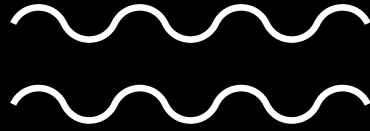


Phytoplankton ID Guide

Common HAB species in the Gulf of Maine and their look-alikes. All photos taken under the 10x objective lens.

Department of Marine Resources



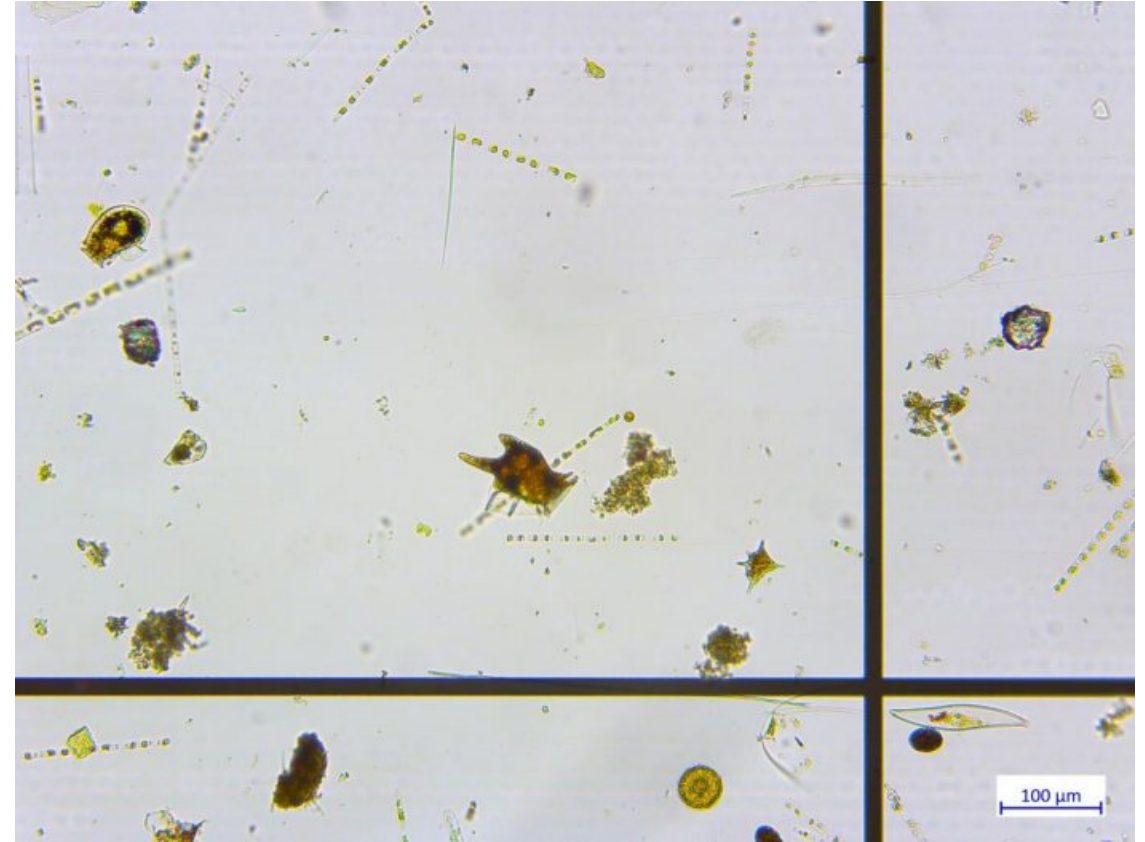
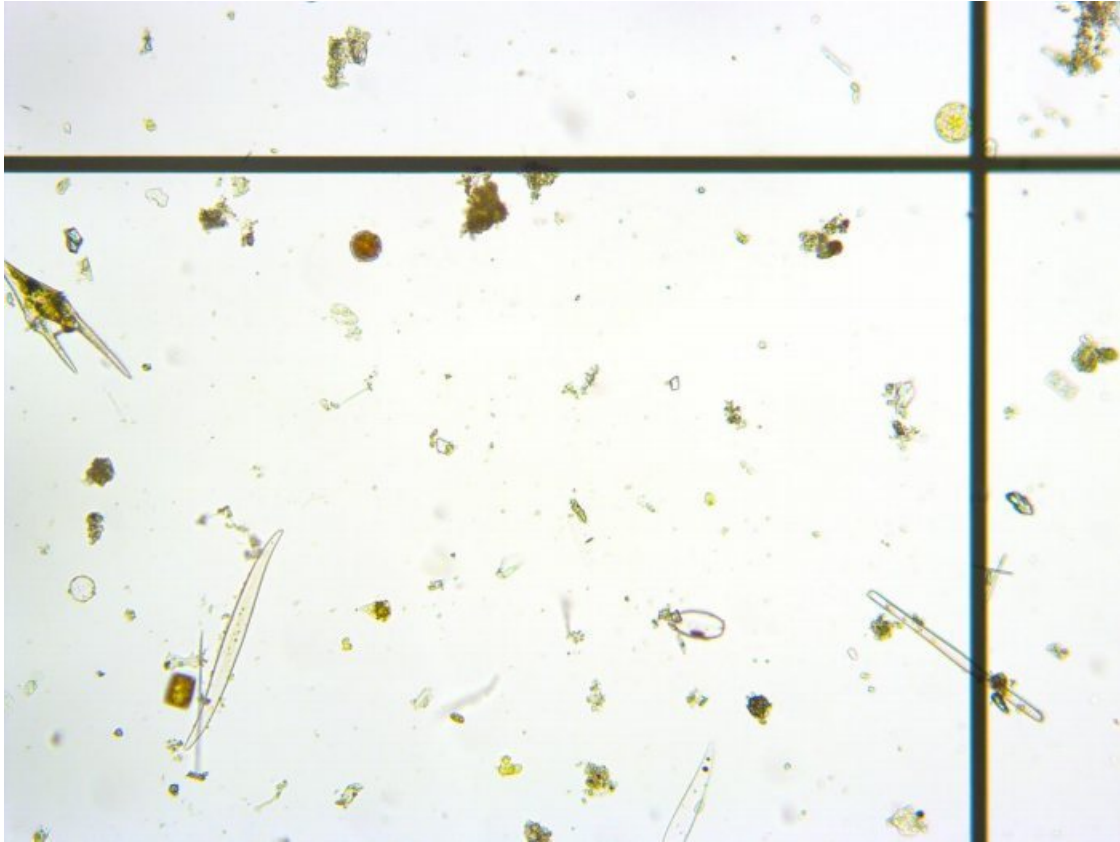
About this Guide

- Every photo was taken under the 10x objective by DMR staff.
- Some photos have been enlarged for a better view of cell structures, but all cell sizes are relative within a photo.
- Other Resources
 - Algae Base: <https://www.algaebase.org/>
 - Marine Species ID Portal: http://species-identification.org/species.php?species_group=dinoflagellates&menuentry=identifying#
 - DMR Volunteer Documents: <https://www.maine.gov/dmr/shellfish-sanitation-management/programs/phytovolunteers/index.html>

Terms

- Girdle = central band of a dinoflagellate where the flagella (cingulum) is found
- Transapical axis = width of cell
- Apex = the top of an armored dinoflagellate cell
- Epitheca = top of an armored dinoflagellate, or diatom (above girdle)
- Hypotheca = bottom of an armored dinoflagellate, or diatom (below girdle)
- Hypocone = top of an unarmored dinoflagellate (above girdle)
- Epicone = bottom of an unarmored dinoflagellate (below girdle)

Dinoflagellates



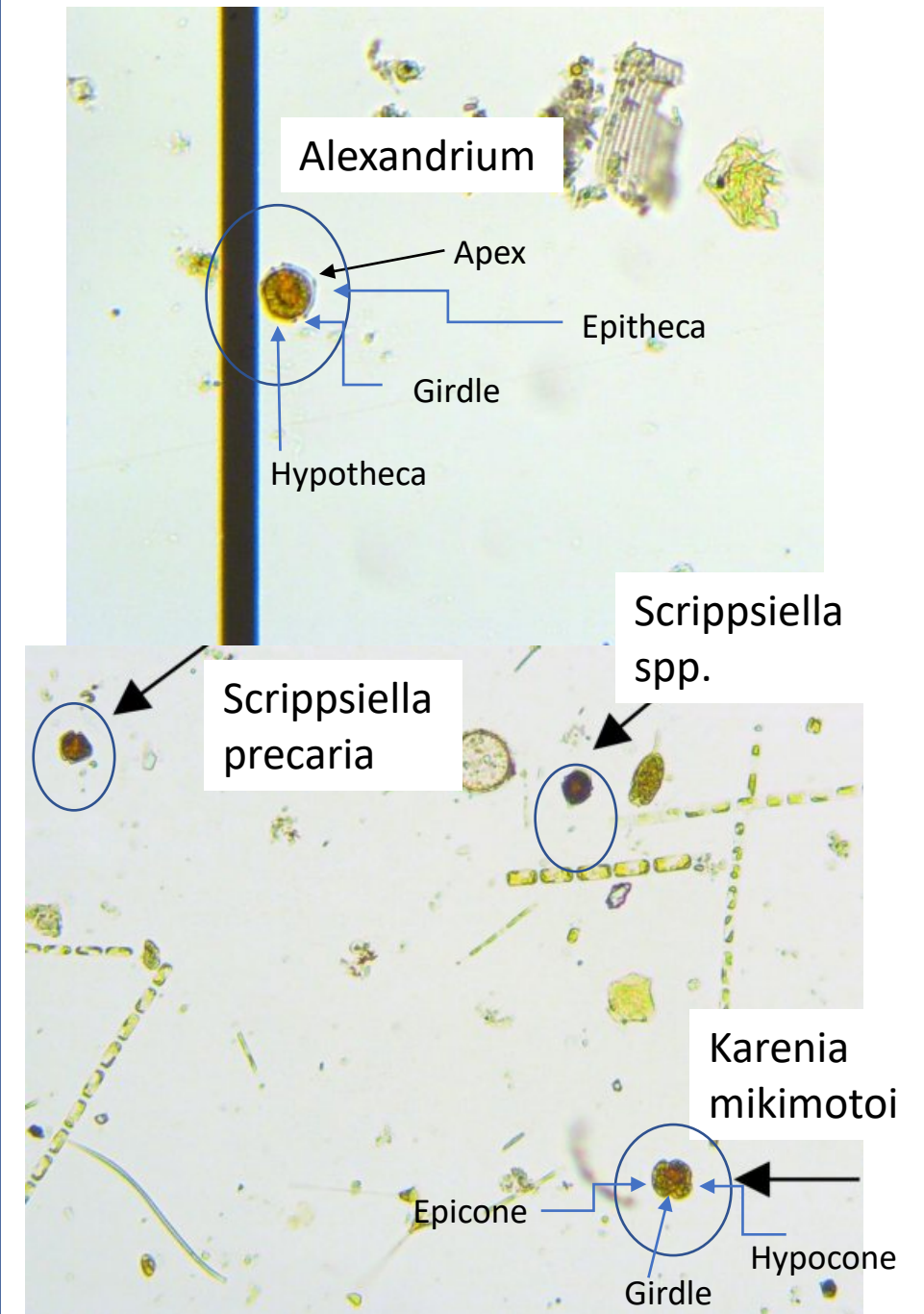
Alexandrium and Look –Alikes

Armored Dinoflagellates

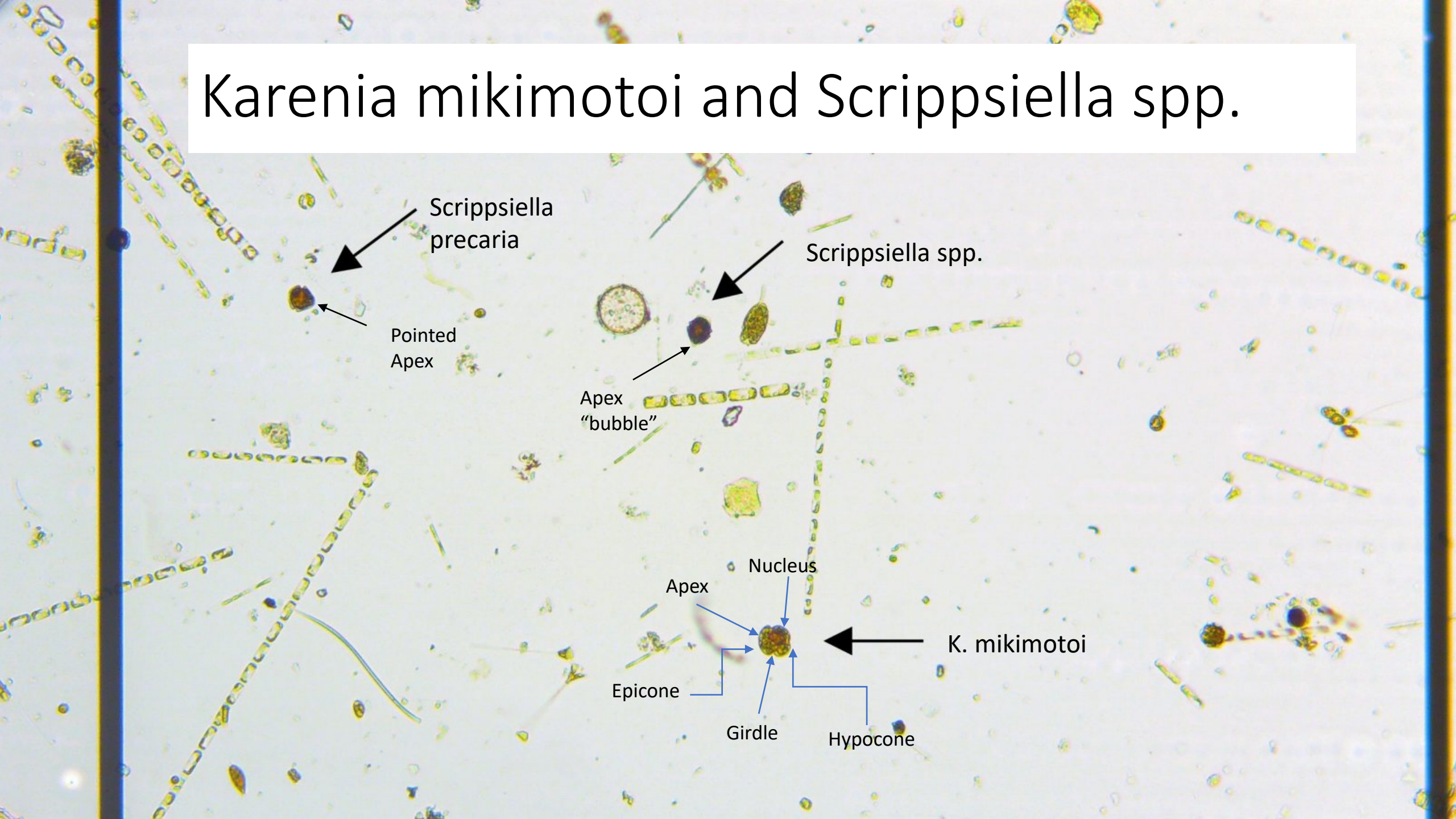
- *Alexandrium spp.*
 - Defined, even girdle
 - Rounded apex
- *Scrippsiella spp.*
 - Defined, even cingulum
 - Pointed apex
 - Generally a “bubble” like structure at the apex
- *Scrippsiella precaria*
 - Pointed apex, no “bubble”

Unarmored Dinoflagellates

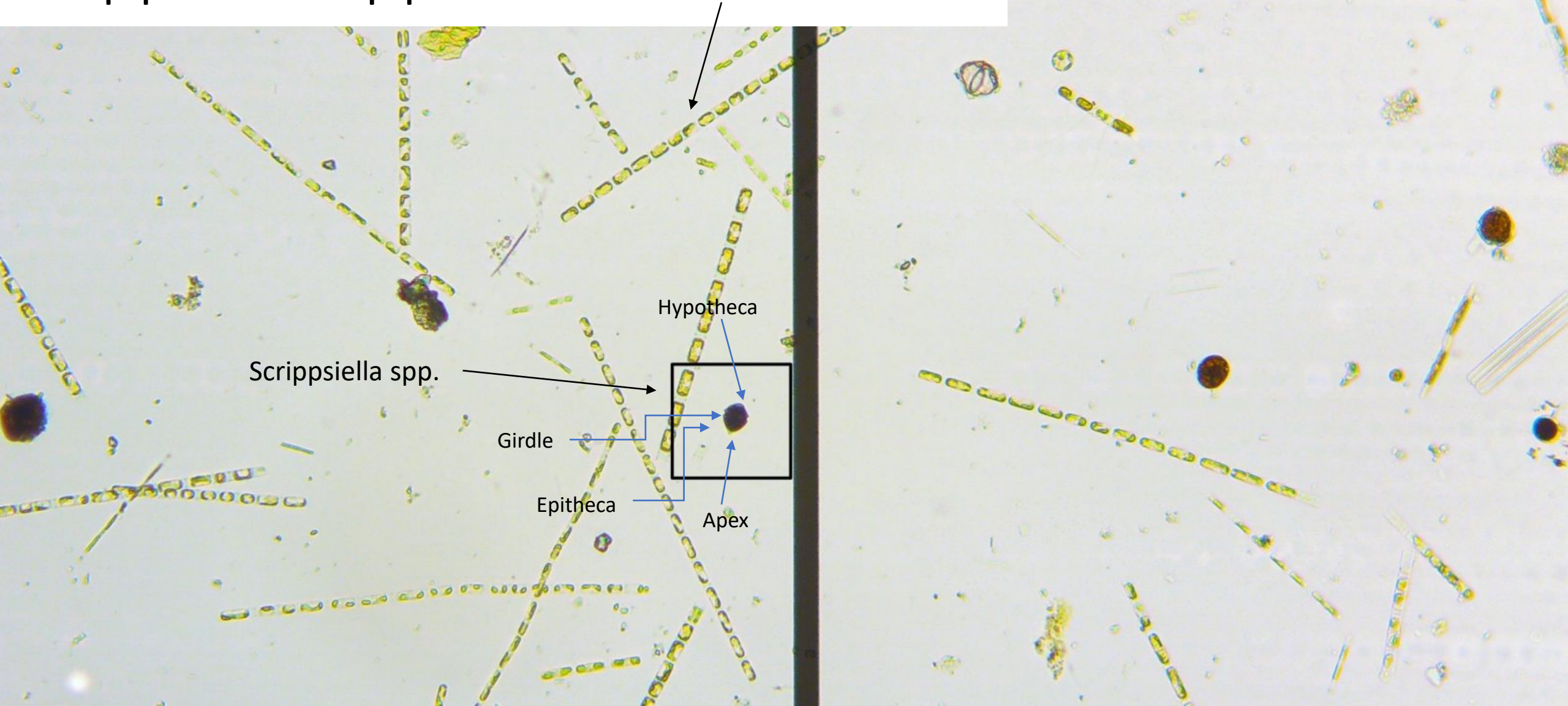
- *Karenia mikimotoi*
 - Less defined, uneven girdle
 - Visible nucleus in the hypocone and epicone
 - Rounded epicone



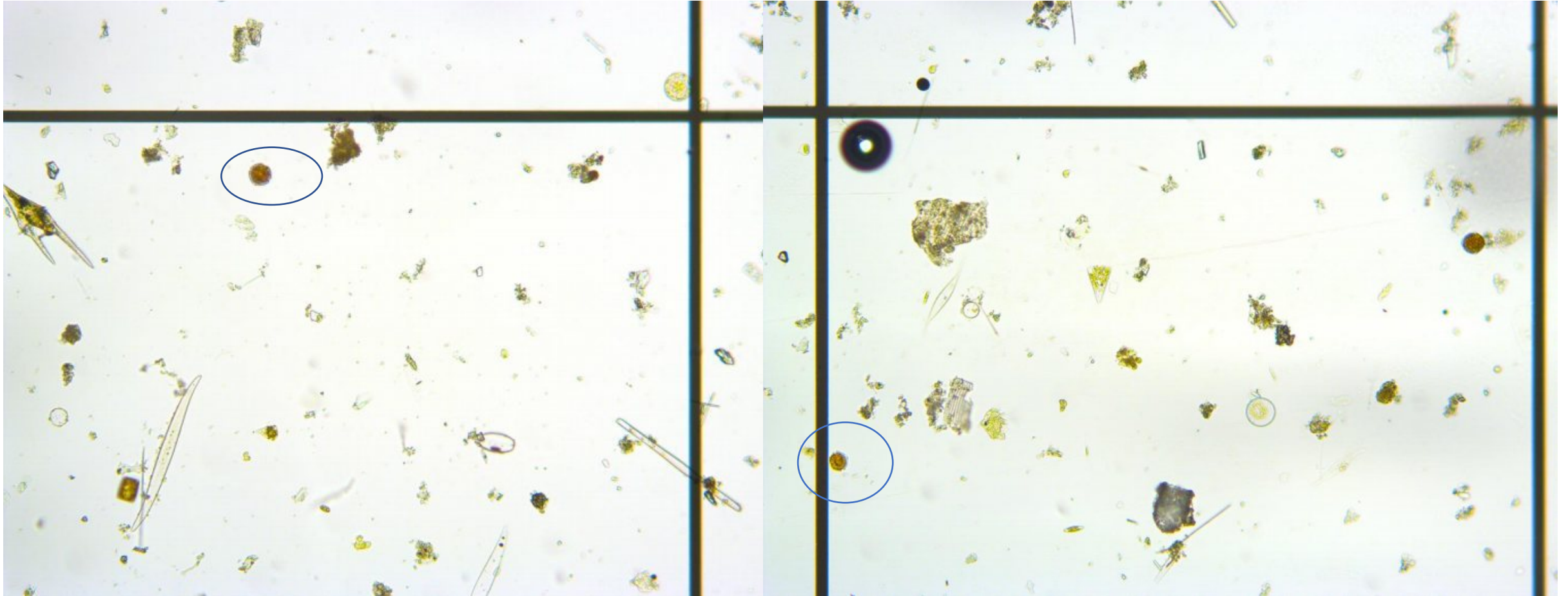
Karenia mikimotoi and Scripppsiella spp.



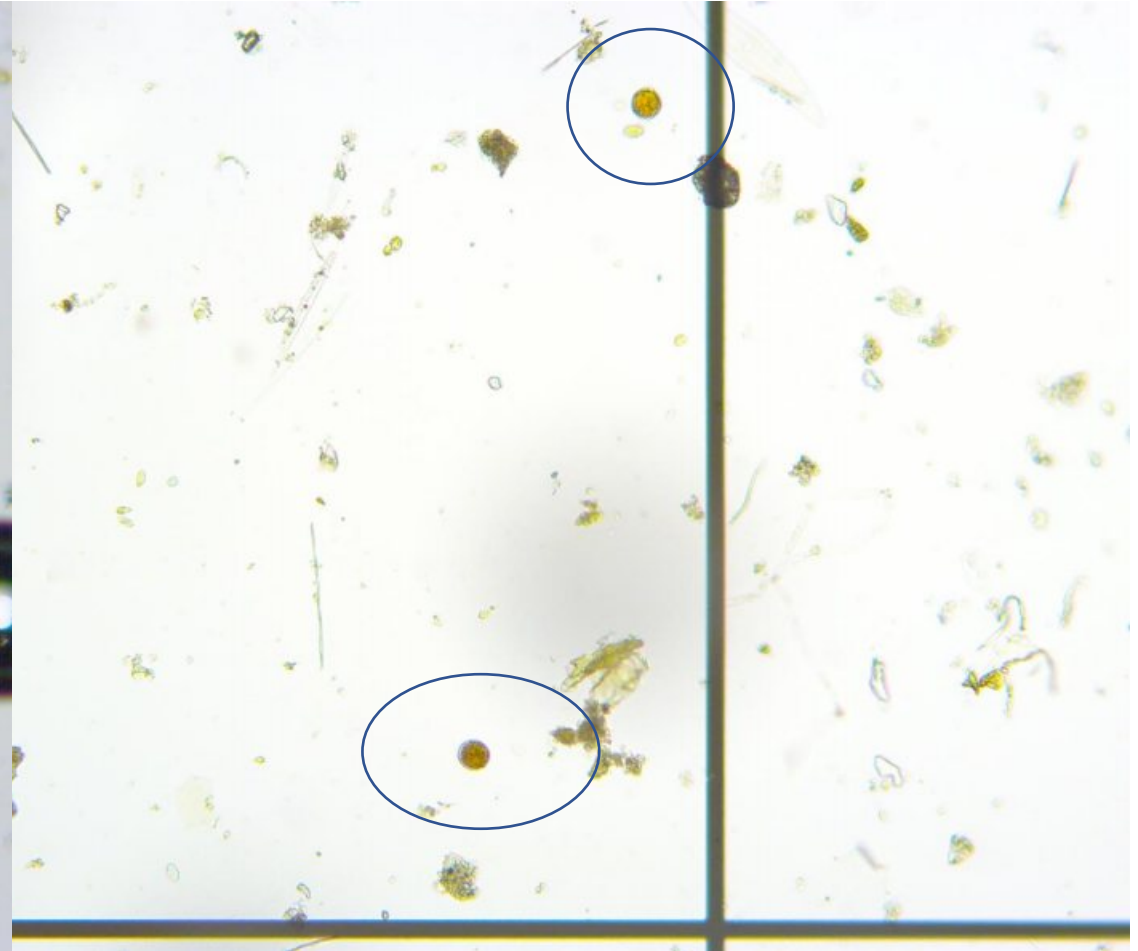
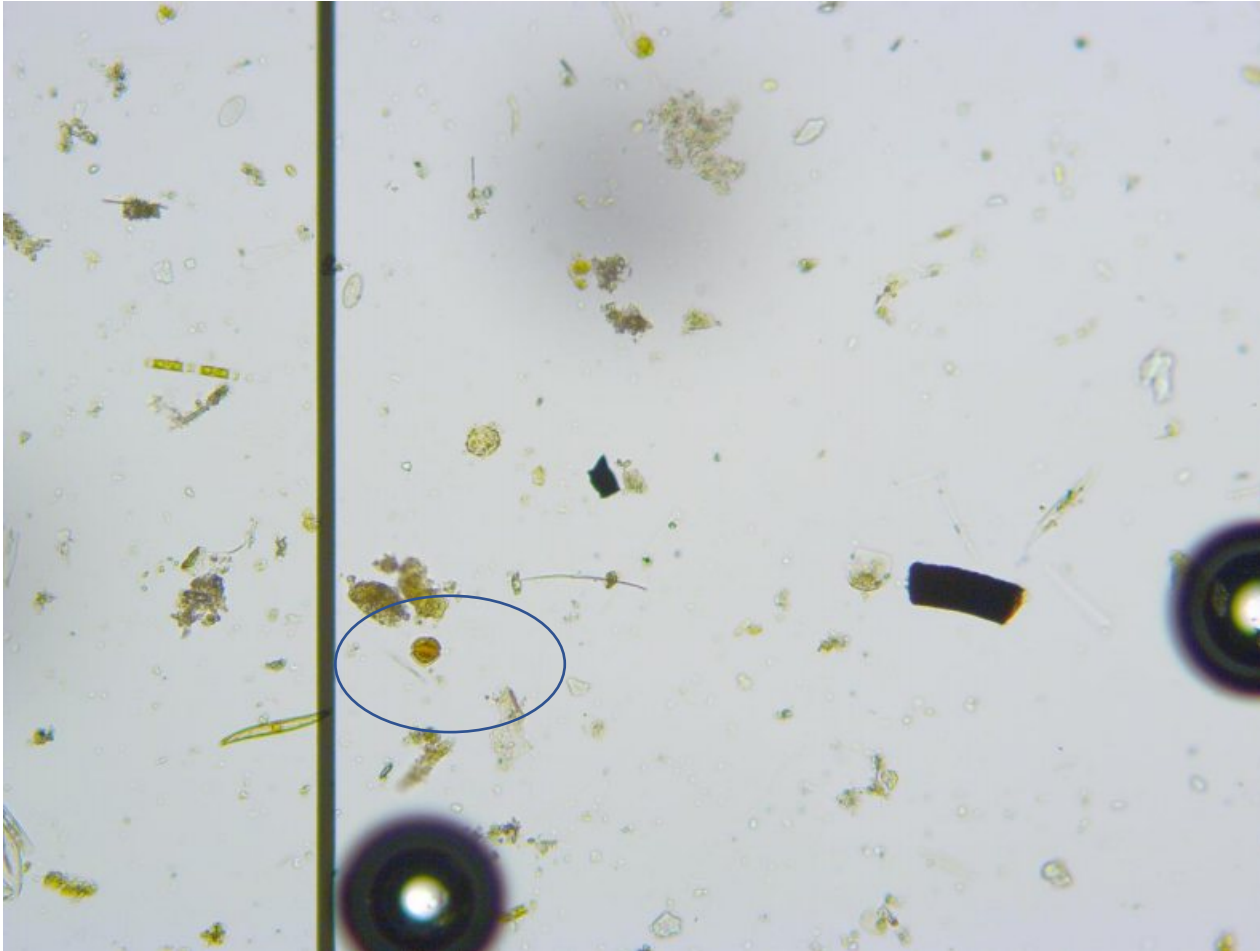
Scripppsiella spp. and Skeletonema



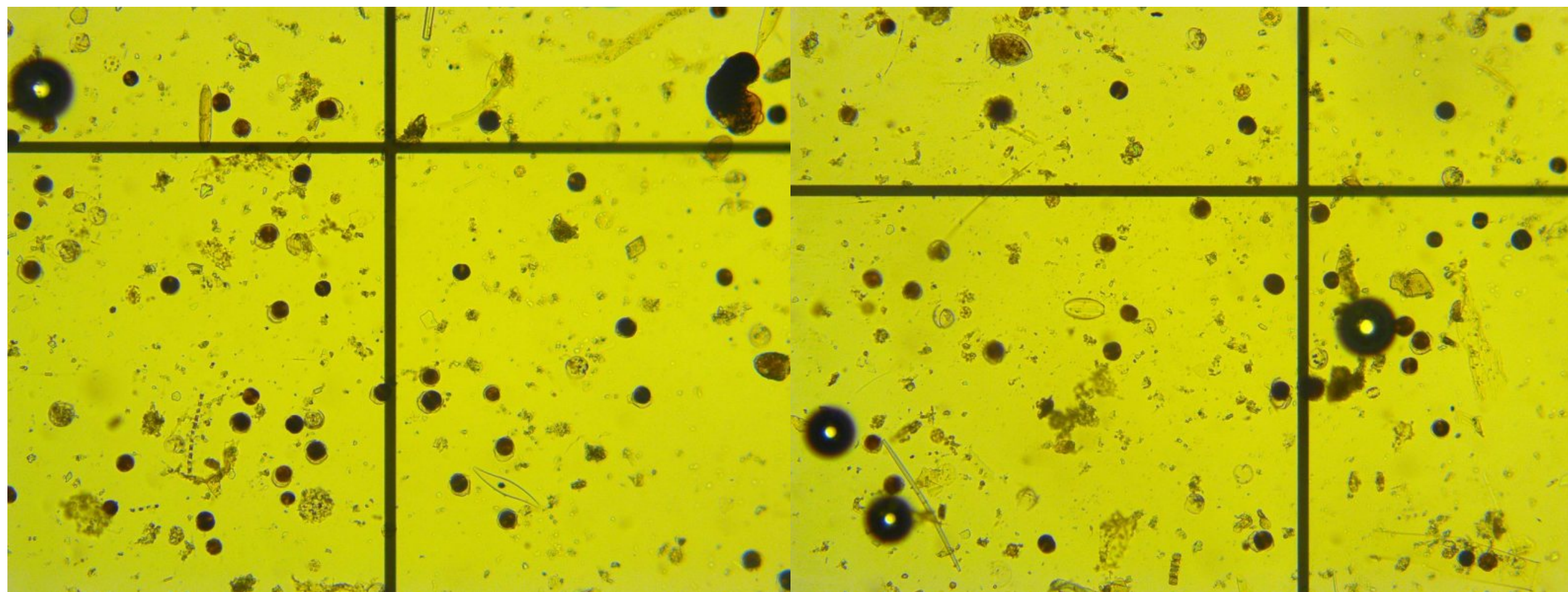
Alexandrium catenella



Alexandrium catenella



Alexandrium catenella



Alexandrium catenella

Coscinodiscus

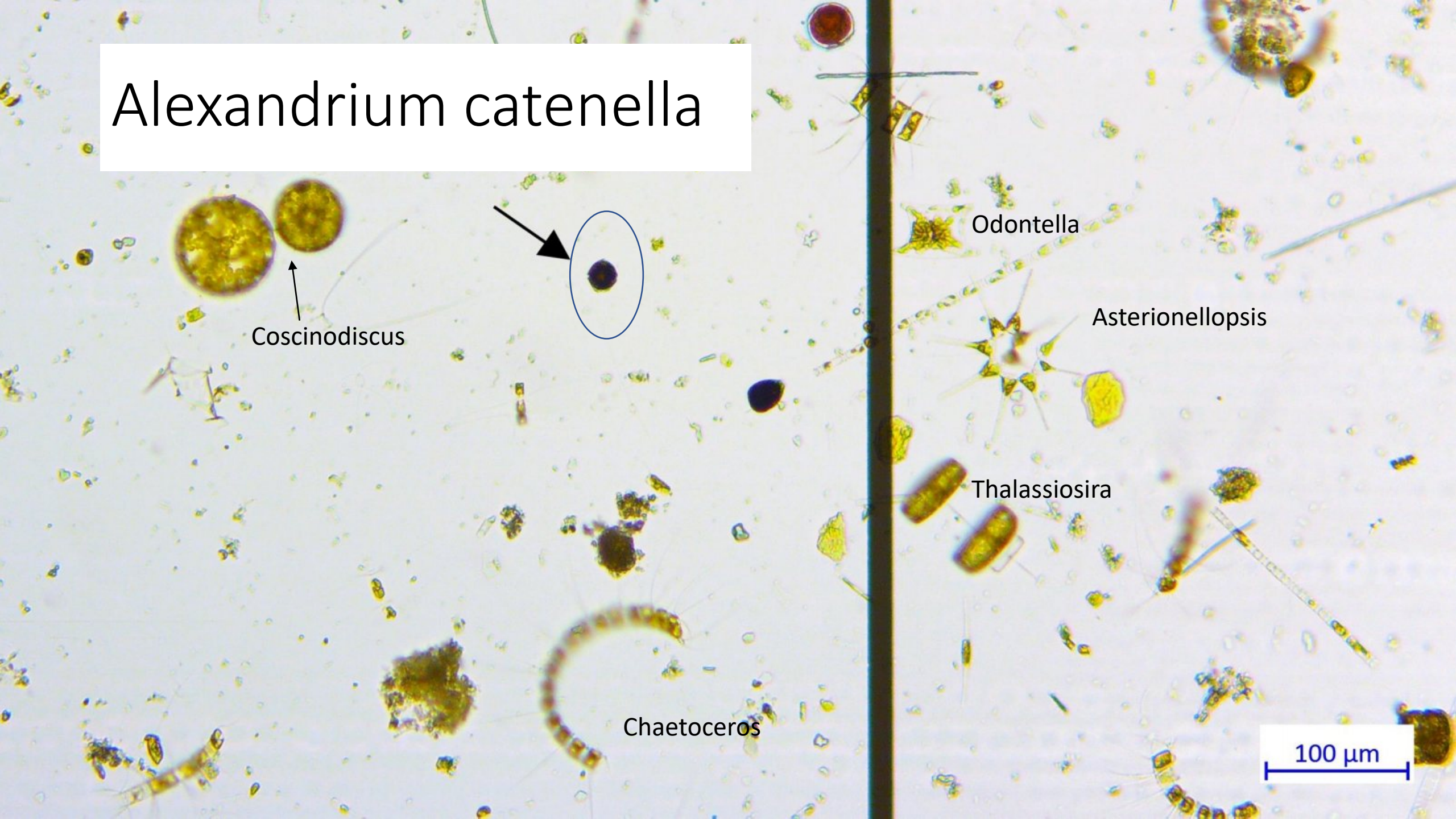
Chaetoceros

Odontella

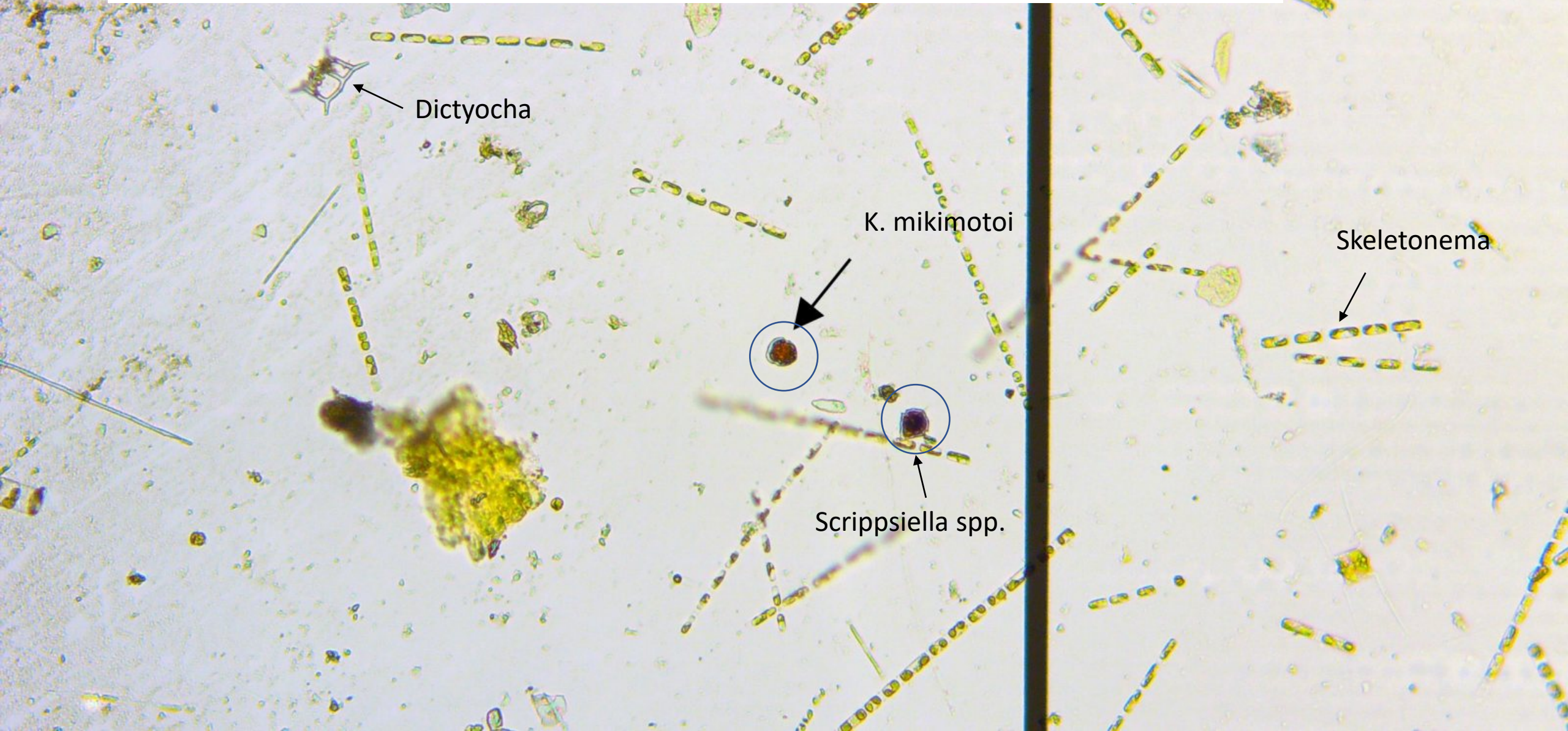
Asterionellopsis

Thalassiosira

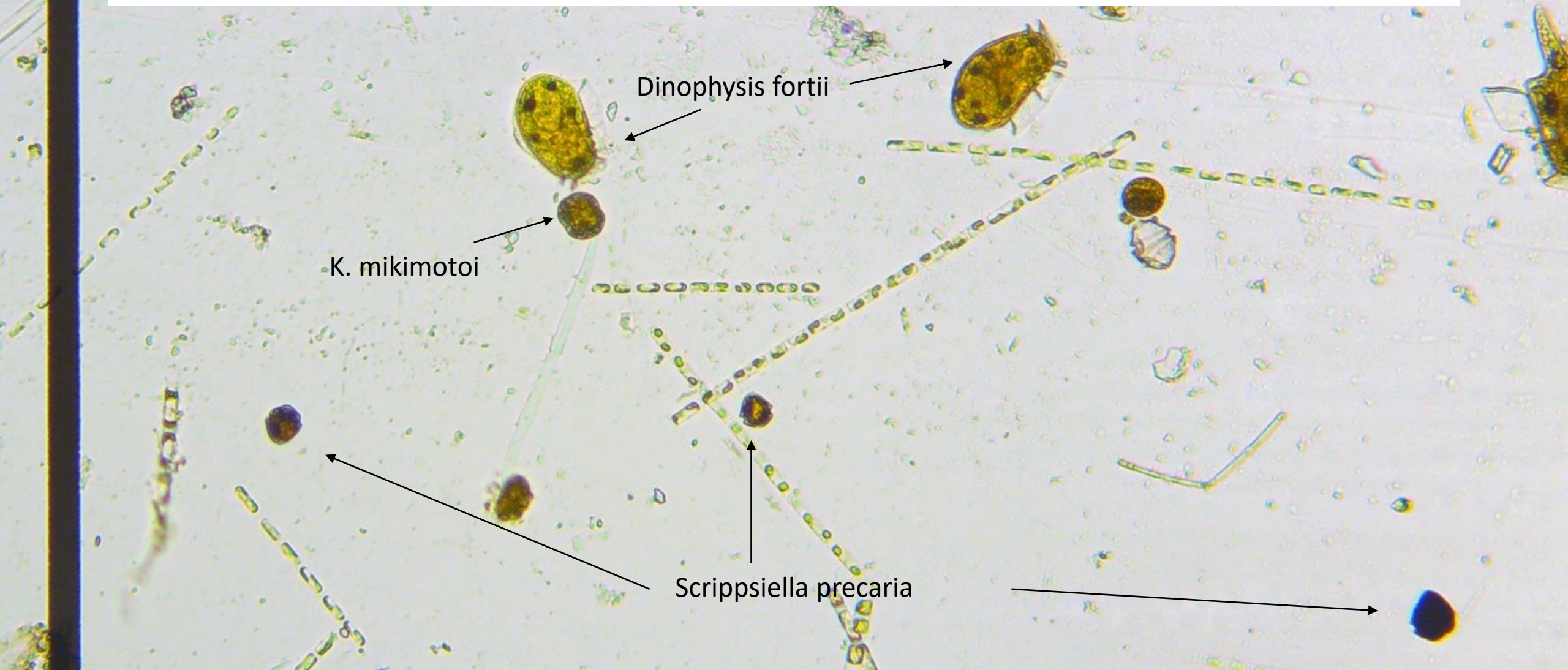
100 μm



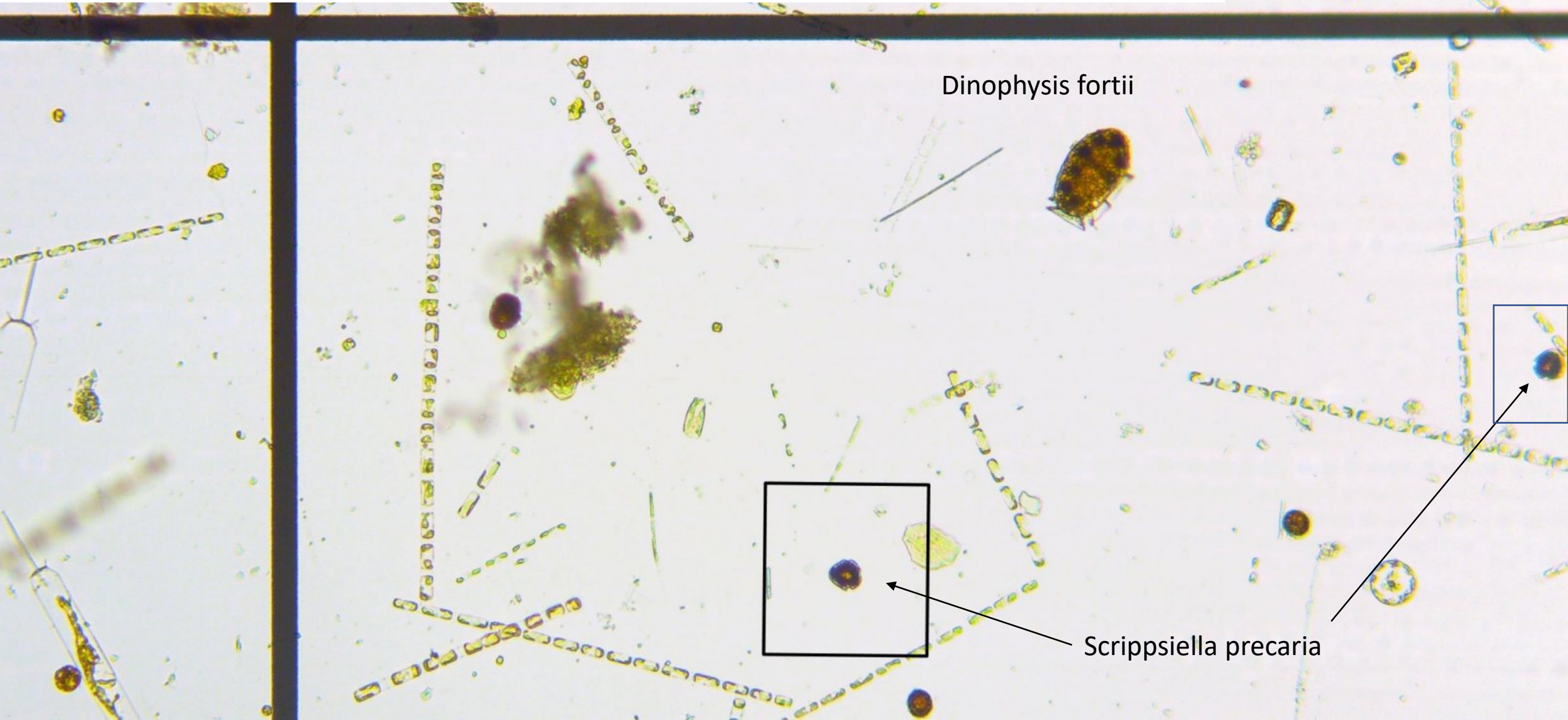
Karenia mikimotoi and Scrippsiella spp.



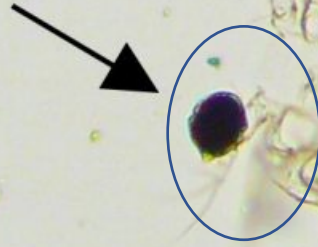
Karenia mikimotoi, Scrippsiella precaria, Dinophysis fortii



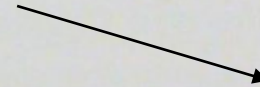
Scrippsiella precaria and Dinophysis fortii



Scripppsiella spp.



Coscinodiscus

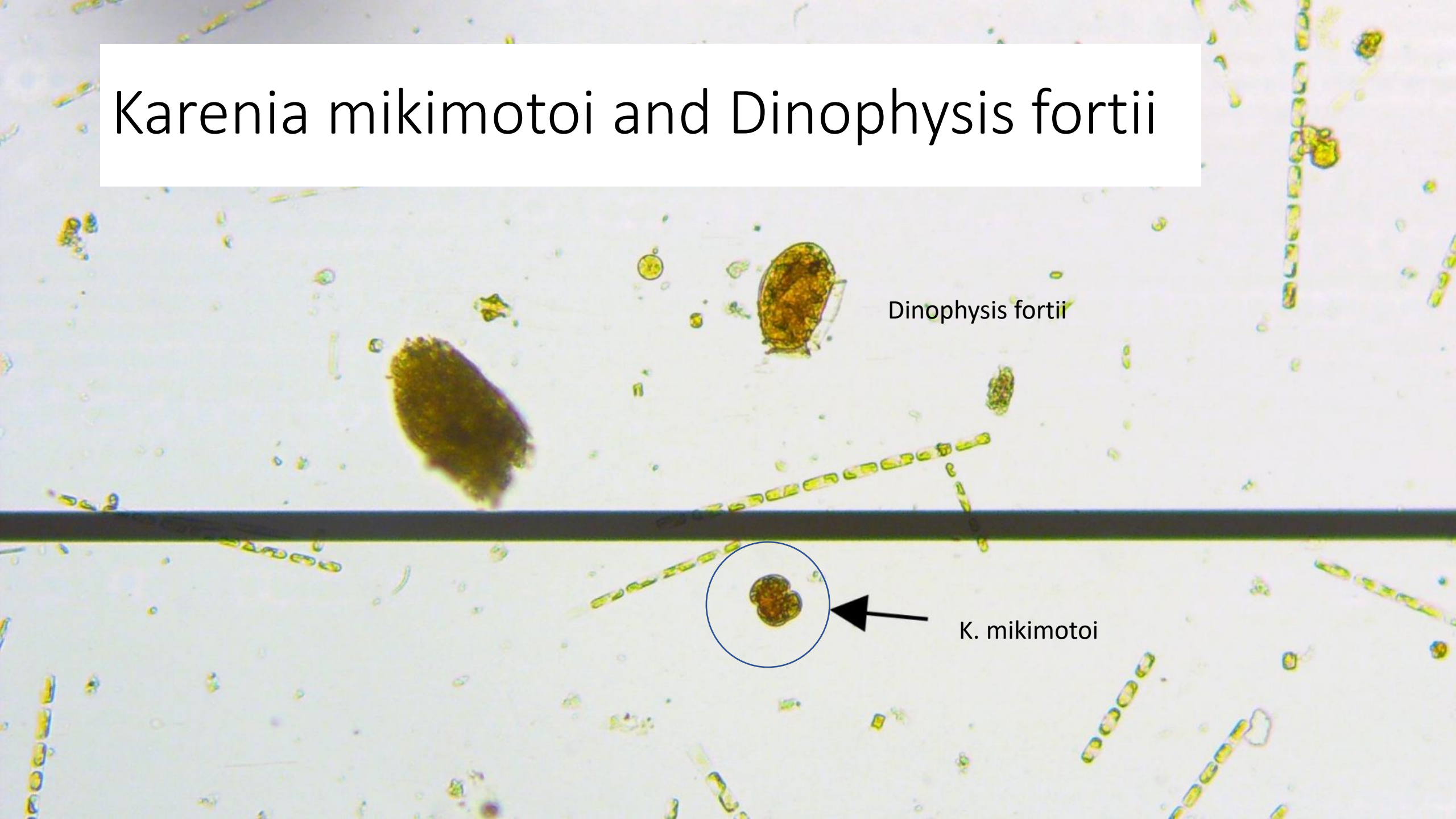


100 μm

Karenia mikimotoi and Dinophysis fortii

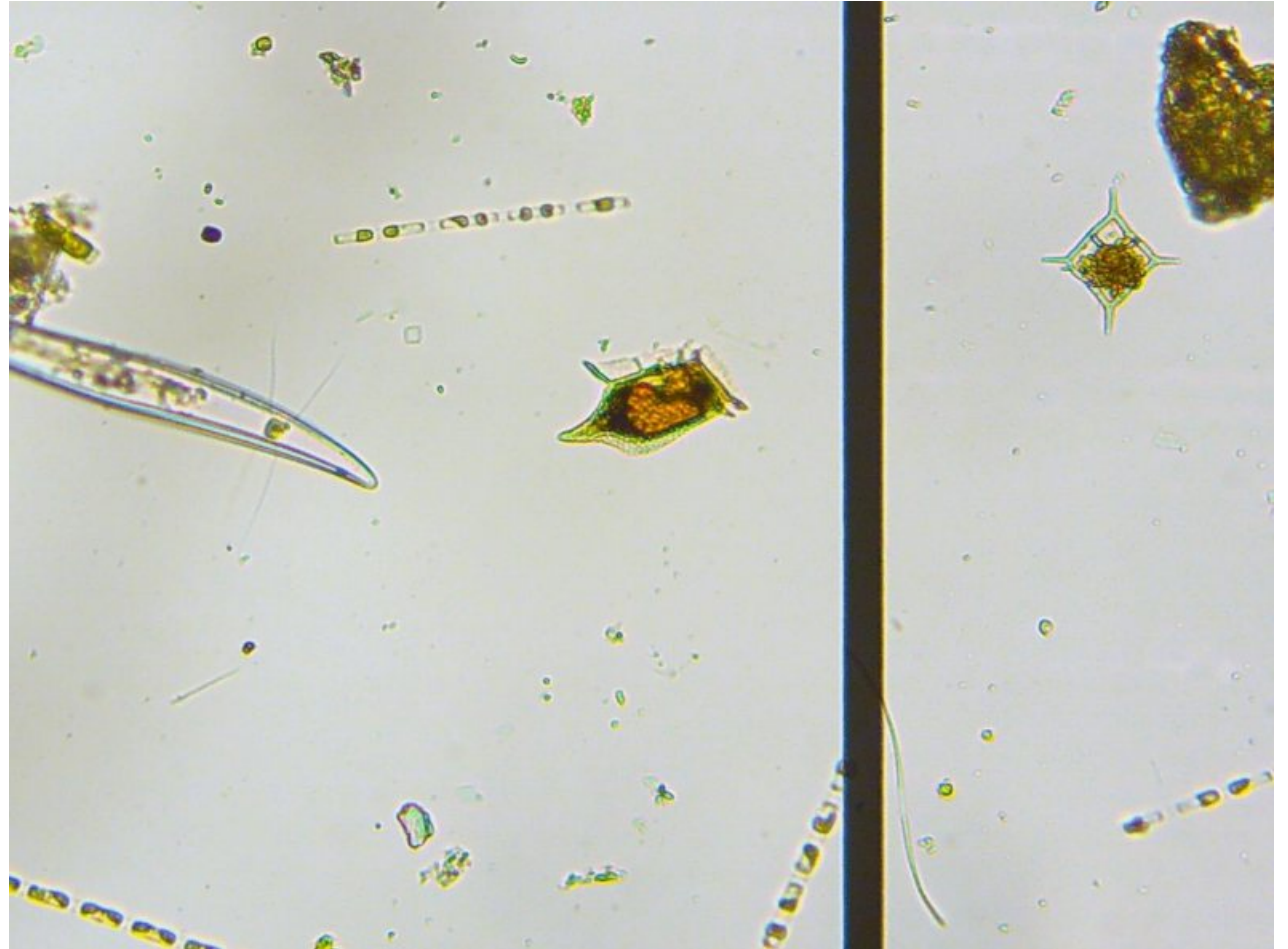
Dinophysis fortii

K. mikimotoi

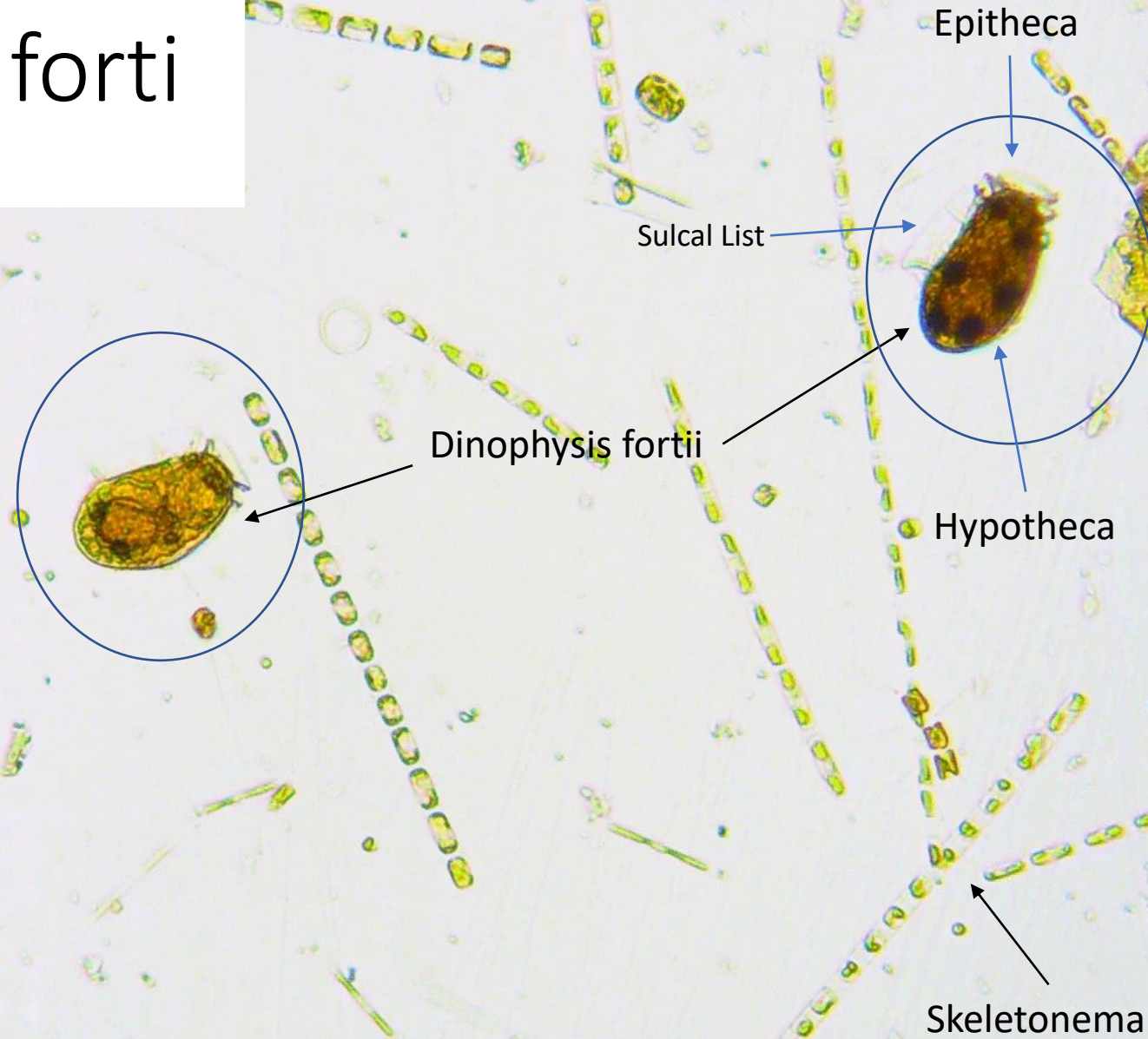


Dinophysis

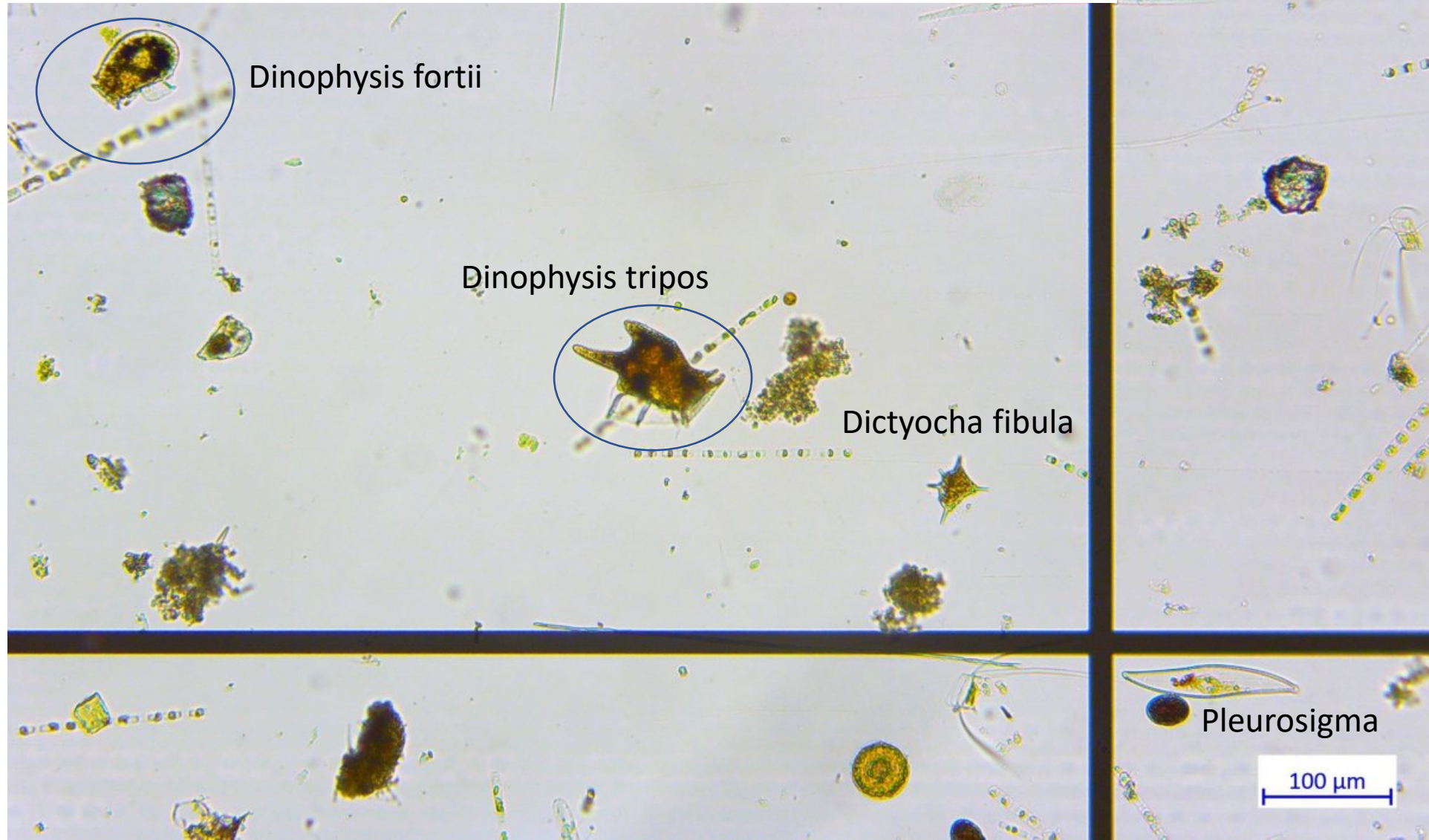
- Wing like epitheca (top of the cell)
- Large sack shaped hypotheca (bottom of the cell)
- Wing like structures on the sulcal list



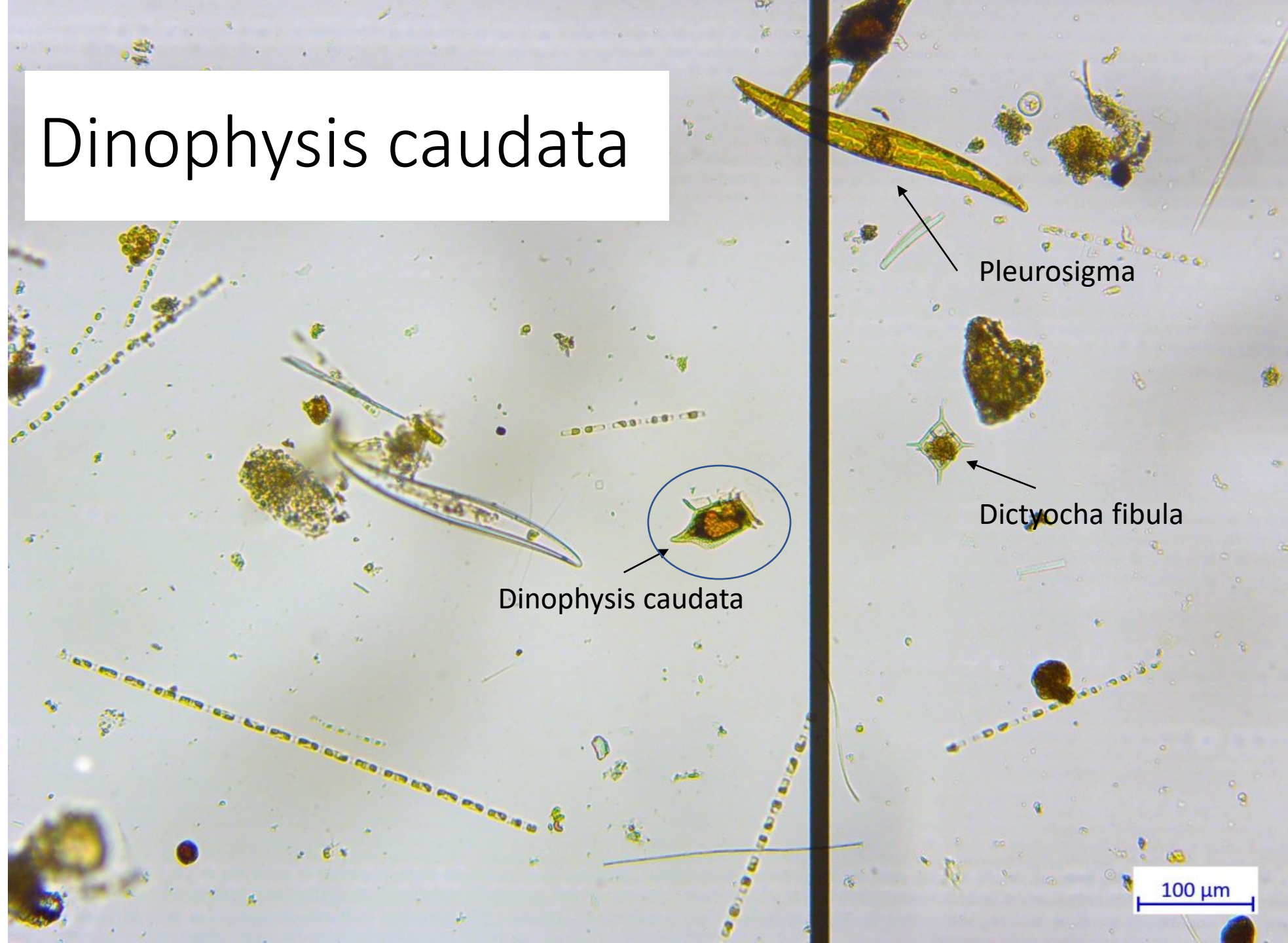
Dinophysis fortii



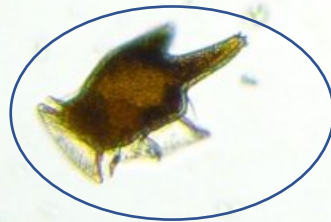
Dinophysis tripos, Dinophysis fortii



Dinophysis caudata

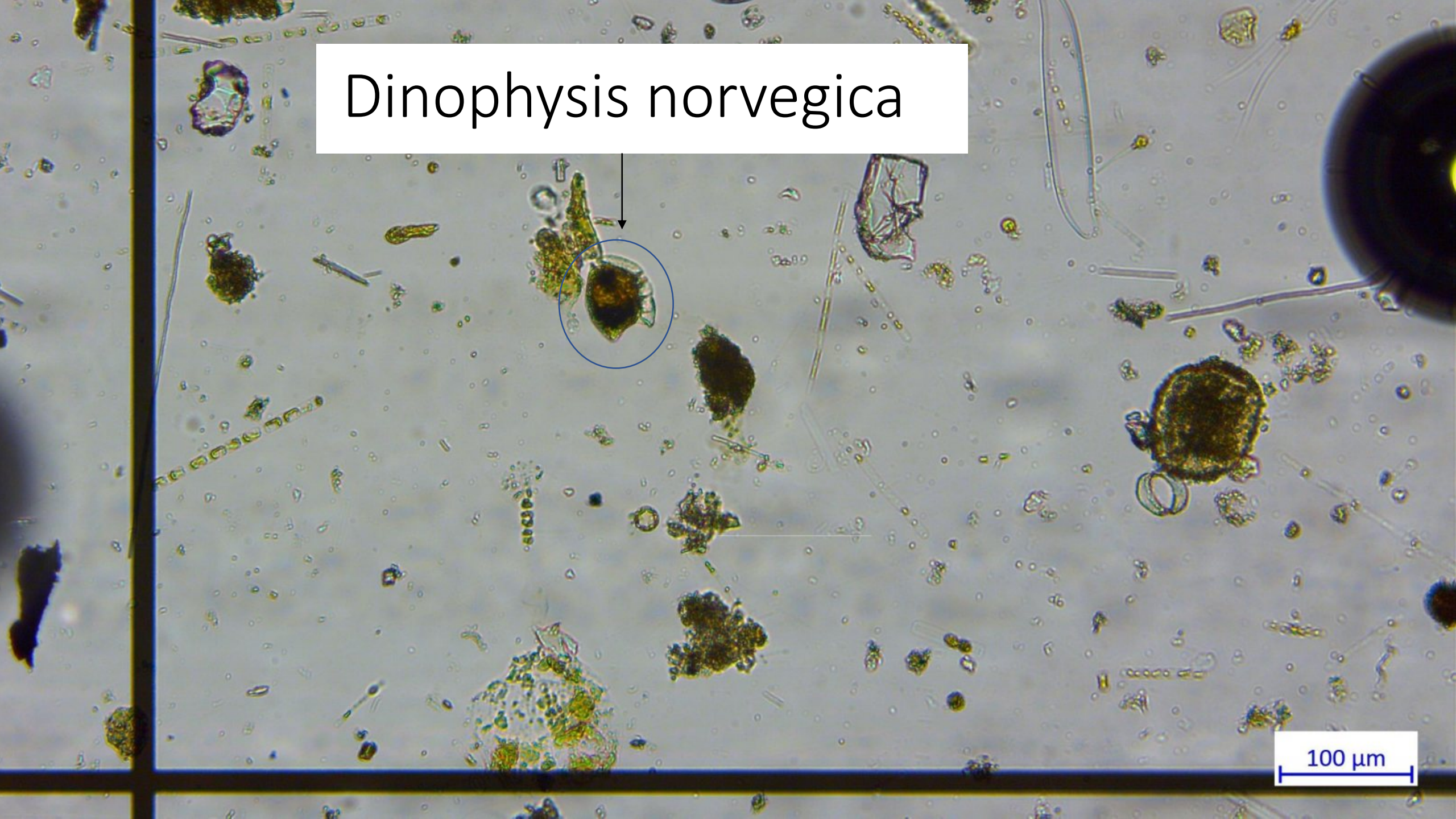


Dinophysis tripos



100 μm

Dinophysis norvegica



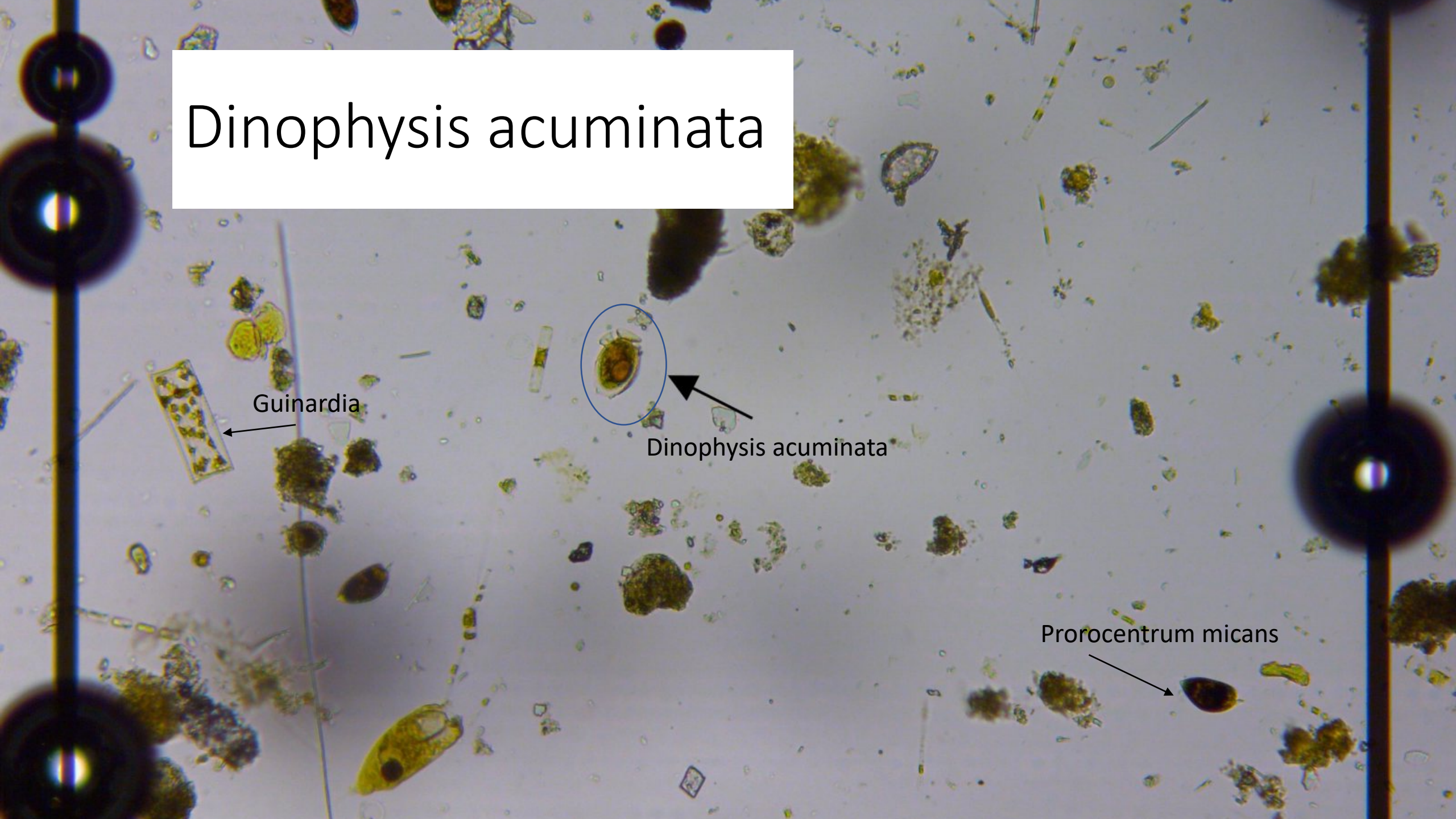
100 μm

Dinophysis acuminata

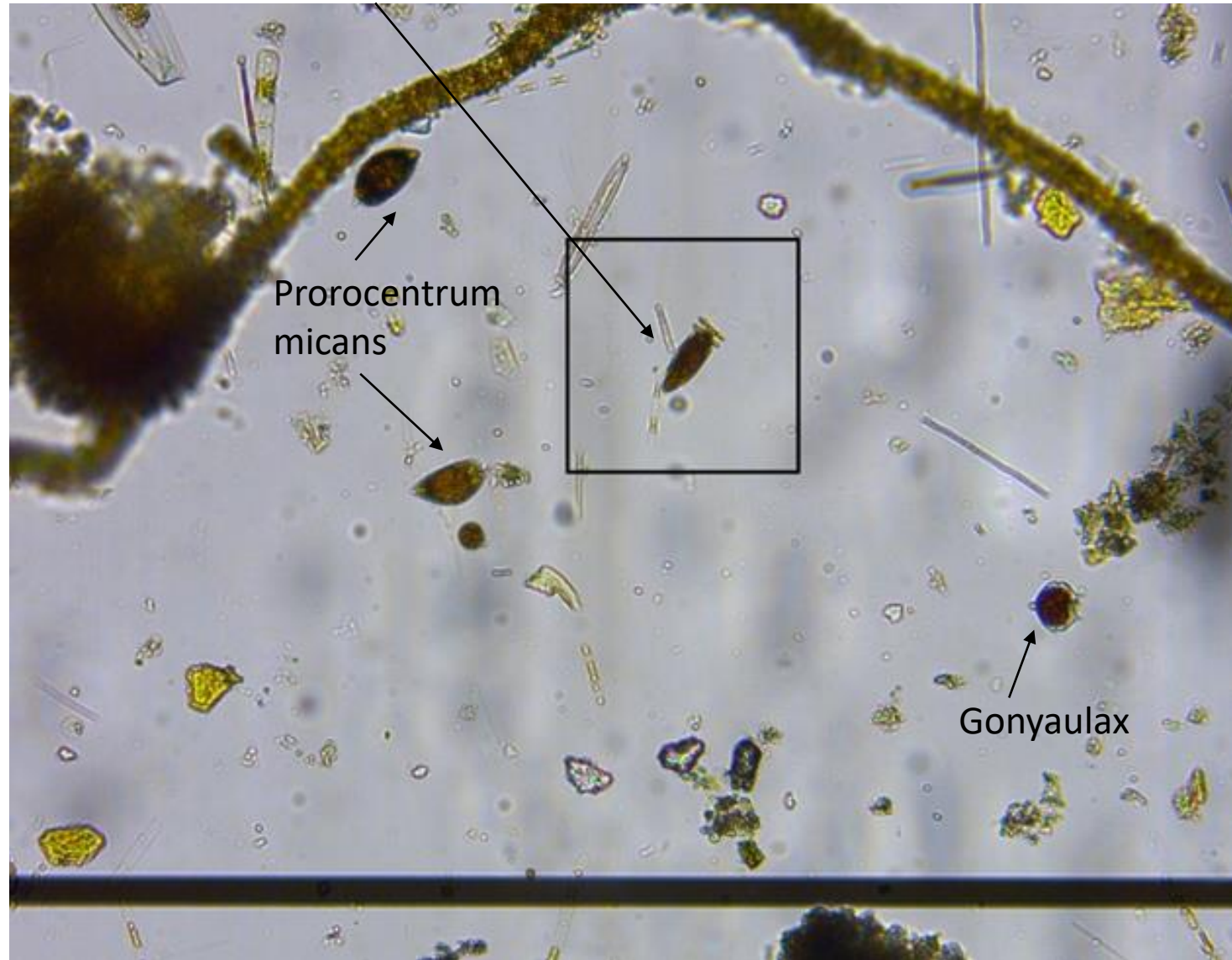
Guinardia

Dinophysis acuminata

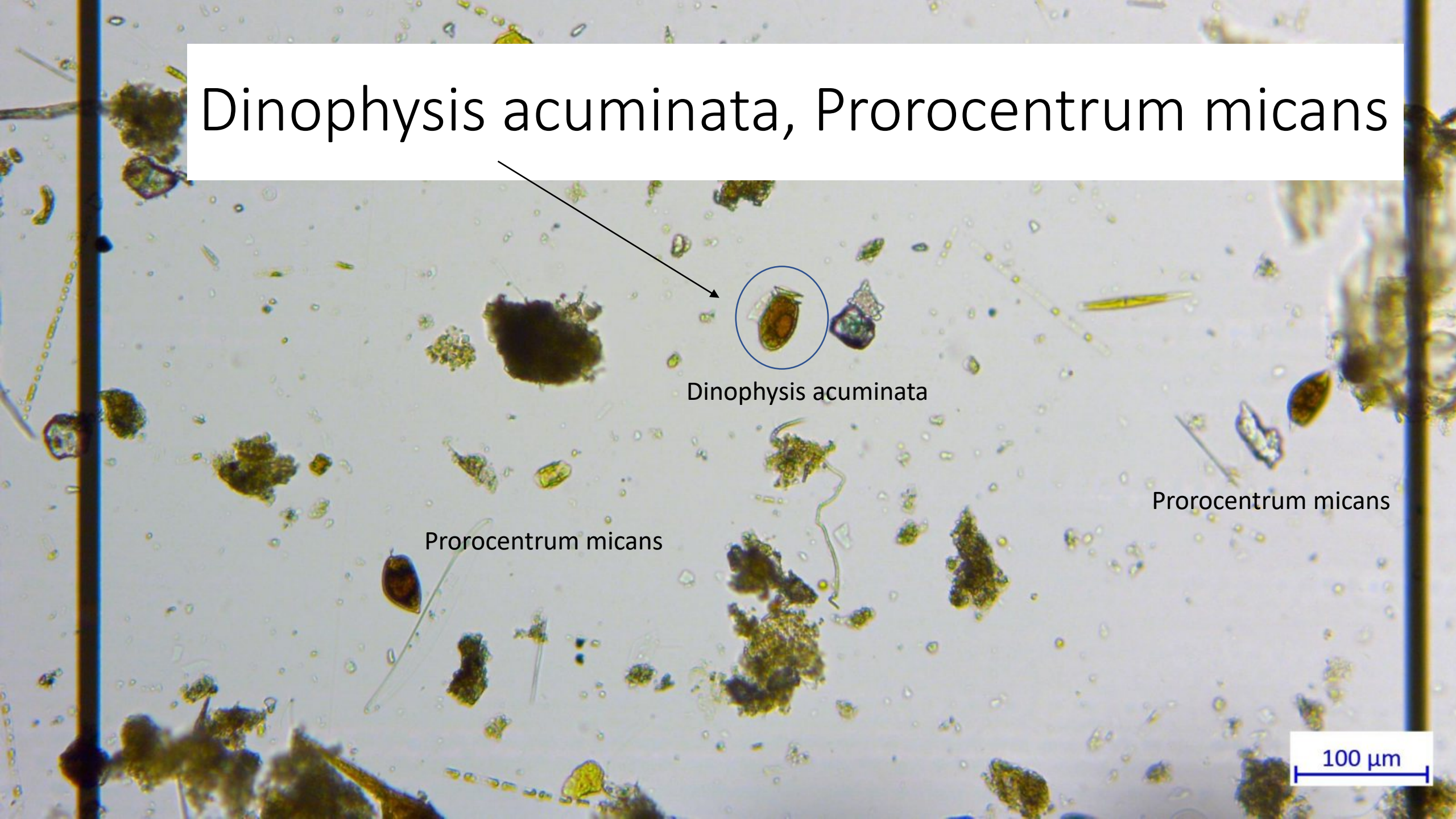
Prorocentrum micans



Dinophysis acuminata, Prorocentrum micans



Dinophysis acuminata, Prorocentrum micans



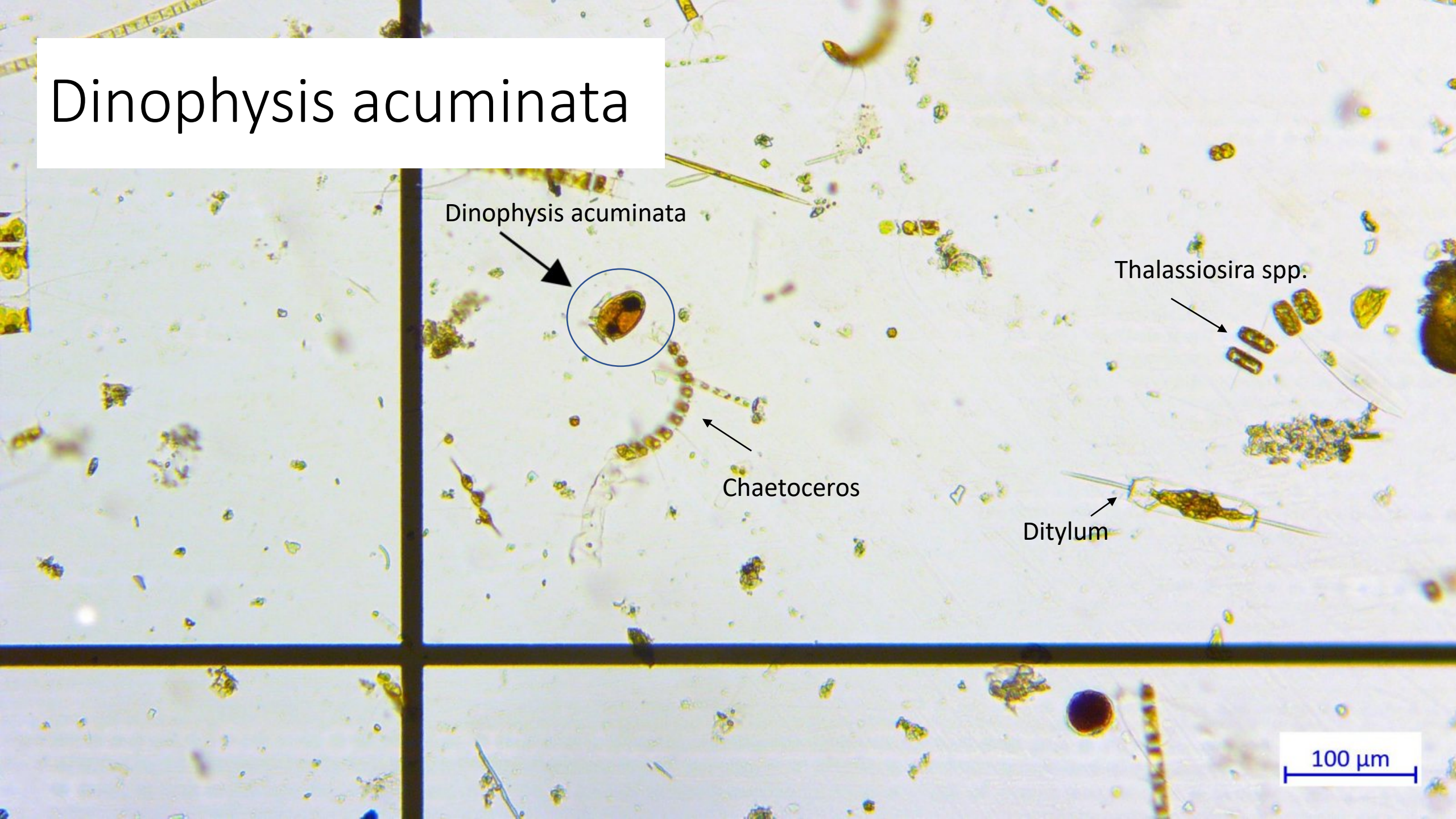
Dinophysis acuminata

Prorocentrum micans

Prorocentrum micans

100 μ m

Dinophysis acuminata



Dinophysis acuminata

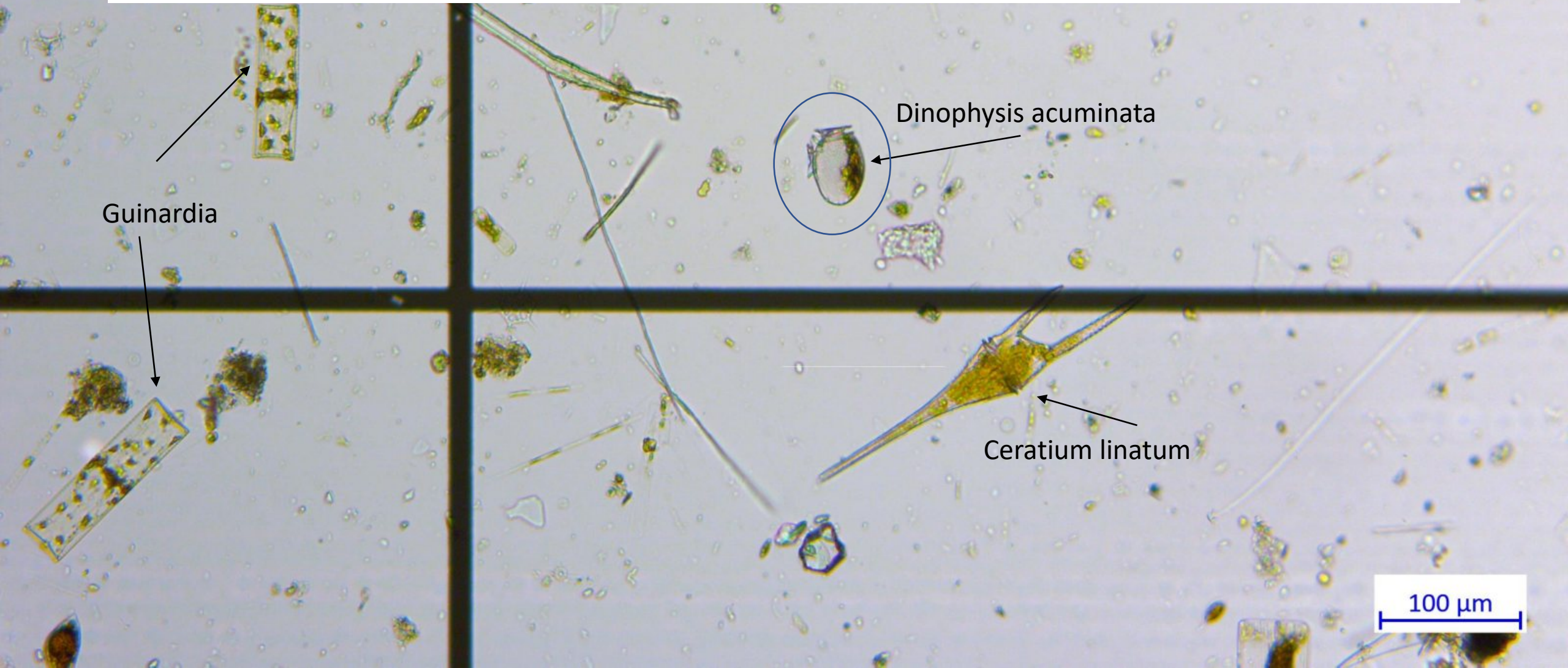
Thalassiosira spp.

Chaetoceros

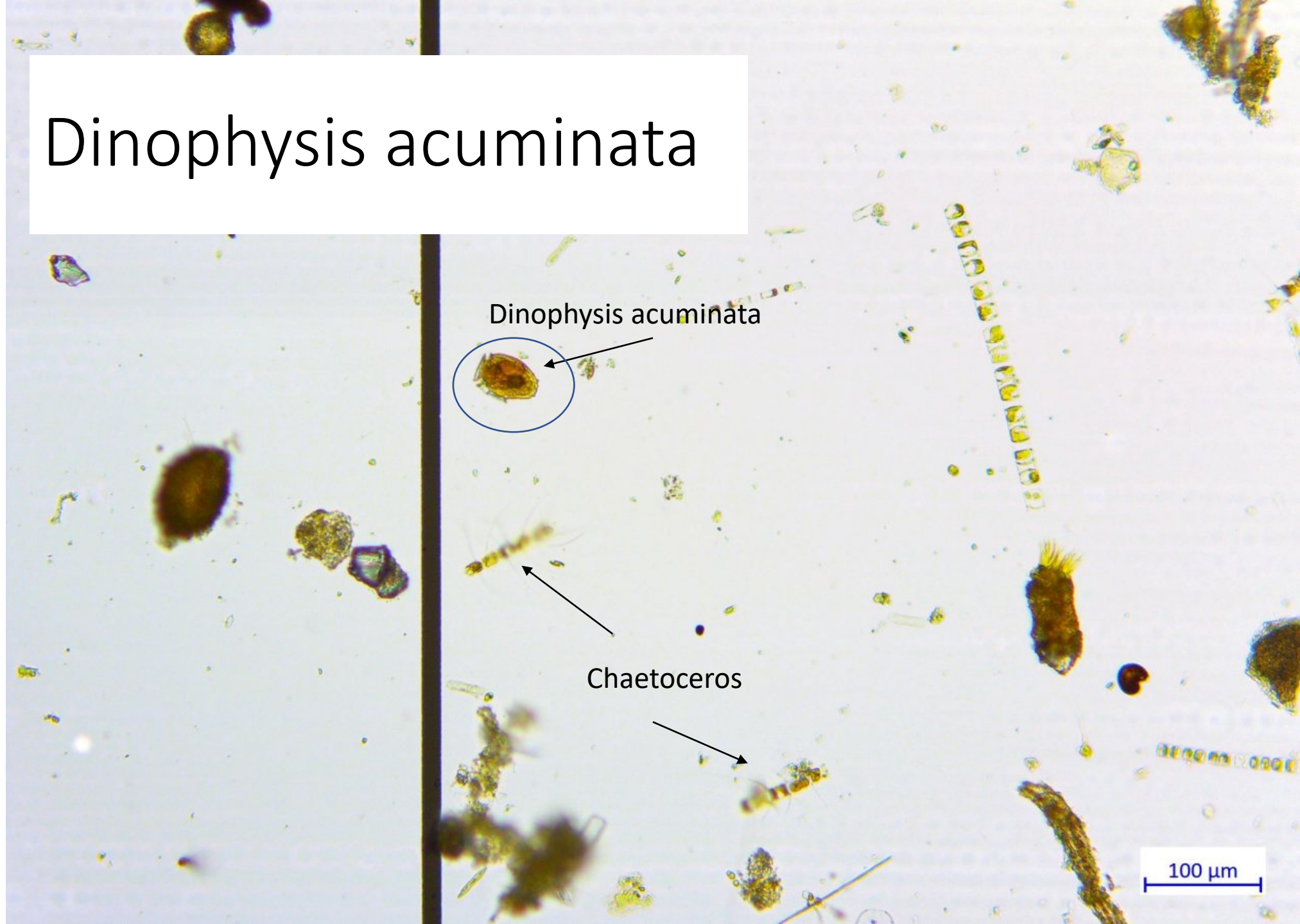
Ditylum

100 μm

Dinophysis acuminata and Ceratium linatum Guinardia

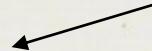


Dinophysis acuminata



Dinophysis acuminata

Dinophysis acuminata



Dichtyocha



Chaetoceros



100 μm



Dinophysis acuminata

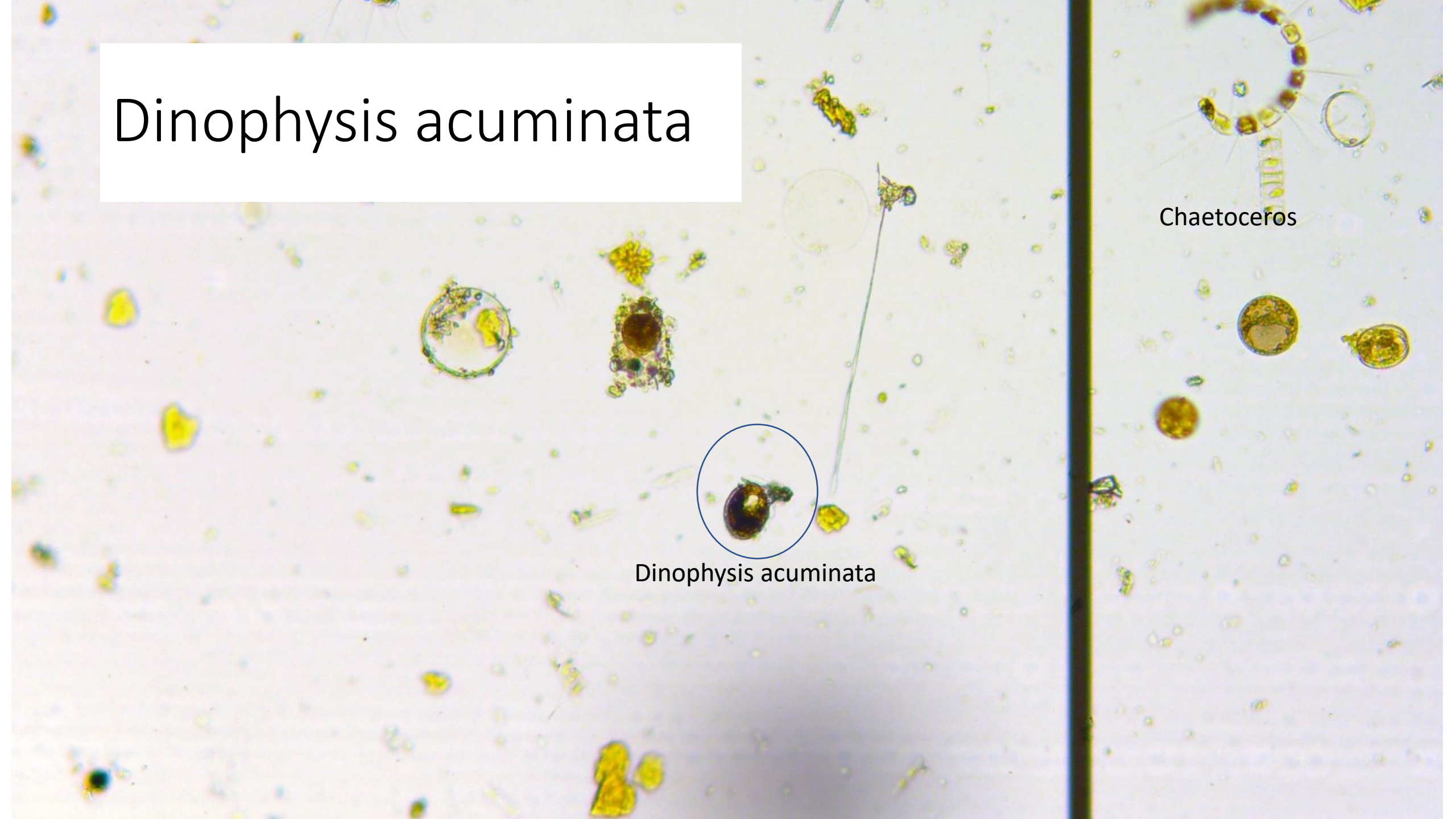
Dinophysis acuminata



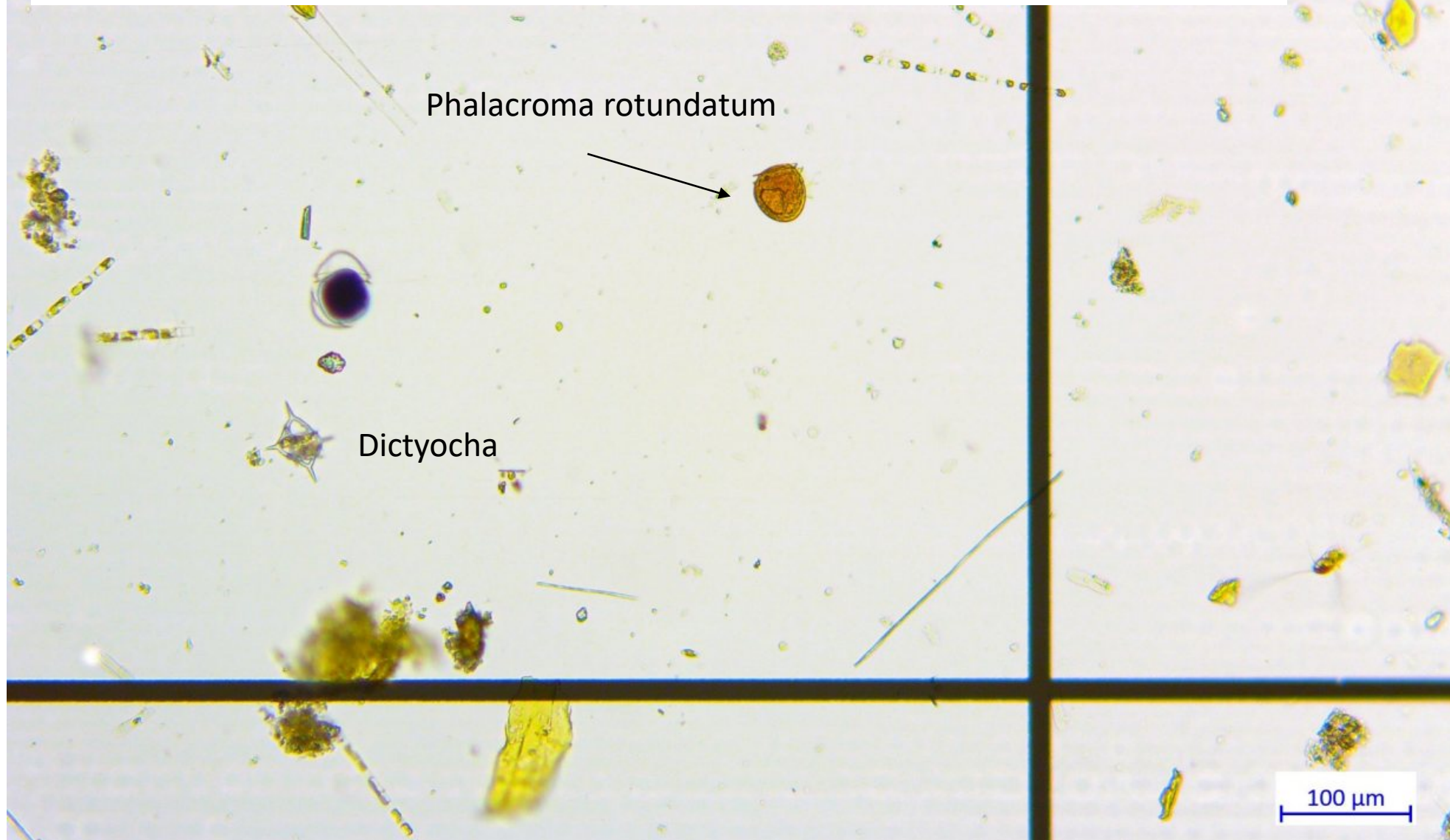
Dinophysis acuminata

Dinophysis acuminata

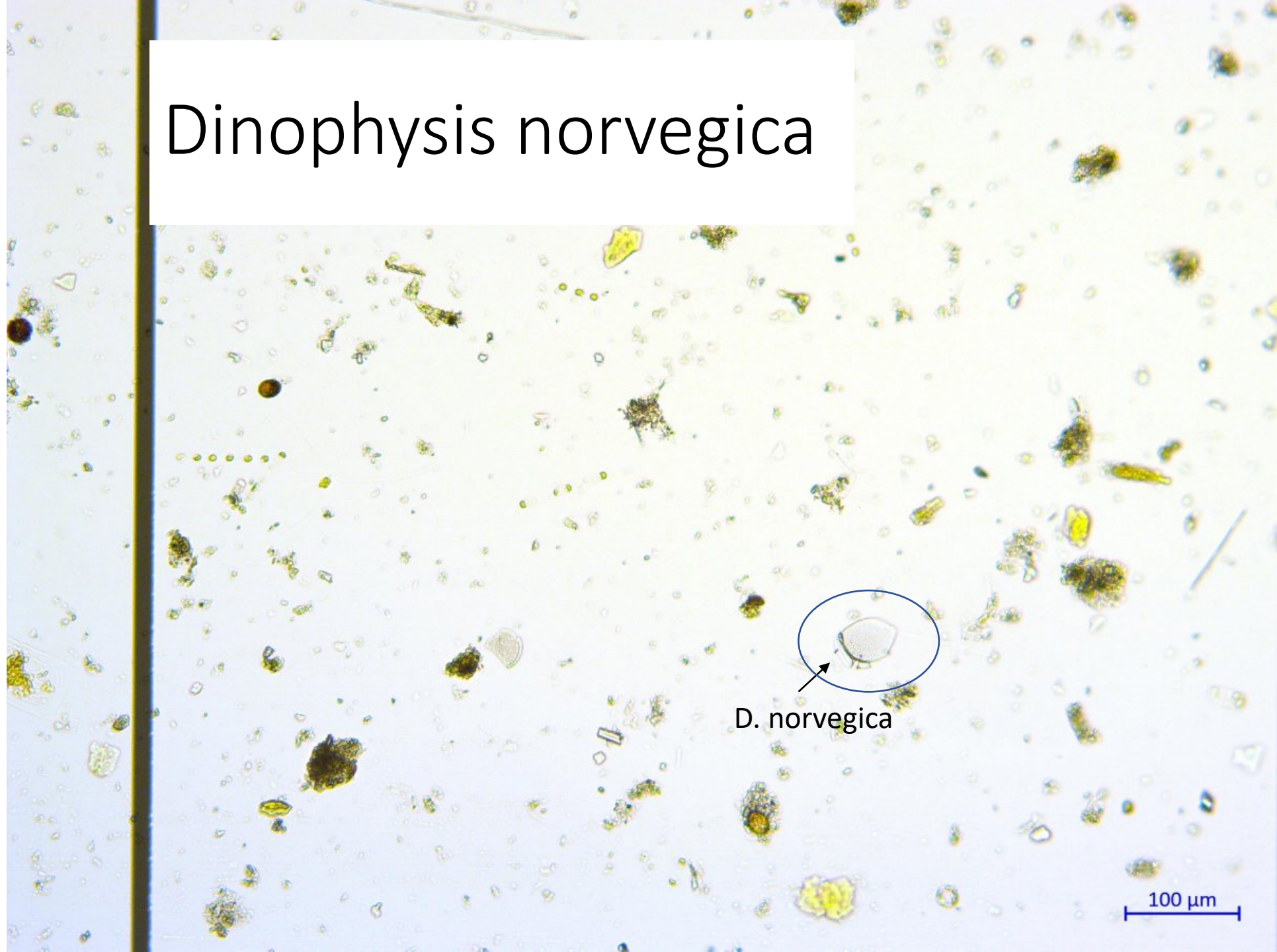
Chaetoceros



Phalacroma rotundatum Dictyocha



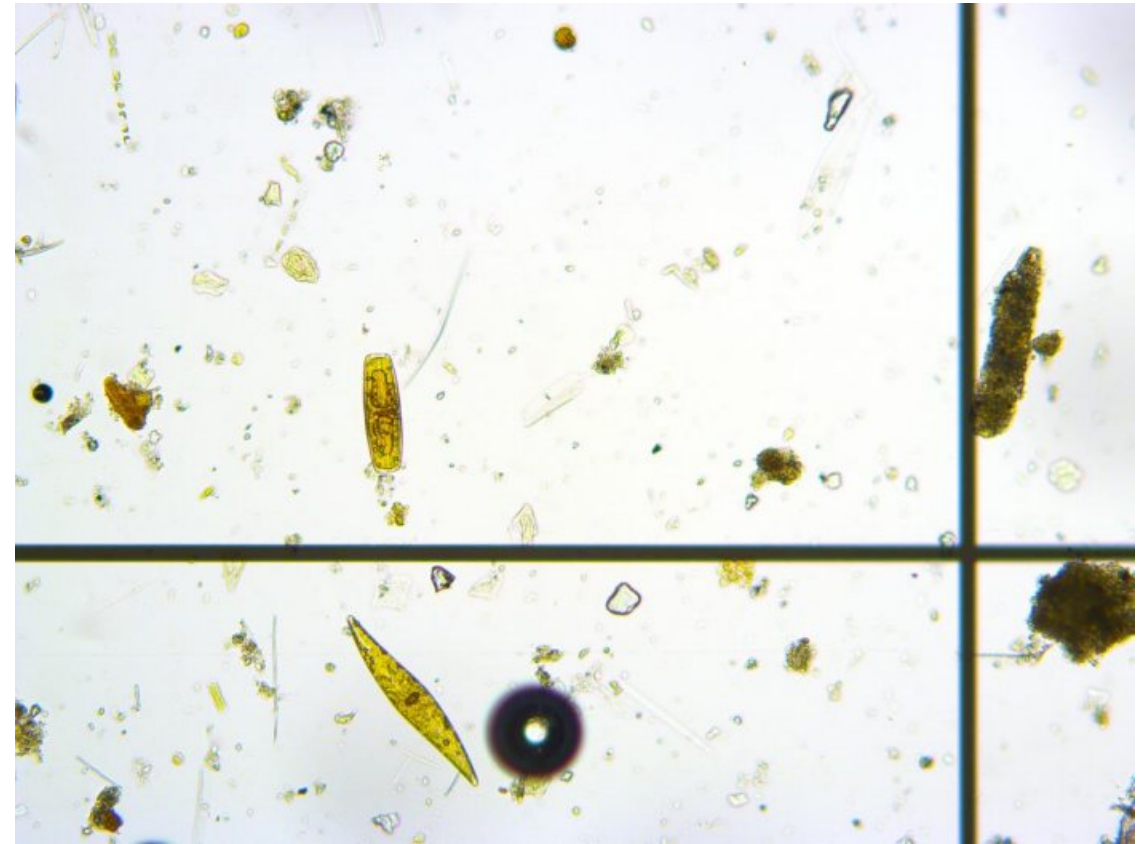
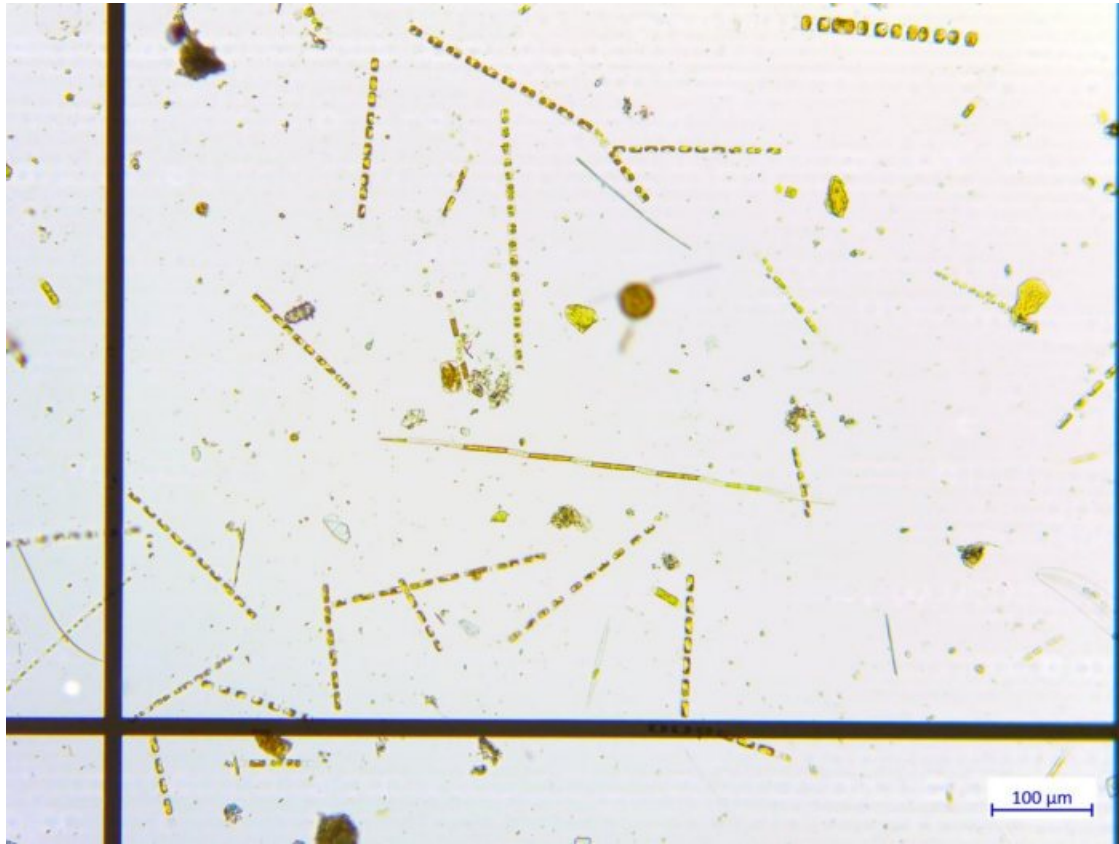
Dinophysis norvegica



D. norvegica

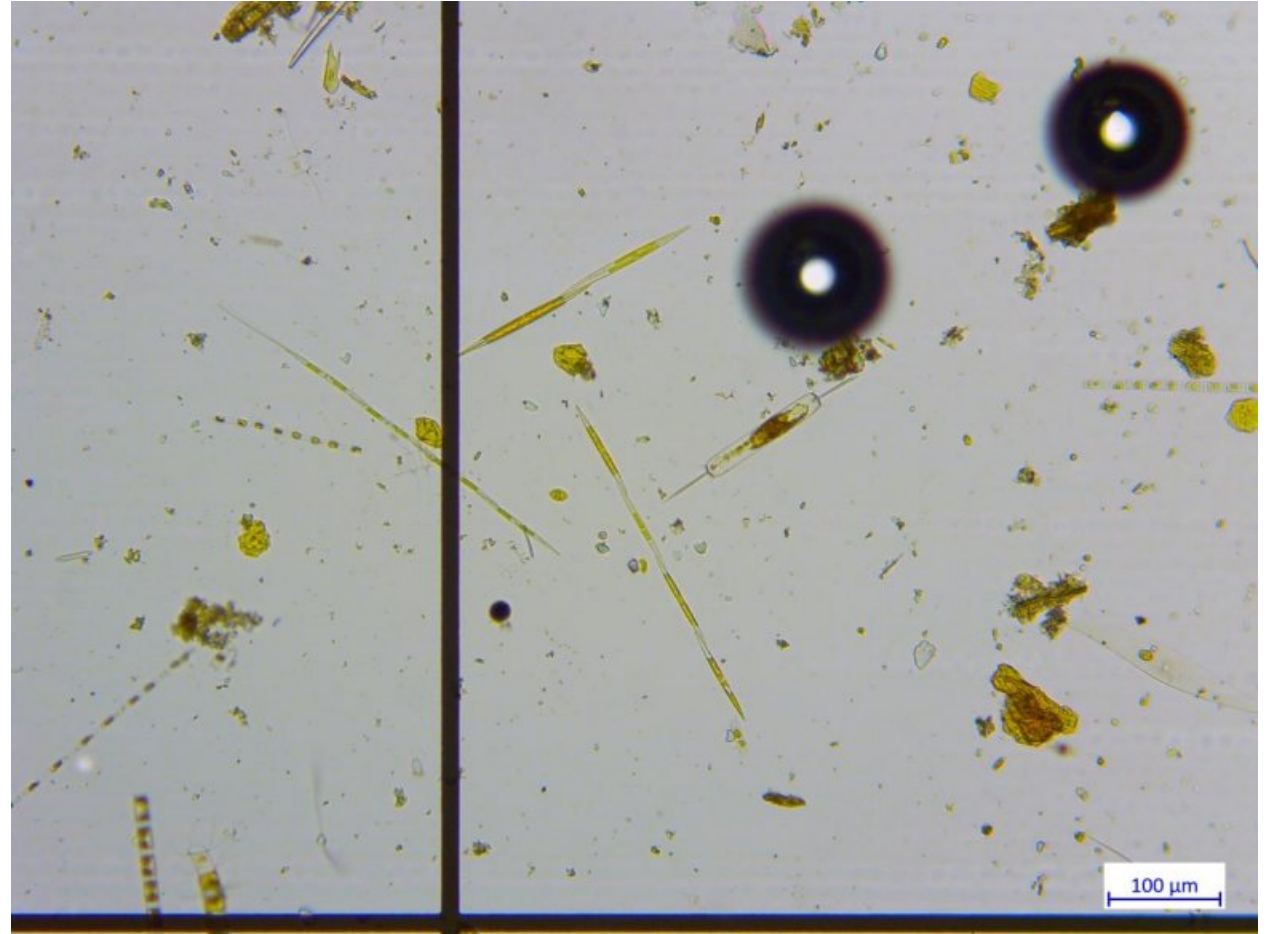
100 μm

Diatoms

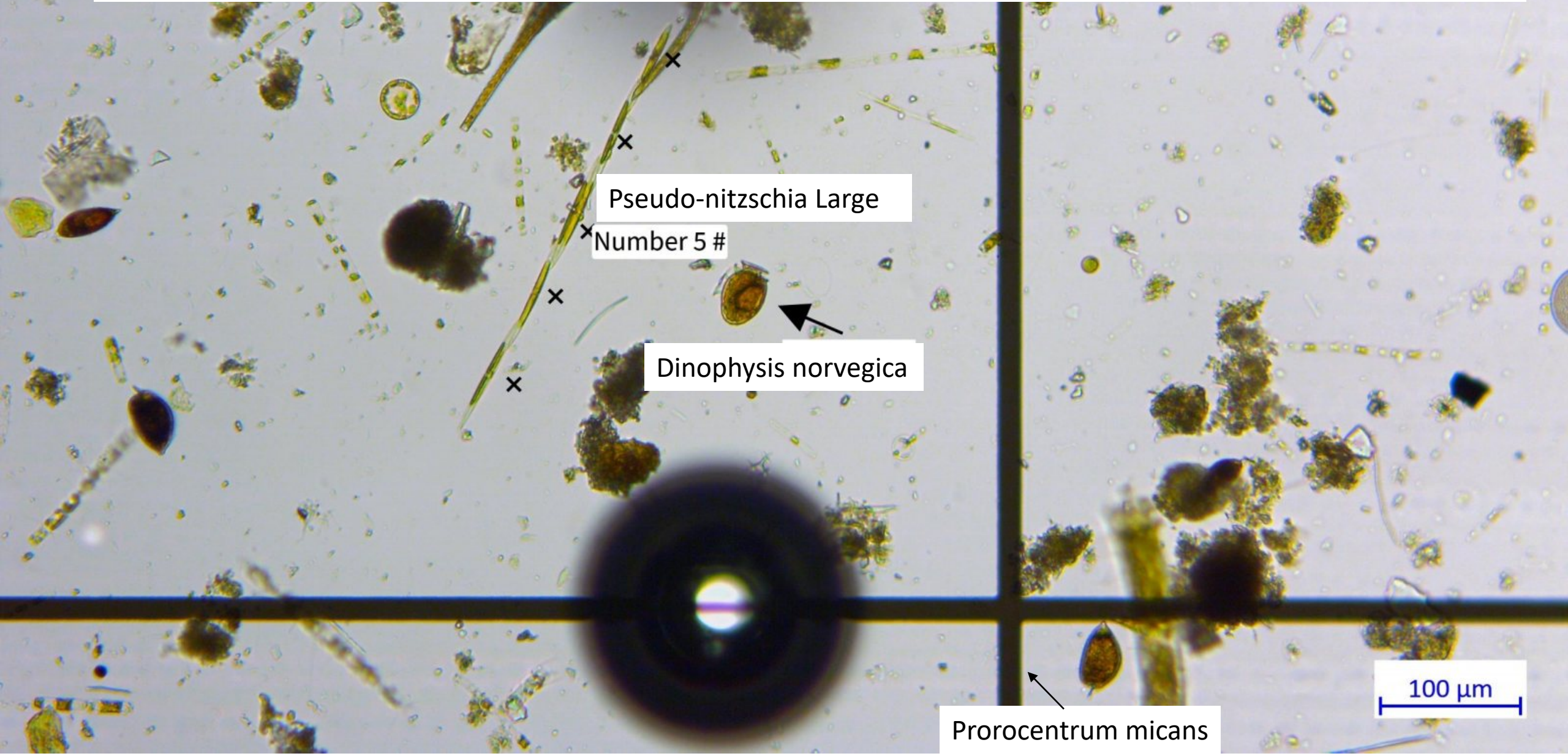


Pseudo-nitzschia

- Pointed ends across the transapical axis towards the apex
- Visible nucleus/organelles
- Form chains
- Small
 - Transapical axis $< 3\mu\text{m}$
 - Barely visible, hair like
- Large
 - Transapical axis $> 3\mu\text{m}$
- Skeletonoma Look-Alike
 - Small and similar in size to Pn small
 - 2 small dot structures between cells not seen in Pn small



Pseudo-nitzschia Large, Dinophysis norvegica



Pseudo-nitzschia Small

#4 Count Pseudo-nitzschia Small

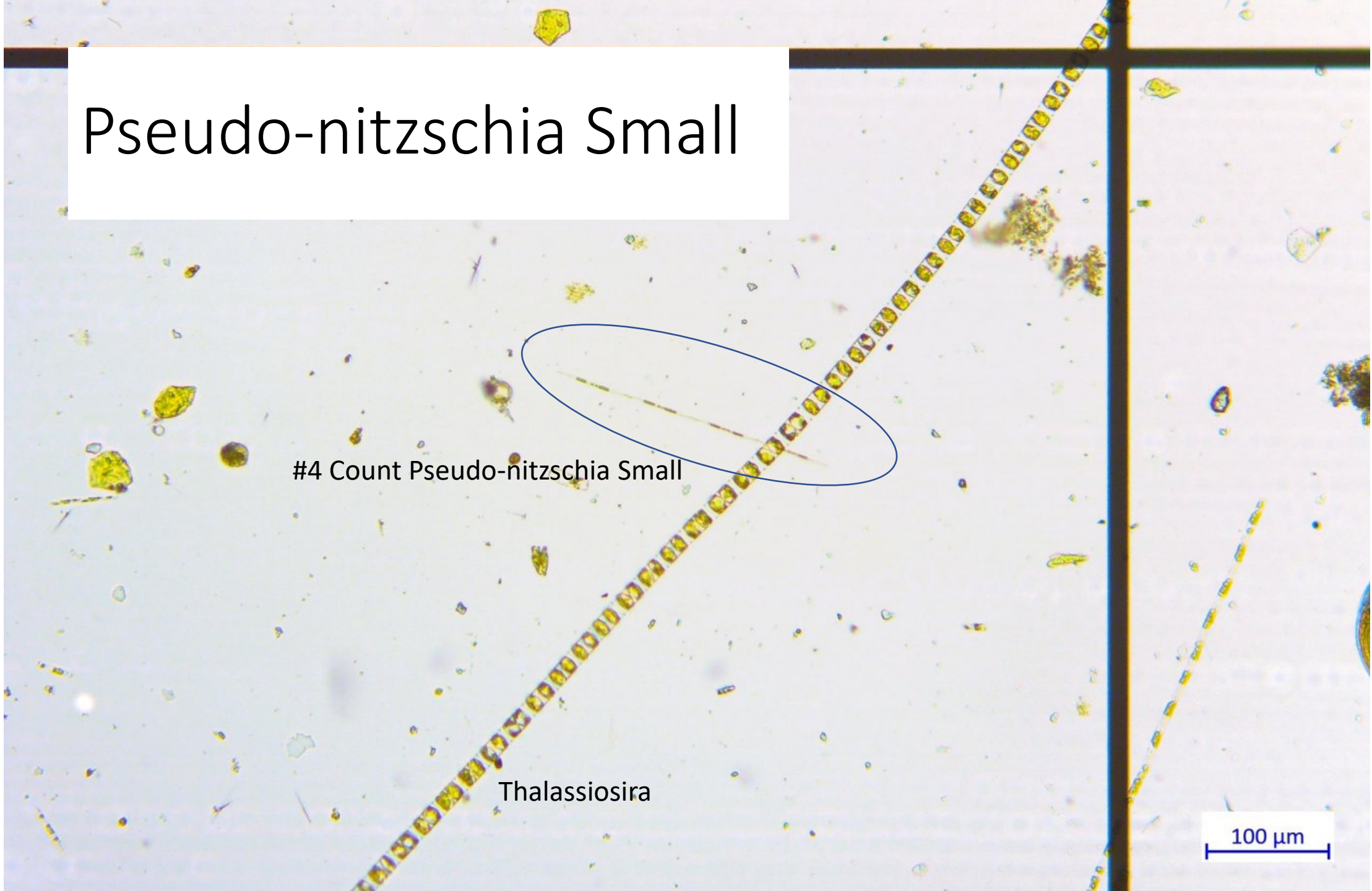
100 μm

Pseudo-nitzschia Small

#4 Count Pseudo-nitzschia Small

Thalassiosira

100 μm



Small Skelentonema, Guinardia, Eucampia

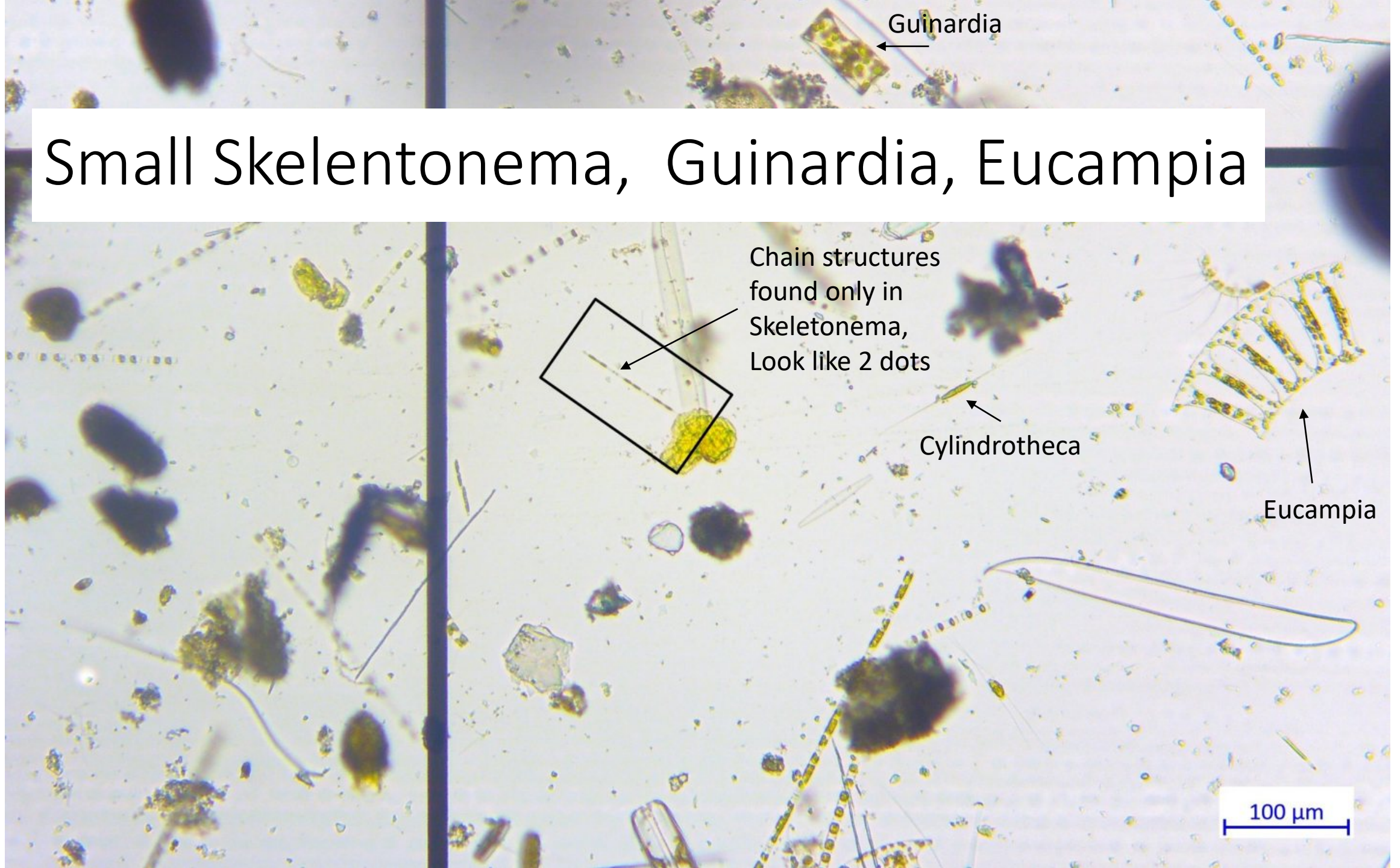
Guinardia

Chain structures
found only in
Skelentonema,
Look like 2 dots

Cylindrotheca

Eucampia

100 μm



Skeletonema (Pseudo-nitzschia look alike)

Chaetoceros Eucampia

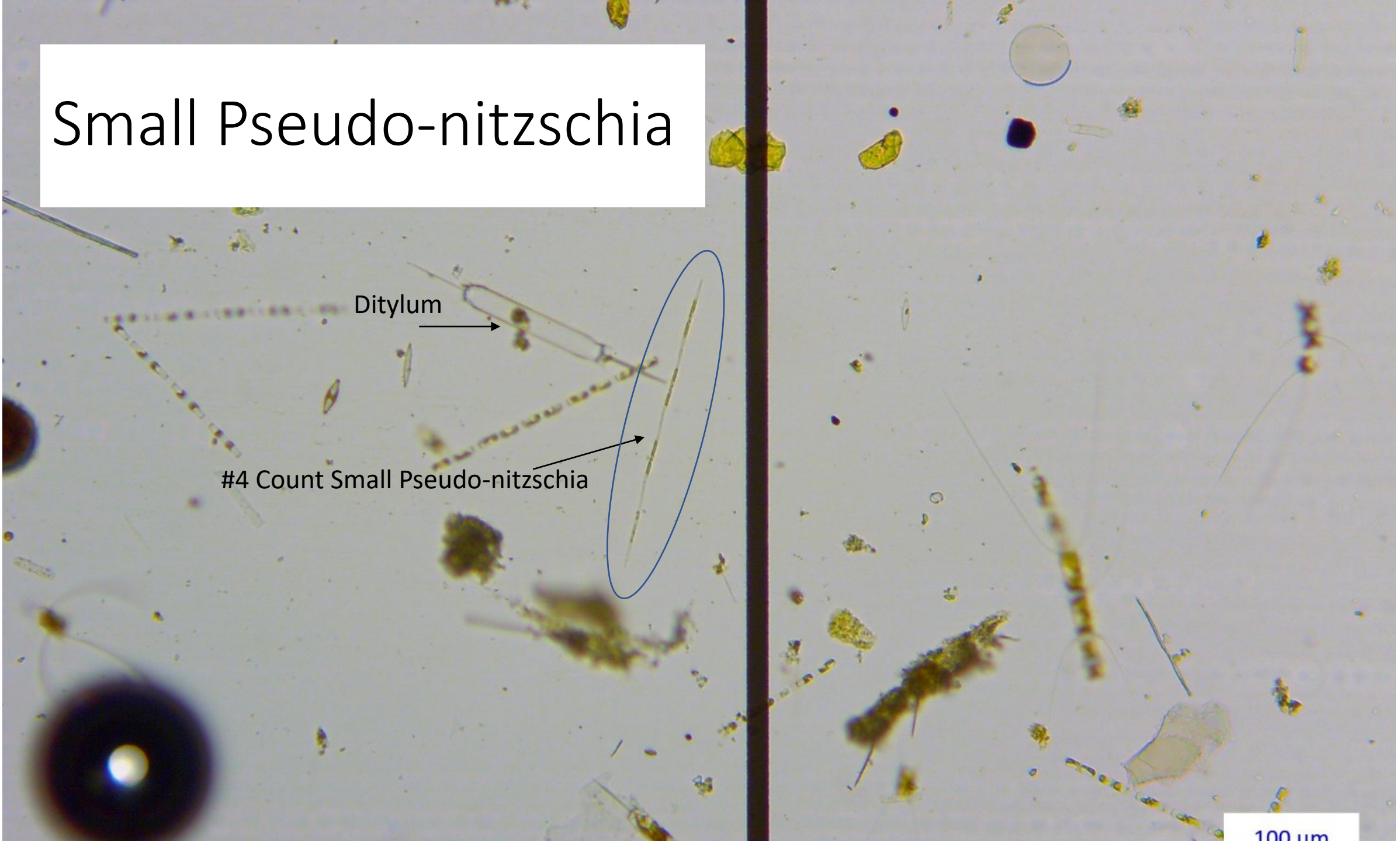


Small Pseudo-nitzschia

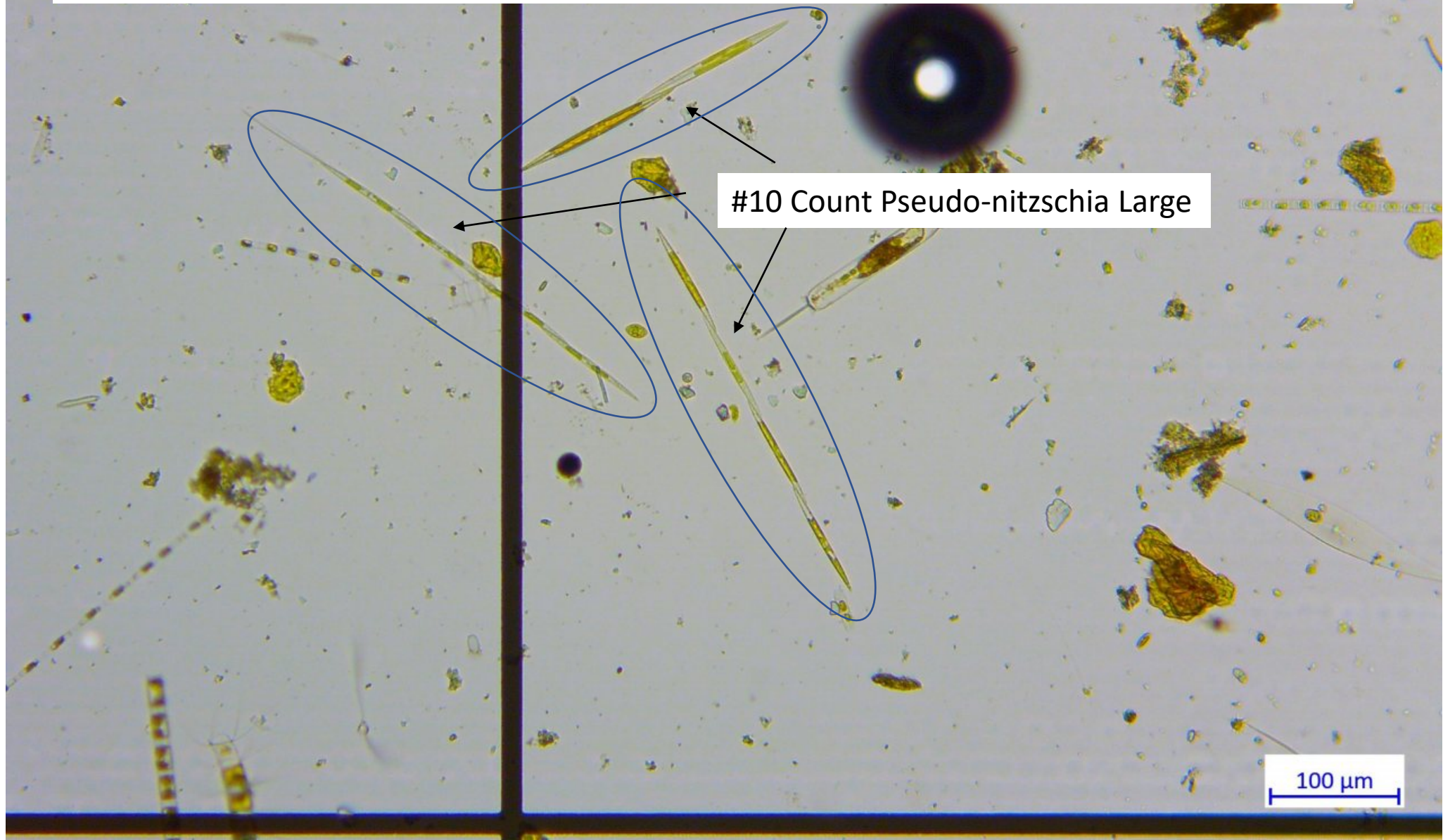
Ditylum

#4 Count Small Pseudo-nitzschia

100 µm

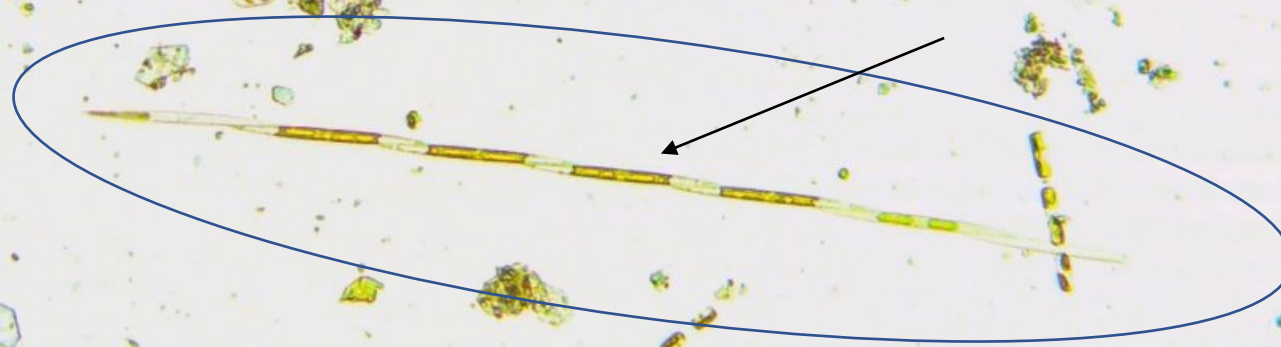


Different Pseudo-nitzschia Large sizes



6 Pseudo-nitzschia Large

#6 Count Pseudo-nitzschia Large



100 μ m

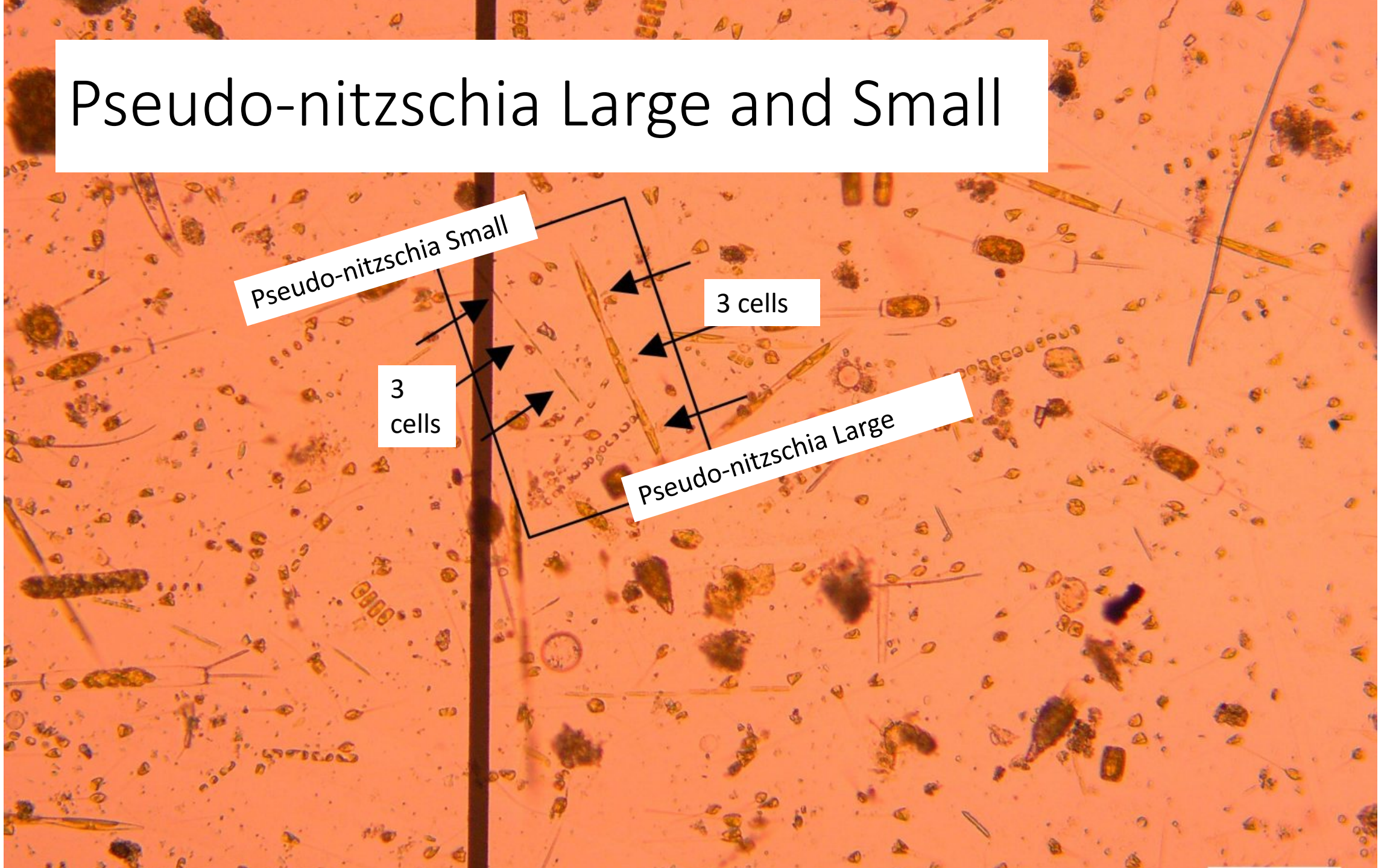
Pseudo-nitzschia Large and Small

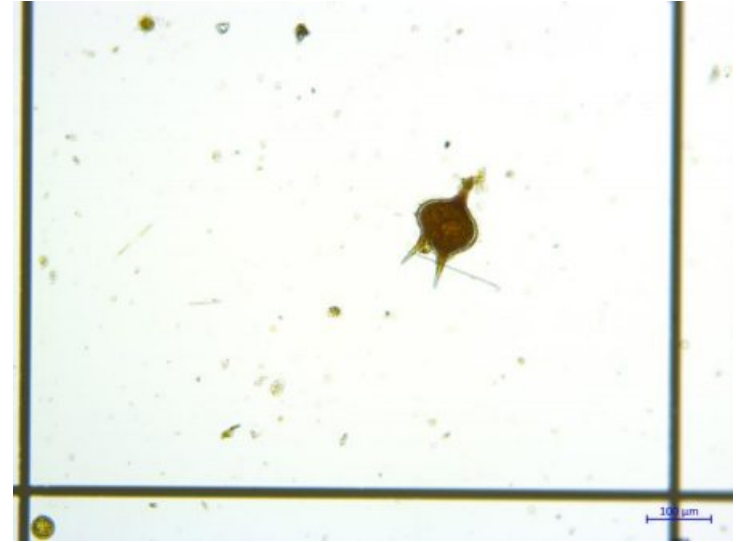
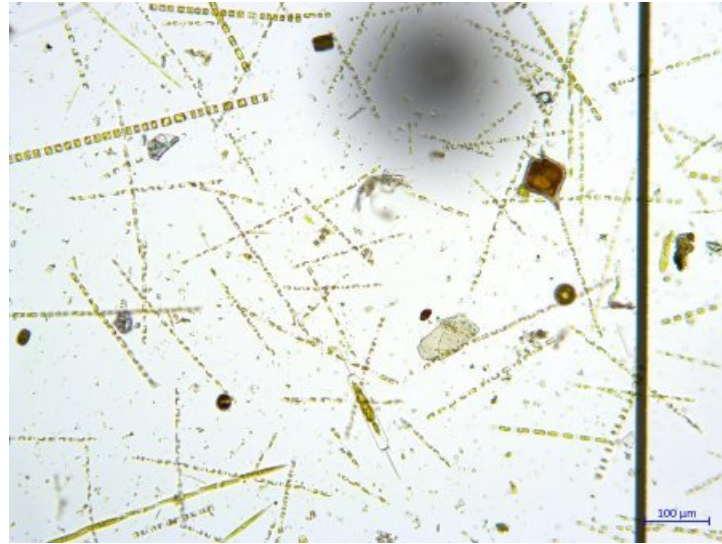
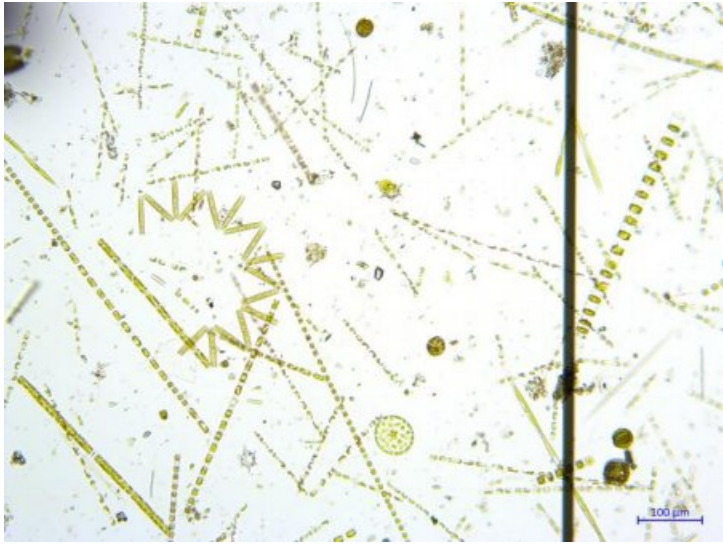
Pseudo-nitzschia Small

3 cells

3
cells

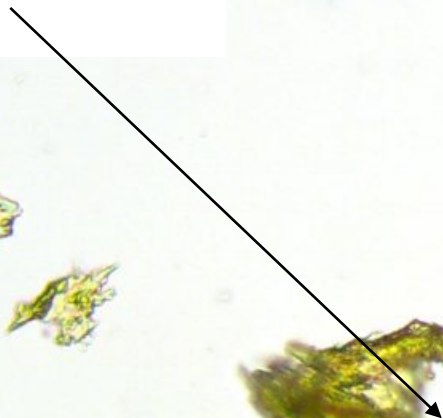
Pseudo-nitzschia Large





Non-HAB Forming Species

Ciliate



Pleurosigma and Navicula

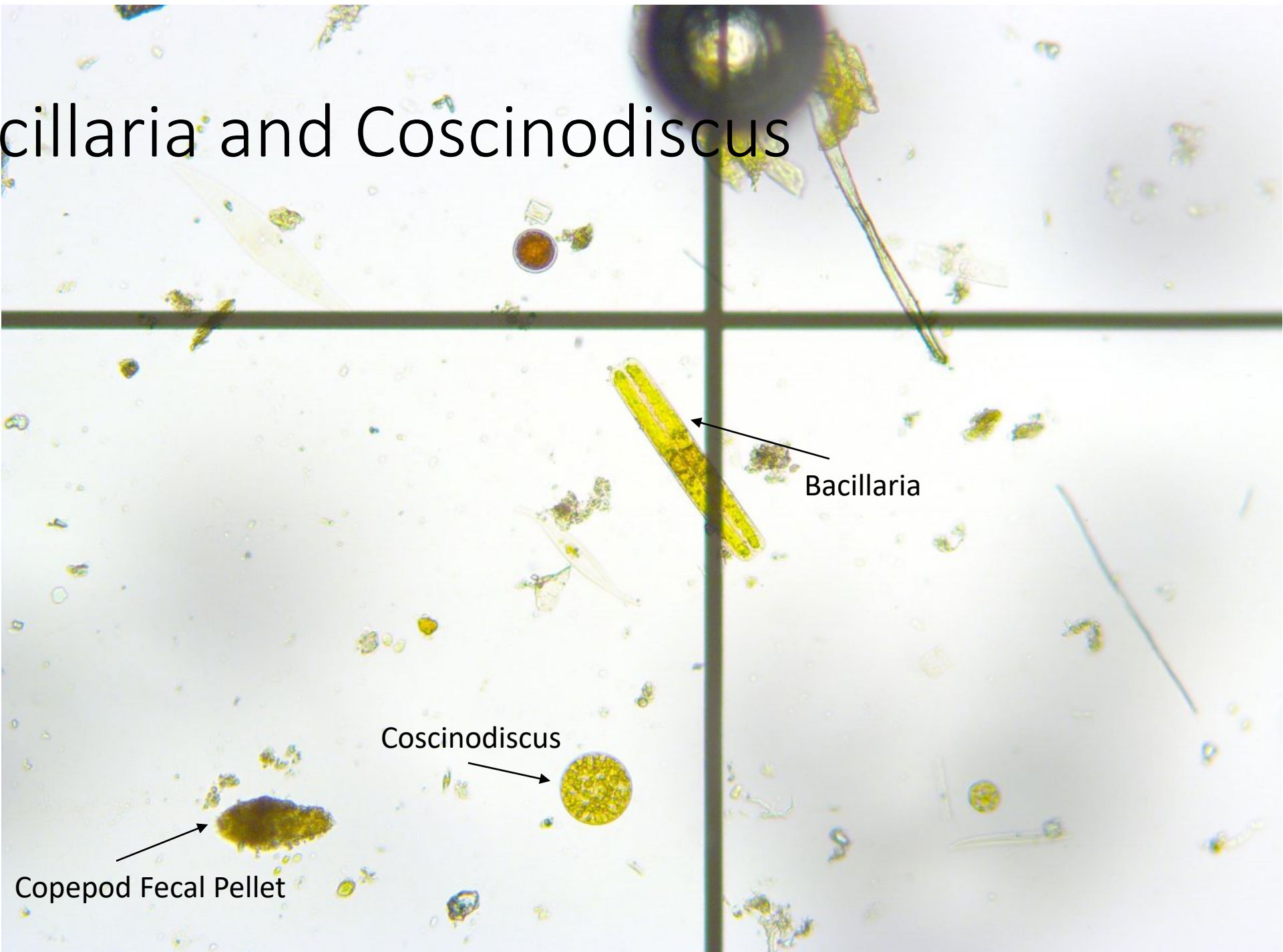


Navicula

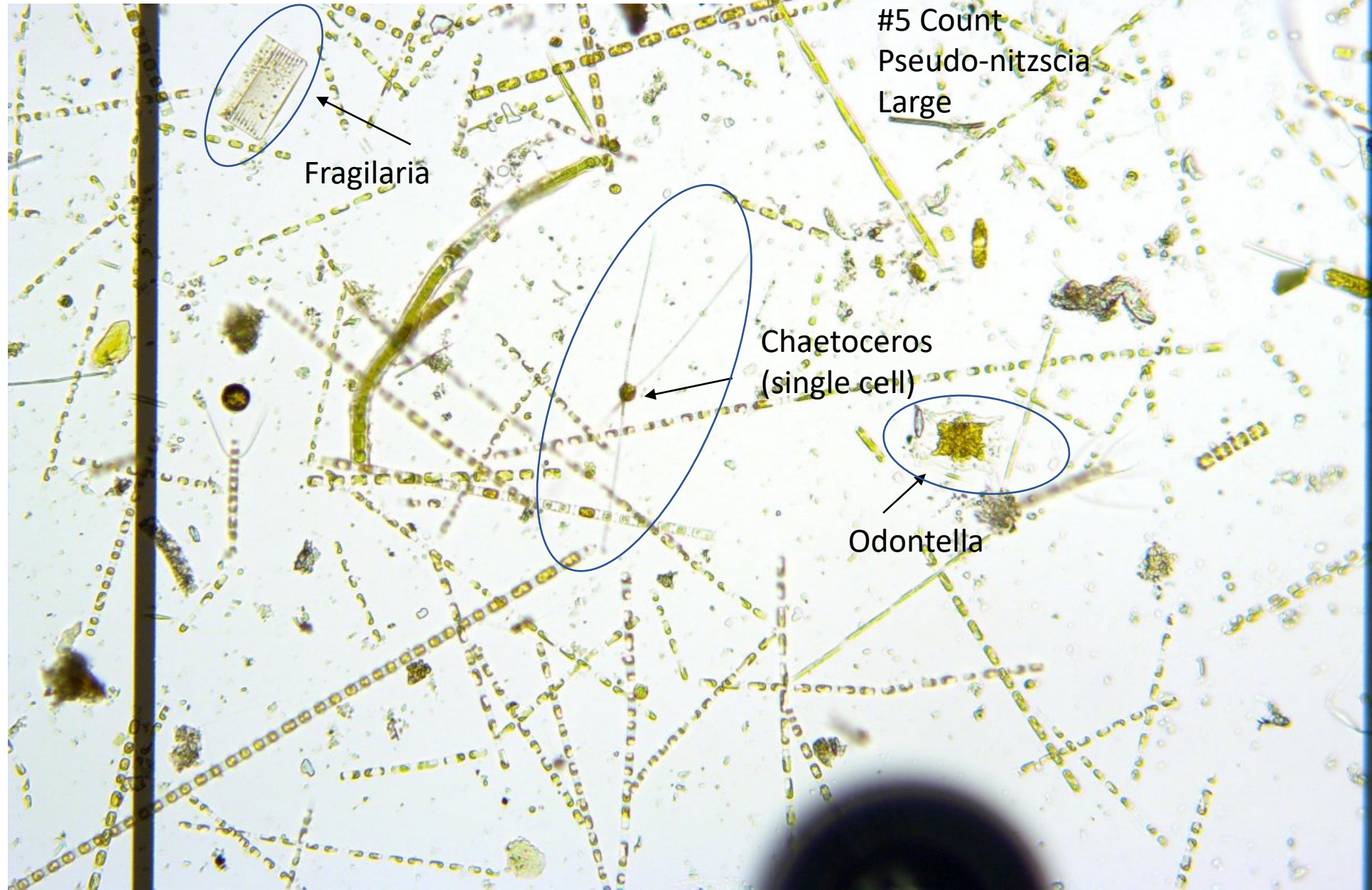


Pleurosigma

Bacillaria and Coscinodiscus



Fragilaria and Odontella

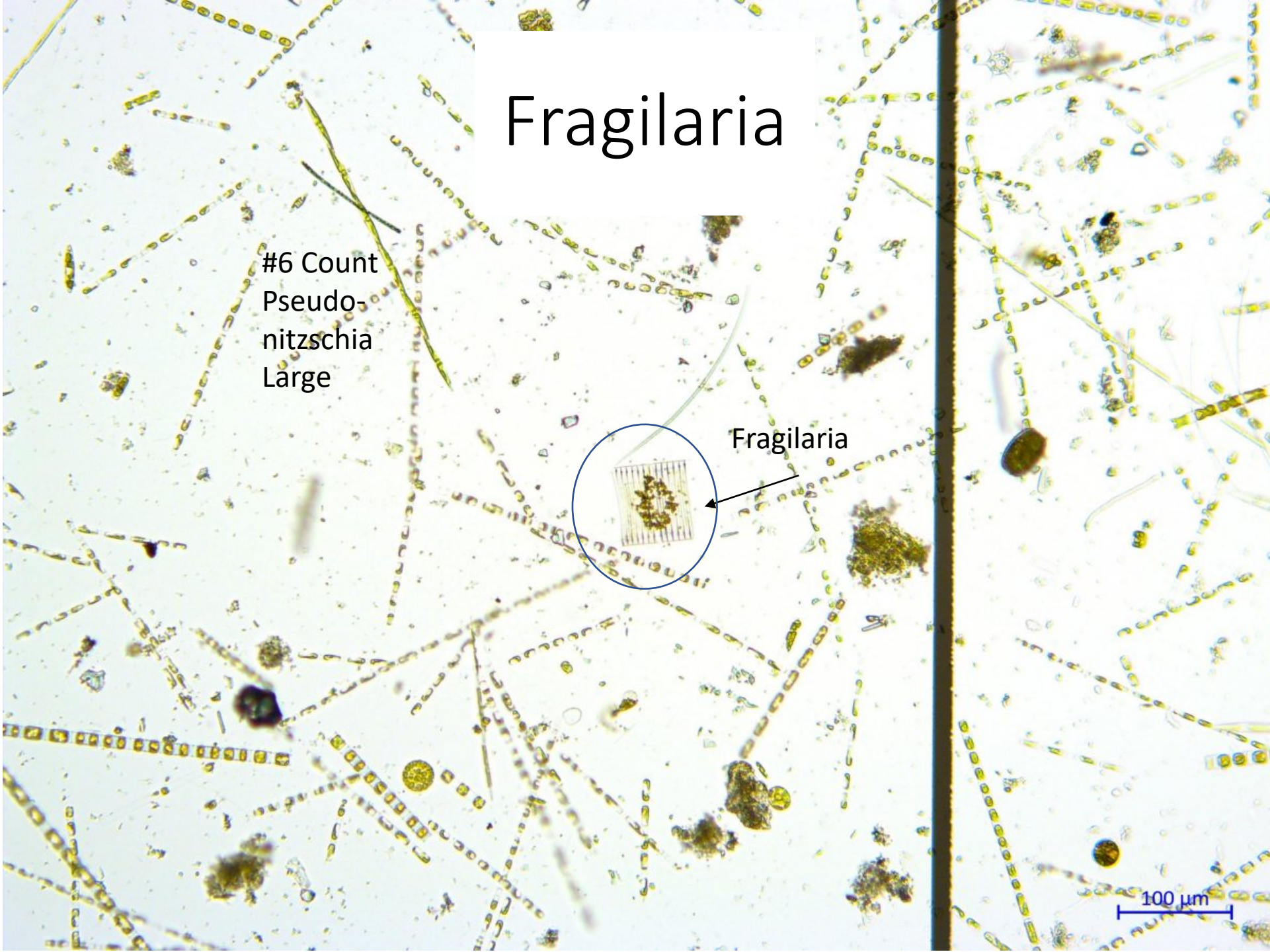


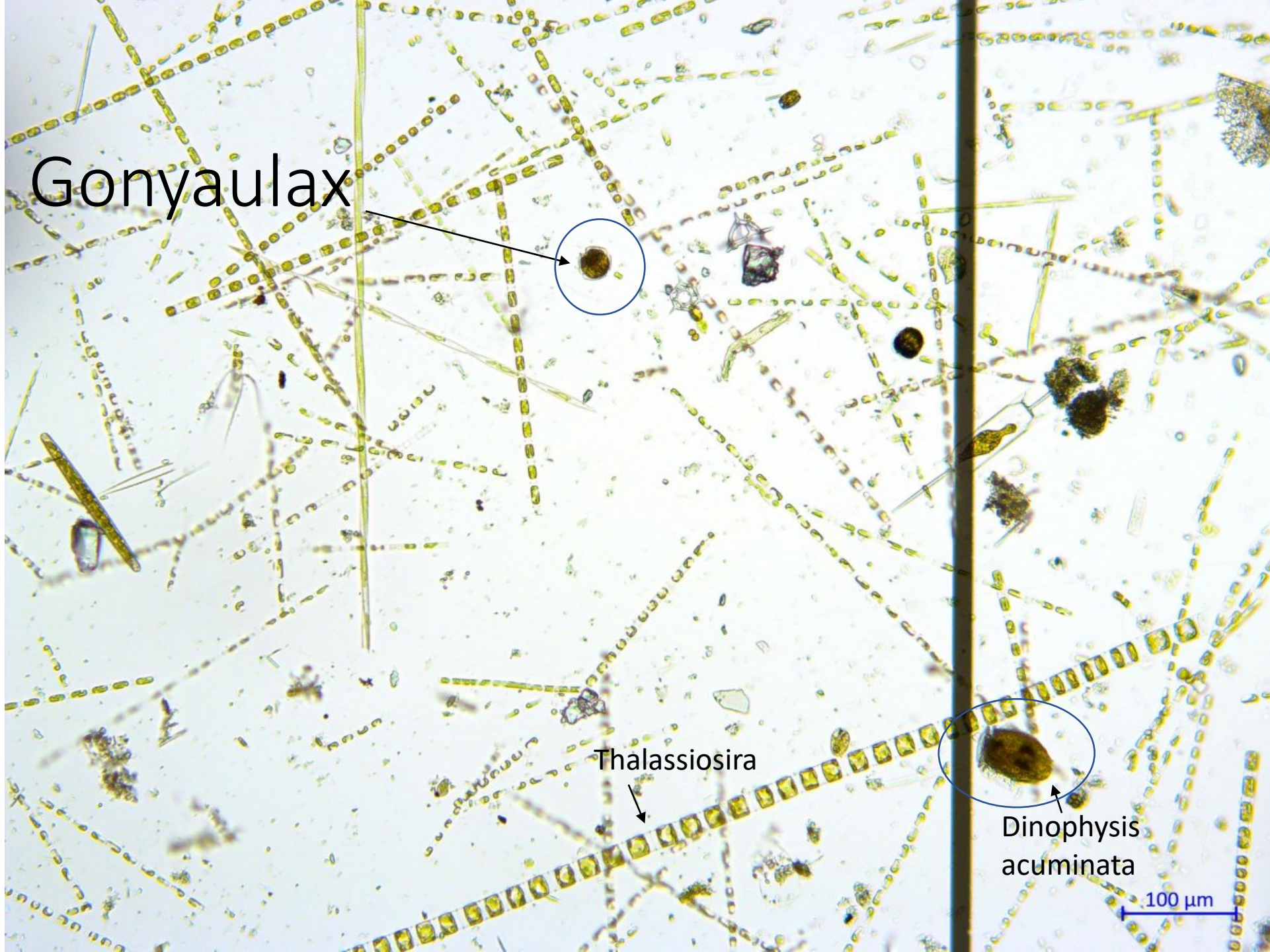
Fragilaria

#6 Count
Pseudo-
nitzschia
Large

Fragilaria

100 μ m





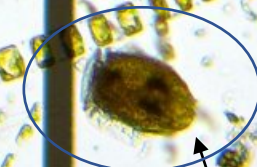
Gonyaulax



Thalassiosira



Dinophysis
acuminata

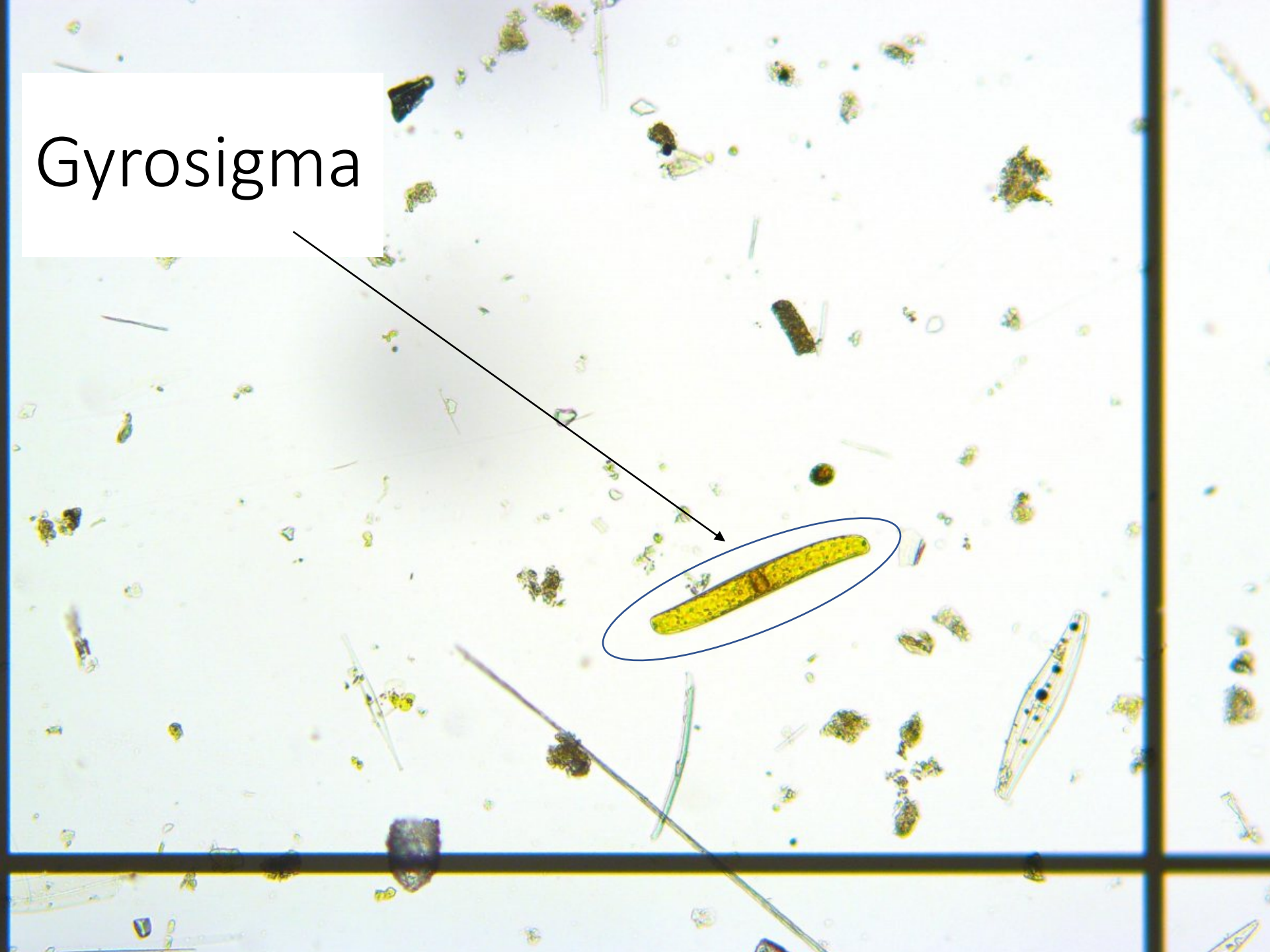


100 μm

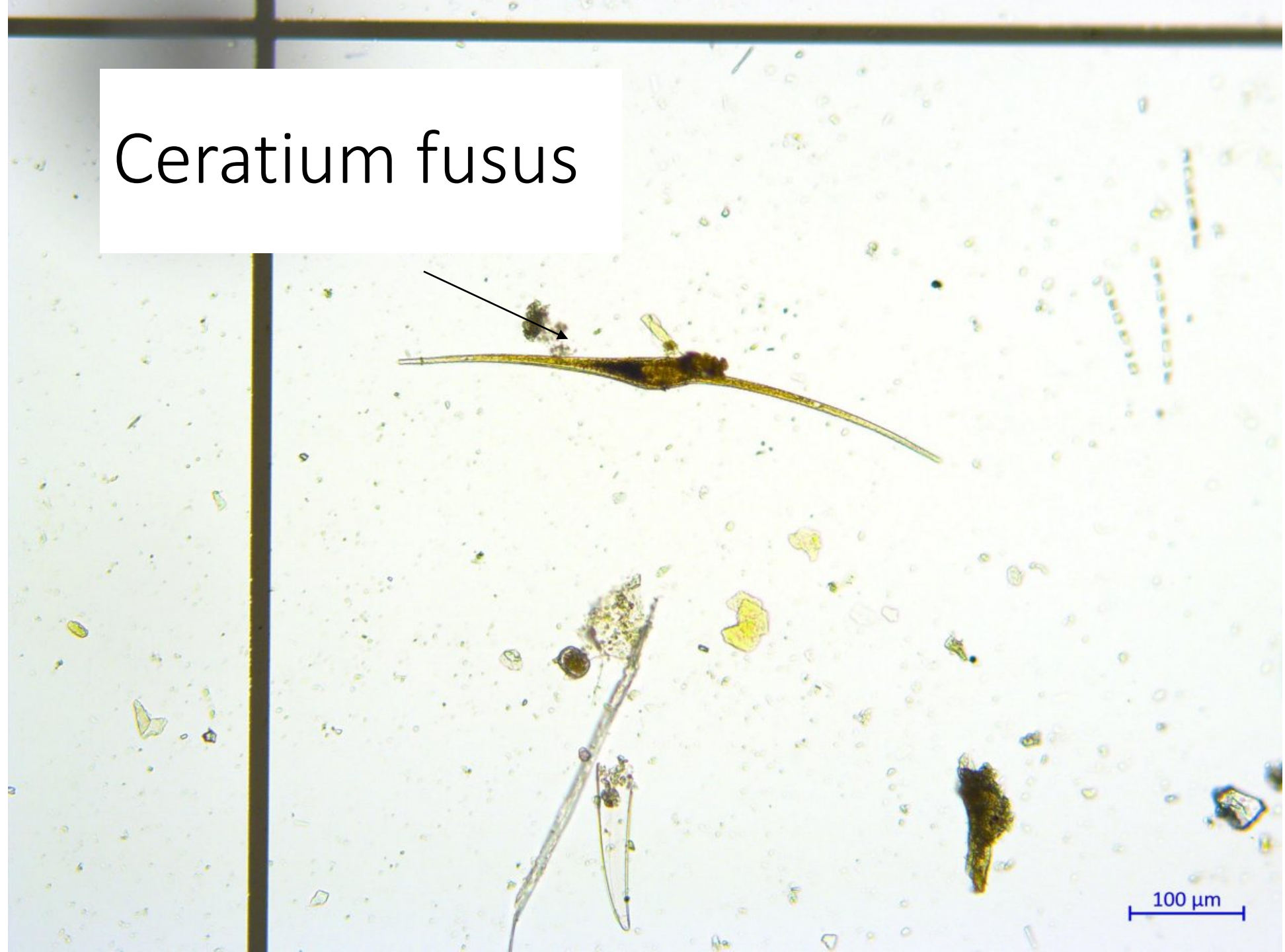
Gonyaulax and Guinardia



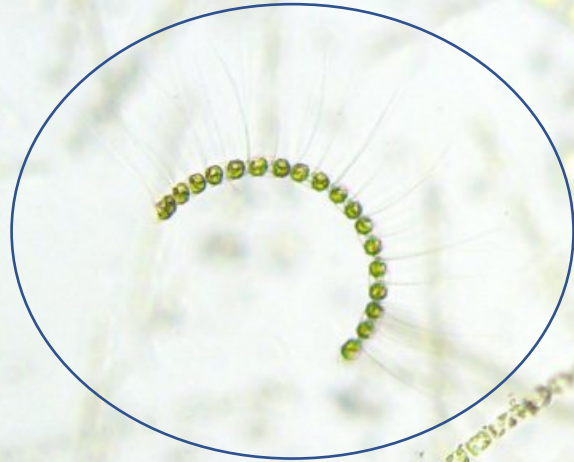
Gyrosigma



Ceratium fusus



Chaetoceros



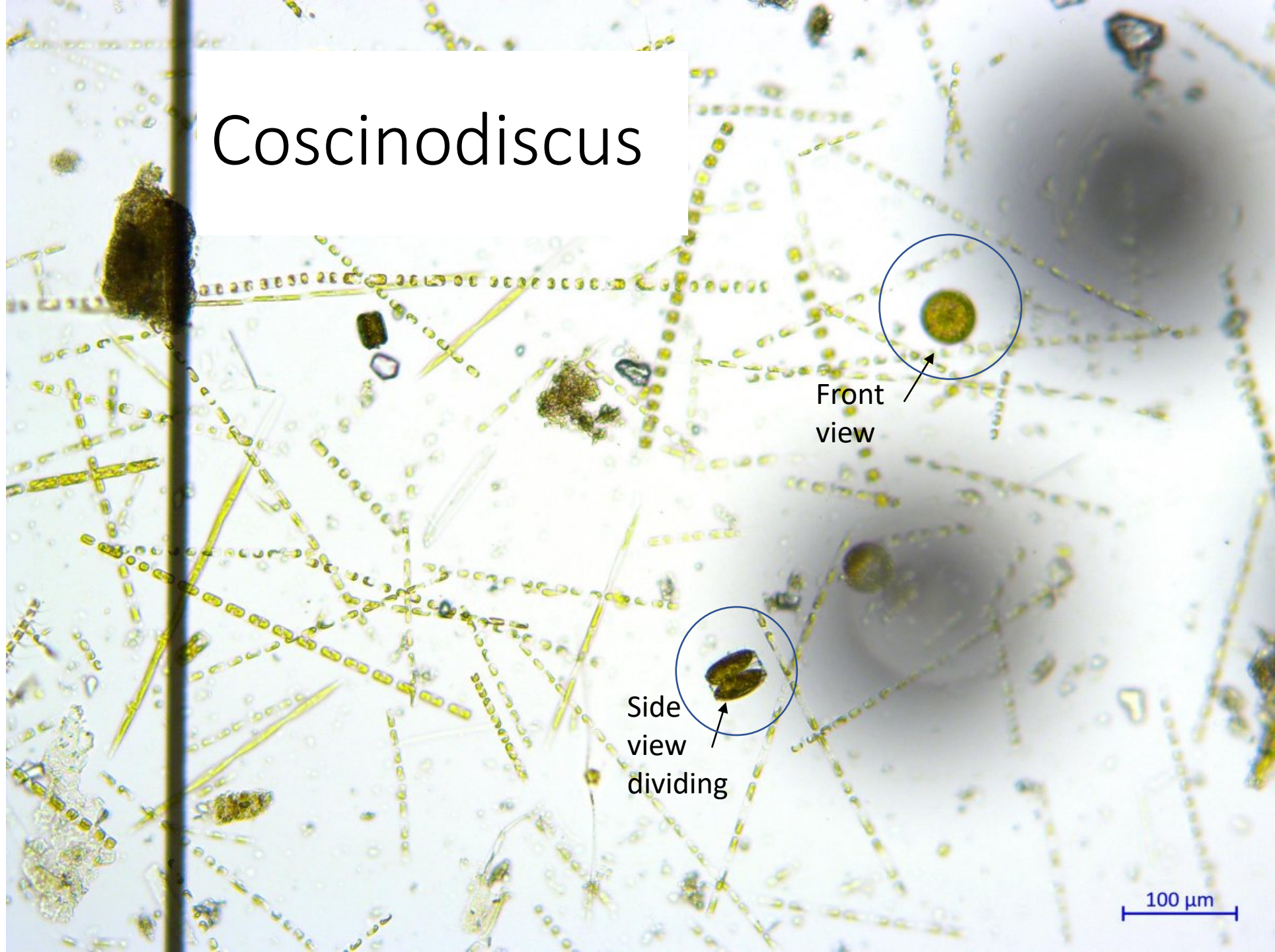
100 μm

Coscinodiscus

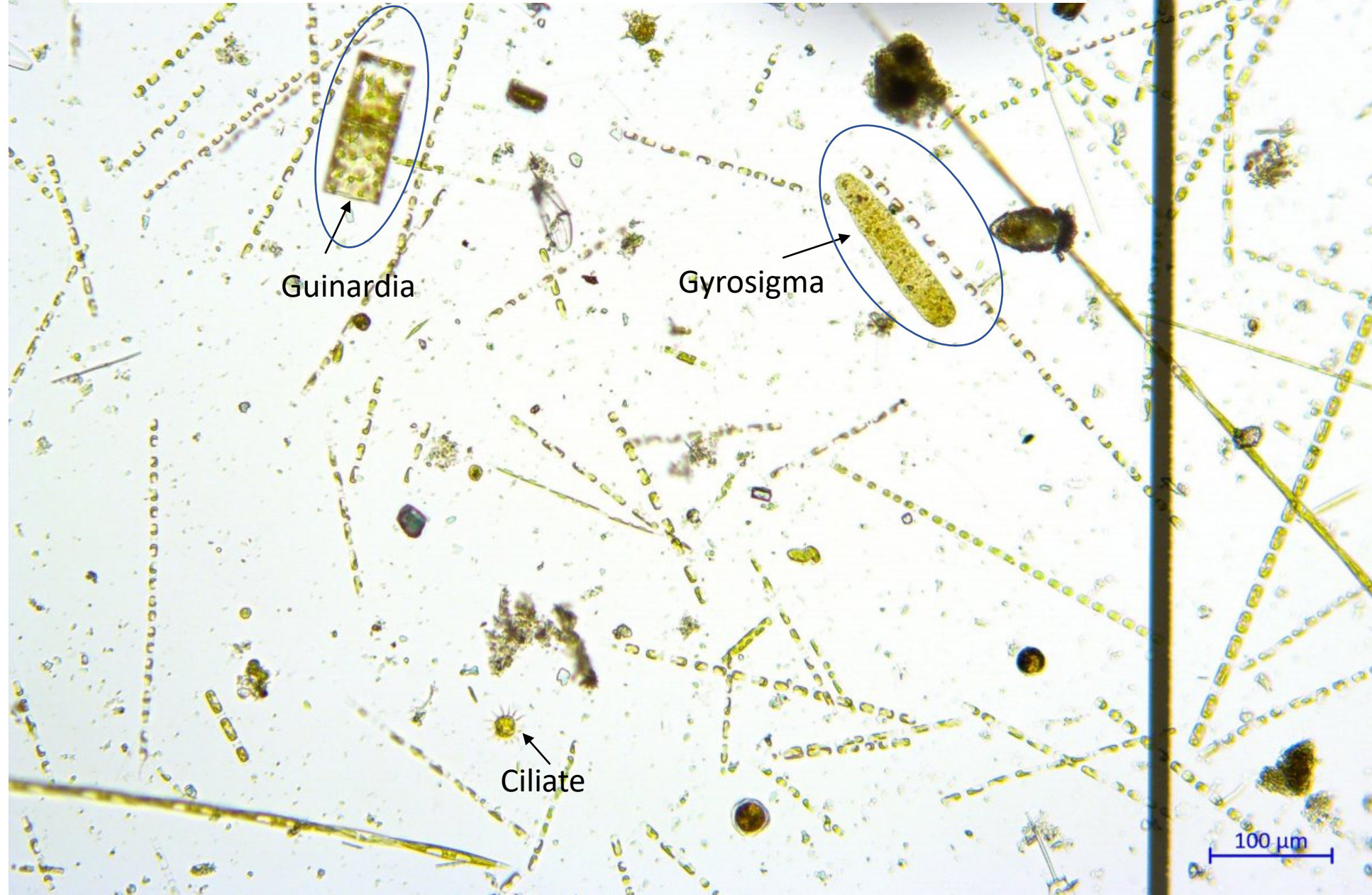
Front
view

Side
view
dividing

100 μm



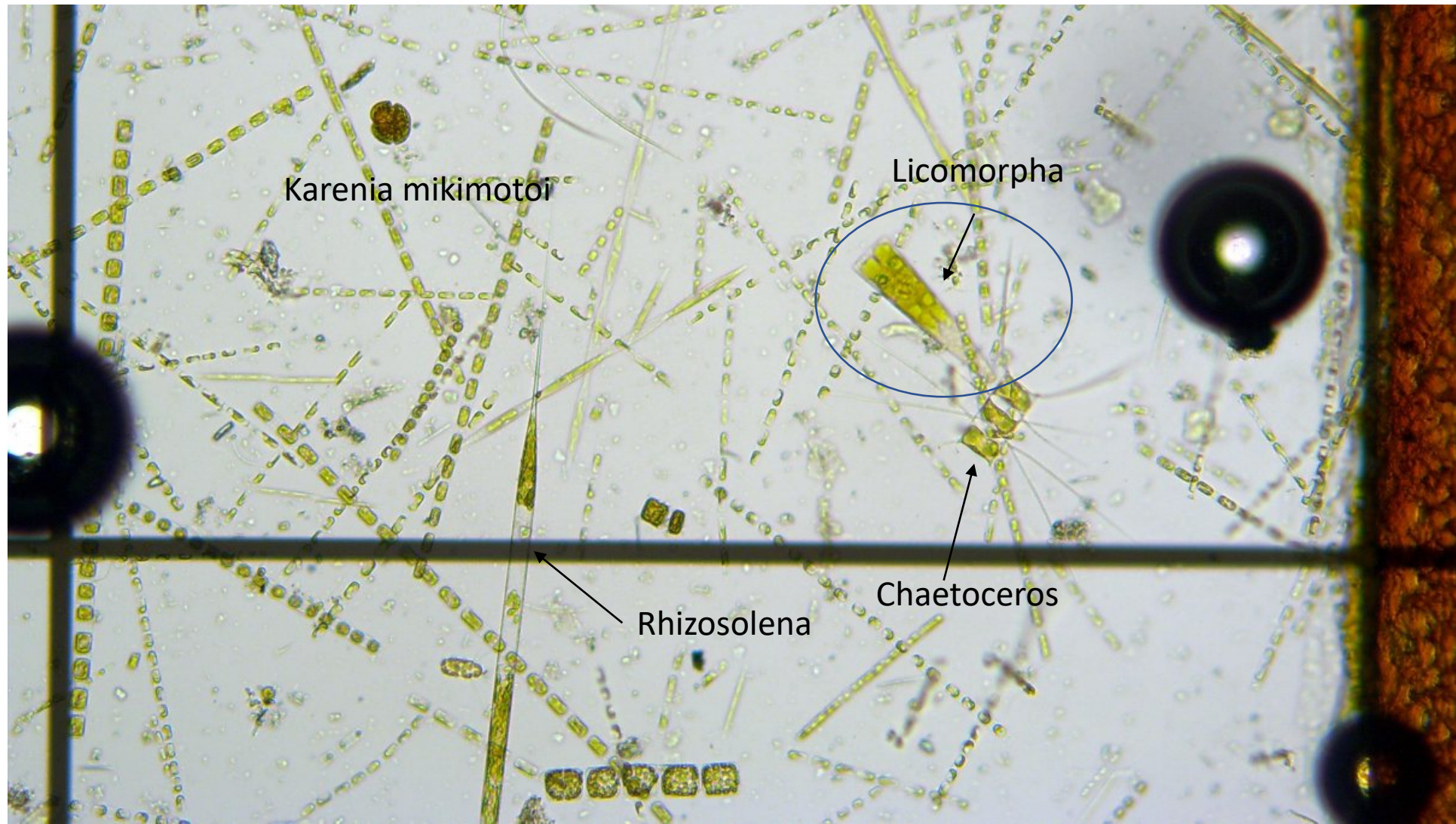
Guinardia, Ciliate, Gryosigma

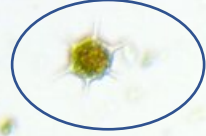


Gyrosigma, Pseudo-nitzschia Large



Licomorpha, Chaetoceros, Rhizosolena





Dictyocha

Dictyocha, Protoperidinium



Protoperidinium

100 μm

Protoperidinium

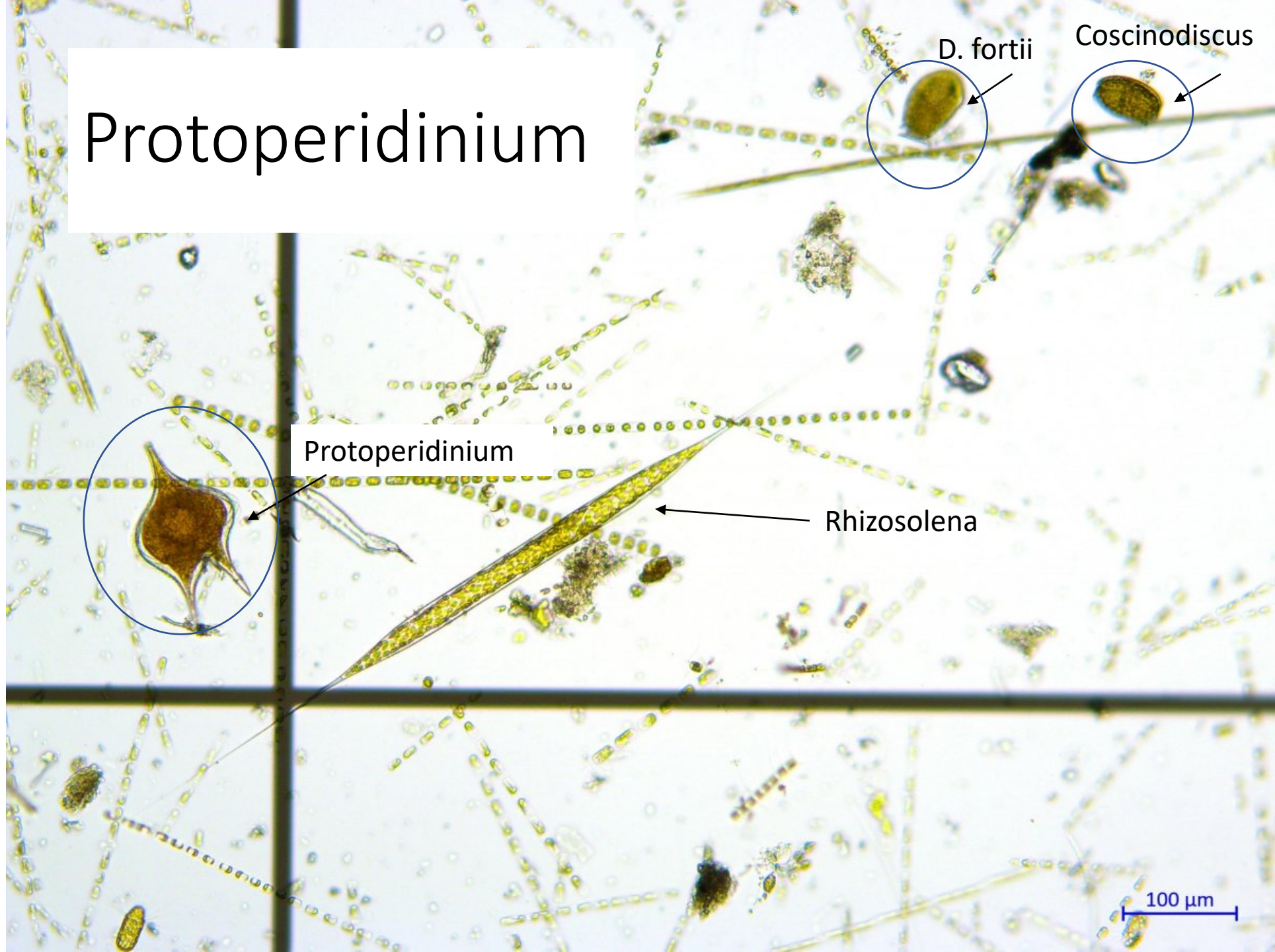
D. fortii

Coscinodiscus

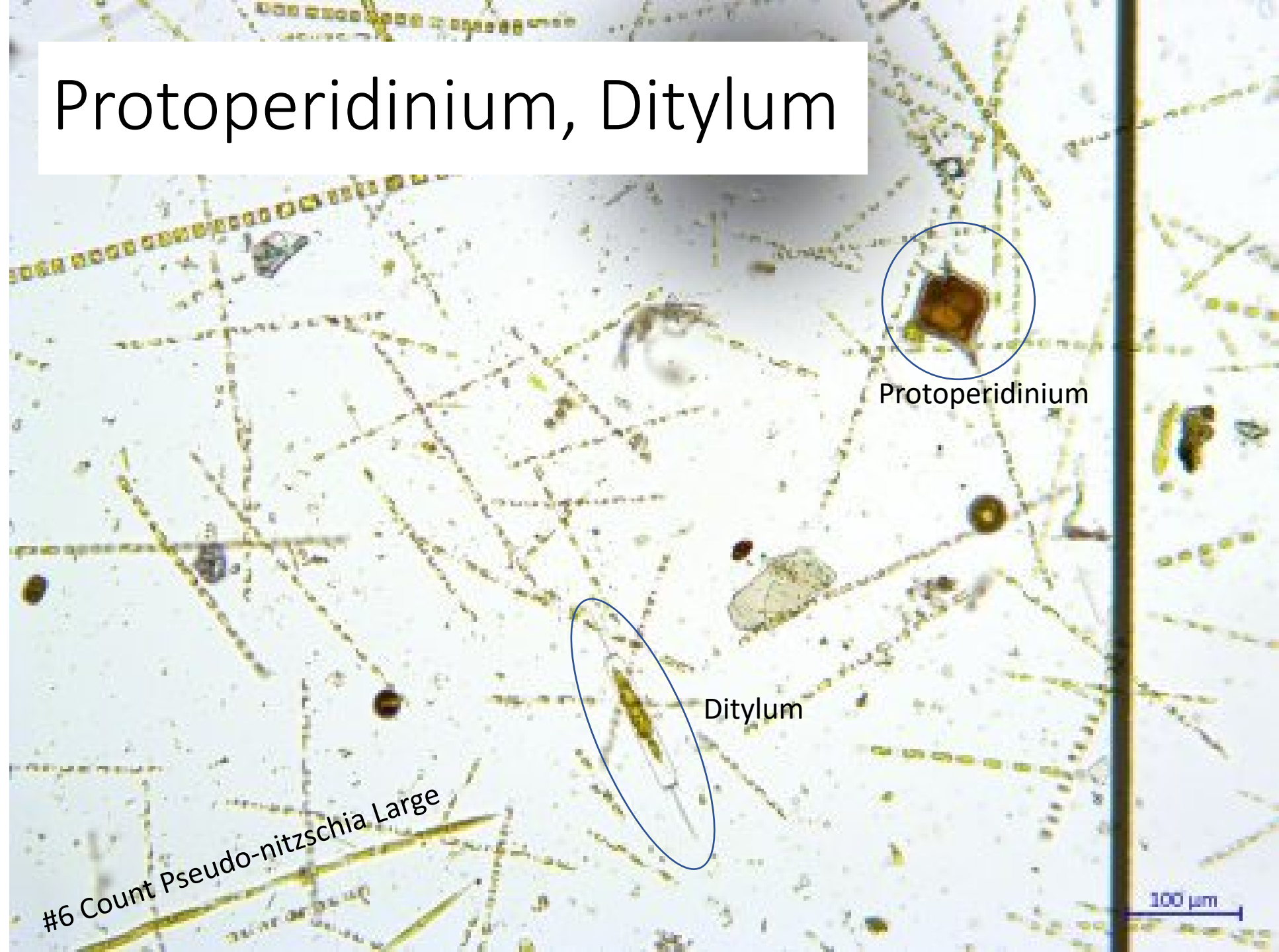
Protoperidinium

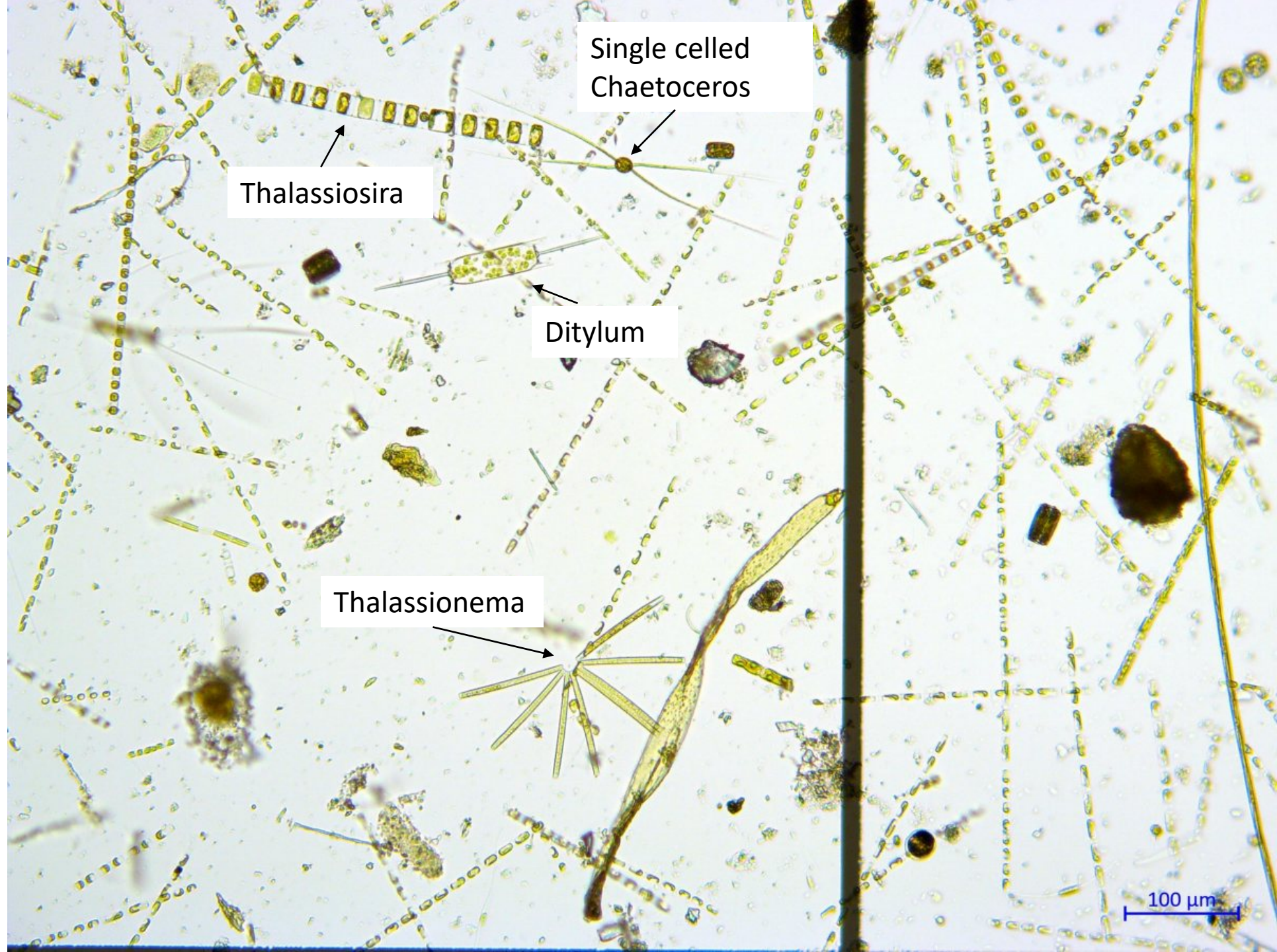
Rhizosolena

100 μ m



Protoperidinium, Ditylum





Single celled
Chaetoceros

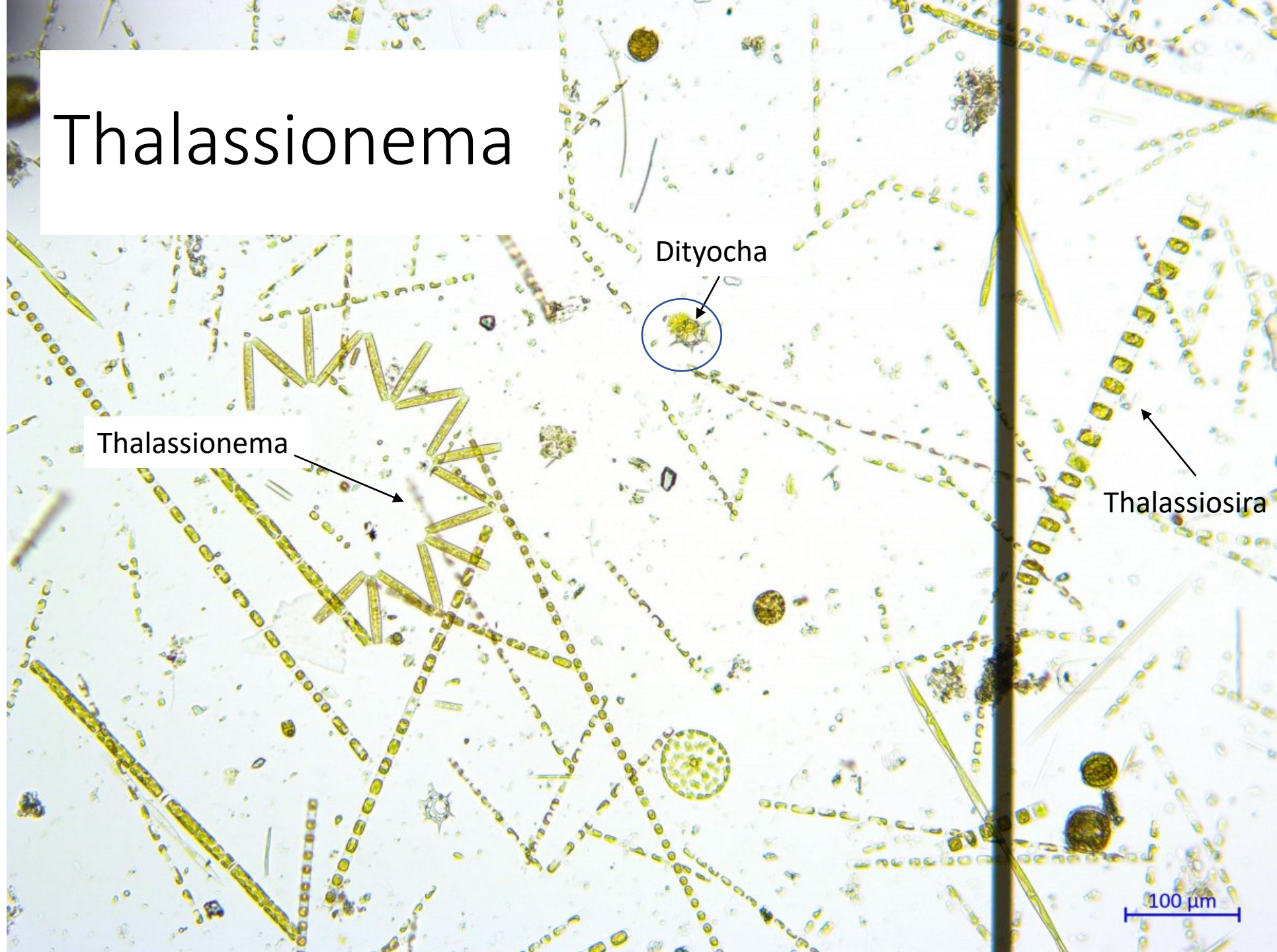
Thalassiosira

Ditylum

Thalassionema

100 μ m

Thalassionema



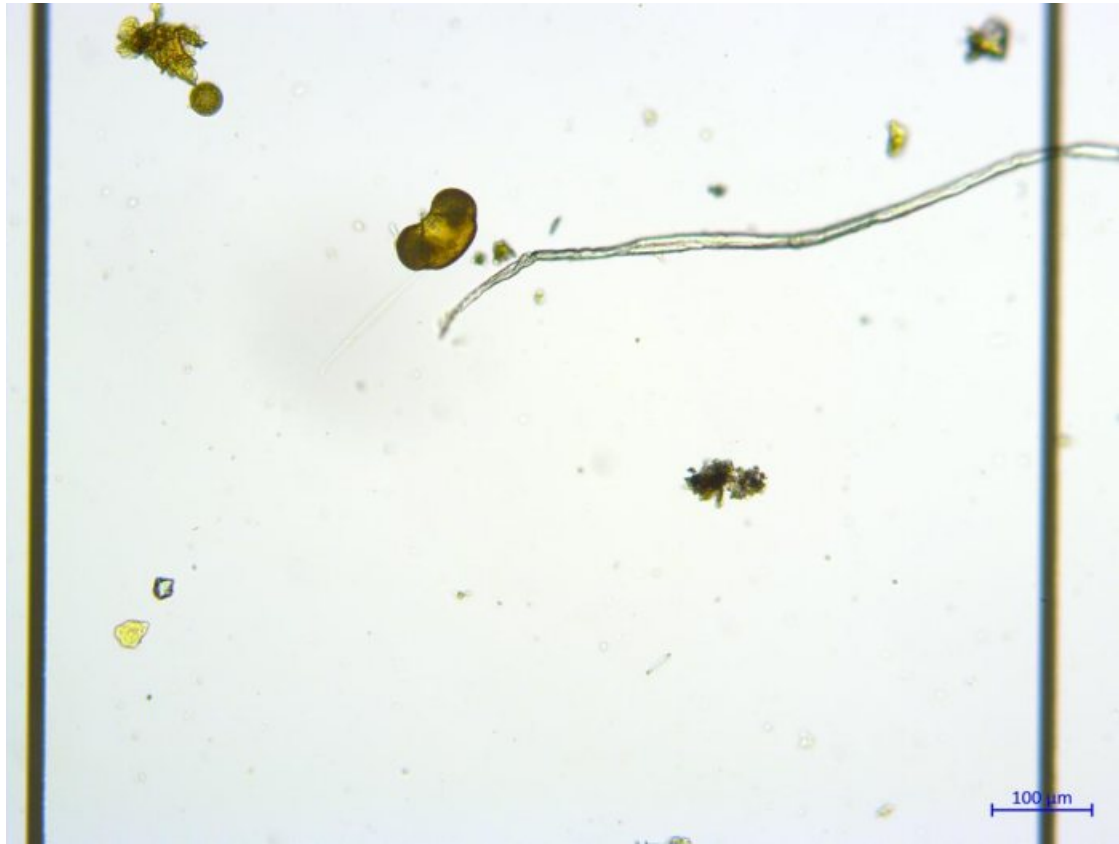
Thalassiosira

Thalassiosira

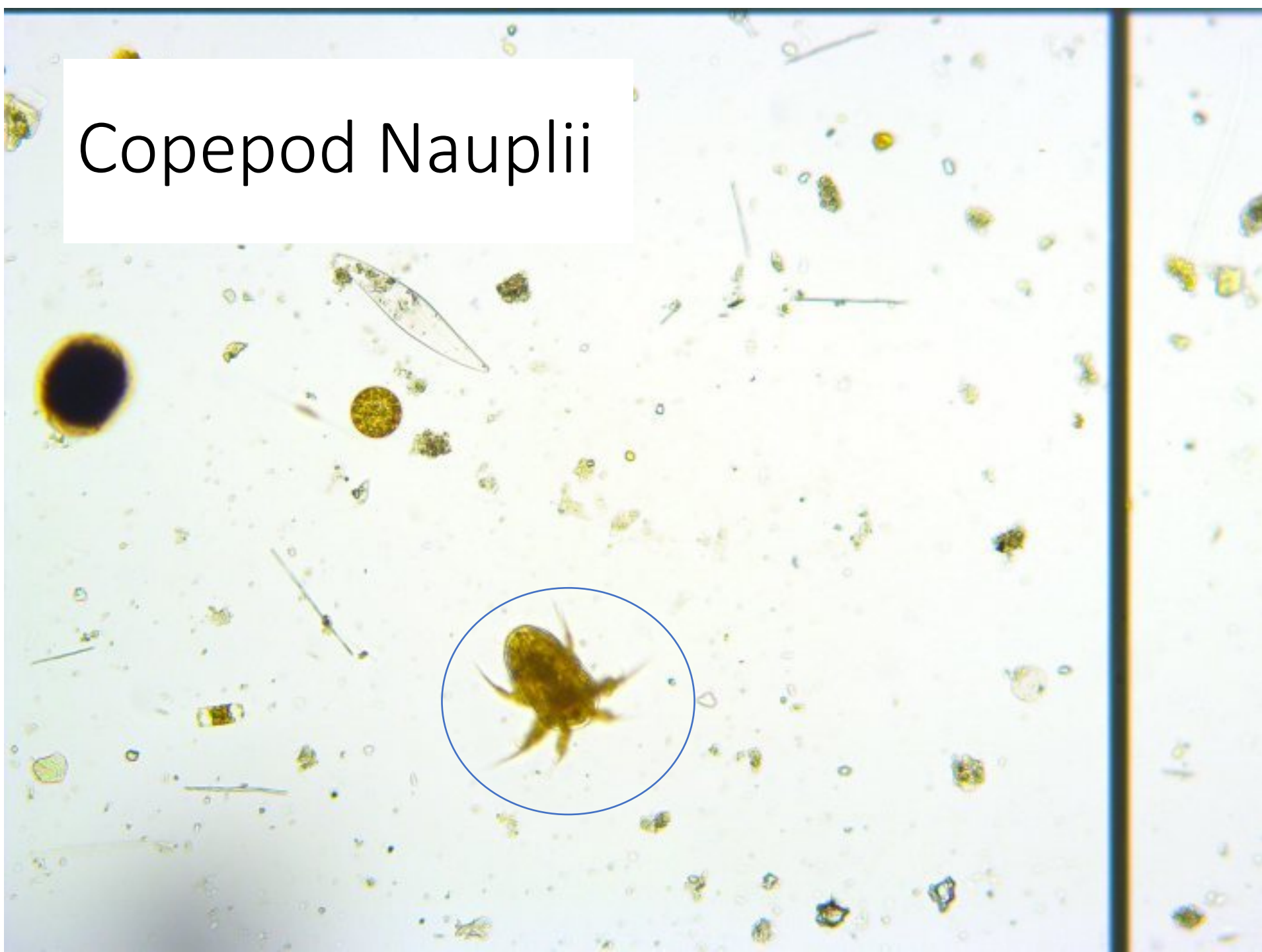
#3 Count Pseudo-
nitzschia Large



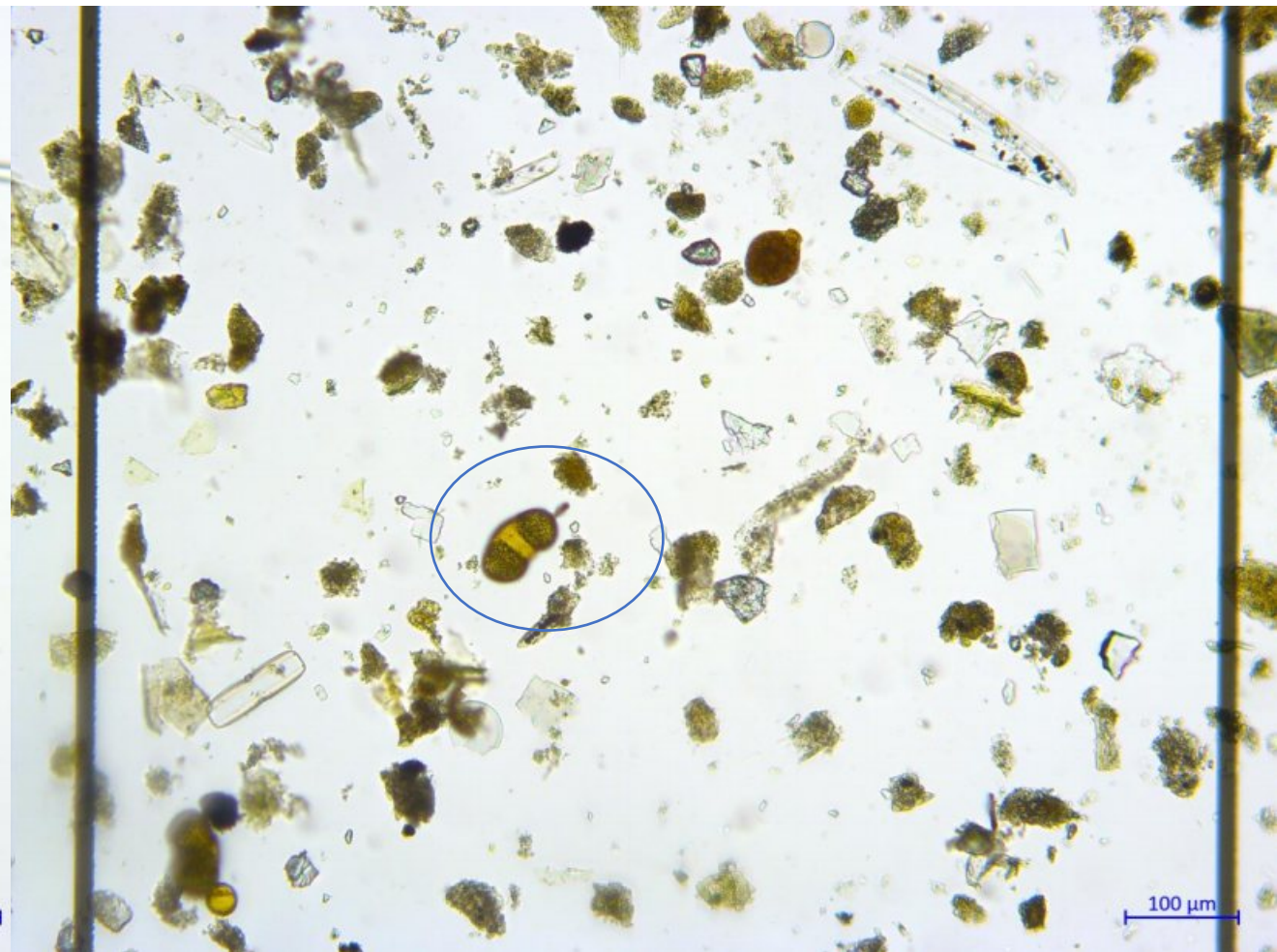
Zooplankton and Other Things You May Find



Copepod Nauplii



Pollen



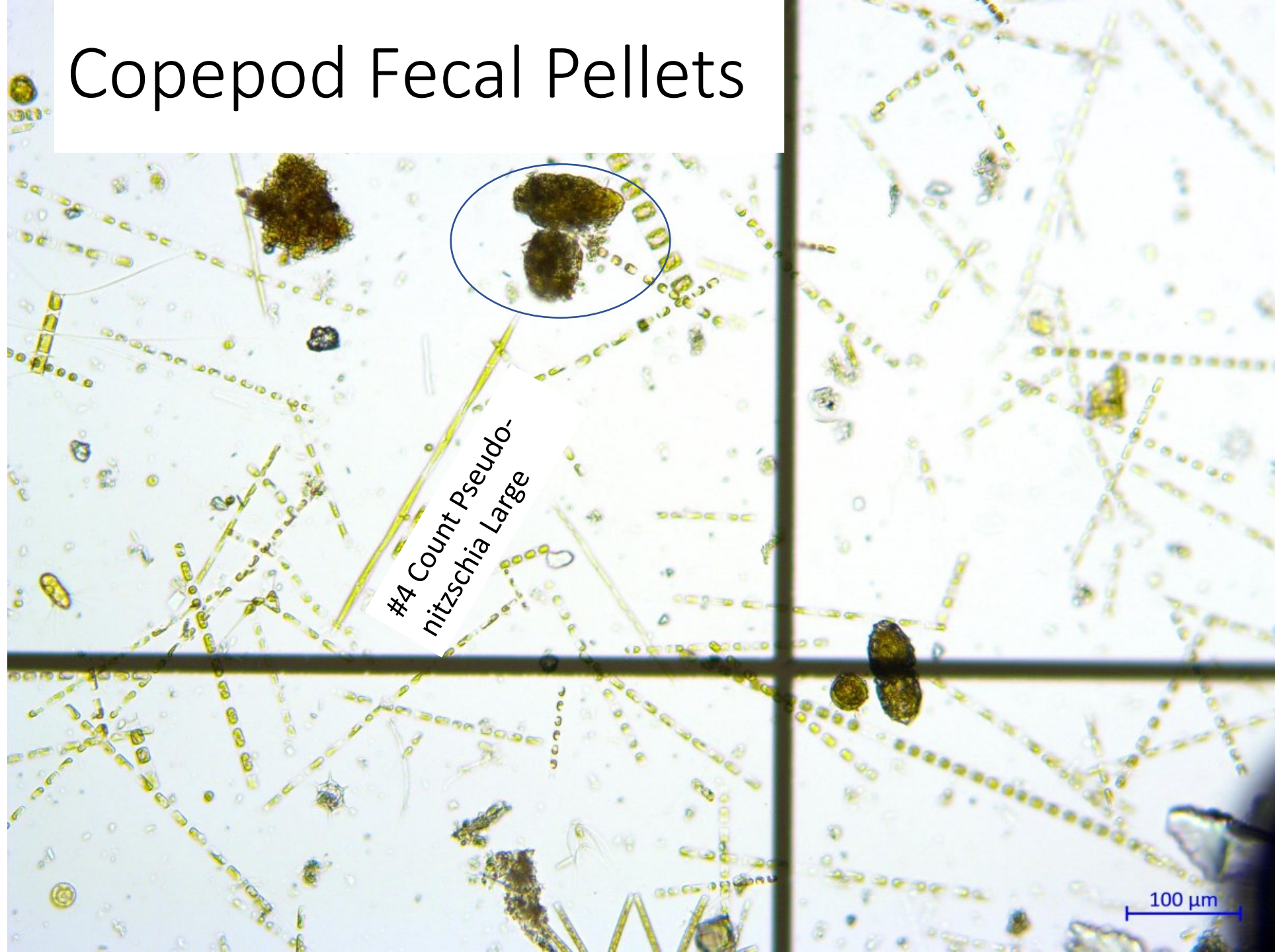
Bryozoan



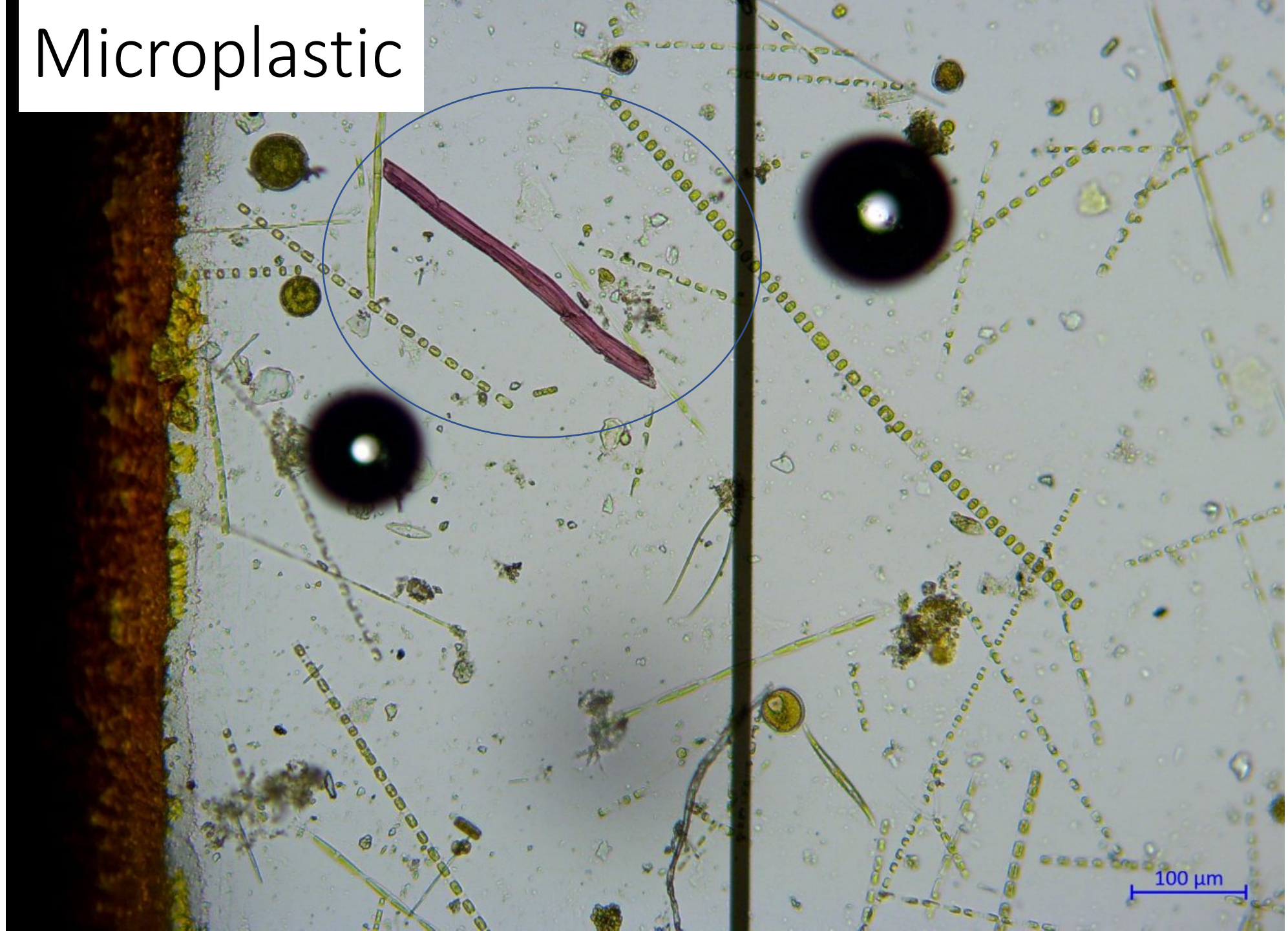
Female Copepod with eggs



Copepod Fecal Pellets



Microplastic



Tintinnid

