerous individuals on each branch.	**niveum**	(p. 32)
6.	(3)	Branches not alternate on main stem.		
7.	(8)	Secondary branches parallel to each other.	**candelabrum**	(p. 33)
8.	(7)	Branches radiating from apex of main stem.	**arbuscula**	(p. 33)

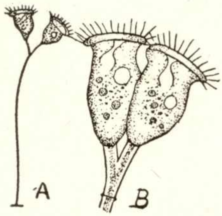

Fig. 92. *Zoothamnium nutans* C. & L. A, x 75; B, x 225.

Z. nutans Claparède and Lachmann (Fig. 92).

Colony consisting of two individuals only.

Length of zooids 60 to 68 μ; stype diameter 6 μ, length variable.

Gabriola pass on algae.

Z. elegans D'Udekem 5, 7 (Fig. 93).

Colony dichotomously branched; branches spreading; number of zooids small.

Length of zooids 55 to 65μ.

Departure bay on algae; freshwater and marine.

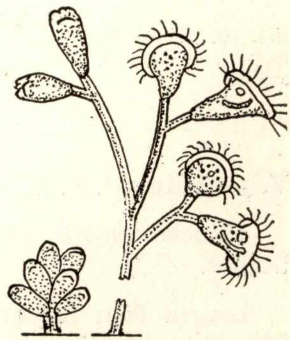

Fig. 93. *Zoothamnium elegans* D'Udek. x 150.

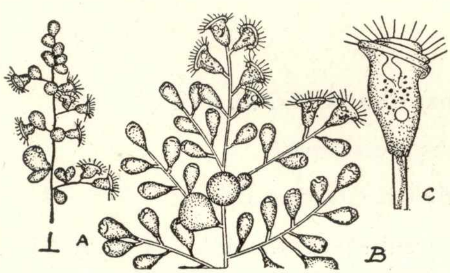

Fig. 94. *Zoothamnium niveum.* Ehrenb. A, small colony x 50; B, part of a larger colony x 100; C, single zooid x 450.

Z. niveum Ehrenberg 5, 7 (Fig. 94).

Syn. *Z. alternans* C. and L.

Colony with main stem and alternate branches.

Wreath 40 to 50μ in diameter; body length 60 to 75μ; main stem up to 400μ or more in length.

Strait of Georgia, dredged from 10 to 15 fathoms; on Bryozoa, Hydrozoa and algae in shallow water.

Z. candelabrum Wailes 5, 17 (Fig. 95).

Colony with secondary branches parallel and each terminating in a pair of zooids.

Zooids length 50μ; breadth 40μ; stypes up to about 570μ in length, diameter 10μ.

Strait of Georgia near shore and dredged from 15 fathoms.

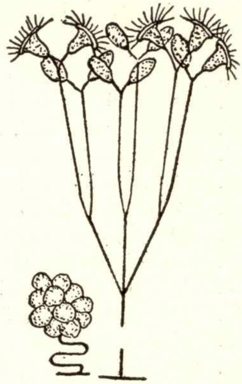

Fig. 95. *Zoothamnium candelabrum.* Wailes x 100.

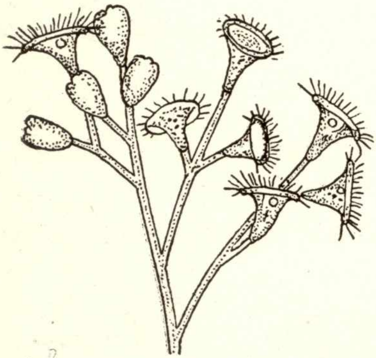

Fig. 96. *Zoothamnium arbuscula* Ehrenb. x 125.

Z. arbuscula Ehrenberg 5, 7 (Fig. 96).

Colony with branches originating from a rather thick main stem.

Zooid 60μ in length, diameter of wreath about equal to length.

Strait of Georgia on algae, etc.; also dredged from 10 fathoms.

Genus **CARCHESIUM**

C. polypinum Linnaeus 5, 7 (Fig. 97).

The pedicel of each zooid capable of independent contraction, the internal portion not being continuous with that of the main stype; zooids arranged unilaterally on stem. Only small colonies observed.

Length of zooids 50 to 75μ; stype 9μ diameter up to about 250μ in length.

Strait of Georgia, on algae; a marine and freshwater species.

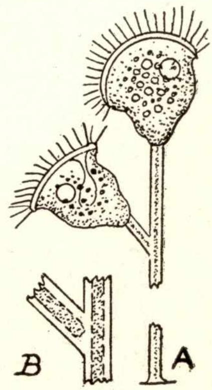

Fig. 97. *Carchesium polypinum* Ehrenb. A x 250; B, junction of branch with main stem enlarged.

Genus **COTHURNIA**

KEY TO SPECIES

1.	(2)	Lorica short, hemispherical.	**poculum**	(p. 34)
2.	(1)	Lorica more or less elongate, vase or goblet-shaped.		
3.	(6)	Lorica flexed.		
4.	(5)	Aperture lipped.	**flexa**	(p. 34)
5.	(4)	Aperture truncate.	**gracilis**	(p. 34)
6.	(3)	Lorica not flexed.		
7.	(12)	Aperture lipped.		
8.	(9)	Lorica corrugated.	**compressa**	(p. 35)
9.	(8)	Lorica smooth.		
10.	(11)	Lorica short, 50μ; conical in broadside view.	**lata**	(p. 35)
11.	(10)	Lorica long, 100μ or more; ovoid in broadside view.	**compressula**	(p. 35)
12.	(7)	Aperture not lipped.		
13.	(14)	Lorica goblet-shaped; aperture full width of lorica.	**calix**	(p. 35)
14.	(13)	Lorica more or less ovoid; aperture contracted.		
15.	(16)	Lorica oval.	**ovalis**	(p. 36)
16.	(15)	Lorica somewhat sac-shaped.	**fecunda**	(p. 36)

C. poculum Kahl 5 (Fig. 98).

Fig. 98. *Cothurnia poculum* Kahl. x 250.

Syn. *C. patula* Wailes 14 nec Fromentel.

Lorica hemispherical; lip sometimes everted.

Length and breadth of lorica equal 35 to 40μ; pedicel about half length of lorica.

Departure bay on red algae; scarce.

C. flexa (Wailes) Kahl 5, 14 (Fig. 99).

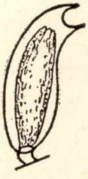

Fig. 99. *Cothurnia flexa* (Wailes) Kahl. x 200.

Syn. *C. compressa* var. *flexa* Wailes 14.

Lorica with neck bent nearly 90°; aperture lipped.

Length 87 to 100μ; breadth 32 to 36μ; pedicel short.

Strait of Georgia on algae; common.

C. gracilis Saville Kent 5, 7, 14 (Fig. 100).

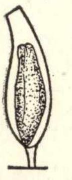

Fig. 100. *Cothurnia gracilis* S.K. x 250.

Lorica flexed about 45°; aperture truncate.

Length of lorica 80 to 100μ; breadth 25 to 33μ; aperture 15μ; pedicel very short.

Departure bay on red algae; Saanich inlet on the copepod *Diosaccus*.

The form found here has a shorter neck than the type.

C. compressa C. and L. f. *sinuosa* Wailes 5, 14 (Fig. 101).

Syn. *C. nodosa* C. and L. Wailes 14.
C. compressa? Kahl 1935.

Lorica with annular corrugations; aperture compressed with shallow lips.

Length 90 to 100μ; breadth 35 to 40μ; length of pedicel 10μ.

Strait of Georgia on green algae; rare.

C. nodosa has a truncate aperture and *C. compressa* has a smooth lorica.

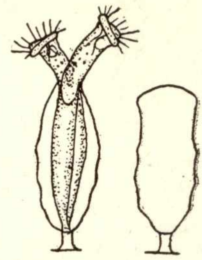

Fig. 101. *Cothurnia compressa* C. & L. f. *sinuosa* Wailes. x 200.

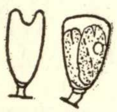

Fig. 102. *Cothurnia lata* Kellicott f. *columbiae* Wailes. Broad and narrow side views. x 200.

C. lata Kellicott f. *columbiae* Wailes 6, 14 (Fig. 102).

Syn. *C. lata*, Wailes 1928.

Lorica conical in broad side view, compressed; aperture lipped.

Length about 50μ; breadth 22 to 30μ.

Departure bay on Copepoda.

C. compressula Kahl 5, 14 (Fig. 103).

Syn. *C. compressa* C. and L. Wailes 14.

Lorica ovoid in broad side view with compressed aperture bordered by long lips.

Length of lorica 100 to 117μ; breadth 35 to 40μ.

Departure bay on *Obelia* and red algae; Gabriola pass on *Bugela*; Saanich inlet at 50 fathoms on the copepod *Diosaccus* sp.; scarce.

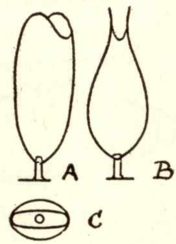

Fig. 103. *Cothurnia compressula* Kahl. A and B, Broad and narrow side views. C, end view. x 200.

Fig. 104. *Cothurnia calix* Kahl. Empty lorica. x 250. Extended animal. x 100.

C. calix Kahl 5, 14 (Fig. 104).

Syn. *C. innata* Wailes 14 nec Müller.

Lorica goblet-shaped, aperture truncate and not contracted; pedicel of variable length.

Length of lorica 85 to 87μ; breadth 40 to 45μ; pedicel up to 60μ in length.

Departure bay on algae and hydroids; rare.

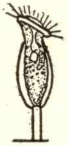

Fig. 105. *Cothurnia ovalis* Kahl. Extended animal in side view. x 200.

C. ovalis Kahl 5, 14 (Fig. 105).

Syn. *C. innata* in part Wailes 14.

Lorica goblet-shaped with contracted orifice.

Length of lorica 40 to 58 μ; breadth 26 to 33 μ; pedicel 20 to 30 μ in length.

Departure bay on algae; not uncommon.

C. fecunda Stokes 5 (Fig. 106).

Lorica vase-shaped, compressed with truncate orifice.

Length of lorica 84 to 100 μ; breadth 34 to 50 μ; pedicel one-quarter to one-sixth of length of lorica.

Generally distributed, numerous; on algae and hydroids, rarely on copepods (*Diosaccus*) and on polychaete worms (*Trophonia papillata*); also in freshwater.

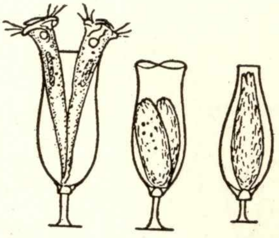

Fig. 106. *Cothurnia fecunda* Stokes. Extended animals after division and broad and narrow side views of same contracted. x 200.

Genus **PLATYCOLA**

P. (Vaginicola) nigra Wailes 5, 14 (Fig. 107).

Lorica thick, compact; black in colour; occurring in groups; the living animal not observed.

Length 200 to 220μ; breadth 100 to 115μ; aperture 20μ.

William Head, Strait of Juan de Fuca on clam shells (*Cardium* and *Saxidomus*).

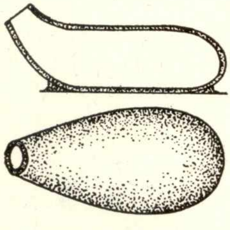

Fig. 107. *Platycola (Vaginicola) nigra* Wailes. Section and dorsal view. x 150.

Genus **THURICOLA**

T. (Cothurnia) valvata (Wright) 5, 14 (Fig. 108).

Syn. *Cothurnia crystallina* Auct.

Lorica cylindrical, circular in section; attached by its flat base; the aperture provided with an operculum which is closed by a filament originating in the posterior part of the animal.

Length of lorica 135 to 180μ; breadth 35 to 50μ.

Generally distributed on algae, Bryozoa, etc.; not common.

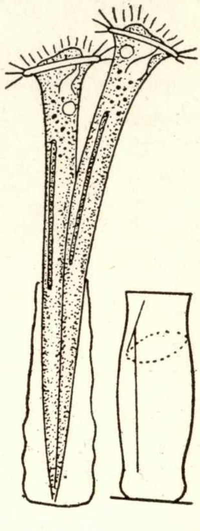

Fig. 108. *Thuricola valvata* (Wright). Active animals recently divided and empty lorica with operculum open. x 200.

SUCTORIA

Sessile forms attached by a stalk or disc; tentacles of two kinds, namely, knobbed and suctorial in function and sharply pointed and piercing in function; no cytostome.

KEY TO FAMILIES

1. (2)	Tentacles of two kinds.	PODOPHRYIDAE	(p. 37)
2. (1)	Tentacles of one kind.		
3. (4)	Tentacles supported on processes.	OPHRYODENDRIDAE	(p. 39)
4. (3)	Tentacles not so supported.		
5. (6)	Animals thecate.	ACINETIDAE	(p. 40)
6. (5)	Animals athecate.	TRICHOPHRYIDAE	(p. 43)

PODOPHRYIDAE

Animals athecate, stalked or sessile; tentacles of two kinds, knobbed and pointed.

KEY TO GENERA

1. (2)	Tentacles distributed over the surface.	**EPHELOTA**	(p .37)
2. (1)	Tentacles confined to certain areas.	**PODOPHRYA**	(p. 39)

Genus **EPHELOTA**

KEY TO SPECIES

1. (2)	Body compressed.	**plana**	(p. 37)
2. (1)	Body not compressed.		
3. (6)	Body not spherical; 60μ or more in diameter.		
4. (5)	Pedicel angular, striated transversely.	**coronata**	(p. 38)
5. (4)	Pedicel circular, striated longitudinally.	**gemmipara**	(p. 38)
6. (3)	Body spherical; 60μ or less in diameter.	**columbiae**	(p. 38)

E. plana Wailes (Fig. 109).

Body compressed, attached to fan-like extremity of pedicel which is striated concentrically and longitudinally; nucleus ramose; propagation by stalked ciliated buds.

Length of body 150 to 320μ; breadth and depth sub-equal 100 to 150μ; length of pedicel 100 to 1000μ, diameter 40 to 50μ.

Strait of Georgia near Nanaimo; on kelp and other algae, hydroids, etc.; numerous in summer of 1924, since then rare.

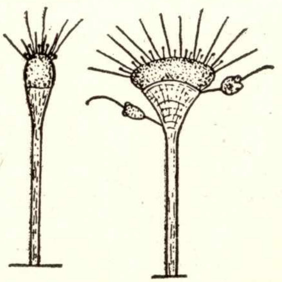

Fig. 109. *Ephelota plana* Wailes. Broad and narrow side views. x 25. Attached to the stem are two individuals of *Ophryocephalus capitatum*.

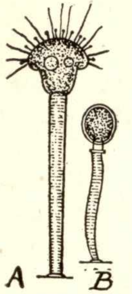

Fig. 110. *Ephelota coronata* Wright. A, active; B, encysted individuals. x 50.

E. coronata Wright 4, 14 (Fig. 110).

Animal conical, pyriform or campanulate, attached by its smaller end to a rigid polygonal (6- to 8-sided) pedicel; pedicel finely striated transversely, occasionally longitudinally; nucleus fragmentary.

Body 60 to 150μ diameter and about the same in length; pedicel 1 to 5 times the length of body, 10 to 13μ in diameter at base and 16 to 23μ in diameter at junction with body.

Generally distributed, on algae, hydroids, etc.; numerous.

E. gemmipara (Hartwig) 4, 14 (Fig. 111).

Animal conical or basin-shaped, attached to the expanded extremity of a rigid pedicel; nucleus ramose; one or two contractile vacuoles sometimes visible; propagation by buds.

Diameter of body 100 to 300μ or more; diameter of pedicel at base 20 to 30μ, at point of attachment to body 40 to 60 μ; length 100 to 800μ.

Strait of Georgia on algae, hydroids, etc.; common; found occasionally attached to copepods (*Gaidius pungens*) and crab zoea.

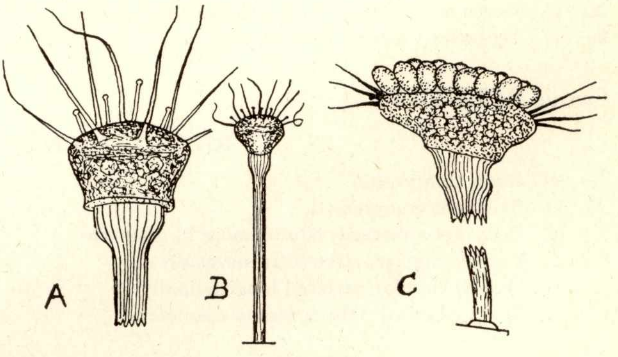

Fig. 111. *Ephelota gemmipara* (Hartwig). A and B, active individuals; C, bud formation. A and C x 50; B x 25.

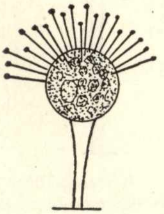

Fig. 112. *Ephelota columbiae* sp. nov. x 200.

E. columbiae sp. nov. (Fig. 112).

Body spherical or subspherical, small; nucleus spherical or oval; pedicel usually short, widening where attached to the body.

Body 30 to 60μ in diameter; suctorial tentacles when extended about half the diameter of the body in length; pedicel up to about 200μ in length and 6 to 12μ in breadth.

Strait of Georgia, epizooic on crustaceans; occasionally very numerous.

Genus **PODOPHRYA**

P. elongata Claparède and Lachmann 2, 7 (Fig. 113).

Body three to four times longer than broad pedicel from about half to three-quarters as long as the body; tentacles distributed along margin of body; nucleus elongate; contractile vacuoles not observed. Propagation by buds (fig. A).

Body 95 to 105μ in length; pedicel 65 to 85μ in length and 7 to 9μ in diameter.

Strait of Georgia off Nanaimo at 150 fathoms; epizooic on the copepod *Euchaeta japonica*.

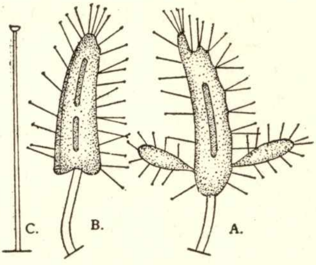

Fig. 113. *Podophrya elongata* C. and L. A and B, active individuals x 200; C, tentacle enlarged.

OPHRYODENDRIDAE

Animals athecate; tentacles consisting of a proboscis-like process with variously formed distal extremity.

KEY TO GENERA

1. (2) Tentacles terminating in a tuft of cirri. **OPHRYODENDRON** (p. 39)
2. (1) Tentacles capitate. **OPHRYOCEPHALUS** (p. 40)

Genus **OPHRYODENDRON**

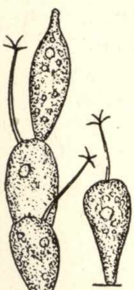

Fig. 114. *Ophryodendron belgicum* var. *stellatum* Wailes. x 200.

O. belgicum var. **stellatum** Wailes 12, 14 (Fig. 114).

Body pyriform, sessile, often in chain formation; a single proboscis-like tentacle originates from the anterior end; nucleus small, spherical, single. Tentacles terminate in 3 to 4 acicular cirri.

Length up to 85μ; breadth 30 to 35μ; length of tentacles 35 to 45μ; length of cirri 10μ.

Gabriola pass, dredged from 16 fathoms attached to polychaete worm, *Syllis armillaris*.

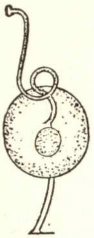

Fig. 115. *Ophryocephalus capitatum* Wailes. x 300.

Genus **OPHRYOCEPHALUS**

O. capitatum Wailes 12, 14 (Fig. 115).

Body spherical, pedicelate with a single proboscis-like capitate tentacle; nucleus single, spherical; propagation by buds.

Diameter when mature about 55μ, juveniles from 20μ in diameter; length of pedicel 30 to 50μ; length of tentacle up to 100μ and 1.5 to 5μ in diameter.

False Narrows reef, strait of Georgia epizooic on *Ephelota* spp. See figure 109 of *Ephelota plana*.

ACINETIDAE

Animals thecate or athecate, stalked or sessile, tentacles all of one kind, usually knobbed.

KEY TO GENERA

1. (2) Animal filling or nearly filling the lorica. **ACINETA** (p. 40)
2. (1) Animal suspended in the lorica by a membrane attached to the aperture. **PARACINETA** (p. 41)

Genus **ACINETA**

KEY TO SPECIES

1. (2) Lorica more than 80μ in length. **tuberosa** (p. 40)
2. (1) Lorica less than 80μ in length.
3. (6) Lorica more than 30μ in length.
4. (5) Lorica triangular in shape. **foetida** (p. 41)
5. (4) Lorica goblet-shaped. **laevis** (p. 41)
6. (3) Lorica less than 30μ in length. **minuta** (p. 41)

A. tuberosa Ehrenberg 4, 7, 14 (Fig. 116).

Lorica triangular in broad side view, compressed; proportion of length to breadth variable.

In one form (A) the tentacles number about 15 in each fascicle, in another form (B) they are twice to three times as numerous.

Length of lorica 80 to 130μ; breadth 50 to 100μ; length of pedicel from one to three times length of lorica.

Generally distributed, occurs on algae, Bryozoa, etc., also on crustaceans; collected from beach pools and down to 30 fathoms; plentiful.

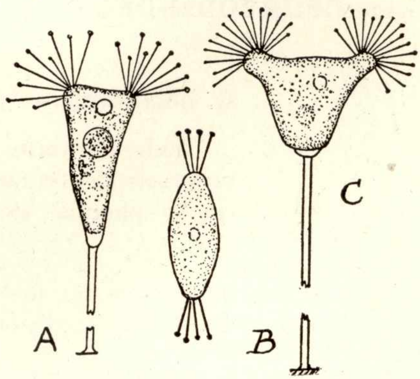

Fig. 116. *Acineta tuberosa* Ehrenb. A, elongate form with few tentacles. x 200. B and C, side and end views of broad form with numerous tentacles. x 150.

A. foetida Maupas 4, 7, 14 (Fig. 117)

Somewhat similar to *A. tuberosa* but smaller and with a short pedicel; form of body less variable; about 15 tentacles in each fascicle.

Length and breadth of lorica subequal, about 50μ; thickness 30 to 35μ; pedicel about 10μ in length.

Hammond bay, strait of Georgia, on algae dredged from 15 fathoms; usually recorded as occurring among decaying seaweed.

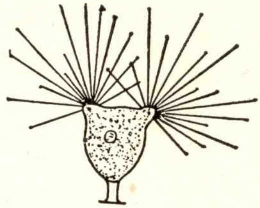

Fig. 117. *Acineta foetida* Maupas. x 200.

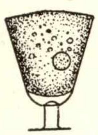

Fig. 118. *Acineta laevis* Dons. x 250.

A. laevis Dons 3, 14 (Fig. 118).

Lorica goblet-shaped; pedicel short and thick.

Breadth and length of lorica each about 50μ; length of pedicel 15μ, diameter 8μ.

Departure bay on red algae; rare.

A. minuta Wailes 14 (Fig. 119).

Lorica triangular or semicircular in broad view, compressed; tentacles about 5 in number in each of two fascicles.

Length of lorica 18 to 30μ; breadth 20 to 30μ; length of pedicel 5 to 6μ.

Departure bay, epizooic on Copepoda.

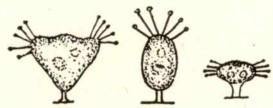

Fig. 119. *Acineta minuta* Wailes. x 300.

Genus **PARACINETA**

KEY TO SPECIES

1.	(2)	Lorica shallow, disk-like.	**limbata**	(p. 42)
2.	(1)	Lorica not shallow.		
3.	(8)	Lorica smooth.		
4.	(5)	Lorica compressed.	**patula**	(p. 42)
5.	(4)	Lorica not compressed.		
6.	(7)	Length of lorica less than width.	**parva**	(p. 42)
7.	(6)	Length of lorica greater than width.	**livadiana**	(p. 42)
8.	(3)	Lorica with transverse crenations.	**crenata**	(p. 43)

P. limbata (Maupas) 4, 7, 14 (Fig. 120).

Body spherical resting on a small conical disk-shaped lorica, surrounded by a spherical hyaline investment to the exterior of which numerous extraneous particles are usually adherent; pedicel long and slender.

Diameter of body 25 to 45μ, usually not over 35μ; diameter of investment 40 to 90μ; length of pedicel 100 to 400μ.

Strait of Georgia on algae, hydroids and Bryozoa, sometimes in numerous colonies.

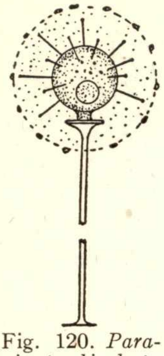

Fig. 120. *Paracineta limbata* (Maupas) x 300.

P. patula Claparède and Lachmann 4, 7, 14 (Fig. 121).

Syn. *Acineta divisa* Fraipont.

Lorica conical, small, compressed; the pedicel may or may not have a constriction at its point of junction with the lorica.

Length and breadth of lorica about equal, 23 to 50μ; length of pedicel up to 250μ.

Strait of Georgia on algae, Bryozoa, etc., from tide pools down to 30 fathoms.

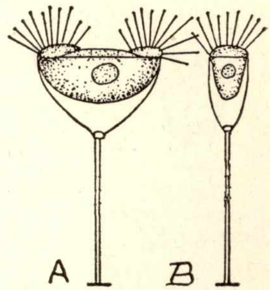

Fig. 121. *Paracineta patula* C. &. L. Broad and narrow side views. x 400.

P. parva Sand 4, 7, 14 (Fig. 122).

Lorica nearly hemispherical, not compressed.

Length of lorica about 10μ; diameter 18 to 22μ; length of pedicel 7μ.

Ruxton pass and Gabriola pass, strait of Georgia; dredged from 20 to 30 fathoms on tubes of the worm *Phyllochaetopterus prolifica*.

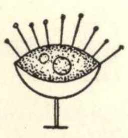

Fig. 122. *Paracineta parva*. Sand. x 500.

P. livadiana Mereschkowsky 4, 14 (Fig. 123).

Lorica wine-glass-shaped, not compressed; the pedicel from 1 to 3 times length of lorica.

Length of lorica 40μ; diameter 30 to 35μ; length of pedicel 50 to 100μ.

Departure bay and Gabriola pass, on algae; rare.

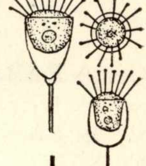

Fig. 123. *Paracineta livadiana* Meresch. End and side views. x 200.

P. crenata Fraipont 4, 14 (Fig. 124).

Lorica amphora-shaped with 15 transverse crenations; pedicel short.

Lorica length 95μ, greatest breadth 40μ; diameter of aperture 22μ; length of pedicel 25μ.

Koprino harbour, Quatsino sound, on the copepod *Microsetella rosea*.

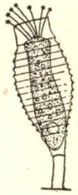

Fig. 124. *Paracineta crenata* Fraipont. x 200.

var. *gracilis* Wailes 14 (Fig. 125).

Lorica biconical about three times as long as greatest width with 4 crenations on anterior portion; pedicel long.

Length of lorica 110μ; greatest diameter 35μ; aperture 22μ diameter; length of pedicel 200μ.

Porlier pass, strait of Georgia, on hydroids from 25 fathoms.

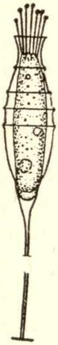

Fig. 125. *Paracineta crenata* var. *gracilis* Wailes. x 200.

var. *pachytheca* Collin 4, 14 (Fig. 126).

Lorica wine-glass-shaped with very thick wall having 3 or 4 transverse corrugations.

Length of lorica 50μ; diameter 70μ; length of pedicel 280μ.

In association with var. *gracilis*.

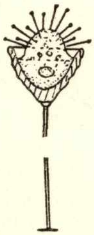

Fig. 126. *Paracineta crenata* var. *pachytheca* Collin. x 150.

TRICHOPHRYIDAE

Genus **TRICHOPHRYA**

Animal naked; usually attached but may then have free-swimming stage when young; tentacles all similar and in groups.

T. columbiae Wailes 17 (Fig. 127).

Body ellipsoidal, free-swimming, with knobbed tentacles, grouped around the poles, the central portion free from tentacles or cilia.

Length 60 to 75μ; diameter 40 to 48μ; nucleus 12μ in diameter, perinuclear membrane 30μ diameter.

In the plankton off Lennard island, Clayquot sound, abundant August 7, 1927.

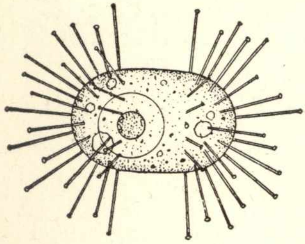

Fig. 127. *Trichophrya columbiae* Wailes. x 300.

INCERTUM SEDIS

Genus **TROCHISCIA** Kutzing

Under this genus have been grouped various spherical and ovoid free-swimming organisms from both salt and fresh water, some of which may be ova (ova hispida) of unknown species.

KEY TO SPECIES

1.	(10)	Body spherical or lenticular.		
2.	(7)	Bearing spines.		
3.	(6)	Spines pointed.		
4.	(5)	Spines long.	**clevei**	(p. 44)
5.	(4)	Spines short.	**multispinosa**	(p. 44)
6.	(3)	Spines capitate.	**brachiolata**	(p. 45)
7.	(2)	Not bearing spines but with lists.		
8.	(9)	Body over 100μ in diameter.	**moebiusi**	(p. 45)
9.	(8)	Body less than 100μ in diameter.	**dictyon**	(p. 45)
10.	(1)	Body elliptical.	**ovata**	(p. 45)

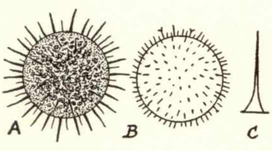

Fig. 128. *Trochiscia clevei* Lemm. x 150. A, long spined form; B, empty shell of short spined form; C, a long spine enlarged.

T. clevei Lemmermann 14 (Fig. 128).

Body spherical with thin membrane; spines usually long and tapering, but a short spined form also occurs.

Diameter of body 75 to 86μ; length of spines 3 to 25μ.

Generally distributed; often abundant in the plankton. They provide a common food for larval herring.

T. multispinosa (Moebius) 14 (Fig. 129).

Body spherical covered with numerous short spines.

Diameter of body 20 to 25μ; length of spines 3 to 6μ.

Off west coast of Vancouver island; rare.

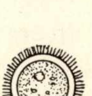

Fig. 129. *Trochiscia multispinosa* (Moeb.). x 400.

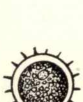

Fig. 130. *Trochiscia multispinosa* forma. x 400.

T. multispinosa *forma* 14 (Fig. 130).

Similar to type but with few spines.

Diameter of body 20μ; length of spines 3μ.

Off west coast of Vancouver island; rare.

T. brachiolata (Moebius) 14 (Fig. 131).

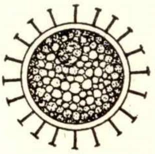

Fig. 131. *Trochiscia brachiolata* (Moeb.). x 400.

Body spherical studded with capitate spines.

Diameter of body 32 to 40μ; length of spines 3 to 5μ.

Generally distributed in the plankton; rare.

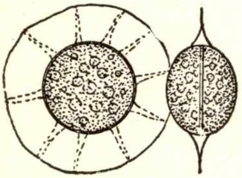

Fig. 132. *Trochiscia moebiusi* (Joerg.). x 150.

T. moebiusi (Joergensen) 14 (Fig. 132).

Body lenticular with broad, thin equatorial disc supported by radial spines.

Body 80 to 90μ diameter; disc 160 to 180μ in diameter.

Generally distributed.

T. moebiusi *forma* 14 (Fig. 133).

Body lenticular situated between two circular lists supported by four or five radial arms.

Diameter of body 115 to 130μ, thickness two-thirds the diameter; lists 175 to 260μ in diameter.

Generally distributed; sometimes numerous.

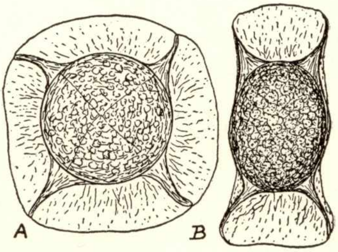

Fig. 133. *Trochiscia moebiusi* forma. A, side; B, edge view. x 150.

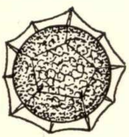

Fig. 134. *Trochiscia dictyon* (Joerg.). x200.

T. dictyon (Joergensen) 14 (Fig. 134).

Body compressed with narrow equatorial disc supported by radial spines.

Diameter of body 60 to 65μ.

Off west coast of Vancouver island; rare.

T. ovata (Pouchet) (Fig. 135).

Cell ellipsoidal, with lists supported on radial arms; dark brown in colour.

Length of cells 65 to 95μ; breadth 35 to 62μ; width of lists 15 to 22μ.

Off the west coast of Vancouver island; not uncommon.

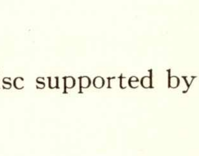

Fig. 135. *Trochiscia ovata* (Pouchet). x 200.

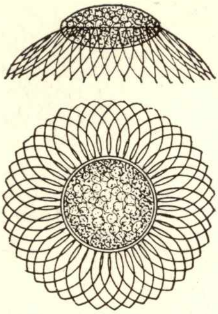

Fig. 136.
Radiospermum textum Meunier. Broad and narrow views. x 300.

Genus **RADIOSPERMUM**

Free-swimming lenticular bodies with an equatorial list formed of thin overlapping plates.

R. textum Meunier 14 (Fig. 136).

With the characters of the genus.

Diameter of cell about 45μ; diameter of list twice that of cell.

Strait of Georgia in the plankton; also off the west coast of Vancouver island; rare.