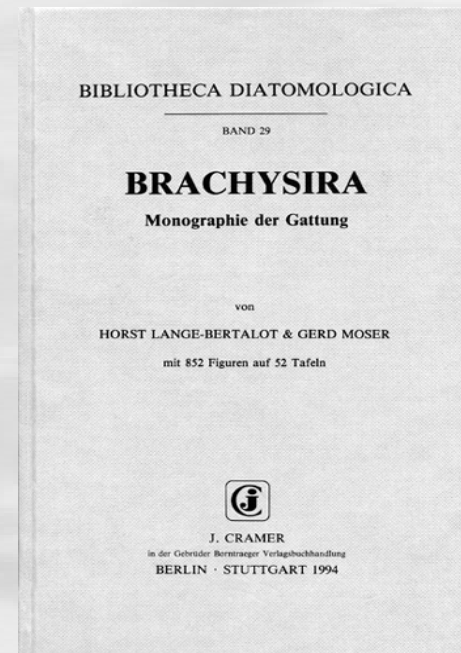
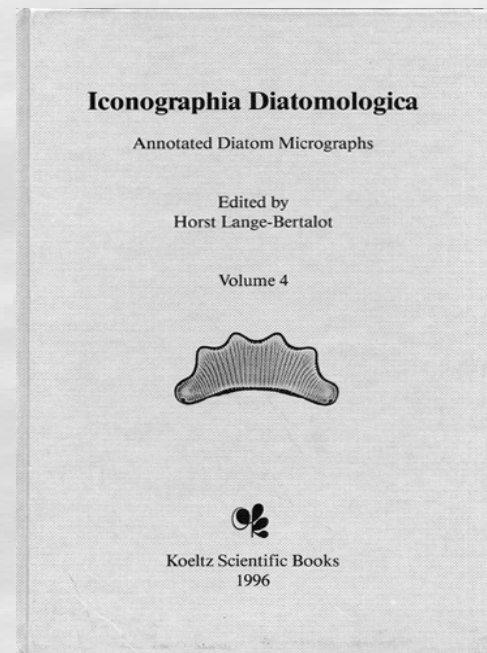
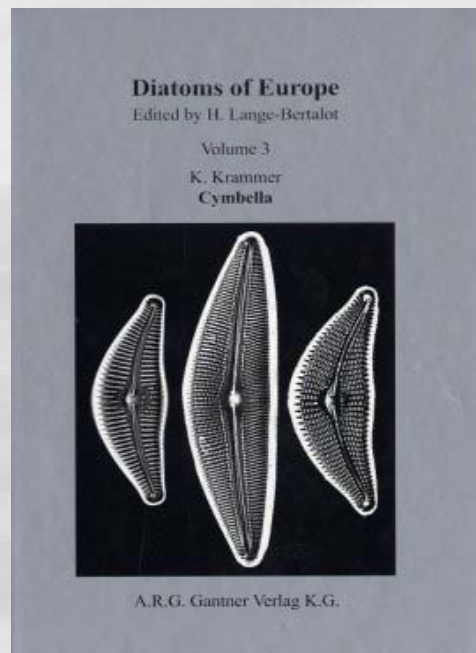
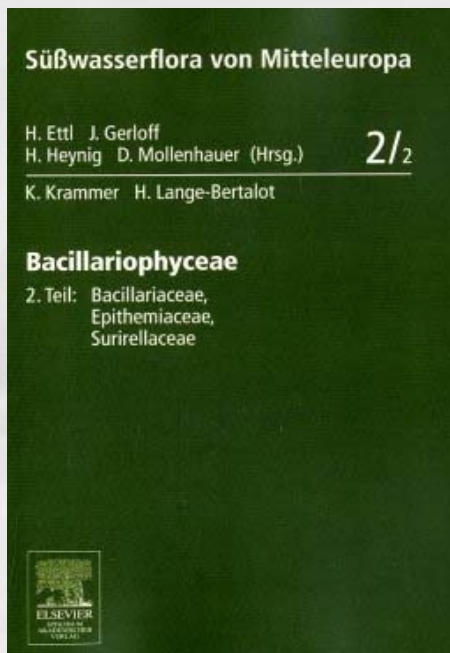
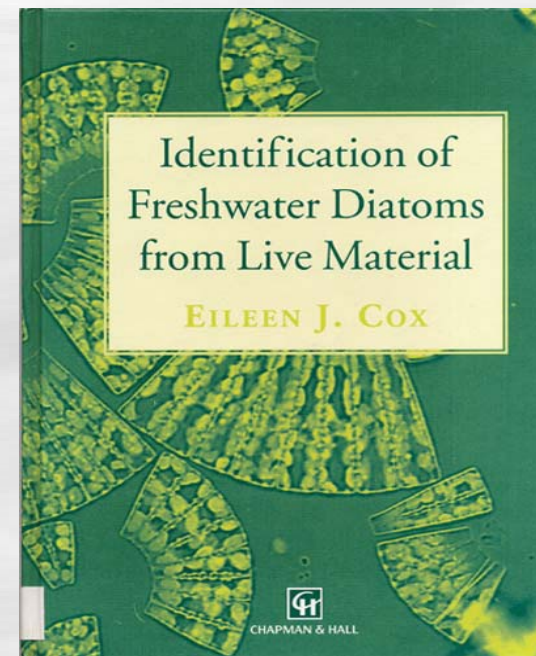
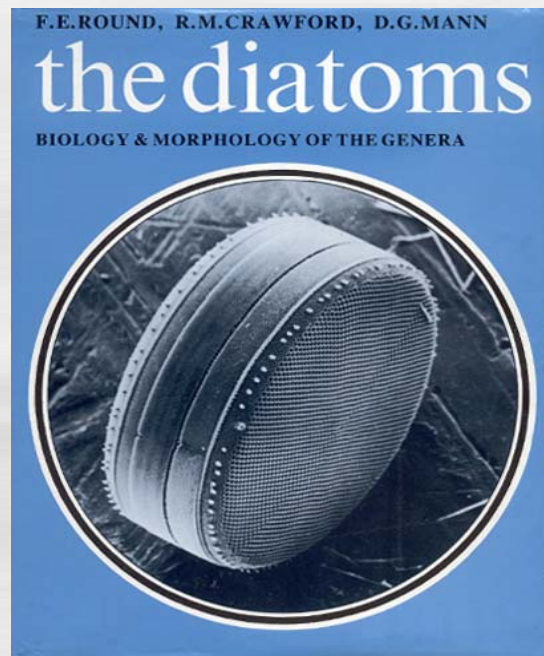
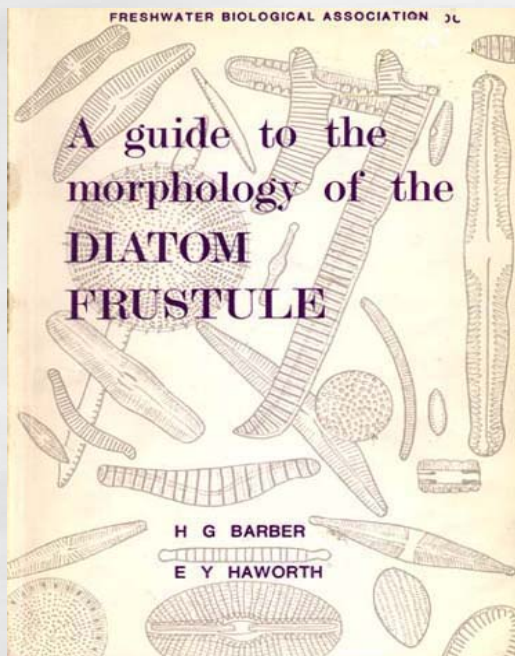


Penátní rozsivky

Jana Veselá
PřF UK



Common Freshwater Diatoms of Britain and Ireland

A multiaccess key

Click image to start key

Manual

Guide to the installation and use of the key

Taxa

Description and illustration of all genera and species included in the key

Environment

The indices used to summarise the environmental preferences of the diatom taxa

Contact Details & Credits



www.environment-agency.gov.uk



Introduction to the Diatom frustule

A beginner's guide to diatom morphology and biology

Characters and States

An illustrated guide to all the features of the used by the key

References

All literature cited on the CD-ROM is listed here

Glossary



www.lucidcentral.com

<http://craticula.ncl.ac.uk/EADiatomKey/html/index.html>

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GENERA

[Achnanthes](#)
[Actinella](#)
[Amphipleura](#)
[Amphora](#)
[Aneumastus](#)
[Anomoeoneis](#)
[Asterionella](#)
[Aulacoseira](#)
[Brachysira](#)
[Campylodiscus](#)
[Capartogramma](#)
[Cavinula](#)
[Chamaepinnularia](#)
[Cocconeis](#)
[Craticula](#)
[Cyclotella](#)
[Cymatopleura](#)
[Cymbella](#)
[Denticula](#)
[Diadesmus](#)
[Diatoma](#)
[Didymosphenia](#)
[Diploneis](#)
[Encyonema](#)
[Entomoneis](#)
[Epithemia](#)
[Eucoconeis](#)
[Eunotia](#)
[Fallacia](#)
[Fragilaria](#)
[Fragilariforma](#)
[Frustulia](#)
[Geissleria](#)
[Gomphoneis](#)
[Gomphonema](#)
[Gomphosphenia](#)
[Gyrosigma](#)
[Hannaea](#)

Achnanthes* Bory*Description**

Frustules pennate, monoraphid, symmetrical to the apical and transapical axes, flexed about the transapical axis. Due to this flexure, raphe valve is usually concave, rapheless valve usually convex. Raphe and rapheless valves have similar or different striae patterns. Occur in periphyton, adnate, or at the ends of short mucilaginous stalks.

Light Microscope Image(s)

Each image is accompanied by the genus and species, California Academy of Sciences slide number (ie. CAS 612010), location of the specimen on the slide, and dimension in microns.



Phycology Section, Patrick Center for Environmental Research



Diatoms and Other Algae: The ANSP Algae Image Database

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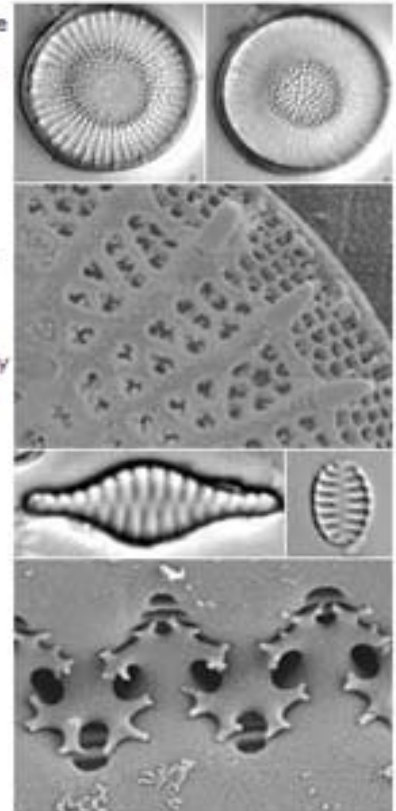
The ANSP Algae Image Database contains light micrograph images of diatom taxa from rivers throughout the USA. Many taxa are represented. There are multiple images of several to help represent within-taxon variability. The images were made primarily by ANSP Patrick Center Phycology Section staff as part of their routine analysis of algal samples.

Purposes of the database are to:

1. provide a set of reference images for ANSP algal analysts and collaborators to help them maintain consistency in taxonomic identifications
2. help document names of taxa used in papers and reports by providing easy access to representative images
3. make images available to other phycologists as a resource to help with identifications

The set of images available here is not meant to be comprehensive or to be taxonomically definitive, but only to show representative specimens that can be used to supplement image resources in the published taxonomic literature. Read the documentation to learn more about the database and how to search for and view images. More images will be added on a regular basis.

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<http://diatom.acnatsci.org/AlgaeImage/SearchCriteria.asp>

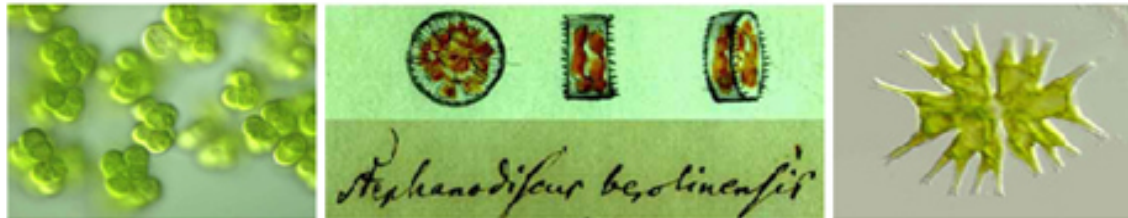
AlgaTerra Information System

An information system for micro algal biodiversity:
a synthesis of taxonomic, molecular and ecological information

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Jahn, R. & Kusber, W.-H. (eds): AlgaTerra Information System [online]. Botanic Garden and Botanical Museum Berlin-Dahlem, Freie Universität Berlin. 23 April 2008 [cited date]. Available from <<http://www.algaterra.org>>.



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algaeBASE.org Our Content	04/08	122,512 species and infraspecific names are in the database, 6,451 images, 39,652 bibliographic items, 141,803 distributional records.	
	News	Contact Us	Alga of the Week: <i>Rhodothamniella floridula</i> (Dillwyn) Feldmann.
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Enter names above the level of genus:

Enter genus name:

Enter species name:

Rhodymenia obtusa South Africa



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***Frustulia saxonica* Rabenhorst 1848-1860, Alg. Sach. Nr. 42**

Published in	Rabenhorst, L. 1848-1860 [ref. 000771]. Die Algen Sachsens. Resp. Mittel-Europa's Gesammelt und herausgegeben von Dr. L. Rabenhorst, Dec. 1-100. No. 1-1000. Dresden. [Exsiccata, issued at various dates]	
Type	INA card not found. Click here to check this name in the INA website.	
Collector	Assessment of record accuracy	uncertain/not verified
List of nomenclatural synonyms	Navicula rhomboides var. saxonica (Rabenhorst; Rabenhorst) F.W. Mills 1934 Frustulia rhomboides var. saxonica (Rabenhorst) De Toni 1891 Navicula saxonica (Rabenhorst; Rabenhorst) Lagerstedt 1873 Vanheurckia rhomboides var. saxonica (Rabenhorst) M. Peragallo 1897 Navicula rhomboides var. saxonica (Rabenhorst) Budde 1928 Vanheurckia rhomboides var. saxonica (Rabenhorst) Holmboe 1899	

Close and Return

Bentické penátní rozsivky

habitat

epifyton – rostliny, mechorosty, vláknité řasy

epiliton – skály, kameny

epipelon – bahnité dno, sediment

epipsamon – mezi zrnky písku

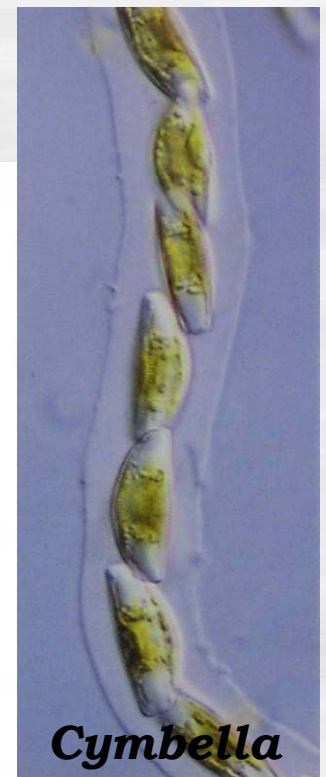
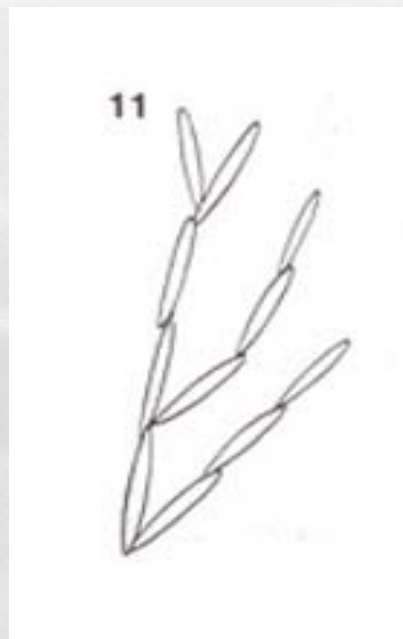
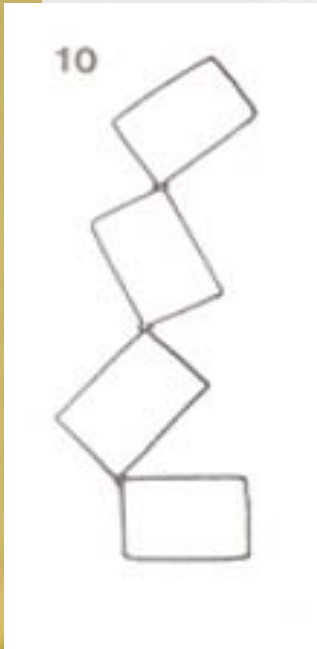
epizoon – korýši, prvoci, ptáci

**metafyton – ve slizu vytvořeném různými
organismy, i význam mezi makrofyty**

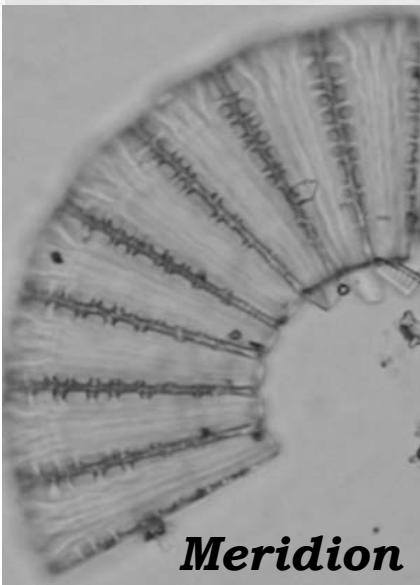
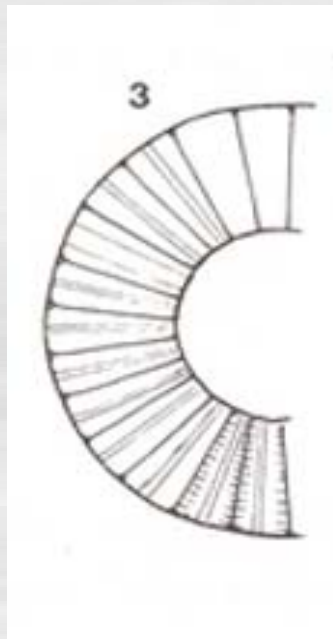
**volně žijící nebo vytvářející kolonie
podmínky prostředí**



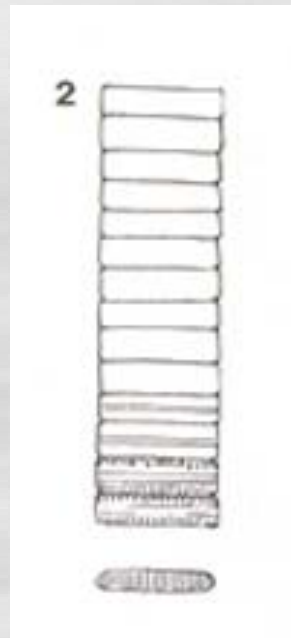
Fragilaria



Cymbella

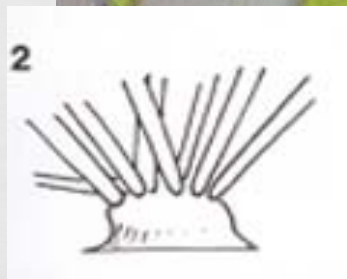
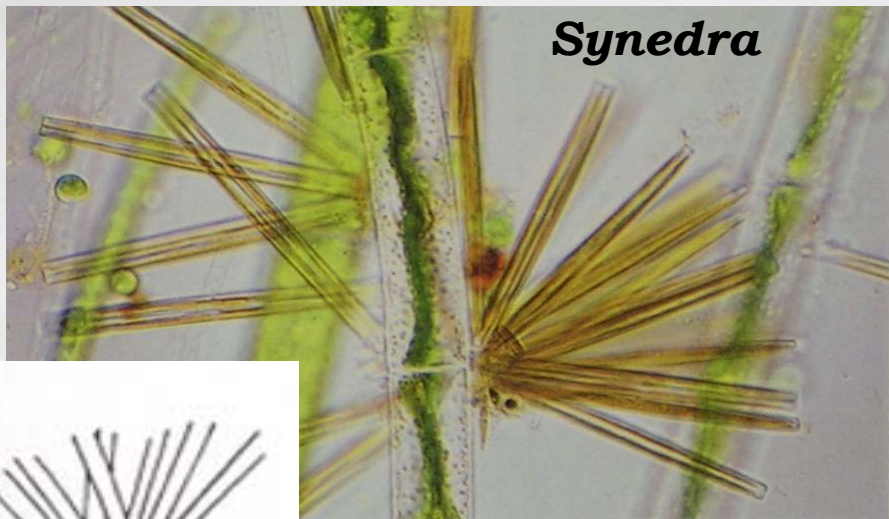


Meridion

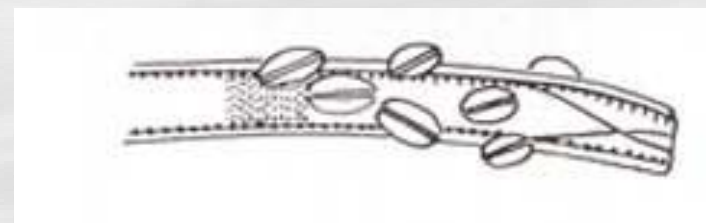
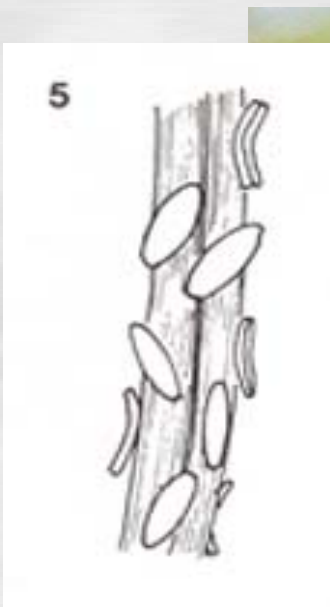
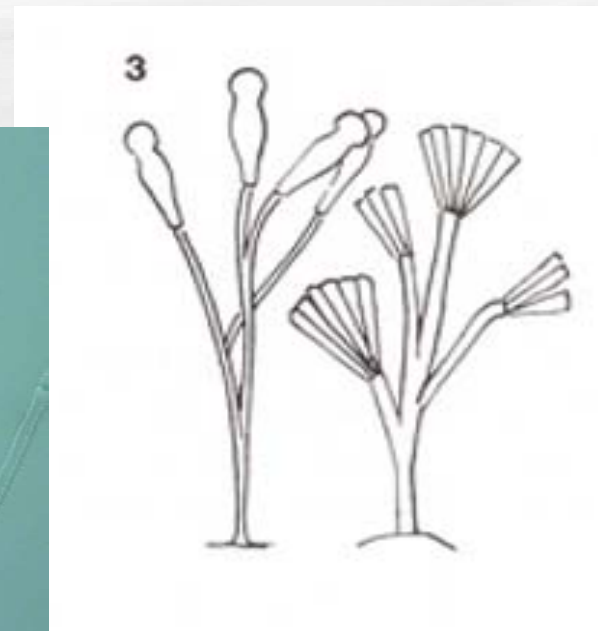


Achnanthes





epifytické



epilitické

Morfologie schránek

souměrnost

boční pohled – girdle view

obrys schránky

typ rafe

ornamentace

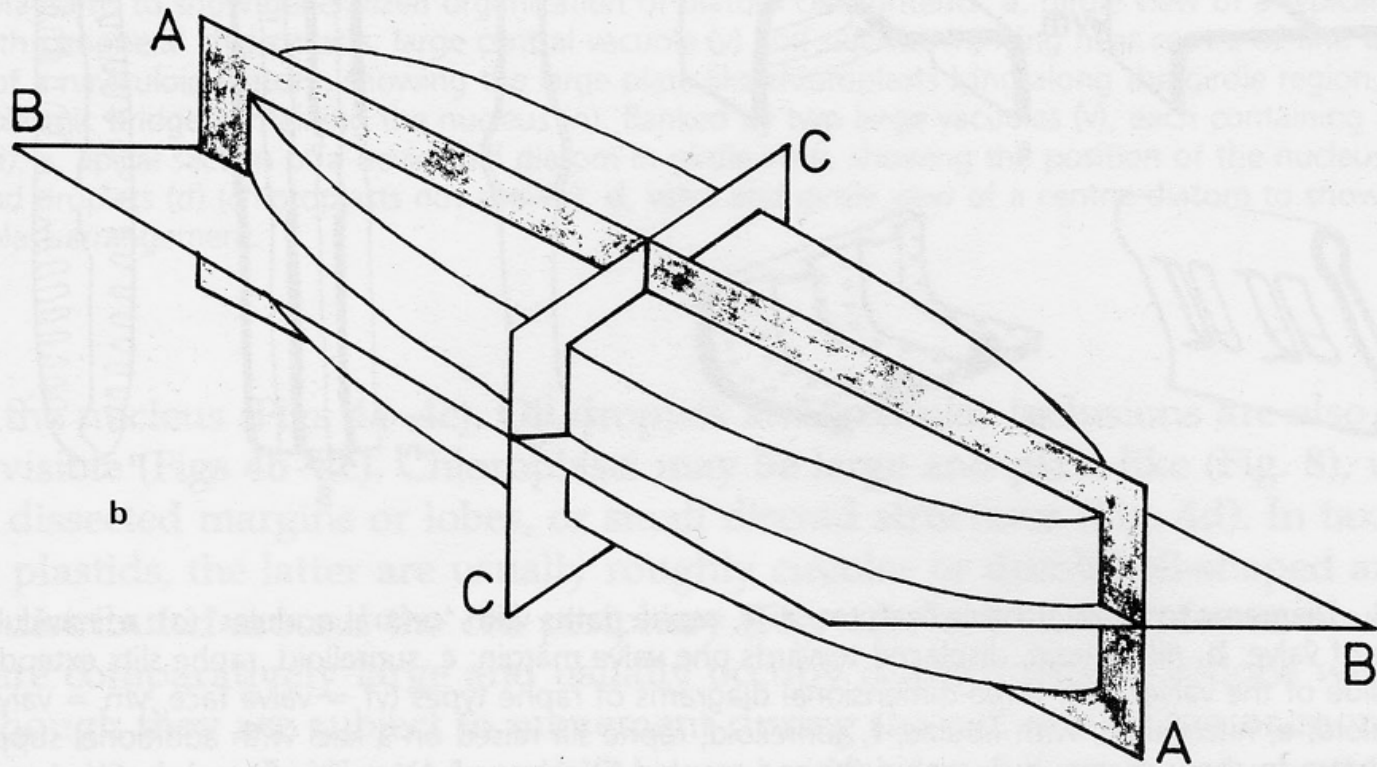


Fig. 2 Diagrams to show axes and planes of symmetry used in diatom descriptions. **a**, centric diatom: AA, radial; BB, valvar. **b**, pennate diatom: AA, apical; BB, valvar; CC, transapical.

valvární

a,b -
Fragilaria

k -
Achnanthes,
Pinnularia,
Neidium,
Diatoma

l,m -
Cocconeis,
Diploneis,
Amphora

t - *Nitzschia*

x - *Eunotia*

y - *Gomphonema*,
Rrhoicosphenia
Meridion

aa - *Surirella*

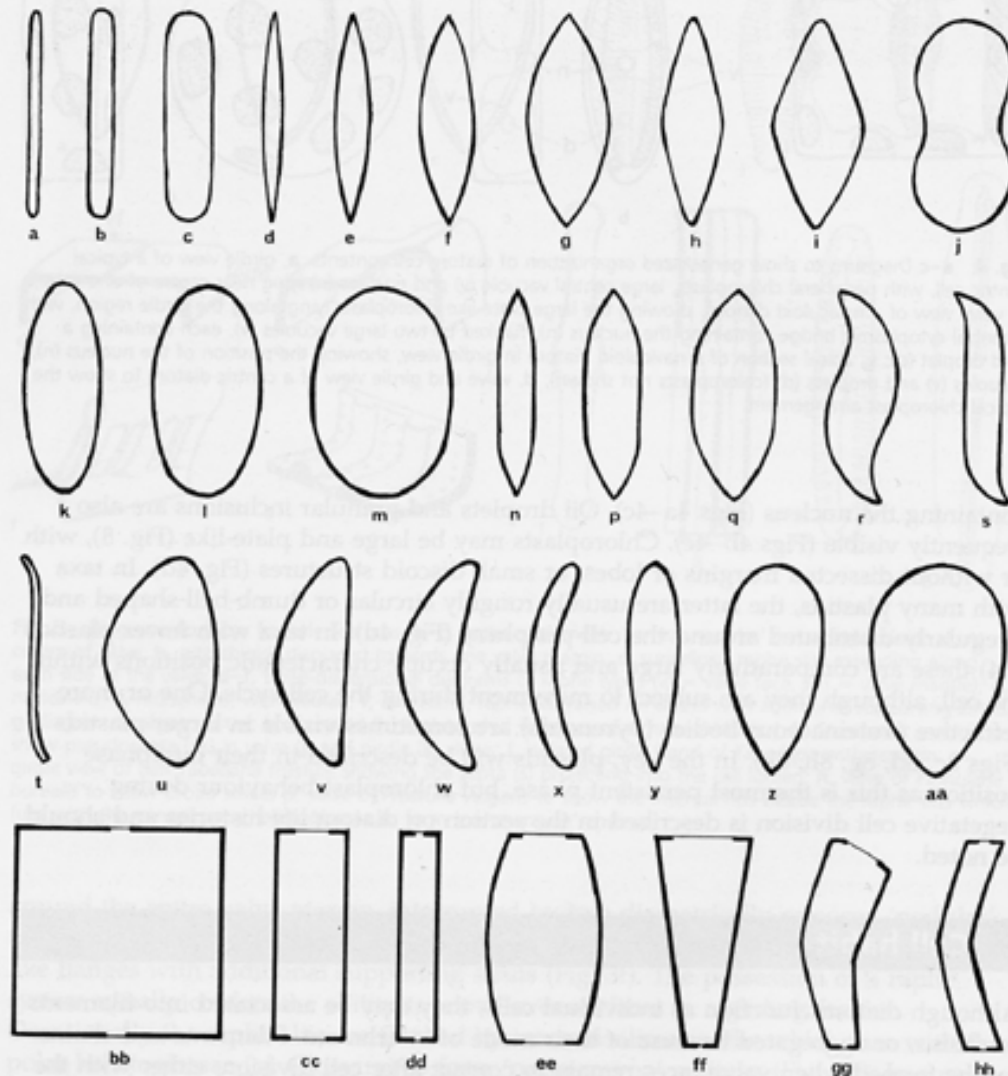


Fig. 5 Diagrams to show valve and girdle shapes. a-t: isopolar; u-x: dorsiventral; y-aa: heteropolar; bb-hh: girdle views. (Figures in brackets are approximate length: breadth ratios of valves.) a, narrowly linear (20:1); b, linear (9:1); c, broadly linear (4:1); d, acicular (10:1); e, narrowly lanceolate (fusiform) (6:1); f, lanceolate (5:1); g, broadly lanceolate (5:2); h, narrowly rhomboidal (7:2); i, rhomboidal (5:2); j, panduriform (dumb-bell-shaped); k, narrowly elliptical (5:2); l, elliptical (>2:1); m, broadly elliptical (3:2); n, narrowly linear-lanceolate (6:1); o, linear-lanceolate (5:1); p, broadly linear-lanceolate (5:2); q, sigmoid; r, oblong-sigmoid; s, oblong-sigmoid; t, linear-sigmoid; u, broadly dorsiventral (2:1); v, semi-lanceolate (3:1); w, semi-arcuate (7:2); x, arcuate or lunate (9:1); y, narrowly ovate (9:2); z, ovate (5:2); aa, broadly ovate (<2:1); bb, square, deep valve mantles; cc, rectangular; dd, narrowly rectangular; ee, biconvex; ff, cuneate; gg, flexed cuneate; hh, flexed.

j - *Cymatopleura*
solea

q -
Surirella

r,s -
Gyrosigma

v - *Cymbella*,
Amhora,
Rhopalodia

w -
Cymbella,
Epithemia

pleurální
ff - *Gomphonema*
gg -
Rhoicosphenia
hh - *Achnanthes*

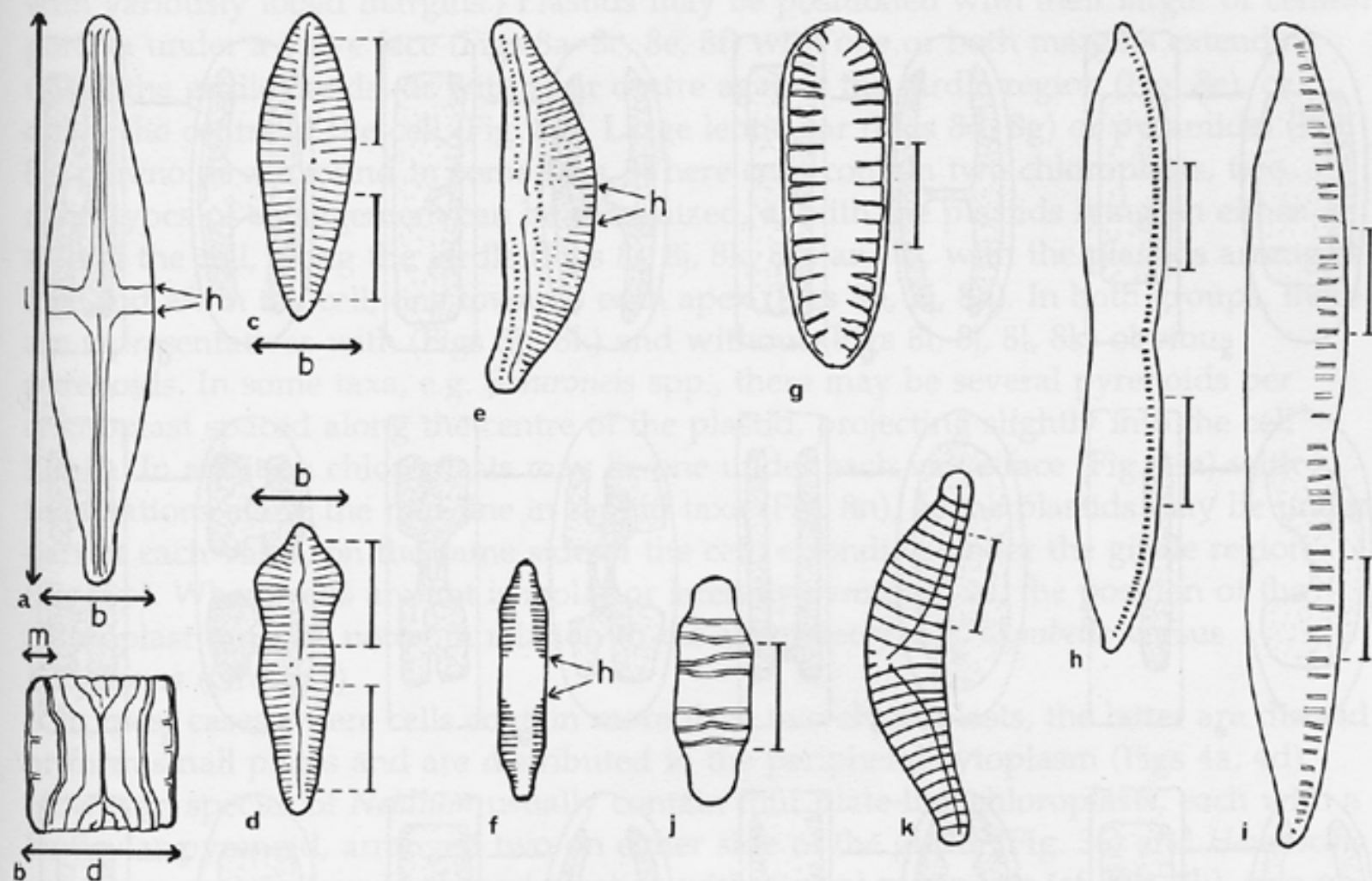
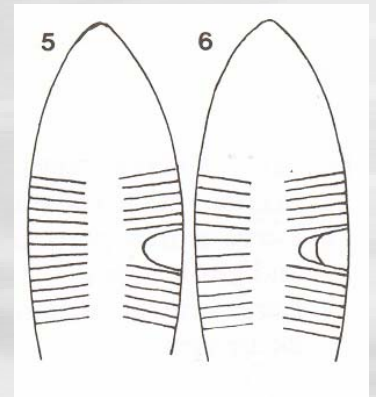
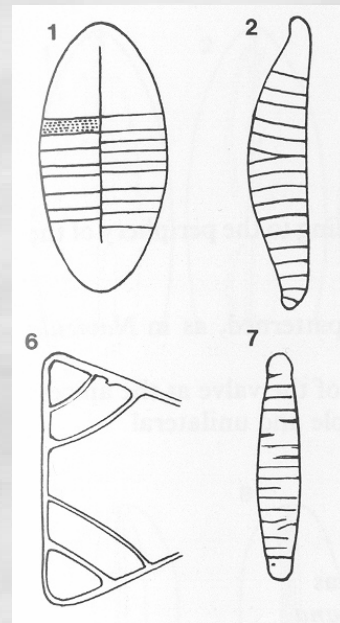
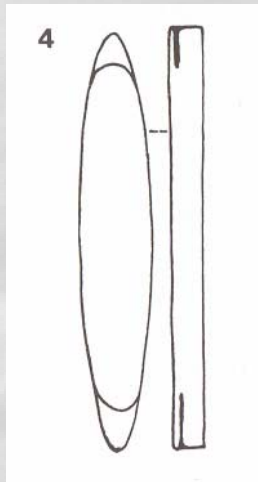
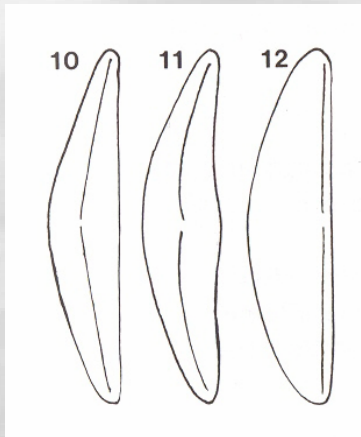
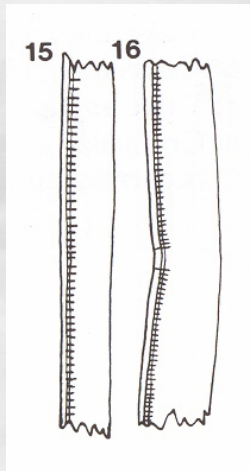
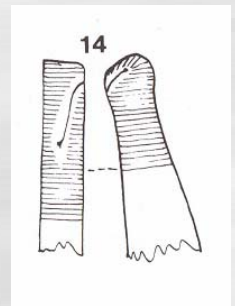
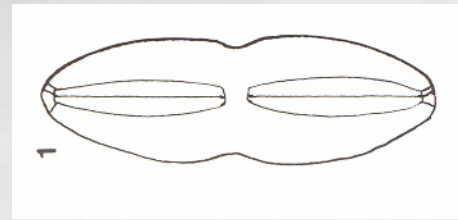
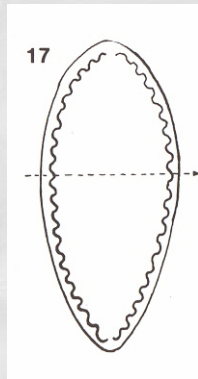
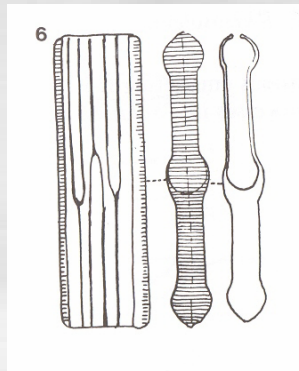
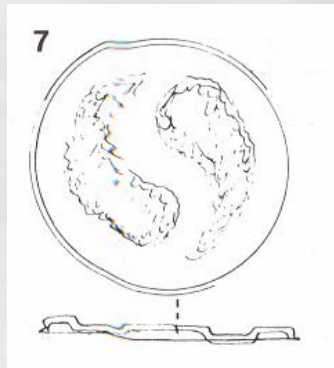
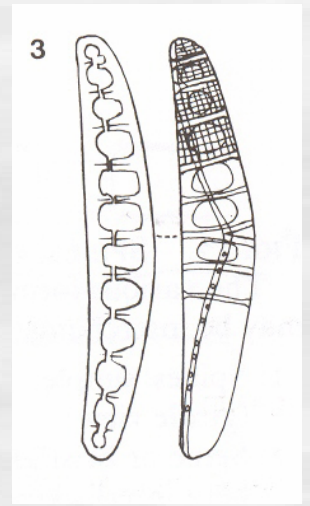
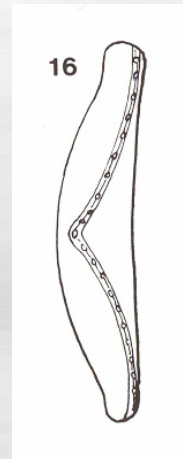
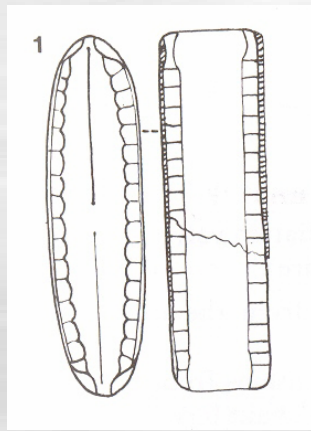
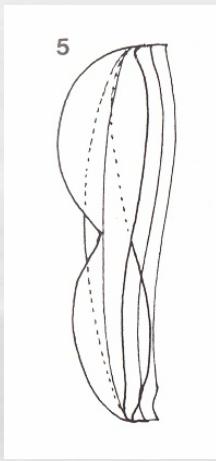
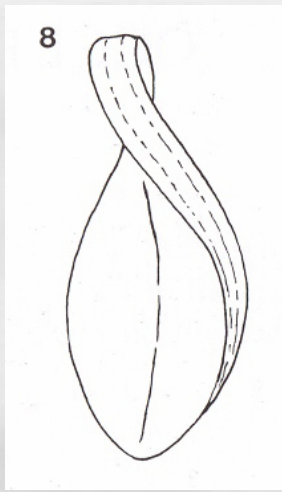
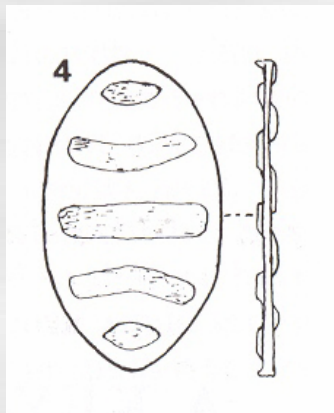


Fig. 7 Guide to measuring diatoms. Arrow bars show length (l), breadth (b), mantle (m) or cell (d) depth; lines (10 μ m) indicate position for measuring stria, costa and fibula densities; h indicates extent of hyaline areas which can often be recognized in live material. **a**, length and breadth of valve with naviculoid symmetry (transverse hyaline area extending from central area as in *Stauroneis*); **b**, girdle view showing measurement of cell and mantle depths; **c**, **d**, maximum breadth nearer one apex than other (**c**) and very near the apex (**d**) (*Gomphonema* spp.); **e**, **f**, different positions of hyaline areas (**e**, *Amphora*; **f**, *Synedra*); **g**–**i**, measurement of fibula density in *Surirella* (**g**) and *Nitzschia* (**h**, **i**) spp.; **j**, **k**, measurement of costa density in *Diatoma* (**j**) and *Epithemia* (**k**) spp.



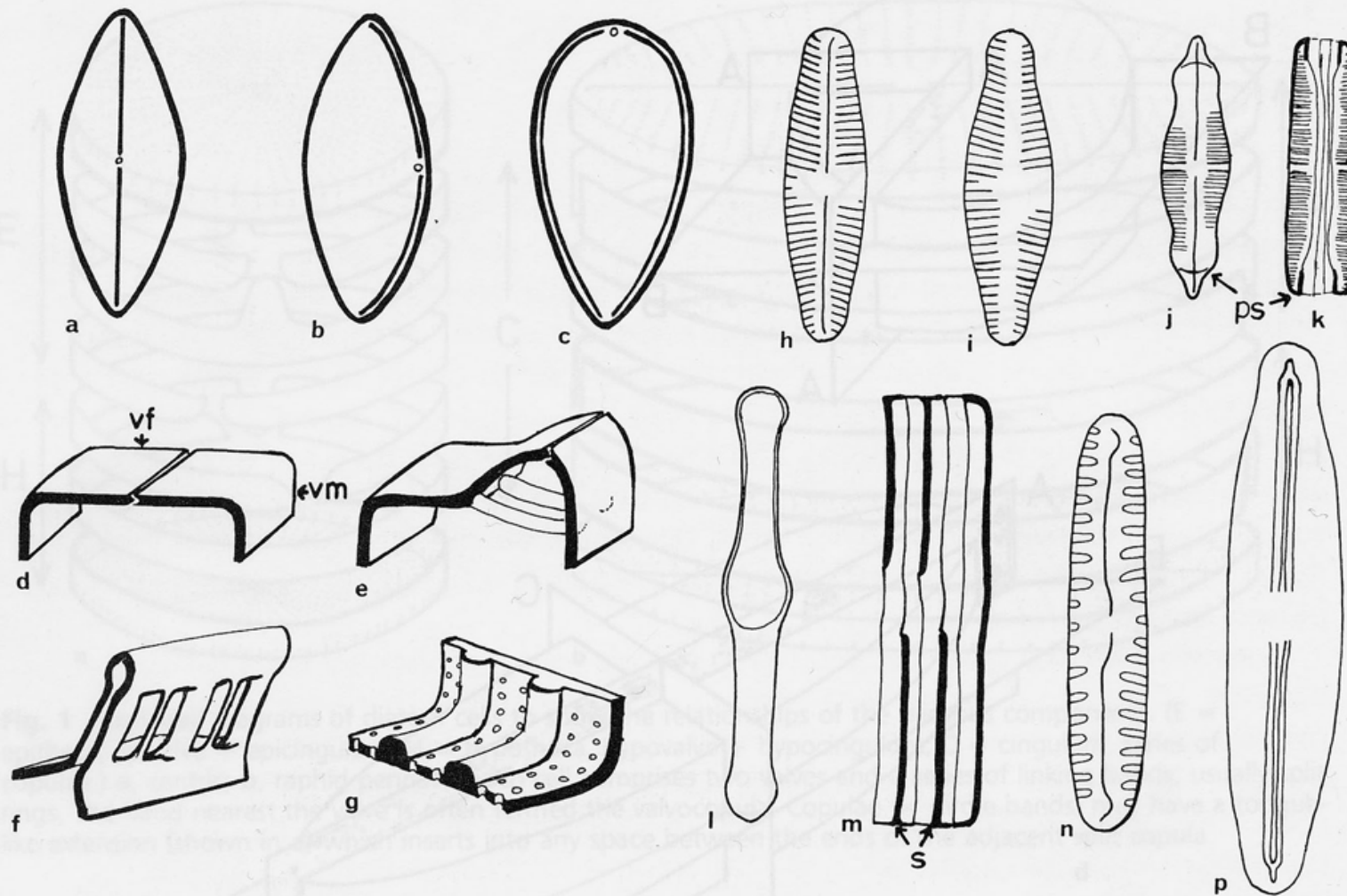


Fig. 3 Diagrams to show frustule features. **a–c**, raphe paths with 'central nodules' (o); **a**, naviculoid, along centre of valve; **b**, nitzschoid, displaced towards one valve margin; **c**, surirelloid, raphe slits extending along each side of the valve; **d–f**, three-dimensional diagrams of raphe types (vf = valve face, vm = valve mantle); **d**, naviculoid; **e**, nitzschoid, with fibulae; **f**, surirelloid, raphe slit raised on a keel with additional supporting struts; **g**, diagram to show costae; **h**, **i**, raphid (**h**) and araphid (**i**) valves of *Achnantheidium*; **j**, **k**, *Stauroneis smithii*, to show pseudosepta (ps) in valve (**j**) and girdle (**k**) views; **l**, isolated girdle band of *Tabellaria* with septum; **m**, girdle view of half *Tabellaria* frustule showing the septa (s) projecting into the cell lumen; **n**, valve of *Pinnularia borealis* to show broad striae; **p**, valve of *Frustulia vulgaris* to show the internal ribs beside the raphe slits which fuse with the conspicuous helictoglossae to form 'porte-crayon' endings.

***Navicula, Pinnularia, Gomphonema, Achnanthes,
Fragilaria, Nitzschia, Cymbella...***

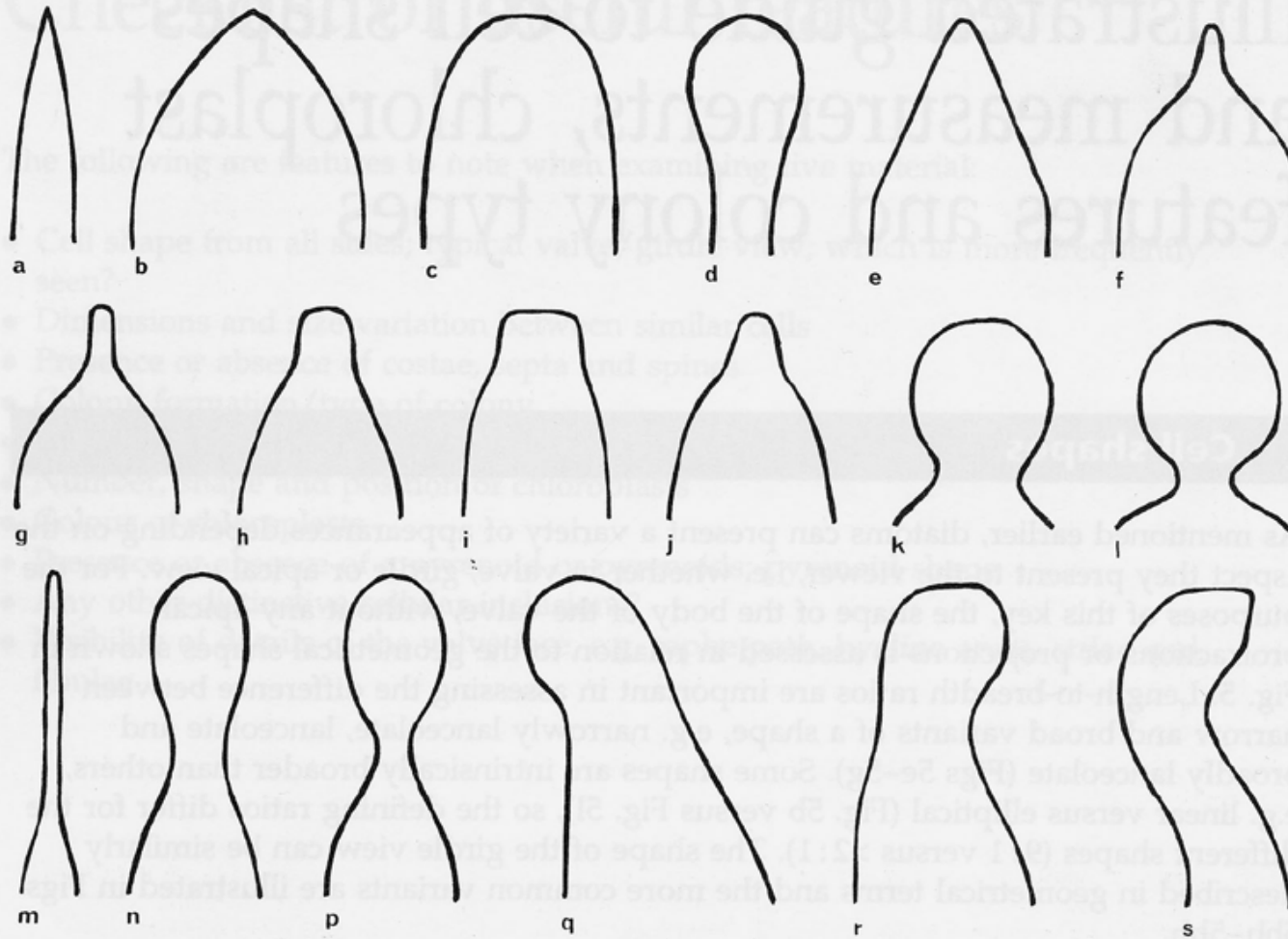
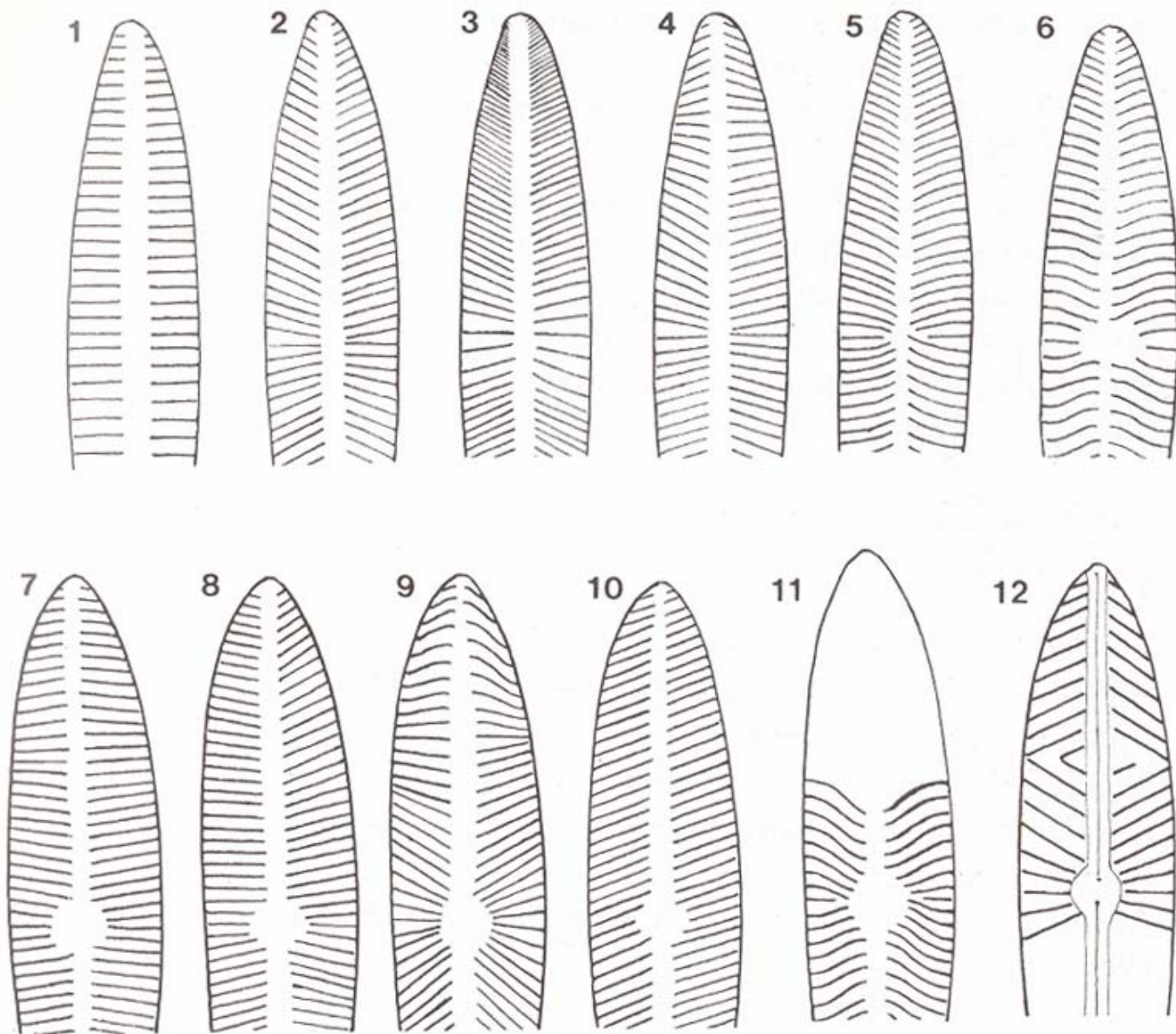


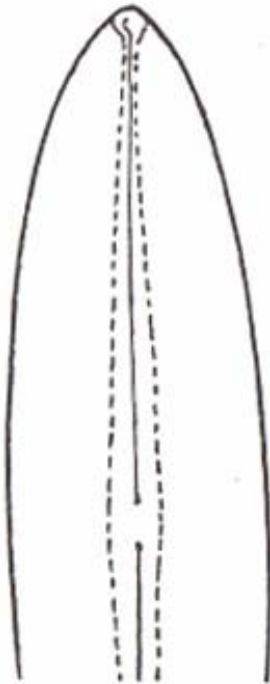
Fig. 6 Diagrams to show valve apices [proportions of length (l) to breadth (b) are given in parentheses]. **a**, acute; **b**, obtuse; **c**, broadly rounded; **d**, spatulate; **e**, cuneate; **f**, apiculate; **g**, narrowly rostrate ($l > b$); **h**, rostrate ($l = b$ approx.); **i**, broadly rostrate ($l < b$); **j**, subrostrate; **k**, subcapitate ($l = b$ approx.); **l**, capitate ($l = b$ approx.); **m**, elongate ($l \gg b$); **n**, narrowly subcapitate ($l > b$); **p**, narrowly capitate ($l > b$); **q**, ventrally directed; **r**, dorsally directed; **s**, recurved.

Navicula, Pinnularia, Achnanthes...

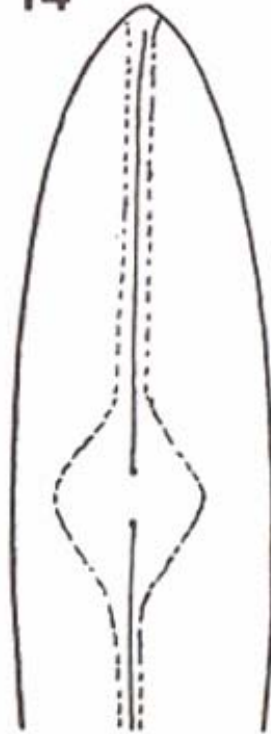


Pinnularia, Caloneis, Achnanthes

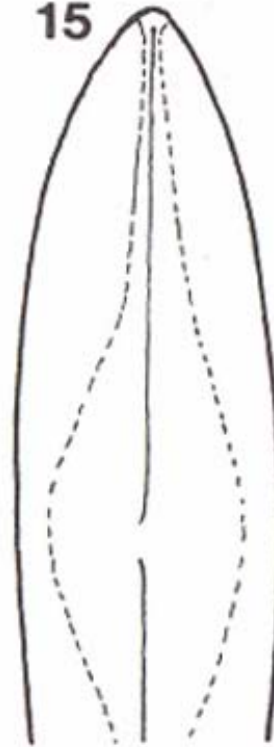
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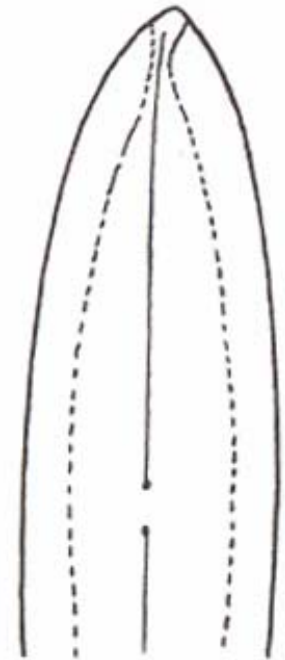
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15



16



Navicula, Pinnularia...

12 - *Craticula*

19, 20 -
Stauroneis,
Achnanthes

17 -
Stauroneis

18 -
Achnanthes

22, 23 -
Neidium

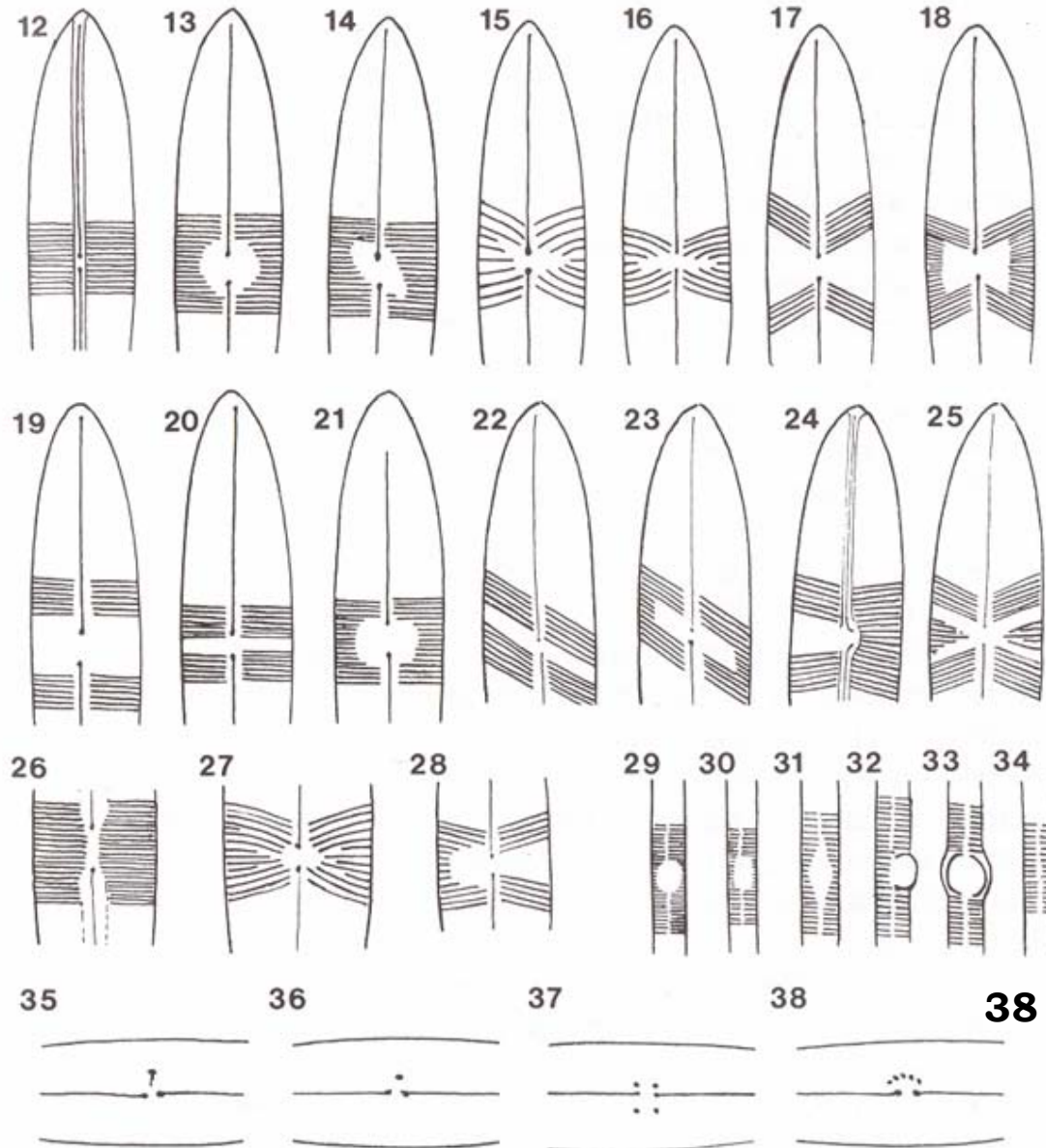
29-34
Fragilaria

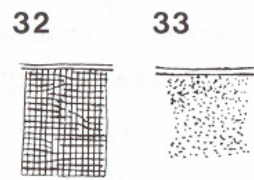
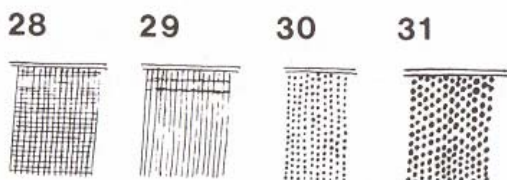
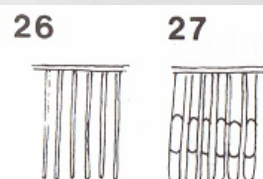
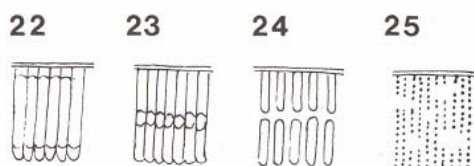
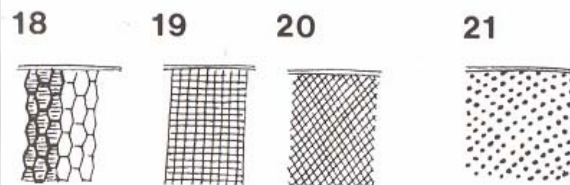
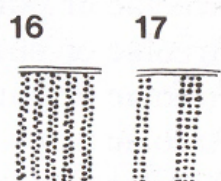
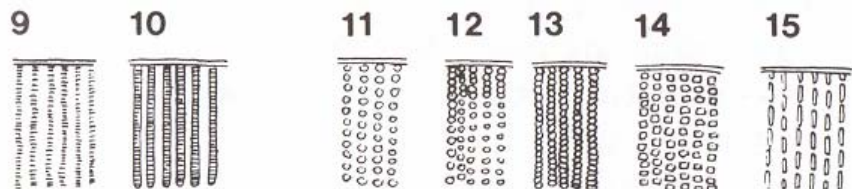
35 - *Luticola*

36 - *Gomphonema*, *Cymbella*

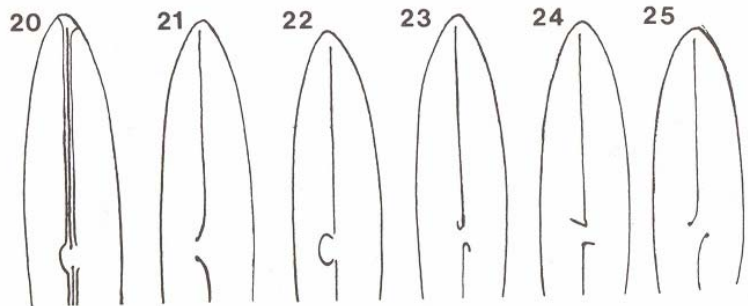
37 - *G. olivaceum*

38 - *Didymosphenia*,
Cymbella



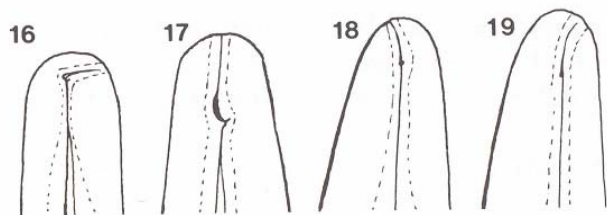


- 9: Striae lineate, not bounded at the edge
- 10: Striae lineate, and bounded or bordered at the edge
- 11: Puncta equally spaced and clearly separated
- 12: Puncta set closer approaching the valve periphery
- 13: Puncta not clearly separated
- 14: Areolae or puncta rectangular in shape
- 15: Areolae bacilliform (rod-shaped)
- 16: Puncta alternately spaced in double rows
- 17: Puncta in double or multiple rows spaced in pairs or triplets
- 18: Areolae rhombic
- 19: Areolae rectangular and perpendicular to the raphe (as in the genus *Gyrosigma*)
- 20: Areolae rhombic and at an angle to the raphe (as in the genus *Pleurosigma*)
- 21: Puncta in curved quincunx
- 22: Alveoli crossed by a wide longitudinal band (as in the genus *Pinnularia*)
- 23: Alveoli crossed by a narrow longitudinal band
- 24: Alveoli crossed by a hyaline band
- 25: Striae scabrous (areas where puncta are absent)
- 26: Striae plain (as in the naviculoid group 'laevistriatae'), without any apparent secondary structure
- 27: Alveoli crossed by longitudinal band of medium width
- 28: Striae interrupted close to the valve margin (as in the genus *Neidium*)
- 29: Striae (fine alveoli) crossed by one or two longitudinal lines close to the valve margin (as in the genus *Caloneis*)
- 30: Striae formed by very fine puncta
- 31: Striae formed by coarse puncta
- 32: Puncta pattern forming undulate longitudinal rows
- 33: Puncta fine and in very irregular lines

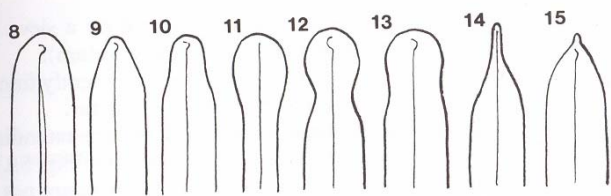


- 20: Raphe situated on a ridge, as in some *Navicula*
 21: Central terminals bent unilaterally (turned to the same side)
 22: Central terminals connected by an arcuate ridge
 23: Central terminals hooked in opposite directions
 24: Central terminals reflexed in opposite directions
 25: Central terminals curved in opposite directions

23-25 *Neidium*

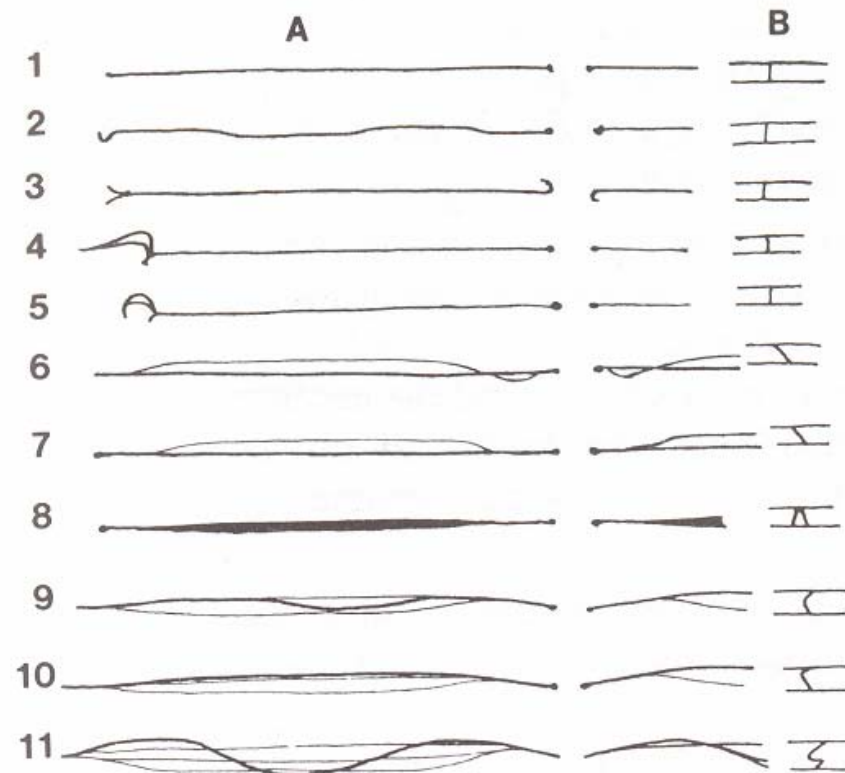


- 16: Polar terminals long and abruptly bent
 17: Polar terminal long, making main raphe distant from the valve apex
 18: Polar terminal bent dorsally, in cymbelloid forms
 19: Polar terminals bent ventrally, in cymbelloid forms



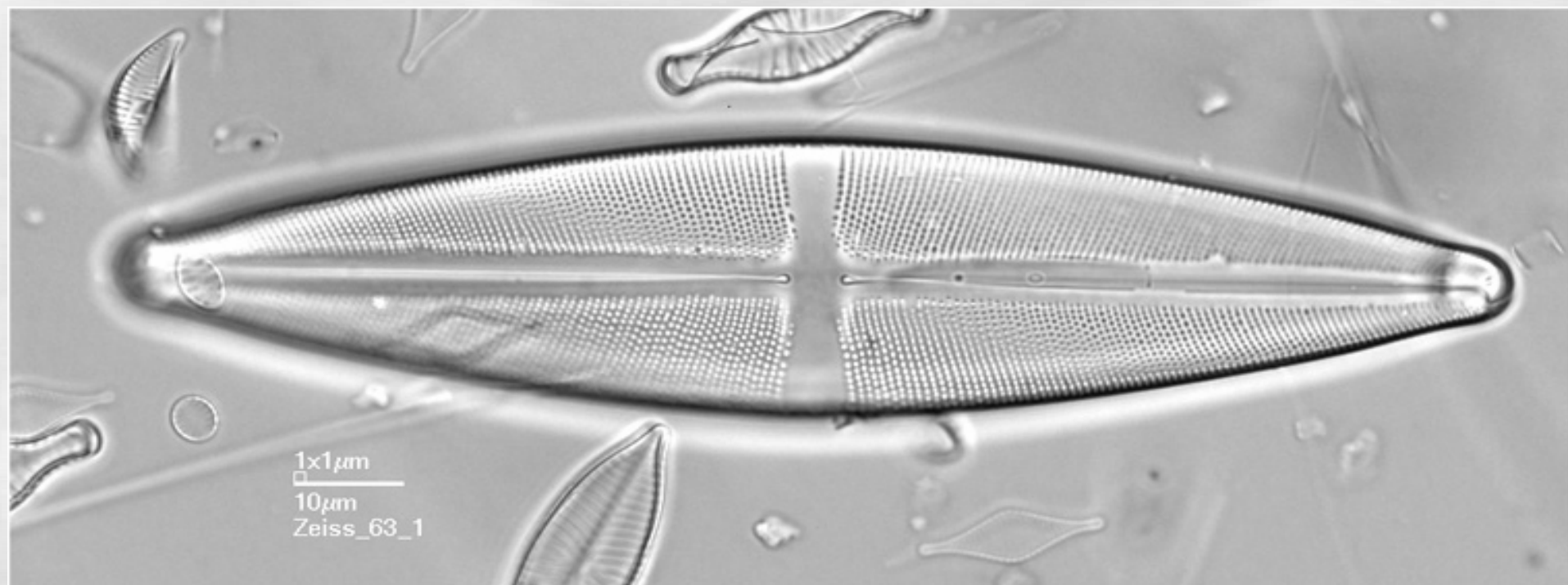
- 8: Ends broadly rounded
 9: Ends cuneate
 10: Ends rostrate
 11: Ends spatulate
 12: Ends capitate
 13: Ends subcapitate
 14: Ends apiculate and produced
 15: Ends apiculate

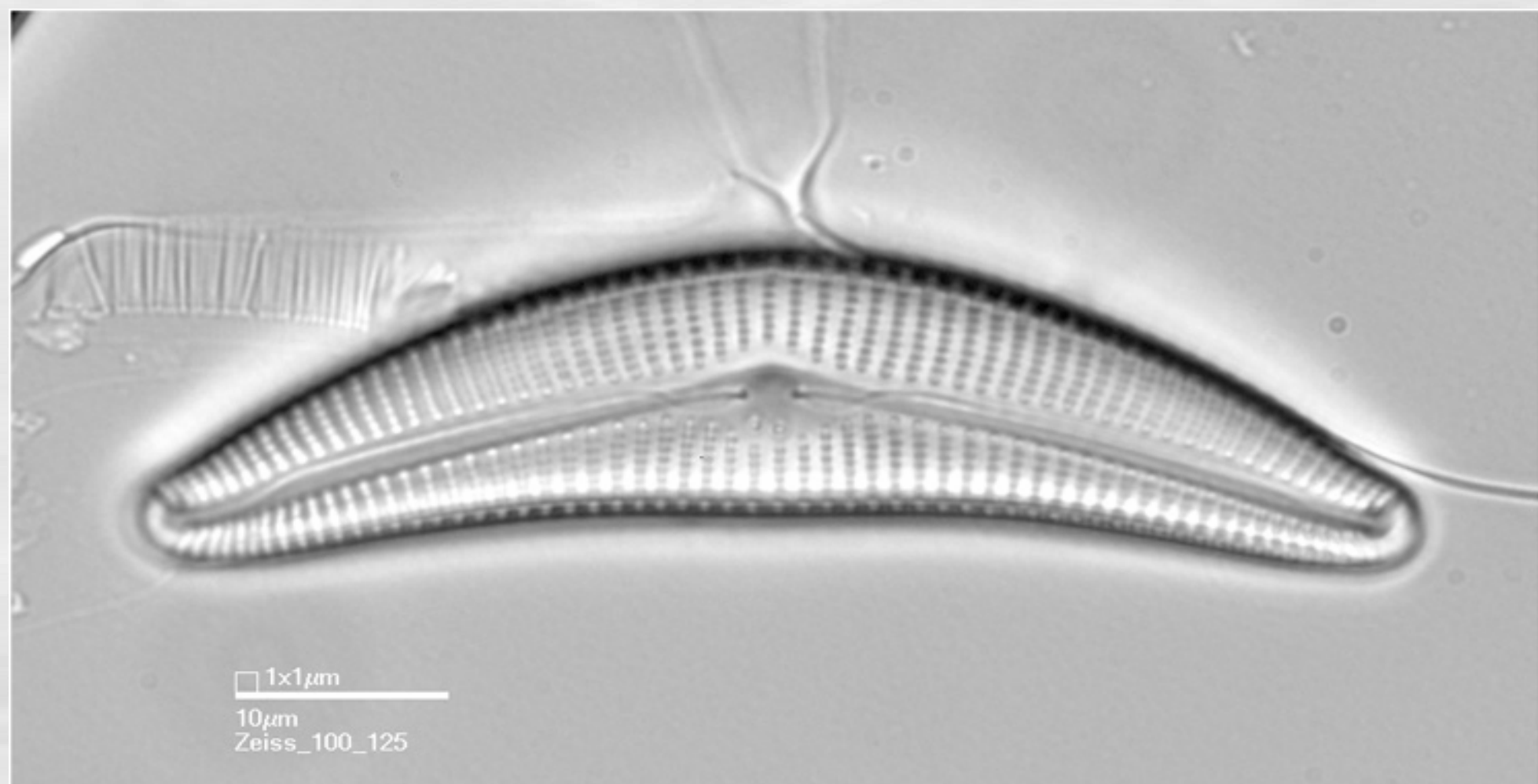
průběh rafe významný především u rodů *Pinnularia*, *Cymbella*

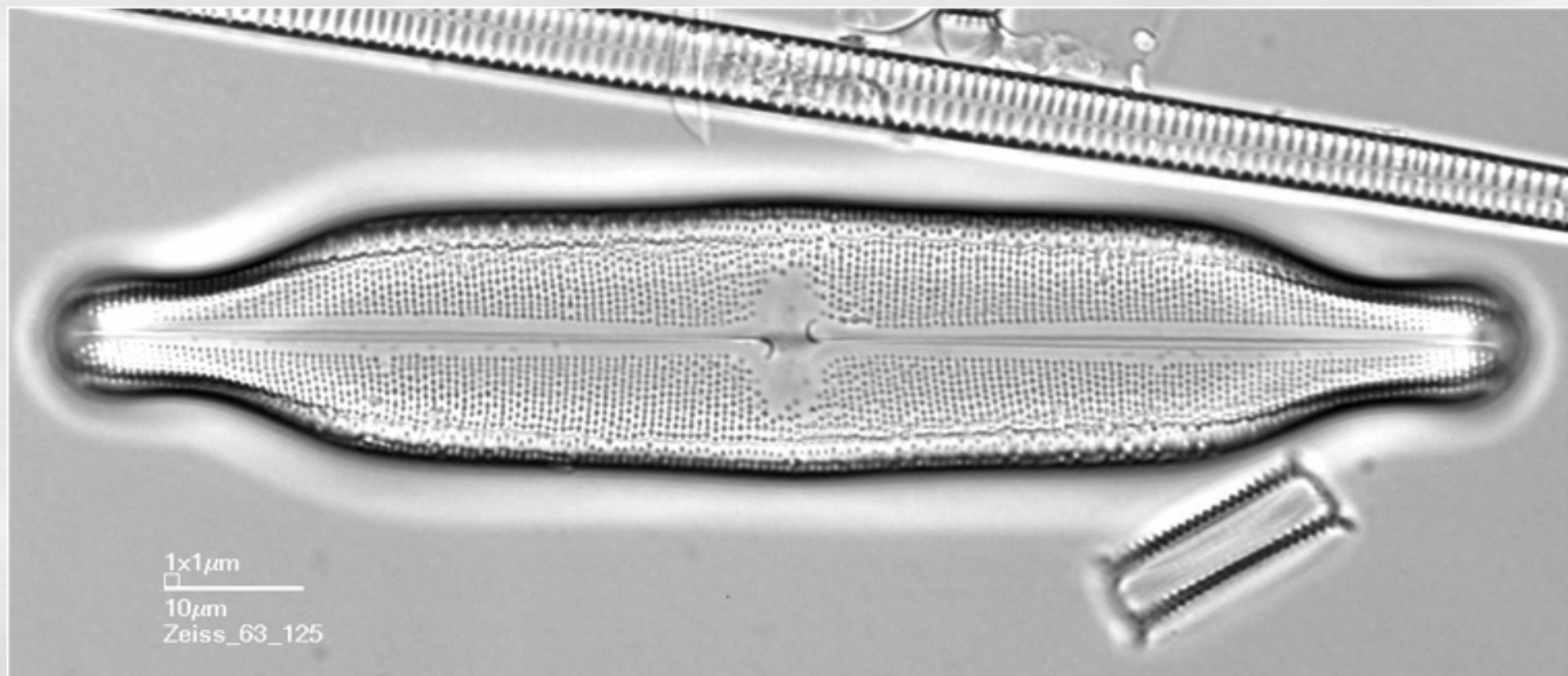


1-11: A, raphe as seen in valve view; B, a transapical section across the raphe midway between the central and polar terminals.

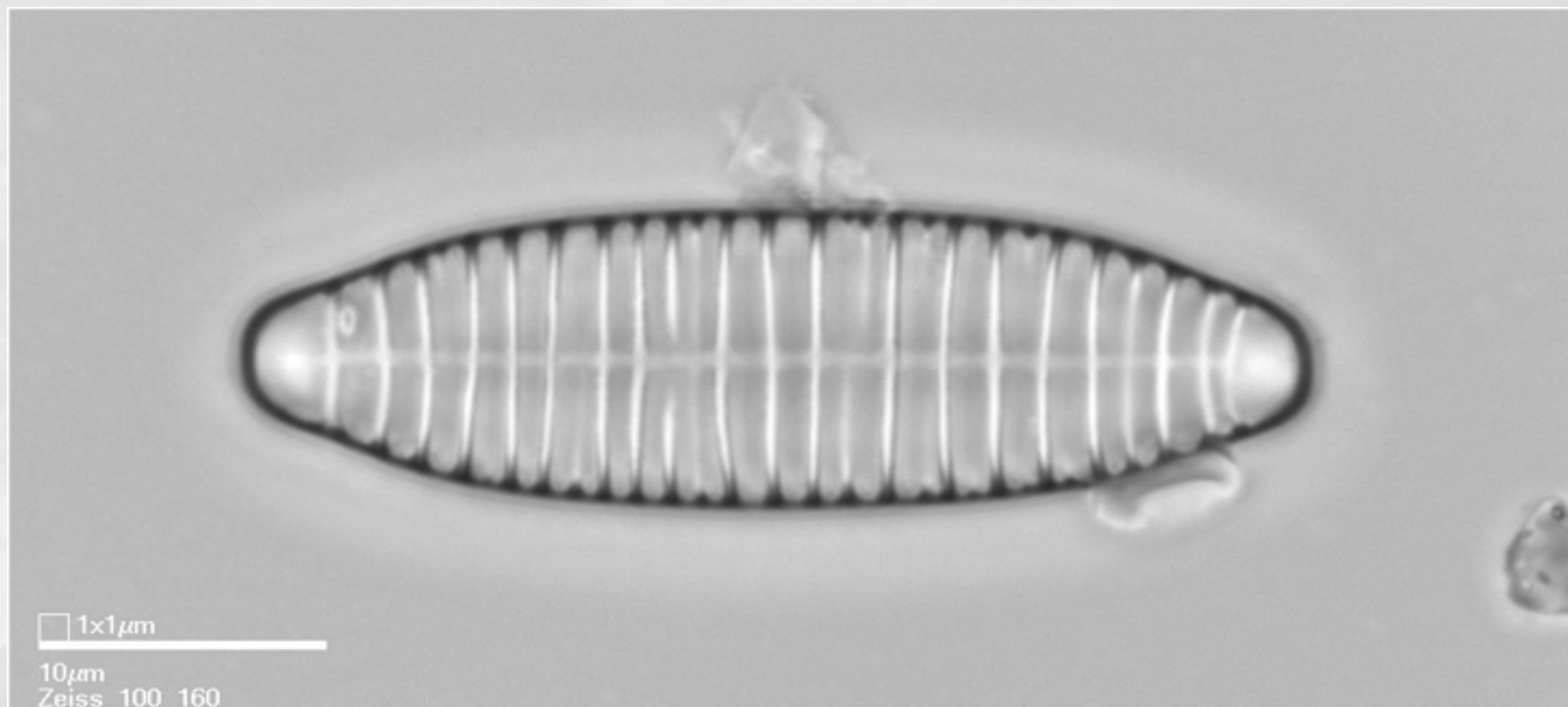
- 1: Raphe simple, threadlike and with simple terminals
- 2: Raphe undulate and threadlike, with sickle-shaped polar terminals
- 3: Raphe straight and threadlike, with bifurcate polar terminals and hooked central terminals as in *Neidium*
- 4: Raphe straight and threadlike, with bayonet-shaped polar terminals as in some *Pinnularia*
- 5: Raphe straight and threadlike, with sickle-shaped polar terminals, as in some *Pinnularia*
- 6: Raphe an oblique slit, portion nearest the central terminals slanting in the opposite direction to the rest of the raphe, as in *Cymbella*
- 7: Raphe mostly oblique, becoming threadlike towards the terminals
- 8: Raphe spindle-shaped, as in some *Navicula*
- 9: Raphe complex, due to changing angle of the slit, central terminals bent to one side (unilaterally)
- 10: Raphe an oblique slit reflexed near outer edge, central terminals flexed unilaterally
- 11: Raphe complex, undulate both in valve view and cross section

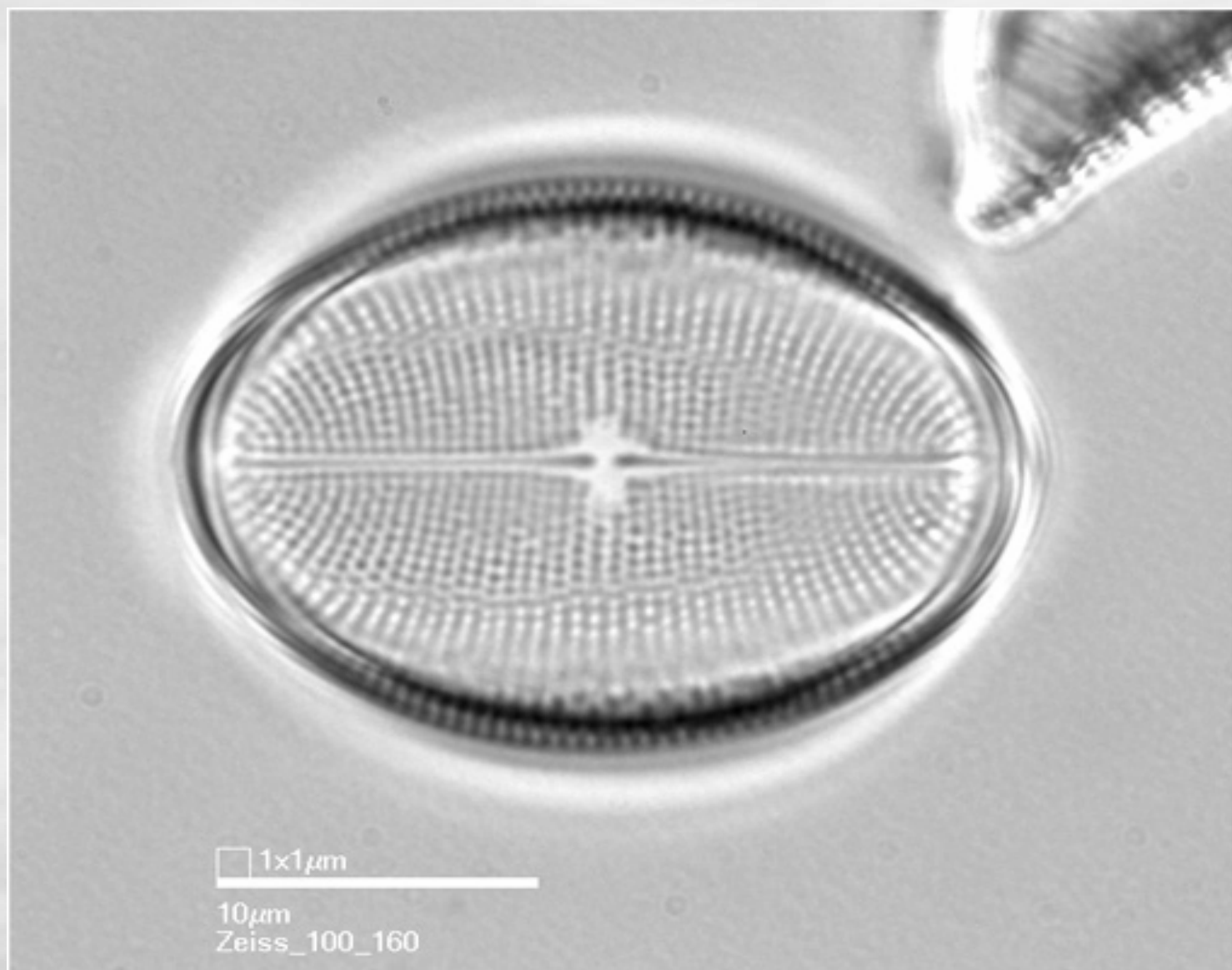


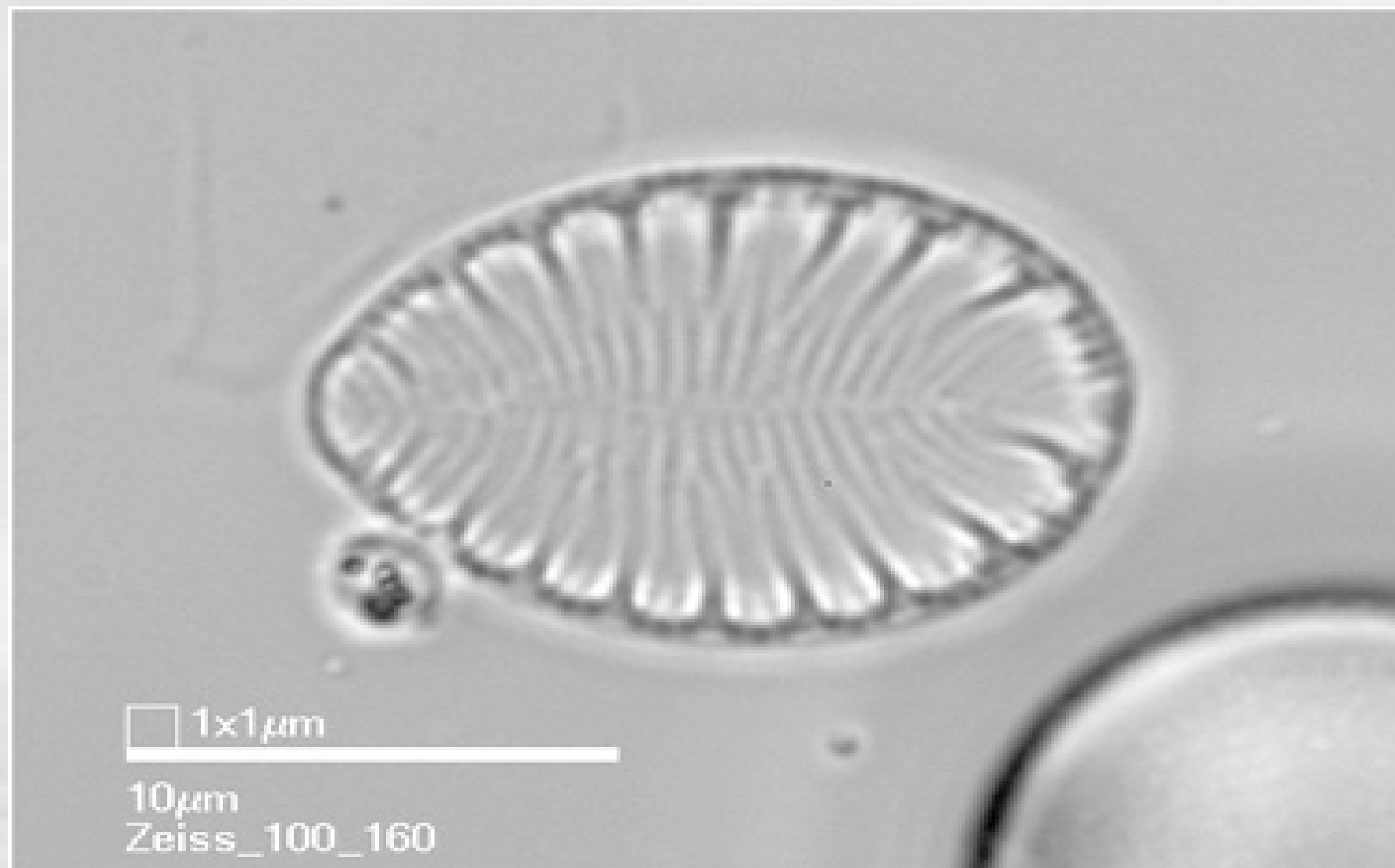


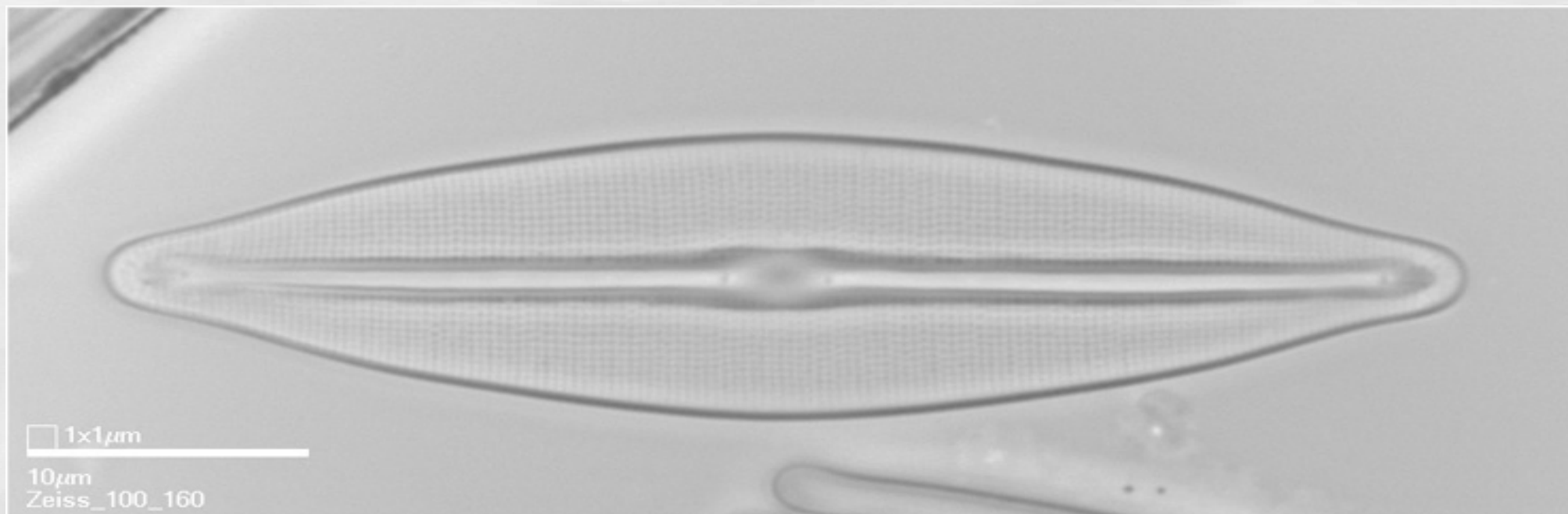


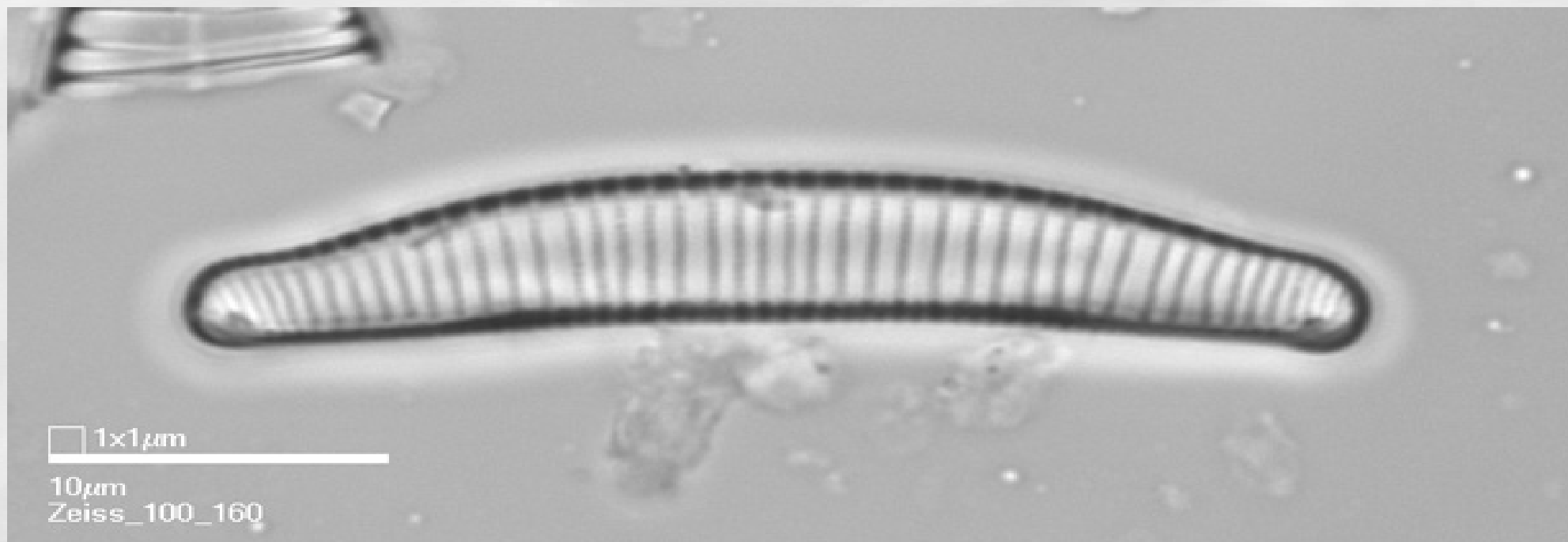




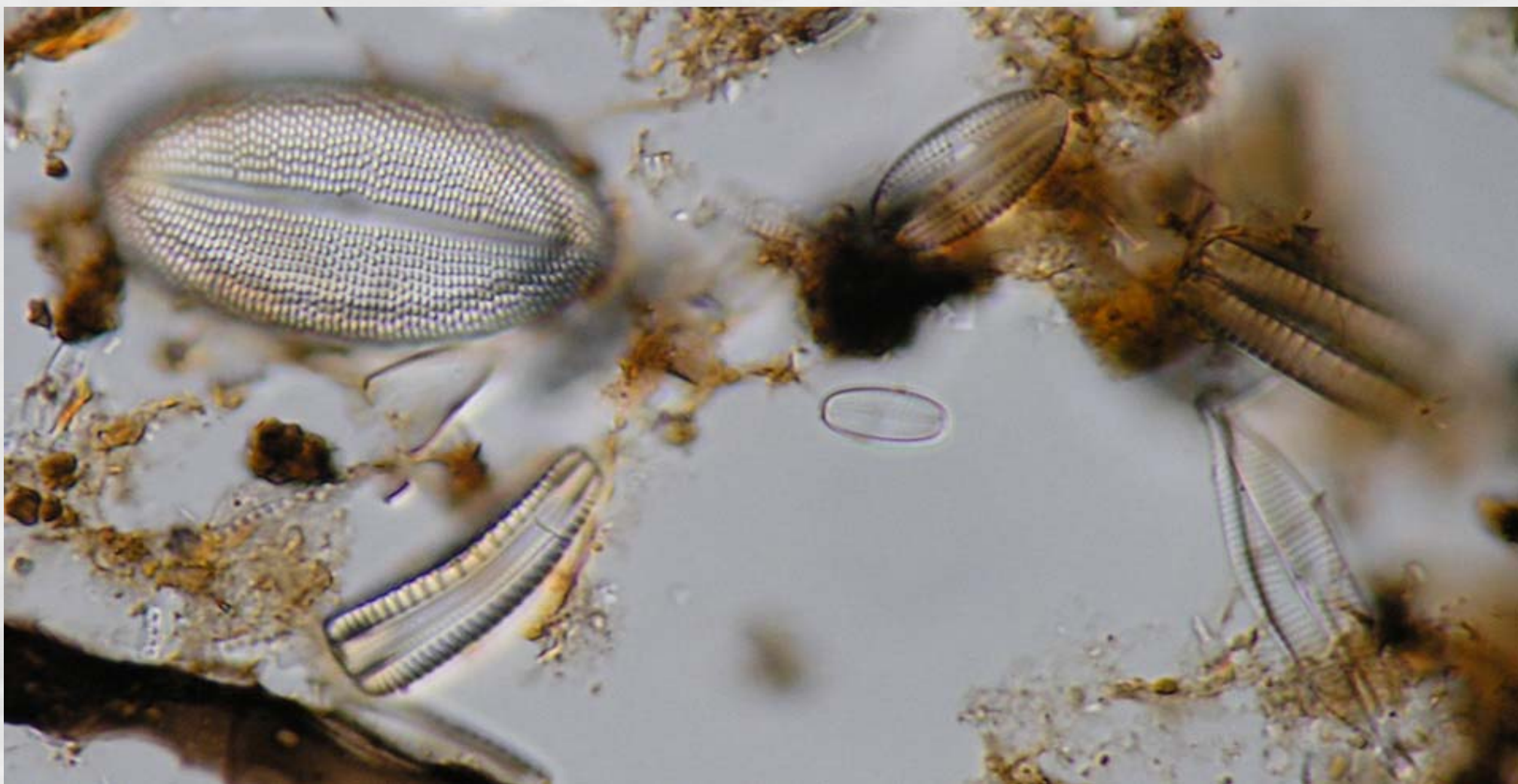


















Druhový koncept rozsivek

Krammer & Lange-Bertalot

Taxony považované za samostatné druhy sloučil na základě jejich podobnosti v jeden druh

Velice variabilní kosmopolitní druhy - téměř žádný není vzácný či ohrožen

V současnosti jemnější taxonomie - 96 druhů rodu *Pinnularia* oproti 55

Variabilita – morfotypy v rámci druhu

Druhový koncept rozsivek

Mann et al.

Reprodukční izolace

Způsob rozmnožování

Životní cyklus

Molekulární data

Morfometrické metody

Citlivost vůči Chytridiomycetes a Oomycetes

Schopnost růst v kultuře

Desítky možná druhů komplexu

komplexy druhů – podpořené studiem

- Sellaphora pupula* (př. Mann et al. 2004)**
- Navicula cryptocephala* (Pouličková et Mann 2006)**
- Neidium ampliatus* (Mann et Chepurnov 2005)**
- Diploneis smithii* / *D. fusca* (Droop et al. 2000)**
- Meridion circulare* (Rhode et al. 2001)**
- Cymbella cistula* (Pappas at Stoermer 2003)**
- Eunotia bilunaris* (př. Vanormelingen et al. 2007)**
- Cyclotella meneghiniana* / *C. scaldensis* (Beszteri et al. 2005)**

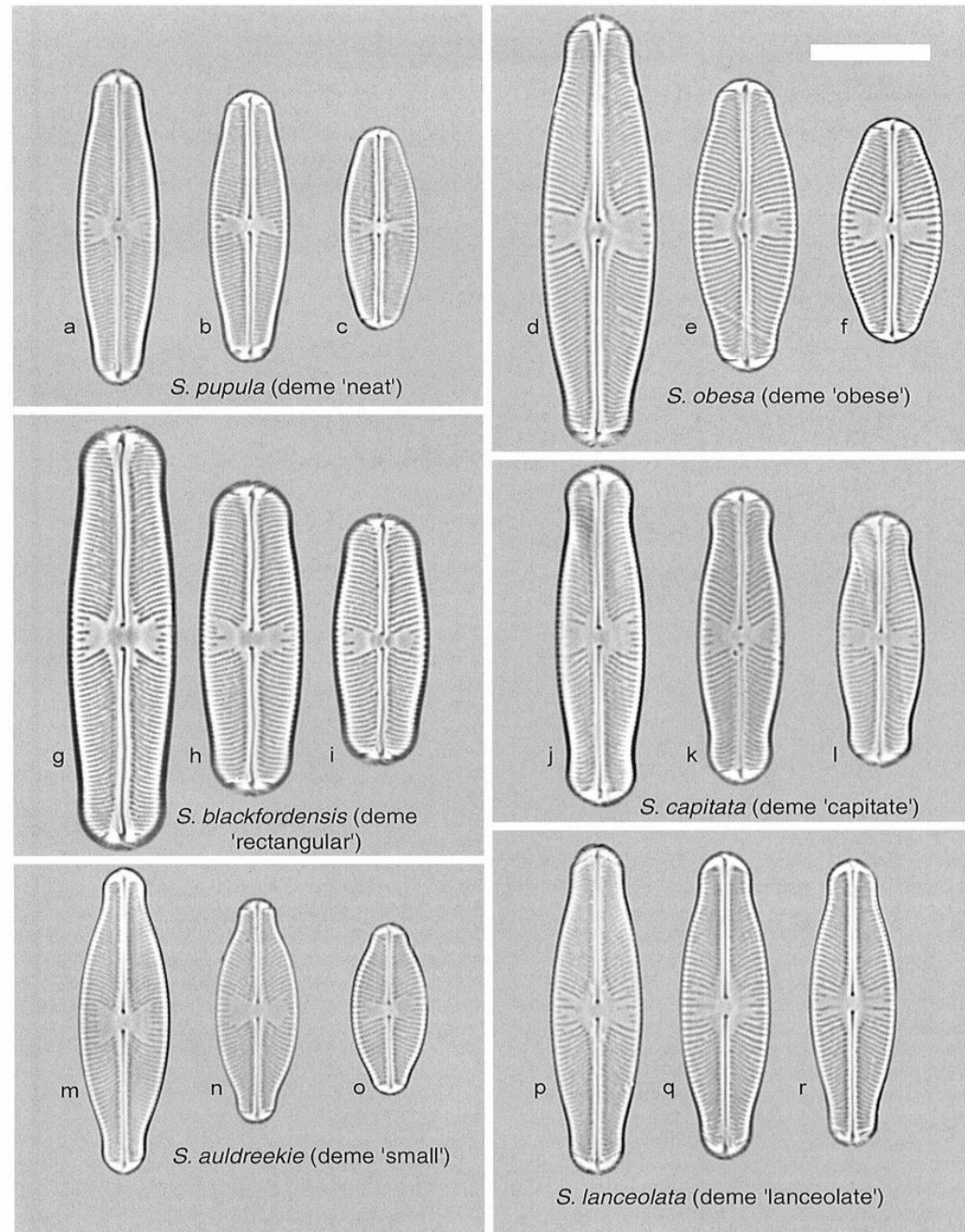


Fig. 4. Six species (demes) of *Sellaphora* from Blackford Pond. The shortest and longest valves are shown for each species from within the morphometric data set, as well as a valve as near to the mean length as possible, to give an idea of the variation in shape that accompanies size reduction. For all species, except *S. lanceolata* (deme 'lanceolate'), length varies much more than width. The illustrations of *S. pupula* (= the 'neat' deme) are designated epitypes. Scale bar = 10 μ m.

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the *Sellaphora* site

Sellaphora has been the focus of research in Edinburgh since the early 1980s. As a result, it has become probably the most fully investigated of all benthic diatoms, although there are still many facets of its biology that remain unknown. In this section of the Algae World website, we provide information about the biology, diversity and evolution of *Sellaphora*, based on our own and other research. We are developing *Sellaphora* as a model system for studying the speciation and biogeography of diatoms, and it was the first to be investigated with respect to DNA bar-coding of diatoms.

We have been developing this site gradually for several months and will continue to add material. The aim is to provide a comprehensive source of reference about the genus, not to replace peer-reviewed scientific publications, but to supplement them and make images and information available to the widest possible audience. In future, floras and other identification aids will undoubtedly be Web-based, rather than printed in expensive bound volumes.

At the moment, we are making a major survey of morphological diversity in *Sellaphora*; the results will be made available via the Web on this site, as well as in a published review.

Material is now available under almost all of the headings listed in the navigation bar at the left. The most fully worked section is 'Biology', where you can find out what *Sellaphora* looks like, how the cells are constructed, and how they change and behave during the life cycle. Some links are still 'dead', especially in the 'Related Links' category. These will be cleaned up during the next couple of months. If you have any suggestions for additions to the site, please contact us (see bottom of page).

David Mann and Kath Evans,
Royal Botanic Garden Edinburgh
September 2007

<http://rbg-web2.rbge.org.uk/algae/sellaphora.htm>



Figure 2. Cleaned valves of original *Eunotia bilunaris* strains, light microscopy. Strains A–D and I belong to the morphological group with narrow valves, the other strains to the group with wide valves. (A) ‘slender’ strain DM33-2, (B) ‘slender’ DM33-17, (C) ‘slender’ DM33-15, (D) ‘slender’ DM33-16, (E) ‘labile’ strain DM33-9, (F) ‘labile’ DM33-7, (G) ‘labile’ DM33-5, (H) ‘labile’ DM33-13, (I) ‘labile’ DM33-18, (J) ‘robust’ strain DM33-8, (K) ‘robust’ DM33-1, (L) ‘robust’ DM33-3, (M) ‘robust’ DM22-5, (N) ‘robust’ DM22-12, (O) ‘robust’ DM22-4, (P) ‘robust’ DM22-17. Scale bar: 10 μ m.

Druhový koncept rozsivek

Klasifikace druhů je příliš hrubá

Široký areál rozšíření, kosmopolitní druhy

Je skryta významná diverzita

Jemnější klasifikace

Odhalení endemických druhů

**Vyšší přesnost ekologického monitoringu a
paleoekologických rekonstrukcí**

200 000 – 10 miliónů druhů rozsivek

pro determinaci pouze specialisté nebo počítač



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Enter one or more words from the taxon name here (or view [help](#) on searching):

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Obnovit



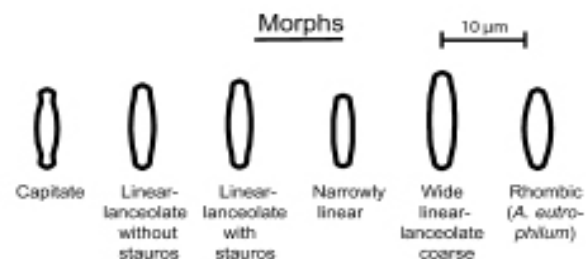
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<http://rbg-web2.rbge.org.uk/ADIAC/db/adiacdb.htm>



Type populations

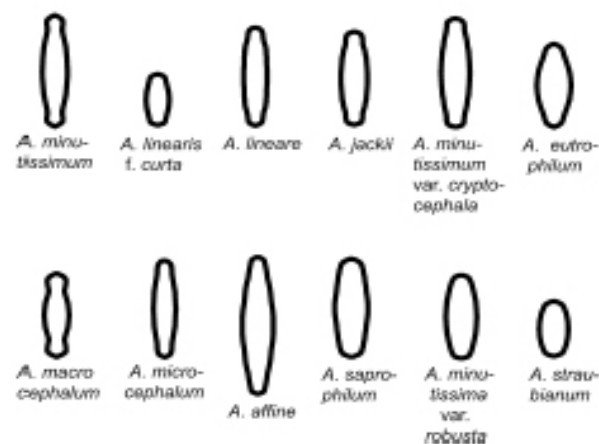


FIG. 9. Average valve shapes of six morphs identified in the North American samples and the 12 type populations of taxa within *Achnanthes minutissimum* species. Shapes were reconstructed by Procrustes superimposition of 16 landmark configurations.

Potapova et Hamilton 2007

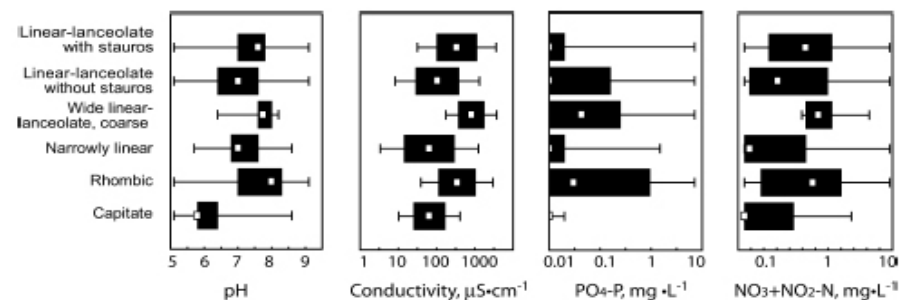


FIG. 10. Box plots showing distribution of selected water chemistry characteristics among six morphotypes identified by the cluster analysis of morphometric data for 728 specimens of *Achnanthes minutissimum* species complex from 30 North American samples.

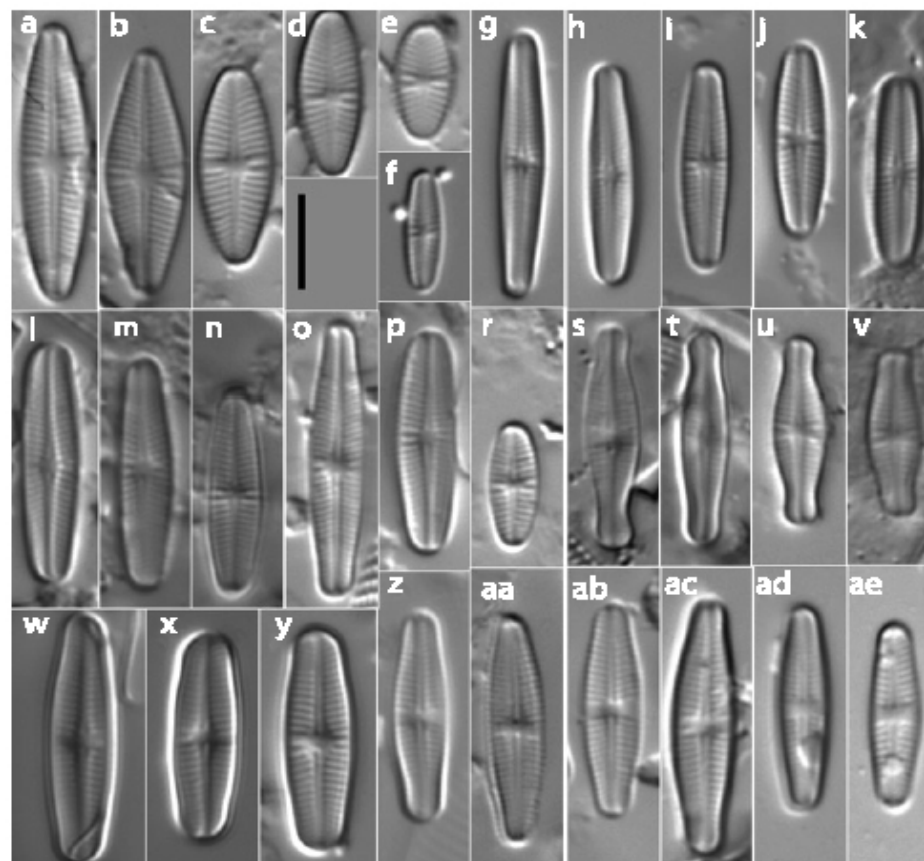


FIG. 8. Light microscopic images of some specimens from North American populations of *Achnanthes minutissimum* complex included in morphometric analysis. (a-e) Rhombic morph or *A. eutrophilum*: Palouse River, Washington. (f-h) Narrowly linear morph: (f-h) Merced River, California; (i) Neversink River, New York; (j) Jacob Fork, North Carolina; and (k) Green River, Washington. (l-r) Linear-lanceolate without stauros morph: (l-n) East Fork Carson River, Nevada; (o-r) Snake Creek, Georgia. (s-v) Capitate morph: Alligator Creek, Georgia. (w-y) Wide linear-lanceolate coarse morph: (w) Tributary of Sluade Creek, Alabama; (x, y) Shirree Creek, Alabama. (z-ae) Linear-lanceolate with stauros morph: (z-ab) Portneuf River, Idaho; (ac) Pequabuck River, Connecticut; and (ad, ae) Yellowstone River, Montana. Scale bar, 5 µm.