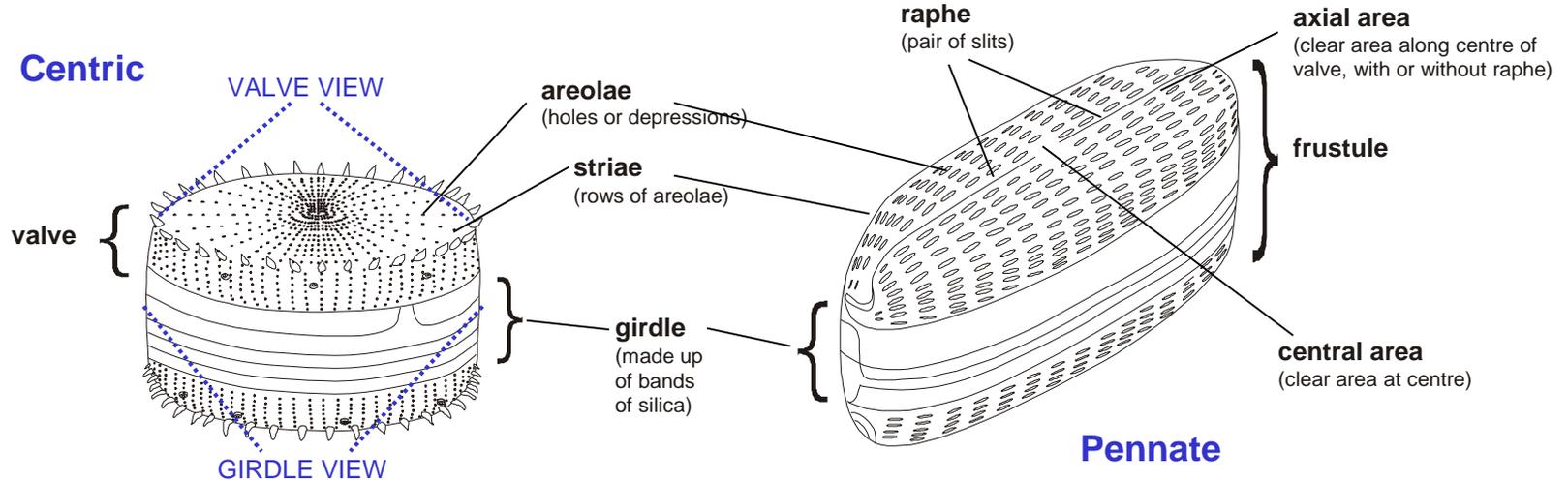


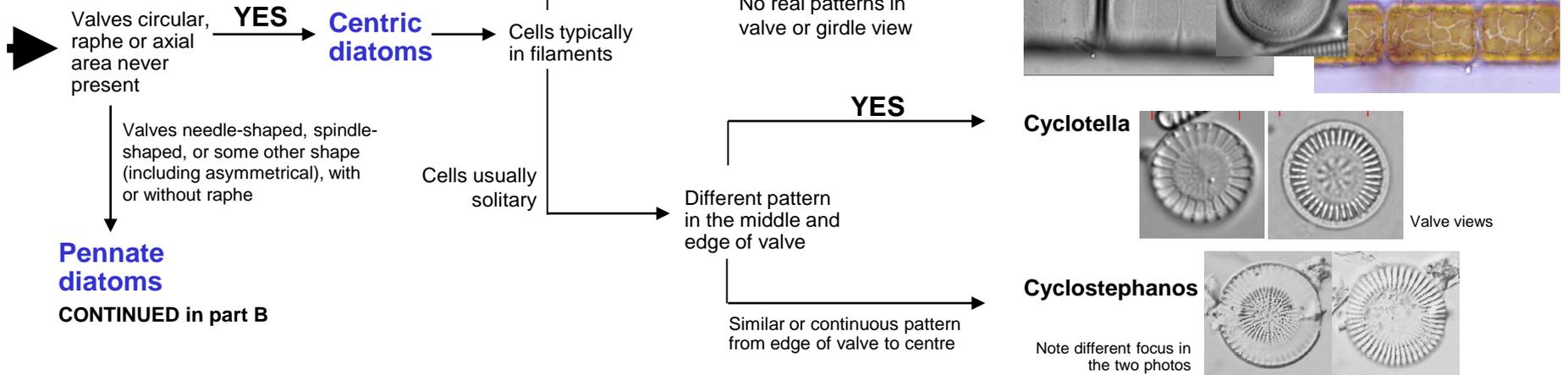
Quick-guide to common diatom genera in New Zealand fresh waters

TERMINOLOGY
(other terms explained in key)



Part A

NOTE: this key works best when looking at acid-cleaned, mounted diatoms at x 1000. The coloured illustrations show live material, in which some of the diagnostic characters may be obscured.



Quick-guide to diatom genera

Part B

continued from Part A

Pennate diatoms

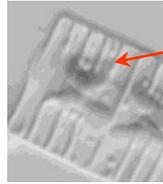
Valves elongated, elliptical or swollen bilaterally. No raphe on either valve

Araphid diatoms

No septa present

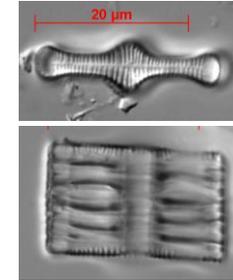
Septa present (internal projections from the girdle band)

YES



Septum

Tabellaria

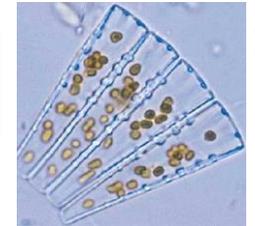
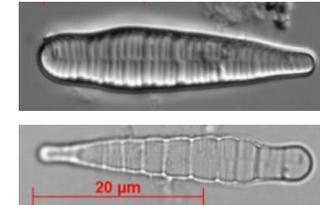


Valve view



Live cells usually in girdle view, forming zig-zag chains
Common and widespread in oligotrophic lakes

Meridion



Fan-like colonies (girdle view)

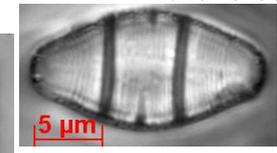
YES

Valves asymmetrical lengthwise

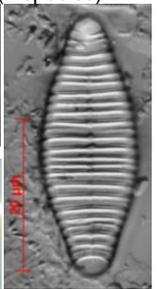
YES

Valves more or less symmetrical

Diatoma



Valve views (2 species)



Live cells forming zig-zag chains (girdle view)



Widespread in rivers from oligotrophic (*D. hiemale*) to eutrophic (*D. vulgare*)

Costae present (internal thickened bands on the valve face)

No

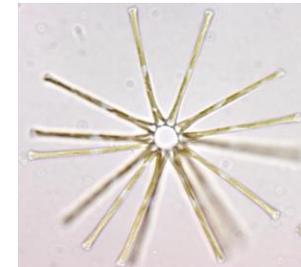
costae present

Valves asymmetrical lengthwise

YES

Asterionella

Planktonic in lakes, where it forms star-like colonies



Valves more or less symmetrical

CONTINUED in part C

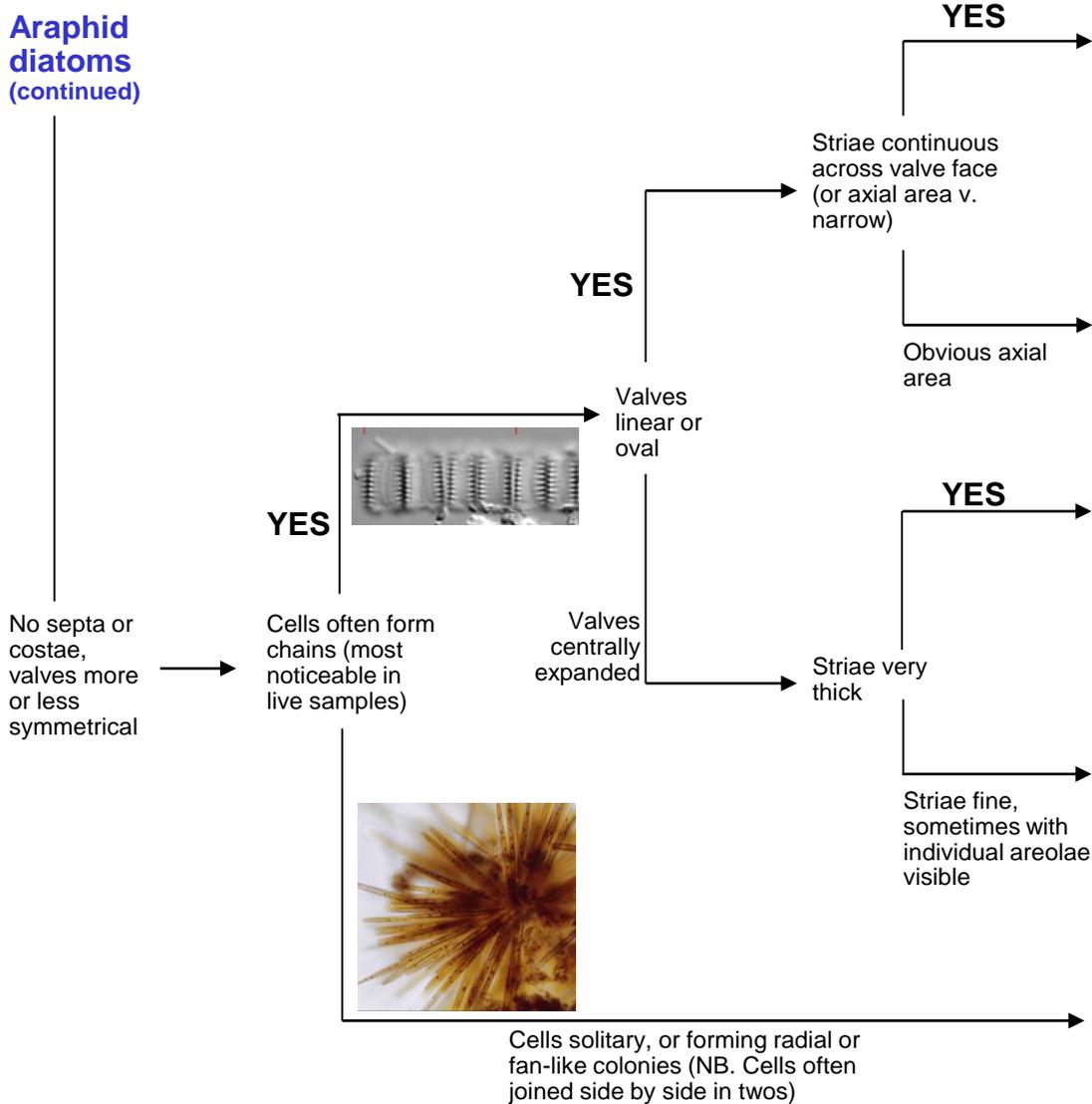
CONTINUED in part D

Quick-guide to diatom genera

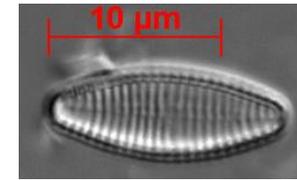
Part C

continued from Part B

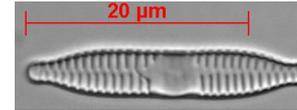
Araphid diatoms (continued)



Fragilariforma (part)

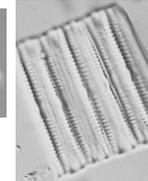


Fragilaria



F. vaucheriae. Common in streams and lakes. Ill-defined species.

Cells in chains always in girdle view

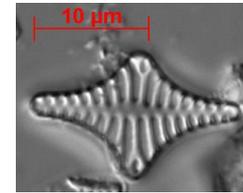


F. crotonesis



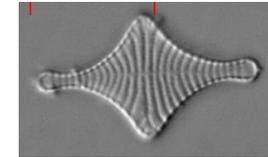
Planktonic in alkaline, ?nutrient-rich? lakes.

Staurosirella



S. leptostauron
Cells in short filaments. Occasionally seen in ?spring-fed systems.

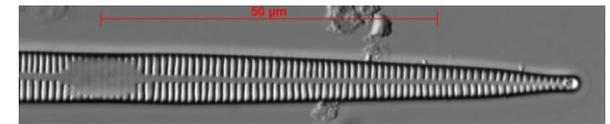
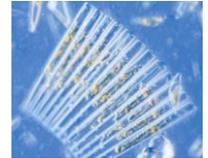
Fragilariforma (part)



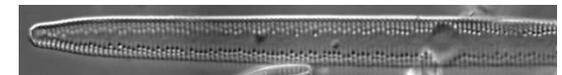
F. cassiaeae
Cells in short zig-zag filaments. Occasionally seen in upland streams.

Synedra

Synedra ulna can be very large. Girdle view is oblong, sometimes seen in fan-like colonies (right). Common and widespread in lowland river periphyton.



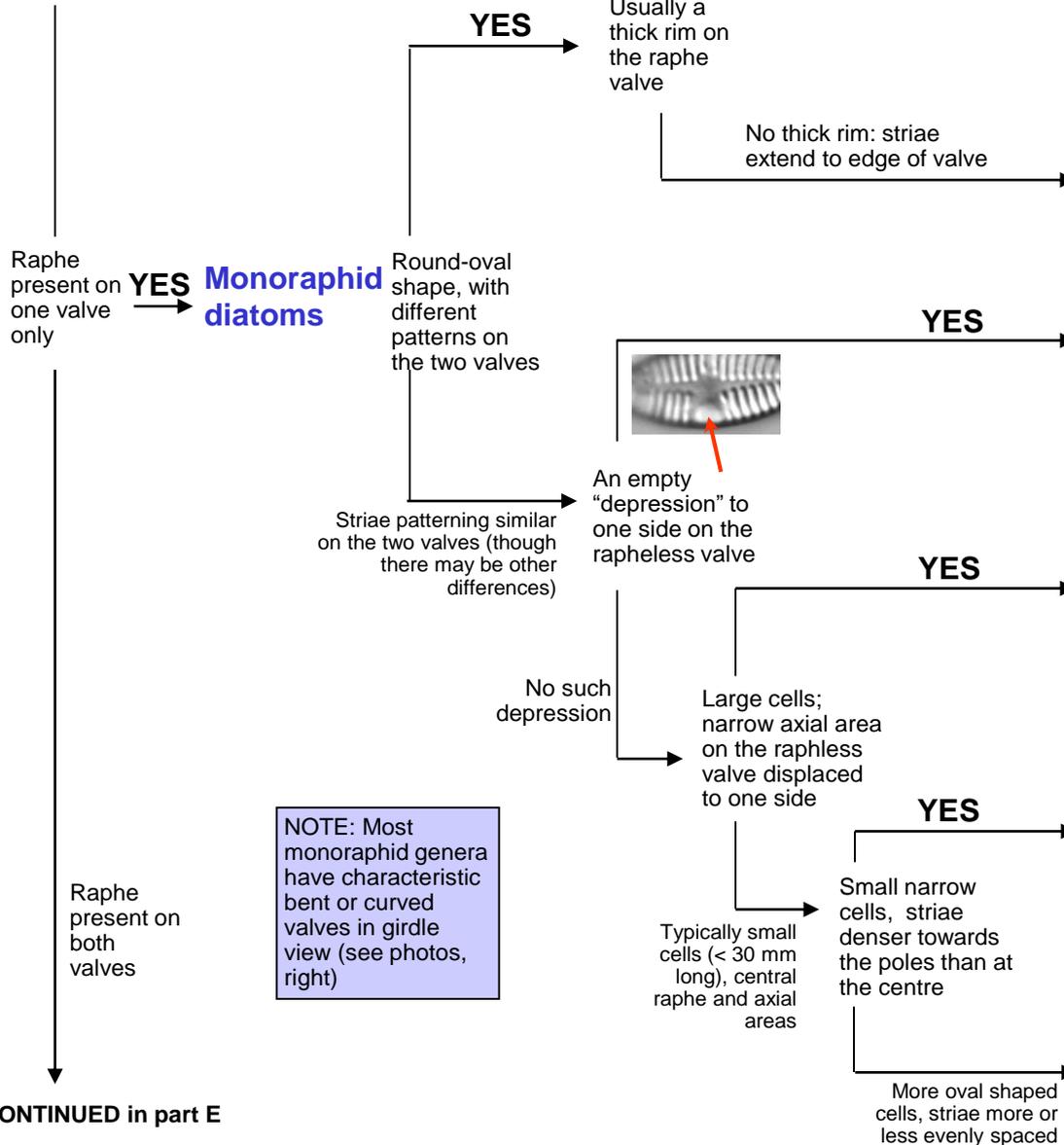
Tabularia Looks similar to *Synedra* but often slightly asymmetrical (fatter at one end). In high conductivity streams.



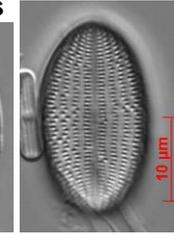
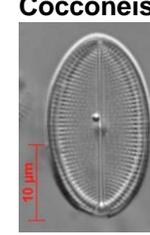
Quick-guide to diatom genera

Part D

continued from Part B



Cocconeis

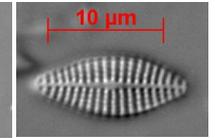
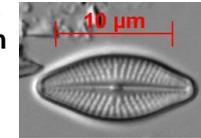


C. placentula.
V. common.
Lives in contact with substrate or on plants/algae.

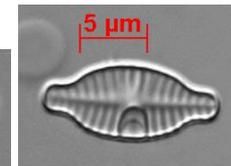
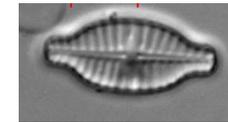
C. pediculus.
Curved cell.
Typically in high cond. waters



Genera related to Achnantheidium

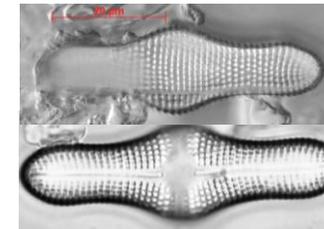


Planothidium

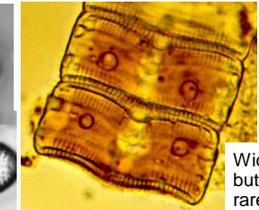


Widespread genus in rivers and lakes

Achnanthes

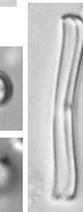
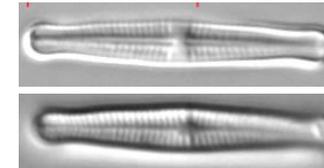


Girdle view



Widespread but usually rare.

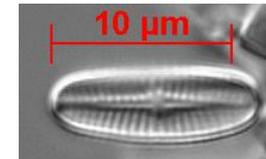
Achnantheidium



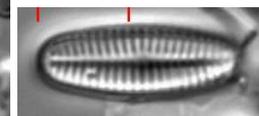
A. minutissimum – a common species in flood-prone rivers. Attaches to substrates with mucilage pads

Girdle view; note slightly "bent" shape

Rossithidium



Note evenly spaced striae

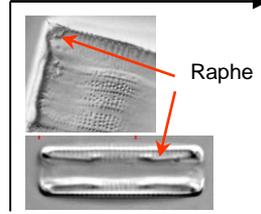
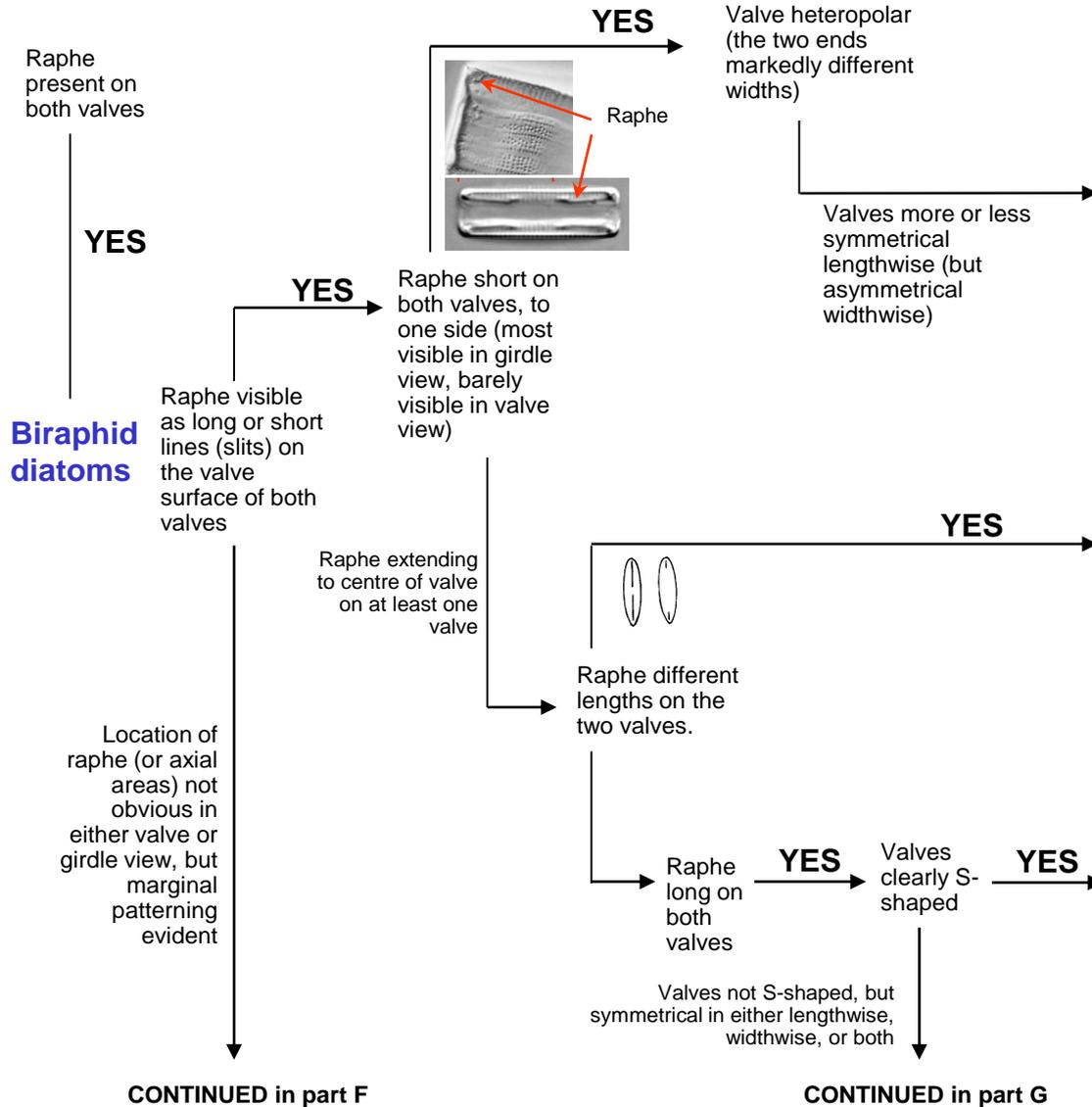


Widespread genus in rivers

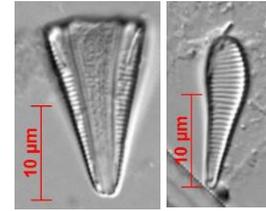
Quick-guide to diatom genera

Part E

continued from Part D



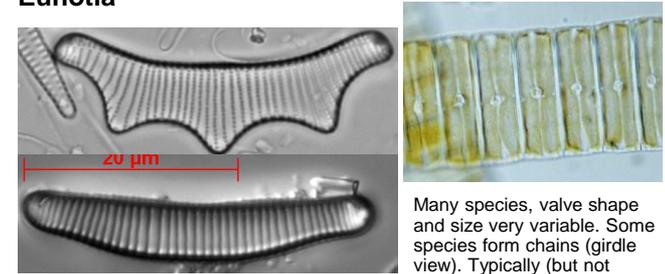
Actinella



Heteropolar in both valve and girdle views.

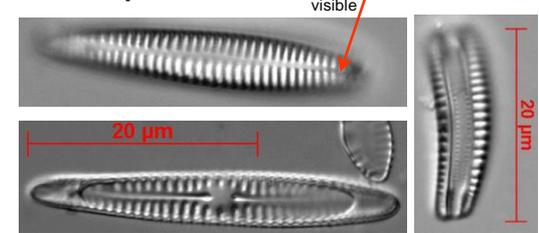
A rare genus.

Eunotia



Many species, valve shape and size very variable. Some species form chains (girdle view). Typically (but not always) in acid habitats

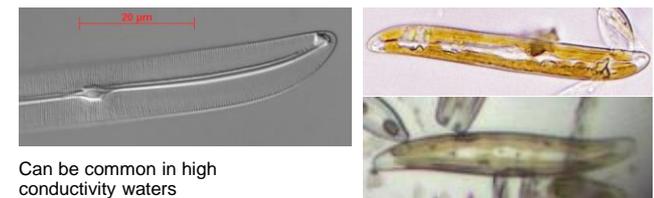
Rhoicosphenia



R. abbreviata; common in rivers.

Septa at valve poles. Curved in girdle view.

Gyrosigma



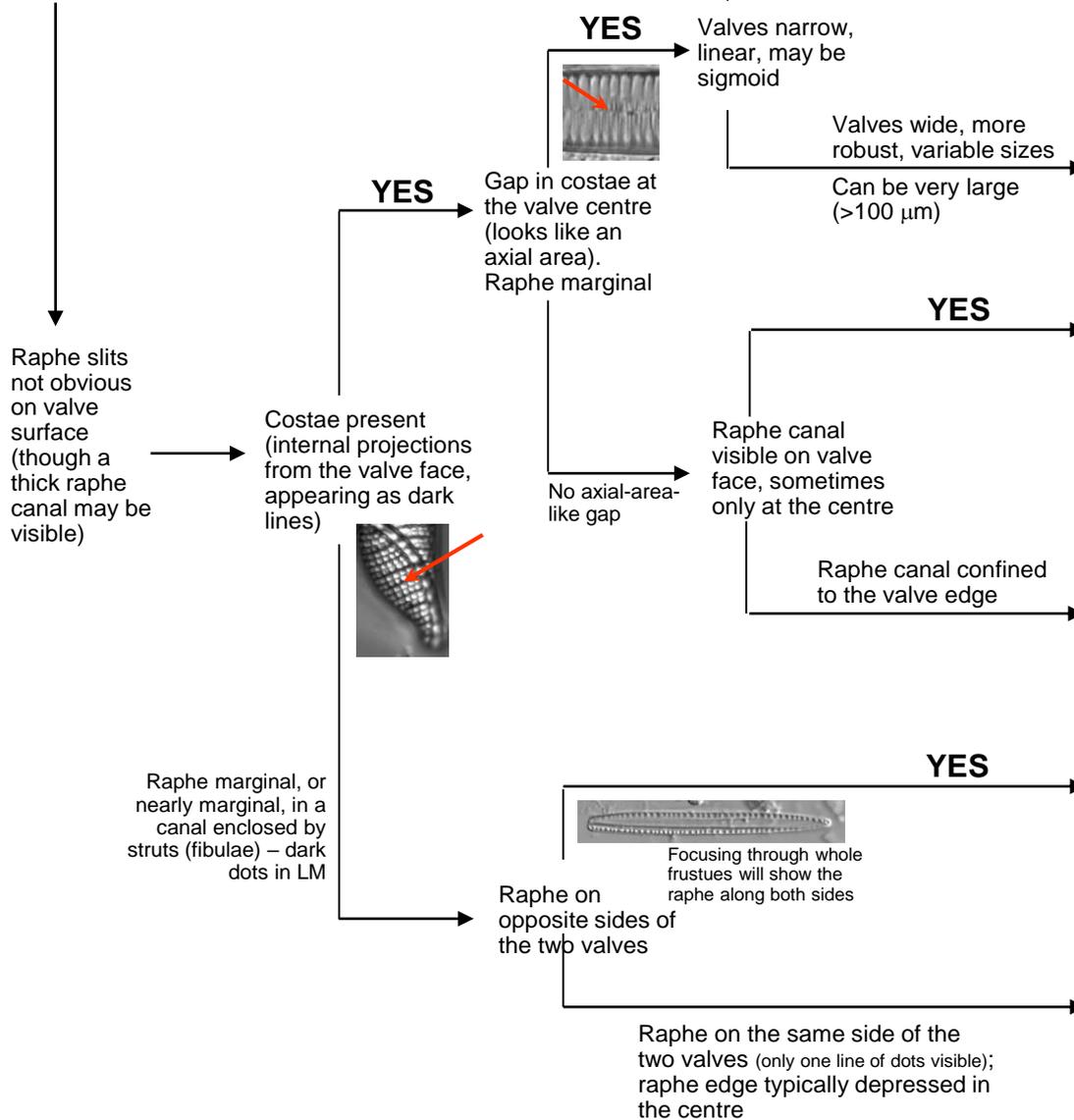
Can be common in high conductivity waters

Quick-guide to diatom genera

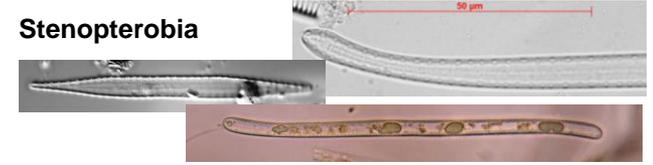
Part F

continued from Part E

Biraphid diatoms

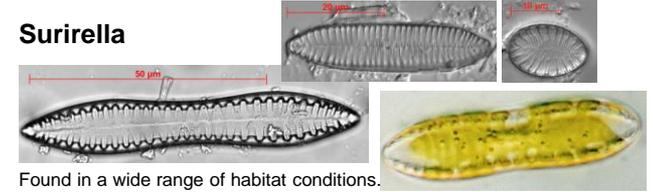


Stenopteroberia



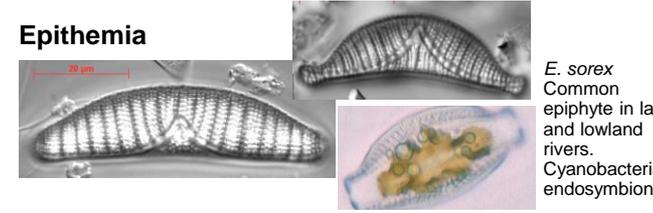
Only found in acidic habitats (e.g., bogs)

Surirella



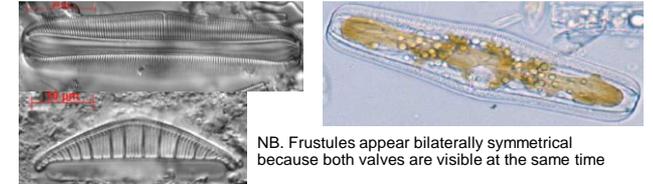
Found in a wide range of habitat conditions.

Epithemia



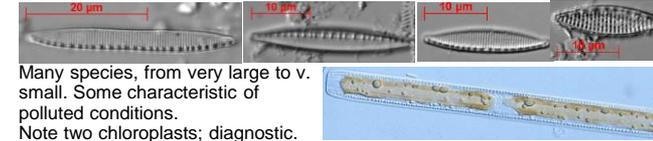
E. sorex
Common epiphyte in lakes and lowland rivers. Cyanobacterial endosymbionts.

Rhopalodia *R. novaezelandiae*. Common in lake periphyton



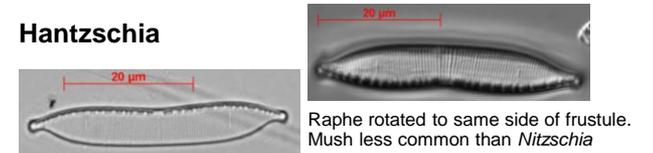
NB. Frustules appear bilaterally symmetrical because both valves are visible at the same time

Nitzschia



Many species, from very large to v. small. Some characteristic of polluted conditions. Note two chloroplasts; diagnostic.

Hantzschia



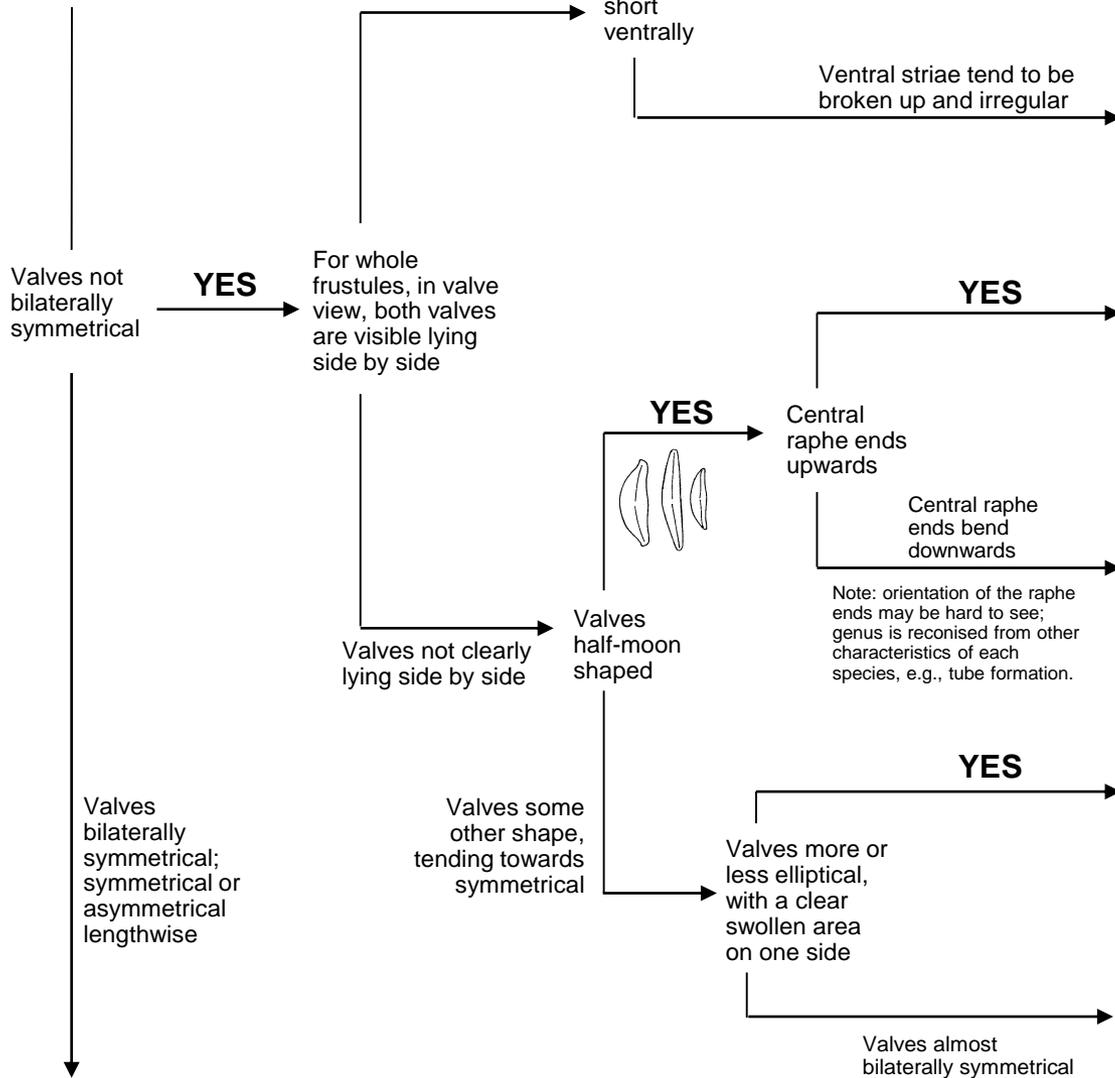
Raphe rotated to same side of frustule. Much less common than *Nitzschia*

Quick-guide to diatom genera

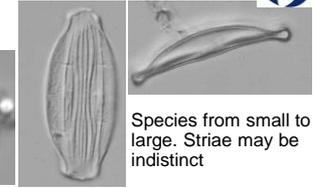
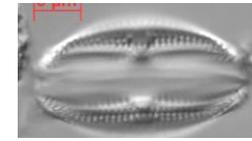
Part G

continued from Part E

Biraphid diatoms



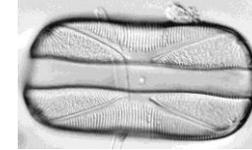
Amphora



Single valve

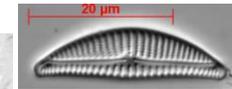
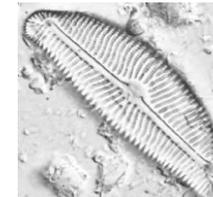
Species from small to large. Striae may be indistinct

Eunophora

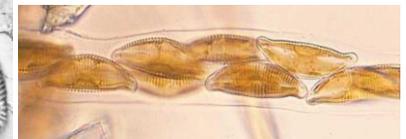


A rare genus, closely related to *Eunotia*. Found in bogs.

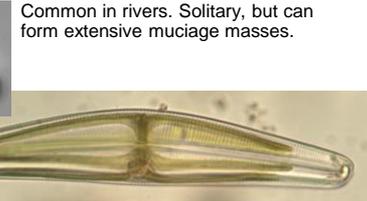
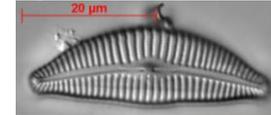
Encyonema



Common in rivers. Some species live in mucilage tubes

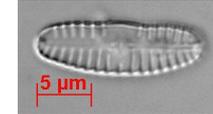


Cymbella



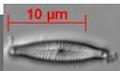
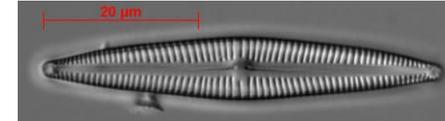
Common in rivers. Solitary, but can form extensive mucilage masses.

Reimeria



Reimeria sinuata is commonly encountered in mixed river communities but not usually abundant. A very small species.

Encyonopsis



Small to large species. Mostly found in acidic habitats.

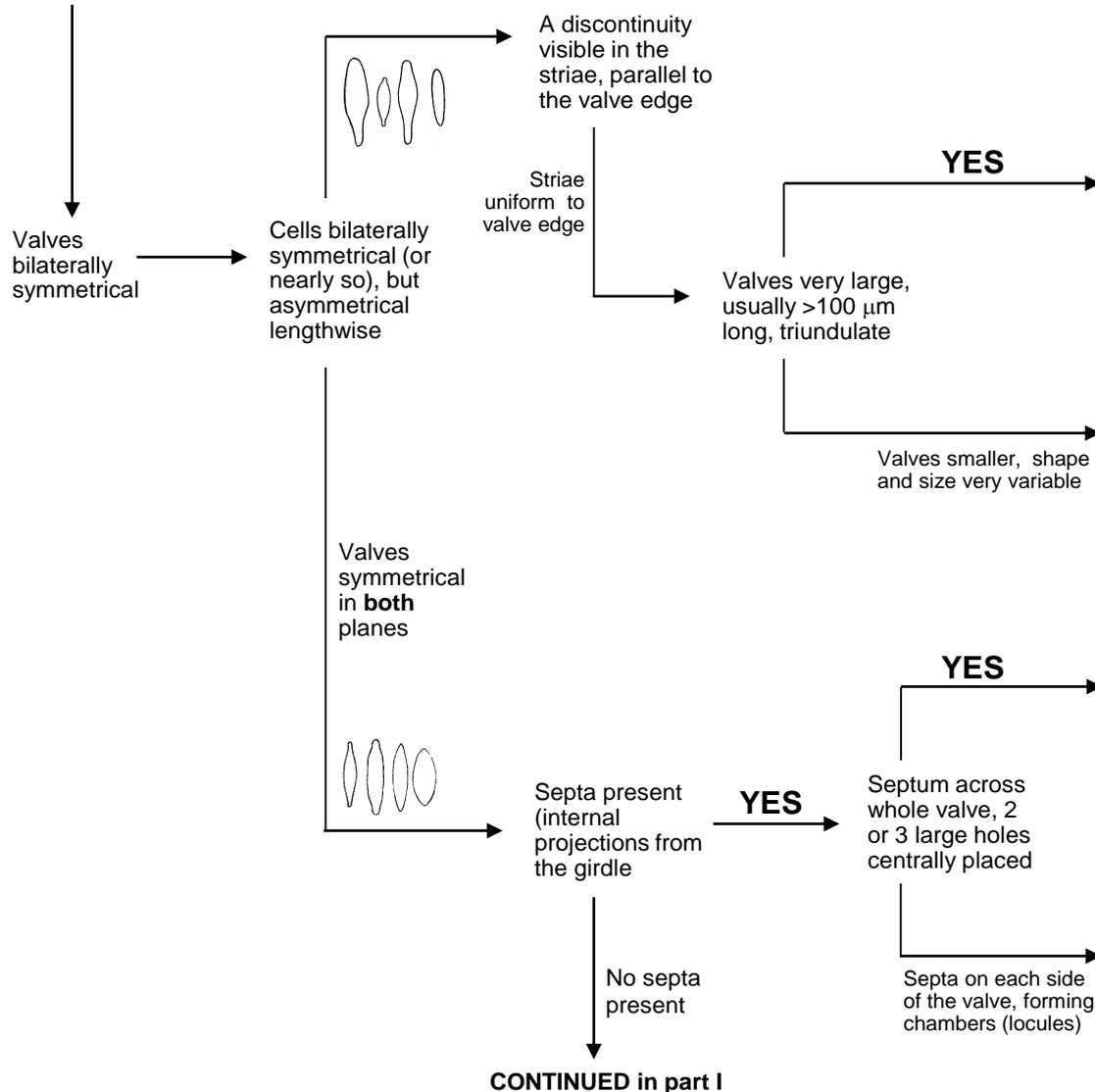
CONTINUED in part H

Quick-guide to diatom genera

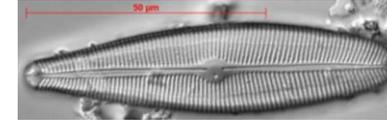
Part H

continued from Part G

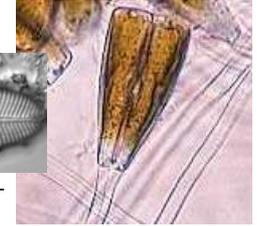
Biraphid diatoms



Gomphoneis

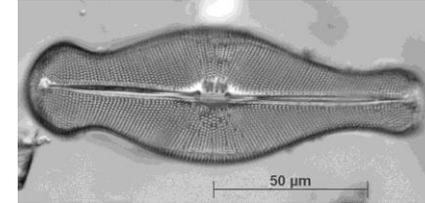


G. minuta var. *cassieae*. Common in hill-country rivers especially in low flows.



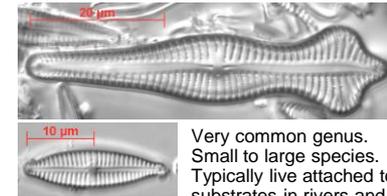
Mucilage stalks. Girdle view.

Didymosphenia



D. geminata. Invasive, stalked diatom first found in New Zealand in 2004.

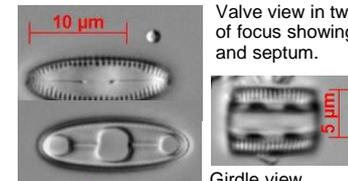
Gomphonema



Very common genus. Small to large species. Typically live attached to substrates in rivers and lakes.



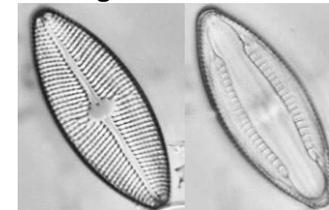
Diatomella



Valve view in two planes of focus showing raphe and septum.

Small-sized diatoms often found inhabiting damp moss.

Mastogloia



Valve view in two planes of focus showing raphe and septum.

Most species in brackish/marine habitats. A few in high conductivity fresh water.

CONTINUED in part I

Quick-guide to diatom genera

Part I

continued from Part H

Biraphid diatoms

Valves bilaterally symmetrical in both planes.

Septa not present

Raphe within an obvious thickened band

Fine raphe with no obvious thickening around it

Central raphe endings curve the same way, or are not curved

Outer ends of raphe usually in an arrowhead shape. Striae very fine

Obvious striae, with discontinuities (due to longitudinal internal canals)

Ornamented valve edges. Central raphe endings often curve in opposite directions

Striae very thick (many tiny areolae, not visible)

Fine striae, individual areolae may be visible

A clear band (stauros) across valve

No stauros; striae continuous along valve edge (though stria length may vary)

YES

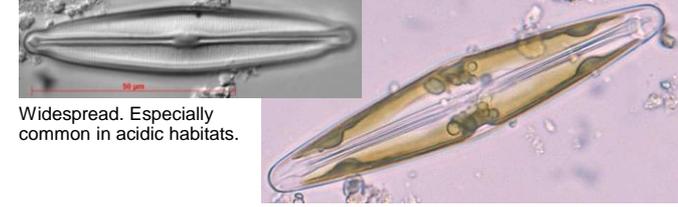
YES

YES

YES

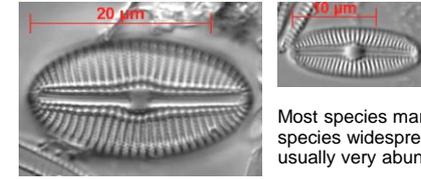
YES

Frustulia



Widespread. Especially common in acidic habitats.

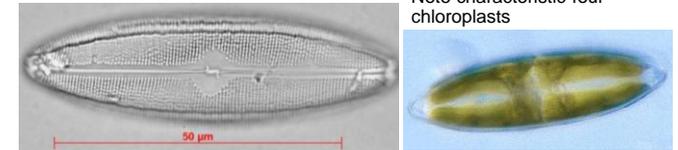
Diploneis



Most species marine. Freshwater species widespread in lakes, not usually very abundant..

See also **Sellaphora** (Part J), which may have a somewhat thickened area around the raphe

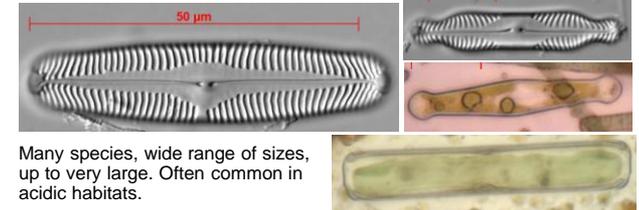
Neidium



Note characteristic four chloroplasts

Species can be very large. Especially common in acidic habitats.

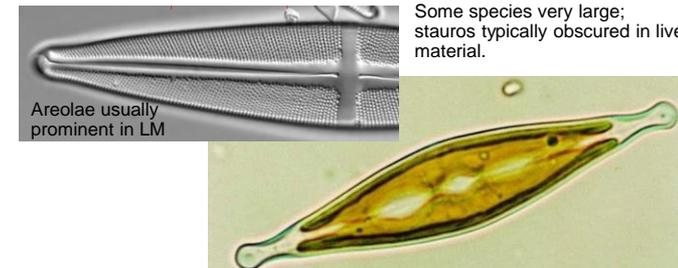
Pinnularia



Many species, wide range of sizes, up to very large. Often common in acidic habitats.

Girdle view

Stauroneis



Some species very large; stauros typically obscured in live material.

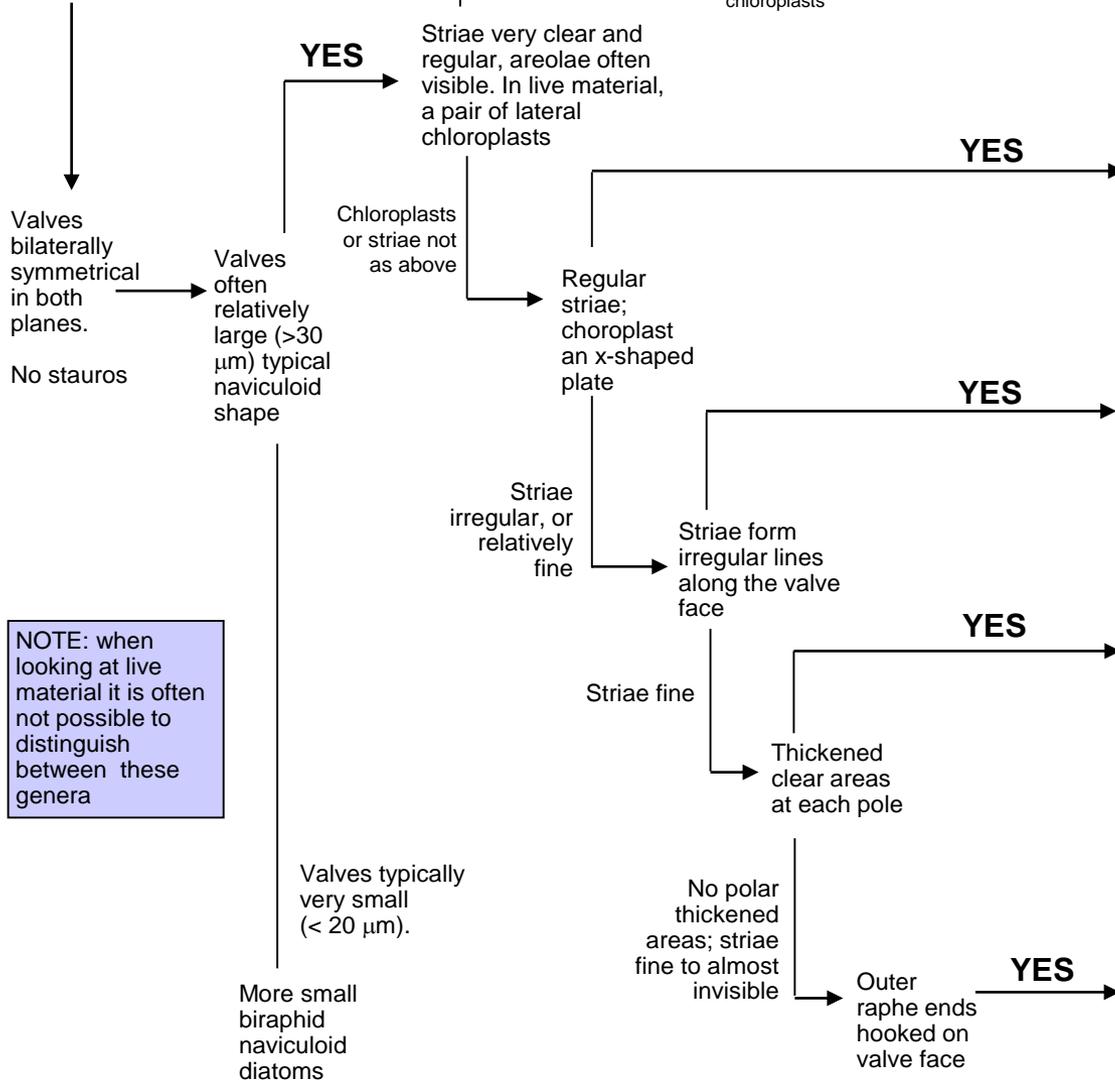
CONTINUED in part J

Quick-guide to diatom genera

Part J

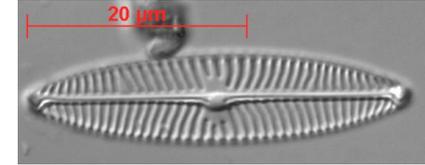
continued from Part I

Biraphid diatoms



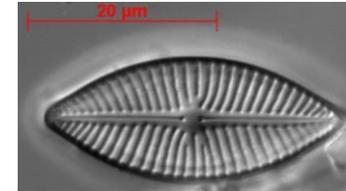
Navicula

Very common genus in river and lake periphyton, with many species.



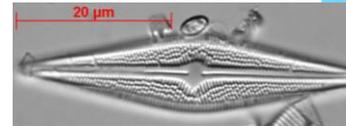
Placoneis

Uncommon genus.
Features hard to see in LM. ID to species will place in genus



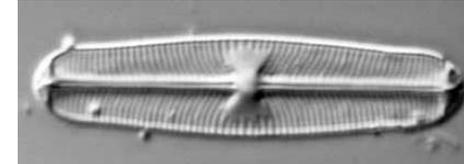
Brachysira

Common in acidic habitats



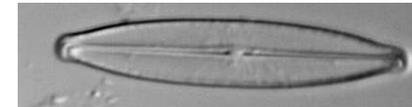
Sellaphora

Widespread in various habitats. Not usually abundant



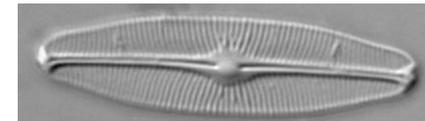
Kobayasiella

These genera typically found in acid habitats. *Kobayasiella* can be locally very abundant



Adlafia

Striae barely visible.



Striae usually visible, with wider spacing at the valve centre.

CONTINUED in part K

Quick-guide to diatom genera

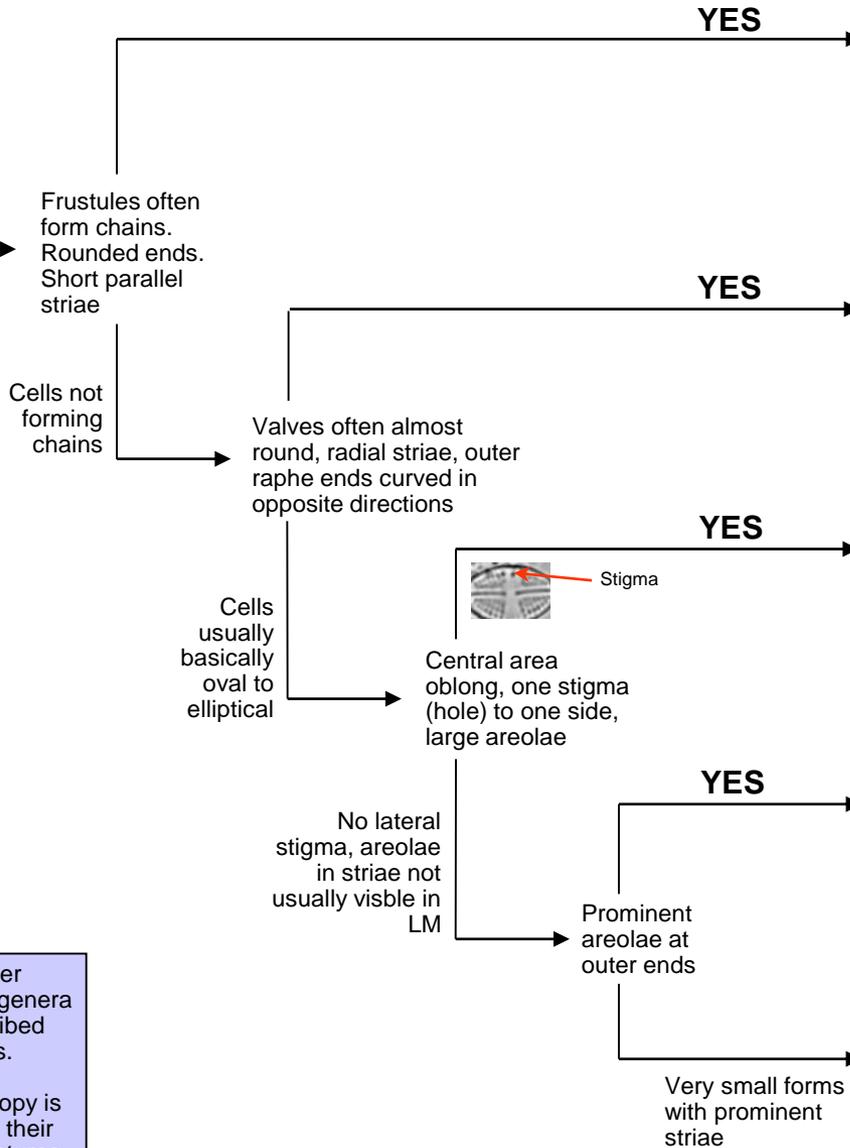
Part K

continued from Part J

Biraphid diatoms

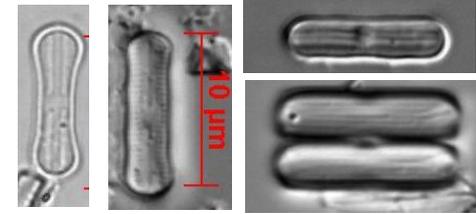
Valves bilaterally symmetrical in both planes.

Valves typically very small (< 20 μm).



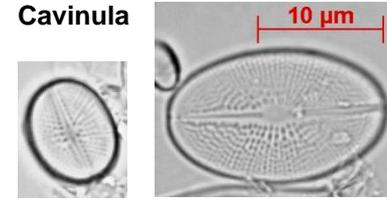
NOTE: Many other small naviculoid genera have been described from fresh waters. Often Scanning Electron Microscopy is required to verify their distinguishing features.

Diadesmis



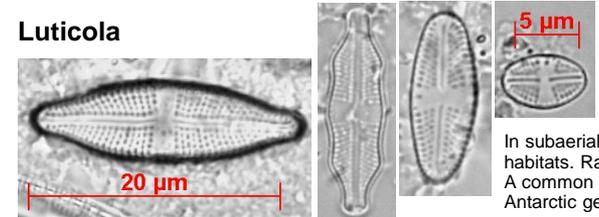
Mostly in subaerial habitats such as damp moss. One larger species *D. confervacea* (not shown) can grow prolifically in warm, shallow streams

Cavinula



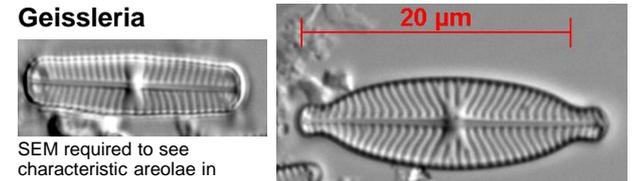
Rare. In oligotrophic lakes.

Luticola



In subaerial habitats. Rare. A common Antarctic genus.

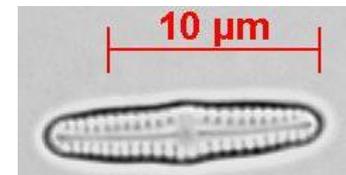
Geissleria



SEM required to see characteristic areolae in some species

Rare. In oligotrophic lakes.

Chamaepinnularia



Very difficult to confirm identity without very high magnification (SEM)