# Diatoms from Honaunau Bay
# Hawaii Island

Collection site on Hawaii Island

## Introduction

This report presents diatoms from the marine littoral habitat of Honaunau Bay on Hawaii Island in the Pacific Ocean.

## Methods

Three samples were collected (in 2009, 2015, and 2022) from the marine littoral habitat of Honaunau Bay (latitude 19.423709, longitude -155.912125). Improvised plankton nets were towed from a wetsuit to collect the samples while swimming. The two earlier nets were simply nylon stockings fitted with a wire rim. The latest net added a plastic bottle at the end of the stocking. This last sample proved to be very rich in diatoms despite spilling much of the sample while getting out of the water.

Samples were cleaned with hydrogen peroxide, rinsed in distilled water, dried on cover slips, and mounted on slides using Zrax.

Images were taken with digital cameras using bright field (BF), oblique lighting (OL). or circular oblique lighting (COL) and then edited (PhotoScape 2022). Metadata such as tags and comments were added to images (Microsoft 2018), then extracted (Harvey 2022) and imported into a database (Microsoft 2020) to provide species lists and caption text.

## Discussion

Diatom images for this report were chosen for their interesting shapes and larger sizes that were easier to see in the light microscope. The choices were also limited by those valves that survived cleaning in hydrogen peroxide.

Images are arranged by morphological groups adapted from Spaulding et al. (2021). No eunotioid diatoms were found in these marine collections. Over 300 images of 90 species are included, often with the same specimen in different focal planes. (A species here is defined as a cleaned valve that can be distinguished mostly by morphometrics from other valves.) Forms that could not be assigned a species name are given numbered epithets such as sp1, sp2, et cetera. These epithets are recorded in keys to differentiate forms. The author assumes responsibility for the many errors that undoubtedly are in the identifications. Many forms that were found in these planktonic collections live attached to rocks or seaweed. These may have washed in from the edges of the bay by actions of swimmers, waves, or grazing turtles.

Several recent works were very helpful. Lee (2021) provided a useful webinar about keeled diatoms with the surirelloid group discussed in the second half. It also clarified the many changes of names in that group. The excellent illustrations in Lobban et al. (2012) was used for names of many species. Lobban et al. (2022b) was invaluable for the revision of names of several species.

When reading this report in Adobe Acrobat Reader, images can be expanded for more detail.

Edition 1 of this report was started by Rob Kimmich on 15 May 2022 and completed on 9 Oct 2022. Edition 2 was started on 24 Nov 2022 and completed on 18 Mar 2023. It includes many name changes and corrections suggested by Chris Lobban (2022a). Provisional species epithets are used when identifications are not clear.

**List of Species**

**Radial Centric**

Actinocyclus octonarius
Actinocyclus sp1
Actinocyclus tenuissimus
Aulacodiscus orientalis
Aulacodiscus sp1
Coscinodiscus sp1
Endictya sp1
Hyalodiscus sp1
Hyalodiscus sp2
Melosira nummuloides
Paralia longispina
Podosira baldjickiana
Podosira sp1
Stictocyclus stictodiscus

**Polar Centric**

Biddulphia sp1
Biddulphiopsis membranacea
Lampriscus shadboltianum
Odontella aurita
Pseudictyota dubia
Pseudotriceratium sp1
Toxarium hennedyanum
Toxarium undulatum
Triceratium favus
Triceratium pentacrinus
Triceratium sp1
Trigonium arcticum cf var pentagonalis
Trigonium arcticum var californicum
Trigonium arcticum var. kerguelense
Trigonium caelatum
Trigonium formosum
Trigonium sp

**Araphid**

Araphid sp1
Ardissonea sp1
Climacosphenia elongata
Grammatophora sp1
Hyalosynedra laevigata
Licmophora ehrenbergii
Licmophora romuli
Podocystis adriatica
Podocystis spathulata
Rhabdonema punctatum
Rhabdonema sp
Rhabdonema sp2
Synedrosphenia sp1
Tabularia sp1

**Symmetric Biraphid**

Diploneis chersonensis
Diploneis crabro
Diploneis didyma
Diploneis graeffii
Diploneis ovalis f angusta
Diploneis smithii
Diploneis sp1
Donkinia sp2
Lyrella hennedyi
Mastogloia citrus
Mastogloia fimbriata
Mastogloia horvathiana
Mastogloia neoborneensis
Mastogloia paradoxa
Mastogloia sp1
Navicula longa
Navicula tsukamotoi
Plagiotropis lepidoptera
Pleurosigma intermedium
Pleurosigma rigidum
Pleurosigma sp1
Pleurosigma sp2
Trachyneis aspera

**Monoraphid**

Achnanthes citronella
Achnanthes sp1
Achnanthes sp2
Anorthoneis sp1
Cocconeis convexa
Cocconeis heteroidea
Cocconeis scutellum
Cocconeis sp
Cocconeis sp5

**Asymmetric Biraphid**

Climaconeis riddleae
Druehlago sp1
Halamphora coffeiformis
Tetramphora decussata

**Epithemioid**

Rhopalodia gibberula

**Nitzschioid**

Nitzschia coarctata
Nitzschia longissima
Nitzschia sigma
Nitzschia sp1
Nitzschia sp2
Nitzschia ventricosa
Nitzschia vidovichii

**Surirelloid**

Campylodiscus collare
Campylodiscus comis

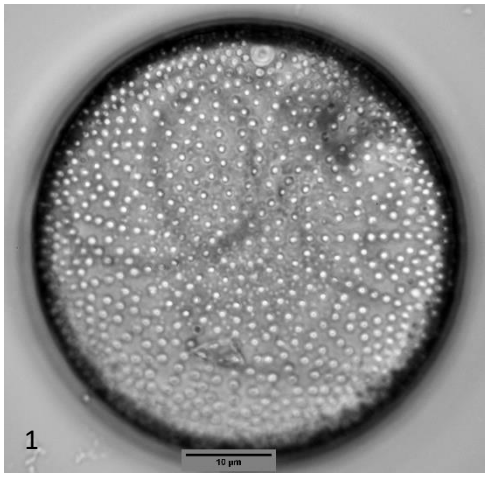
Campylodiscus neofastuosus
Campylodiscus sp1
Campylodiscus sp7
Coronia decorus
Coronia samoensis
Hydrosilicon mitra
Plagiodiscus nervatus

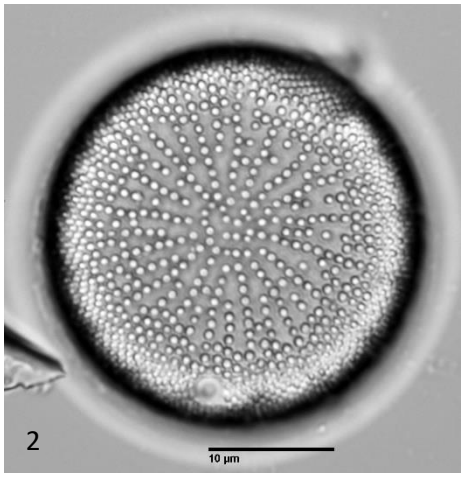
## Radial Centric
## Radial Symmetry Without Poles

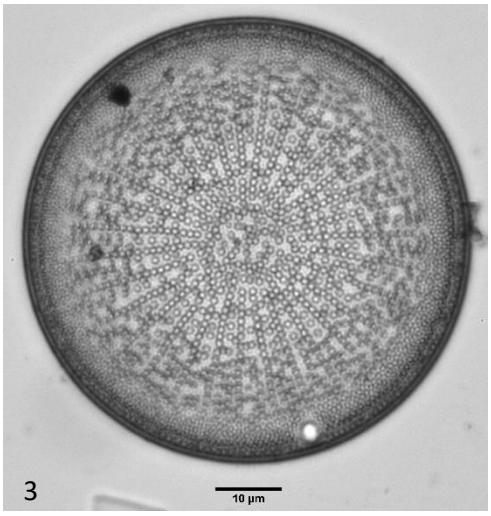
Plate 1

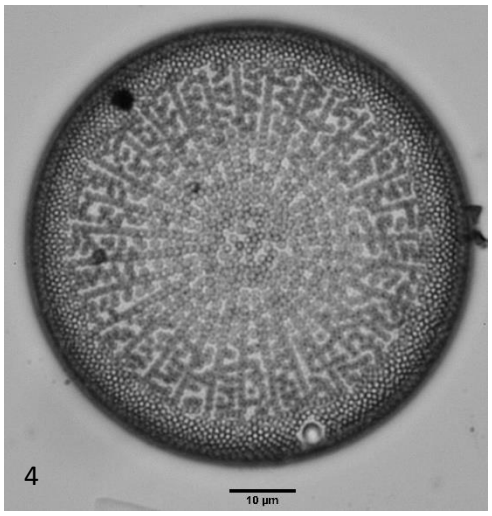
| | | |
|---|---|---|
| 1 | Actinocyclus octonarius | 100x. From Al-Yamani & Suburova (2019) pl 6-8. |
| 2 | Actinocyclus octonarius | 100x. From Al-Yamani & Suburova (2019) pl 6-8. |
| 3 | Actinocyclus octonarius | 60x. Internal view. Focus on center. Good example of marginal pseudonodulus. From Al-Yamani & Suburova (2019) pl 6-8. |
| 4 | Actinocyclus octonarius | 60x. Internal view. Focus on pseudonodulus. Good example of marginal pseudonodulus. From Al-Yamani & Suburova (2019) pl 6-8. |
| 5 | Actinocyclus octonarius | 100x. High focus on pseudonodulus. From Al-Yamani & Suburova (2019) pl 6-8. |
| 6 | Actinocyclus octonarius | 100x. Low focus on center. From Al-Yamani & Suburova (2019) pl 6-8. |

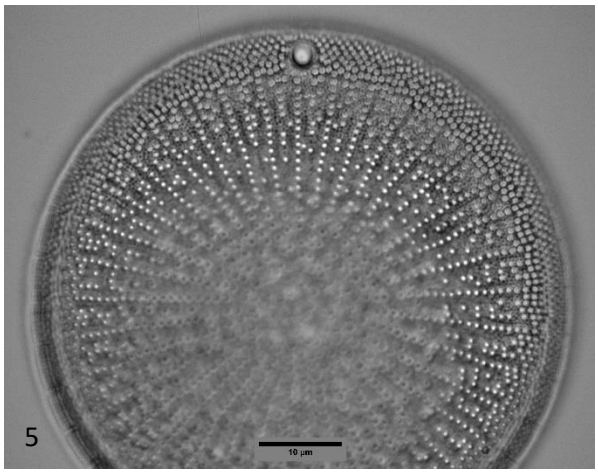
Plate1



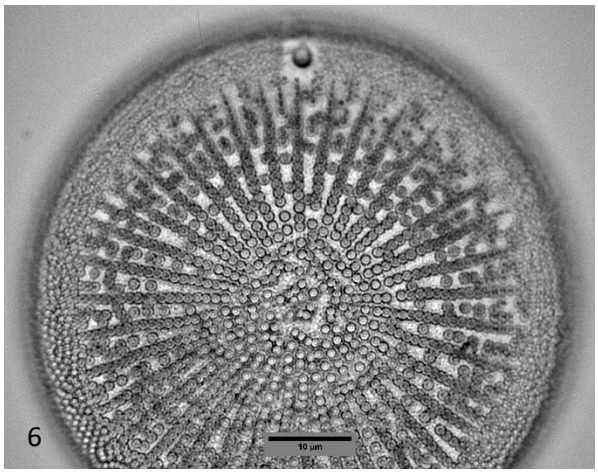
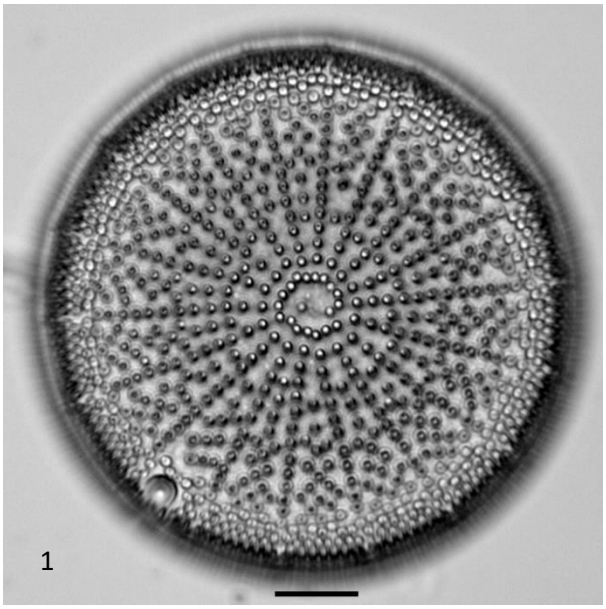
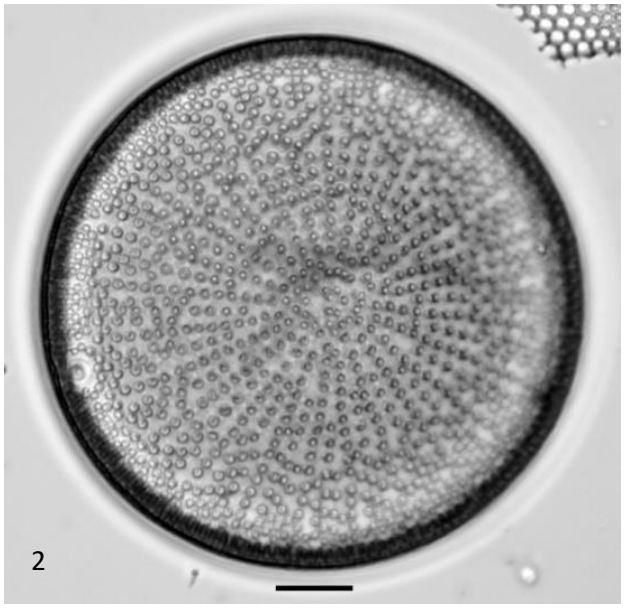



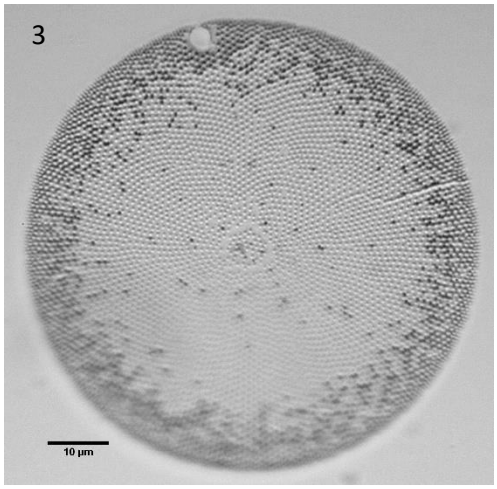
Plate 2

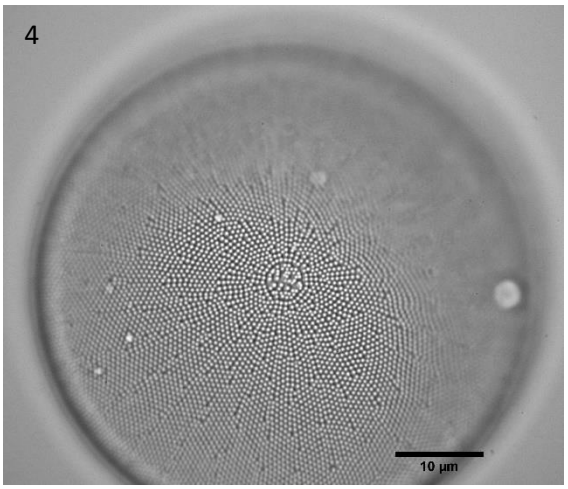
| | | |
|---|---|---|
| 1 | Actinocyclus octonarius | 60x. Scale bar = 10 µm. Internal view. Low focus on center and pseudonodulus. From Al-Yamani & Suburova (2019) pl 6-8. |
| 2 | Actinocyclus octonarius | 60x. Scale bar = 10 µm. External view. High focus on center and pseudonodulus. From Al-Yamani & Suburova (2019) pl 6-8. |
| 3 | Actinocyclus sp1 | 60x, OL, NA070. Alveolae 10 in 10 µm. Valve perhaps dissolving. From Round et al. (1990). |
| 4 | Actinocyclus tenuissimus | 100x, BF, NA080. Near focus on center. Areolae 18 in 10 µm. From Lobban et al. (2012) pl 5: 1-2 |
| 5 | Actinocyclus tenuissimus | 100x, BF, NA080. Far focus on pseudonodulus and rim processes at 10:00 and rim marks at 1:00. Areolae 18 in 10 µm. From Lobban et al. (2012) pl 5: 1-2 |
| 6 | Actinocyclus tenuissimus | 60x. Scale bar 10 µm. |

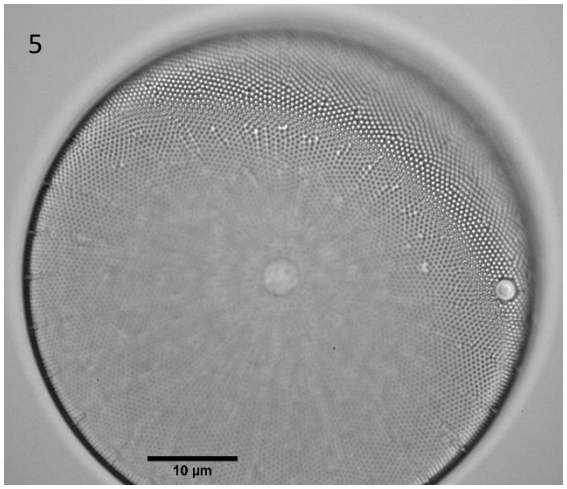
Plate 2



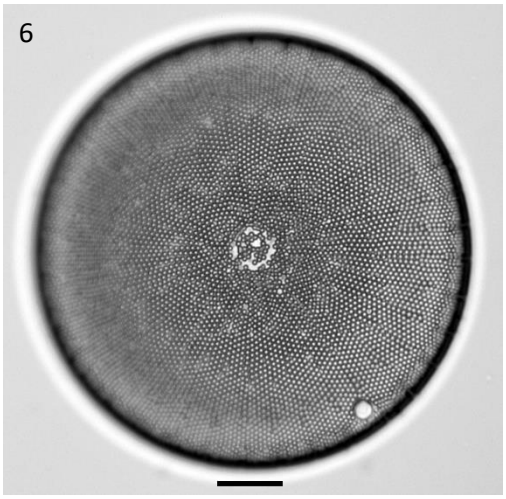
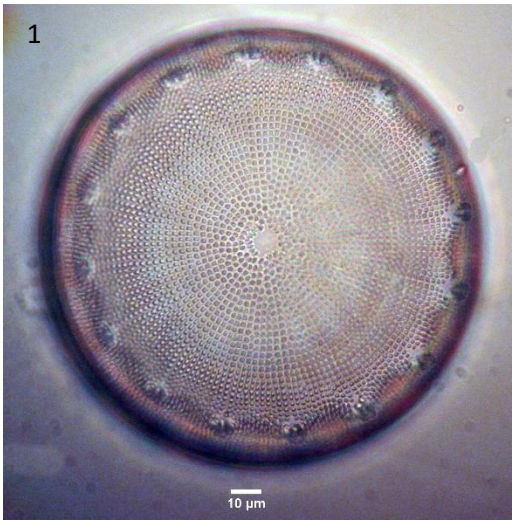
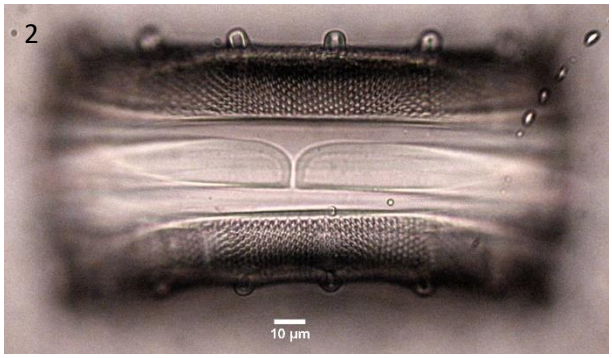



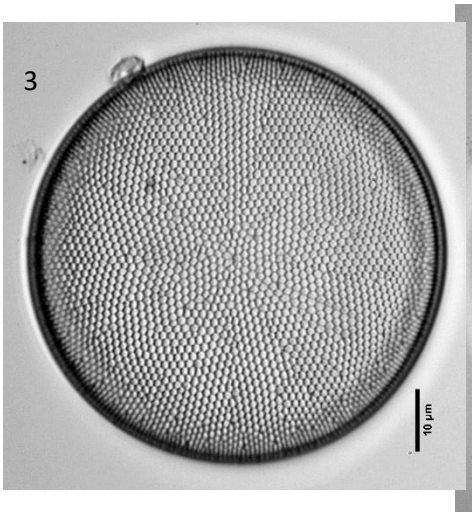
Plate 3

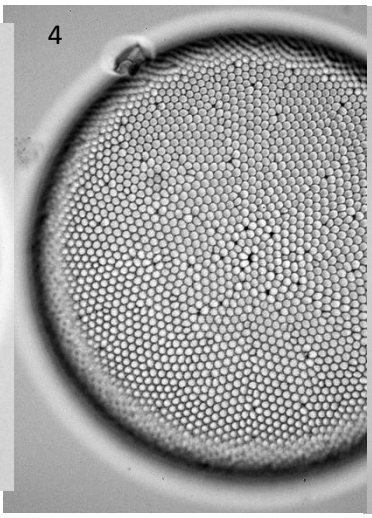
| | | |
|---|---|---|
| 1 | Aulacodiscus orientalis | 40x. Dia 145 µm. Wet mount slip supported by coverslip fragments. From Schmidt (1874-1959) pl 34: 1-2 and Round et al. (1990) p 188. |
| 2 | Aulacodiscus sp1 | High focus on a split ring girdle band. Marginal processes with rimoportulae extend above valve face. From Round et al. (1990) p 188. |
| 3 | Coscinodiscus sp1 | 60x, OL. Whole valve. From Round et al. (1990). |
| 4 | Coscinodiscus sp1 | 100x. BF, NA100. High focus on valve face. Shows faint detail of areolae. From Round et al. (1990). |
| 5 | Coscinodiscus sp1 | 100x. BF, NA100. Mid focus on internal openings. From Round et al. (1990). |
| 6 | Coscinodiscus sp1 | 100x. BF, NA100. Low focus on marginal points at 10:00. From Round et al. (1990). |
| 7 | Endictya sp1 | 100x. High focus on center and margin at 10:00. From Round et al. (1990) p 160. |
| 8 | Endictya sp1 | 100x. Low focus on center and lower margin. From Round et al. (1990) p 160. |

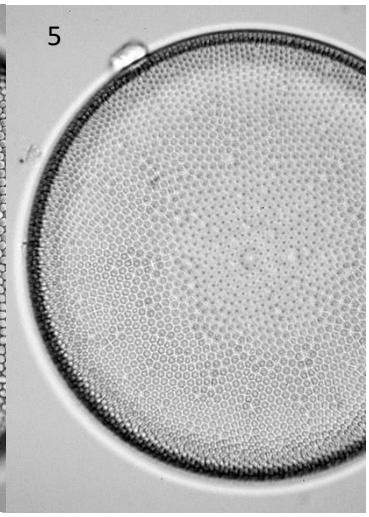
Plate 3

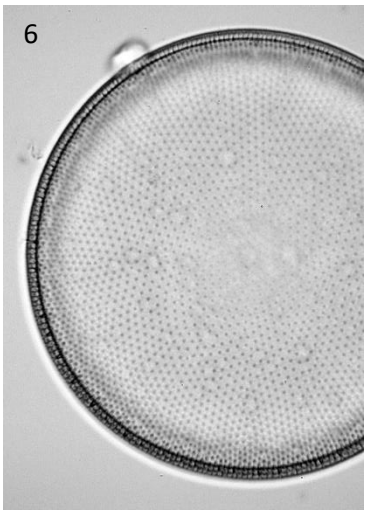


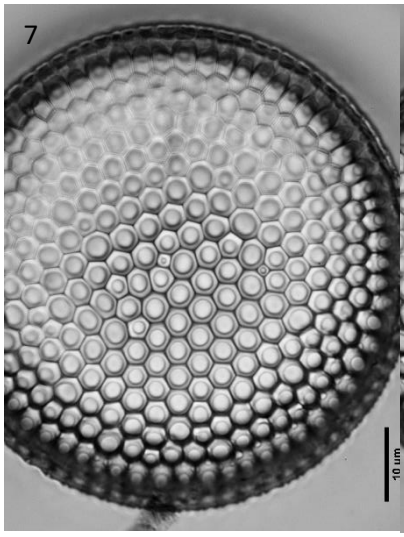



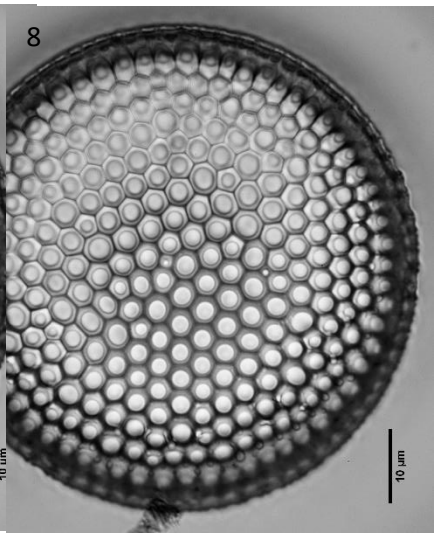



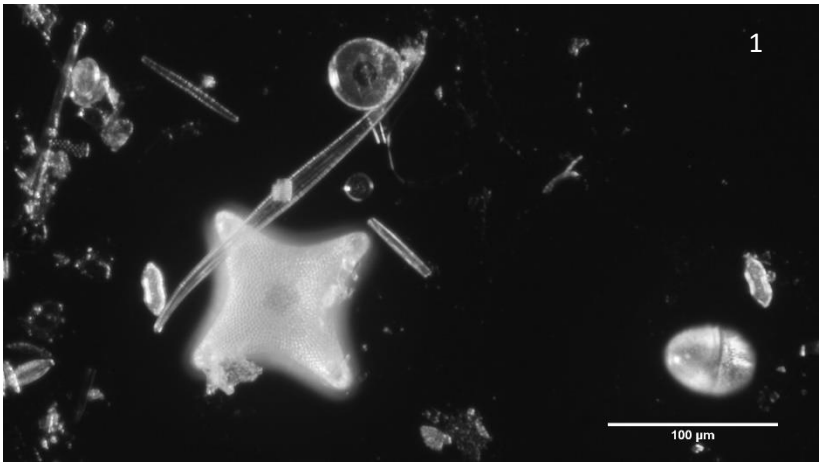



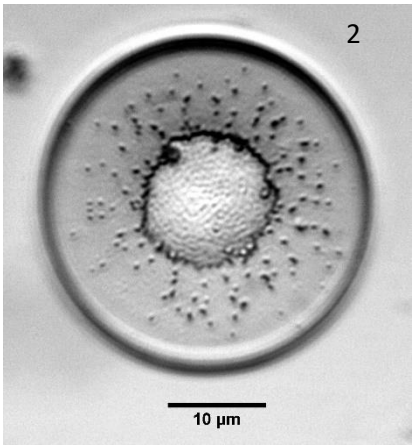



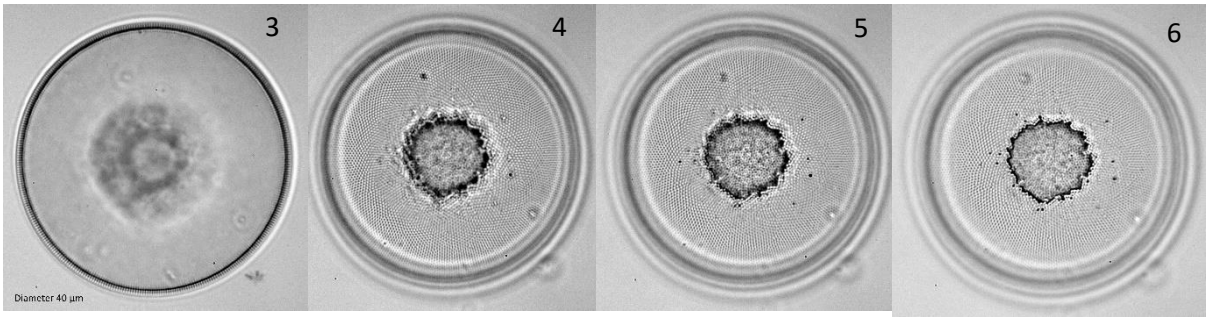
# Plate 4

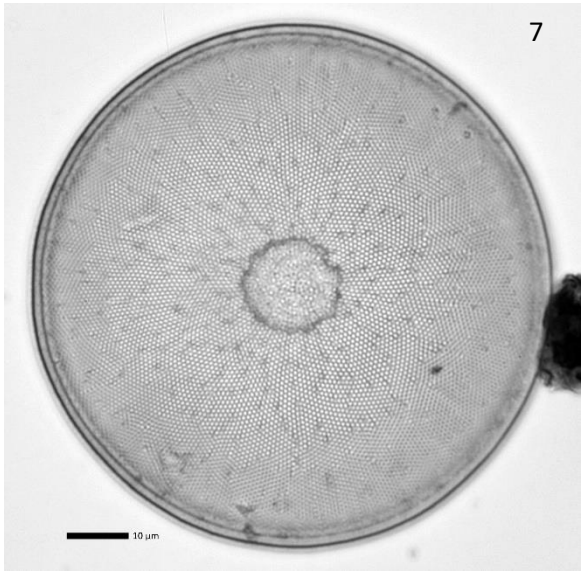
| | | |
|---|---|---|
| 1 | Hyalodiscus sp1 | 10x, OL. Scale bar 100 µm. Reflected illumination, with light shining in from the side of the slide, showing the glassiness of the diatoms. From Sims (ed.) (1996) pl 190 fig 1 for N. sigma. |
| 2 | Hyalodiscus sp2 | 60x. From Round et al. (1990) p 162. |
| 3 | Hyalodiscus sp1 | 100x, COL, NA080. Internal view. Highest focus F1 on valve outline. From Round et al. (1990) p 162. |
| 4 | Hyalodiscus sp1 | 100x, COL, NA080. Internal view. Focus F2 on areolae. From Round et al. (1990) p 162. |
| 5 | Hyalodiscus sp1 | 100x, COL, NA080. Internal view. Focus F3 on central areolae. From Round et al. (1990) p 162. |
| 6 | Hyalodiscus sp1 | 100x, COL, NA080. Internal view. Lowest focus F4 on central rim. From Round et al. (1990) p 162. |
| 7 | Hyalodiscus sp1 | 60x, BF. Focus on inner valve face. From Round et al. (1990) p 162. |
| 8 | Hyalodiscus sp1 | 100x. Scale bar 10 µm. Focus white spot to show radial striae in central area. Applied HDR. In binder # 17. From Round et al. (1990). |

Plate 4



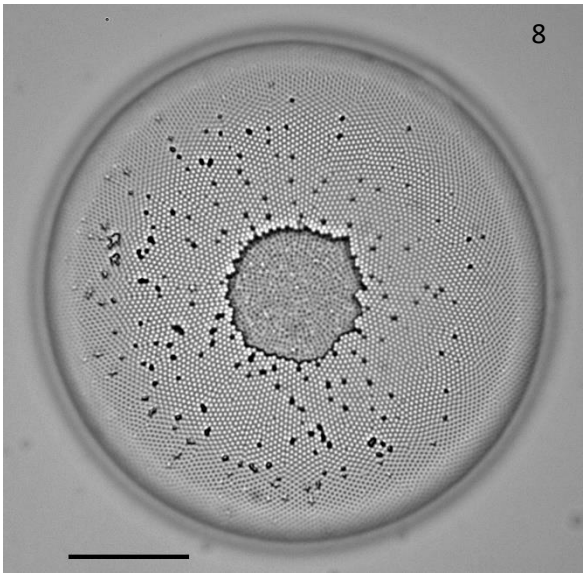
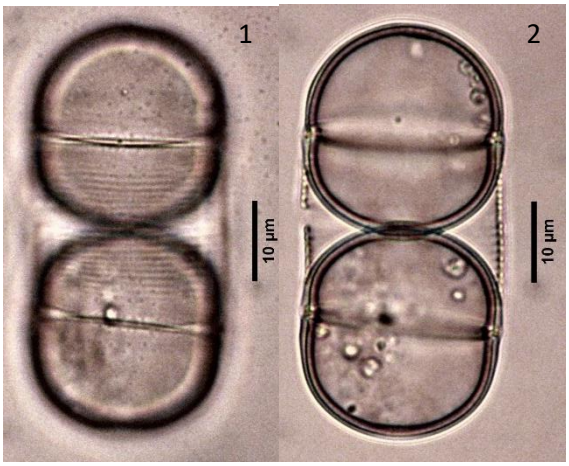
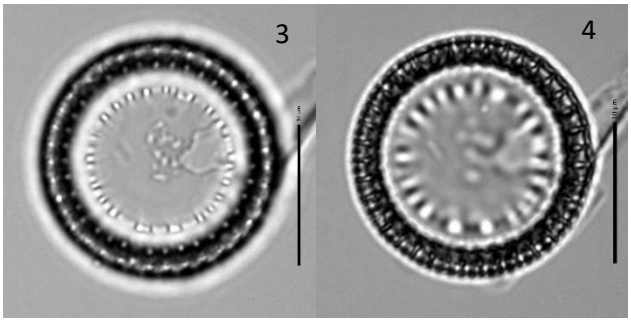



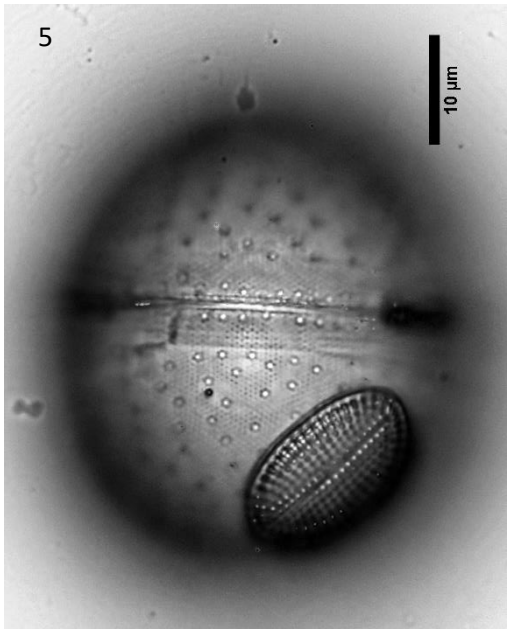
Plate 5

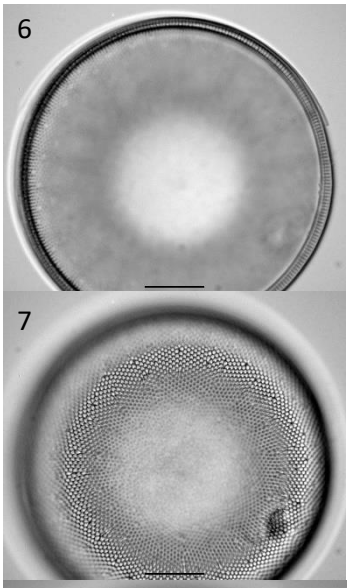
| | | |
|---|---|---|
| 1 | Melosira nummuloides | 40x. High focus on girdle bands. Wet mount. From Cupp (1943) fig 1. |
| 2 | Melosira nummuloides | 40x. Low focus on outline and girdle bands. Wet mount. From Cupp (1943) fig 1. |
| 3 | Paralia longispina | 100x. Scale bar 10 µm. High focus. From Lobban et al. (2012) pl 4: 3-5 (beautiful SEM). |
| 4 | Paralia longispina | 100x. Scale bar 10 µm. Low focus. From Lobban et al. (2012) pl 4: 3-5 (beautiful SEM). |
| 5 | Podosira baldjickiana | 100x. Scale bar 10 µm. Cocconeis epiphytic on Podosira. A stacked image. From Schmidt (1874-1959) pl 130 fig 40. |
| 6 | Podosira baldjickiana | 100x. Scale bar 10 µm. Low focus on outline. From Lobban et al. (2012) pl 3 fig 3-5. |
| 7 | Podosira baldjickiana | 100x. Scale bar 10 µm. Mid focus on mid radius. Rosettes visible around rimoportulae. From Lobban et al. (2012) pl 3 fig 3-5. |
| 8 | Podosira baldjickiana | 100x. Scale bar 10 µm. High focus on valve center. From Lobban et al. (2012) pl 3 fig 3-5. |
| 9 | Podosira baldjickiana | 100x. Girdle view. Low focus on outline. Scale bar 10 µm. |
| 10 | Podosira baldjickiana | 100x. Scale bar 10 µm. High focus on mantles showing areolae and rosettes around rimoportulae. From Lobban et al. (2012) pl 3 fig 3-5. |

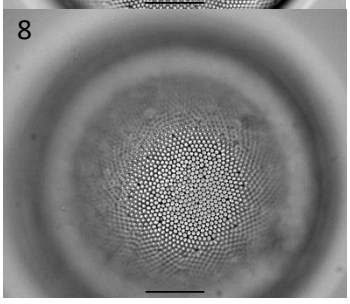
Plate 5

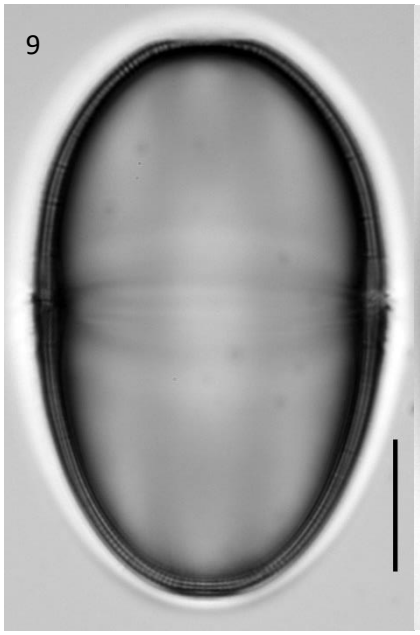


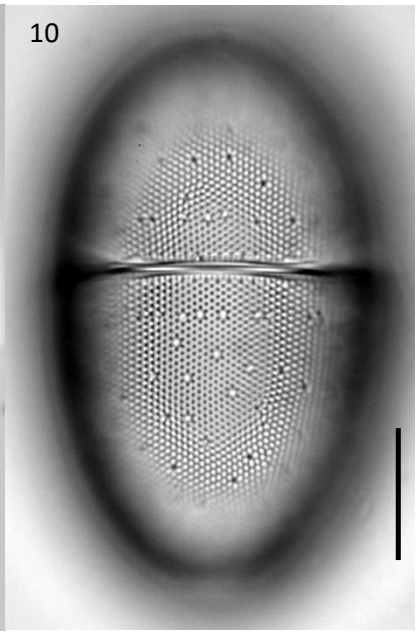
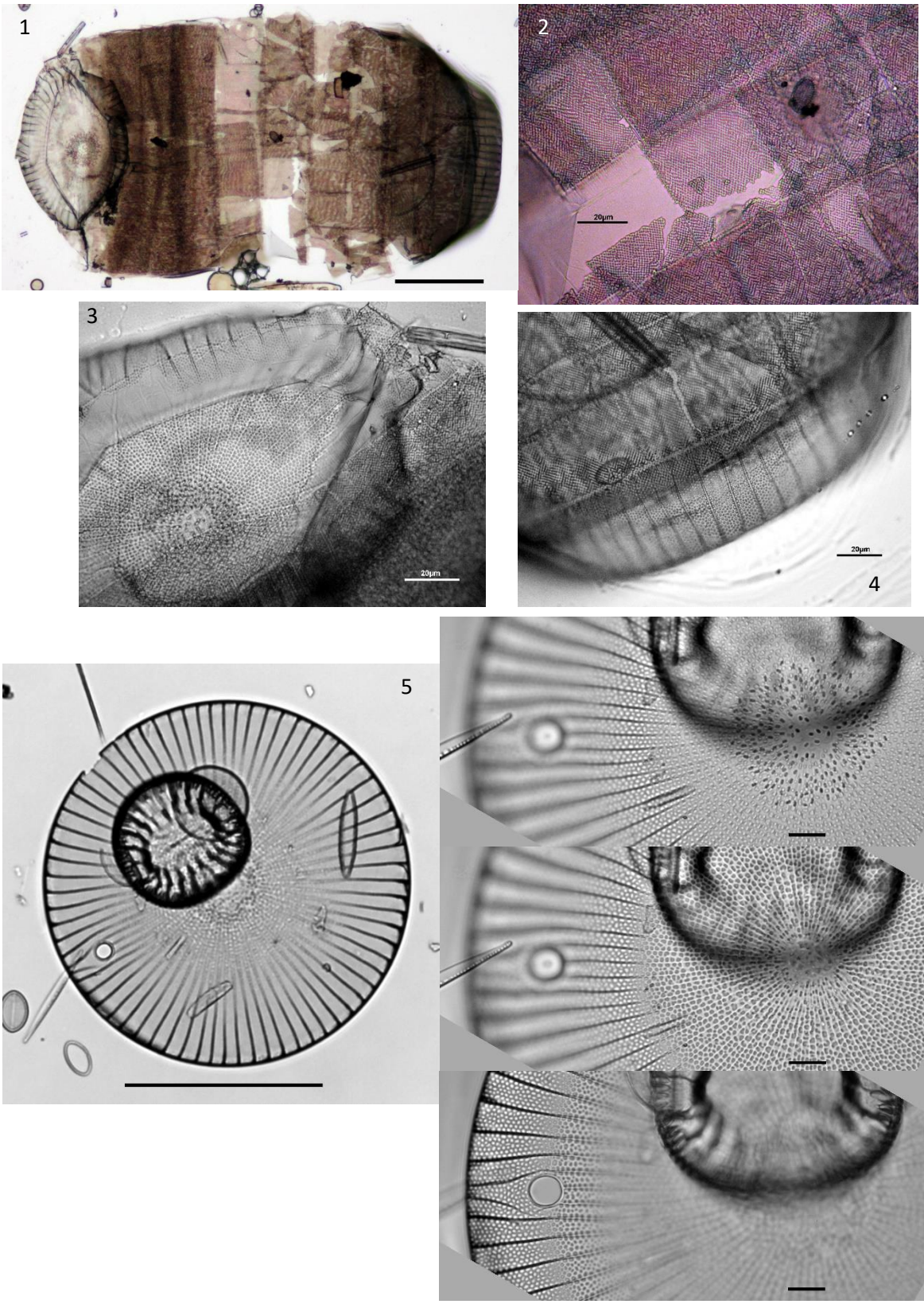



Plate 6

| | | |
|---|---|---|
| 1 | Stictocyclus stictodiscus | 10x. Scale bar 100 µm. L 400 µm. Crushed by coverslip. From Round et al. (1990) p 208; AlgaeBase.org. |
| 2 | Stictocyclus stictodiscus | 40x. Scale bar 20 µm. Crushed by coverslip. Girdle section. From Round et al. (1990) p 208; AlgaeBase.org. |
| 3 | Stictocyclus stictodiscus | 40x. Scale bar 20 µm. Crushed by coverslip. Rim of folded end. From Round et al. (1990) p 208; AlgaeBase.org. |
| 4 | Stictocyclus stictodiscus | 40x. Scale bar 20 µm. Crushed by coverslip. Rim of open end. From Round et al. (1990) p 208; AlgaeBase.org. |
| 5 | Stictocyclus stictodiscus | 10x. Scale bar 100 µm. Valve dia 186 µm, pseudonodulus dia 7.6 µm. From Round et al. (1990); AlgaeBase.org. |
| 6 | Stictocyclus stictodiscus | 60x. Scale bar 10 µm. High focus F1 on central, scattered rimoportulae in black spot. From Round et al. (1990); AlgaeBase.org. |
| 7 | Stictocyclus stictodiscus | 60x. Scale bar 10 µm. Focus F2 on areolae around center. From Round et al. (1990); AlgaeBase.org. |
| 8 | Stictocyclus stictodiscus | 60x. Scale bar 10 µm. Focus F3 on pseudonodulus. From Round et al. (1990); AlgaeBase.org. |

Plate 6

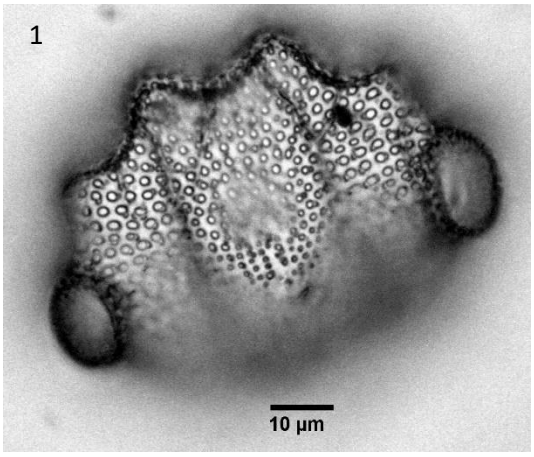


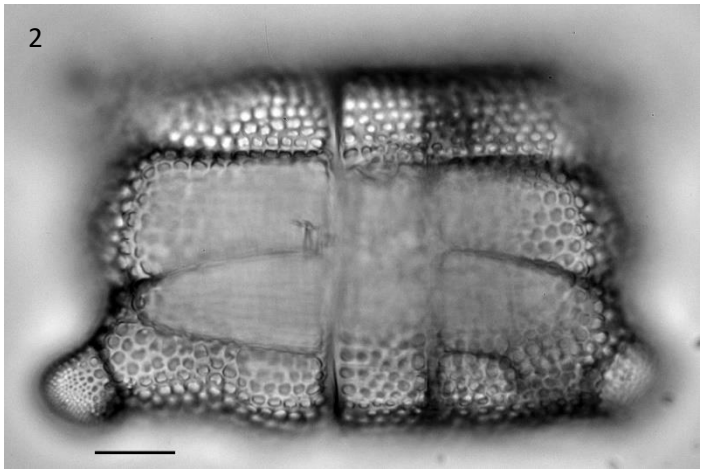
## Polar Centric
## Radial Symmetry With Poles

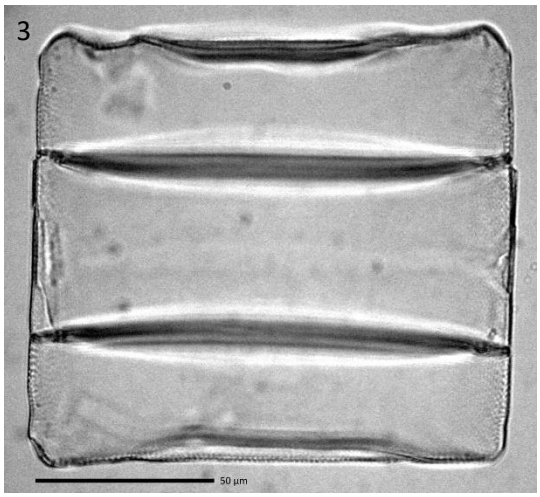
Plate 7

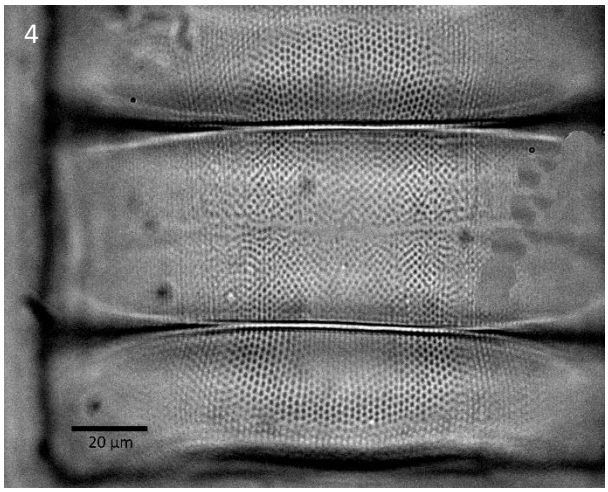
| | | |
|---|---|---|
| 1 | Biddulphia sp1 | 40x. Scale bar 10 µm. |
| 2 | Biddulphia sp1 | 100x. Scale bar = 10 µm. |
| 3 | Biddulphiopsis membranacea | 10x. Scale bar 50 µm. Wet mount. Whole frustule in girdle view. Bipolar, the two indistinct poles visible on bottom valve. From Stidolph et al. (2012) pl 21 fig 7; Navarro & Lobban (2009) fig 6-7 and good discussion of ecology; Round et al. (1990) genus description. |
| 4 | Biddulphiopsis membranacea | 40x. Scale bar 20 µm. Wet mount. Whole frustule in girdle view. From Stidolph et al. (2012) pl 21 fig 7; Navarro & Lobban (2009) fig 6-7 and good discussion of ecology; Round et al. (1990) genus description. |
| 5 | Biddulphiopsis membranacea | 40x. Scale bar 50 µm. Wet mount after cleaning. Girdle and valve views. Two poles on valves visible, indistinct. From Stidolph et al. (2012) pl 21 fig 7; Navarro & Lobban (2009) fig 6-7 and good discussion of ecology; Round et al. (1990) genus description. |
| 6 | Biddulphiopsis membranacea | 40x. Scale bar 20 µm. Wet mount after cleaning. Valve view. From Stidolph et al. (2012) pl 21 fig 7; Navarro & Lobban (2009) fig 6-7 and good discussion of ecology; Round et al. (1990) genus description. |

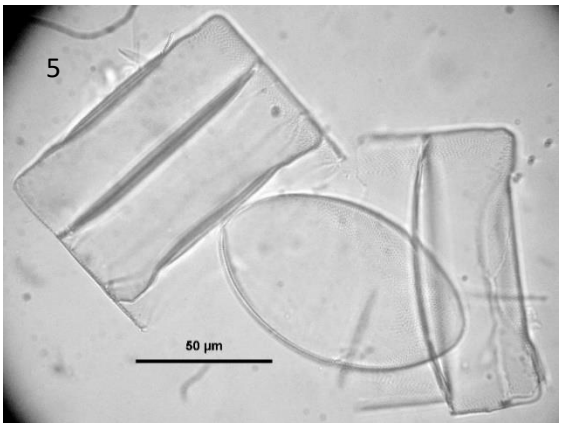
Plate 7

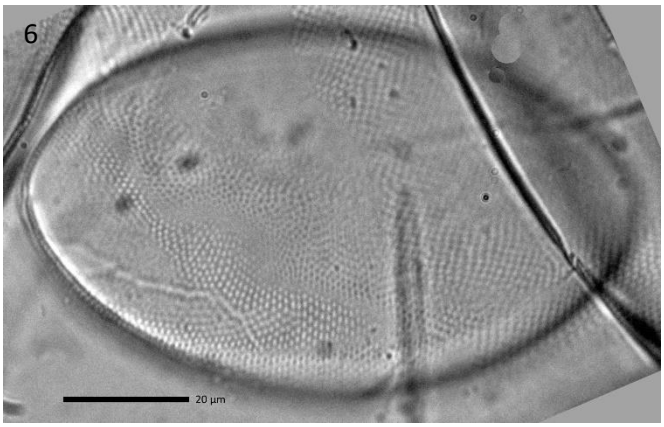


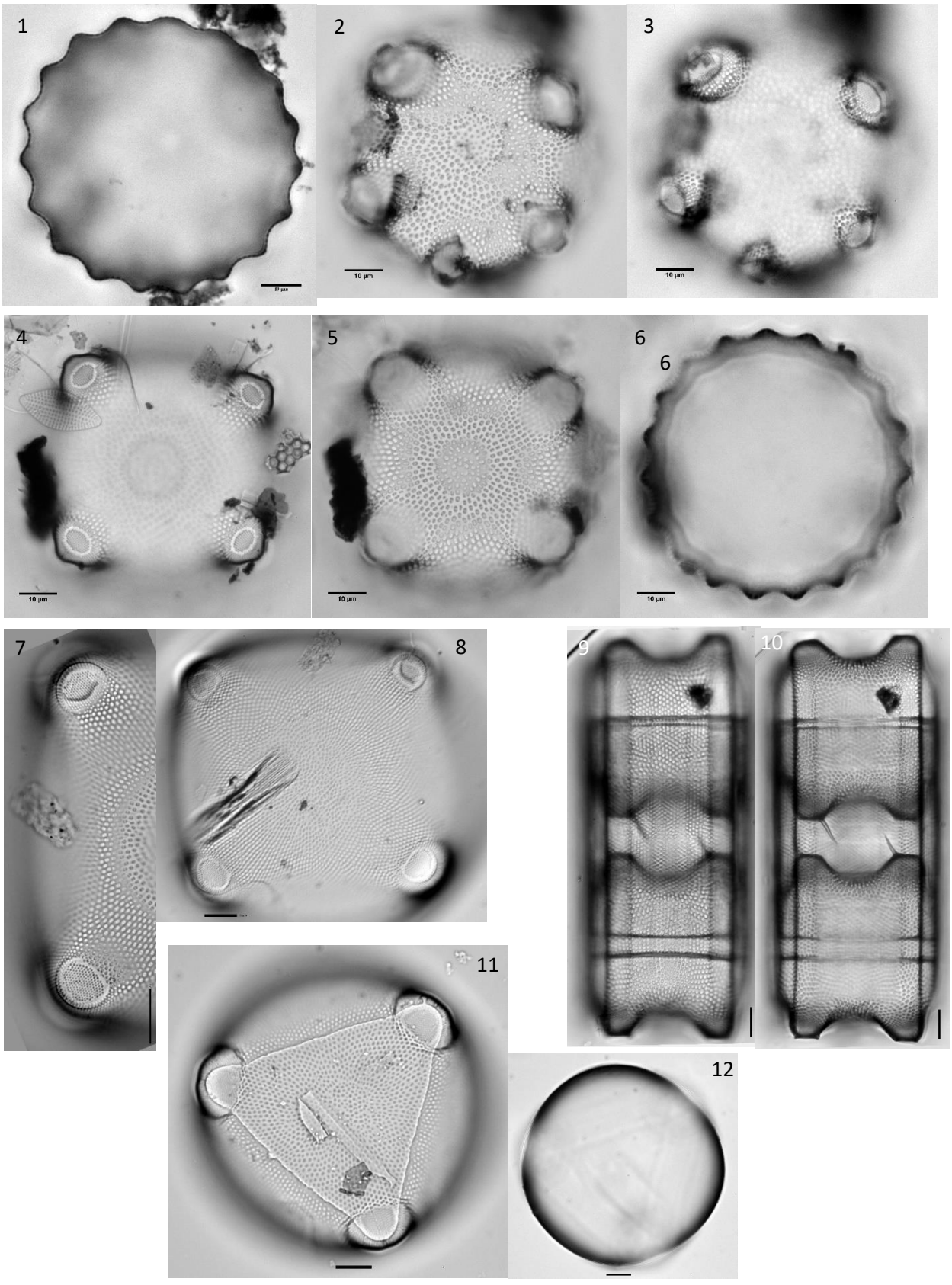



# Plate 8

| | | |
|---|---|---|
| 1 | Lampriscus shadboltianum | 60x, BF, NA045. Internal view of five-pole valve. High focus on crenulated outline. See # 6313 ff for valve face. From Navarro & Lobban (2009) fig 25-26. |
| 2 | Lampriscus shadboltianum | 60x, BF, NA050. Internal view of five-pole valve. Mid focus on valve center. See # 6295 for outline. From Navarro & Lobban (2009) fig 25-26. |
| 3 | Lampriscus shadboltianum | 60x, BF, NA050. Internal view of five-pole valve. Low focus on inside of pseudocelli. See # 6295 for outline. From Navarro & Lobban (2009) fig 25-26. |
| 4 | Lampriscus shadboltianum | 60x, BF, NA050. Focus on pseudocelli. From Navarro & Lobban (2009) fig 25-26. |
| 5 | Lampriscus shadboltianum | 60x, BF, NA050. Mid focus on center of valve. From Navarro & Lobban (2009) fig 25-26. |
| 6 | Lampriscus shadboltianum | 60x, BF, NA050. Low focus on outline. From Navarro & Lobban (2009) fig 25-26. |
| 7 | Lampriscus shadboltianum | 60x. Scale bar 10 µm. From Navarro & Lobban (2009) fig 25-26. |
| 8 | Lampriscus shadboltianum | 100x. Scale bar 10 µm. From Navarro & Lobban (2009) fig 25-26. |
| 9 | Lampriscus shadboltianum | 60x. Scale bar 10 µm. High focus on connecting copulae. From Navarro & Lobban (2009). |
| 10 | Lampriscus shadboltianum | 60x. Scale bar 10 µm. Low focus on spines. From Navarro & Lobban (2009). |
| 11 | Lampriscus shadboltianum | 60x. Scale bar 10 µm. Diameter 83 µm. Only three pseudocelli. High focus on pseudocelli. From Navarro & Lobban (2009). |
| 12 | Lampriscus shadboltianum | 60x. Scale bar 10 µm. Diameter 83 µm. Low focus on valve outline. From Navarro & Lobban (2009). |

Plate 8



## Plate 9

| | | |
|---|---|---|
| 1 | Odontella aurita | 60x, OL, NA070. Scale bar 10 µm. Focus on lower outline. Lobban et al. (2012) pl 6 fig 1-2 (a good SEM). |
| 2 | Odontella aurita | 60x, OL, NA070. Scale bar 10 µm. Focus on upper girdle joint. Lobban et al. (2012) pl 6 fig 1-2 (a good SEM). |
| 3 | Odontella aurita | 100x. From Sims (ed.) (1996) pl 195 fig 1-2 ; Round et al. (1990) p230. |
| 4 | Odontella aurita | 100x. Scale bar 10 µm. From Sims (ed.) (1996) pl 195 fig 1-2 ; Round et al. (1990) p230. |
| 5 | Odontella aurita | 100x. Internal view. High focus F1 on outline. From Sims (ed.) (1996) pl 195 fig 1-2 ; Round et al. (1990) p230. Scale bar 10 µm. |
| 6 | Odontella aurita | 100x. Internal view. Scale bar 10 µm. Focus F3 in series. From Sims (ed.) (1996) pl 195 fig 1-2 ; Round et al. (1990) p230. |
| 7 | Odontella aurita | 100x. Internal view. Scale bar 10 µm. Focus F4 in series. From Sims (ed.) (1996) pl 195 fig 1-2 ; Round et al. (1990) p230. |
| 8 | Odontella aurita | 100x. Internal view. Scale bar 10 µm. Lowest focus F5 in series. From Sims (ed.) (1996) pl 195 fig 1-2 ; Round et al. (1990) p230. |
| 9 | Odontella aurita | 100x. Focus F2 in series to F1-F5. From Sims (ed.) (1996) pl 195 fig 1-2 ; Round et al. (1990) p230. Scale bar 10 µm. |
| 10 | Pseudotriceratium sp1 | 60x. Whole frustule. Upper valve. Scale bar = 10 µm. Upper focus on central rimoportulae. From Round et al. (1990). Compared Stidolph et al. (2012) p 149 fig 40 Stictodiscus parallelus but in this specimen distinct network is not visible and it does seem to have central and perhaps small marginal rimoportulae. |
| 11 | Pseudotriceratium sp1 | 60x. Whole frustule. Lower valve. Internal view. Scale bar = 10 µm. Focus on angles, central rimoportulae, and edge in white spot. From Round et al. (1990). Compared Stidolph et al. (2012) p 149 fig 40 Stictodiscus parallelus but in this specimen distinct network is not visible and it does seem to have central and perhaps small marginal rimoportulae. |
| 12 | Pseudotriceratium sp1 | 60x. Whole frustule. Lower valve. Internal view. Scale bar = 10 µm. Focus on outline in black spot. From Round et al. (1990). Compared Stidolph et al. (2012) p 149 fig 40 Stictodiscus parallelus but in this specimen distinct network is not visible and it does seem to have central and perhaps small marginal rimoportulae. |
| 13 | Pseudotriceratium sp1 | 100x, BF. Whole frustule. Upper valve. External view. Scale bar = 10 µm. Focus on center. From Round et al. (1990). Compared Stidolph et al. (2012) p 149 fig 40 Stictodiscus parallelus but in this specimen distinct network is not visible and it does seem to have central and perhaps small marginal rimoportulae. |

*Pseudotriceratium* lacks pseudocelli. Dots between some of the rows of areolae near the margin are interpreted here as rimoportulae. This cell appears to have several rimoportulae in center of both valves in this frustule, though Round et al. (1990) says there should be only one rimoportula.

This frustule lacks a distinct network which distinguishes it from genus *Stictodiscus*. (Round et al. 1990 page 216; Stidolph 2012 p149 fig 40).

Plate 9

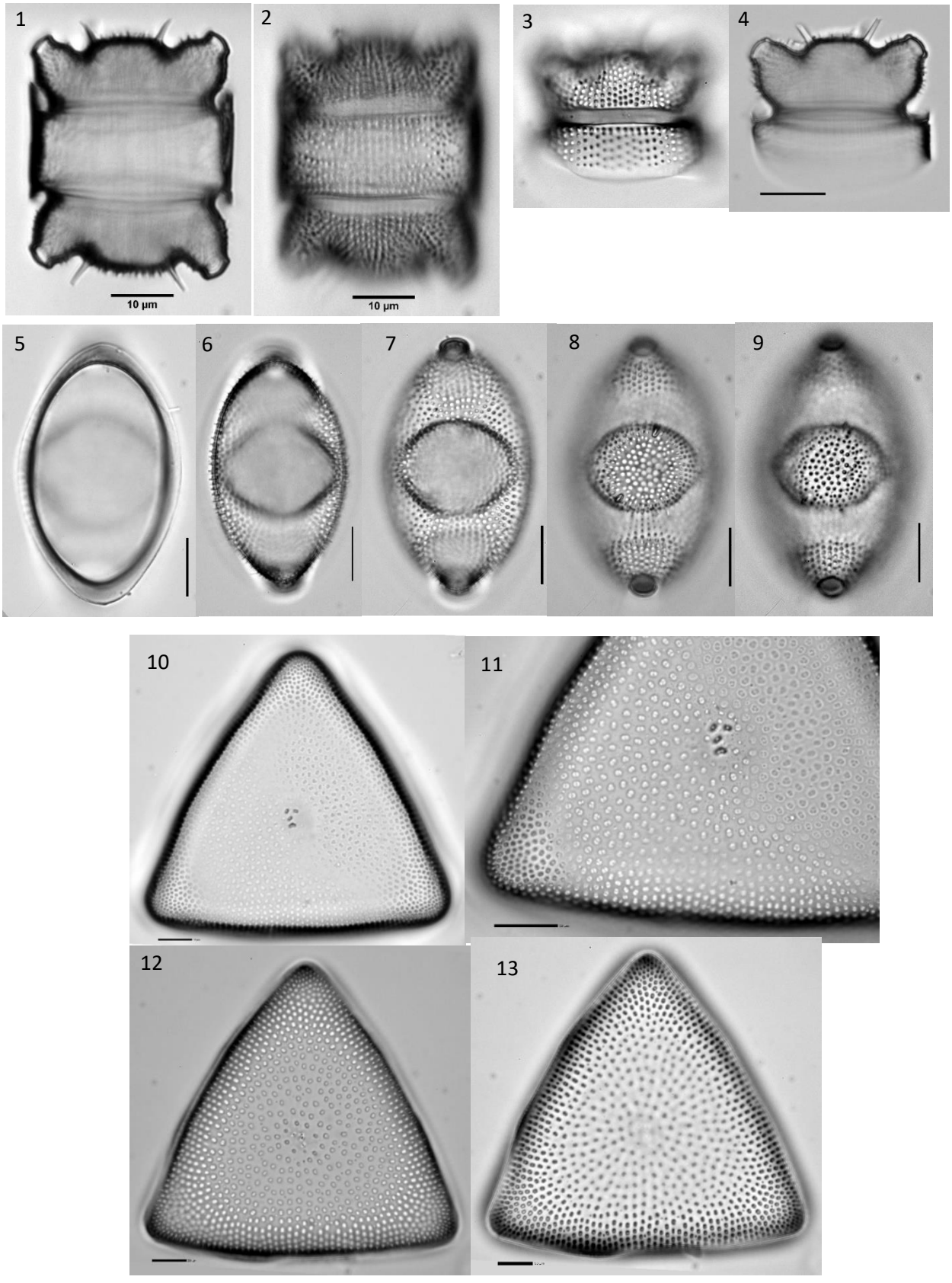
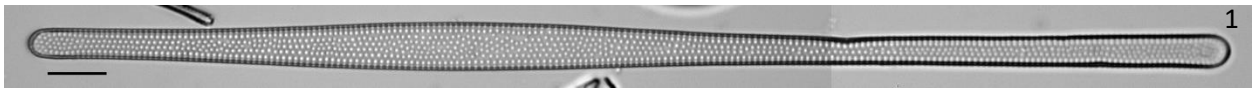
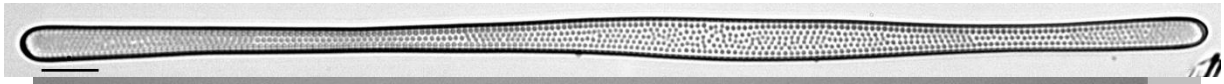


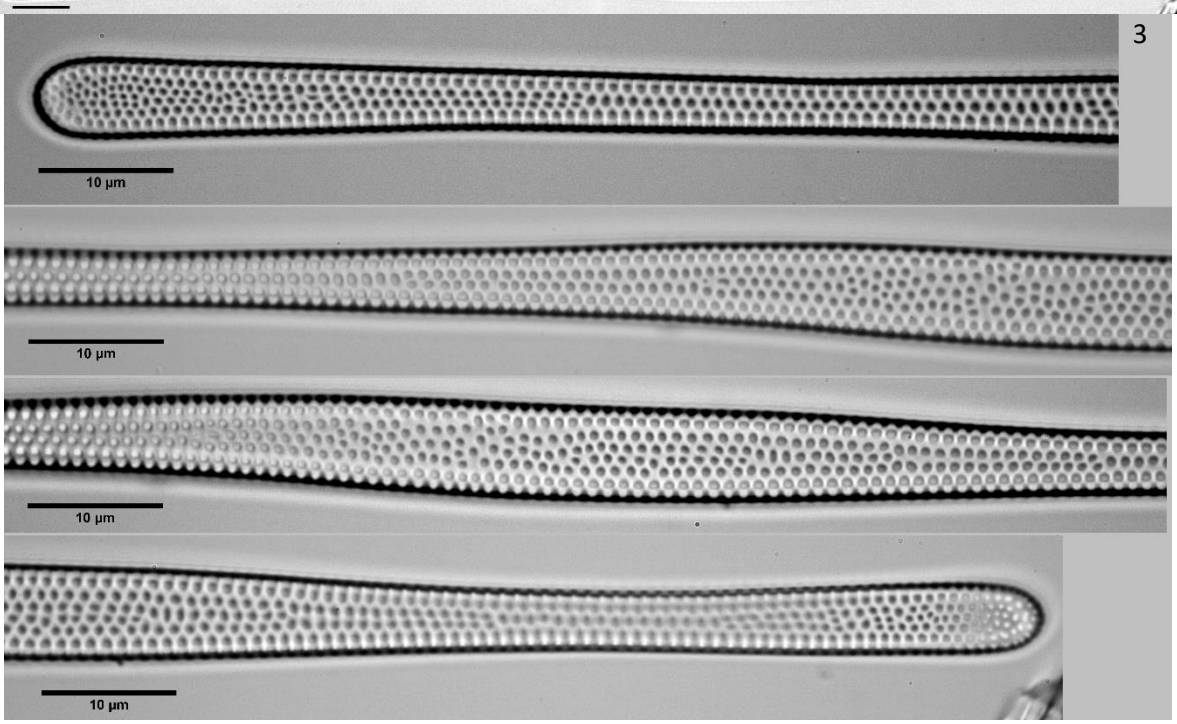
Plate 10

| | | |
|---|---|---|
| 1 | Toxarium hennedyanum | 100x. Scale bars 10 µm. From Kooistra et al. (2003); Lobban et al. (2012) pl 17 figs 1-5. |
| 2 | Toxarium hennedyanum | 40x. Length 204, width 7 µm. Scale bar 10 µm. From Kooistra et al. (2003); Lobban et al. (2012) pl 17 figs 1-5. |
| 3 | Toxarium hennedyanum | Whole valve at 10x. Scale bar 20 µm. L 329 µm, W 8 µm. Sections (8341-8344) at 60x. Scale bars 10 µm. |
| 4 | Toxarium hennedyanum | 60x. Scale bar 10 µm. From Lobban et al. (2012) pl 17 figs 1-5. |

Plate 10



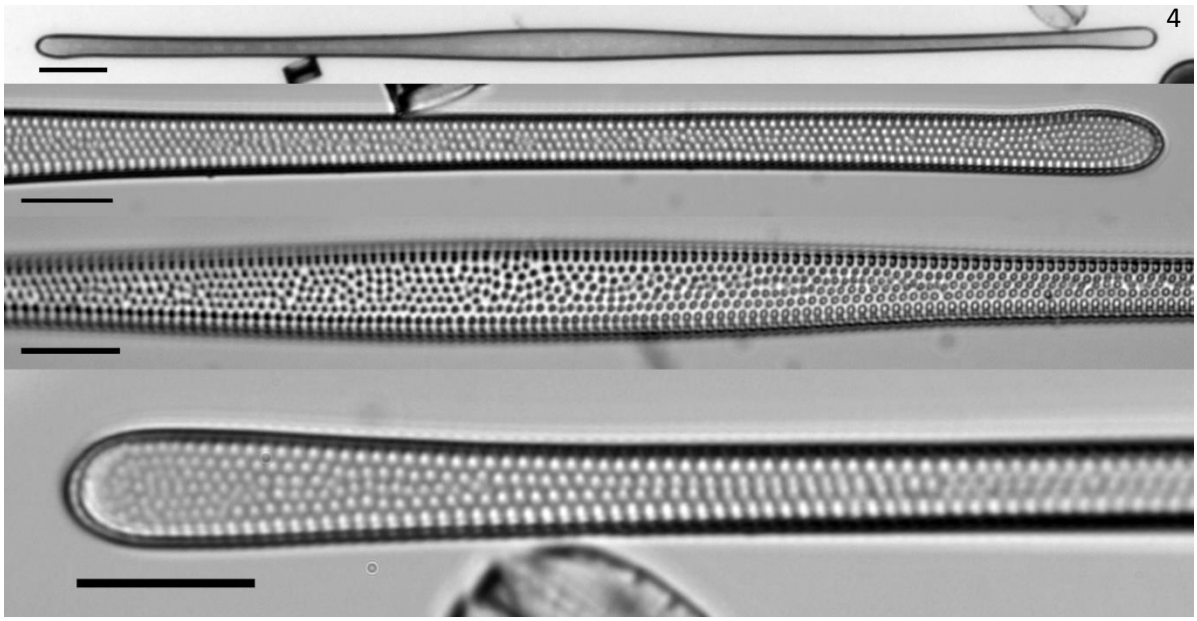



Plate 11

| | | |
|---|---|---|
| 1 | Toxarium undulatum | Complete valve 10x. Length along arch 760 µm. Width at center 9 µm. Scale bar 100 µm. Color fill overlay black. Valve sections 60x. Scale bars 10 µm. |
| 2 | Toxarium undulatum | 60x. Scale bar 100 µm. L 705, W 14 µm. Stitched with PhotoScape. From Stidolph et al. (2012) pl 16 fig 49; Lobban et al. (2012) pl 17 fig 6–8. |

Plate 11

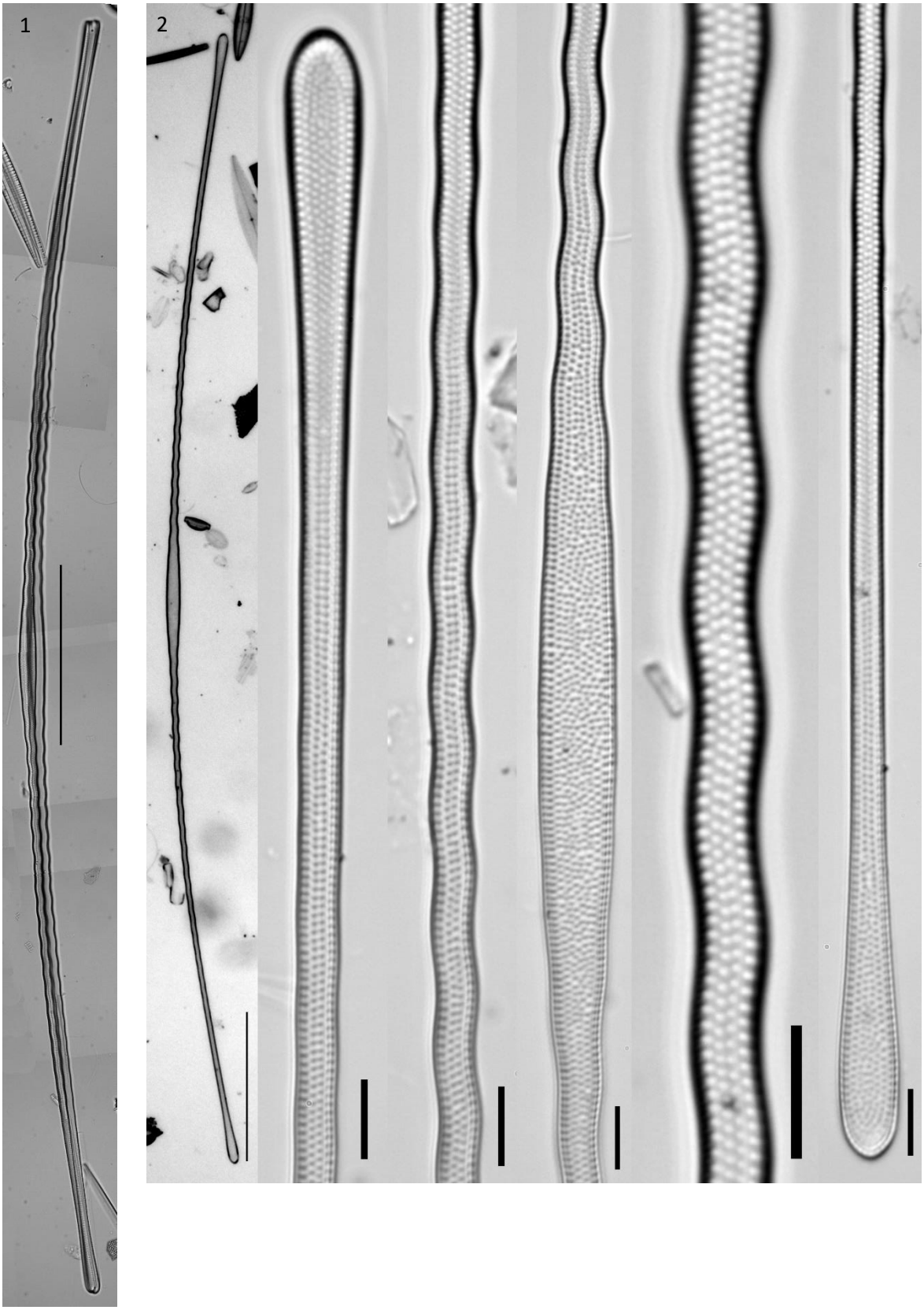
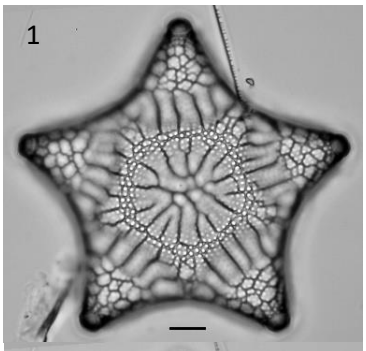
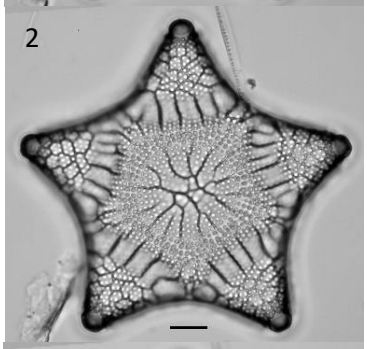


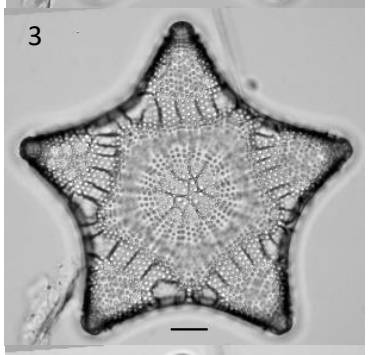
Plate 12

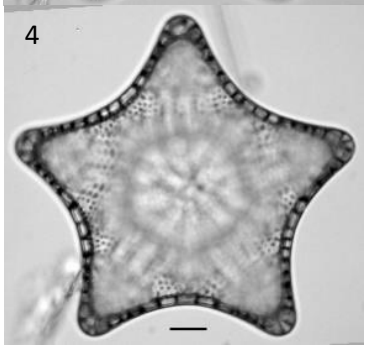
| | | |
|---|---|---|
| 1 | Triceratium pentacrinus | 60x. External view. Scale bar 10 µm. Highest focus F1. From Schmidt (1874-1959) pl 98 fig 7 ; Stidolph et al. (2012) pl 48 fig 24. |
| 2 | Triceratium pentacrinus | 60x. External view. Scale bar 10 µm. Focus F2 on ocelli edges. From Schmidt (1874-1959) pl 98 fig 7 ; Stidolph et al. (2012) pl 48 fig 24. |
| 3 | Triceratium pentacrinus | 60x. External view. Scale bar 10 µm. Focus F3. From Schmidt (1874-1959) pl 98 fig 7 ; Stidolph et al. (2012) pl 48 fig 24. |
| 4 | Triceratium pentacrinus | 60x. External view. Scale bar 10 µm. Focus F4 on pseudoseptum. From Schmidt (1874-1959) pl 98 fig 7 ; Stidolph et al. (2012) pl 48 fig 24. |
| 5 | Triceratium favus | 40x, BF, NA040. Scale bar 10 µm. Approximately 155 µm on a side. From Schmidt (1874-1959) pl 82 figs 1,3,4; Sims (ed.)(1996) pl 290 fig 1. |
| 6 | Triceratium favus | 60x, BF. Scale bar 10 µm. Focus on outline. From Schmidt (1874-1959) pl 82 figs 1,3,4; Sims (ed.)(1996) pl 290 fig 1. |
| 7 | Triceratium favus | 60x, BF. Scale bar 10 µm. Focus on ocellus. From Schmidt (1874-1959) pl 82 figs 1,3,4; Sims (ed.)(1996) pl 290 fig 1. |
| 8 | Pseudictyota dubia | 100x, OL, NA090. Scale bar 10 µm. Lower focus center in black spot. Previously Triceratium dubium. From Sims et al. (2018) fig 133-138; Navarro & Lobban (2009) fig 21-24; AlgaeBase (https://www.algaebase.org/search/species/detail/?species_id=171151) for "dubia" spelling. |
| 9 | Pseudictyota dubia | 100x, OL, NA090. Scale bar 10 µm. Low focus on inner outline. Previously Triceratium dubium. From Sims et al. (2018) fig 133-138; Navarro & Lobban (2009) fig 21-24; AlgaeBase (https://www.algaebase.org/search/species/detail/?species_id=171151) for "dubia" spelling. |
| 10 | Triceratium sp1 | 60x, OL, NA060. Scale bar 10 µm. Focus on center showing spines on valve face. |

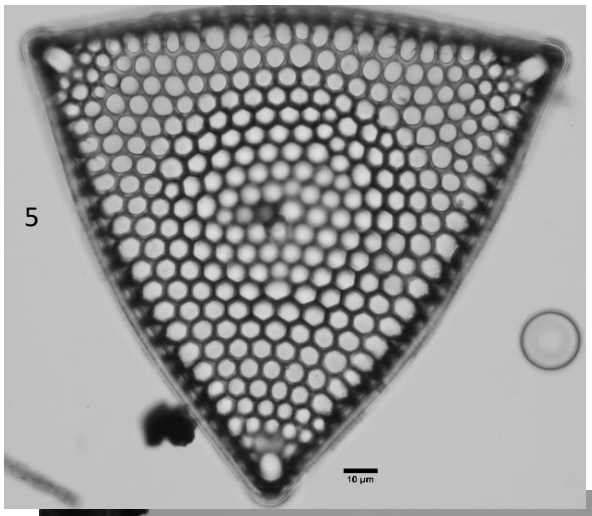
Plate 12

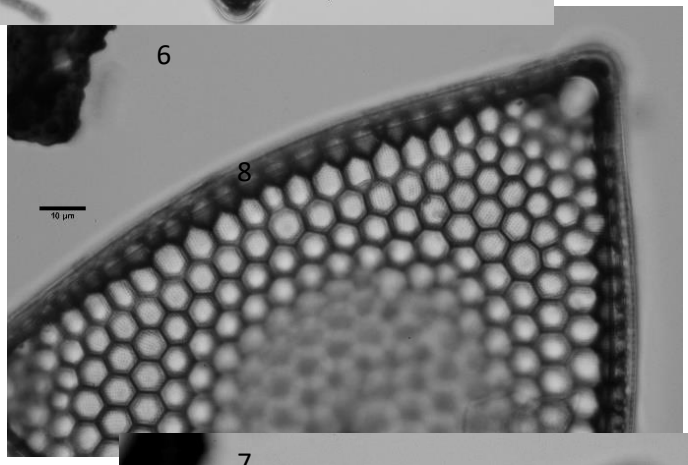


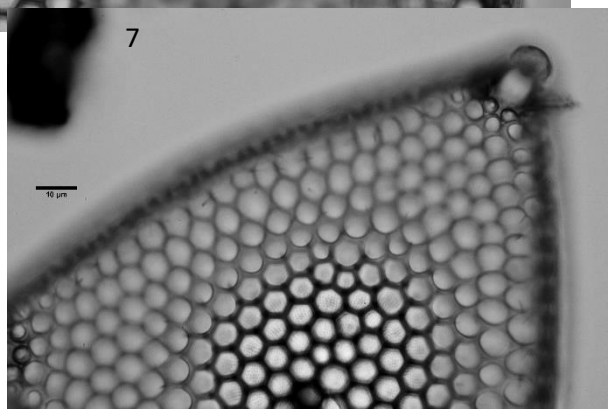



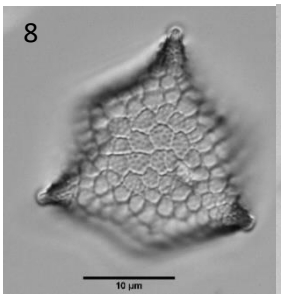



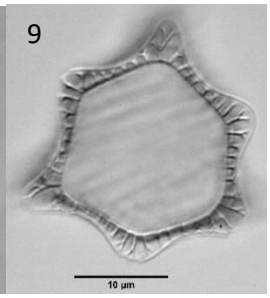



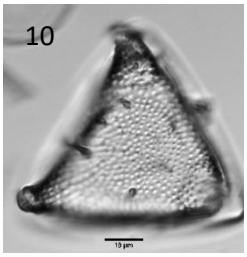



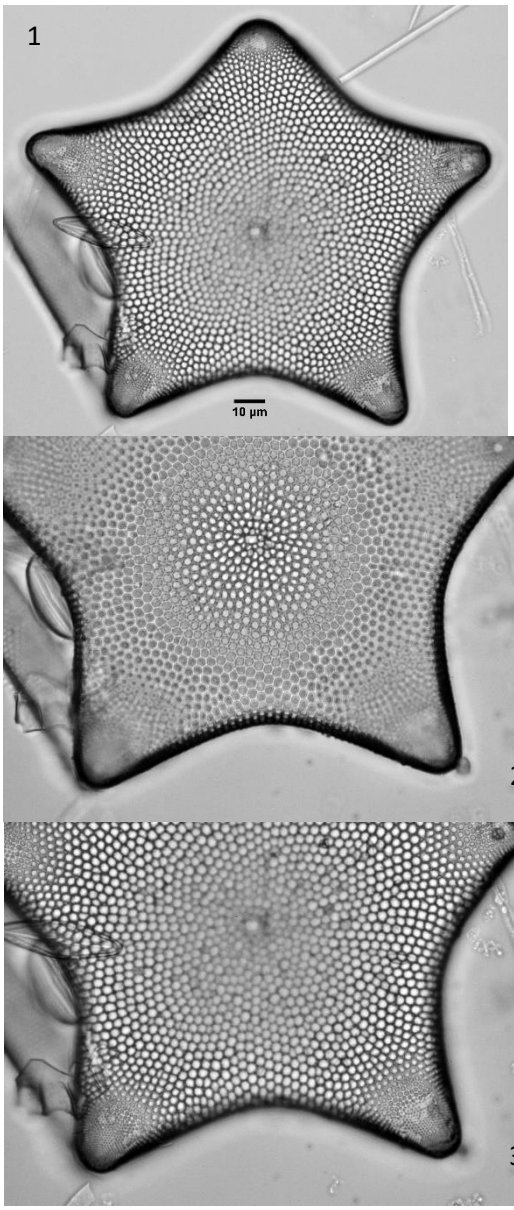



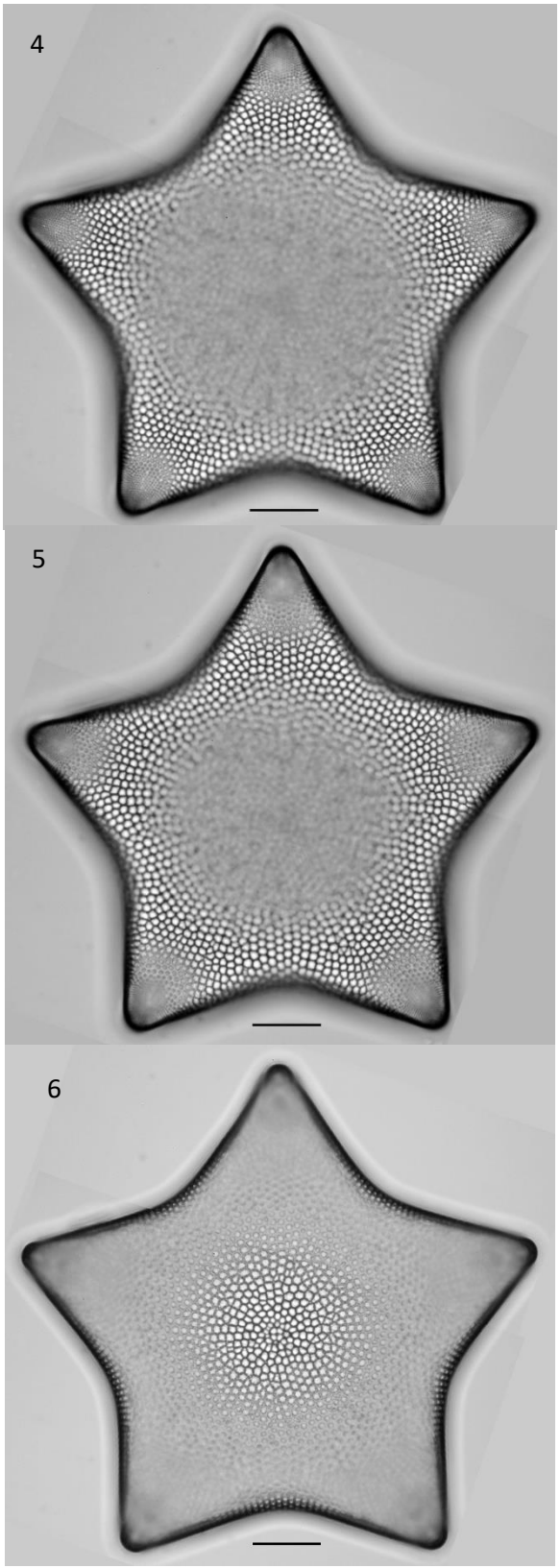



# Plate 13

| | | |
|---|---|---|
| 1 | Trigonium arcticum cf var pentagonalis | 40x, BF, NA035. Focus on pore fields. From Schmidt pl 79 fig 4 (but see Trigonium graeffeanum in Stidolph pl 27 fig 119 and pl 37 fig 1). |
| 2 | Trigonium arcticum cf var pentagonalis | 60x. Focus on network around center. Seems clearer than Olympus 3116.. From Schmidt pl 79 fig 4 (but see Trigonium graeffeanum in Stidolph pl 27 fig 119 and pl 37 fig 1). |
| 3 | Trigonium arcticum cf var pentagonalis | 60x. Focus on pole. Clearer than Olympus 3117. From Schmidt pl 79 fig 4 (but see Trigonium graeffeanum in Stidolph pl 27 fig 119 and pl 37 fig 1). |
| 4 | Trigonium arcticum cf var pentagonalis | 100x, BF. Scale bar 10 µm. Length between horizontal angles 128 µm. Focus on external openings of areolae forming rings. Compilation with PhotoScape. From Schmidt pl 79 fig 4 but see T. graeffeanum in Stidolph pl 27 fig 119 and pl 37 fig 1. |
| 5 | Trigonium arcticum cf var pentagonalis | 60x. Scale bar 10 µm. High focus on pseudocelli. From Schmidt pl 79 fig 4. |
| 6 | Trigonium arcticum cf var pentagonalis | 60x. Scale bar 10 µm. Mid focus on valve face. From Schmidt pl 79 fig 4. |
| 7 | Trigonium arcticum cf var pentagonalis | 60x. Scale bar 10 µm. Low focus on center. From Schmidt pl 79 fig 4. |

Plate 13

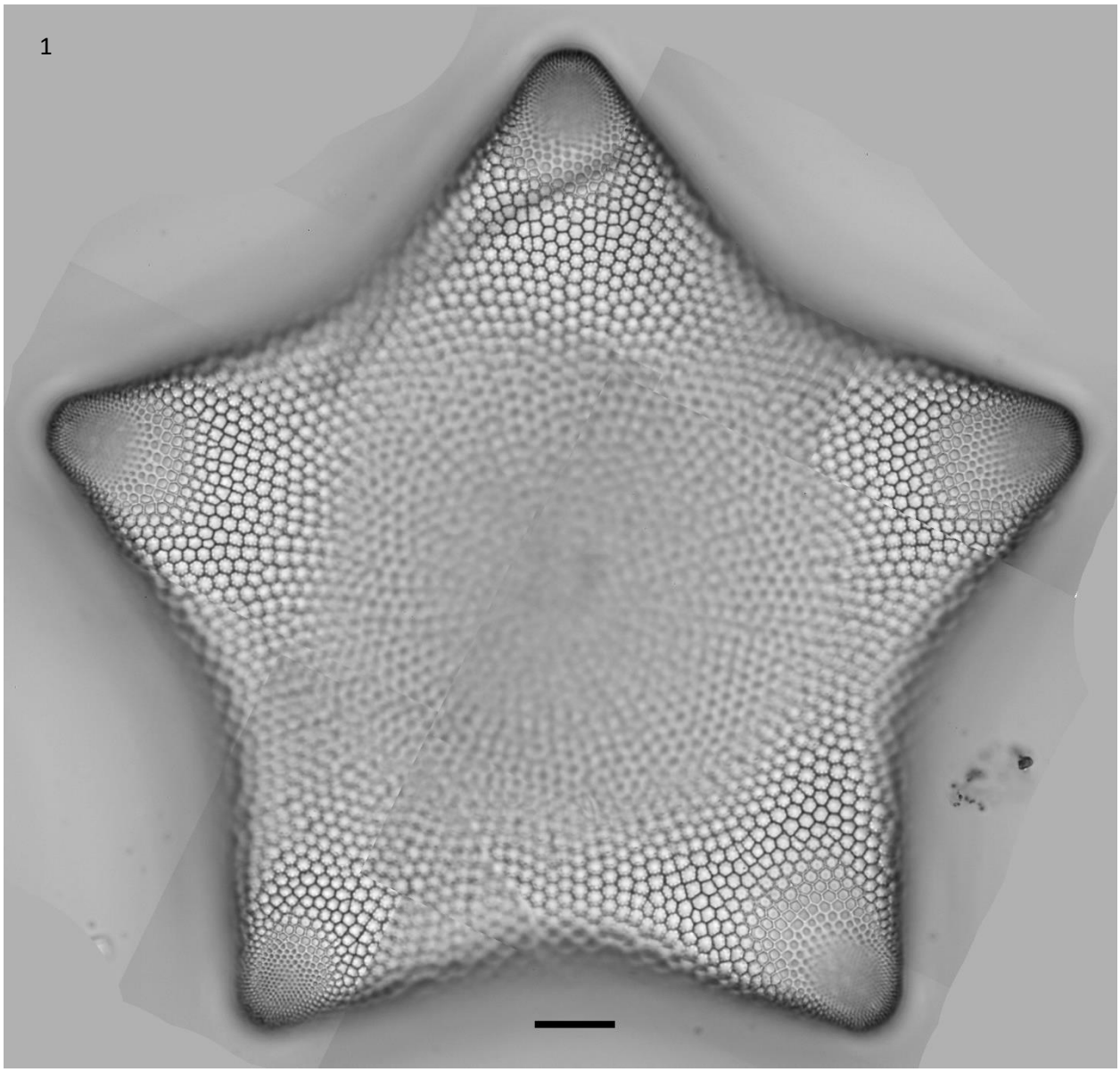


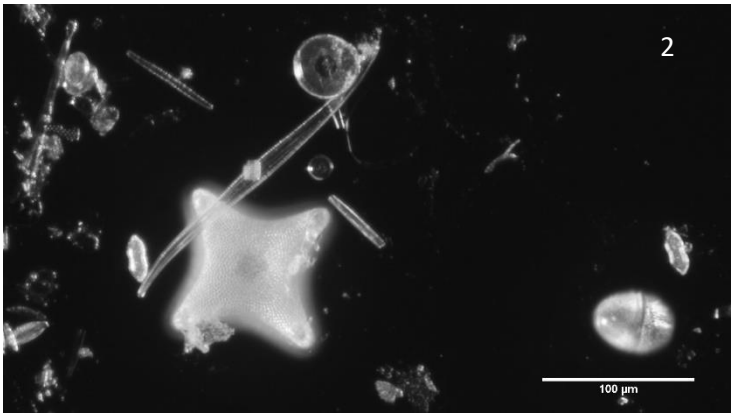



# Plate 14

| | | |
|---|---|---|
| 1 | Trigonium arcticum var californicum | 100x, OL, NA090. Inside view. Perhaps a rimoportula in center of valve. From Schmidt pl 79 fig 5. |
| 2 | Trigonium sp | 10x, OL. Scale bar 100 µm. Reflected illumination, with light shining in from the side of the slide, showing the glassiness of the diatoms. From Sims (ed.) (1996) pl 190 fig 1 for N. sigma. |

Plate 14

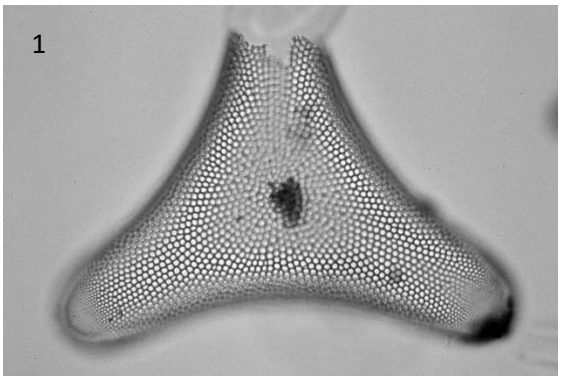


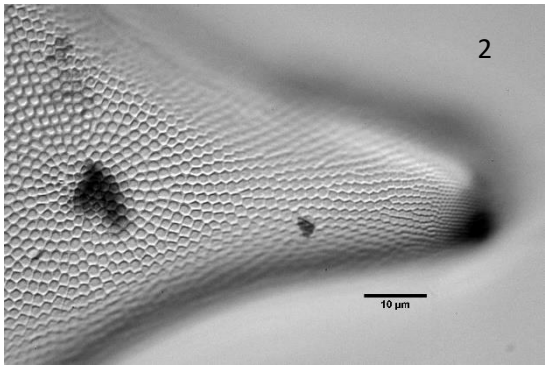



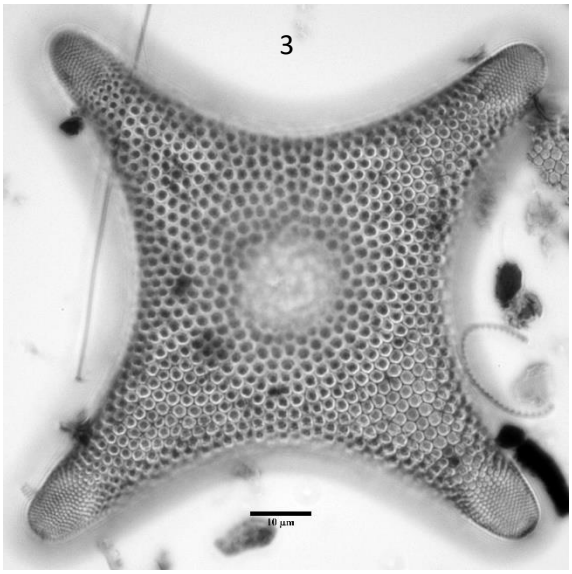
# Plate 15

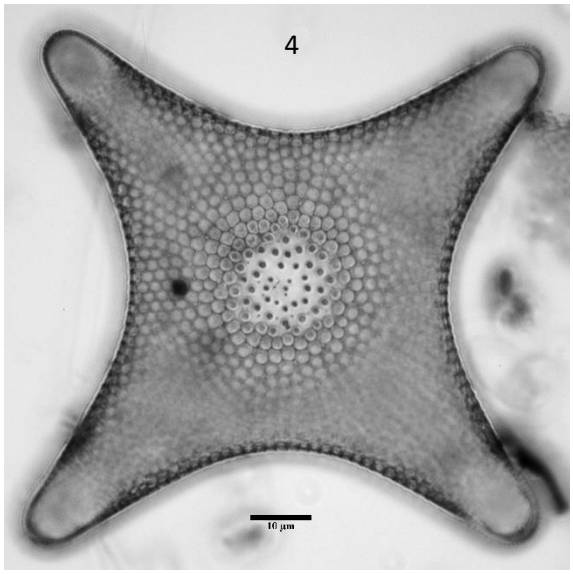
| | | |
|---|---|---|
| 1 | Trigonium arcticum var californicum | 60x, BF. Inside view. Low focus on one pole. Poles broadly rounded. From Schmidt pl 79 fig 5. |
| 2 | Trigonium arcticum var californicum | 100x, OL, NA090. Inside view. Perhaps a rimoportula in center of valve. From Schmidt pl 79 fig 5. |
| 3 | Trigonium arcticum var californicum | 60x, COL, NA085. High focus on pore fields. From Schmidt pl 79 fig 3 presumed (Schmidt pl 166 fig 6-8 T. radians has small areolae near edge of valve face). |
| 4 | Trigonium arcticum var californicum | 60x, COL, NA085. Low focus on center. From Schmidt pl 79 fig 3 presumed (Schmidt pl 166 fig 6-8 T. radians has small areolae near edge of valve face). |
| 5 | Trigonium arcticum var californicum | 60x, BF, NA050. High focus on one pole. Poles broadly rounded. From Schmidt pl 79 fig 5. |
| 6 | Trigonium arcticum var californicum | 40x, BF, NA040. Poles broadly rounded. From Schmidt pl 79 fig 5. |

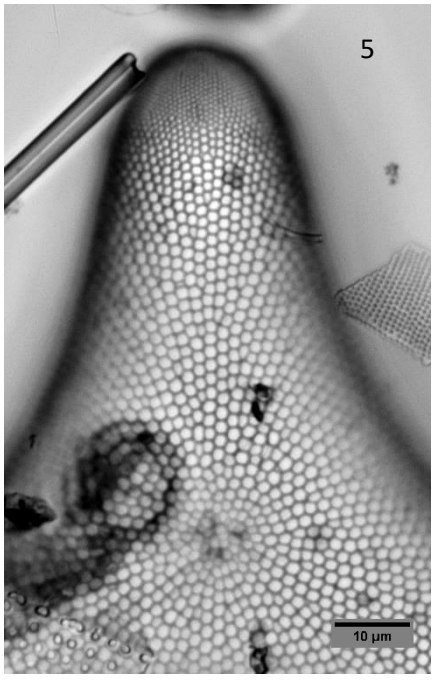
Plate 15

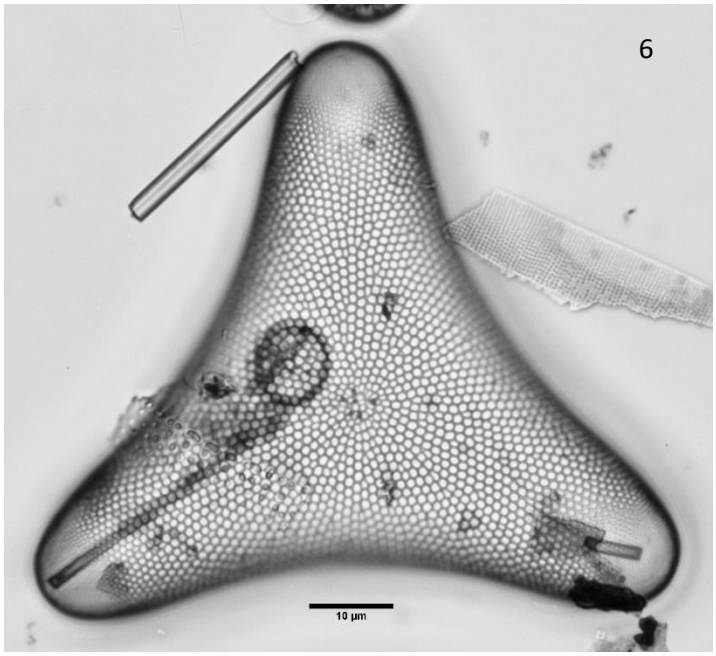


# Plate 16

| | | |
|---|---|---|
| 1 | Trigonium arcticum var. kerguelense | 60x. High focus on poles. Two image stitch. From Stidolph et al. (2012) p 113 fig 2. |
| 2 | Trigonium arcticum var. kerguelense | 60x. Low focus on center. Two image stitch. From Stidolph et al. (2012) p 113 fig 2. |
| 3 | Trigonium arcticum var. kerguelense | 100x. Lower focus on areolae around center showing white dots on edges of areolae which are pores. Inset is high focus on a pseudocellus. From Stidolph et al. (2012) p 113 fig 2. |
| 4 | Trigonium caelatum | 100x, BF, NA090. High focus on poles. Straight margins, large areolae. From Schmidt pl 81 fig 19 (pl 166 fig 5 T. radians has small areolae near edge of valve face). |
| 5 | Trigonium caelatum | 100x, BF, NA090. Mid focus on valve face. Straight margins, large areolae. From Schmidt pl 81 fig 19 (pl 166 fig 5 T. radians has small areolae near edge of valve face). |
| 6 | Trigonium caelatum | 100x, BF, NA090. Low focus on center. Straight margins, large areolae. From Schmidt pl 81 fig 19 (pl 166 fig 5 T. radians has small areolae near edge of valve face). |

Plate 16

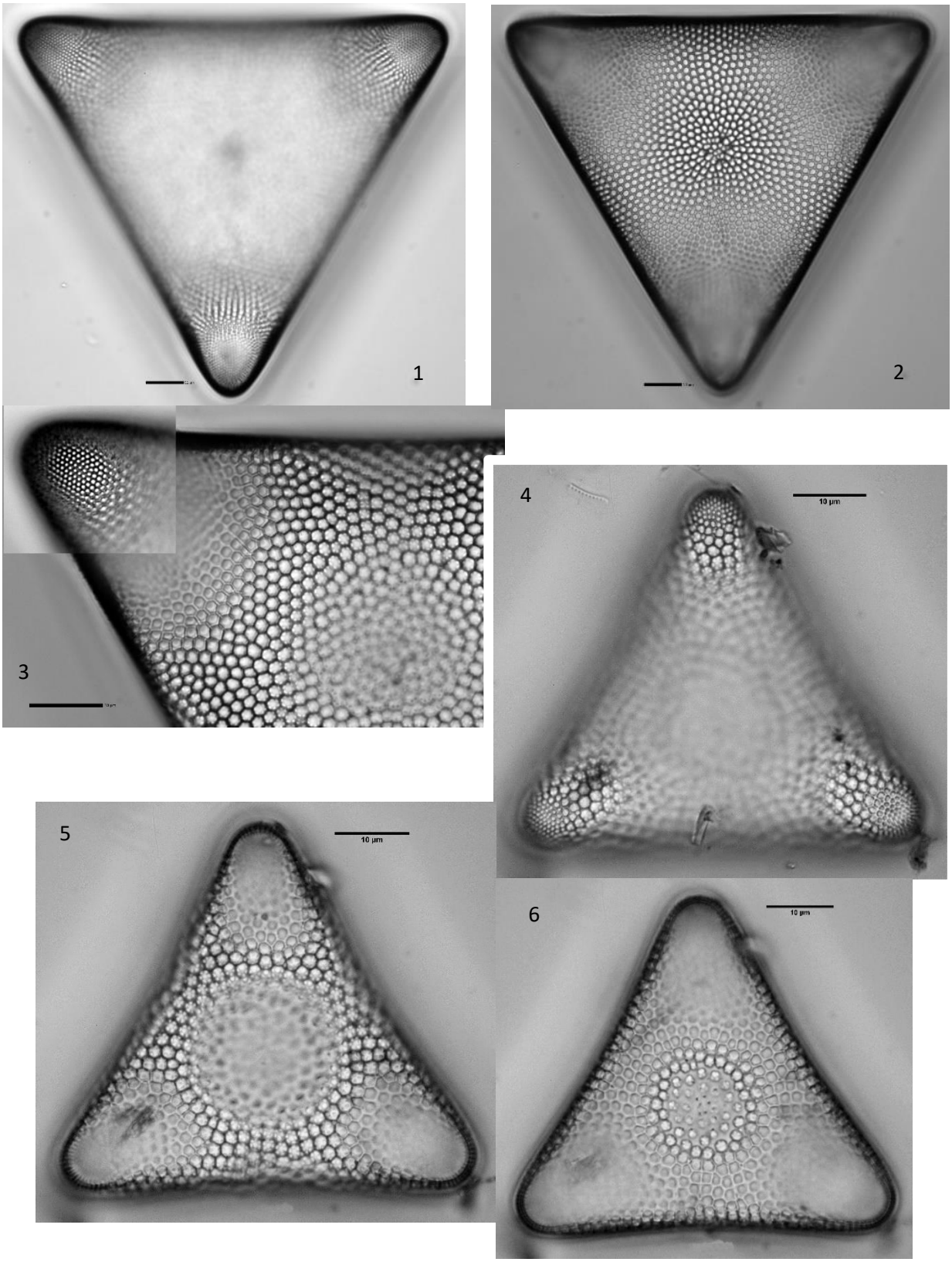
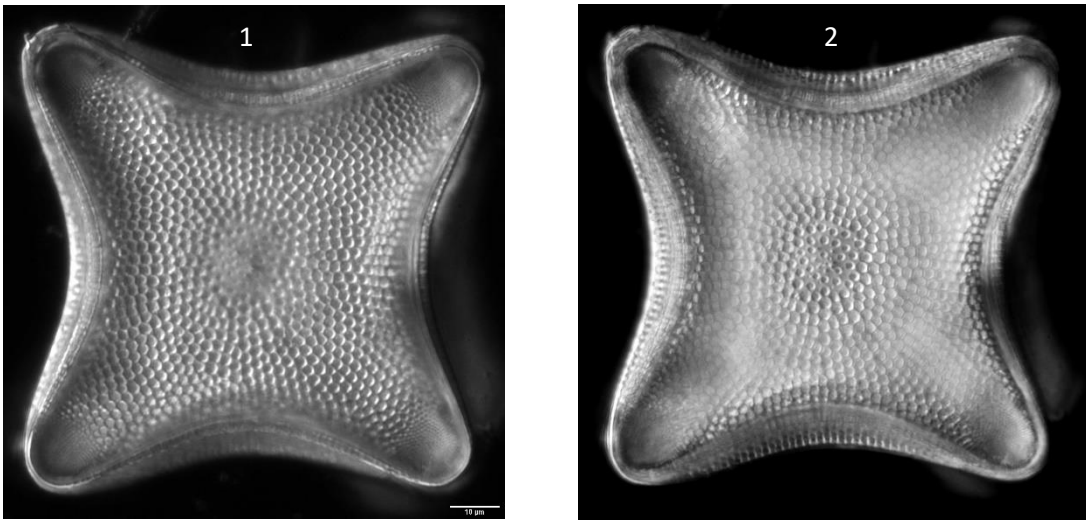
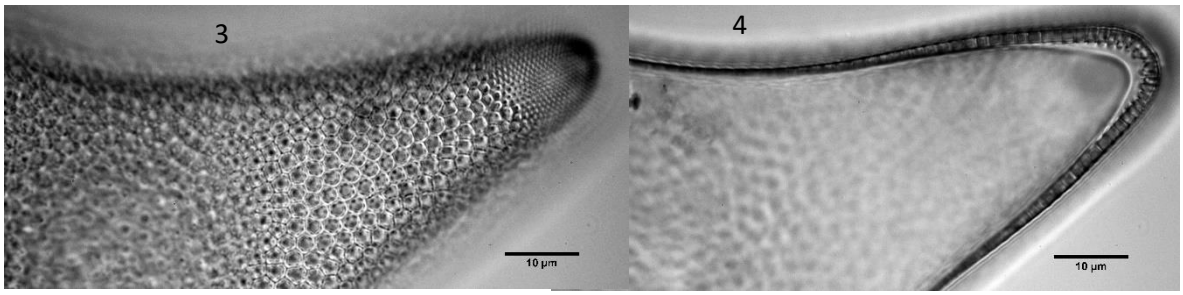


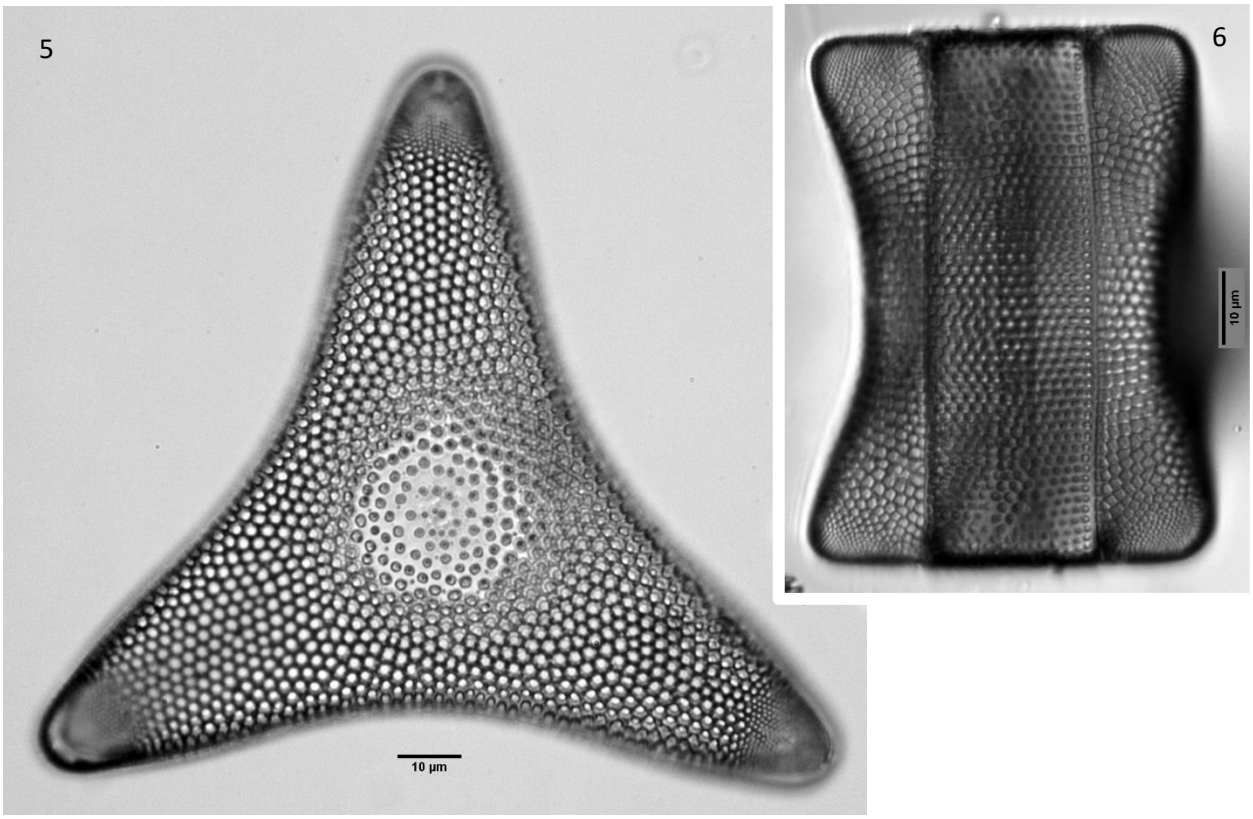
Plate 17

| | | |
|---|---|---|
| 1 | Trigonium formosum | 40x, COL, Abbe condenser. Scale bar = 10 µm. Focus on valve face. From Schmidt pl 79 fig 3 (pl 166 fig 6-8 T. radians has small areolae near edge of valve face). |
| 2 | Trigonium formosum | 40x, COL, Abbe condenser. Focus on valve center. From Schmidt pl 79 fig 3 (pl 166 fig 6-8 T. radians has small areolae near edge of valve face). |
| 3 | Trigonium formosum | 100x, COL, NA100. Detail of 5452. Inside view of valve. Mid focus on locules. From Schmidt pl 79 fig 2 |
| 4 | Trigonium formosum | 100x, COL, NA100. Detail of 5452. Inside view. High focus on pseudoseptum and perhaps locules on edge. From Schmidt pl 79 fig 2 |
| 5 | Trigonium formosum | 40x, BF, NA040. Inside view. Low focus on valve center and pore fields. Distance between tips of lower two poles = 122 µm. See # 5427-5428 for detail of a pole. Used for body plan for 2017 Straub talk. From Schmidt pl 79 fig 2. |
| 6 | Trigonium formosum | 60x, OL, NA070, N382-893. Girdle view. Focus on poles. |

Plate 17



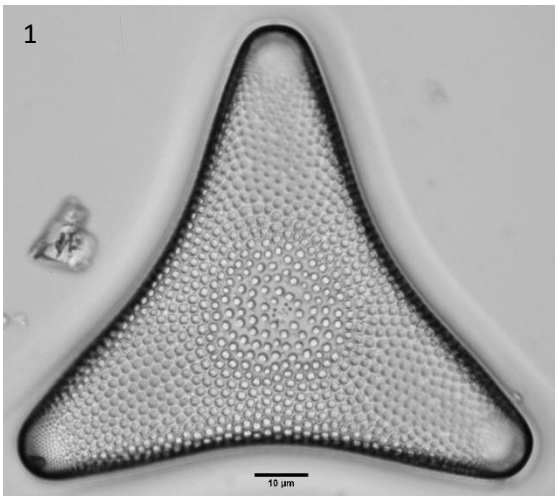



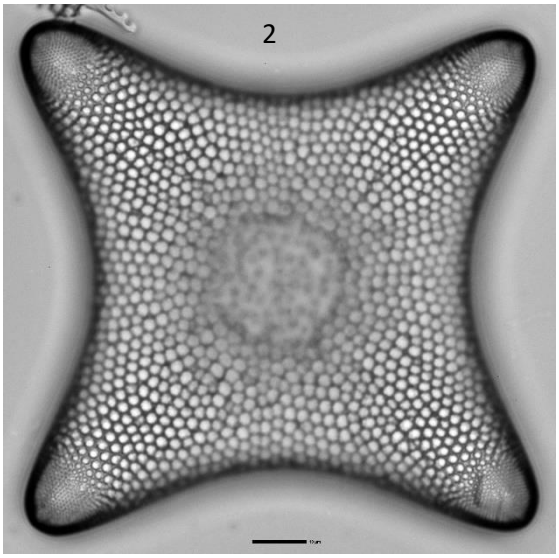



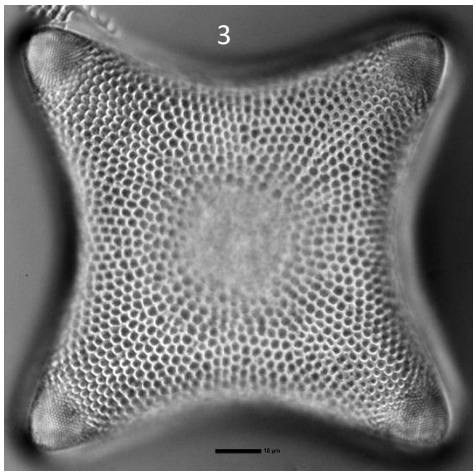
# Plate 18

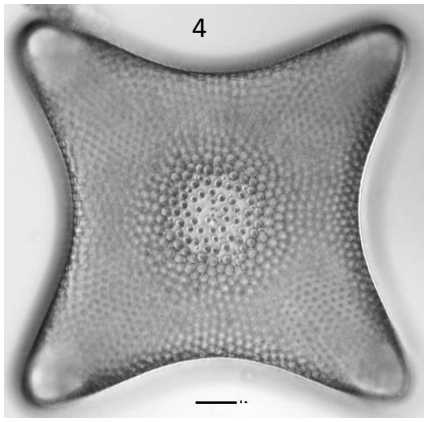
| | | |
|---|---|---|
| 1 | Trigonium formosum | 60x, BF, NA045. Focus on center. From Schmidt pl 79 fig 2. |
| 2 | Trigonium formosum | 60x, BF, NA045. Scale bar = 10 µm. Stitched # 7385-7386 with MS-ICE. From Schmidt pl 79 fig 3 (pl 166 fig 6-8 T. radians has small areolae near edge of valve face). |
| 3 | Trigonium formosum | 40x, OL, NA090. Scale bar = 10 µm. High focus on apices. From Schmidt pl 79 fig 3 (pl 166 fig 6-8 T. radians has small areolae near edge of valve face). |
| 4 | Trigonium formosum | 60x, OL, NA090. Stitched with MS-ICE from # 7394 and 7395. Focus low on center. From Schmidt pl 79 fig 3 (pl 166 fig 6-8 T. radians has small areolae near edge of valve face). |
| 5 | Trigonium formosum | 100x. Scale bar 100 µm. 5-image stitch with PhotoScape. From Schmidt pl 79 fig 3 (pl 166 fig 6-8 T. radians has small areolae near edge of valve face). |

Plate 18



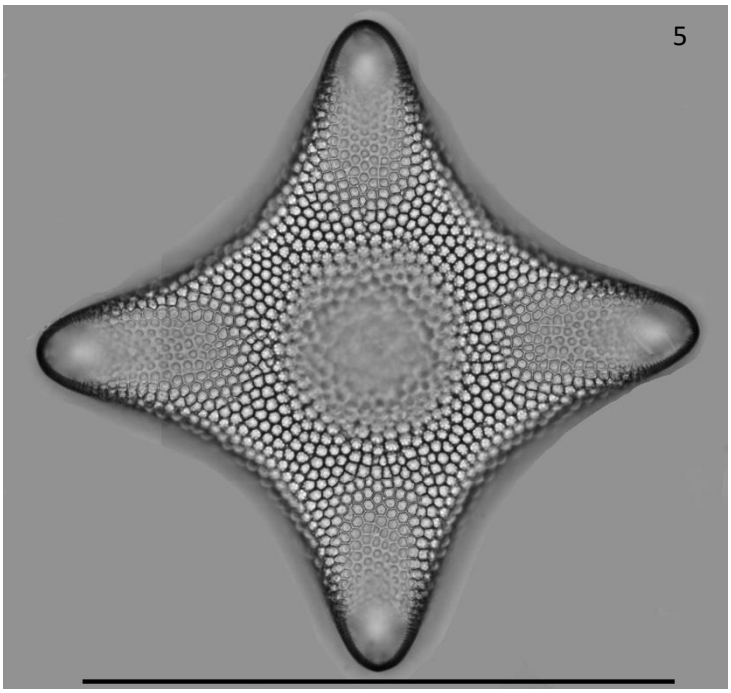
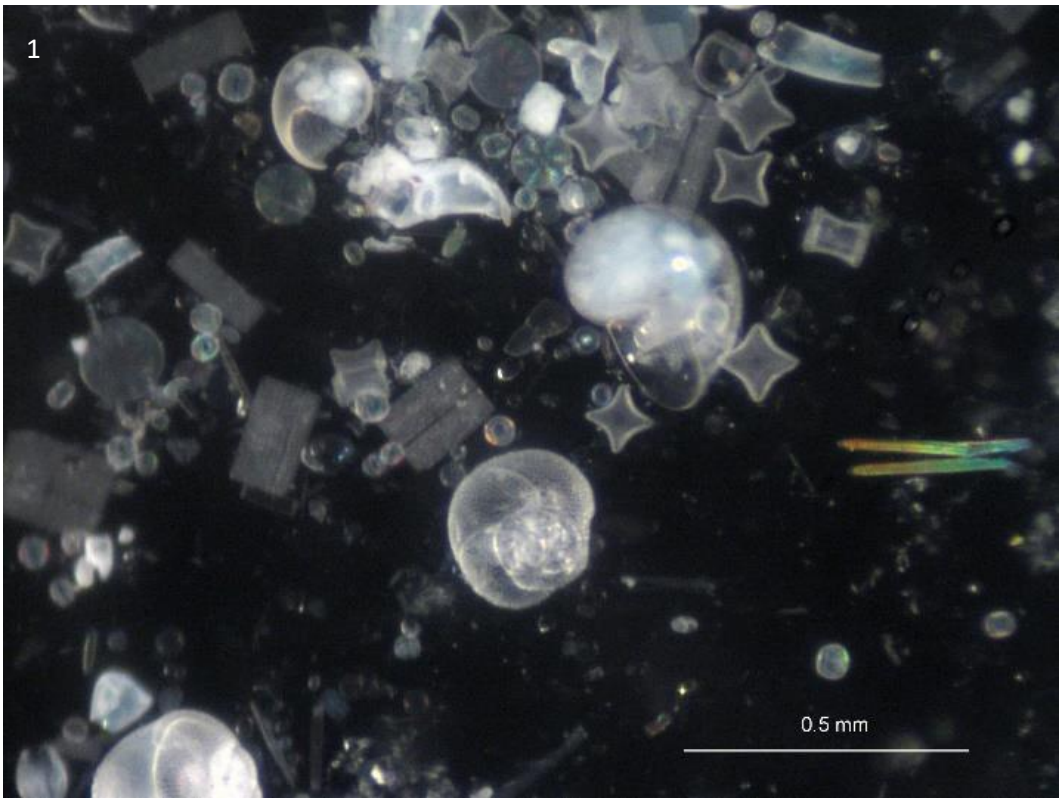
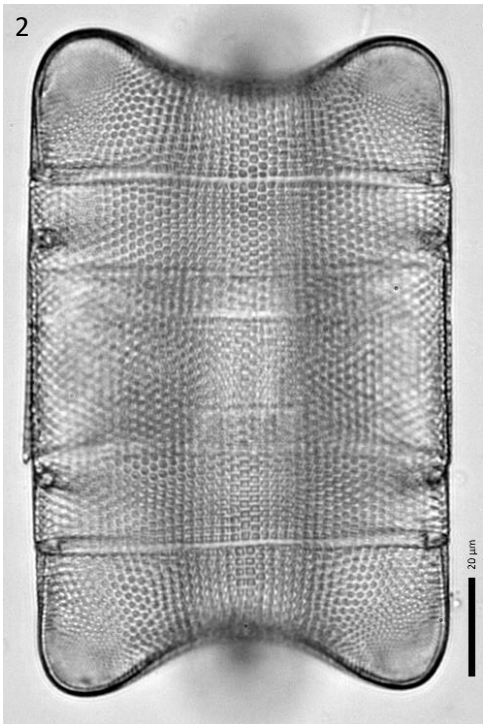



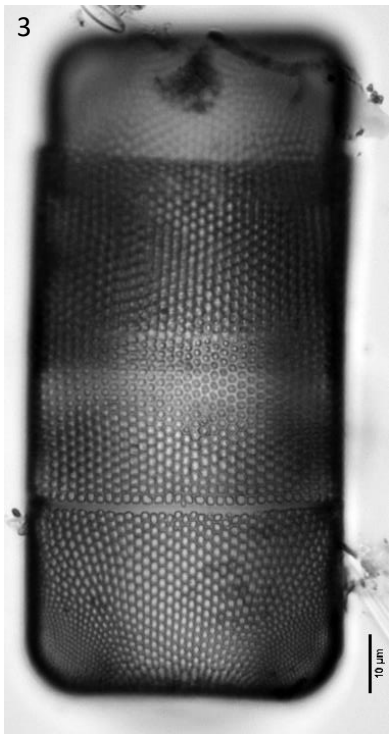
Plate 19

| | | |
|---|---|---|
| 1 | Trigonium sp | Scale bar 0.5 mm. A bit of the collection from plankton tow with improvised net. |
| 2 | Trigonium sp | 40x. Water mount. Low focus on two poles resting on slide. Third pole out of focus in higher plane. |
| 3 | Trigonium sp | 60x, BF, NA050. Girdle view of Trigonium with straight sides. High focus on hyaline band on girdle. |

Plate 19



## Araphid
## Bilateral symmetry. No raphe.

Plate 20

| | | |
|---|---|---|
| 1 | Synedrosphenia sp1 | 100x, BF, NA080. Scale bar 10 µm. Length 230 µm. External view. Not S. crystallina; perhaps new species. From Lobban (2022 pers comm); Lobban et al. (2022); Round et al. (1990) p 444. |
| 2 | Ardissonea sp1 | 40x whole cell and 100x apex. Scale bars 10 µm. Might be new species. Has stria density of A. formosa but shape of A. densistriata. From Lobban et al. (2012) pl 1 fig 1-2 live cells; Lobban (2022 pers comm); Lobban et al. (2022); Round et al. (1990) p 420. |
| 3 | Araphid sp1 | 100x, BF, NA070. Scale bar 10 µm. Length 424 µm. Width 5 µm at center. Striae 10 in 10 µm. SEM of apical structure needed to distinguish between Synedrosphenia and Ardissoneopsis. From Lobban (2022 pers comm). |
| 4 | Araphid sp1 | 40x. Scale bar 10 µm. Length 425 µm. SEM of apical structure needed to distinguish between Synedrosphenia and Ardissoneopsis. From Lobban (2022 pers comm). |

Plate 20

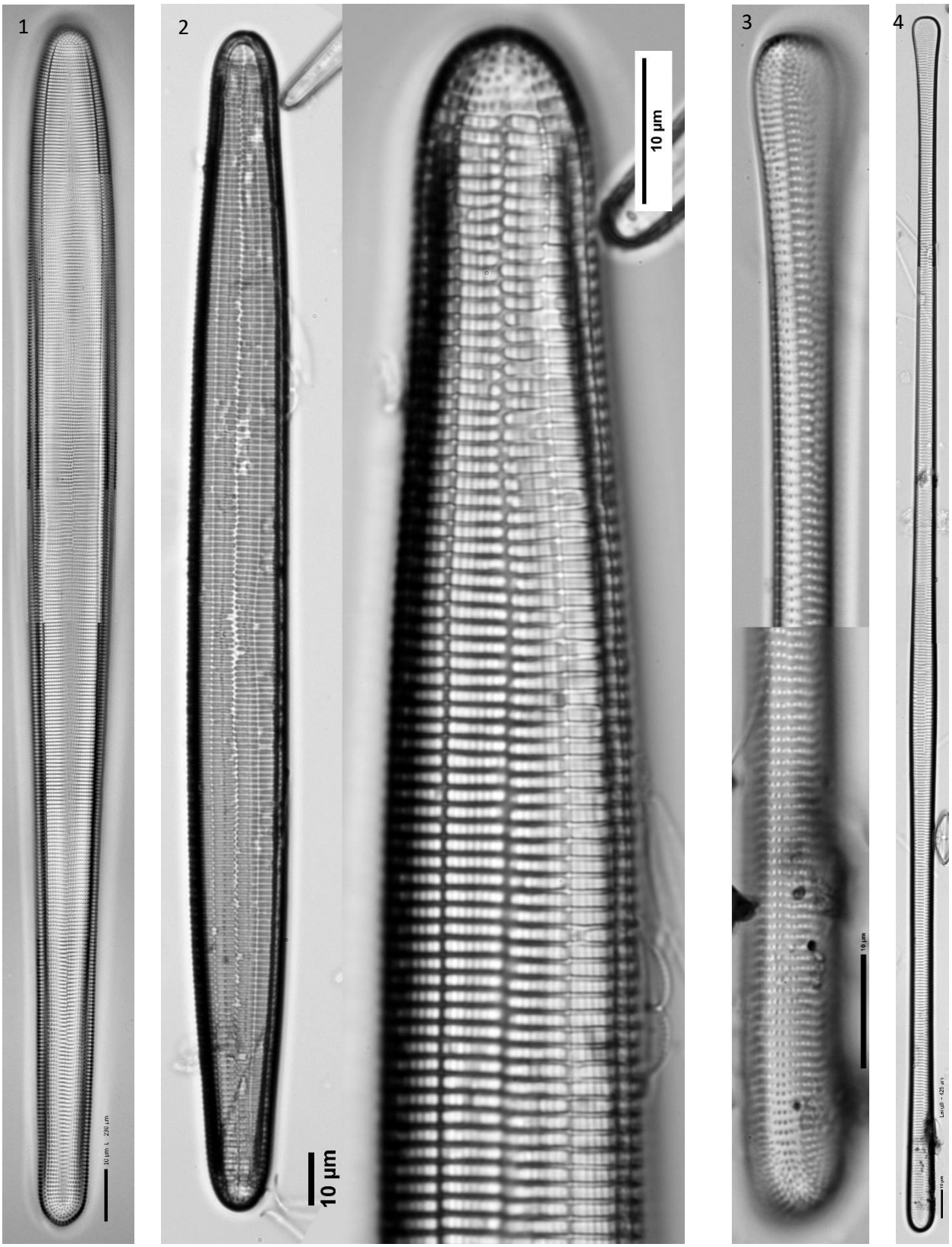


Plate 21

| | | |
|---|---|---|
| 1 | Climacosphenia elongata | 10x. Scale bar 100 µm. Wet mount of cleaned material. From Al-Handal et al. (2016). |
| 2 | Climacosphenia elongata | 40x, COL, NA100. Scale bar 10 µm. Length 209 µm. Width near headpole 18 µm. Bright center by dropping condenser. Focus on footpole. From Al-Handal et al. (2016). |
| 3 | Climacosphenia elongata | 10x, BF, NA020. Scale bar 100 µm. Length 303 µm. Details of headpole and footpole in following images. From Al-Handal et al. (2016). |
| 4 | Climacosphenia elongata | 100x, BF, NA100. Scale bar 10 µm. Focus on headpole with spines visible! From Al-Handal et al. (2016). |
| 5 | Climacosphenia elongata | 100x, BF, NA100. Scale bar 10 µm. Focus in blackspot on footpole. From Al-Handal et al. (2016). |

Plate 21

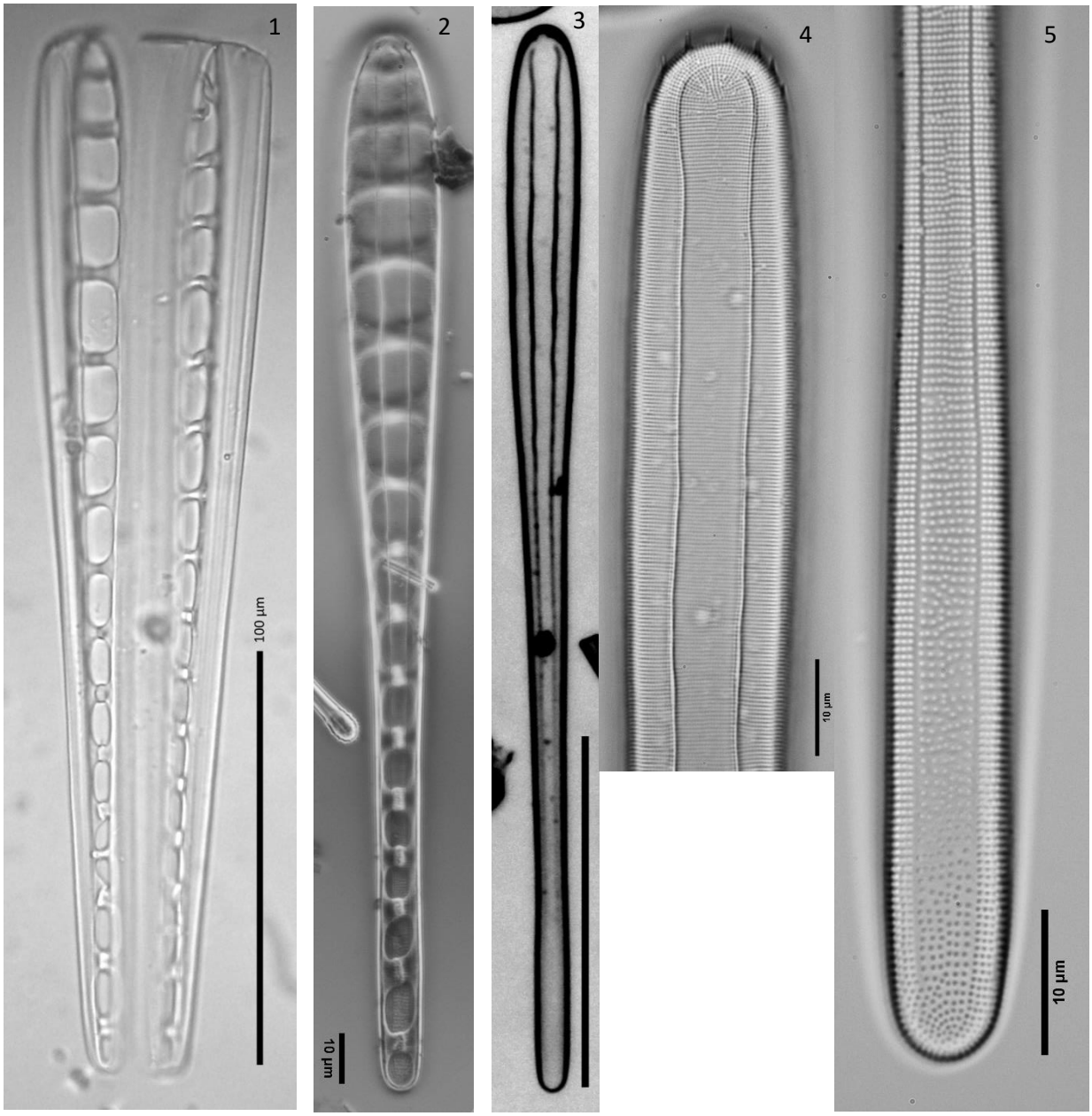


Plate 22

| | | |
|---|---|---|
| 1 | Grammatophora sp1 | 100x. Scale bar 10 µm. Internal view. High focus on outline. From Round et al. (1990). |
| 2 | Grammatophora sp1 | 100x. Scale bar 10 µm. Internal view. Low focus on inside of valve face. From Round et al. (1990). |
| 3 | Hyalosynedra laevigata | 100x. Scale bar 10 µm. Length = 190 µm. From Round et al. (1990) p 380 and corroborated by Michael Sullivan in email of 2 Apr 2015. |
| 4 | Licmophora romuli | 40x, OL. Scale bar 10 µm. L 212, W 12 µm. Focus on headpole. Very slender stem and areola pattern separate this from L. remulus. From Lobban (2021); Lobban (2022 pers comm). |
| 5 | Licmophora romuli | 100x, OL. Scale bar 10 µm. L 212, W 12 µm. Focus on headpole, on footpole. Very slender stem and areola pattern separate this from L. remulus. From Lobban (2021); Lobban (2022 pers comm). |
| 6 | Licmophora ehrenbergii | 40x. A variation within the L. ehrenbergii complex. From Lobban (2022 pers comm); Stidolph et al. (2012) pl 24 fig 63. |

Plate 22

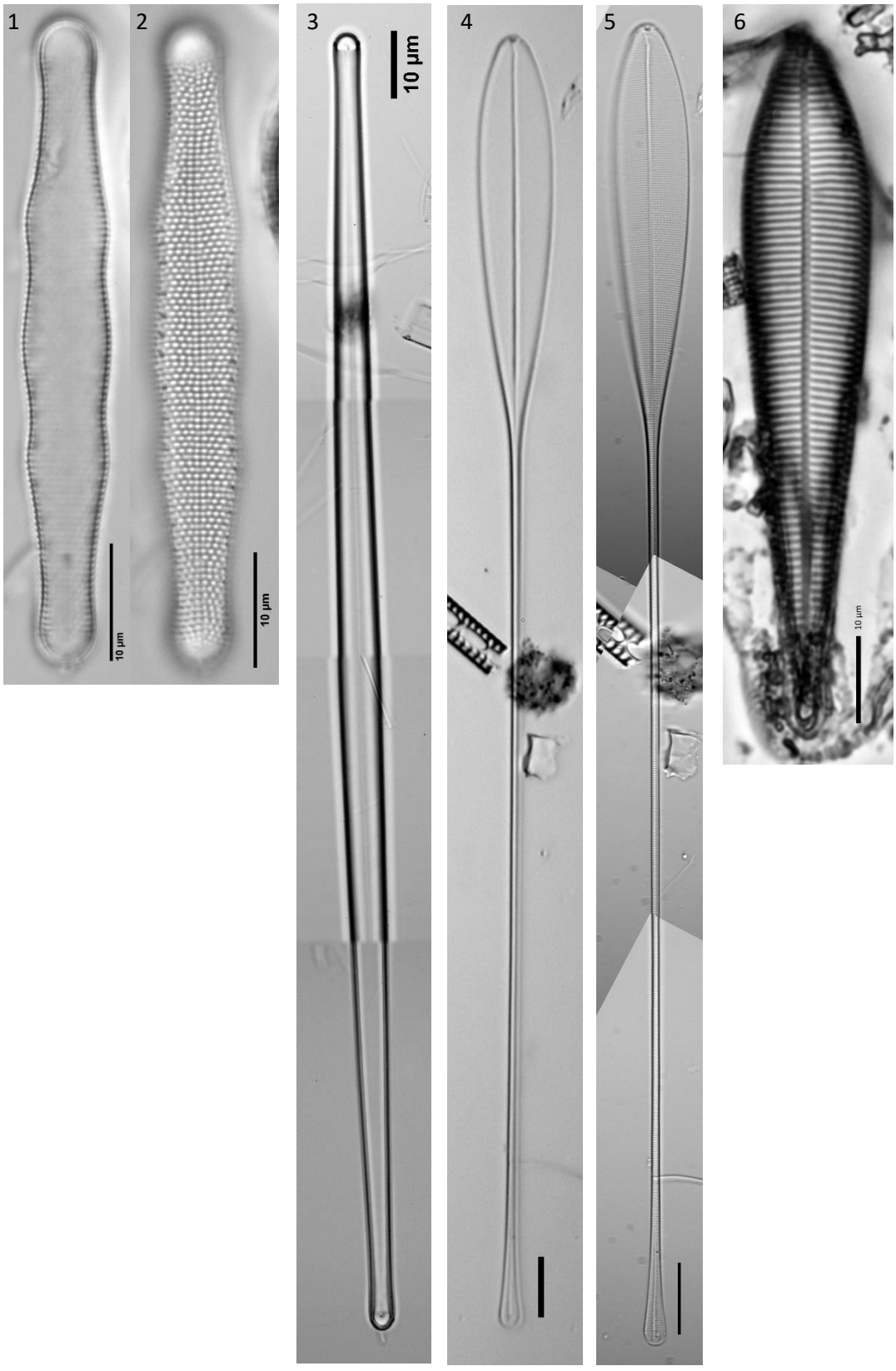
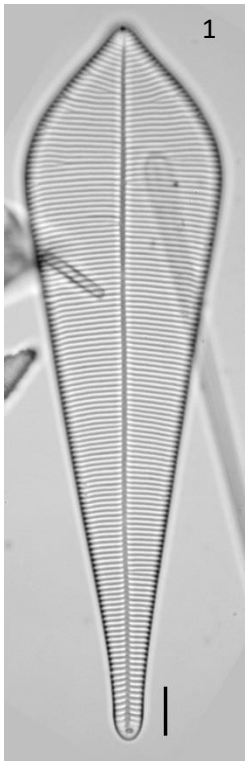
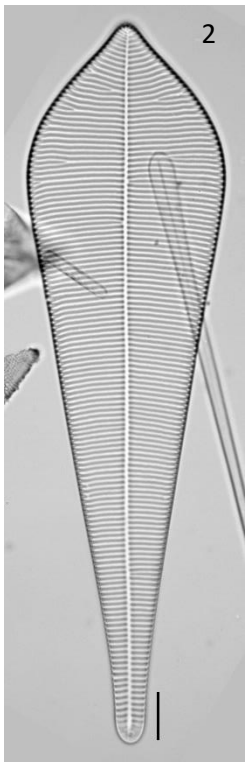


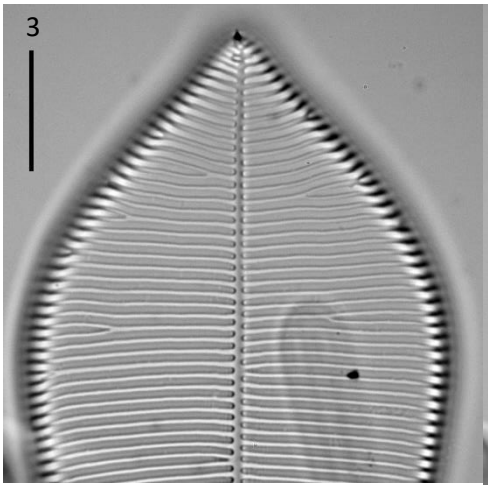
Plate 23

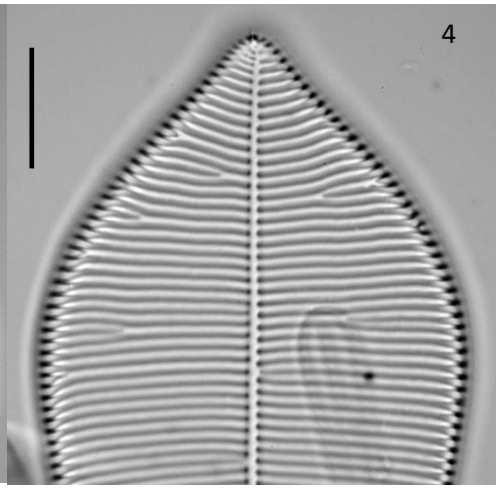
| | | |
|---|---|---|
| 1 | Licmophora ehrenbergii | 60x. Scale bar 10 µm. High focus on footpole rimoportula. A variation within the L. ehrenbergii complex. From Lobban pers. comm. 2022; Round et al. (1990); Kimmich, Araphid key. |
| 2 | Licmophora ehrenbergii | 60x. Scale bar 10 µm. Low focus on headpole. A variation within the L. ehrenbergii complex. From Lobban pers. comm. 2022; Round et al. (1990); Kimmich, Araphid key. |
| 3 | Licmophora ehrenbergii | 100x. Scale bar 10 µm. Headpole high focus on outside of tiny rimoportula near the apex. A variation within the L. ehrenbergii complex. Lobban (2022 pers comm); Round et al. (1990); Kimmich, Araphid key. |
| 4 | Licmophora ehrenbergii | 100x. Scale bar 10 µm. Headpole low focus on inside of tiny rimoportula near the apex. A variation within the L. ehrenbergii complex.Lobban (2022 pers comm); Round et al. (1990); Kimmich, Araphid key. |
| 5 | Licmophora ehrenbergii | 100x. Scale bar 10 µm. Footpole high focus on outer side of rimoportula. A variation within the L. ehrenbergii complex. Lobban (2022 pers comm); Round et al. (1990); Kimmich, Araphid key. |
| 6 | Licmophora ehrenbergii | 100x. Scale bar 10 µm. Footpole low focus on end striae and inner rimoportula. A variation within the L. ehrenbergii complex. Lobban (2022 pers comm); Round et al. (1990); Kimmich, Araphid key. |

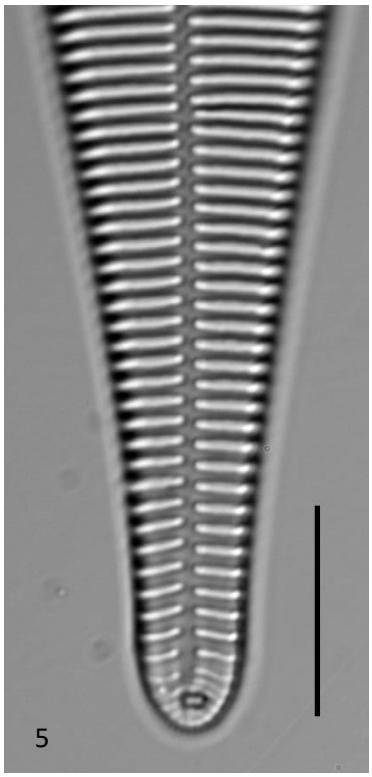
Plate 23



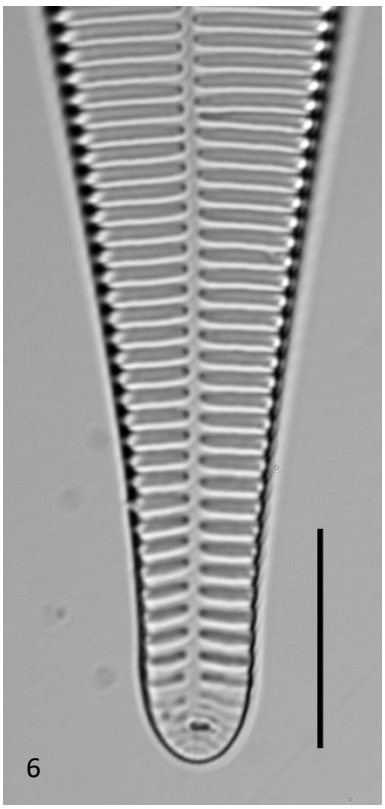
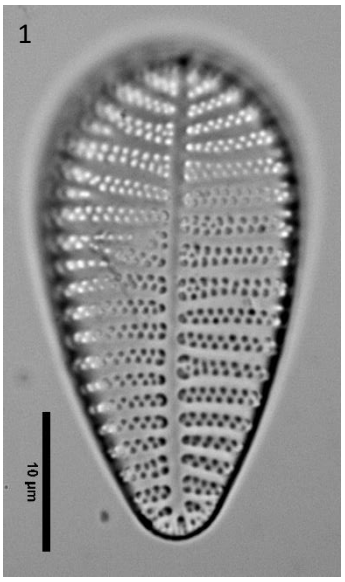
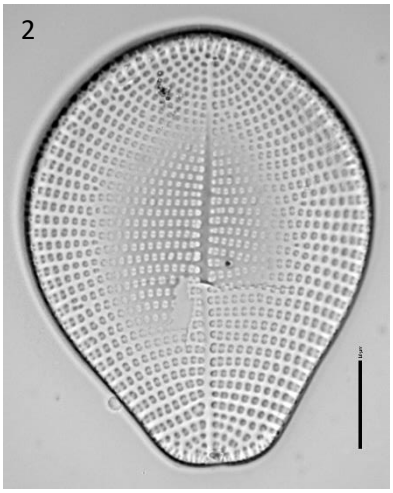



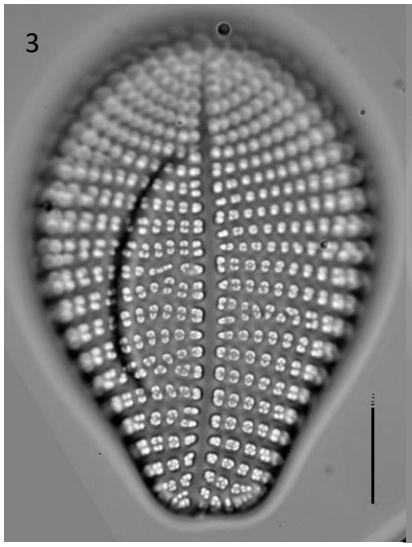
Plate 24

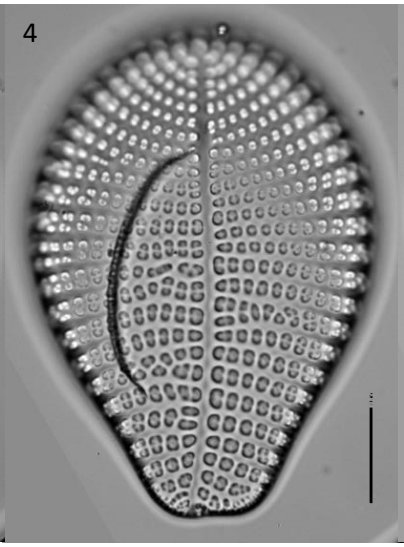
| | | |
|---|---|---|
| 1 | Podocystis adriatica | 100x. Scale bar 10 µm. Focus on footpole in black spot. From Lobban et al. (2012) pl 12 fig 2-3 ; Stidolph et al. (2012) pl 26 fig 114. |
| 2 | Podocystis spathulata | 100x. Scale bar 10 µm. From Lobban et al. (2012) pl 12 fig 4-6 ; Stidolph et al. (2012) pl 50 fig 47. |
| 3 | Podocystis spathulata | 100x. Scale bar 10 µm. High focus F1 on areolae in white spot. From Lobban et al. (2012) pl 12 fig 4-6 ; Stidolph et al. (2012) pl 50 fig 47. |
| 4 | Podocystis spathulata | 100x. Scale bar 10 µm. Focus F2 on footpole. From Lobban et al. (2012) pl 12 fig 4-6 ; Stidolph et al. (2012) pl 50 fig 47. |
| 5 | Podocystis spathulata | 100x. Scale bar 10 µm. Low focus F3 on headpole. From Lobban et al. (2012) pl 12 fig 4-6 ; Stidolph et al. (2012) pl 50 fig 47. |
| 6 | Rhabdonema sp2 | 60x, OL, NA070. Scale bar 10 µm. A girdle band in valve view. From Round et al. (1990). |

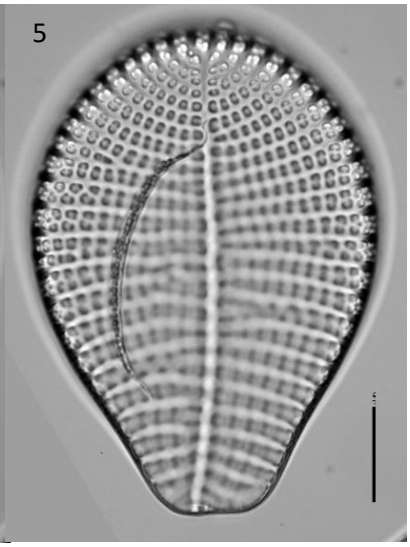
Plate 24

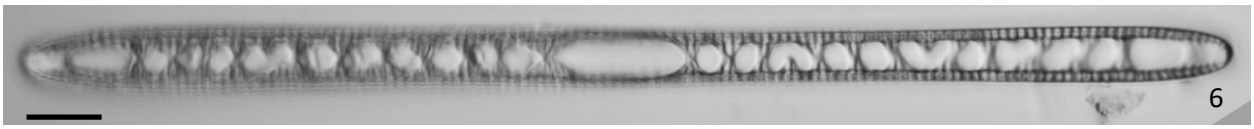


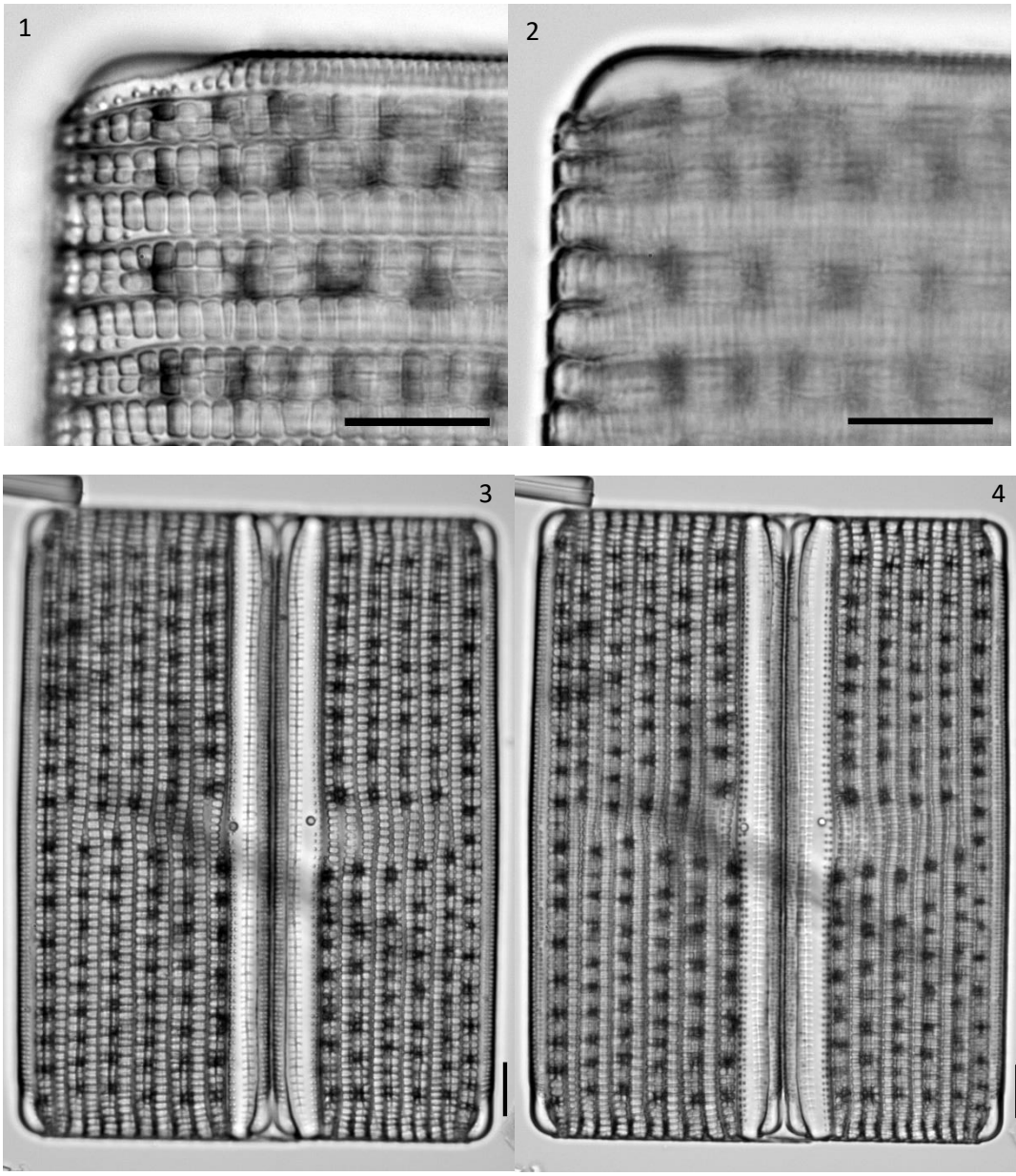



# Plate 25

| | | |
|---|---|---|
| 1 | Rhabdonema punctatum | 100x. Scale bar 10 µm. Girdle view. Focus on end pore field of valve. From Stidolph et al. (2012) pl 28 fig 5. |
| 2 | Rhabdonema punctatum | 100x. Scale bar 10 µm. Low focus on overlapping girdle band edges. From Stidolph et al. (2012) pl 28 fig 5. |
| 3 | Rhabdonema punctatum | 60x. Scale bar 10 µm. High focus F1 on center of old and new valves, new valvocopula with framework in black and with double row of areolae prominent along distal edge. Two central circles are suspected artifacts. From Stidolph et al. (2012) pl 28 fig 5. |
| 4 | Rhabdonema punctatum | 60x. Scale bar 10 µm. Focus F2 with valvocopula framework in white and double row of areolae in white spot. Two central circles are suspected artifacts. From Stidolph et al. (2012) pl 28 fig 5. |
| 5 | Rhabdonema sp | 60x. Scale bar 10 µm. High focus on central striae. From Round et al. (1990). |
| 6 | Rhabdonema sp | 60x. Scale bar 10 µm. Low focus on valvocopula septa. |
| 7 | Tabularia sp1 | 100x. Scale bar 10 µm. From Round et al. (1990). |

Plate 25



**Symmetric Biraphid**
**Bilateral symmetry. Raphe on both valves.**

Plate 26

| | | |
|---|---|---|
| 1 | Diploneis chersonensis | 100x, COL, NA100. Scale bar 10 µm. High focus on areolae along canal parallel to raphe. From Lobban et al. (2012) pl 44 fig 1-4. |
| 2 | Diploneis chersonensis | 100x, COL, NA100. Scale bar 10 µm. Mid focus on proximal raphe ends. From Lobban et al. (2012) pl 44 fig 1-4. |
| 3 | Diploneis chersonensis | 100x, COL, NA100. Scale bar 10 µm. Low focus on outline. From Lobban et al. (2012) pl 44 fig 1-4. |
| 4 | Diploneis sp1 | 100x. Scale bar 10 µm. |
| 5 | Diploneis crabro | 100x. Scale bar 10 µm. High focus on distal raphe and ridge. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2; Sullivan (23 Oct 2021). |
| 6 | Diploneis crabro | 100x. Scale bar 10 µm. Focus on proximal raphe ends. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2; Sullivan (email 23-Oct-2021): too hard to tell var pandura from nominate. Striae separated from longitudinal canal. |
| 7 | Diploneis crabro | 100x. Scale bar 10 µm. Focus on central area. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2; Sullivan (email 23-Oct-2021): too hard to tell var pandura from nominate. Striae separated from longitudinal canal. |
| 8 | Diploneis crabro | 100x. Scale bar 10 µm. Focus on outline. L 71, W 19 µm. Striae 5.5 in 10 µm. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2; Sullivan (email 23-Oct-2021): too hard to tell var pandura from nominate. Striae separated from longitudinal canal. |

Plate 26

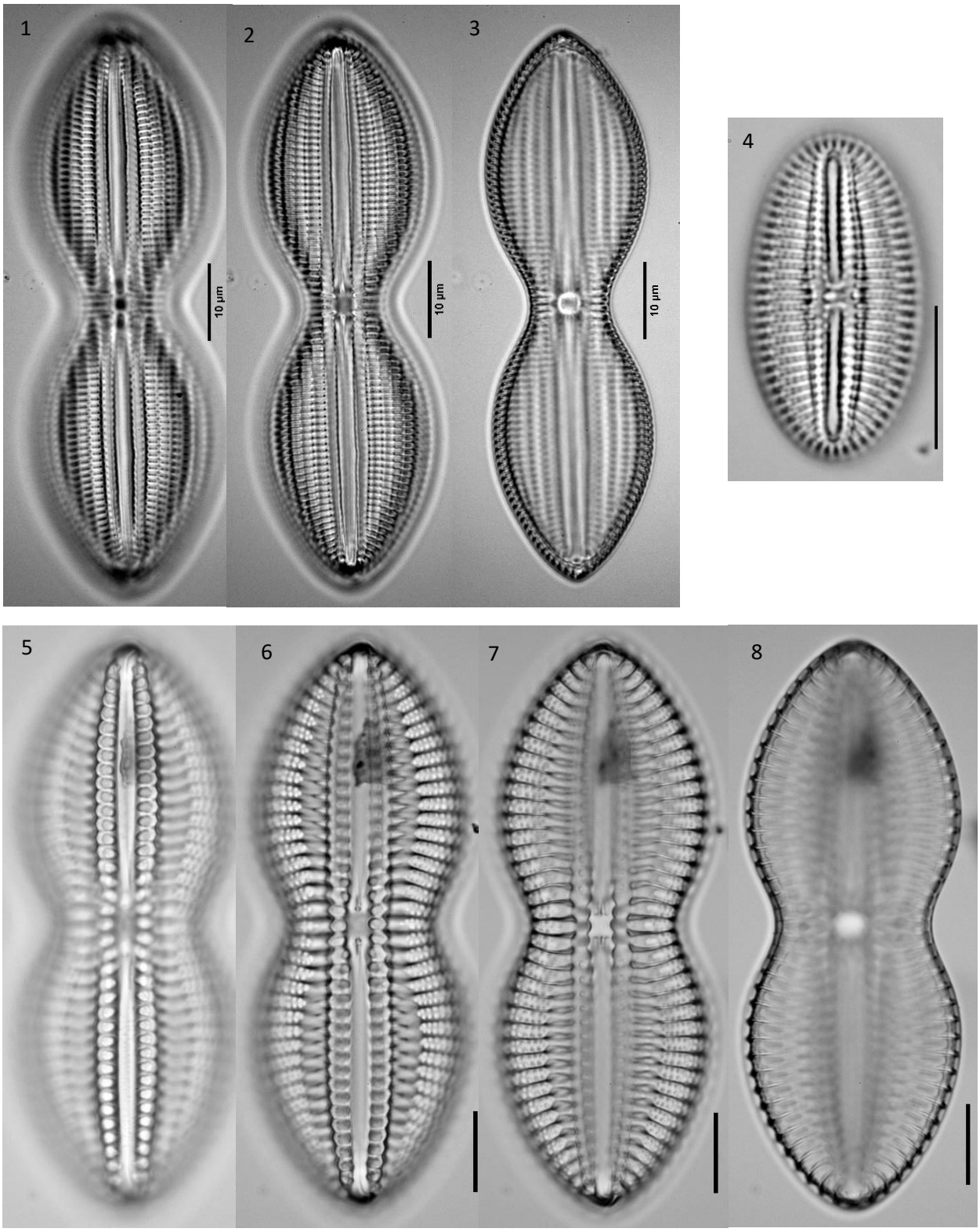


Plate 27

| | | |
|---|---|---|
| 1 | Diploneis crabro | 100x. L 70 µm, W 19 µm, scale bar 10 µm. High focus F1 (0 µm) on outside of pores in external wall of the longitudinal canal. 1 of 5. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2; Sims (ed.) (1996 pl 78 fig 6, pl 79 fig 1-7). |
| 2 | Diploneis crabro | 100x. L 70 µm, W 19 µm, scale bar 10 µm. F2. 1 µm. White spot focus on proximal and distal raphe ends. Distal raphe ends curve toward the secondary side of valve. 2 of 5. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2; Sims (ed.) (1996 pl 78 fig 6, pl 79 fig 1-7). |
| 3 | Diploneis crabro | 100x. Scale bar 10 µm. L 70 µm, W 19 µm. Focus F3 (2 µm) white spot on areolae of striae. 3 of 5. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2; Sims (ed.) (1996 pl 78 fig 6, pl 79 fig 1-7). |
| 4 | Diploneis crabro | 100x. L 70 µm, W 19 µm, scale bar 10 µm. Focus F4 (3 µm) black spot on areolae of striae. 4 of 5. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2; Sims (ed.) (1996 pl 78 fig 6, pl 79 fig 1-7). |
| 5 | Diploneis crabro | 100x. L 70 µm, W 19 µm, scale bar 10 µm. Focus F5 (5.5 µm) on distal ends of ribs between striae. 5 of 5. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2; Sims (ed.) (1996 pl 78 fig 6, pl 79 fig 1-7). |
| 6 | Diploneis crabro | 100x. Scale bar 10 µm. Low focus on outline. L 121, W 31 µm. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2. |
| 7 | Diploneis crabro | 100x. Scale bar 10 µm. High focus on curled proximal raphe ends. L 121, W 31 µm. From Lobban et al. (2012) pl 44 fig 5, pl 45 fig 1-2. |

Plate 27

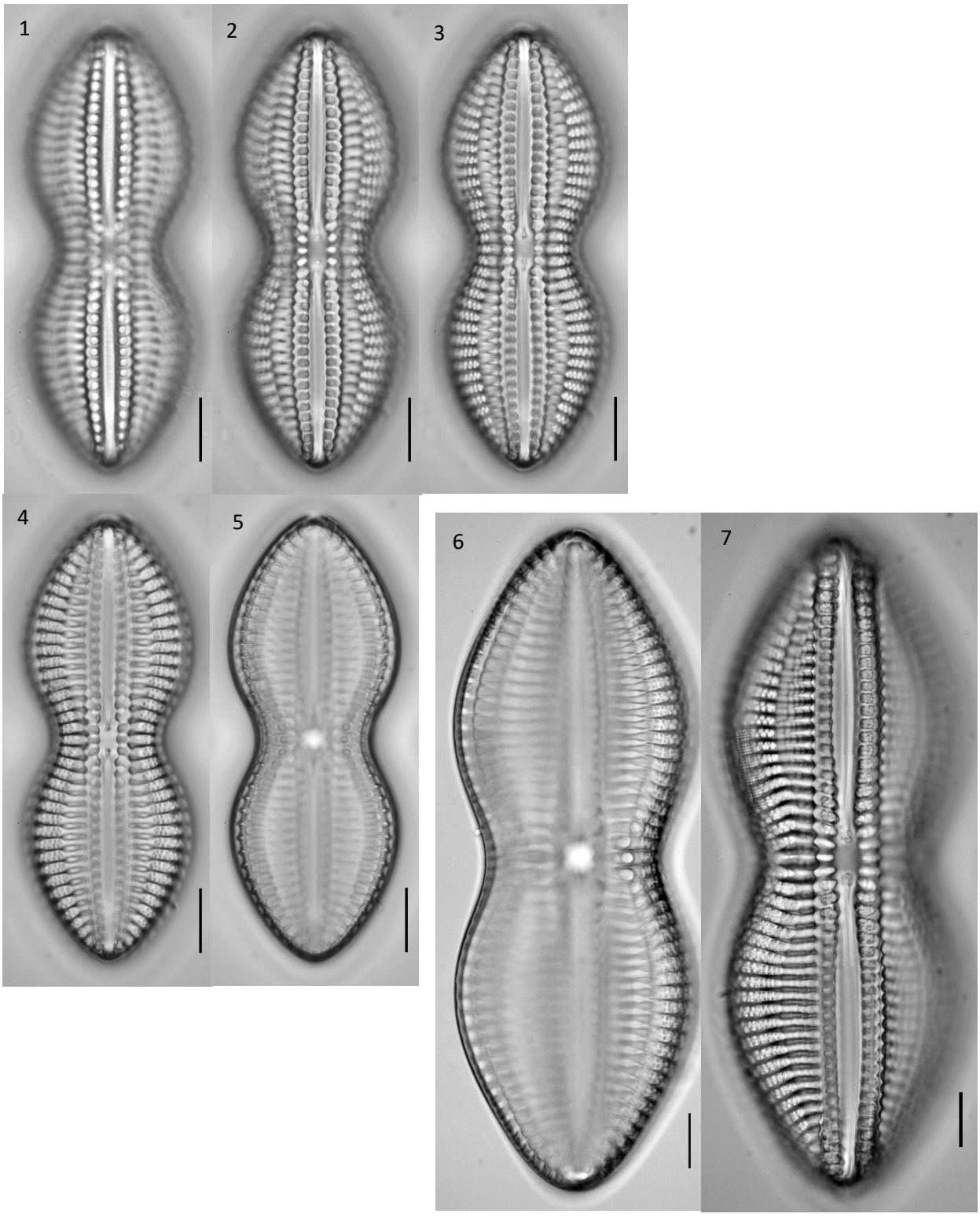


Plate 28

| | | |
|---|---|---|
| 1 | Diploneis didyma | 100x. Scale bar 10 µm. High focus on proximal raphe ends. From Sims (ed.) (1996) pl 80 fig 1. |
| 2 | Diploneis didyma | 100x. Scale bar 10 µm. Low focus on outline. From Sims (ed.) (1996) pl 80 fig 1. |
| 3 | Diploneis graeffii | 100x, BF, NA070, N345-982. Scale bar 10 µm. Focus on proximal raphe. Unknown dots on the canal next to raphe. Marginal striae with double rows of areolae. From Stidolph pl 3 fig 71, 84 and Schmidt pl 7 fig 6. |
| 4 | Diploneis ovalis f angusta | 100x. Scale bar 10 µm. From Schmidt Atlas pl 7 fig 36. |
| 5 | Diploneis smithii | 100x. Scale bar 10 µm. High focus areolae in white spot. From Sims (ed.) (1996) pl 86 fig 6. |
| 6 | Diploneis smithii | 100x. Scale bar 10 µm. Mid focus on longitudinal canal. From Sims (ed.) (1996) pl 86 fig 6. |
| 7 | Diploneis smithii | 100x. Scale bar 10 µm. Low focus on outline. From Sims (ed.) (1996) pl 86 fig 6. |

Plate 28

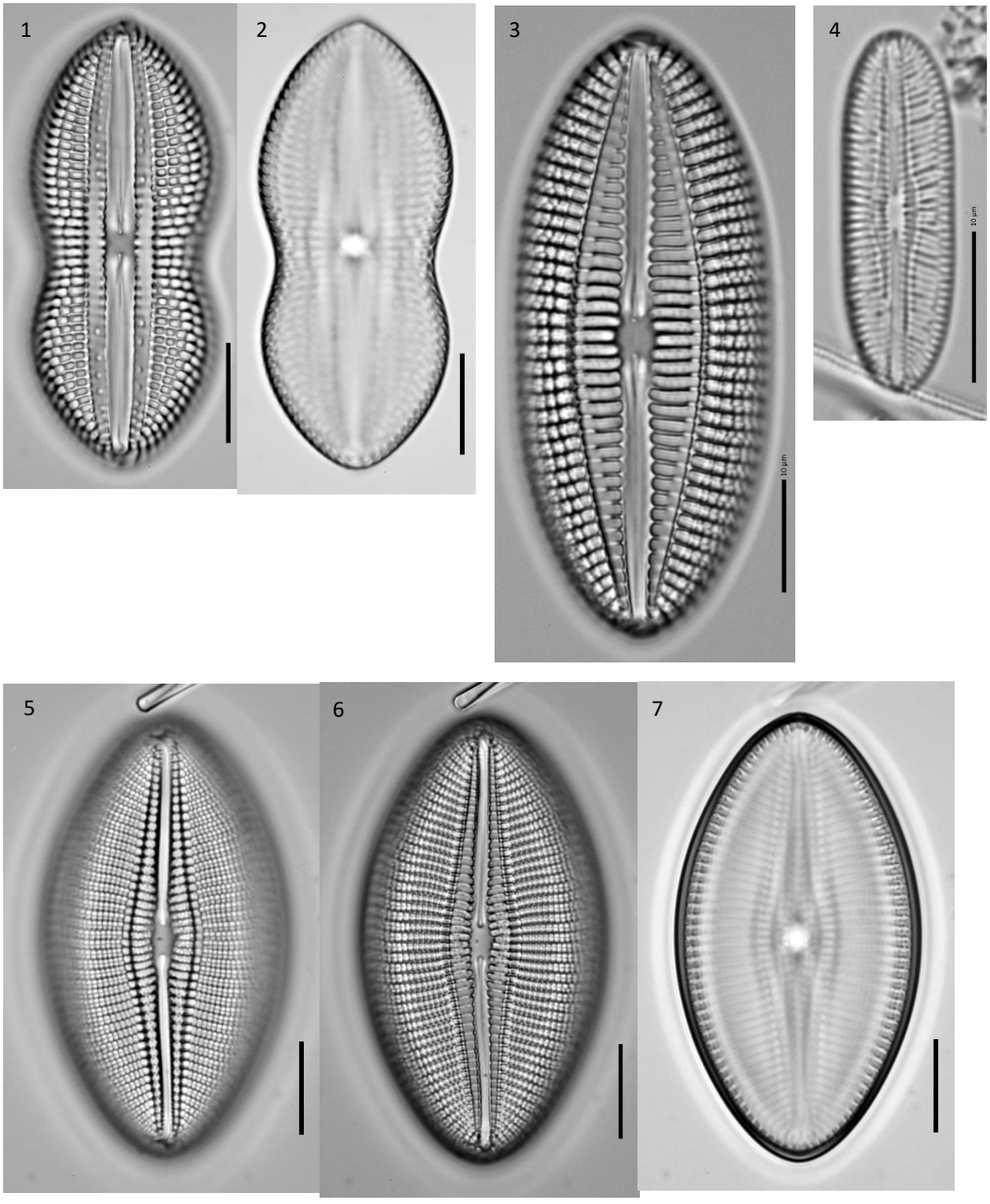


Plate 29

| | | |
|---|---|---|
| 1 | Donkinia sp2 | 100x. Scale bar 10 µm. High focus on central ring. Separated from Pleurosigma on the strongly sigmoid raphe. From Round et al. (1990). |
| 2 | Donkinia sp2 | 100x, BF, NA080. Scale bar 10 µm. Low focus on proximal raphe ends and areolae around central area. Separated from Pleurosigma on the strongly sigmoid raphe. From Round et al. (1990). |
| 3 | Donkinia sp2 | 60x. Scale bar 10 µm. Length 134 µm. Focus on central ring. Separated from Pleurosigma on the strongly sigmoid raphe. From Round et al. (1990). |
| 4 | Donkinia sp2 | 100x. Scale bar 10 µm. Detail of # 4797. Focus on central ring. Separated from Pleurosigma on the strongly sigmoid raphe. From Round et al. (1990). |

Plate 29

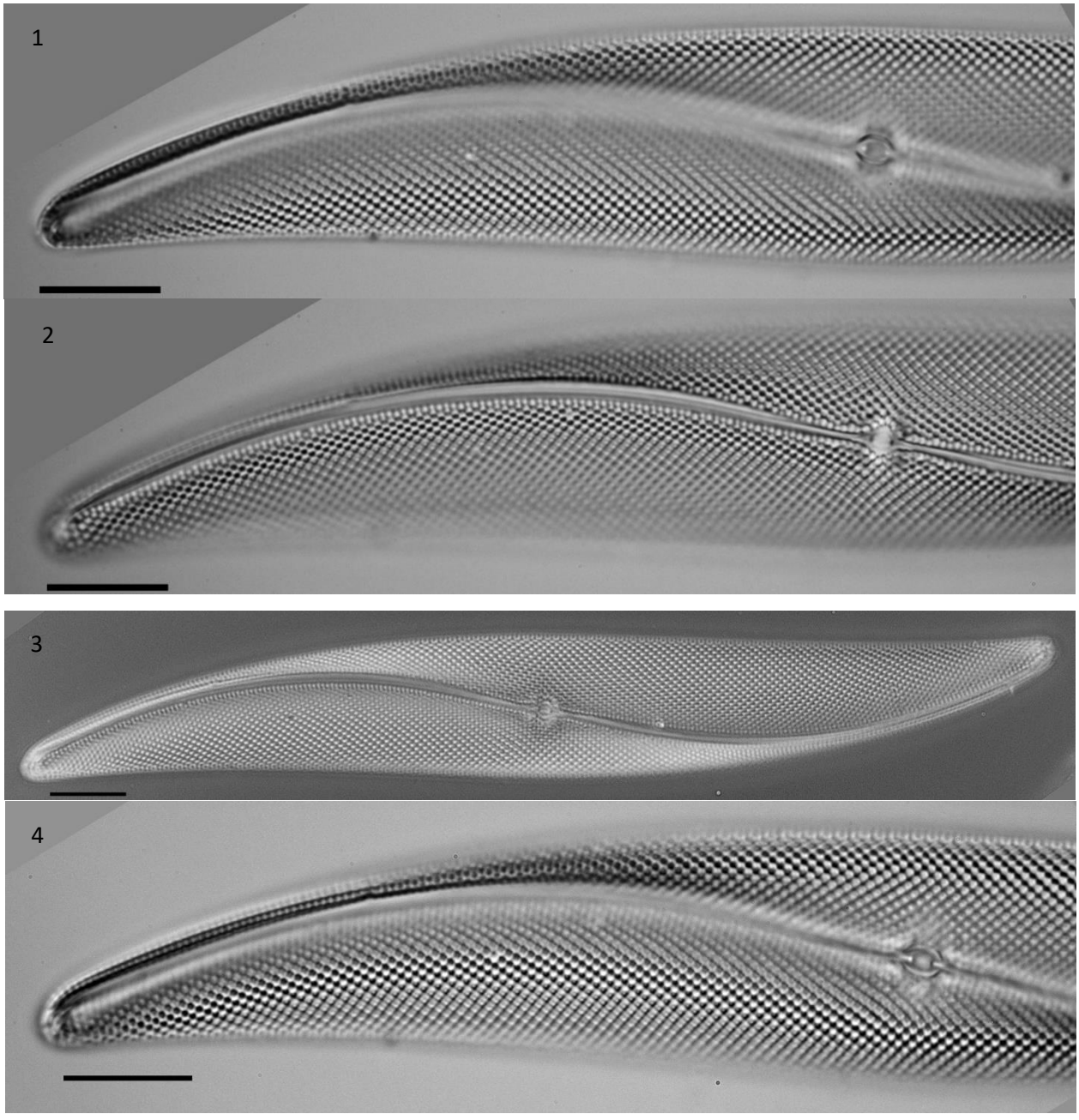
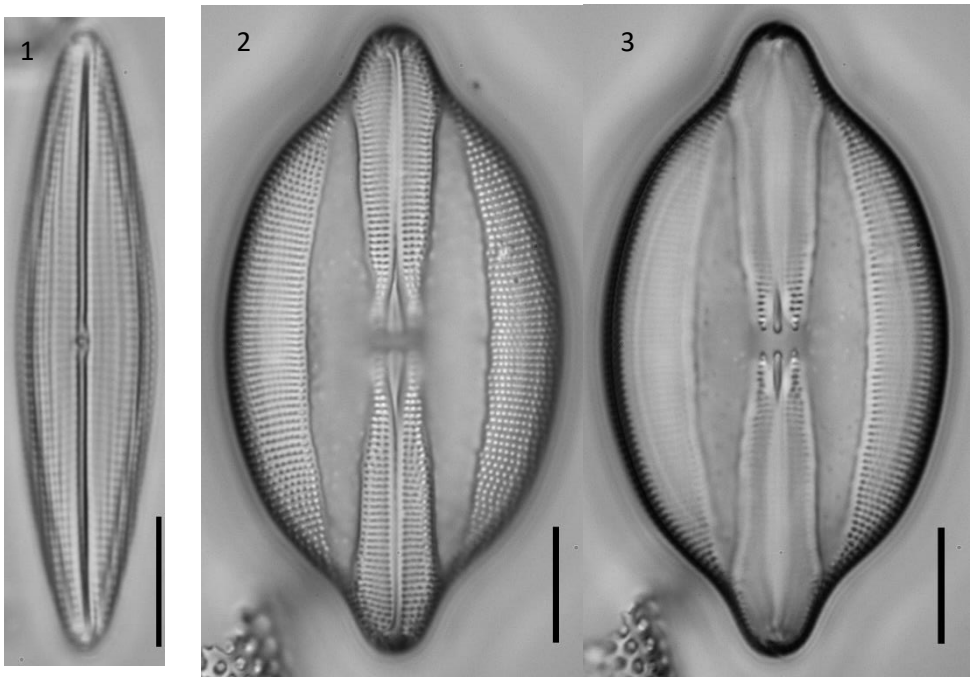
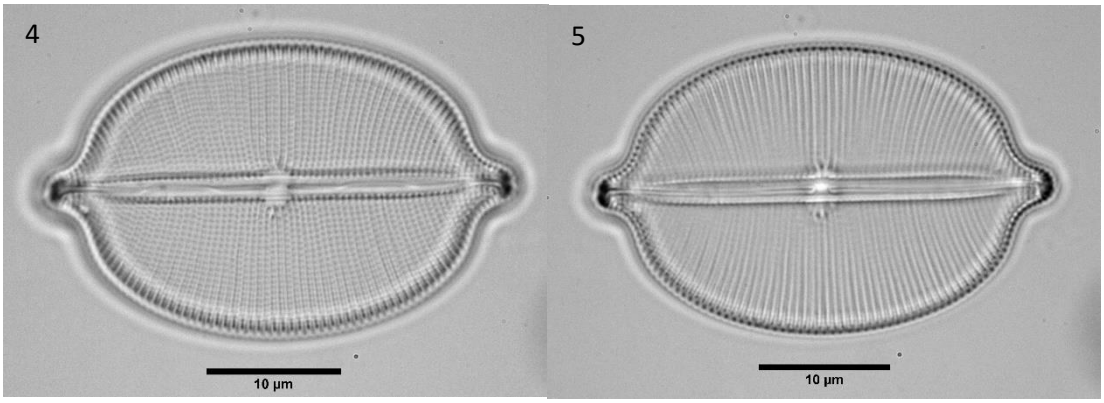


Plate 30

| | | |
|---|---|---|
| 1 | Navicula tsukamotoi | 100x. Scale bar 10 µm. From Lobban pers. comm. 2022; Yuhang Li et al. (2017). |
| 2 | Lyrella hennedyi | 100x, BF. Scale bar 10 µm. High focus on distal raphe end. Whole frustule. Lobban et al. (2012) pl 20 fig 6-8. |
| 3 | Lyrella hennedyi | 100x, BF. Scale bar 10 µm. Low focus on proximal raphe end. Whole frustule. Lobban et al. (2012) pl 20 fig 6-8. |
| 4 | Mastogloia citrus | 100x, COL, NA100. Black spot focus on areolae. From Lobban et al. (2012) pl 25 fig 4-5. |
| 5 | Mastogloia citrus | 100x, COL, NA100. Focus on a distal raphe end. From Lobban et al. (2012) pl 25 fig 4-5. |
| 6 | Mastogloia fimbriata | 100, BF. High focus on valve face. From Lobban et al. (2012) pl 28 fig 8-9. |
| 7 | Mastogloia fimbriata | 100x, BF. Mid focus on valve face in black spot. From Lobban et al. (2012) pl 28 fig 8-9. |
| 8 | Mastogloia fimbriata | 100x, BF. Low focus on partecta. From Lobban et al. (2012) pl 28 fig 8-9. |

Plate 30



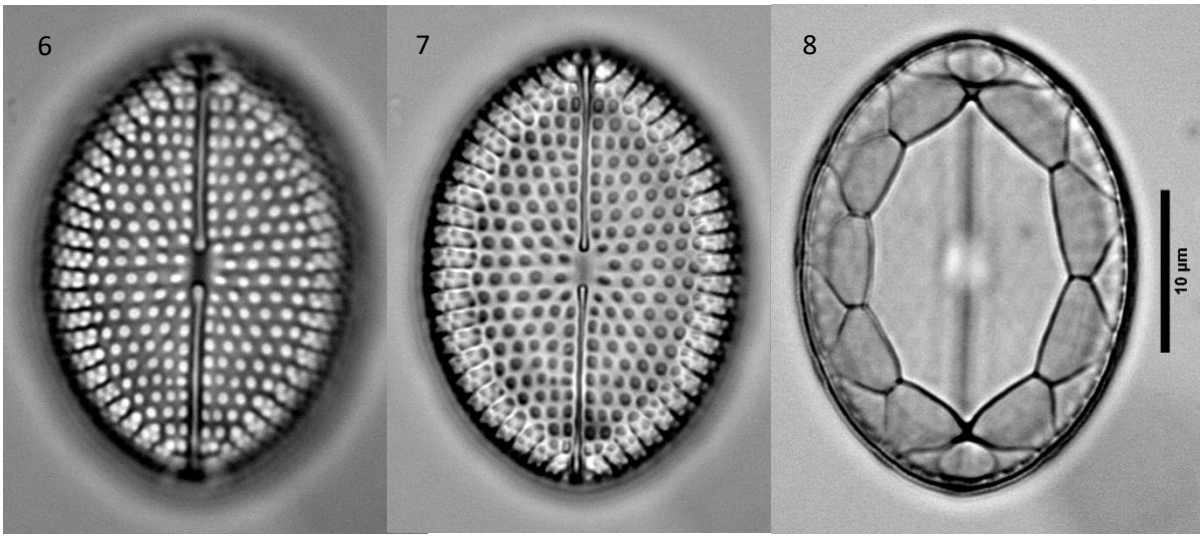
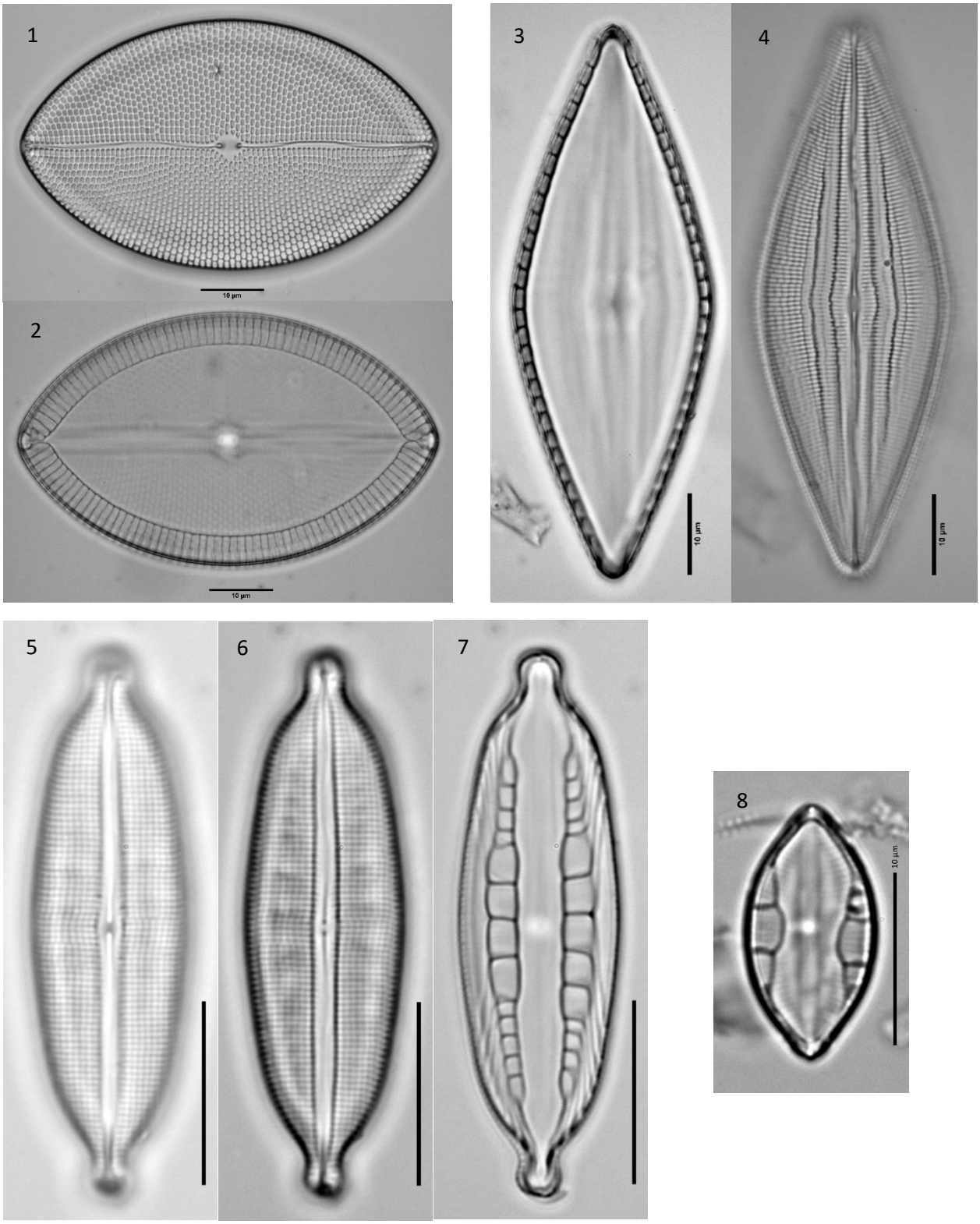



Plate 31

| | | |
|---|---|---|
| 1 | Mastogloia horvathiana | 100x. Scale bar 10 µm. Focus on valve face. From Lobban et al. (2012) pl 29: 1-2; Stidolph et al. (2012) pl 34, 35, 36. |
| 2 | Mastogloia horvathiana | 100x. Scale bar 10 µm. Focus on partecta. From Lobban et al. (2012) pl 29: 1-2; Stidolph et al. (2012) pl 34, 35, 36. |
| 3 | Mastogloia neoborneensis | 100x, BF. Scale bar 10 µm. Internal view. High focus on partecta. From Lobban et al. (2012) pl 33 fig 3. |
| 4 | Mastogloia neoborneensis | 100x, BF. Scale bar 10 µm. Internal view. Low focus on proximal raphe ends and dark lines of bases of pseudoconopea. From Lobban et al. (2012) pl 33 fig 3. |
| 5 | Mastogloia paradoxa | 100x. Honaunau-K # 18. Scale bar 10 µm. From Lobban et al. (2012) p. 280, pl 34 fig 3-5. |
| 6 | Mastogloia paradoxa | 100x. Honaunau-K # 18. Scale bar 10 µm. From Lobban et al. (2012) p. 280, pl 34 fig 3-5. |
| 7 | Mastogloia paradoxa | 100x. Honaunau-K # 18. Scale bar 10 µm. From Lobban et al. (2012) p. 280, pl 34 fig 3-5. |
| 8 | Mastogloia sp1 | 100x. Scale bar 10 µm. |

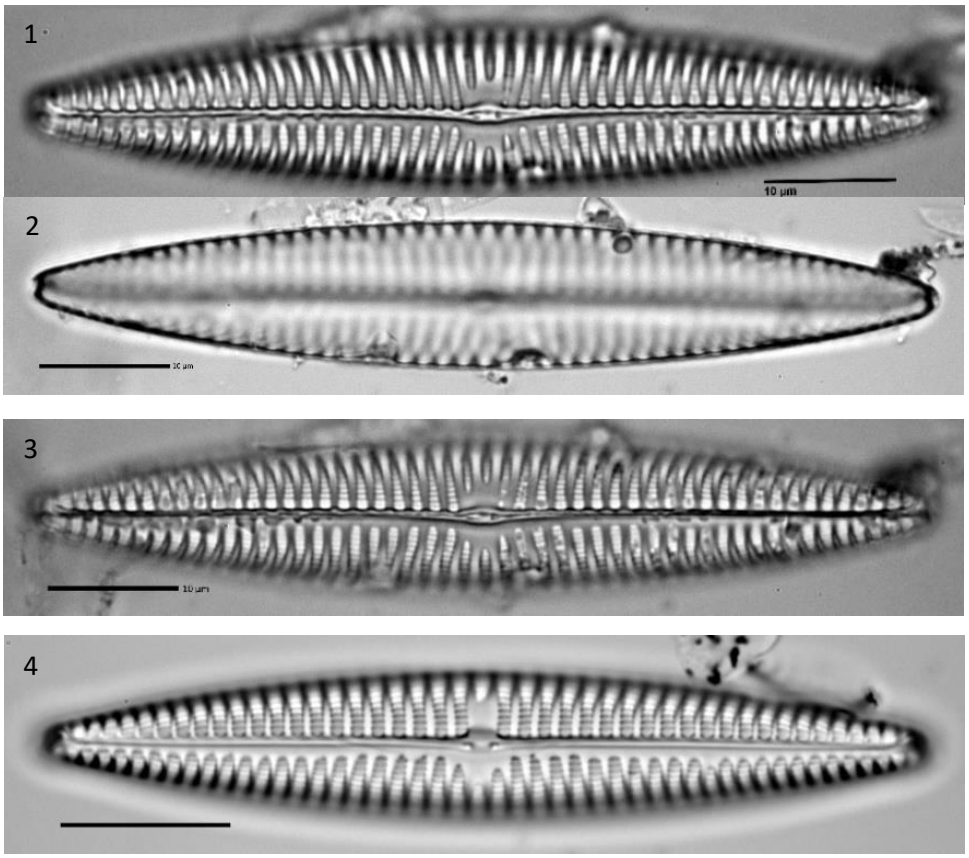
Plate 31

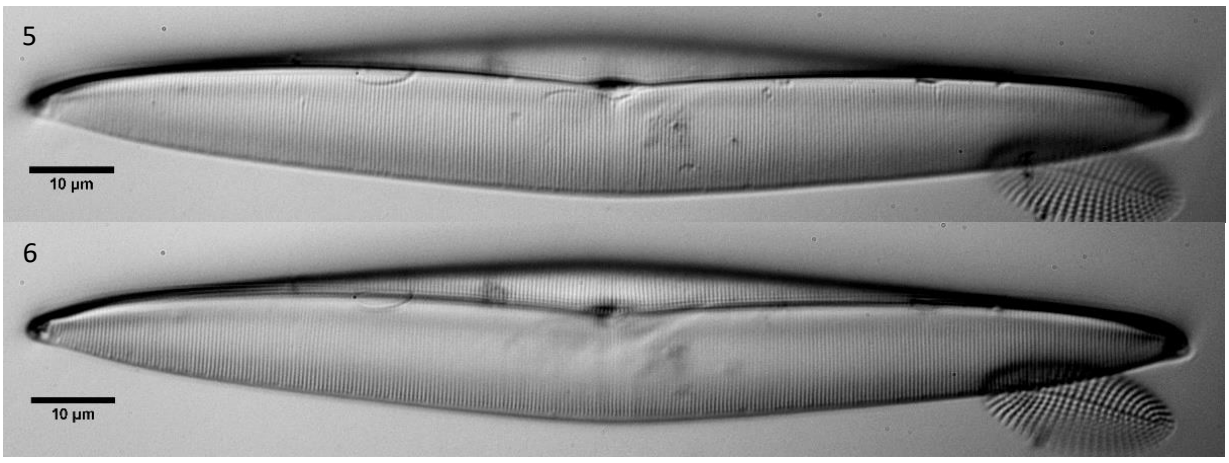


# Plate 32

| | | |
|---|---|---|
| 1 | Navicula longa | 100x. Scale bar 10 µm. From Schmidt (1874-1959) pl 47: 1-4, 6, 8-10; Stidolph et al. (2012) pl 3: 86-87. |
| 2 | Navicula longa | 100x, BF, NA090. Scale bar 10 µm. Internal view. High focus on outline. From Schmidt (1874-1959) pl 47: 1-4, 6, 8-10; Stidolph et al. (2012) pl 3: 86-87. |
| 3 | Navicula longa | 100x, BF, NA090. Scale bar 10 µm. Internal view. Low focus on central area. From Schmidt (1874-1959) pl 47: 1-4, 6, 8-10; Stidolph et al. (2012) pl 3: 86-87. |
| 4 | Navicula longa | 100x. Scale bar 10 µm. |
| 5 | Plagiotropis lepidoptera | 60x, OL using folded foil under a slide placed on field filter, NA090. Scale bar 10 µm. High focus on central valve face. From Sims (ed.) (1996) pl 243 fig 12; Round et al. (1990). |
| 6 | Plagiotropis lepidoptera | 60x, OL using folded foil under a slide placed on field filter, NA090. Scale bar 10 µm. Low focus on distal helictoglossa. From Sims (ed.) (1996) pl 243 fig 12; Round et al. (1990). |

Plate 32

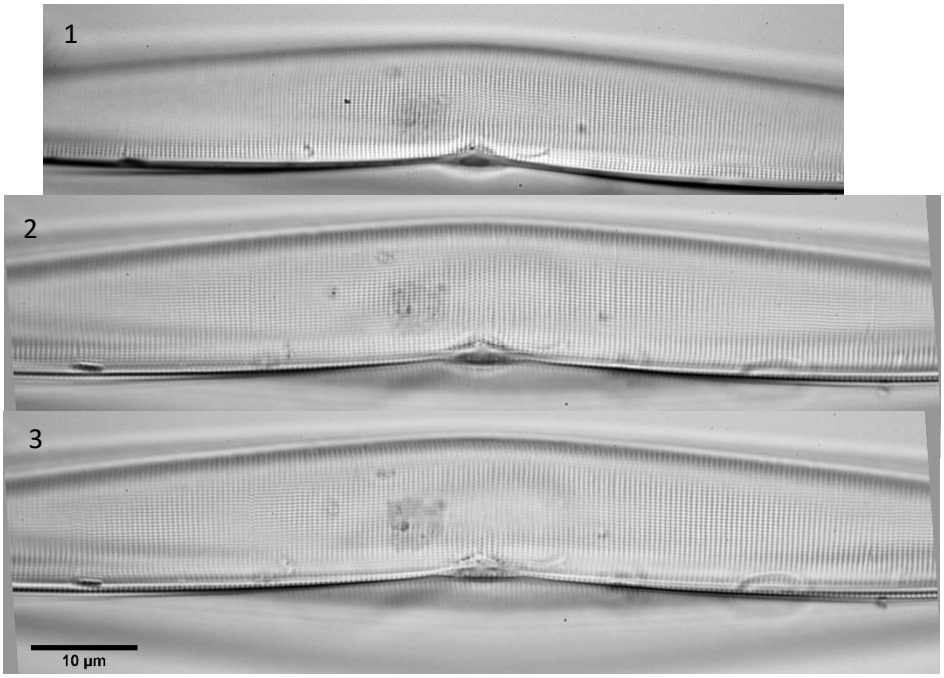


# Plate 33

| | | |
|---|---|---|
| 1 | Plagiotropis lepidoptera | 100x, BF, NA080. Scale bar 10 µm. Detail of plate 32 fig 5 (#5414). Focus on central striae. From Sims (ed.) (1996) pl 243 fig 12; Round et al. (1990). |
| 2 | Plagiotropis lepidoptera | 100x, COL, NA100. Scale bar 10 µm. High focus on edge of central nodule. See images plate 32 fig 5-6 (#5414-5415) for full valve. From Sims (ed.) (1996) pl 243 fig 12; Round et al. (1990). |
| 3 | Plagiotropis lepidoptera | 100x, COL, NA100. Scale bar 10 µm. Low focus on proximal raphe ends. See images 5414-5415 for full valve. From Sims (ed.) (1996) pl 243 fig 12; Round et al. (1990). |
| 4 | Plagiotropis lepidoptera | 60x. Scale bar 10 µm. High focus on edge of mantle. From Sims (ed.) (1996) pl 243 fig 12; Round et al. (1990). |
| 5 | Plagiotropis lepidoptera | 60x. Scale bar 10 µm. Low focus on central dip in the keel and on a helictoglossae at one apex. From Sims (ed.) (1996) pl 243 fig 12; Round et al. (1990). |
| 6 | Plagiotropis lepidoptera | 100x. Scale bar 10 µm. Girdle view. Focus on apices of valves. From Sims (ed.) (1996) pl 243 fig 12; Round et al. (1990). |

Plate 33



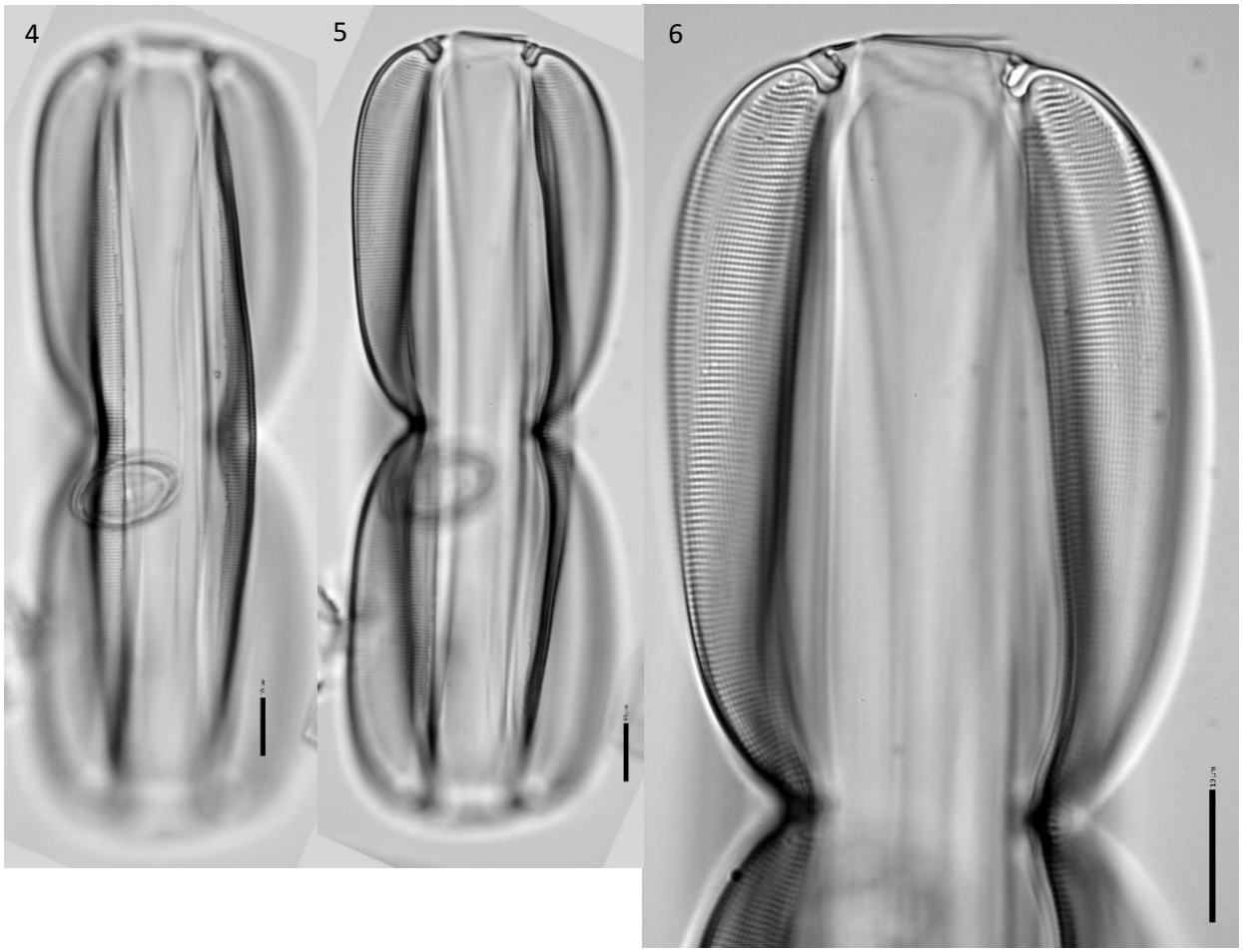
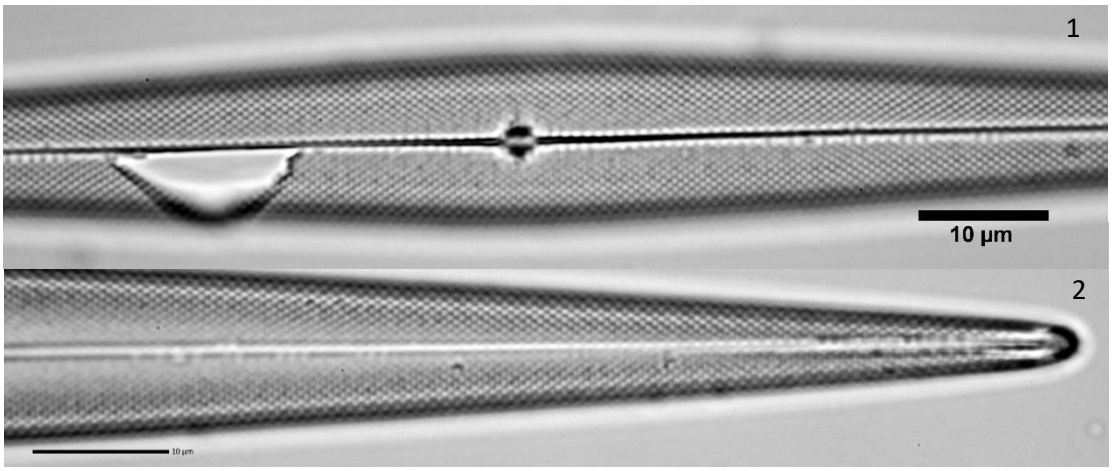
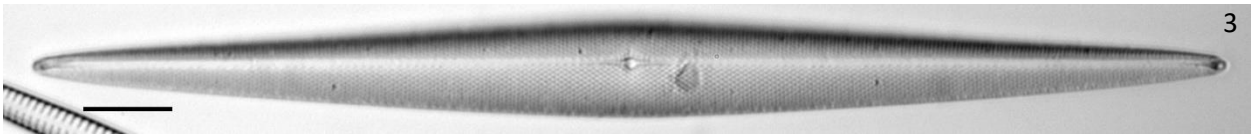



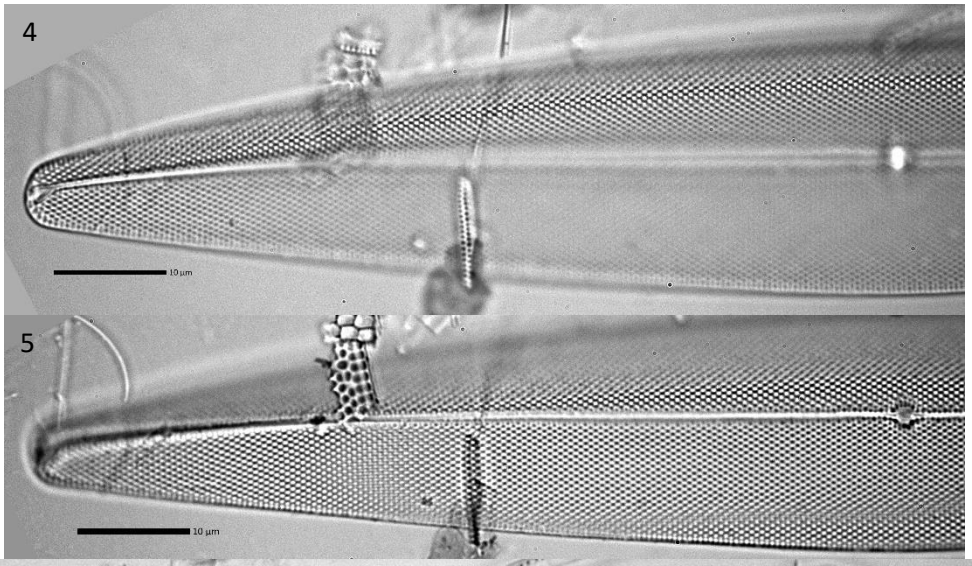
Plate 34

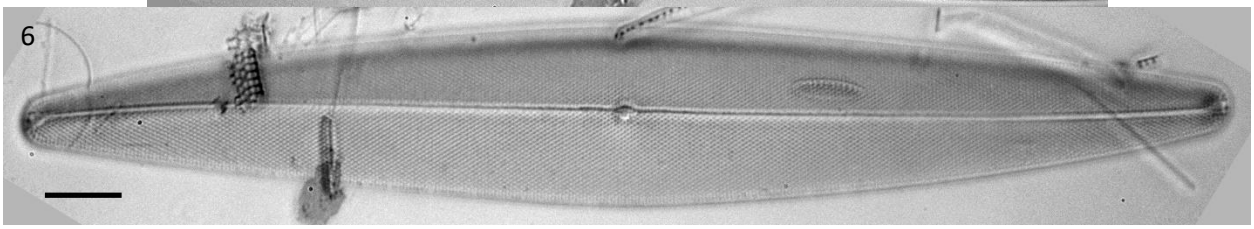
| | | |
|---|---|---|
| 1 | Pleurosigma sp1 | 100x. SEM needed to distinguish species. Lobban (2022 pers comm). |
| 2 | Pleurosigma sp1 | 100x. SEM needed to distinguish species. Lobban (2022 pers comm). |
| 3 | Pleurosigma sp1 | 60x. Scale bar 10 µm. SEM needed to distinguish species. Lobban (2022 pers comm). |
| 4 | Pleurosigma rigidum | 100x. Focus on distal raphe end. From Sims (ed.)(1996) pl 247 fig 1 and Frithjof Sterrenburg (Michael Sullivan pers comm). |
| 5 | Pleurosigma rigidum | 100x. Focus on proximal raphe end. From Sims (ed.)(1996) pl 247 fig 1 and Frithjof Sterrenburg (Michael Sullivan pers comm). |
| 6 | Pleurosigma rigidum | 60x. Scale bar 10 µm. From Sims (ed.)(1996) pl 247 fig 1 and Frithjof Sterrenburg (Michael Sullivan pers comm). |

Plate 34



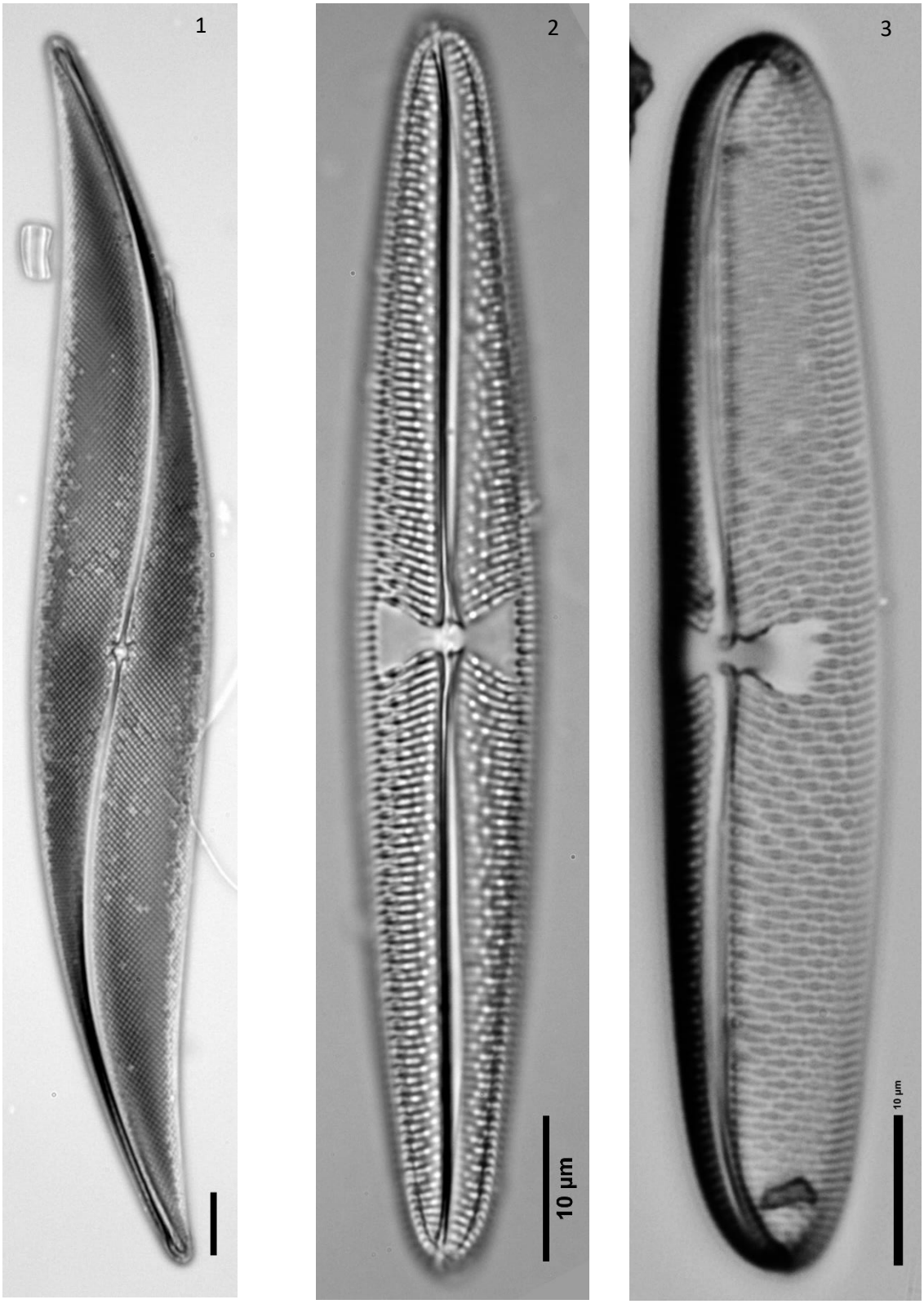



# Plate 35

| | | |
|---|---|---|
| 1 | Pleurosigma sp2 | 40x. Scale bar 10 µm. Focus on central area with proximal raphe ends in white spot. Easily confused with Donkinia. From Round et al. (1990). |
| 2 | Trachyneis aspera | 100x. From Round et al. (1990). |
| 3 | Trachyneis aspera | 60x, BF, NA055. Focus on hexagonal alveoli of the striae. From Round et al. (1990). |

Plate 35

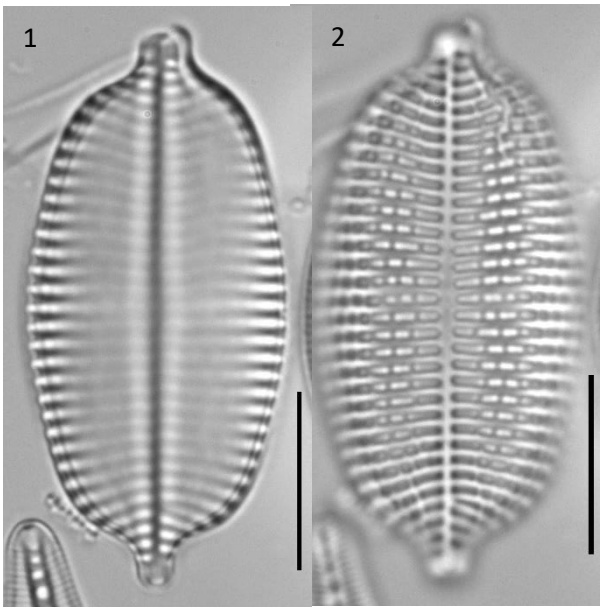


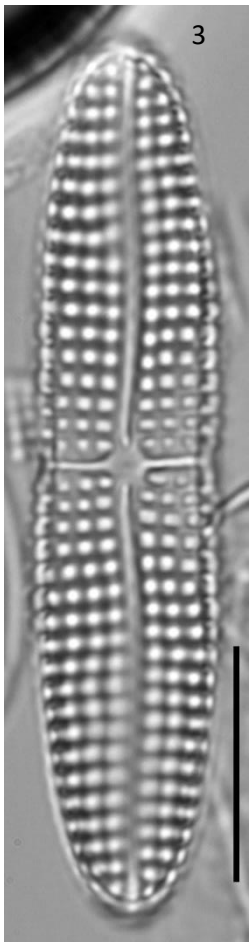
**Monoraphid**
**Bilateral symmetry. Raphe on one valve.**

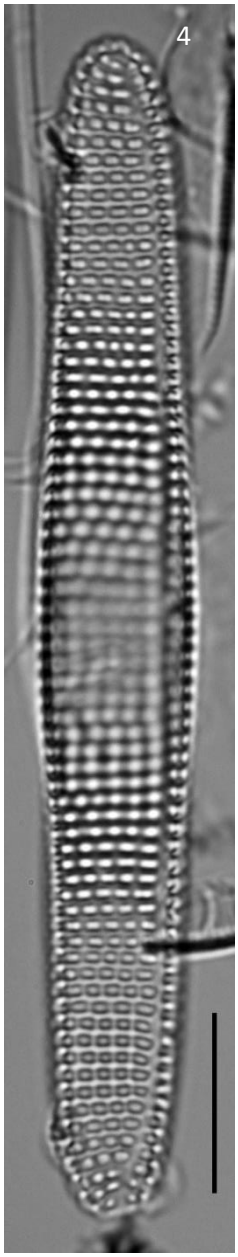
Plate 36

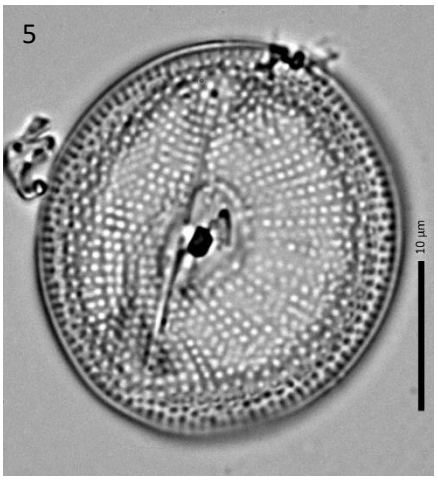
| | | |
|---|---|---|
| 1 | Achnanthes citronella | 100x. Scale bar 10 µm. Outline focus. From Schmidt (1874-1959) pl 415: 3-8; Lobban et al. (2012) pl 38: 5-6. |
| 2 | Achnanthes citronella | 100x. Scale bar 10 µm. Sternum focus. From Schmidt (1874-1959) pl 415: 3-8; Lobban et al. (2012) pl 38: 5-6. |
| 3 | Achnanthes sp2 | 100x. Scale bar 10 µm. |
| 4 | Achnanthes sp1 | 100x. Scale bar 10 µm. |
| 5 | Anorthoneis sp1 | 100x. Scale bar 10 µm. From Round et al. (1990); Lobban et al. (2012) p 286 good description. |
| 6 | Cocconeis convexa | 100x. Scale bar 10 µm. External view. High focus on striae between longitudinal lines. From López-Fuerte et al. (2020) fig 24g-j. |
| 7 | Cocconeis convexa | 100x. Scale bar 10 µm. External view. Low focus on outline. From López-Fuerte et al. (2020) fig 24g-j. |

Plate 36



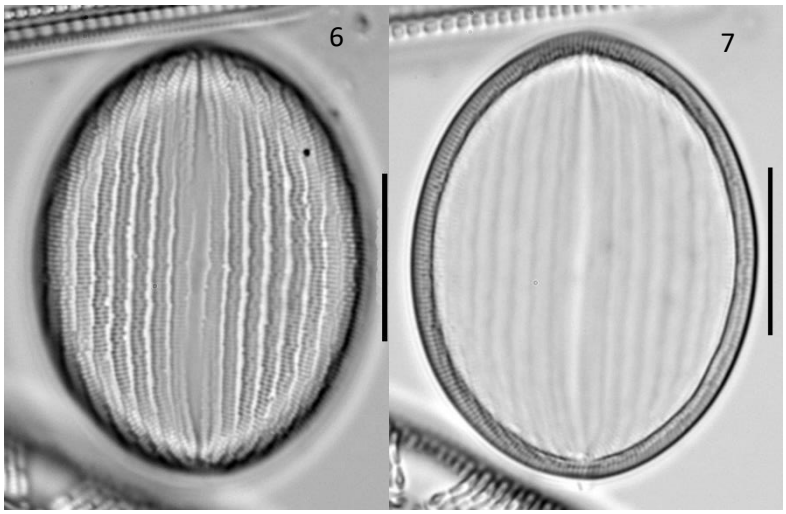
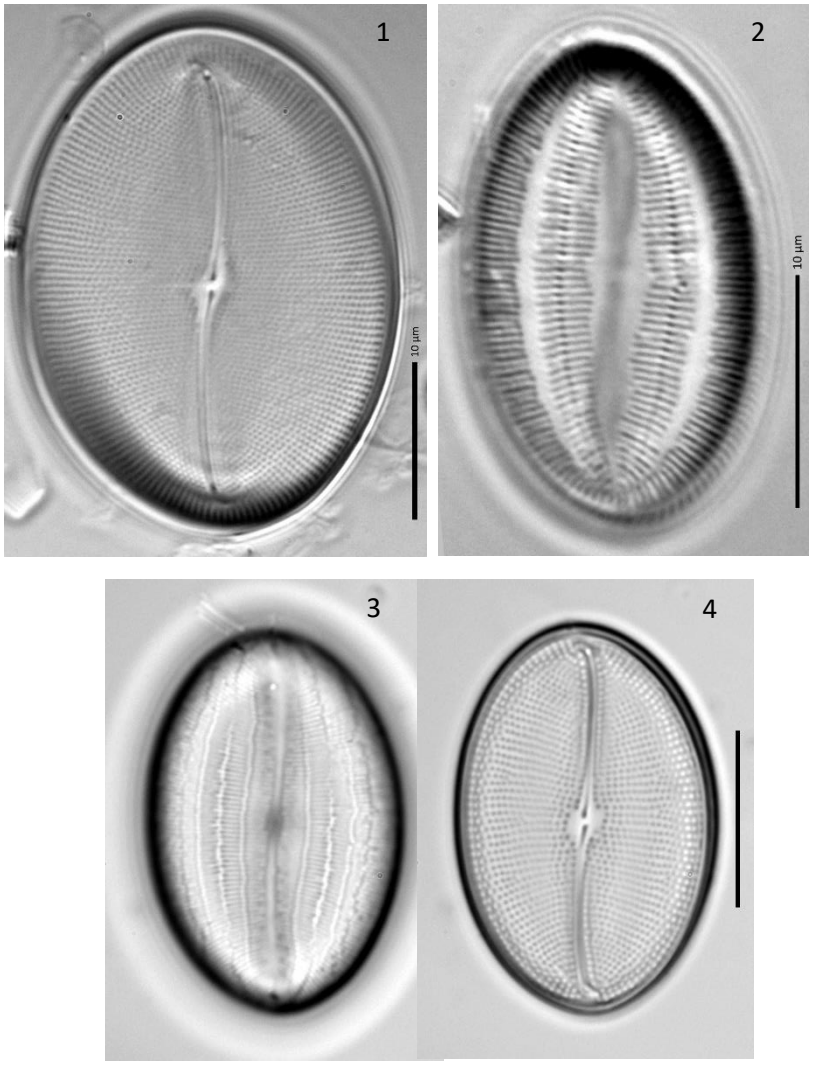



Plate 37

| | | |
|---|---|---|
| 1 | Cocconeis heteroidea | 100x, COL. Scale bar 10 µm. From Lobban et al. (2012) pl 41 fig 1-3 for raphe valve; Schmidt (1874-1959) pl 196 fig 40. |
| 2 | Cocconeis heteroidea | 100x, COL. Scale bar 10 µm. From Lobban et al. (2012) pl 41 fig 1-3 for raphe valve; Schmidt (1874-1959) pl 196 fig 40. |
| 3 | Cocconeis sp | 100x. Scale bar 10 µm. Whole frustule. High focus on rapheless valve striae. From Round et al. (1990). |
| 4 | Cocconeis sp | 100x. Scale bar 10 µm. Whole frustule. Low focus on raphe valve. From Round et al. (1990). |
| 5 | Cocconeis scutellum | 100x. Scale bar 10 µm. Cocconeis epiphytic on Podosira. A stacked image. From Schmidt (1874-1959) pl 130 fig 40. |
| 6 | Cocconeis sp5 | 100x. Scale bar 10 µm. Focus on proximal raphe ends. From Round et al (1990). |

Plate 37



**Asymmetric Biraphid**
**Transapical symmetry. Raphe on both valves.**

Plate 38

| | | |
|---|---|---|
| 1 | Climaconeis riddleae | 60x, Scale bar 20 µm. OL. Length 137 µm. From Prasad (2003). |
| 2 | Climaconeis riddleae | 100x, OL. Scale bar 10 µm. Focus on distal raphe end. From Prasad (2003). |
| 3 | Climaconeis riddleae | 100, OL. Scale bar 10 µm. Focus on proximal raphe ends. From Prasad (2003). |
| 4 | Climaconeis riddleae | 100, OL. From Prasad (2003). |
| 5 | Halamphora coffeiformis | 100x. Scale bar 10 µm. From Sims (ed.)(1996) pl 16:6 ; Stidolph et al. (2012) pl 17:114 ; AlgaeBase (2022). |
| 6 | Tetramphora decussata | 100x. Scale bar 10 µm. From image on protistcentral.org; Stepanek et al. (2016); Lobban et al. (2012) pl 54 fig 5, pl 55 fig 1-3 (SEM). |
| 7 | Tetramphora decussata | 100x, OL. Scale bar 10 µm. High focus F1 on raphe and decussate areolae in black spot. From Stepanek et al. (2016); Lobban et al. (2012) pl 54 fig 5, pl 55 fig 1-3 (SEM). |
| 8 | Tetramphora decussata | 100x, OL. Scale bar 10 µm. Focus F2 on raphe and ventral striae. From Stepanek et al. (2016); Lobban et al. (2012) pl 54 fig 5, pl 55 fig 1-3 (SEM). |
| 9 | Tetramphora decussata | 100x, OL. Scale bar 10 µm. Focus F3 on ventral edge and conopium. From Stepanek et al. (2016); Lobban et al. (2012) pl 54 fig 5, pl 55 fig 1-3 (SEM). |
| 10 | Tetramphora decussata | 100x, OL. Scale bar 10 µm. Low focus F4 on distal raphe ends. From Stepanek et al. (2016); Lobban et al. (2012) pl 54 fig 5, pl 55 fig 1-3 (SEM). |

Plate 38

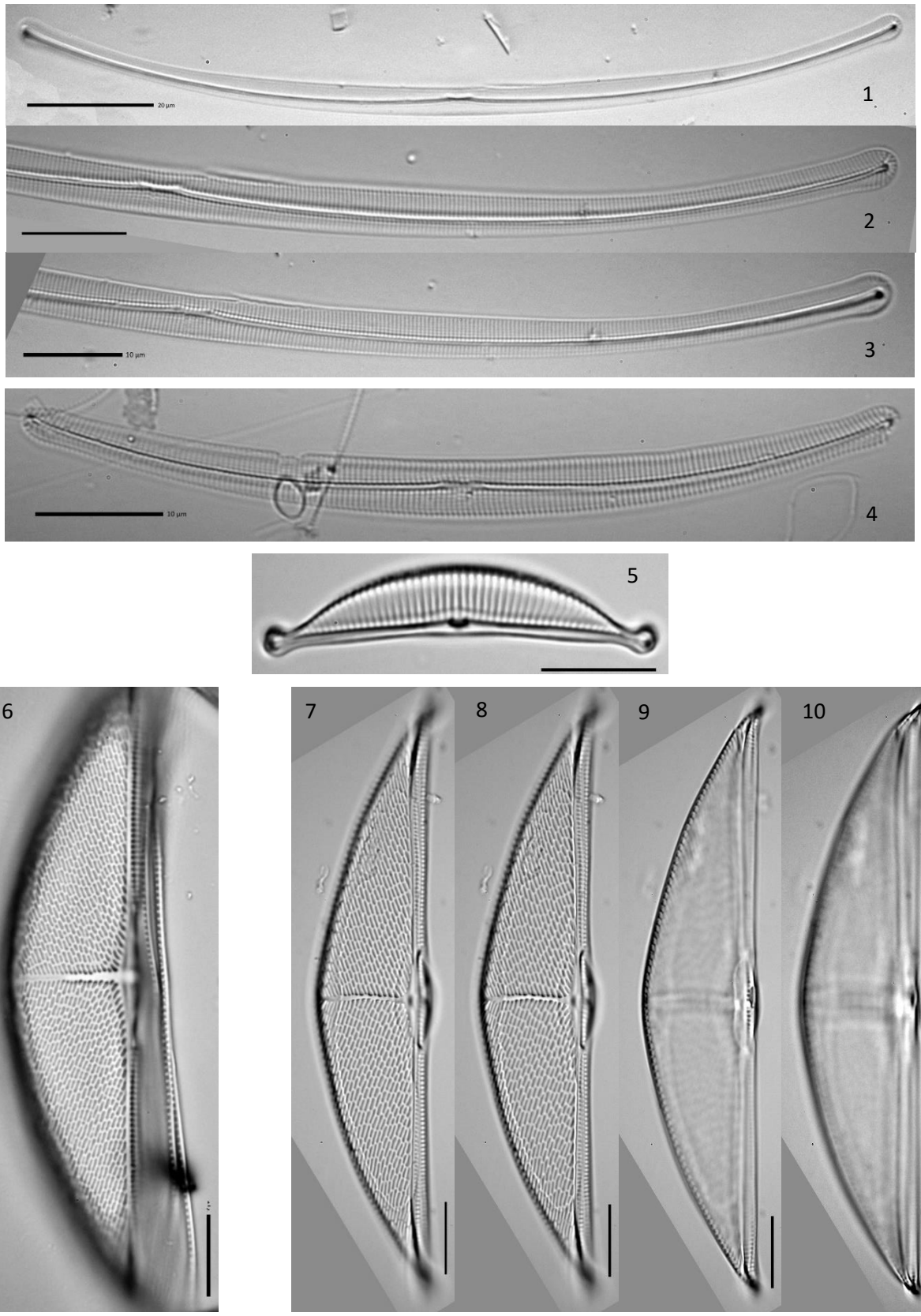
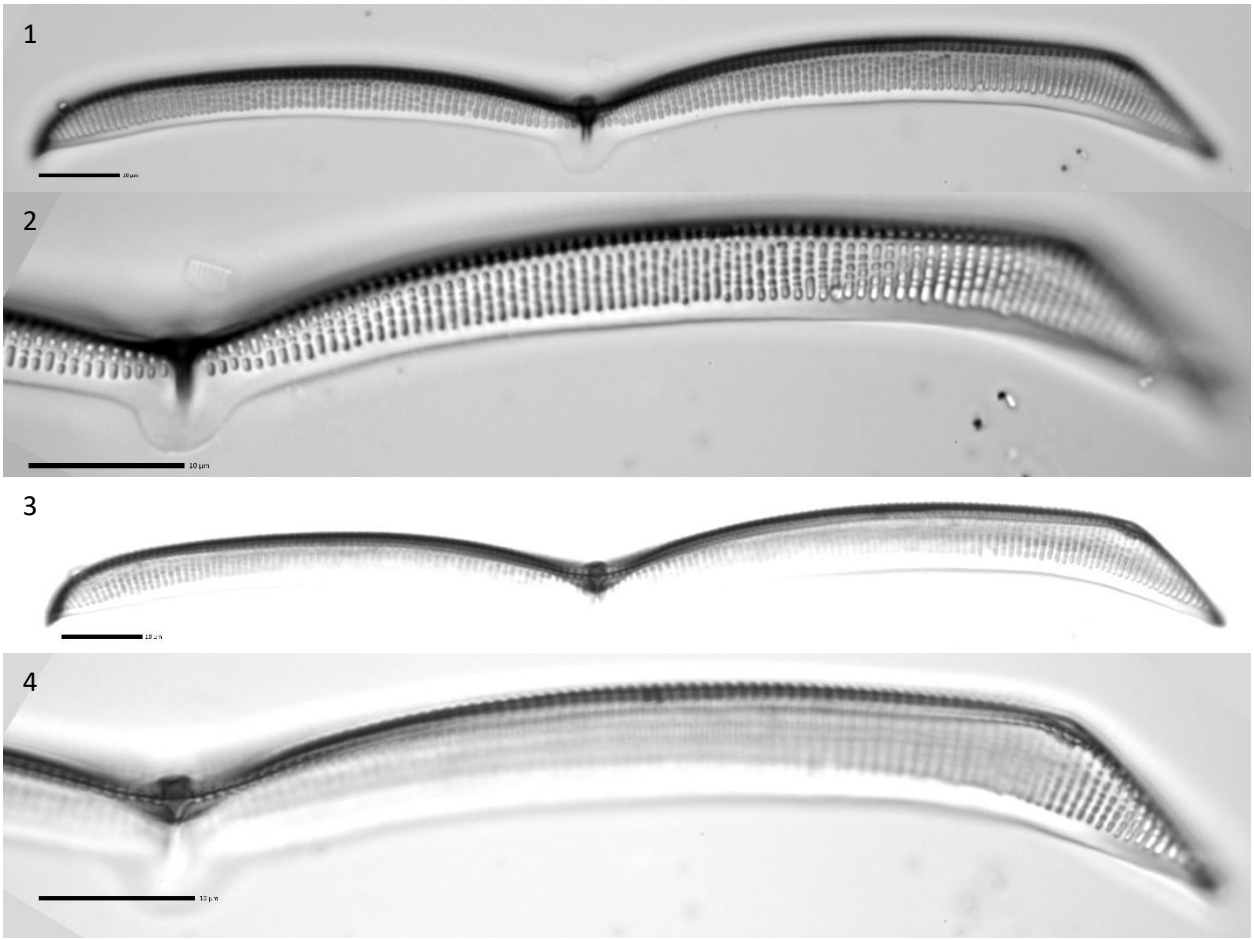
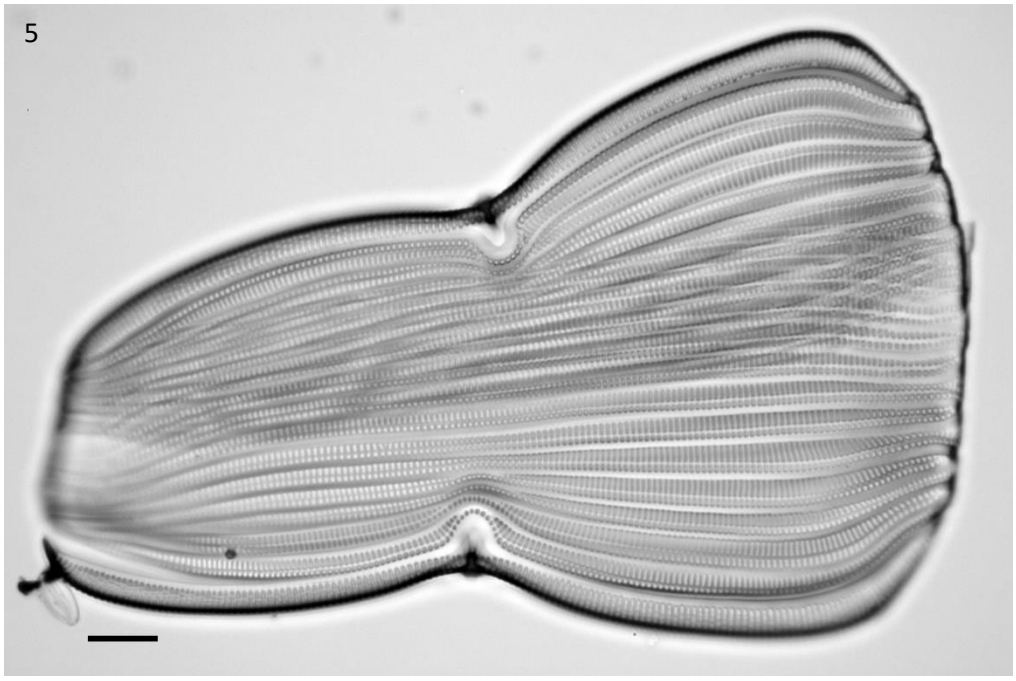


Plate 39

| | | |
|---|---|---|
| 1 | Druehlago sp1 | 60x. Girdle view (copulae absent). High focus of mantle. Black spot. Scale bar 10 µm. See # 8330, 8331 for detail. From Majewska et al. (2021). |
| 2 | Druehlago sp1 | 100x. Girdle view (copulae absent). High focus on edge of valve at the center. Scale bar 10 µm. See # 8311, 8312 for full valve. From Majewska et al. (2021). |
| 3 | Druehlago sp1 | 60x. Girdle view (copulae absent). Low focus on central nodule and raphe. Scale bar 10 µm. See # 8330, 8331 for detail. From Majewska et al. (2021). |
| 4 | Druehlago sp1 | 100x. Girdle view (copulae absent). Low focus on raphe in center of valve and fibulae near distal raphe end. Scale bar 10 µm. See # 8311, 8312 for full valve. From Majewska et al. (2021). |
| 5 | Druehlago sp1 | 60x. Scale bar 10 µm. Girdle view. L 130, W (at central constriction) 53 µm. High focus on one central stauros, valvocopula in black spot. From Majewska et al. (2021). |

Plate 39

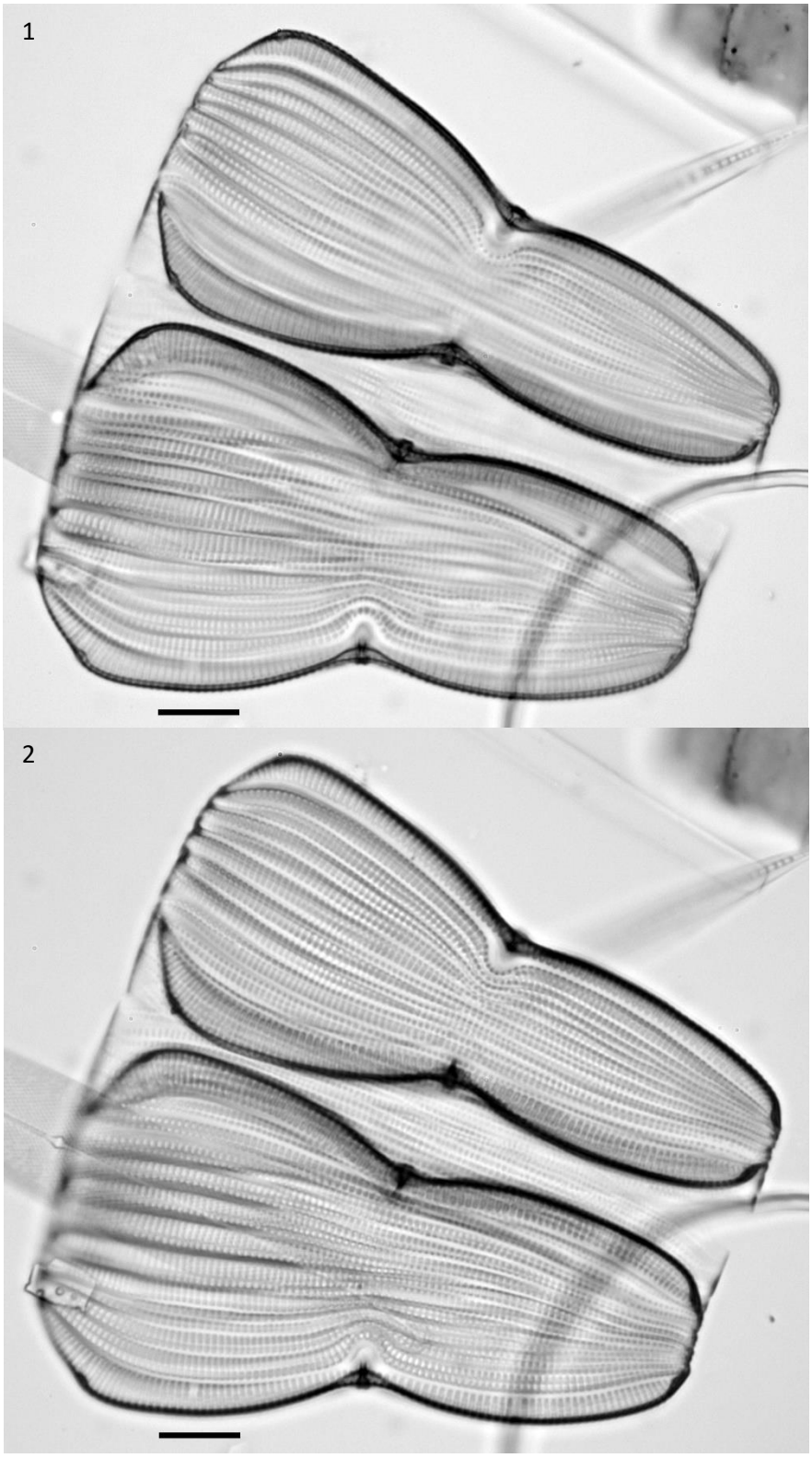


# Plate 40

| | | |
|---|---|---|
| 1 | Druehlago sp1 | 60x. Scale bar 10 µm. Low focus on central constrictions of daughter valves. From Majewska et al. (2021). |
| 2 | Druehlago sp1 | 60x. Scale bar 10 µm. High focus on copulae of parent cell. From Majewska et al. (2021). |

Plate 40

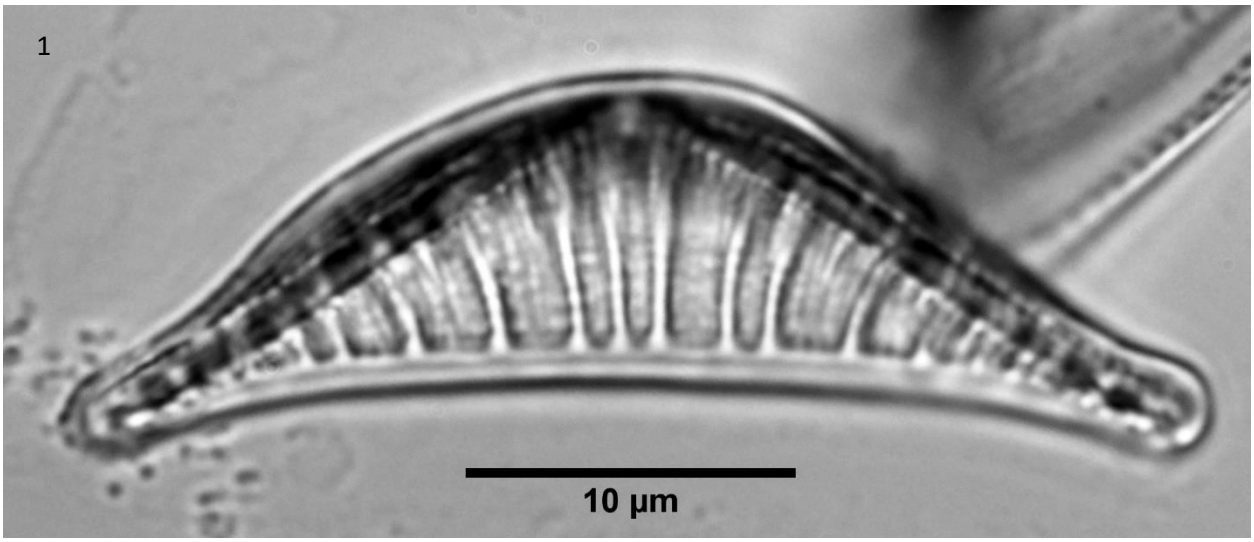


**Epithemioid**
**Transapical symmetry. Raphe eccentric and on a canal.**

Plate 41

1 Rhopalodia gibberula 100x. Scale bar 10 µm. From Sims (ed.) (1996) pl 252 fig 8.

Plate 41



## Nitzschioid
## Bilateral symmetry. Raphe on a canal on a keel.

Plate 42

| | | |
|---|---|---|
| 1 | Nitzschia sp1 | 100x. Scale bar 10 µm. Inside view. Raphe canal is central on valve face instead of eccentric as in many Nitzschia. A conopeate species. SEM needed to distinguish from other conopeates. Full valve in pl 42 fig 2 (#6418). From Lobban (2022 pers comm); Sims (ed.) (1996) pl 181 fig 1; Lobban et al. (2012) pl 59 fig 3-5. |
| 2 | Nitzschia sp1 | 60x, OL, NA065. Scale bar 10 µm. Inside view. High focus on outline. Raphe canal is central to valve face, instead of eccentric as in many Nitzschia. A conopeate species. SEM needed to distinguish from other conopeates. 100x view in pl 42 fig 1 (#1244). From Lobban (2022 pers comm); Sims (ed.) (1996) pl 181 fig 1; Lobban et al. (2012) pl 59 fig 3-5. |
| 3 | Nitzschia coarctata | 100x, BF, NA070. Scale bar 10 µm. Internal view. L 74, W (at central constriction) 16 µm. High focus F1. Depth from coverslip 0. Striae 10.5 in 10 µm. From Sims (ed.) (1996) pl 182 fig 3; Lobban et al. (2012) for N. constricta comparison. |
| 4 | Nitzschia coarctata | 100x, BF, NA070. Scale bar 10 µm. Internal view. Focus F2. From Sims (ed.) (1996) pl 182 fig 3; Lobban et al. (2012) for N. constricta comparison. |
| 5 | Nitzschia coarctata | 100x, BF, NA070. Scale bar 10 µm. Internal view. Focus F3. From Sims (ed.) (1996) pl 182 fig 3; Lobban et al. (2012) for N. constricta comparison. |
| 6 | Nitzschia coarctata | 100x, BF, NA070. Scale bar 10 µm. Internal view. Focus F4. From Sims (ed.) (1996) pl 182 fig 3; Lobban et al. (2012) for N. constricta comparison. |
| 7 | Nitzschia coarctata | 100x, BF, NA070. Scale bar 10 µm. Internal view. Low focus F5. From Sims (ed.) (1996) pl 182 fig 3; Lobban et al. (2012) for N. constricta comparison. |

Plate 42

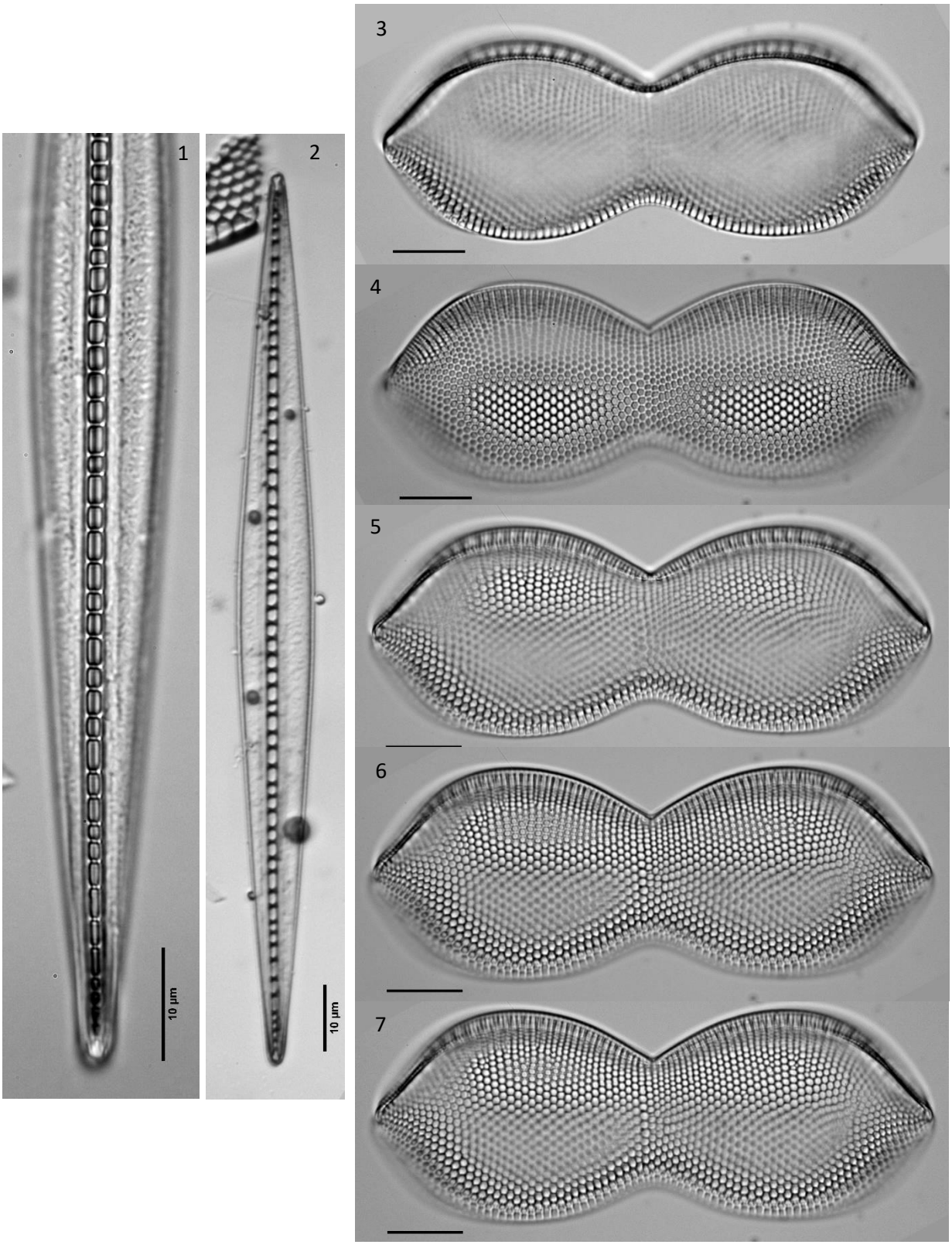
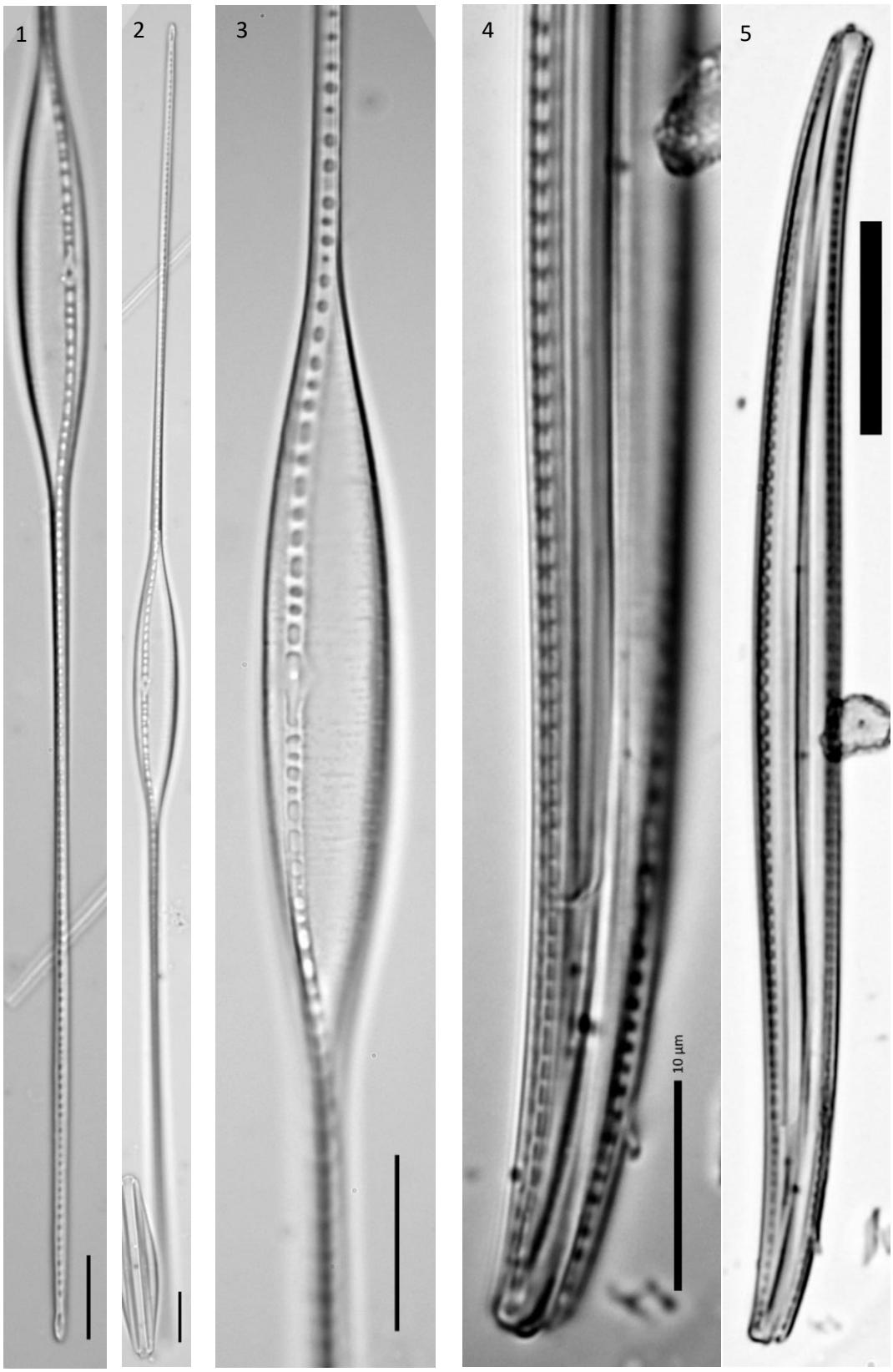


Plate 43

| | | |
|---|---|---|
| 1 | Nitzschia longissima | 60x. Scale bar 10 µm. From Lobban et al. (2012) pl 60 fig 9, pl 61 fig 1. |
| 2 | Nitzschia longissima | 60x. Scale bar 10 µm. From Lobban et al. (2012) pl 60 fig 9, pl 61 fig 1. |
| 3 | Nitzschia longissima | 100x. Scale bar 10 µm. Focus on central nodule with some striae just visible. From Lobban et al. (2012) pl 60 fig 9, pl 61 fig 1. |
| 4 | Nitzschia sigma | 100x. Girdle view. Detail of an apex of complete frustule with a raphe on each valve. From Sims (ed.) (1996) pl 190 fig 1. |
| 5 | Nitzschia sigma | 40x. Scale bar 20 µm. Girdle view. Detail in # 0299. From Sims (ed.) (1996) pl 190 fig 1. |

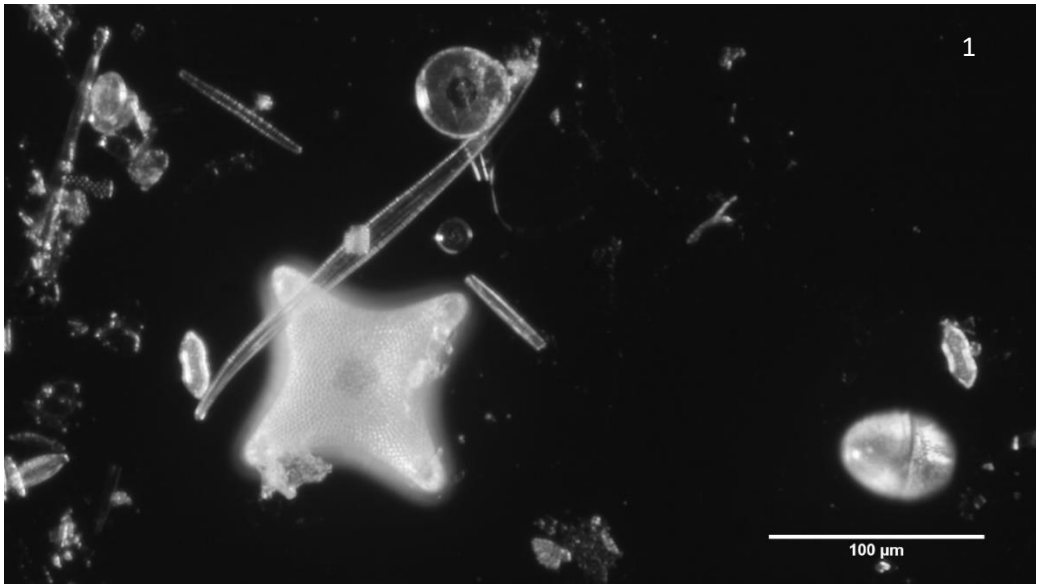
Plate 43

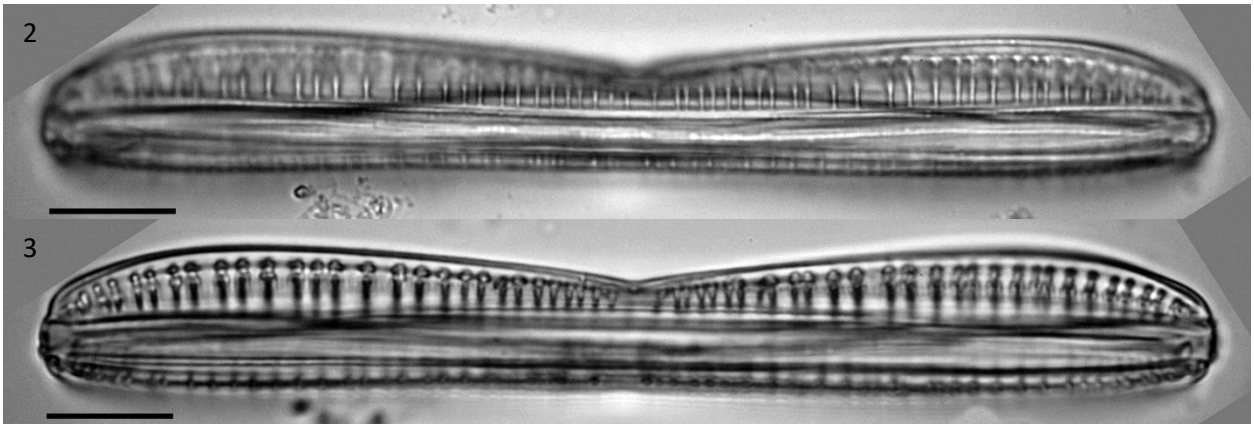


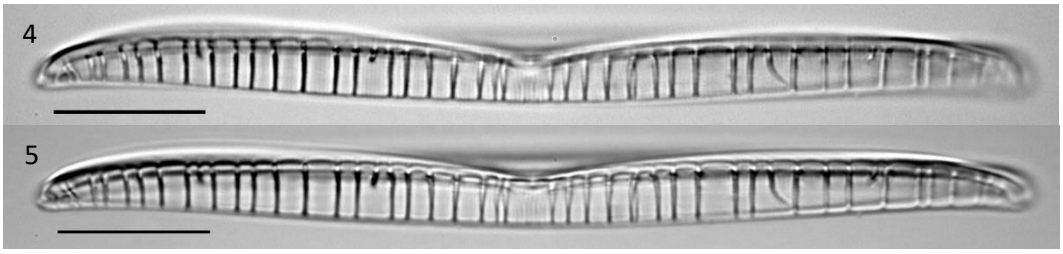
# Plate 44

| | | |
|---|---|---|
| 1 | Nitzschia sigma | 10x, OL. Scale bar 100 µm. Reflected illumination, with light shining in from the side of the slide, showing the glassiness of the diatoms. From Sims (ed.) (1996) pl 190 fig 1 for N. sigma. |
| 2 | Nitzschia sp2 | 100x. Scale bar 10 µm. Girdle view. High focus on central girdle bands. Raphe appears to be on a raised keel lower at the valve center. Long fibulae starting at valve margin. |
| 3 | Nitzschia sp2 | 100x. Scale bar 10 µm. Girdle view. Low focus on outline. Raphe appears to be on a raised keel lower at the valve center. Long fibulae starting at valve margin. |
| 4 | Nitzschia sp2 | 100x. Scale bar 10 µm. Faint striae in central area. From Kimmich (2022) nitzschioid key. |
| 5 | Nitzschia sp2 | 100x. Scale bar 10 µm. Focus on center and apices. From Kimmich (2022) nitzschioid key. |
| 6 | Nitzschia sp2 | 100x. Scale bar 10 µm. Focus on raphe. From Kimmich (2022) nitzschioid key. |

Plate 44



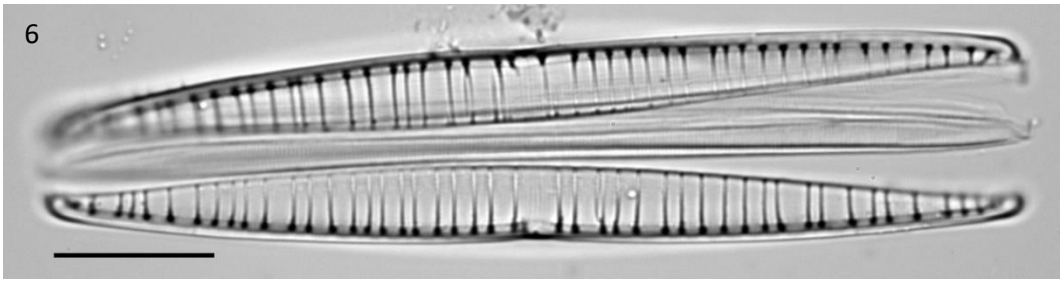



Plate 45

| | | |
|---|---|---|
| 1 | Nitzschia ventricosa | 100x. Scale bar 10 µm. From Lobban et al. (2012) pl 62 fig 1-2. |
| 2 | Nitzschia ventricosa | 40x. From Lobban et al. (2012) pl 62 fig 1-2. |
| 3 | Nitzschia ventricosa | 60x. Scale bar 10 µm. From Lobban et al. (2012) pl 62 fig 1-2. |
| 5 | Nitzschia ventricosa | 60x. Scale bar 10 µm. From Lobban et al. (2012) pl 62 fig 1-2. |
| 4 | Nitzschia ventricosa | 100x. Scale bar 10 µm. Focus on central nodule. From Lobban et al. (2012) pl 62 fig 1-2. |
| 6 | Nitzschia ventricosa | 100x. Scale bar 10 µm. Focus on ridge of keel. From Lobban et al. (2012) pl 62 fig 1-2. |

Plate 45

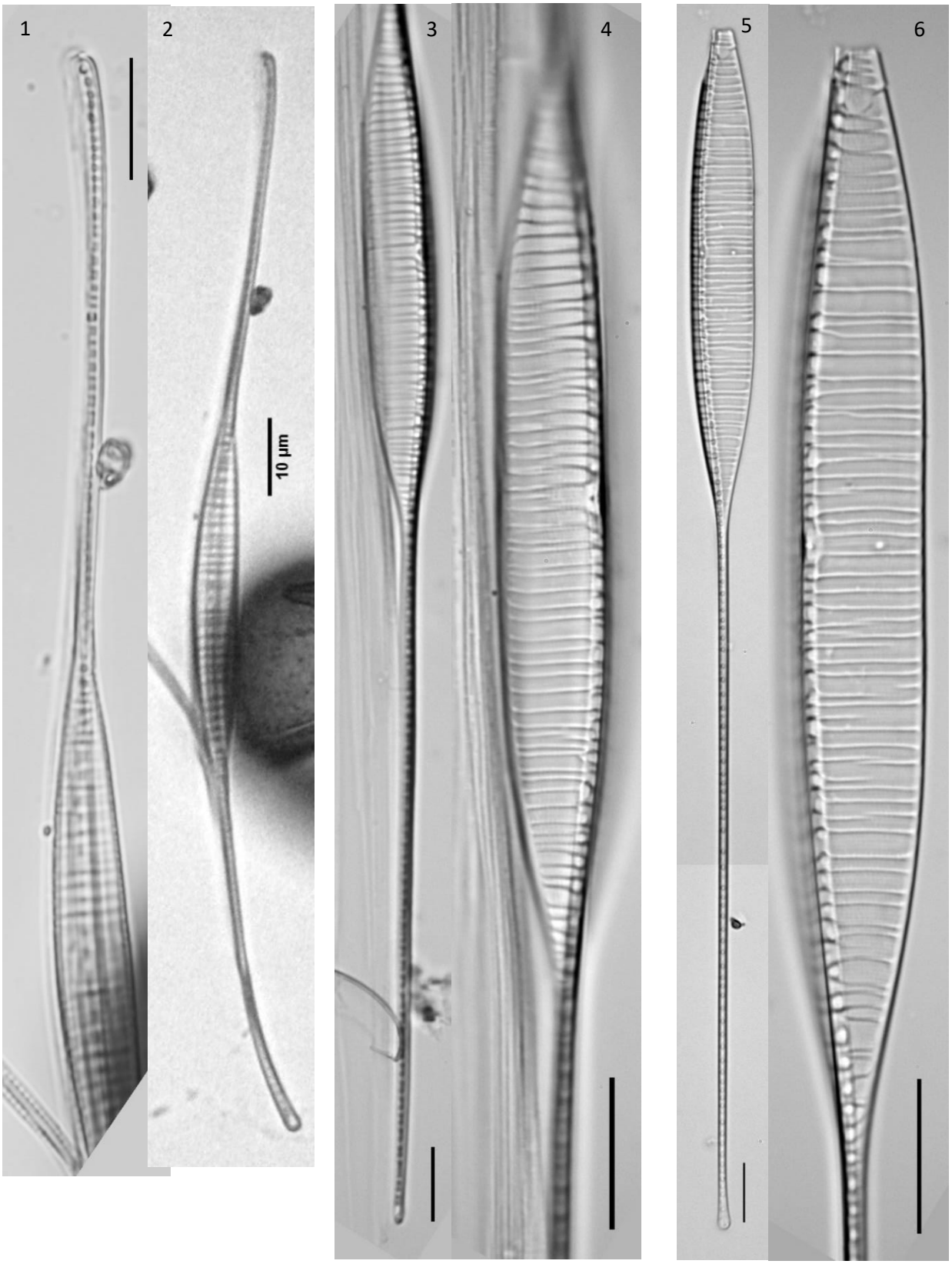
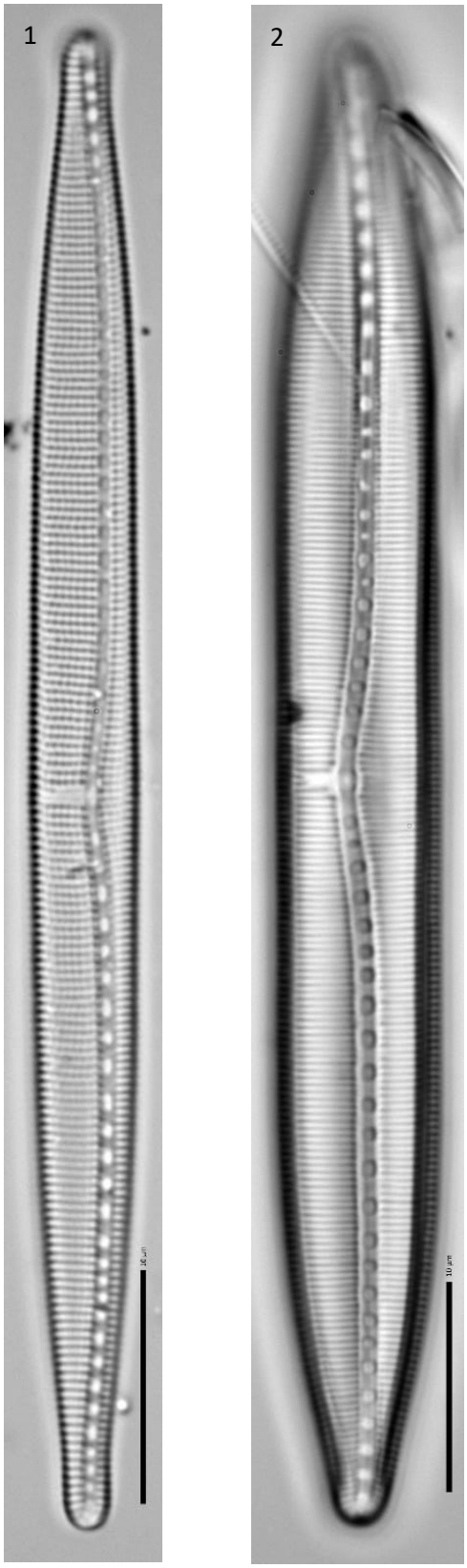


Plate 46

| | | |
|---|---|---|
| 1 | Nitzschia vidovichii | 100x. From Navarro & Lobban (2009) fig 102-104; Stidolph et al. (2012) pl 25 fig 92. |
| 2 | Nitzschia vidovichii | 100x. Whole frustule. 100x. From Navarro & Lobban (2009) fig 102-104; Stidolph et al. (2012) pl 25 fig 92. |

Plate 46

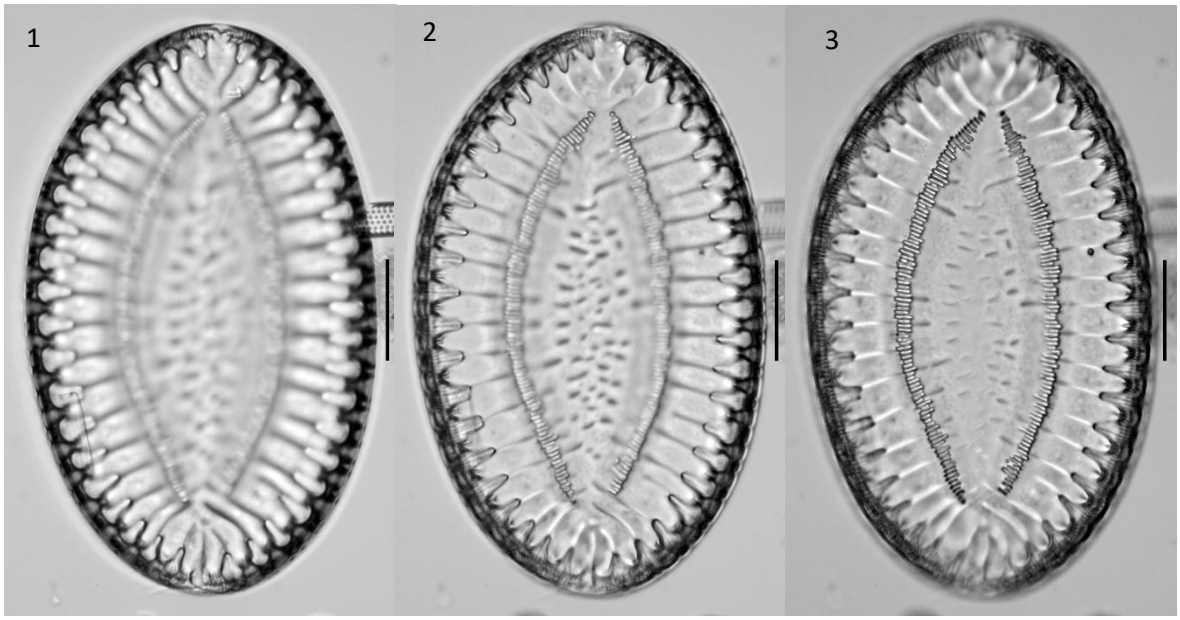


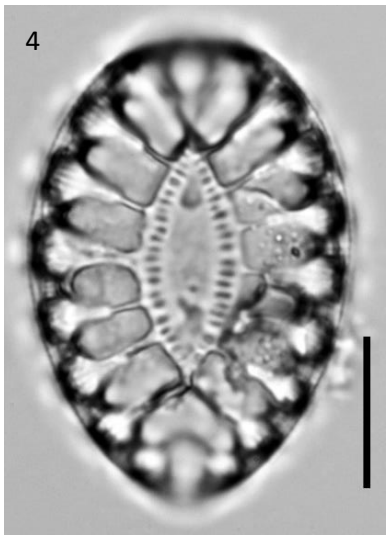
## Surirelloid
## Bilateral symmetry. Raphe on a canal on a keel on the perimeter.

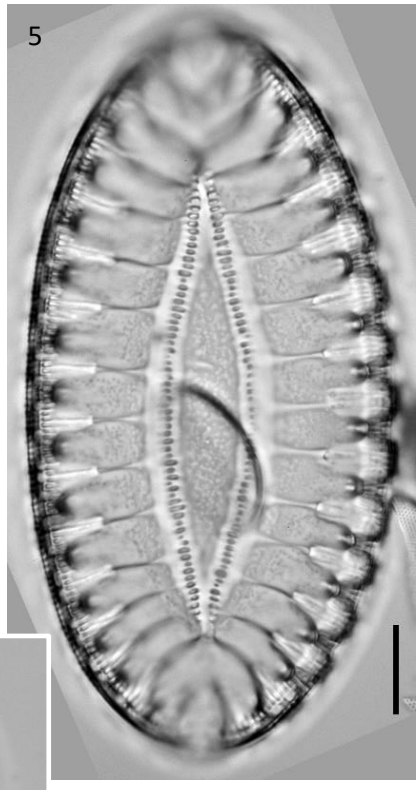
Plate 47

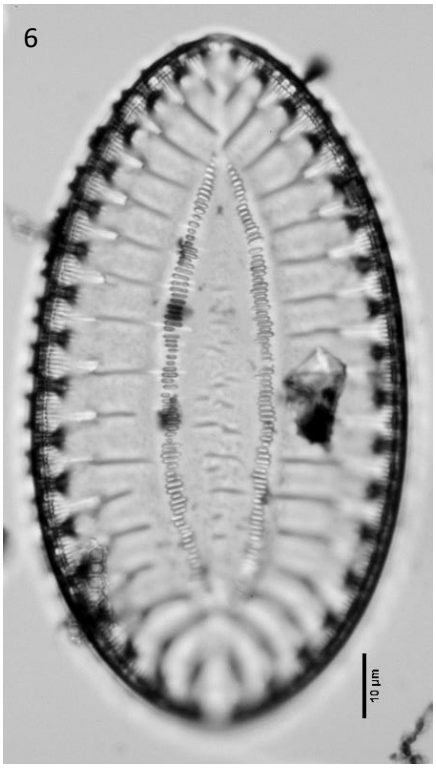
| | | |
|---|---|---|
| 1 | Campylodiscus collare | 60x. Scale bar 20 µm. L 113, W = 70 µm. High focus on outline. From Paddock, T.B.B. (1985) fig. A5; Schmidt (1874-1959) pl 4 fig 14. |
| 2 | Campylodiscus collare | 60x. Scale bar 20 µm. Middle focus on infundibula. From Paddock, T.B.B. (1985) fig. A5; Schmidt (1874-1959) pl 4 fig 14. |
| 3 | Campylodiscus collare | 60x. Scale bar 20 µm. Low focus on circlet. From Paddock, T.B.B. (1985) fig. A5; Schmidt (1874-1959) pl 4 fig 14. |
| 4 | Campylodiscus comis | 100x. Scale bar 10 µm. Has infundibula. No ornamentation in center. From Sims (ed.) (1996) pl 269 fig 1. |
| 5 | Campylodiscus comis | 100x. Scale bar 10 µm. Focus on outline and center. Assigned to S. comis by the unornamented central area. From Sims (ed.) (1996) pl 269 fig 1. |
| 6 | Campylodiscus neofastuosus | 60x, BF, NA050. Scale bar 10 µm. Focus on circlet and infundibula. From Sims (ed.) (1996) pl 273 fig 1. |
| 7 | Campylodiscus sp1 | 60x, BF. Scale bar 10 µm. Has infundibula. From Round et al. (1990.) |

Plate 47



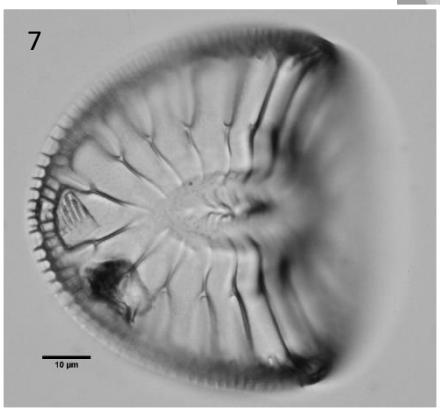



Plate 48

| | | |
|---|---|---|
| 1 | Campylodiscus neofastuosus | 100x. Scale bar 10 µm. High focus on central area and central outline. From Sims (ed.) (1996). |
| 2 | Campylodiscus neofastuosus | 100x. Scale bar 10 µm. Low focus on apices. From Sims (ed.) (1996). |
| 3 | Campylodiscus neofastuosus | 100x. Scale bar 10 µm. Focus on central circlet. Apical axes in lower focal plane. |
| 4 | Campylodiscus neofastuosus | 100x. Scale bar 10 µm. High focus on online. From Sims (ed.) (1996) pl 270-273. |
| 5 | Campylodiscus neofastuosus | 100x. Scale bar 10 µm. Mid focus on infundibula. From Sims (ed.) (1996) pl 270-273. |
| 6 | Campylodiscus neofastuosus | 100x. Scale bar 10 µm. Low focus on central area. From Sims (ed.) (1996) pl 270-273. |
| 7 | Campylodiscus sp7 | 100x. Scale bar 10 µm. Internal view. High focus. In Campylodiscus Fastuosae group because of infundibula. From Ruck et al. (2016) Fig 3 node 4. |
| 8 | Campylodiscus sp7 | 100x. Scale bar 10 µm. Internal view. Low focus. In the Fastuosae. |

Plate 48

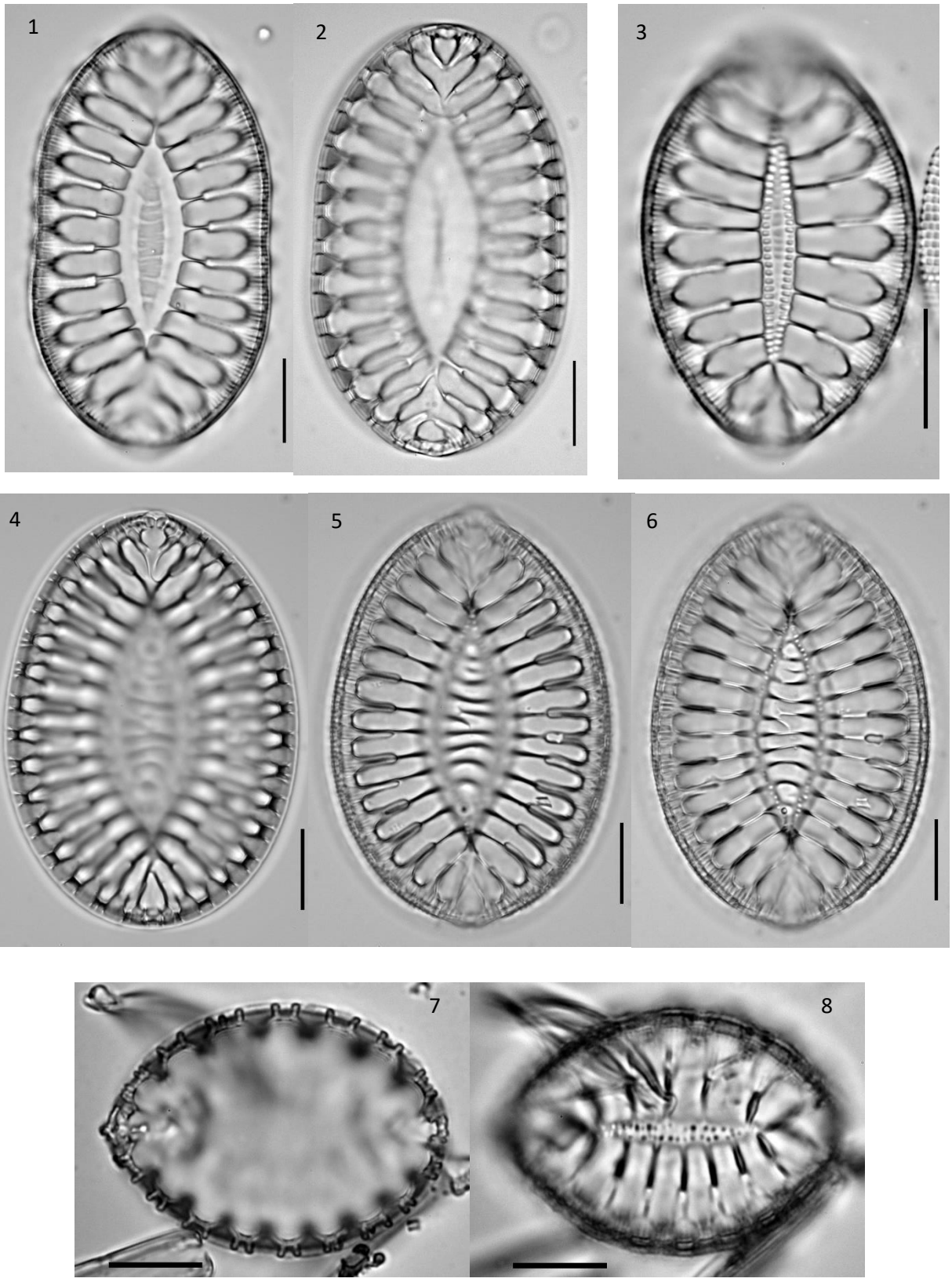
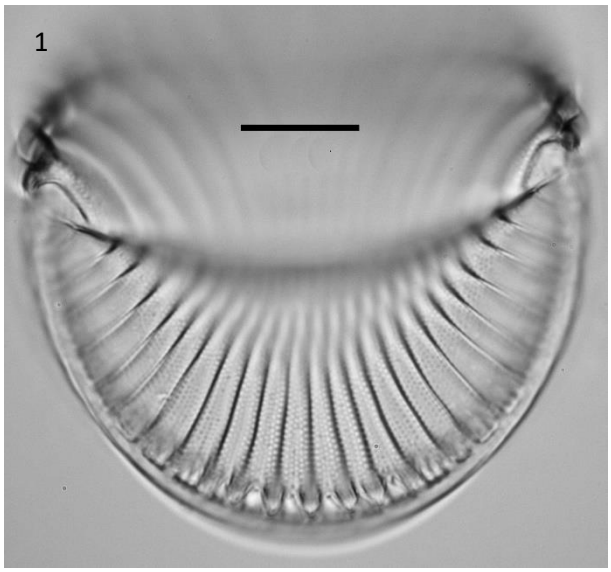
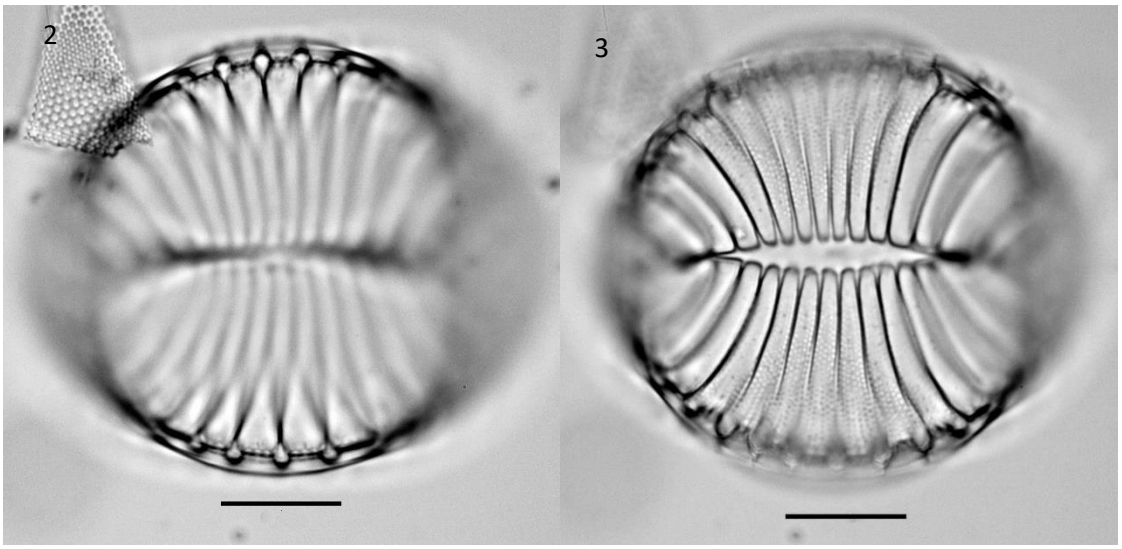


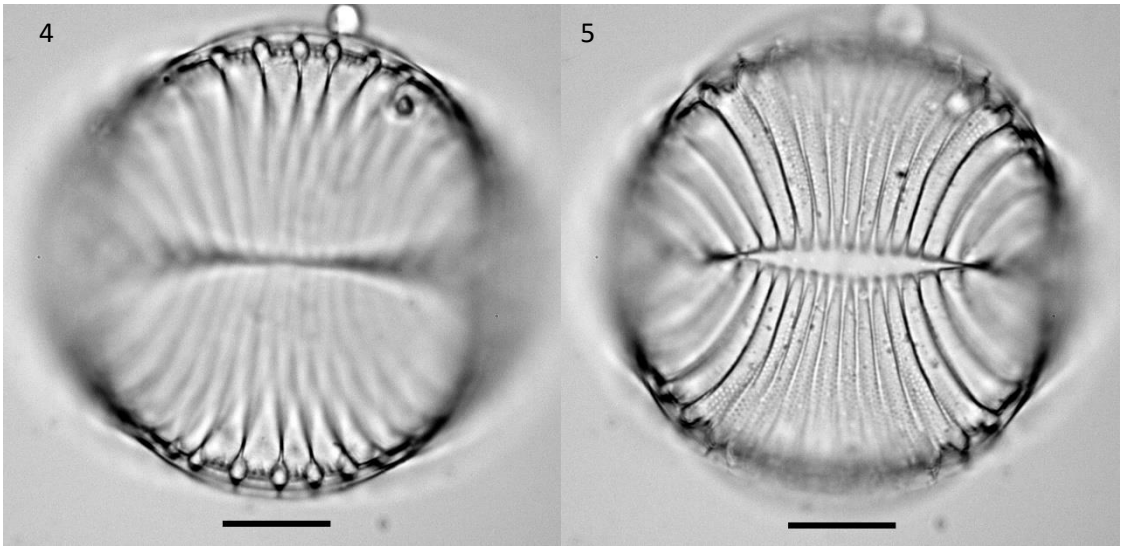
Plate 49

| | | |
|---|---|---|
| 1 | Coronia decorus | 100x, BF. Scale bar 10 µm. Focus on visible areolae in striae. From Lobban et al. (2012) pl 64 fig 5-6; Schmidt (1874-1959) pl 14 fig 4; Ruck et al. (2016) Fig 3 node 4. |
| 2 | Coronia decorus | 100x, BF. Scale bar 10 µm. High focus on outline. From Lobban et al. (2012) pl 64 fig 5-6; Schmidt (1874-1959) pl 14 fig 4; Ruck et al. (2016) Fig 3 node 4. |
| 3 | Coronia decorus | 100x, BF. Scale bar 10 µm. Low focus on areolae. From Lobban et al. (2012) pl 64 fig 5-6; Schmidt (1874-1959) pl 14 fig 4; Ruck et al. (2016) Fig 3 node 4. |
| 4 | Coronia decorus | 100x, BF. Scale bar 10 µm. High focus on outline. From Lobban et al. (2012) pl 64 fig 5-6; Schmidt (1874-1959) pl 14 fig 4; Ruck et al. (2016) Fig 3 node 4. |
| 5 | Coronia decorus | 100x, BF. Scale bar 10 µm. Low focus on areolae. From Lobban et al. (2012) pl 64 fig 5-6; Schmidt (1874-1959) pl 14 fig 4; Ruck et al. (2016) Fig 3 node 4. |

Plate 49



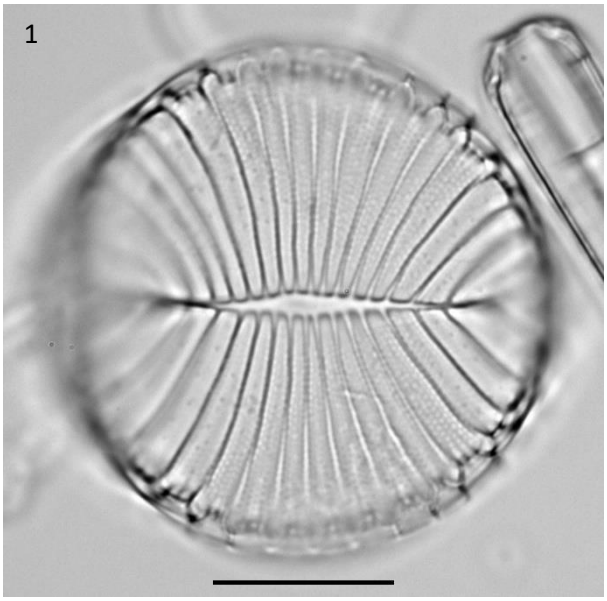



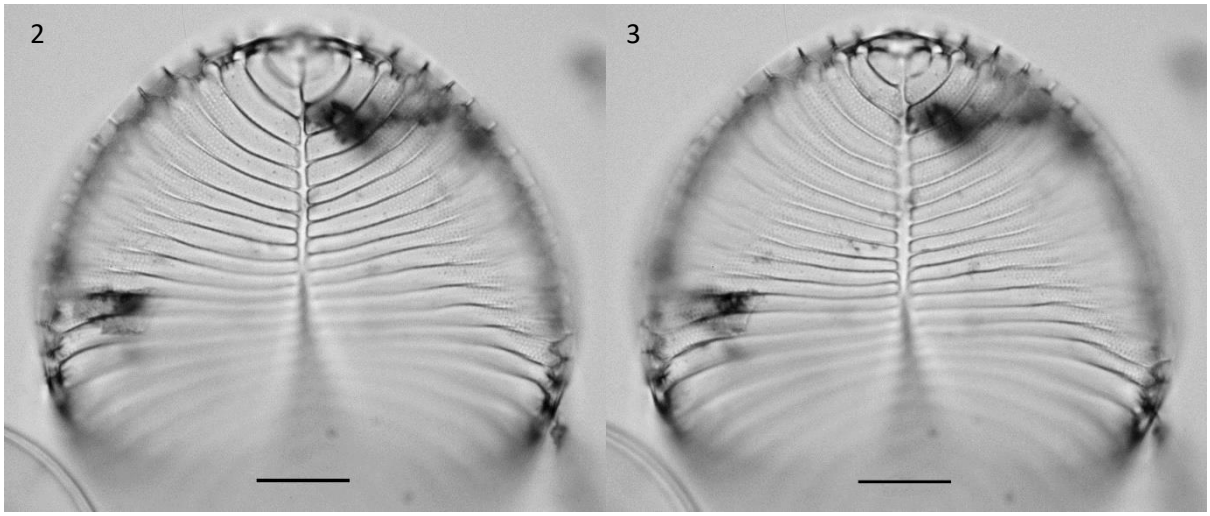



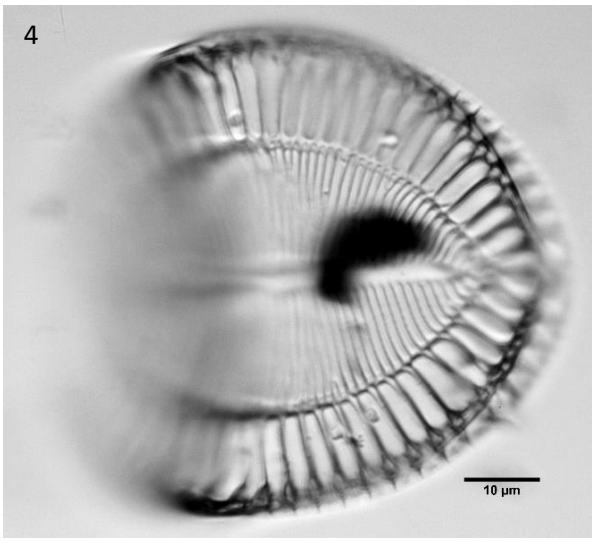
# Plate 50

| | | |
|---|---|---|
| 1 | Coronia decorus | 100x. Scale bar 10 µm. Mid focus. Apical axis (along the hyaline central area) curving away and transapical axis curving toward observer. From Lobban et al. (2012) pl 64 fig 5-6; Schmidt (1874-1959) pl 14 fig 4; Ruck et al. (2016) Fig 3 node 4. |
| 2 | Coronia decorus | 100x, BF, NA090. Scale bar 10 µm. Mid focus. Areolae visible. From Lobban et al. (2012) pl 64 fig 5-6; Schmidt (1874-1959) pl 14 fig 4; Ruck et al. (2016) Fig 3 node 4. |
| 3 | Coronia decorus | 100x, BF, NA090. Scale bar 10 µm. Low focus. Areolae visible. From Lobban et al. (2012) pl 64 fig 5-6; Schmidt (1874-1959) pl 14 fig 4; Ruck et al. (2016) Fig 3 node 4. |
| 4 | Coronia samoensis | 60x, OL. Scale bar 10 µm. Structures along margin are not infundibula. From Schmidt pl 15 fig 20; Ruck et al. (2016) Fig 3 node 4. |

Plate 50



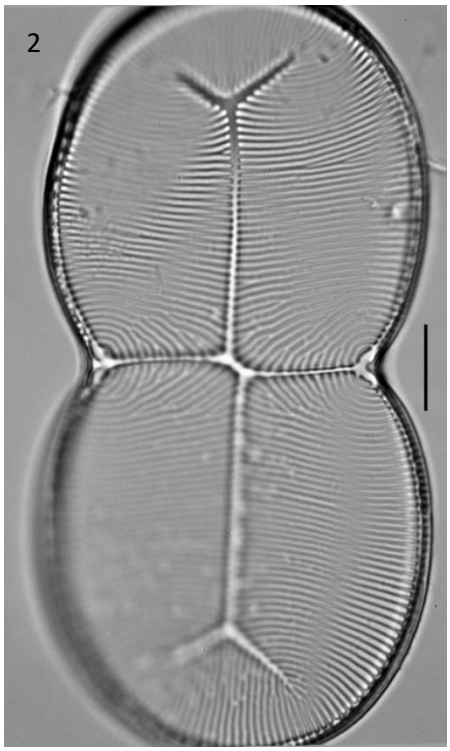



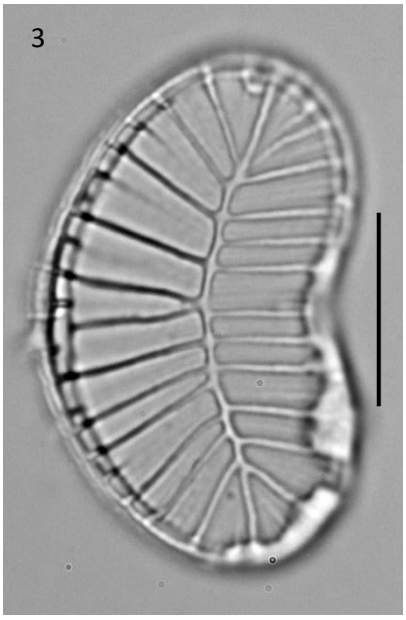



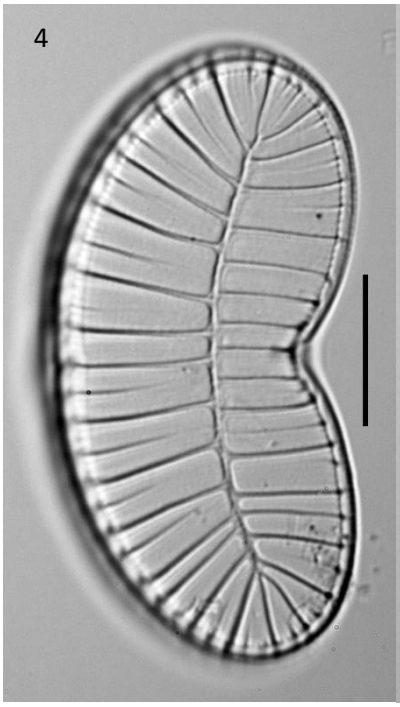
# Plate 51

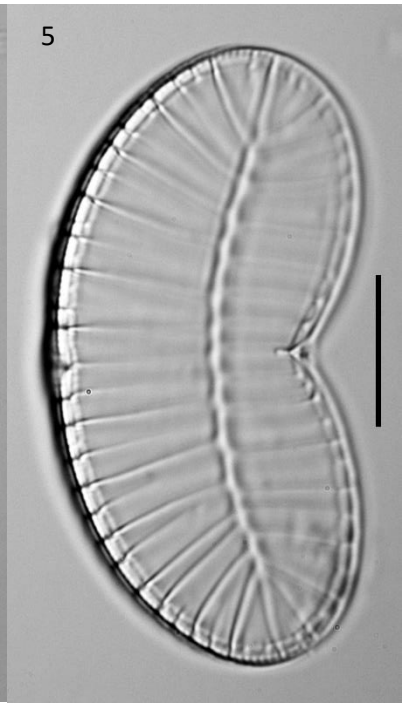
| | | |
|---|---|---|
| 1 | Hydrosilicon mitra | 40x, COL, Abbe condenser. Scale bar 10 µm. From Round et al. (1990) p 636. |
| 2 | Hydrosilicon mitra | 100x. Scale bar 10 µm. From Round et al. (1990) p 636. |
| 3 | Plagiodiscus nervatus | 100x. Scale bar 10 µm. From Stidolph et al. (2012) pl 26 fig 108; Round et al. (1990) p 640 for SEM. |
| 4 | Plagiodiscus nervatus | 100x, OL, NA090. Scale bar 10 µm. High focus. From Stidolph et al. (2012) pl 26 fig 108; Round et al. (1990) p 640 for SEM. |
| 5 | Plagiodiscus nervatus | 100x, OL, NA090. Scale bar 10 µm. Low focus on raphe ends in center. From Stidolph et al. (2012) pl 26 fig 108; Round et al. (1990) p 640 for SEM. |

Plate 51

## Acknowledgements

Michael J Sullivan (Emeritus, Mississippi State University) provided Diploneis species identifications. Mady Kimmich provided companionship on collecting trips.

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Second Edition
Published in the April 2023 issue of Micscape Magazine.
www.micscape.org

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(First Edition published in November 2022.)