

Fig. 168. *Nitzschia* spp. **A-F.** LM, living cells. **A, C-E.** Valve views, note lipid bodies. **B, F.** Girdle view, note lipid bodies. Scale bars = 10 μ m (A-F).

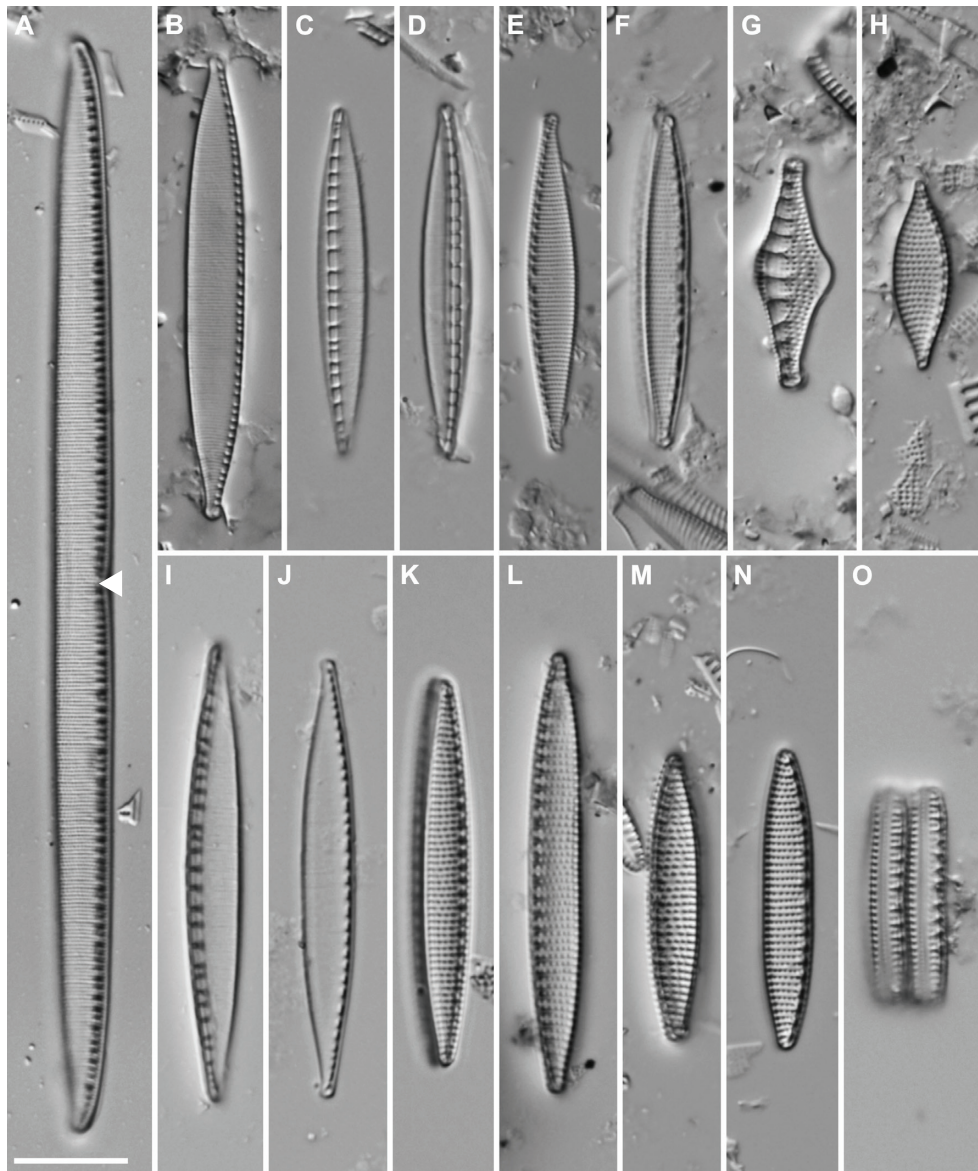


Fig. 169. *Nitzschia* spp. **A-O.** LM, cleaned valves. **A-N.** Valve views. **A.** *N. linearis* (C. Agardh) W. Smith, note central gap in the fibulae (arrow). **C-D.** *N. dissipata*. **G.** *N. sinuata* var. *tabellaria* (Grunow) Grunow. **H.** *N. lancetulla* O. Müller. **M-N.** *N. amphibia* Grunow. **I.** *N. recta* Hantzsch ex Rabenhorst. **O.** Girdle view. Scale bar = 10 μ m (A-O).

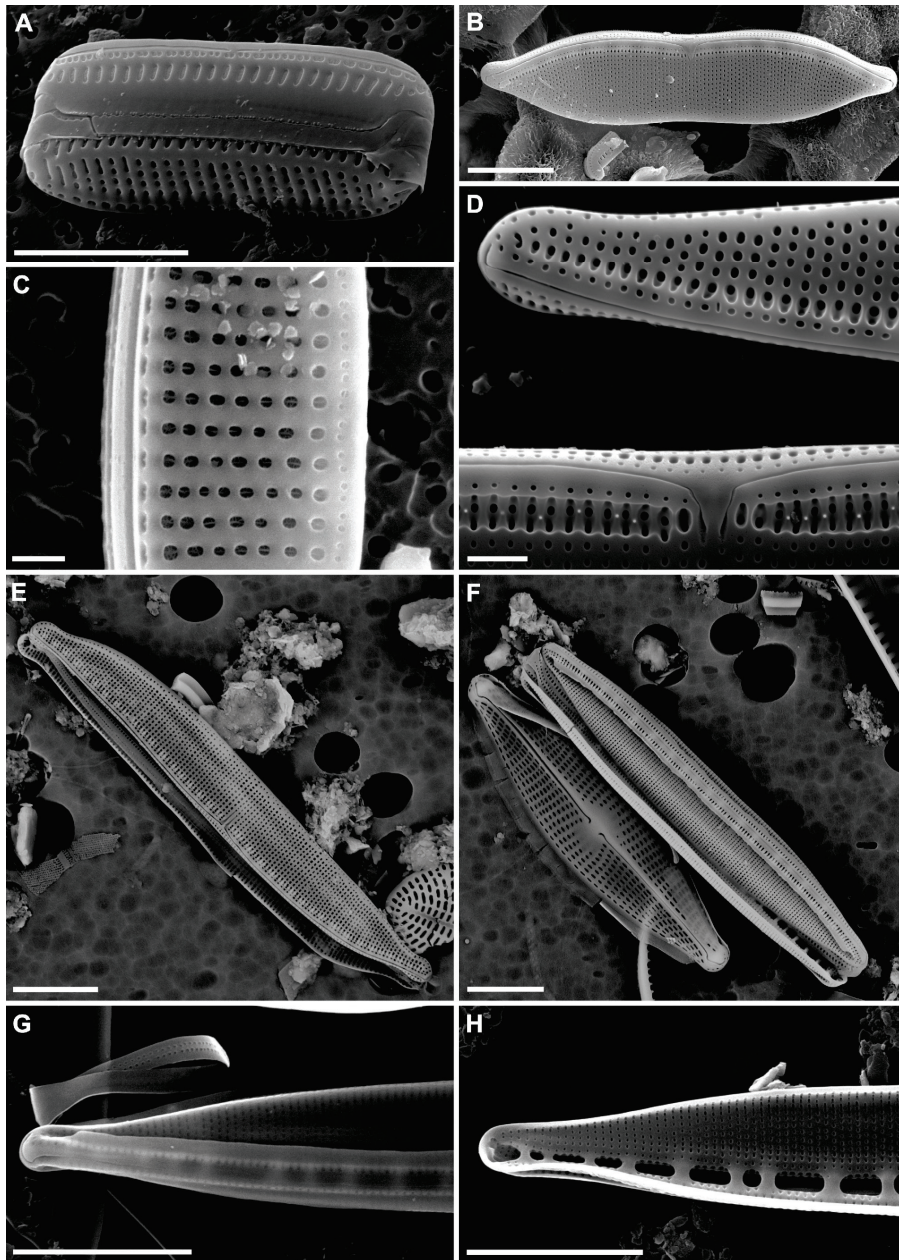


Fig. 170. *Nitzschia* spp. **A-H.** SEM. **A-E.** External view of valves. **A.** Oblique view showing the valve mantle and girdle bands. **D.** Detail of terminal raphe ending and central raphe endings. **F-G.** *N. dissipata*, detail of terminal raphe ending (**G**), note the external conopeum covering the raphe. **H.** Internal view of valve of *N. dissipata*, note the fibulae.

Scale bars = 5 μ m (A-B, E-H), 1 μ m (C-D).

Simonsenia Lange-Bertalot 1979

Type species: *Simonsenia delognei* (Grunow) Lange-Bertalot

SYNONYM:

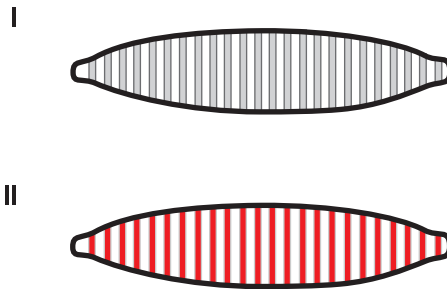
Nitzschia Hassall 1845 pro parte

Characteristics – Cells **biraphid**, very small, elliptical to linear elliptical with narrow rostrate apices. Striae fine, parallel, composed of double rows of areolae which are not discernable under LM. Raphe carried on a keel at the junction of one side of the valve face and mantle, supported by **costae** (II) which traverse the width of the valve face (Fig. 171: F-H). **Costae** are the only structure clearly discernable in LM. Cells similar in appearance to *Nitzschia* but **fibulae** are absent (Fig. 171: F-H).

Plastid structure – Cells with 2 plastids, each one extending from mid-valve to each apex (see *Nitzschia*).

Identification of species – Up till now only one species known: *Simonsenia delognei*.

Ecology – Cells solitary, free living and motile. Found in the benthos of waters with moderate conductivities.



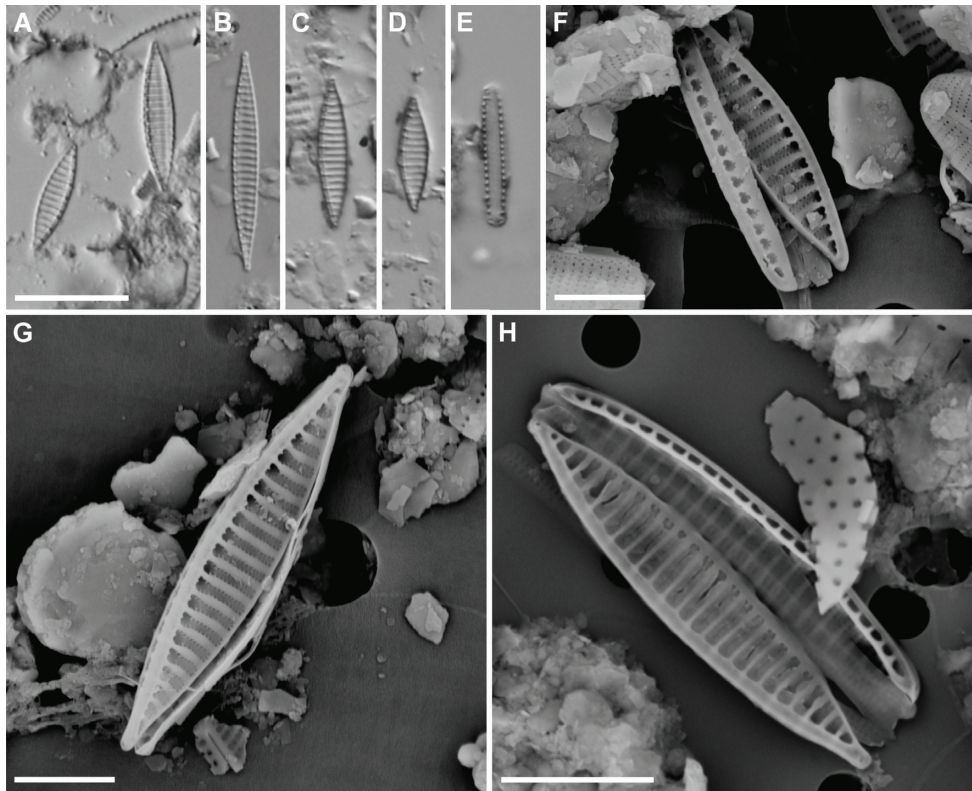


Fig. 171. *Simonsenia delognei*. **A-E.** LM, cleaned valves. **F-H.** SEM. **F** Internal view of valve. **G-H.** External view of valves. Scale bars = 10 μm (A-E), 3 μm (F-H).

Tryblionella W. Smith 1853

Type species: *Tryblionella acuminata* W. Smith

SYNONYM:

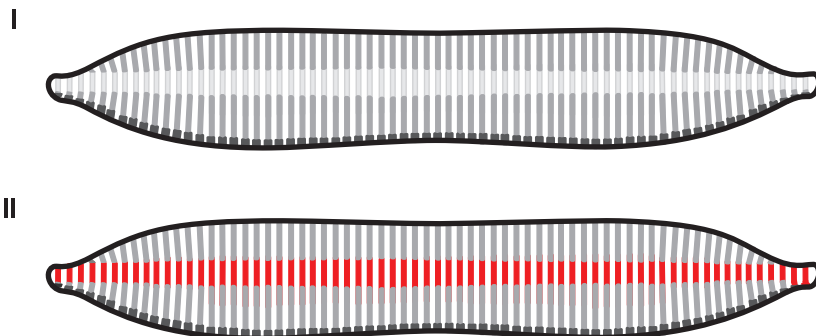
Nitzschia Hassall 1845 pro parte

Characteristics – Cells **biraphid**, elliptical to linear elliptical with cuneate and occasionally subrostrate apices. Marginal raphe carried in canal at junction of valve face and valve mantle. Raphe difficult to discern, supported by fibulae (Fig. 173), interrupted mid-valve. Striae very fine composed of rows of small round areolae which are not discernable under LM. Valve face strongly longitudinally undulated (II; Fig. 173: A-C, E-G). **Costae** cross the valve face. Occasionally silica granules may be scattered on the valve face (Fig. 174: B).

Plastid structure – Cells with 2 large plastids, each one extending from mid-valve to each apex (Fig. 172: A-B). Several small lipid droplets scattered throughout the cell (Fig. 172: A-C).

Identification of species – Species can be identified by cell size, cell shape, shape of the apices, structure and density of the striae as well as the degree of the constriction mid-valve.

Ecology – Cells solitary, free living and motile. Found in the benthos of oligotrophic to eutrophic waters in both moderate to high conductivities.



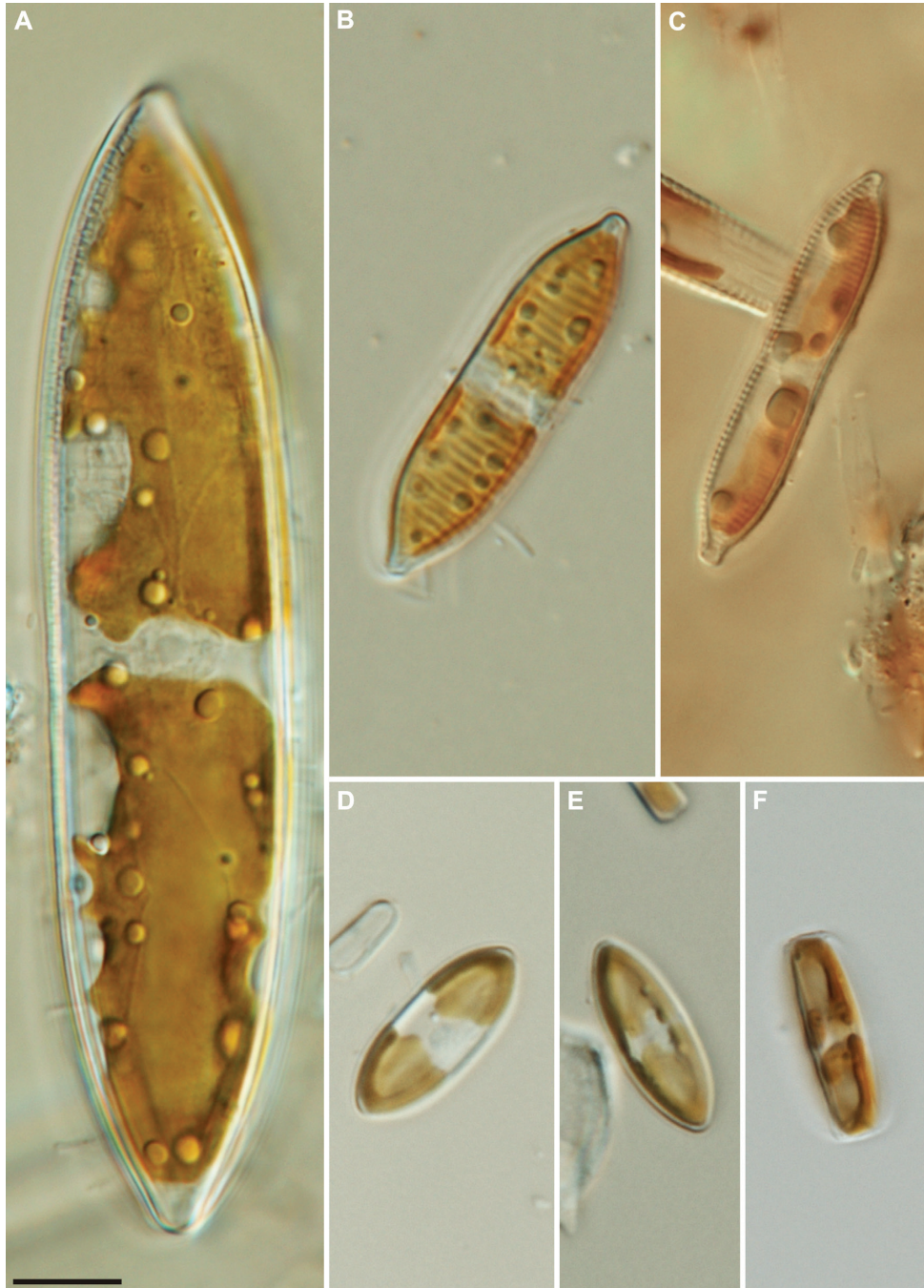


Fig. 172. *Tryblionella* spp. **A-F.** LM, living cells, note two large plastids, each one extending from mid-valve to each apex, and several small lipid droplets.

A. *T. littoralis* (Grunow) D.G. Mann. **B.** *T. calida* (Grunow) D.G. Mann.

C. *T. apiculata* (W. Gregory) D.G. Mann. **D-F.** *T. debilis* Arnott.

Scale bar = 10 μ m (A-F).

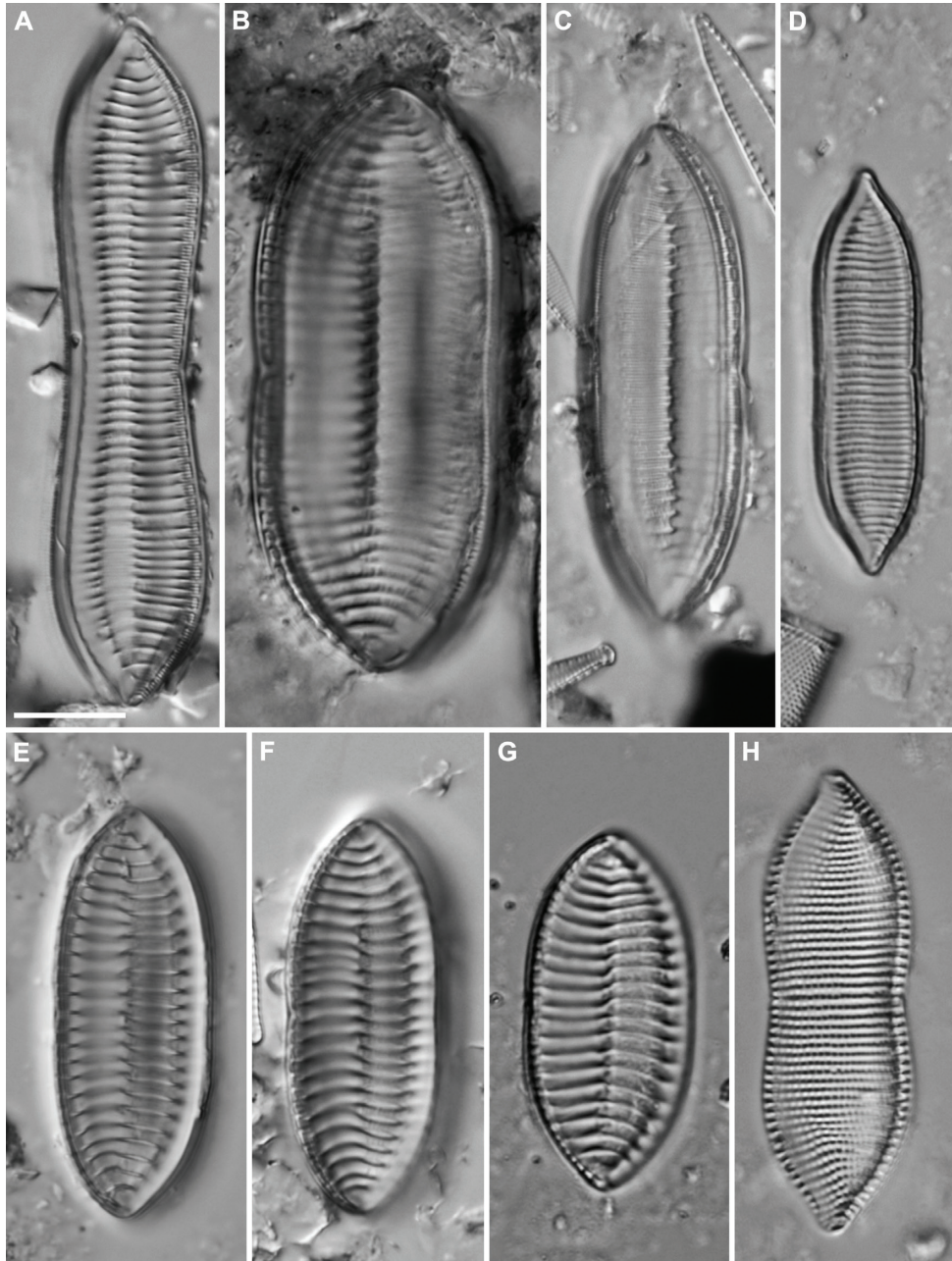


Fig. 173. *Tryblionella* spp. **A-H.** LM, cleaned valves. **C.** *T. littoralis*. **D.** *T. calida*.
E-F. *T. levidensis* W. Smith. **H.** *T. coarctata* (Grunow) D.G. Mann.
Scale bar = 10 μ m (A-H).

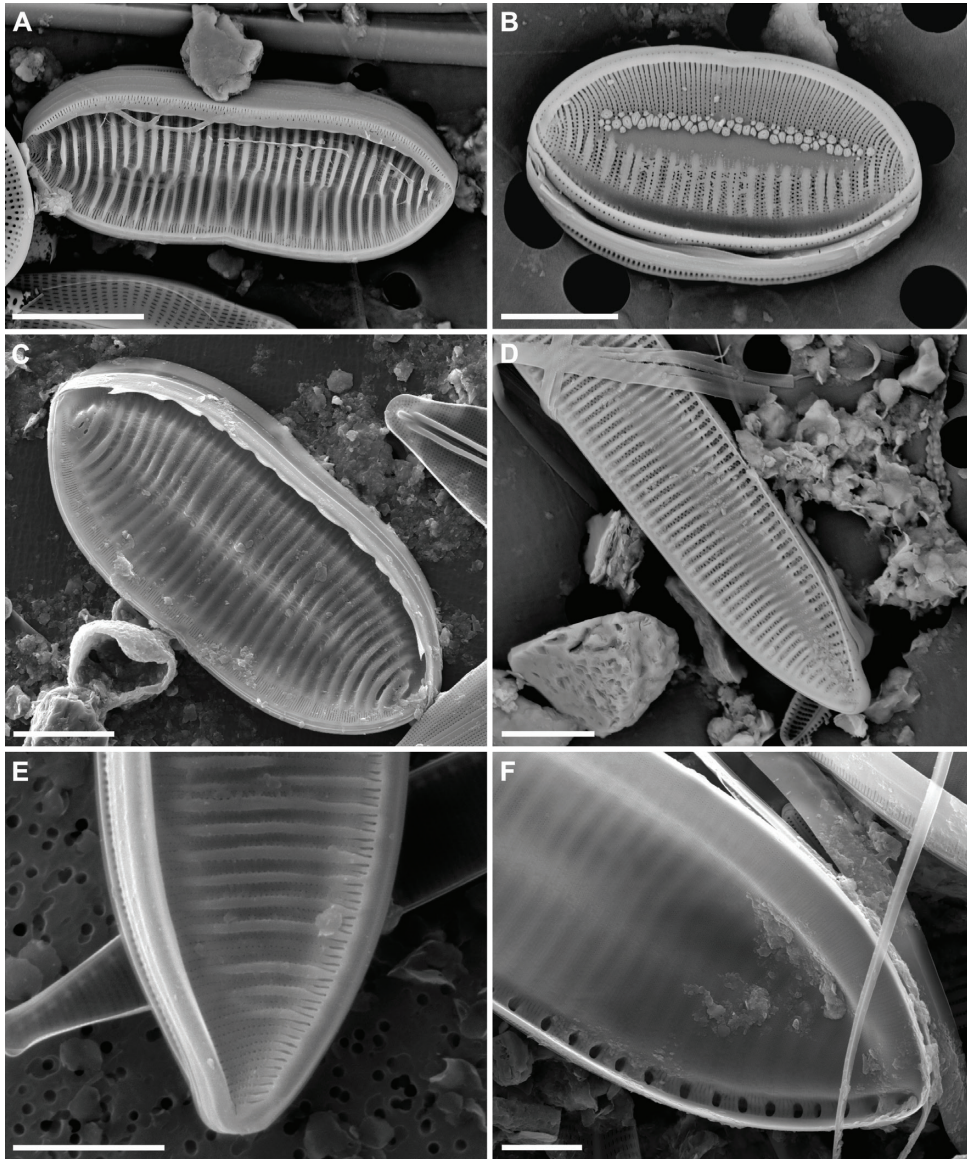


Fig. 174. *Tryblionella* spp. **A-F.** SEM. **A-E.** External view of valves. **B.** *T. debilis*, note scattered silica granules on valve face. **C.** *T. levidensis*. **D.** *T. hungarica* (Grunow) Frenguelli. **E.** *T. calida*. **F.** Internal view of valve, note fibulae.
 Scale bars = 10 μ m (A, C), 5 μ m (B, D-F).

***Epithemia* Kützing 1844**

Type species: *Epithemia turgida* (Ehrenberg) Kützing

Characteristics – Cells **biraphid, dorsiventral**, robust and heavily silicified. **Costae** (I) traverse the valve face in the transapical plane. Striae are easily discernable and composed of complex areolae (Fig. 176; Fig. 177: D). Raphe (II) supported by **fibulae** (III; Fig. 177: F) and located in a canal close to the ventral margin near the apices, each branch of the raphe is arched towards the dorsal valve margin. Septum like extensions found on the valvocopula (first girdle band next to the valve mantle) (Fig. 177: B).

Plastid structure – Cells with single, many-lobed plastid (Fig. 175: A-C). Many scattered lipid droplets.

Identification of species – Species can be identified by cell size, cell shape, shape of the apices, structure and density of the striae and costae as well as shape and degree of arching of the raphe.

Ecology – Cells solitary, free living and motile. Found in the benthos of oligotrophic to eutrophic waters in both low and moderate conductivities. Cells can contain endosymbiotic prokaryotes which are able to fix nitrogen.

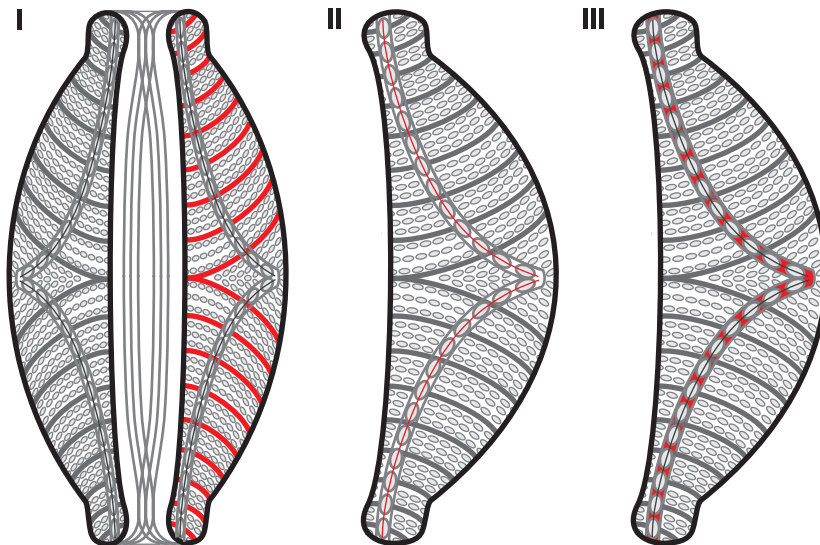




Fig. 175. *Epithemia* spp. **A-C.** LM. **A.** Living cell, girdle view (left) and valve view (right). **B-C.** Living cells of *Epithemia adnata* (Kützinger) Brébisson, girdle view showing highly lobed plastid (**B**) and valve view (**C**).
Scale bar = 10 μ m.

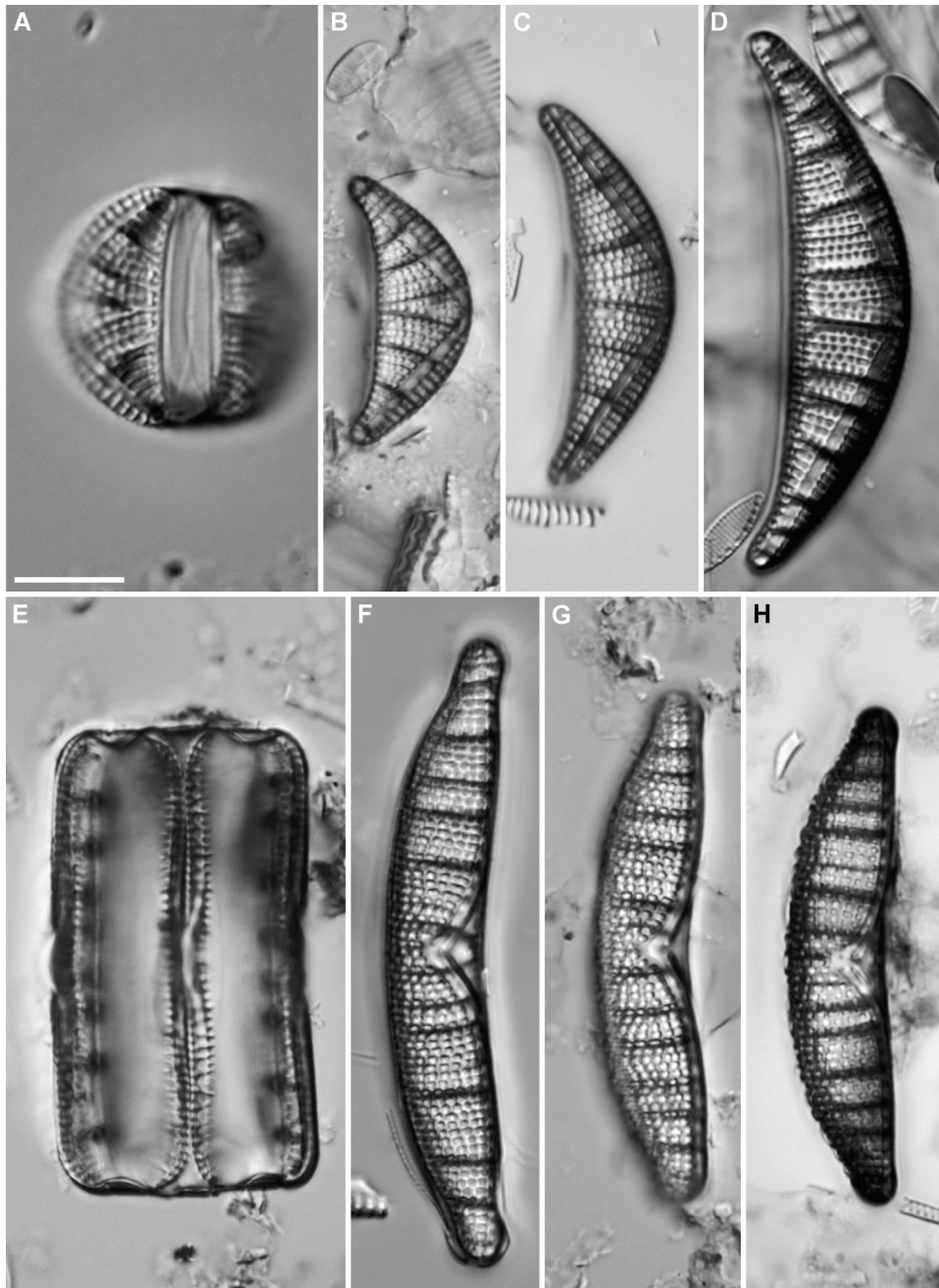


Fig. 176. *Epithemia* spp. **A-H.** LM. **A-D.** *Epithemia* sp., valve view. **E.** *E. adnata*, girdle view of cell undergoing asexual reproduction. **F-H.** *E. adnata* valve view. Scale bar = 10 μ m.

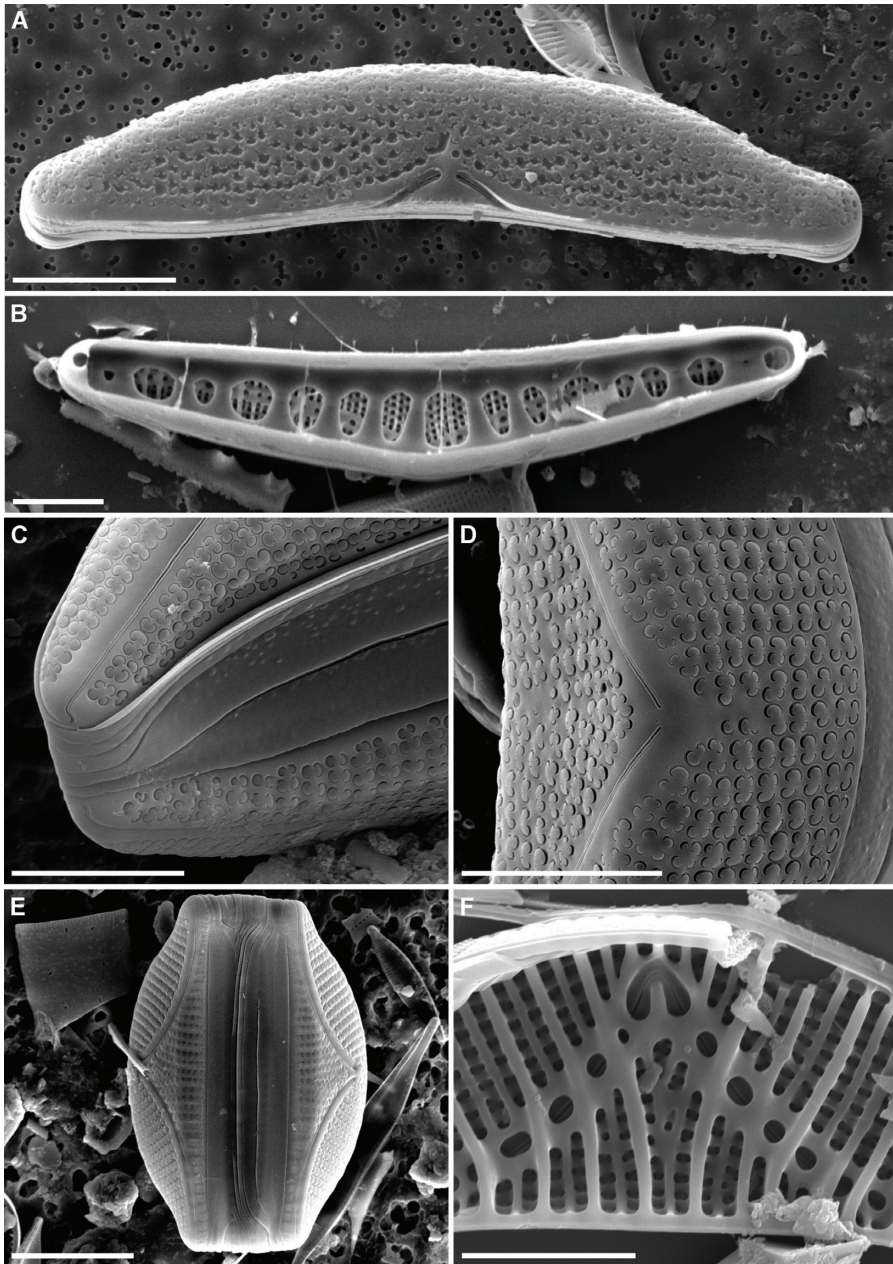


Fig. 177. *Epithemia* spp. **A-F.** SEM. **A.** *E. adnata*, external view of valve. **B.** Internal view of valve showing septum like extensions from the valvocopula. **C-F.** *E. sorex* Kützing. **C.** External view of terminal raphe endings. **D.** External view of central raphe endings. **E.** External view of ventral margin of intact cell. **F.** Internal view of valve showing heavily silicified costae.
Scale bars = 10 μ m (A-B, E), 5 μ m (C-D, F).

Rhopalodia O. Müller 1897

Type species: *Rhopalodia gibba* (Ehrenberg) O. Müller

Characteristics – Cells **biraphid**, **dorsiventral** with often straight ventral side, sometimes **heteropolar**, robust and heavily silicified. Cells large to extremely large. **Costae** traverse the valve face in the transapical plane (III; Fig. 180: E-I). Striae are easily discernible and composed of complex areolae (Fig. 181: F). Raphe (II) is very difficult to discern in LM, located in a canal on the dorsal valve margin, each branch of the raphe follows the curvature of the margin and is usually indented at the central nodule (Fig. 181: C). Girdle bands not complex such as those found in *Epithemia*.

Plastid structure – Single plate-like plastid lying along the ventral side of the girdle with highly lobed margins extending under the valve faces (Fig. 178: A-D).

Identification of species – Species can be identified by cell size, cell shape, shape and curvature of the apices, structure and density of the striae and costae as well as the degree of heteropolarity.

Ecology – Cells solitary, free living and motile or attached with mucilage stalks. Found in the benthos of oligotrophic to eutrophic waters in both low and moderate conductivities. Cells can contain endosymbiotic prokaryotes which are able to fix nitrogen.

