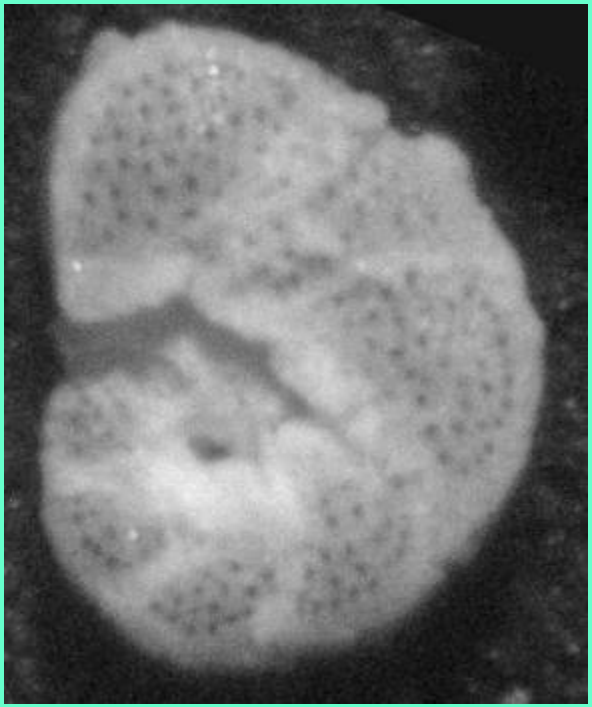
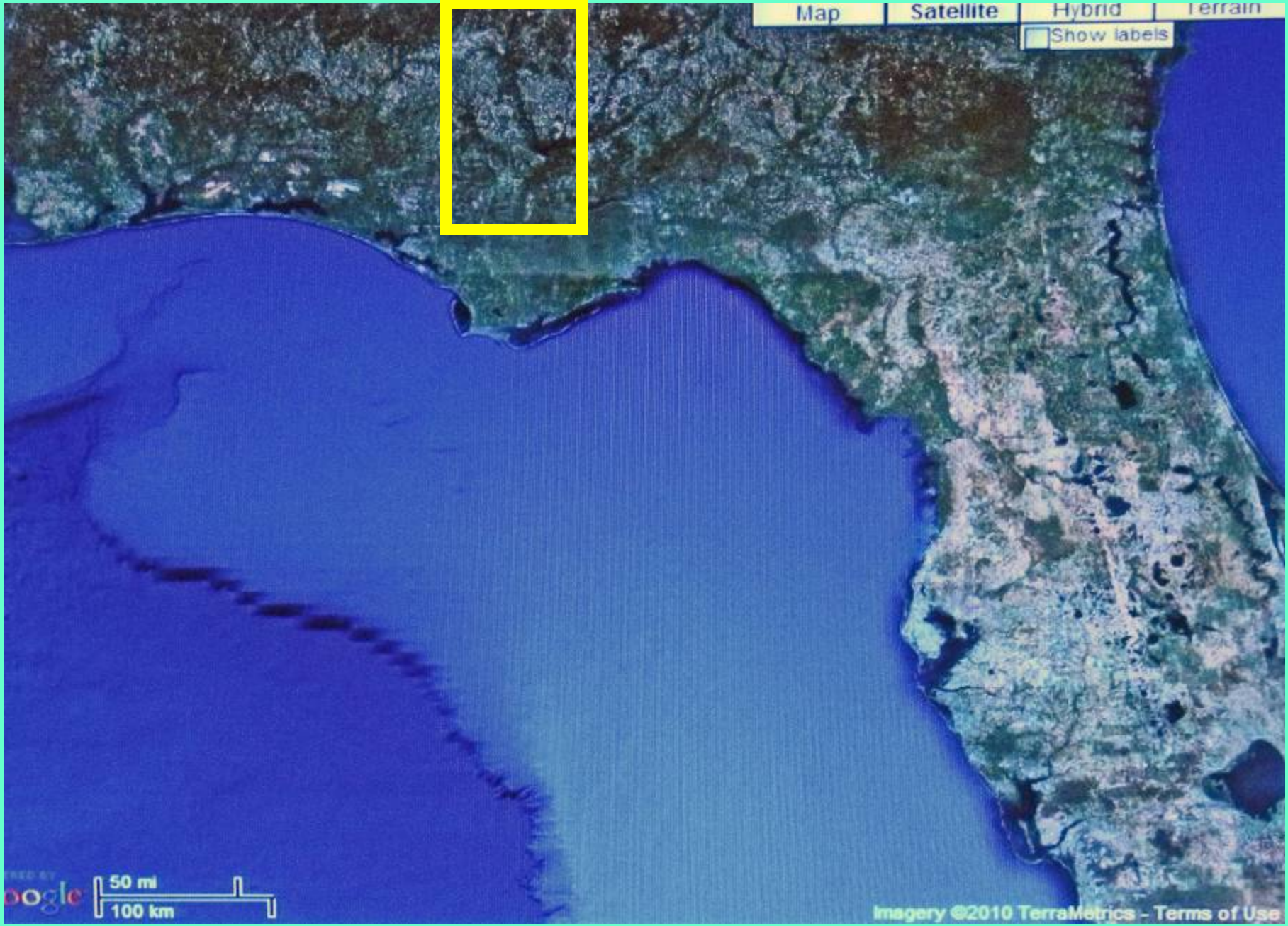
Early Miocene (Burdigalian, ~18.5 Ma) Microfossils of the CHIPOLA FORMATION, Farley Creek, Calhoun Co., Florida

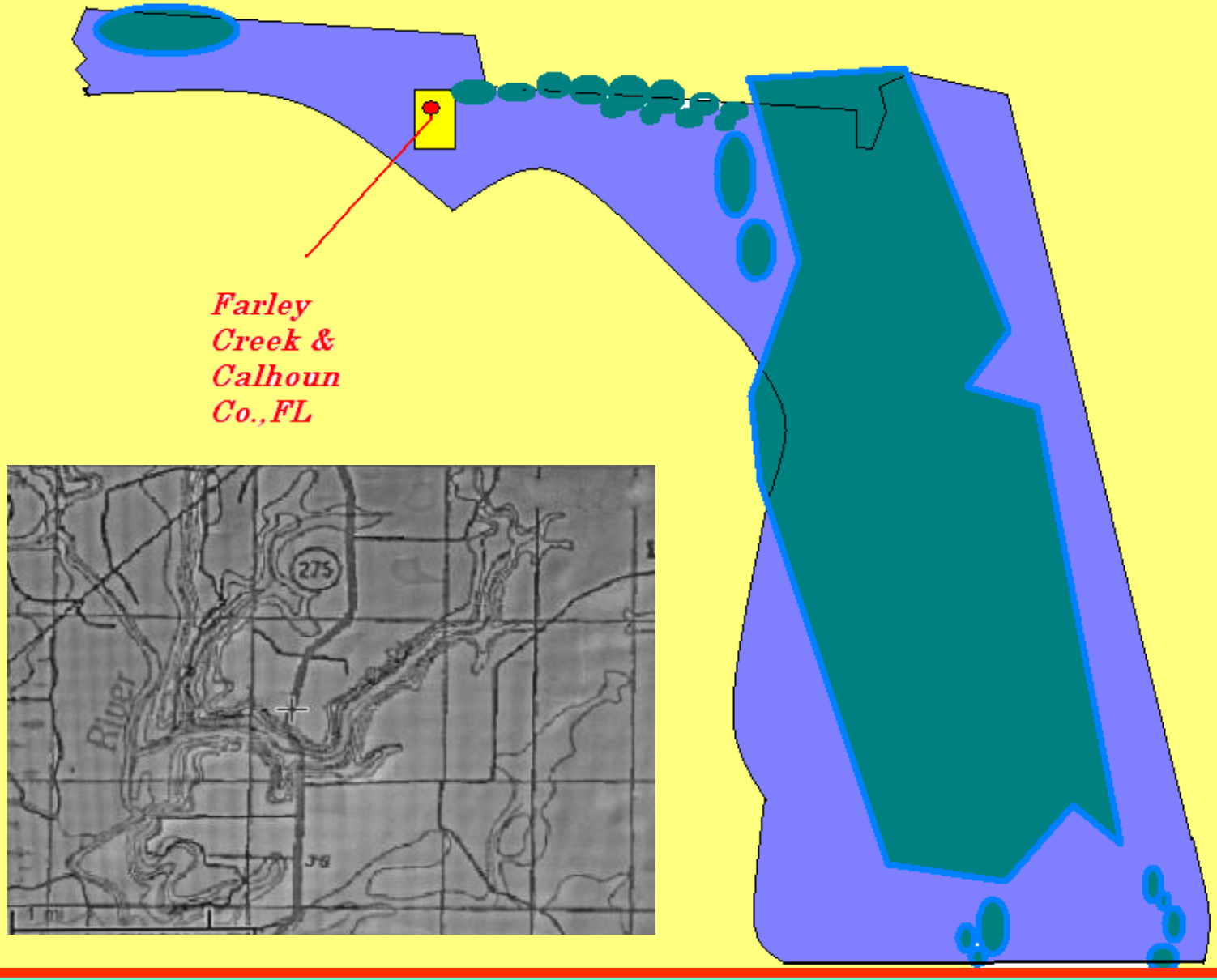
John E.B. Baker, Microgeo

Cibicides sp.

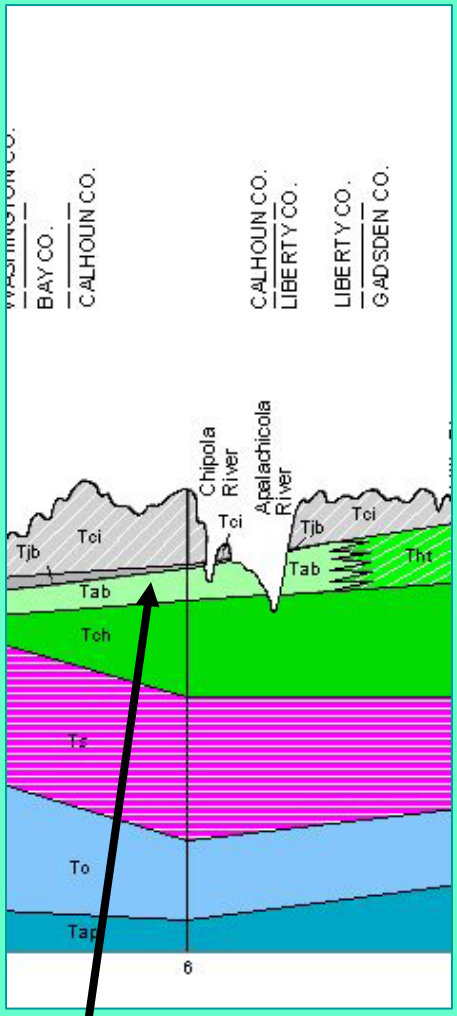


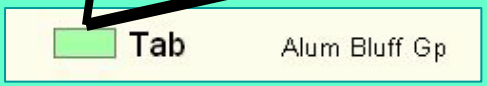

Map
Satellite
Hybrid
Terrain
Show labels
50 mi
100 km
Imagery ©2010 TerraMetrics - Terms of Use

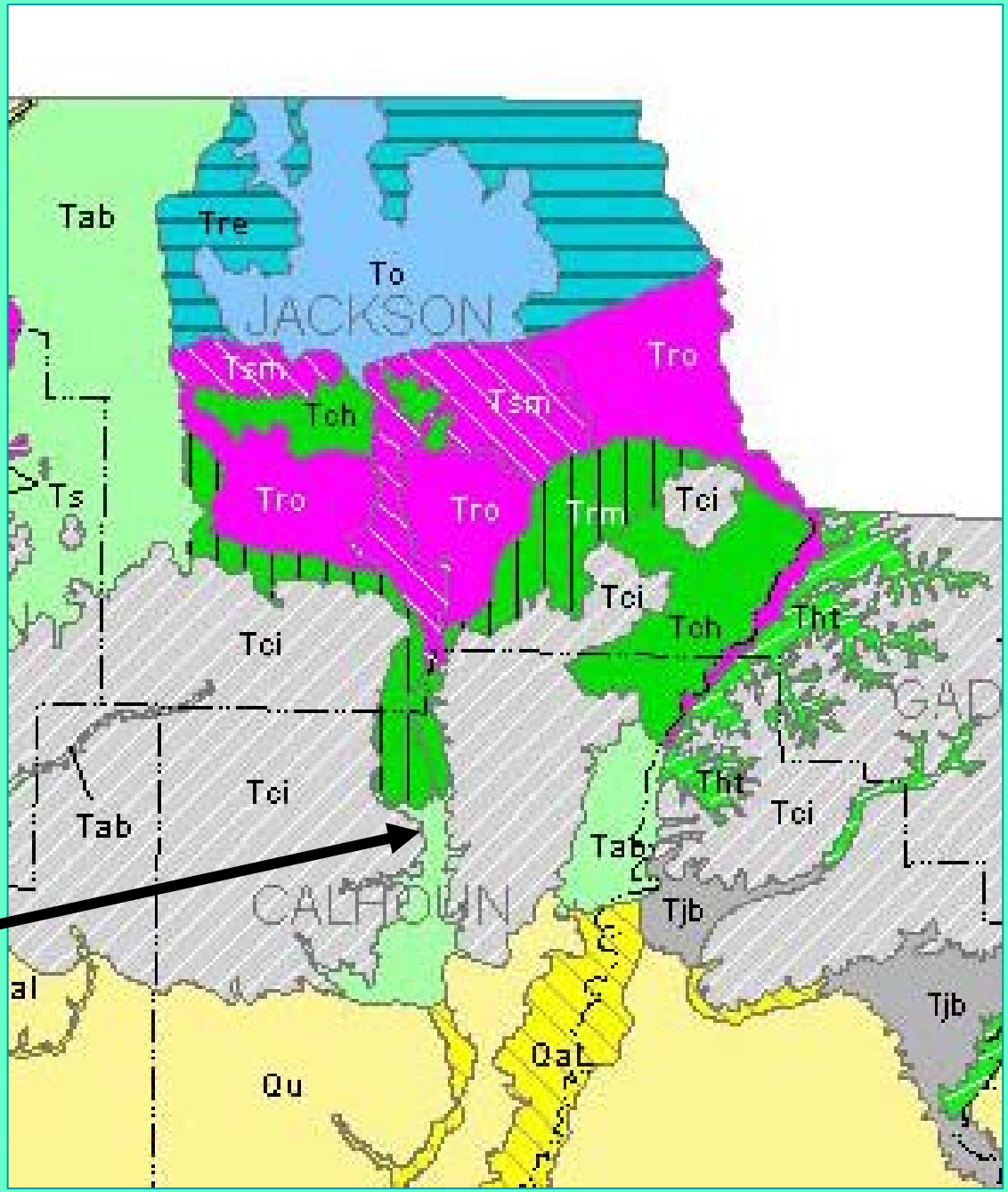
Early Miocene Land & Islands



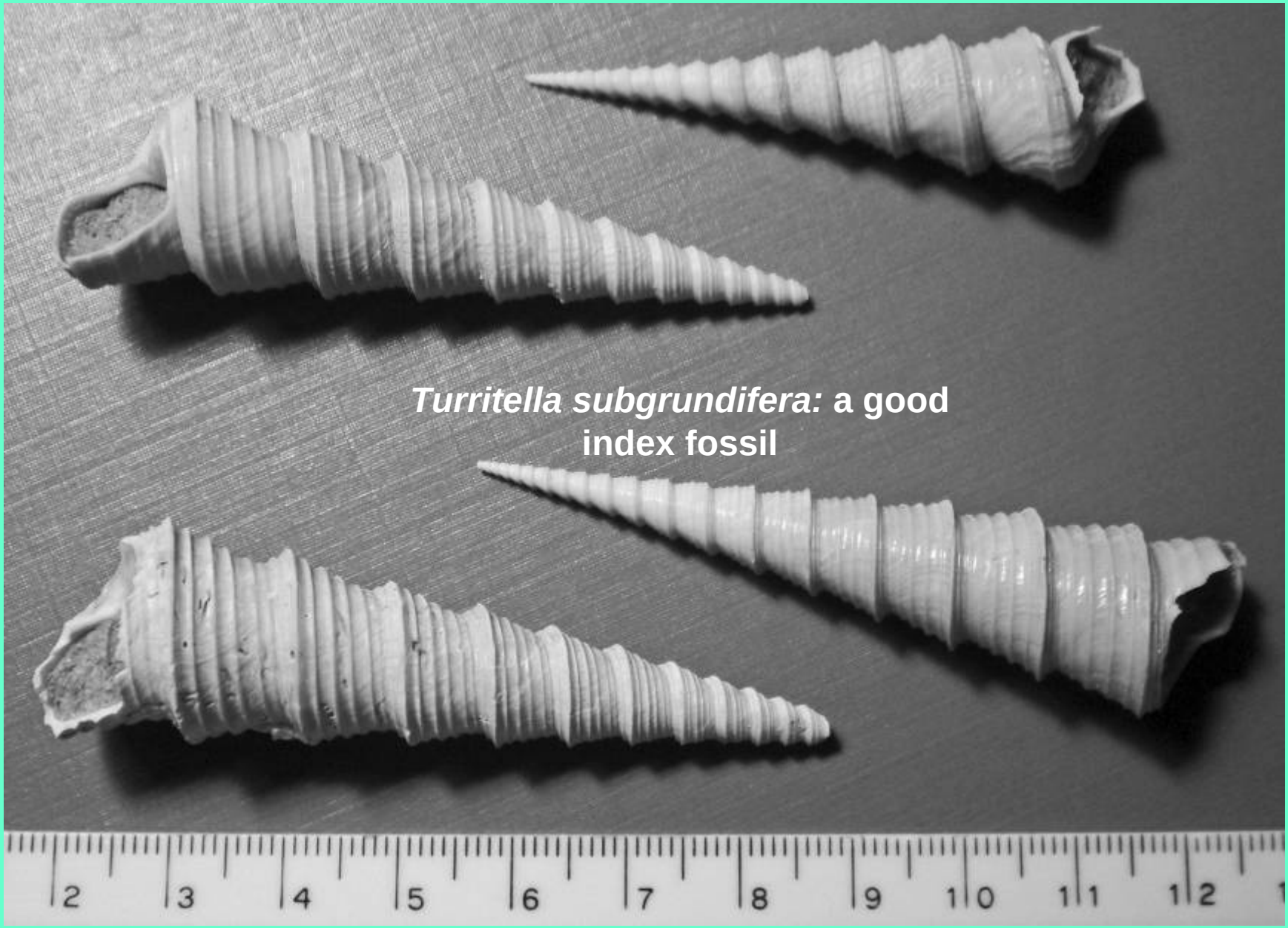
Farley Creek & Calhoun Co., FL

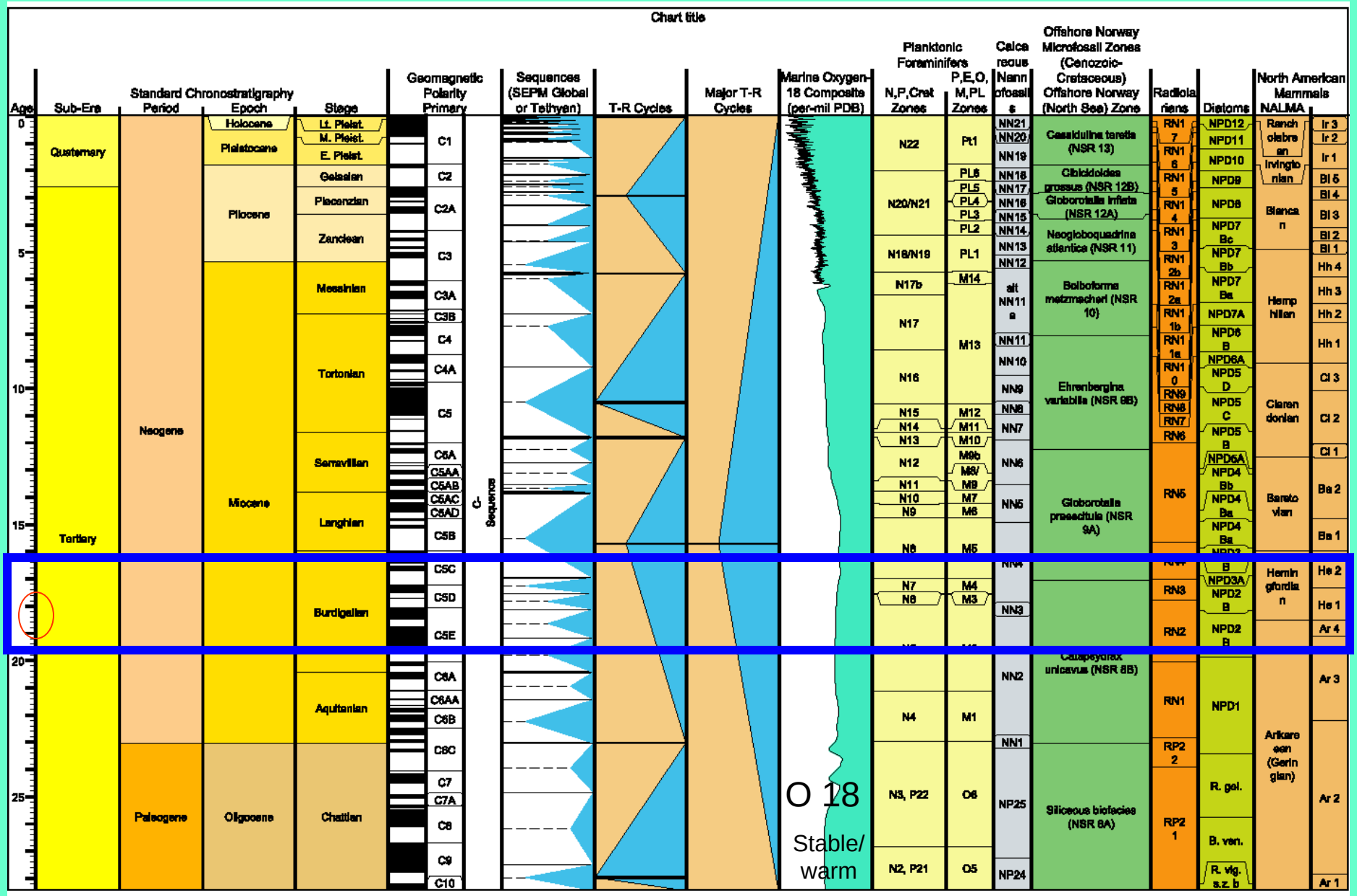




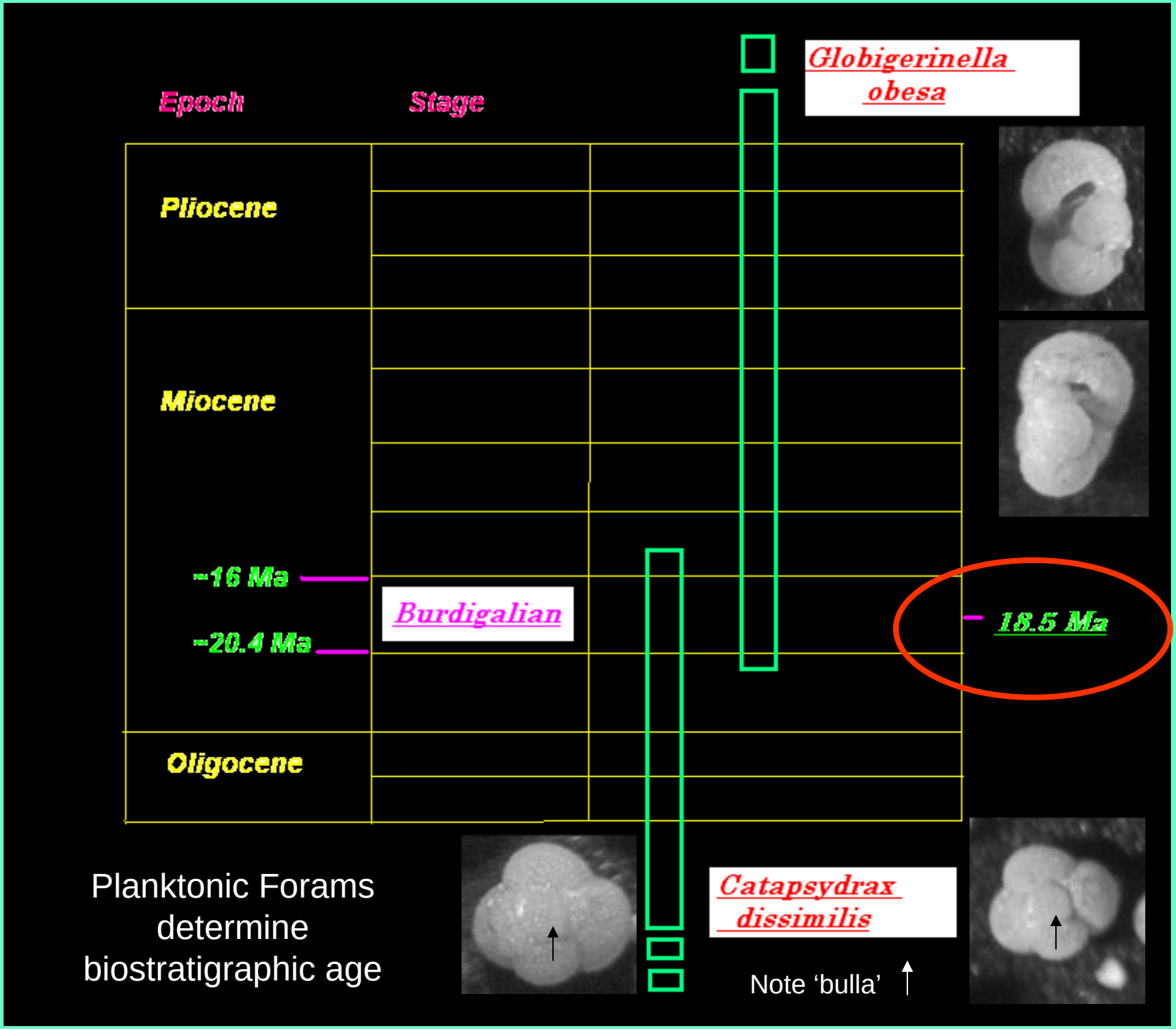


Geologic Map Fl:
FGS,USGS: Scott,2001


Turritella subgrundifera: a good index fossil

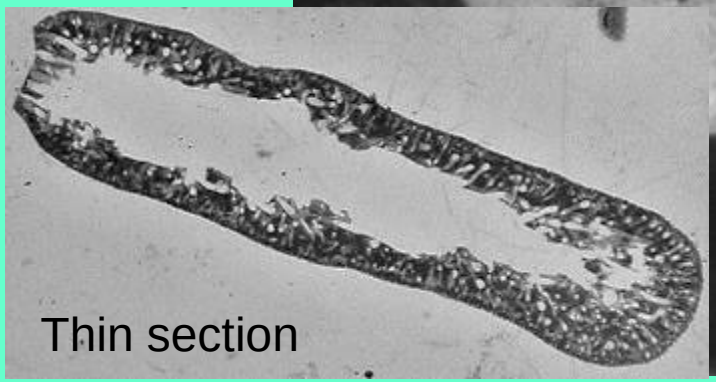


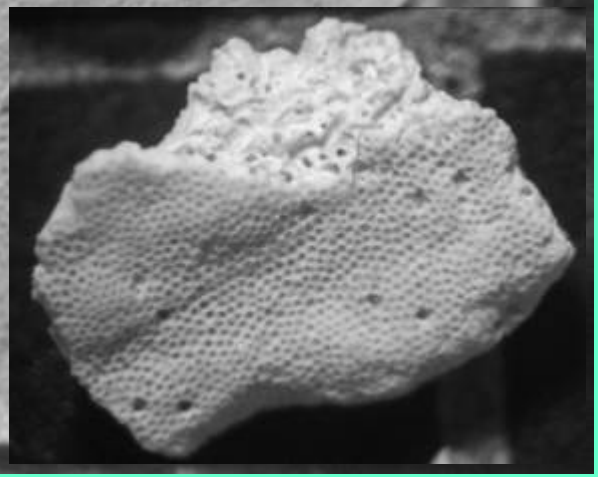
transgressive N 5-7

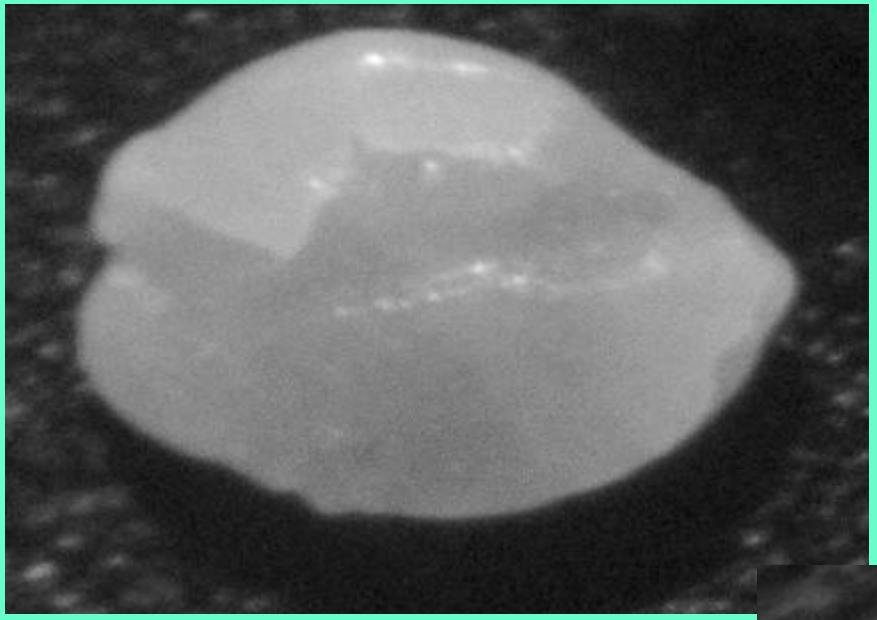

Epoch
Stage
Pliocene
Miocene
Oligocene
~16 Ma
~20.4 Ma
Burdigalian
Globigerinella obesa
18.5 Ma
Catapsydrax dissimilis
Note 'bulla'
Planktonic Forams determine biostratigraphic age

Presence means very shallow <20 M, well lit, warm water

Codiacean green calcareous algae: *Halimeda sp.*

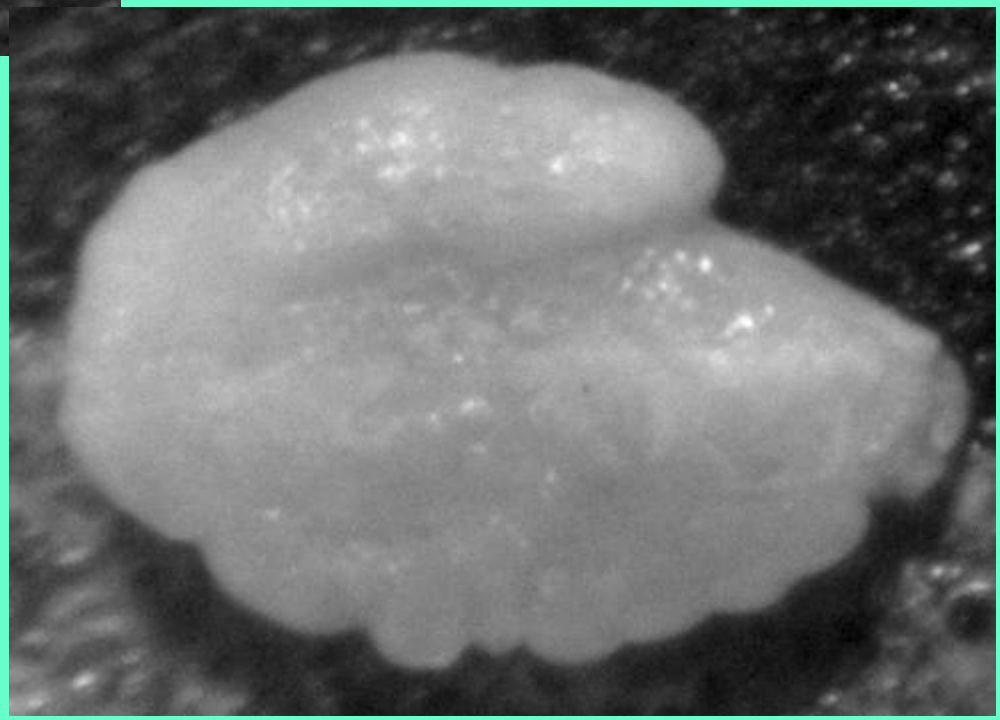


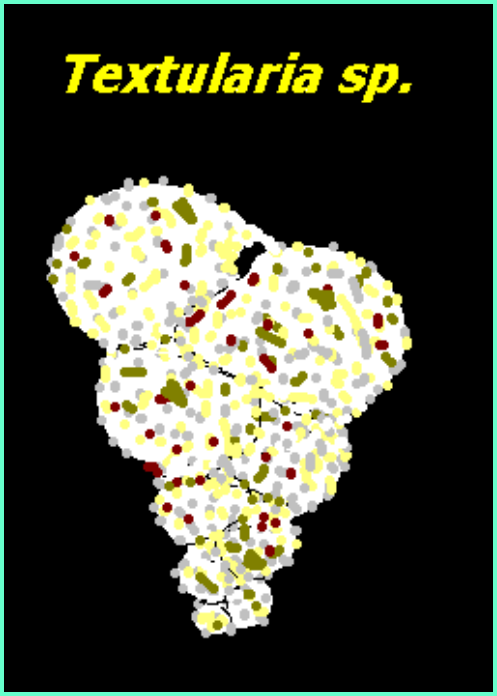




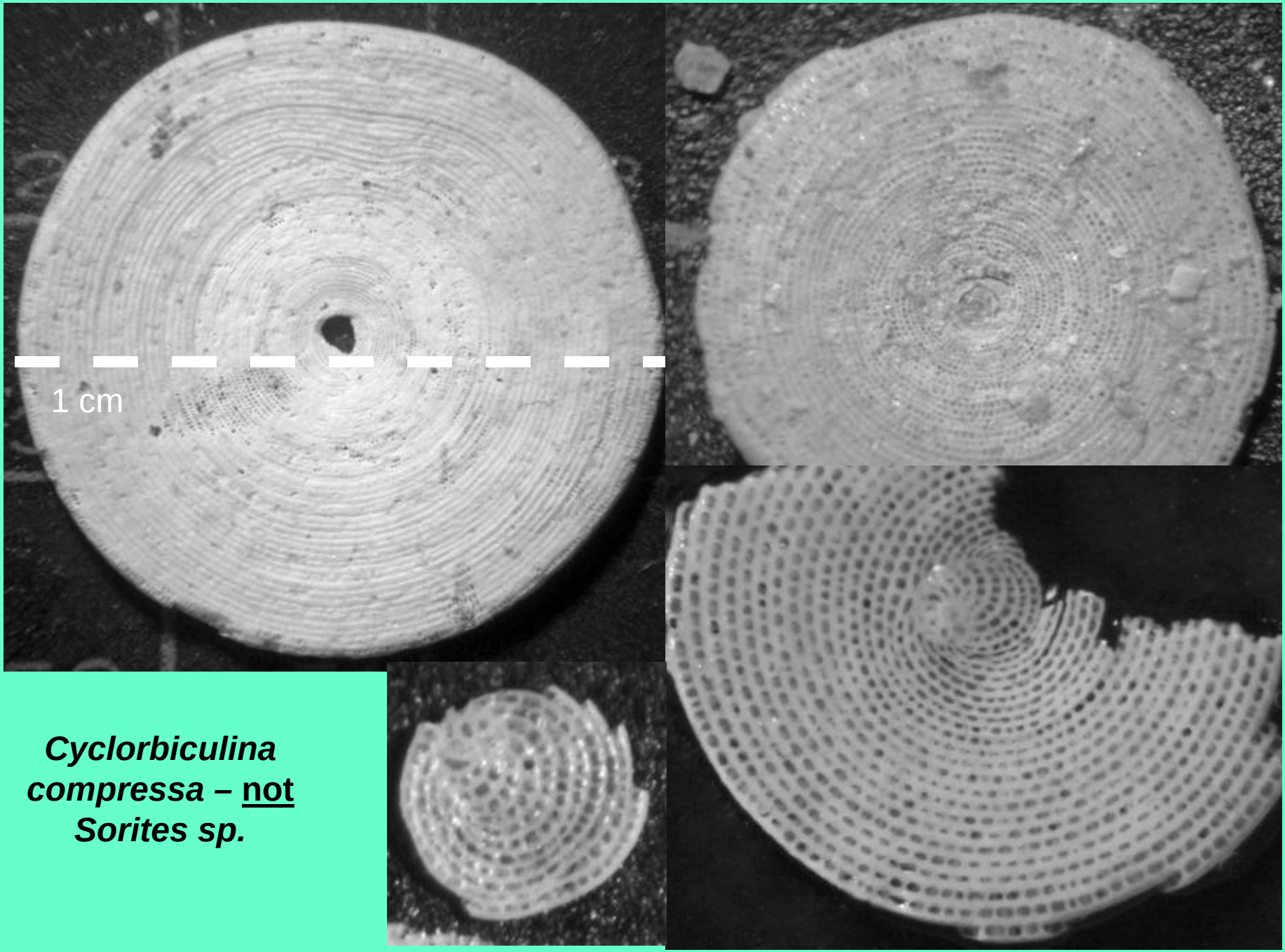
Fish (Perciformes) Otoliths

?Morone sp.: Sea bass

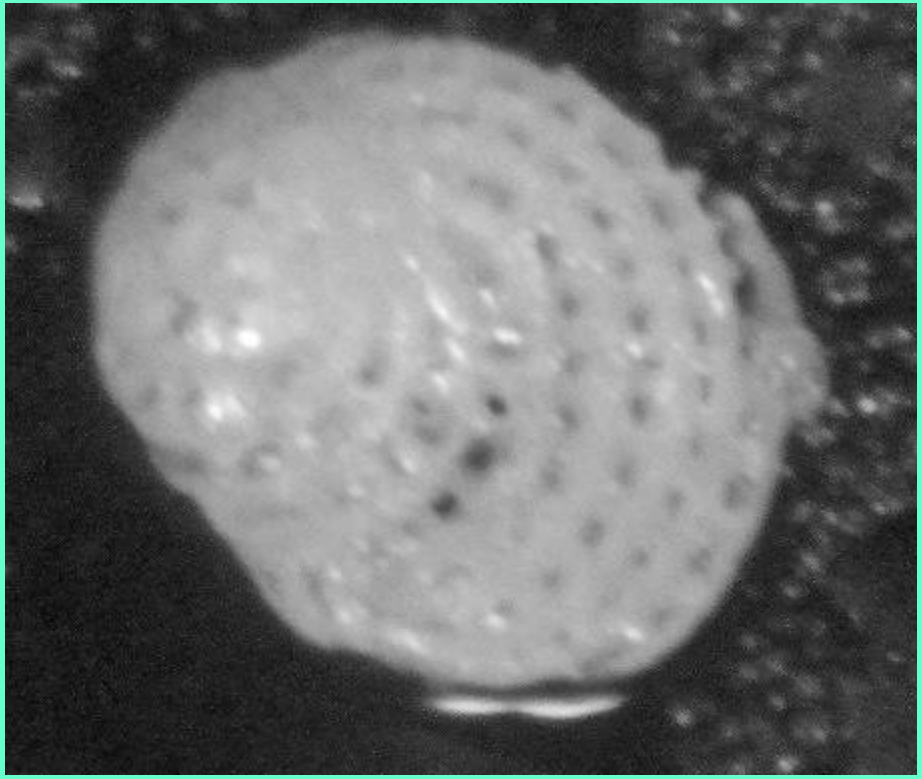


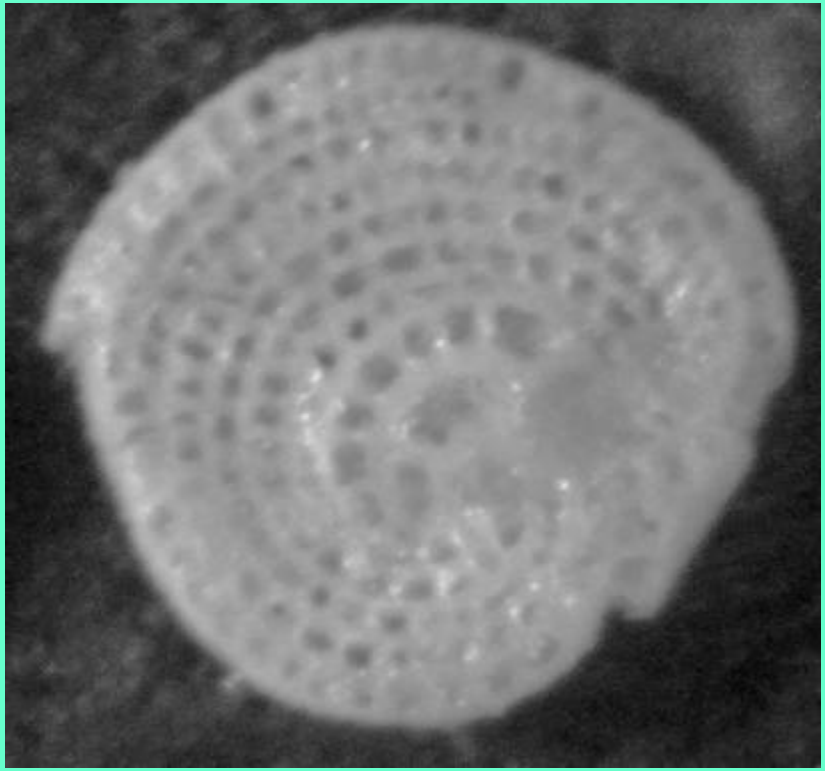


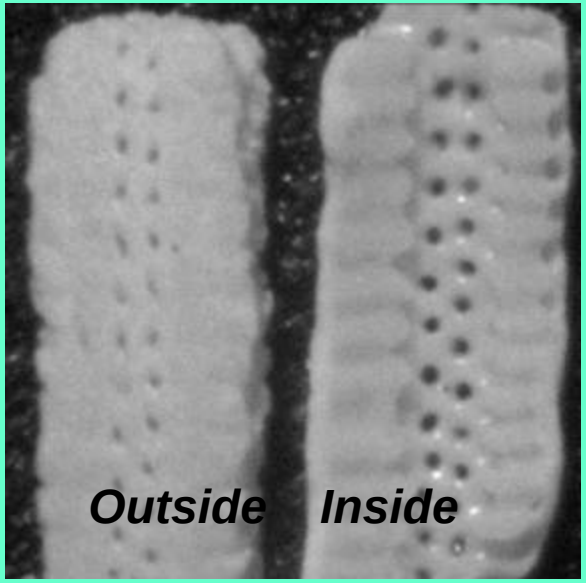
Foraminifera



Cyclorbiculina compressa* – <u>not</u> *Sorites sp.

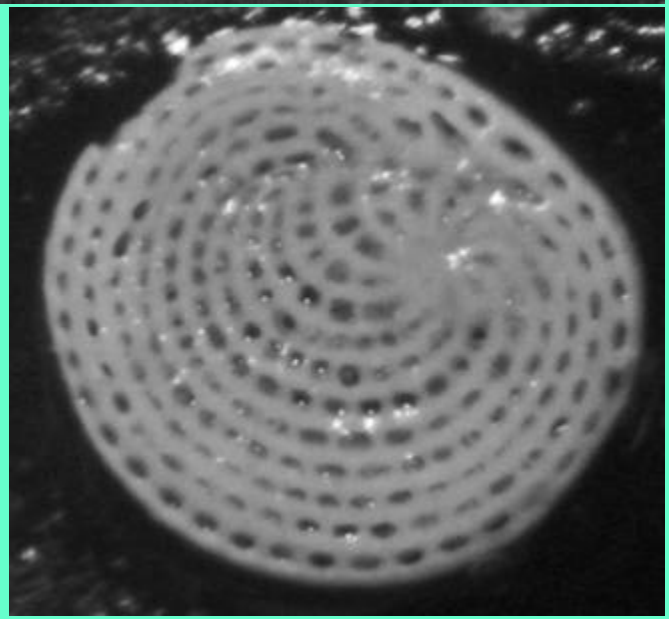


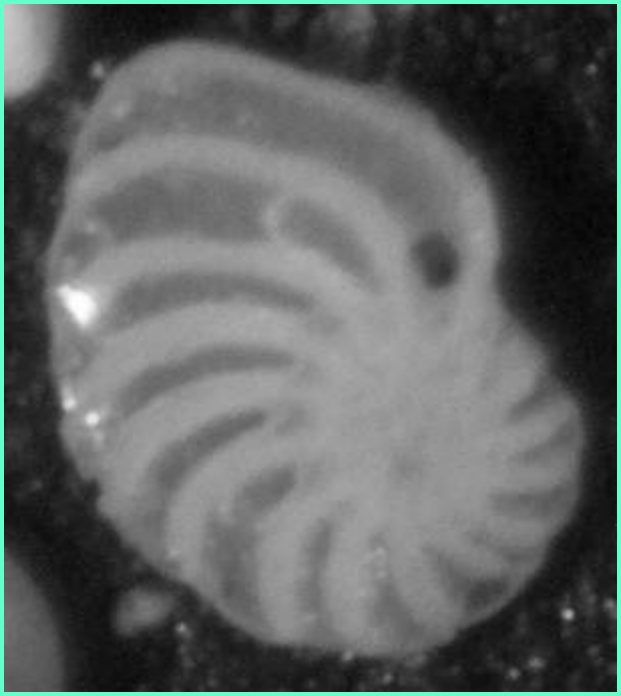


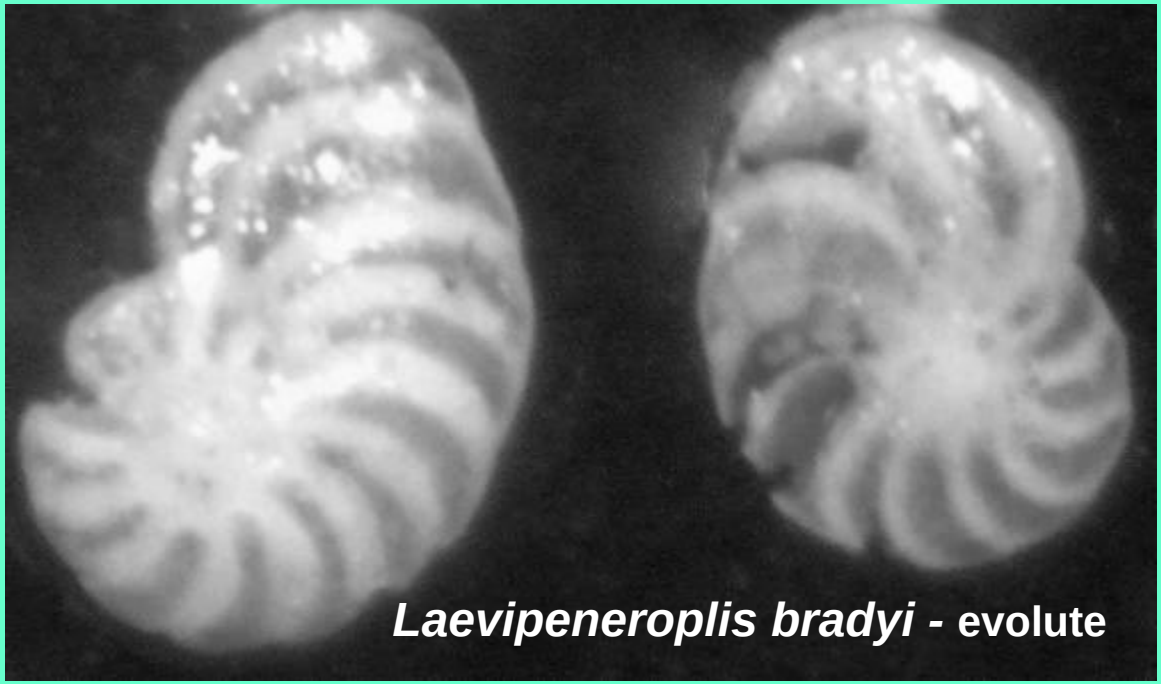


***Cyclorbiculina compressa* -**
juveniles

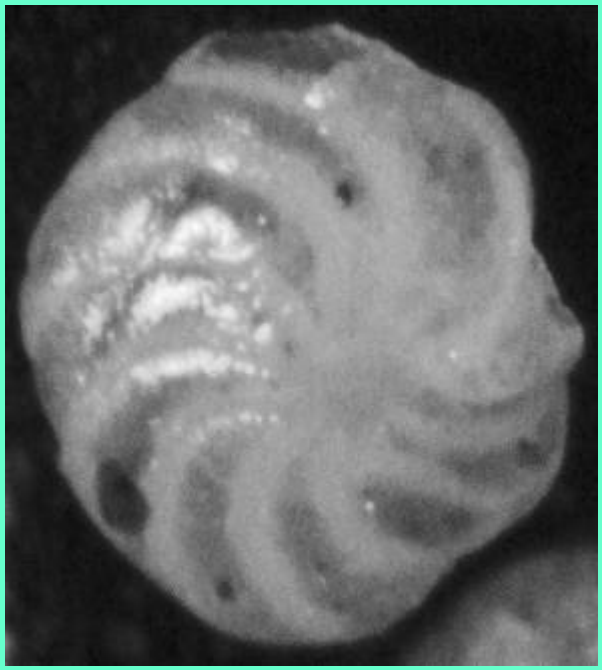
Peripheral view



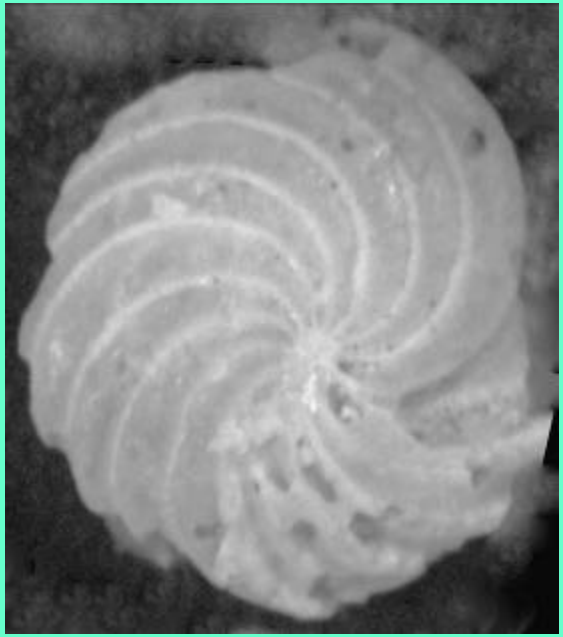




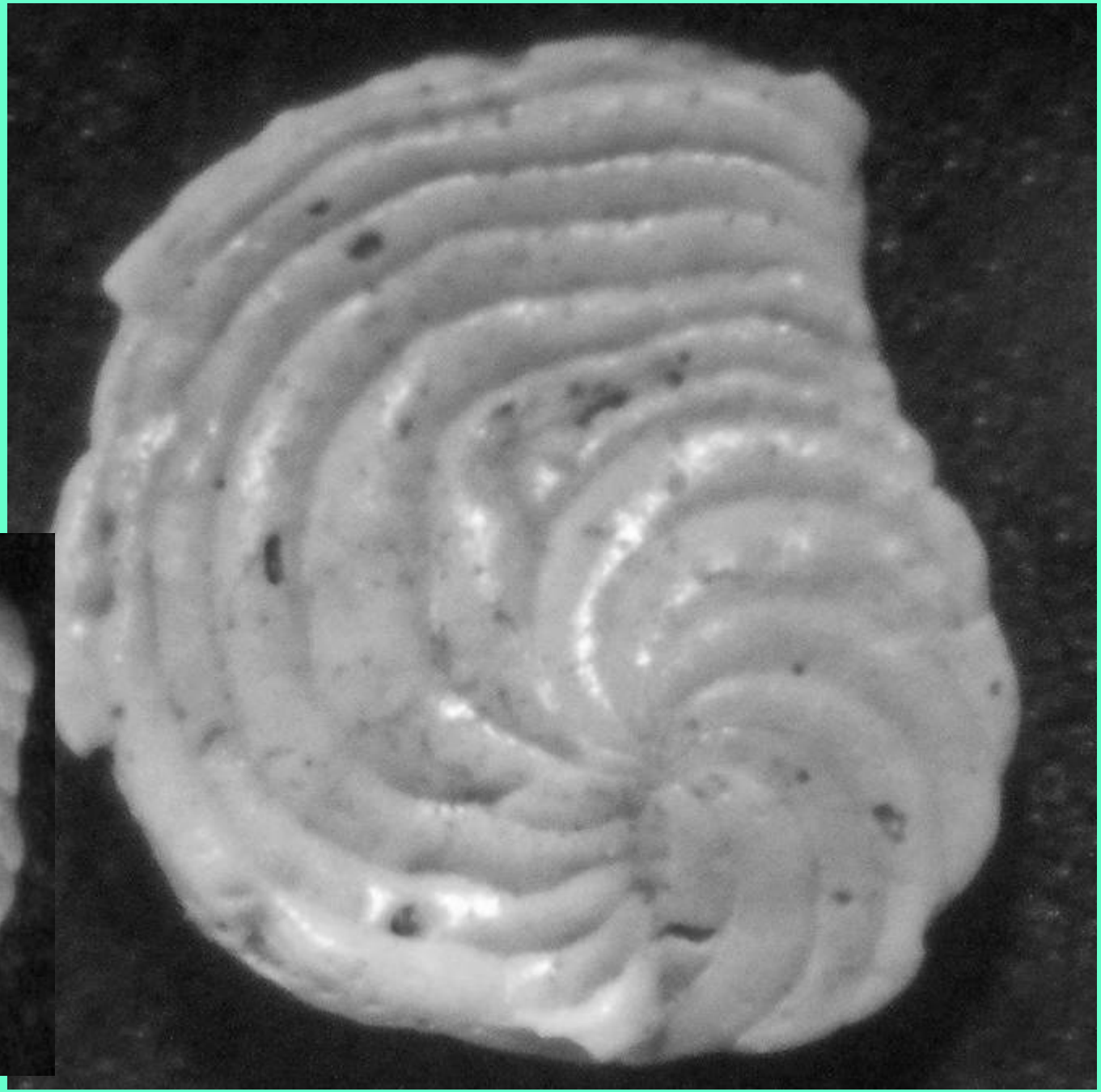
***Laevipeneroplis bradyi* - evolute**

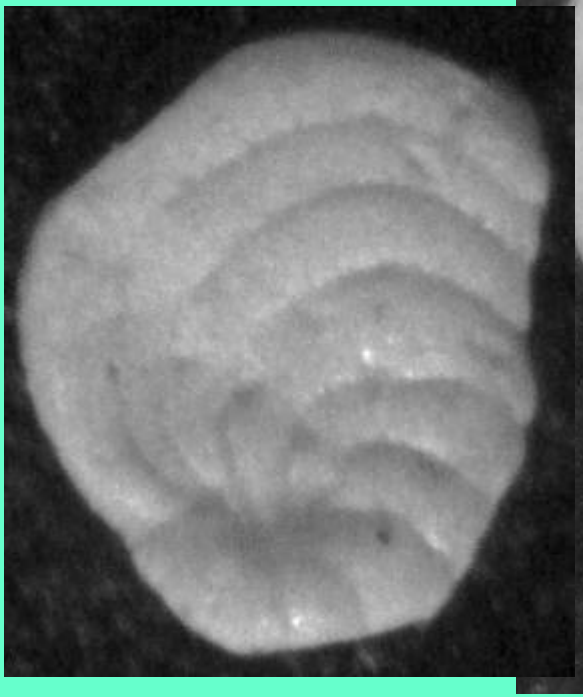


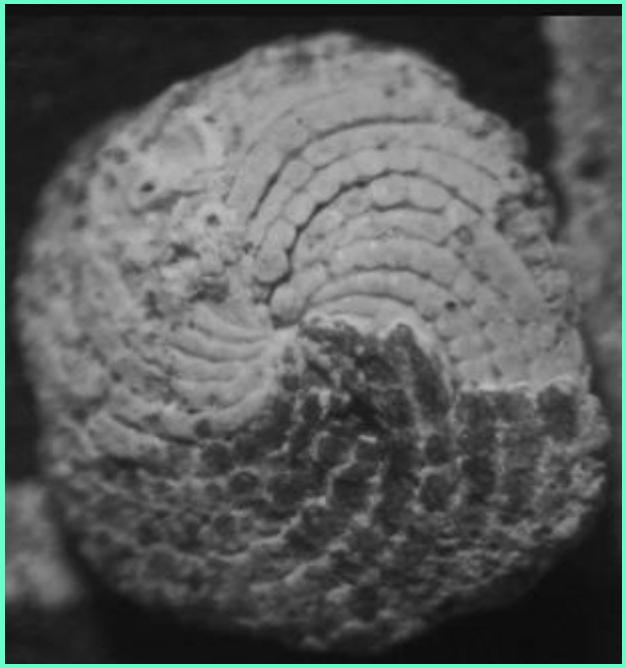
***Laevipeneroplis proteus*- involute**

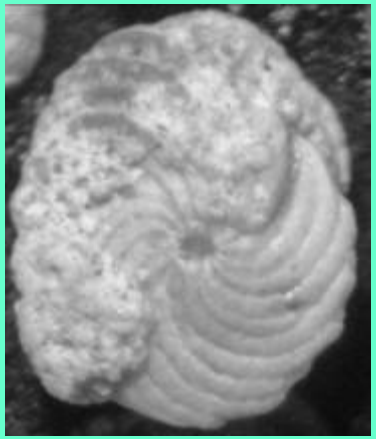


Laevipeneroplis bradyi – much thinner than L. proteus

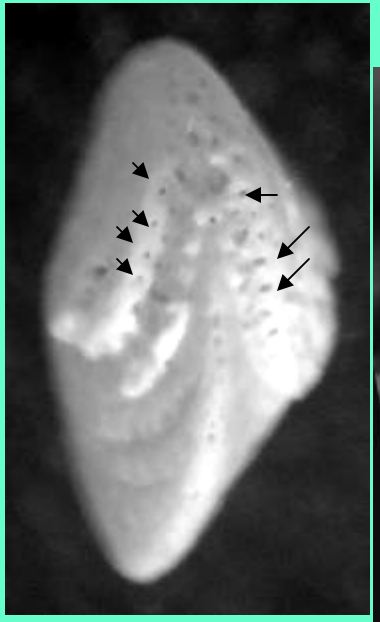


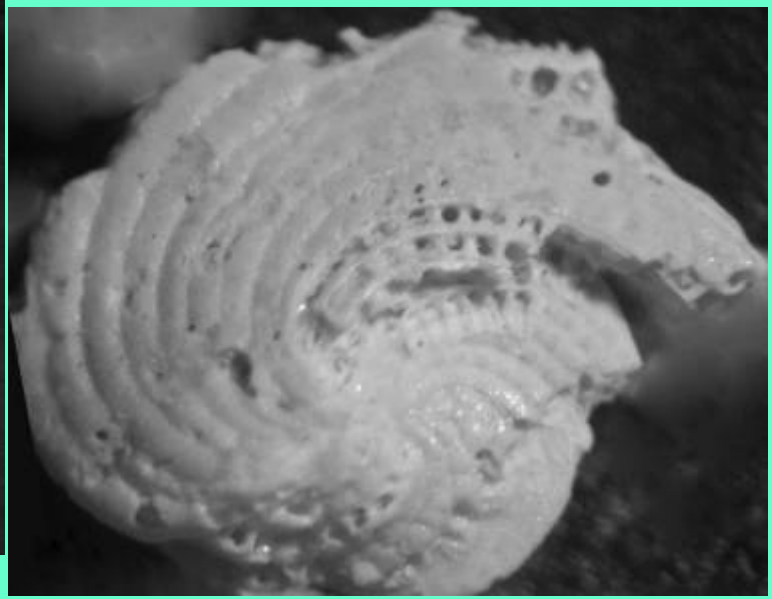


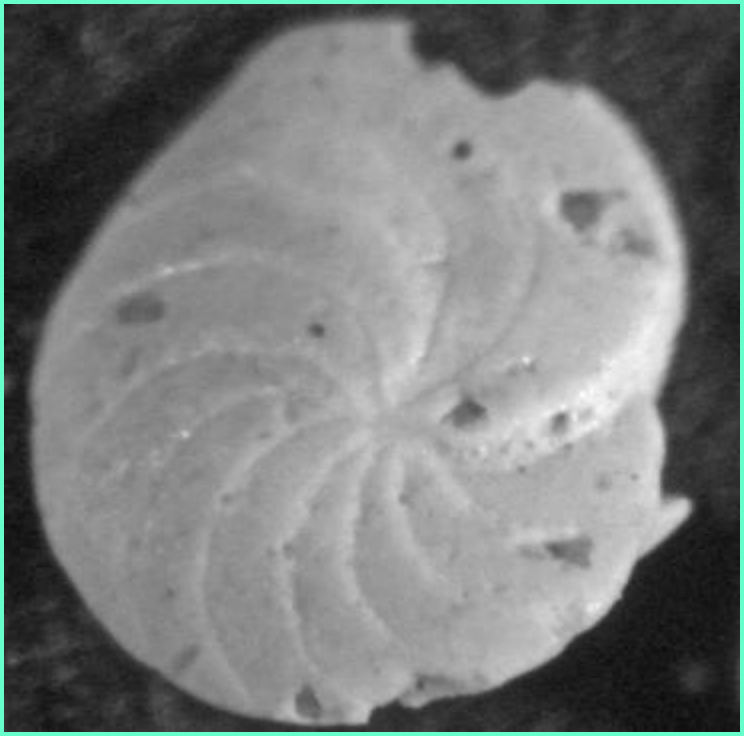


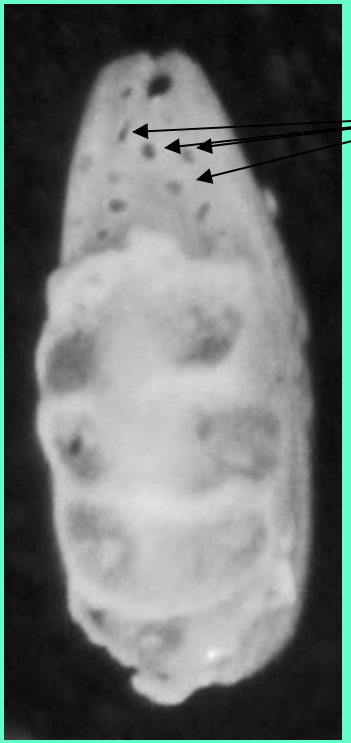


Archaias* cf *angulatus

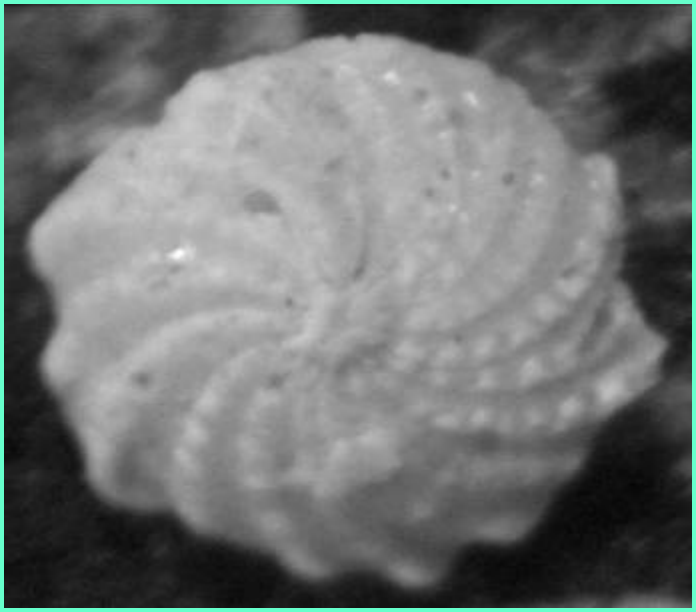


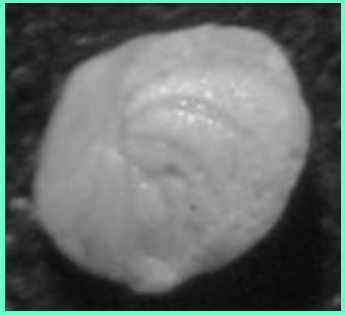




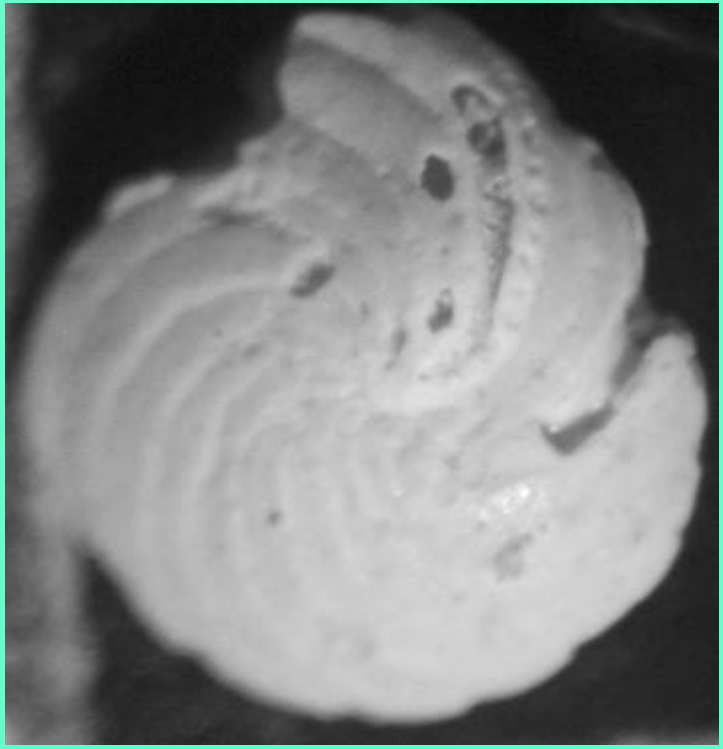


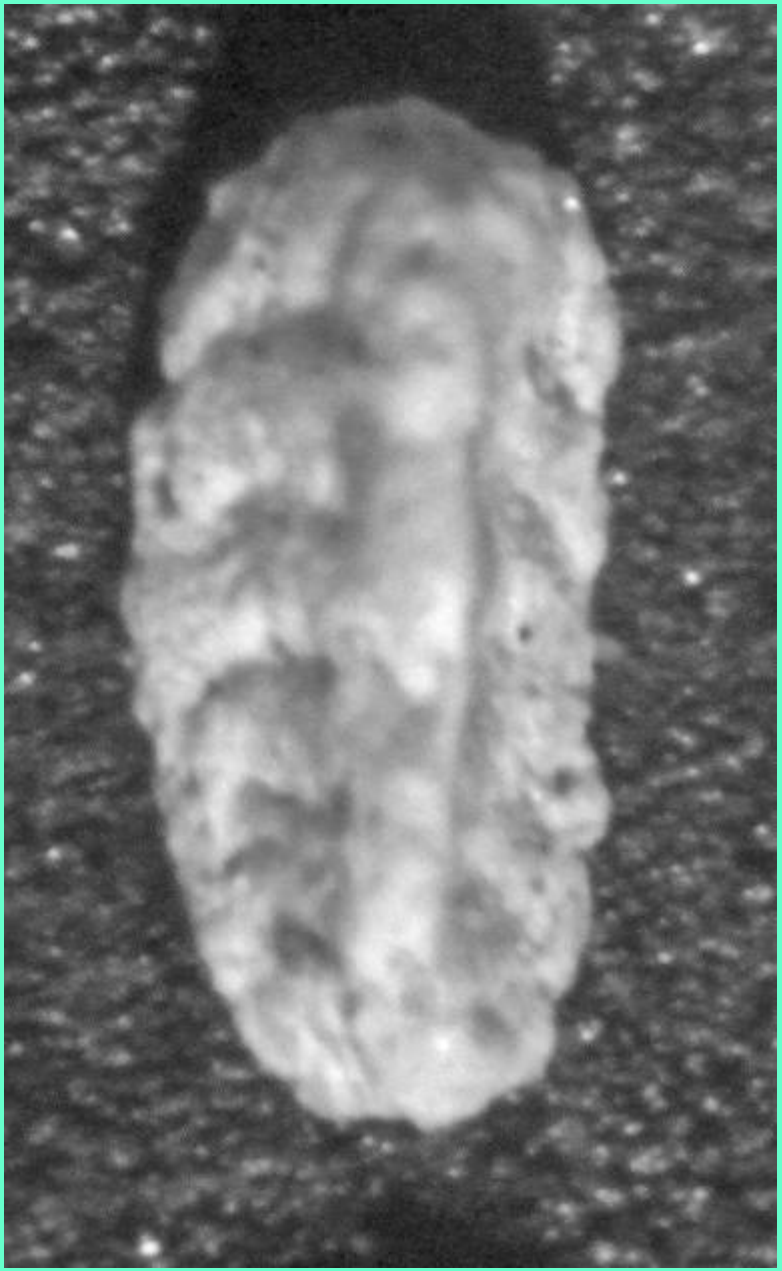
Apertural pores

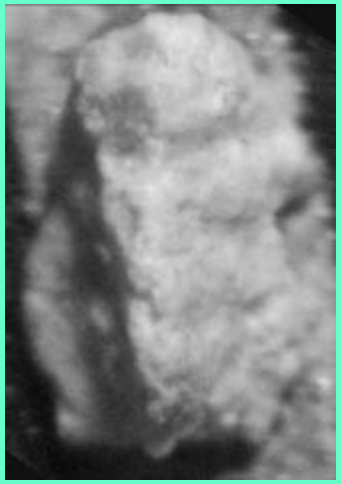




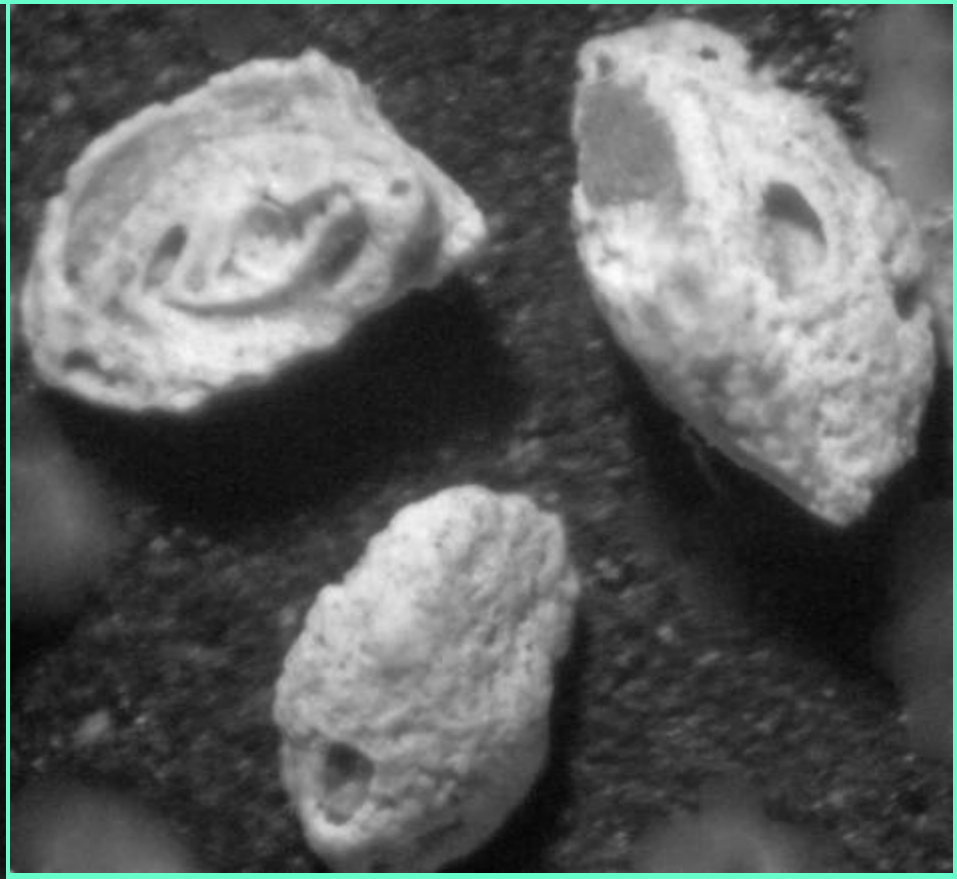
Laevipeneroplis proteus





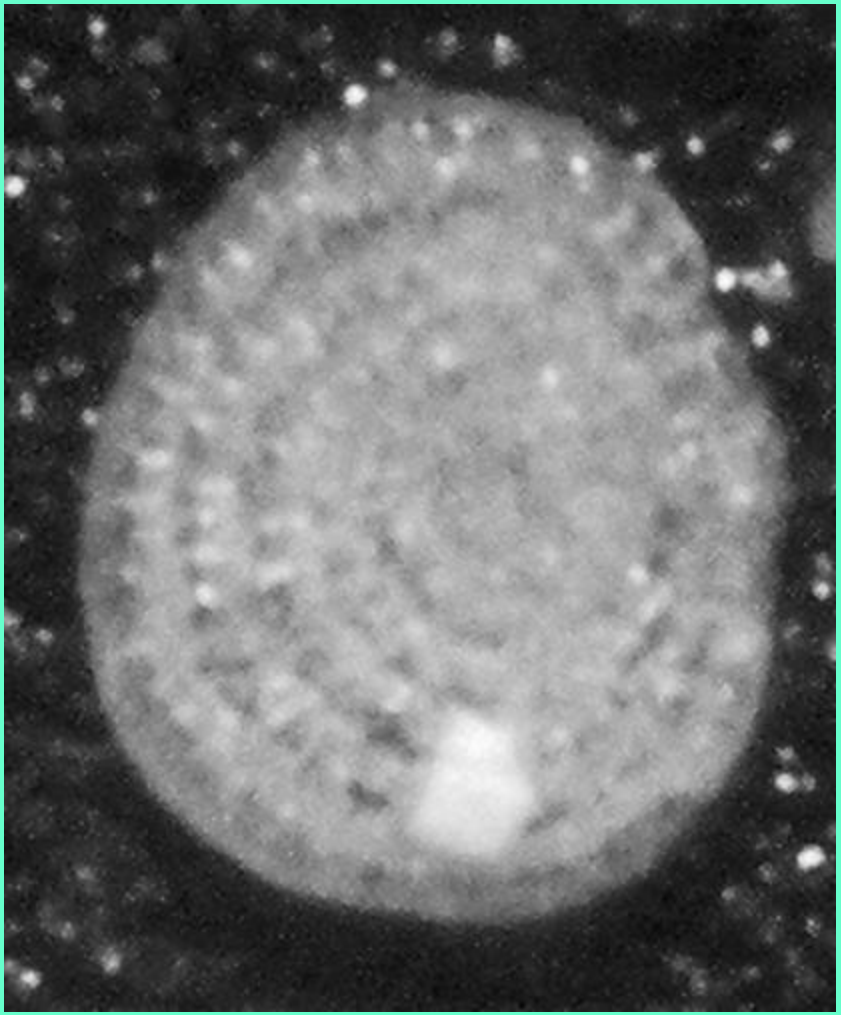


Clavulina tricarinata

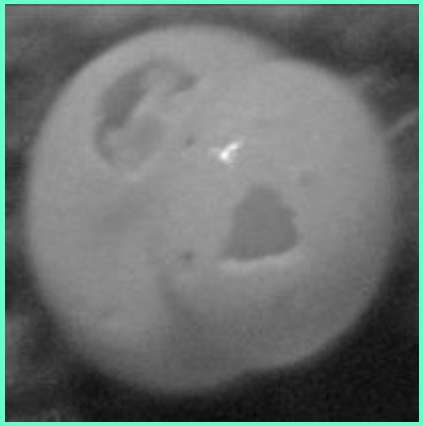


Schlumbergerina alveoliniformis:
a very abundant foram, second only to *Amphistegina*

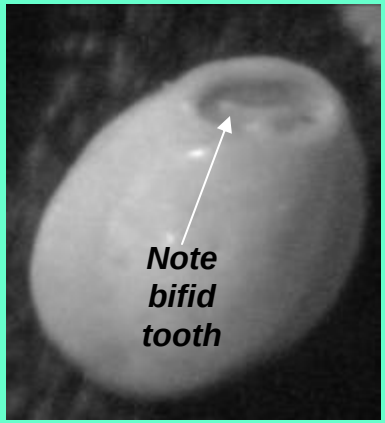
Planispirillina orbicularis



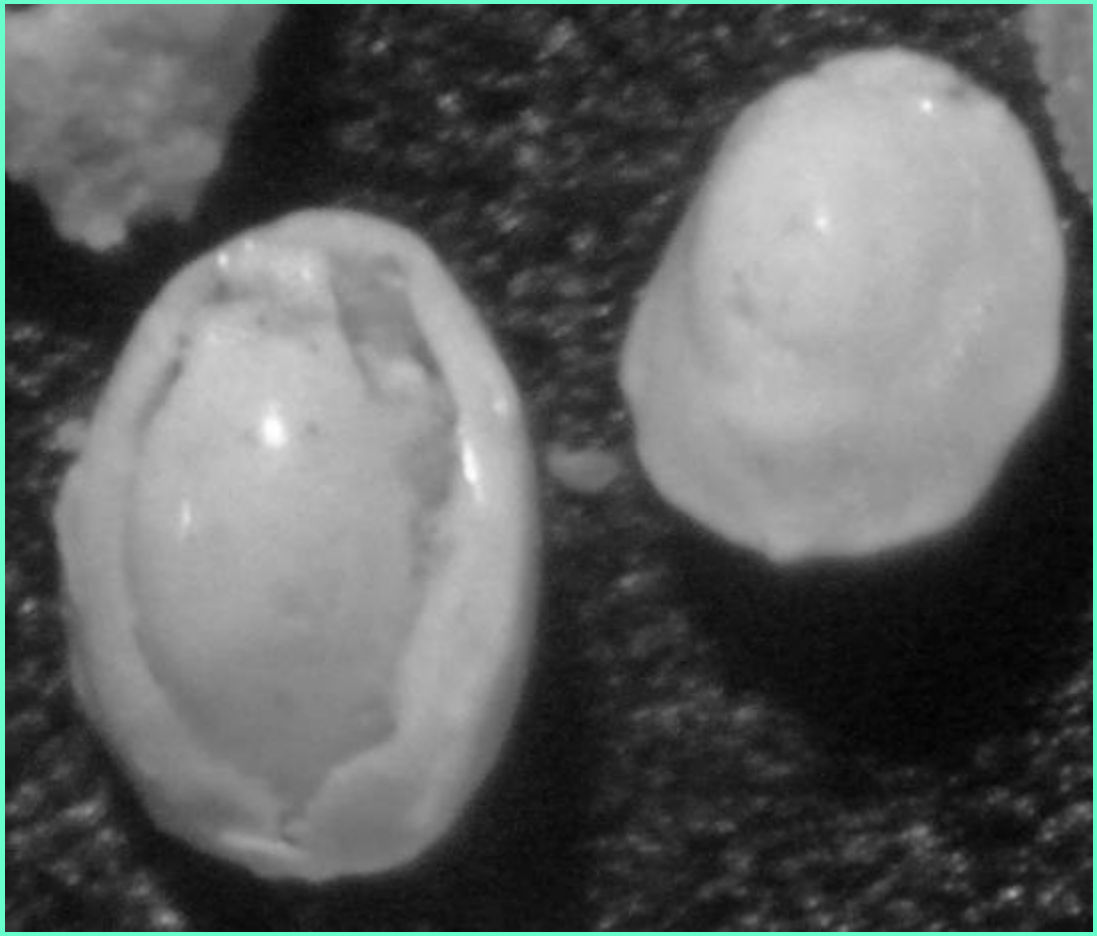
Pavonia miocenica

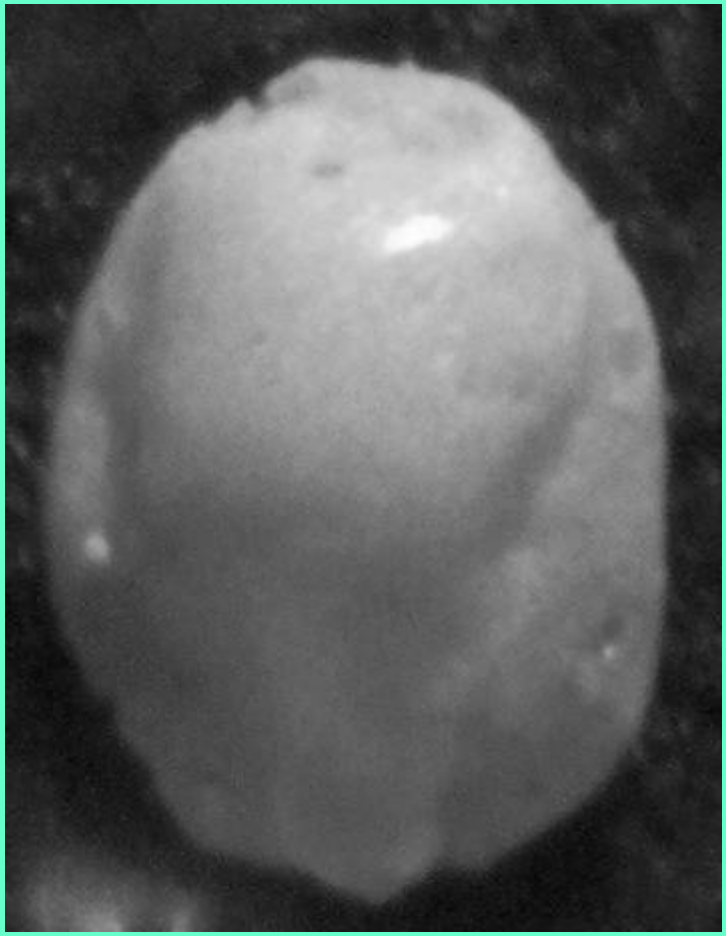


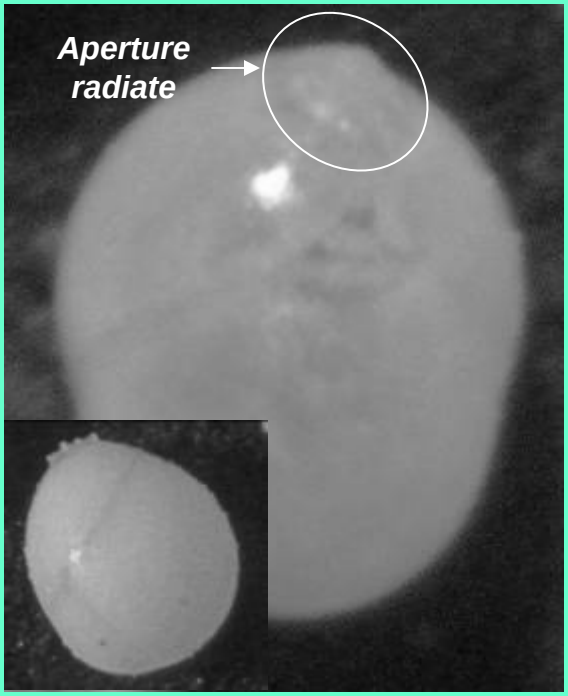
Pyrgo subsphaerica



Pyrgo denticulata

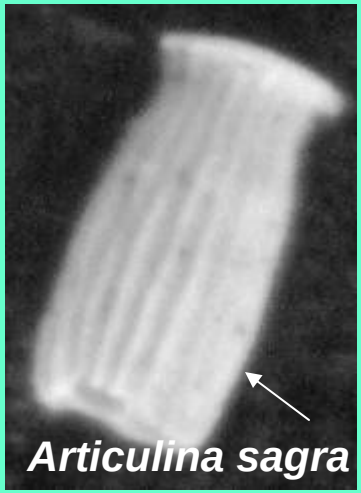


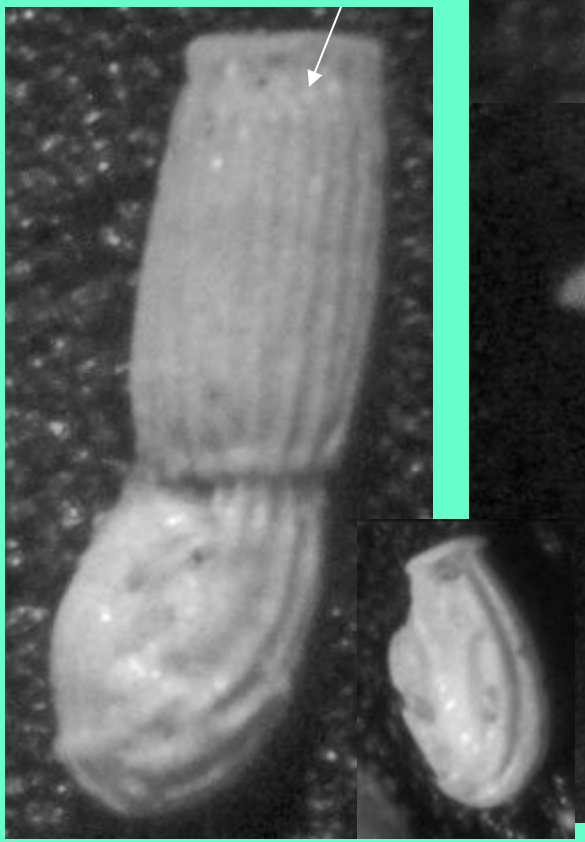


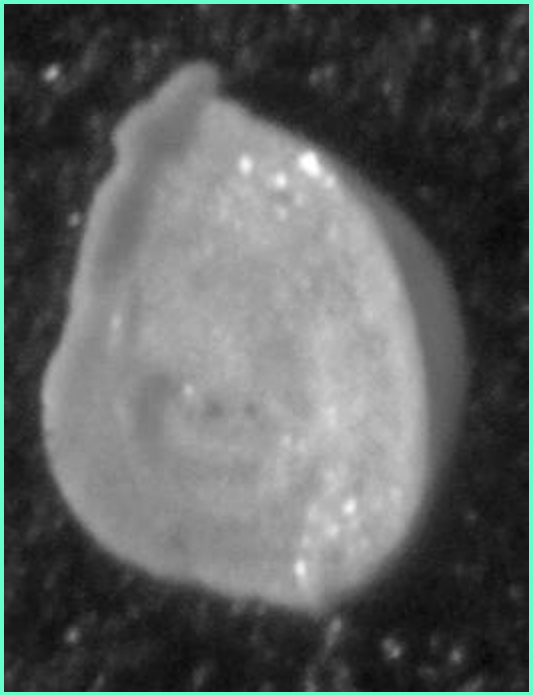


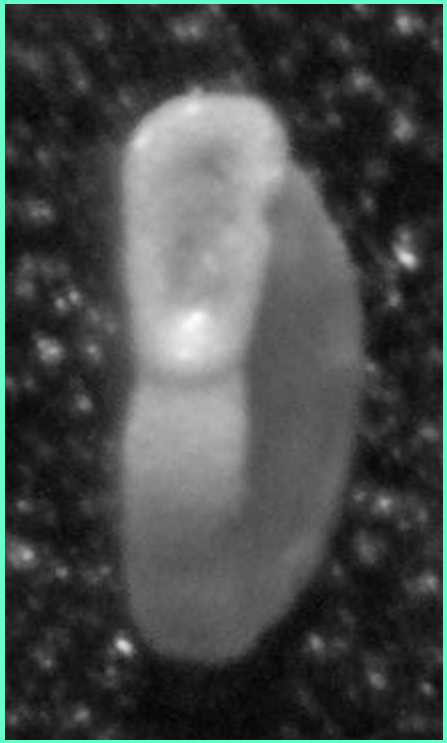
Globulina gibba

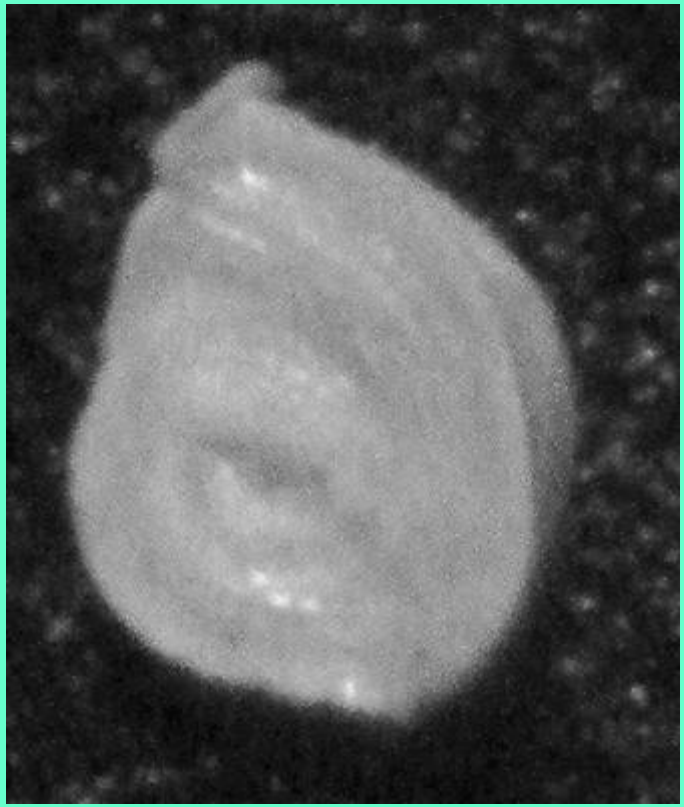
Dentalina pyrula





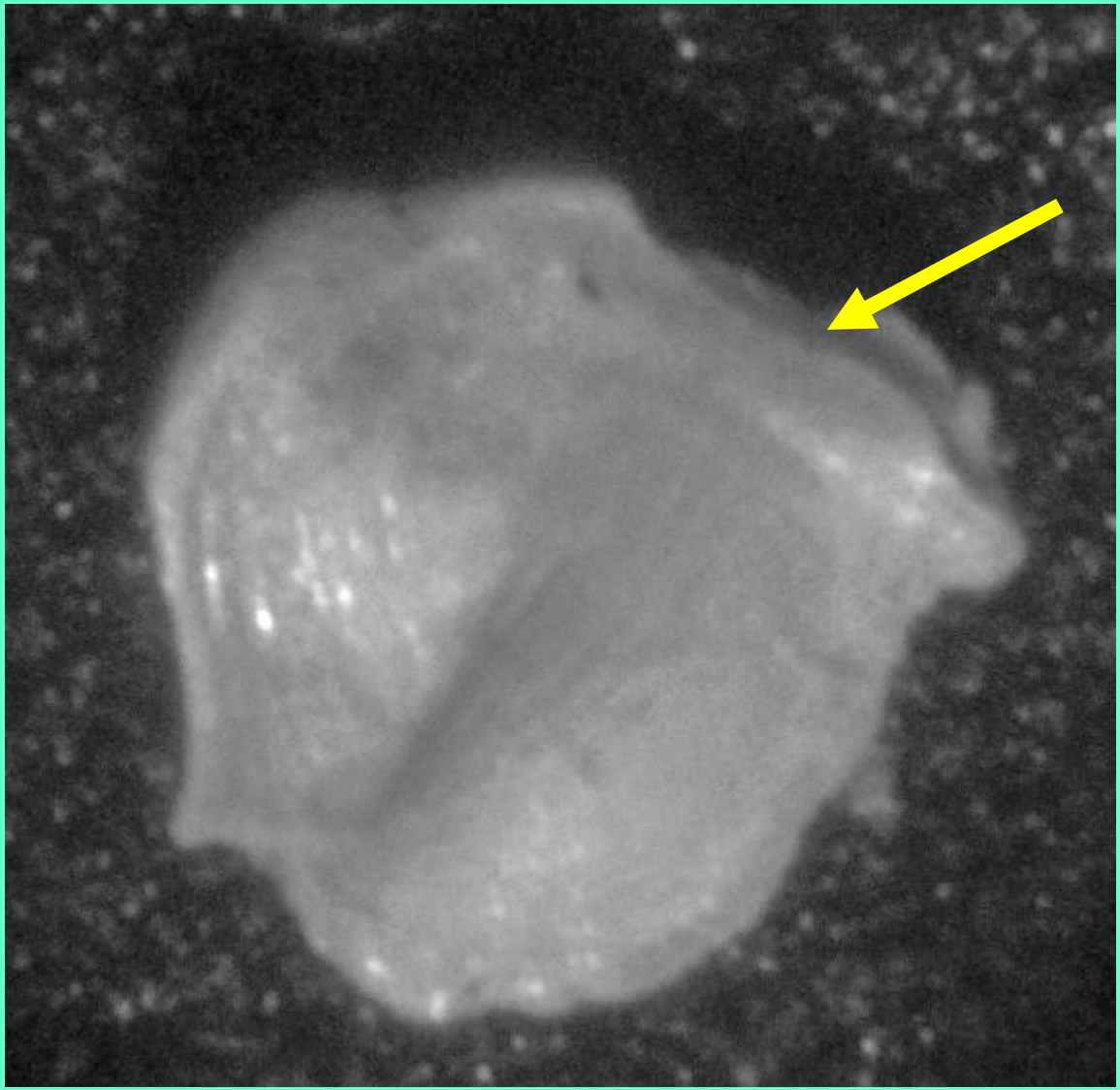




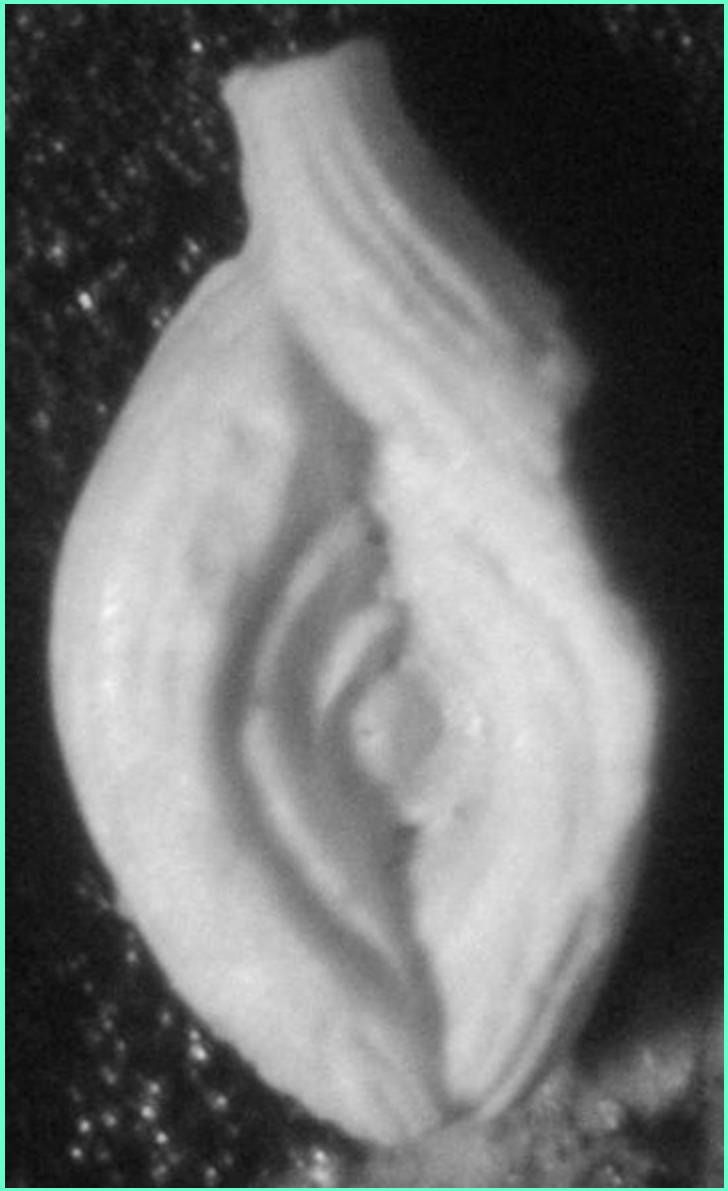


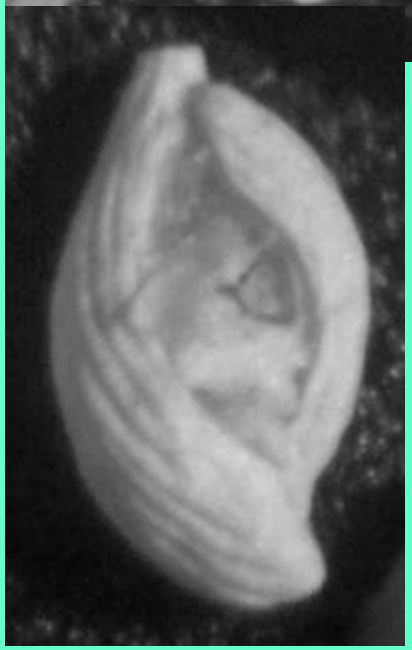
Vertebralina multilocularis

Lagena sp.

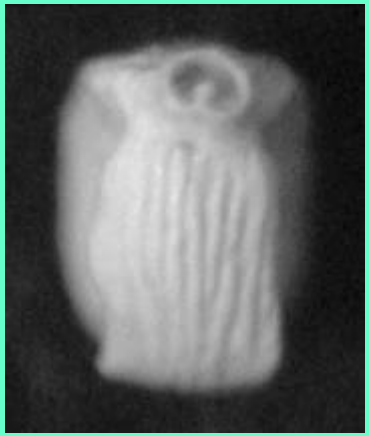


Articulina advena

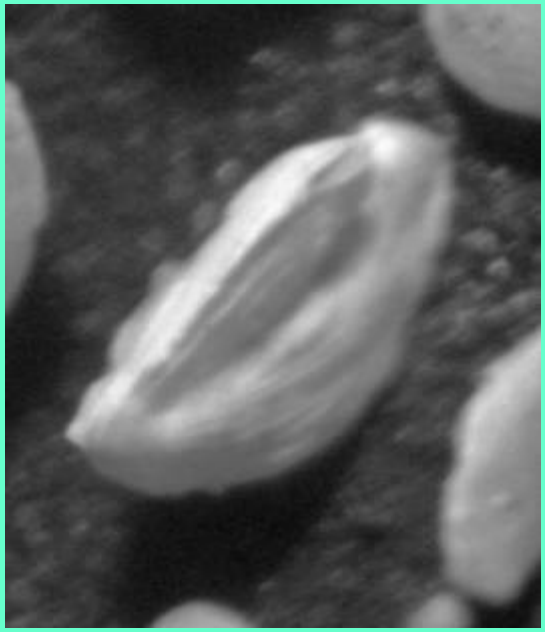




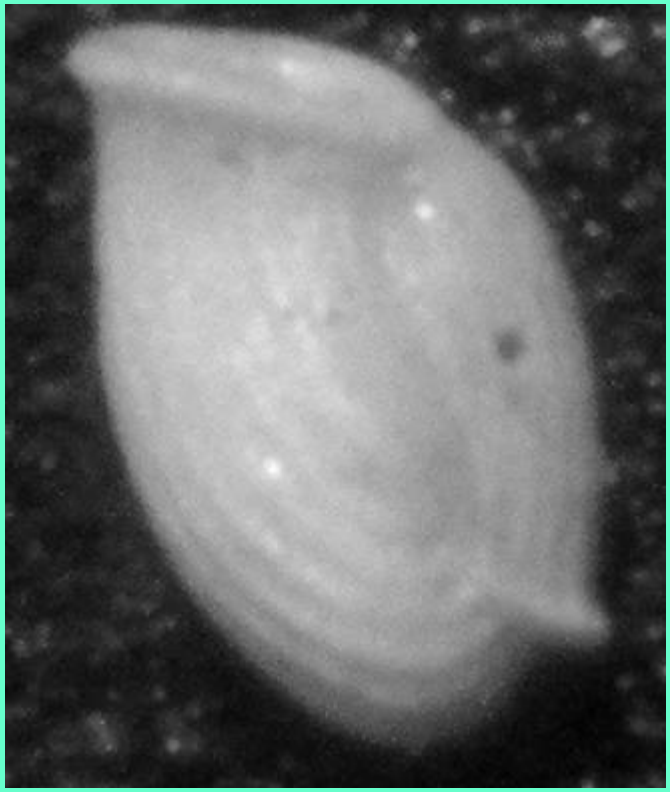
Spiroloculina spinata?



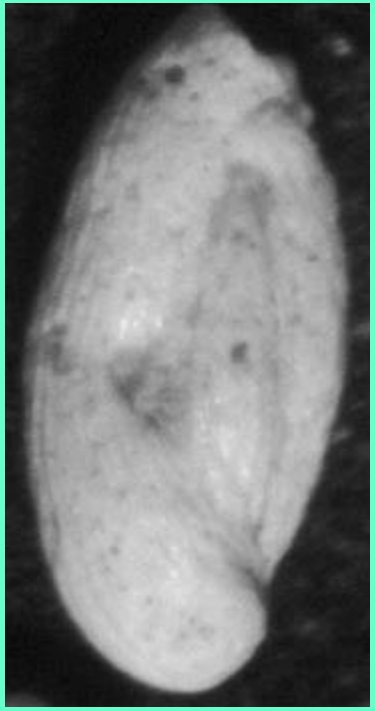
Triloculina fitterei

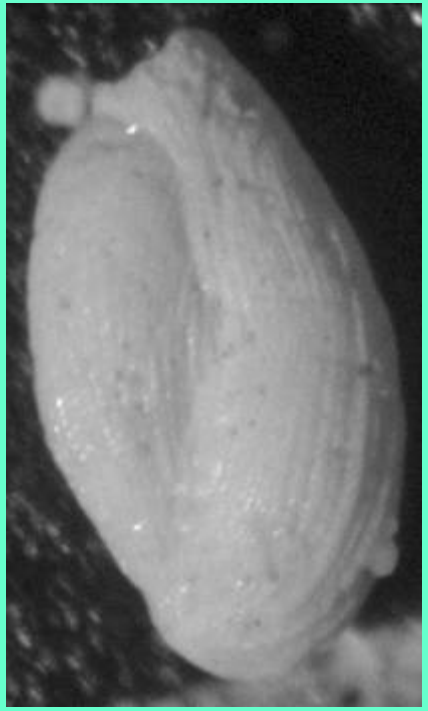


Quinqueloculina crassa



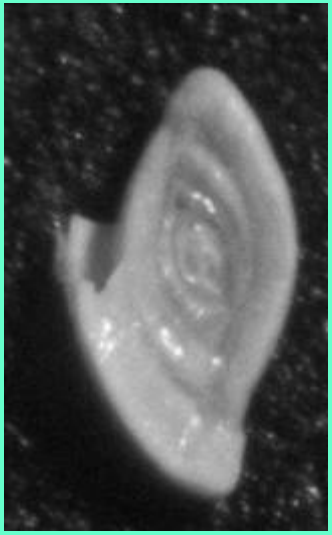
Articulina pacifica





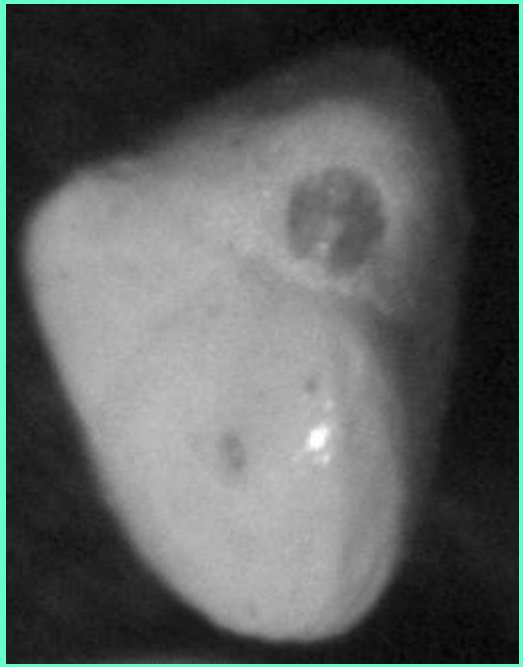
Quinqueloculina striata

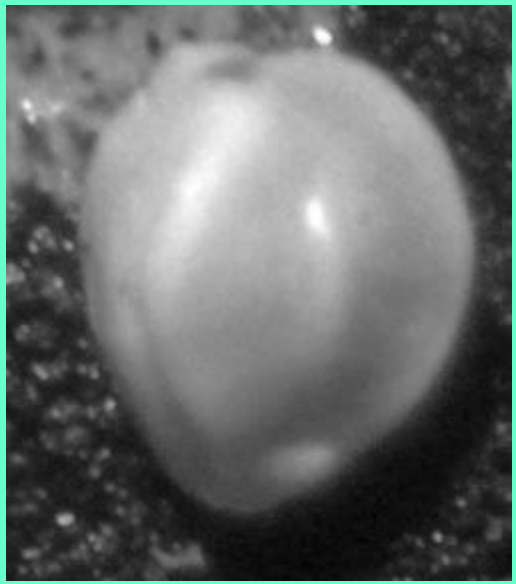
Triloculina linneiana



Spiroloculina

Quinqueloculina lamarckina

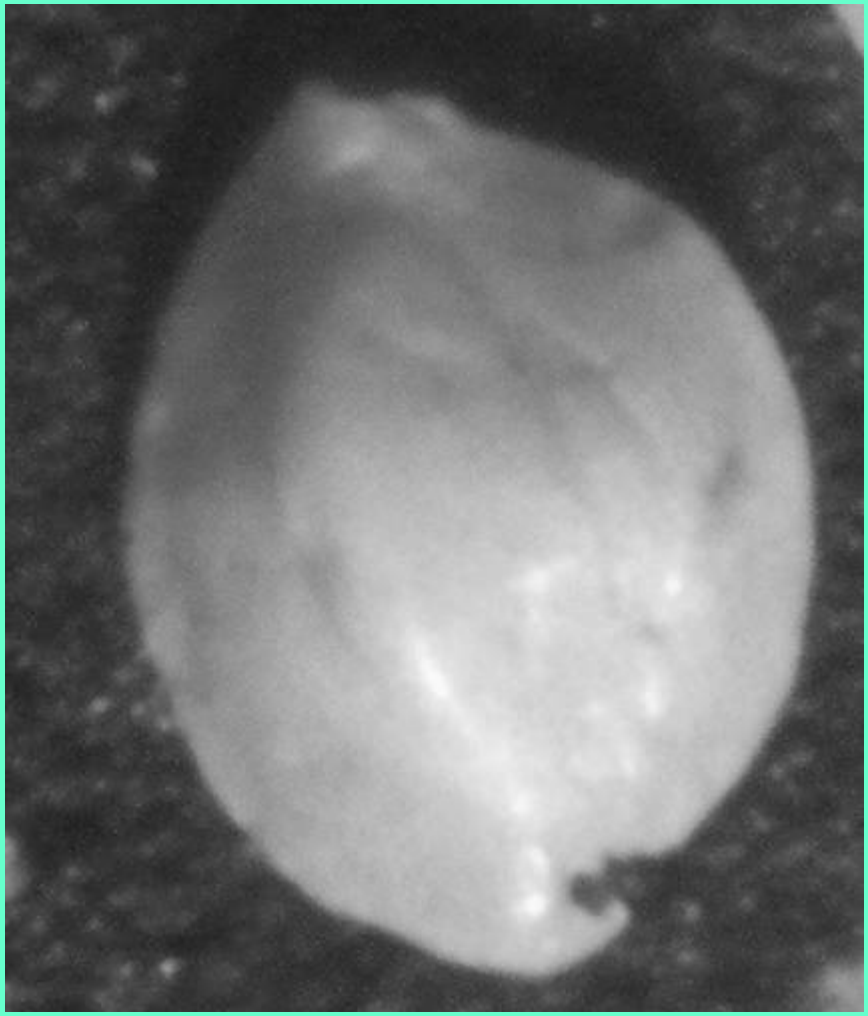


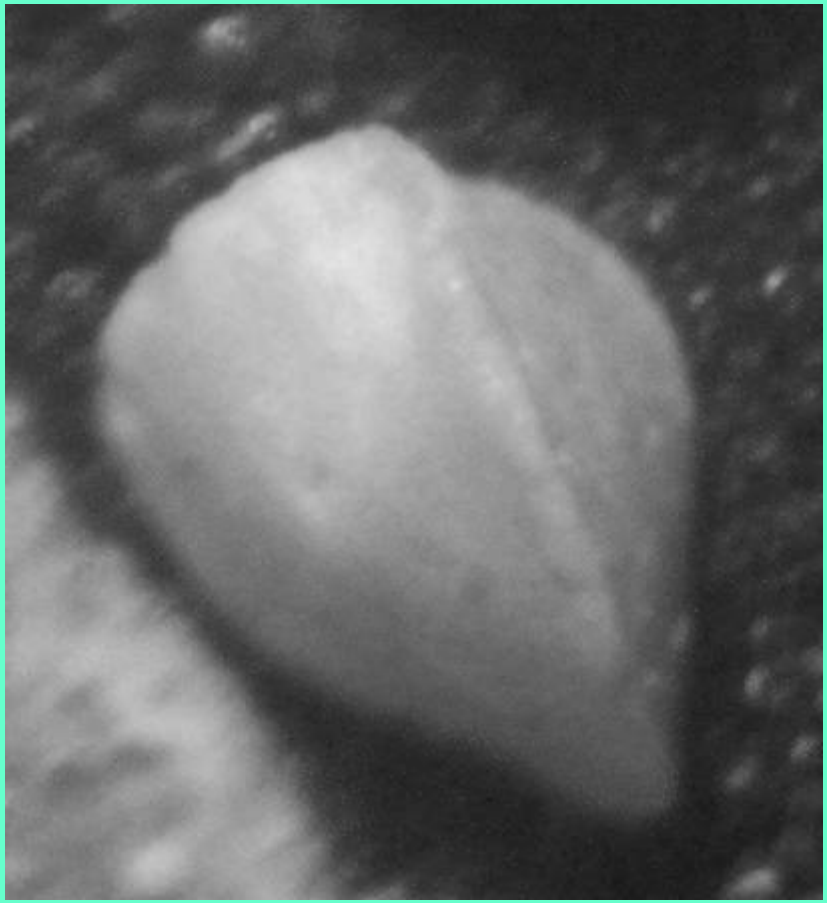


Triloculina trigonula

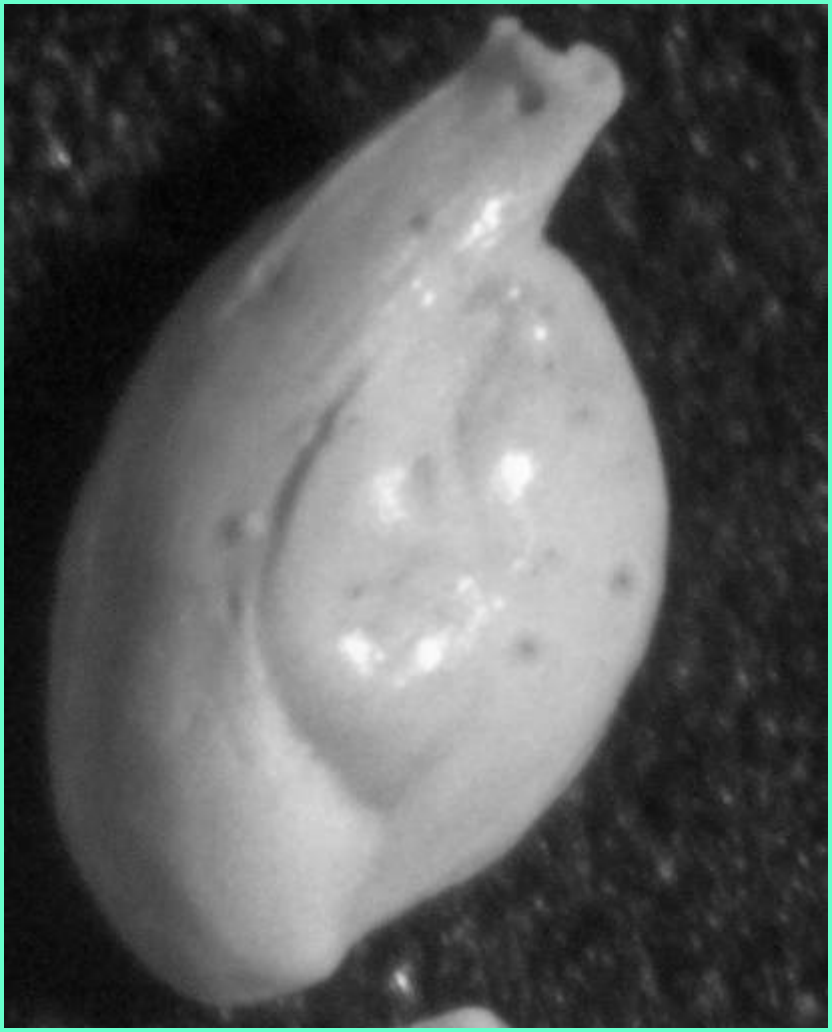
Quinqueloculina chipolensis

Quinqueloculina triangularis





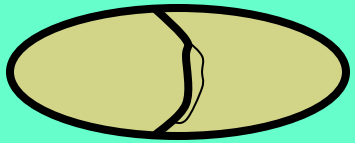
Triloculina tricarinata



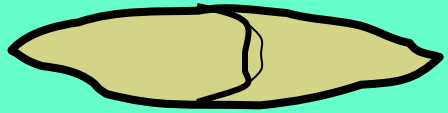
Spiroloculina dentata

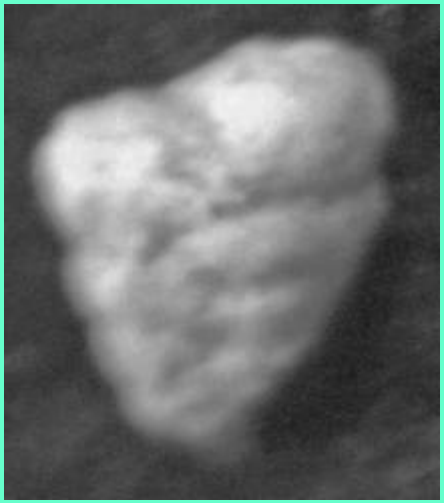
Textularia sp.

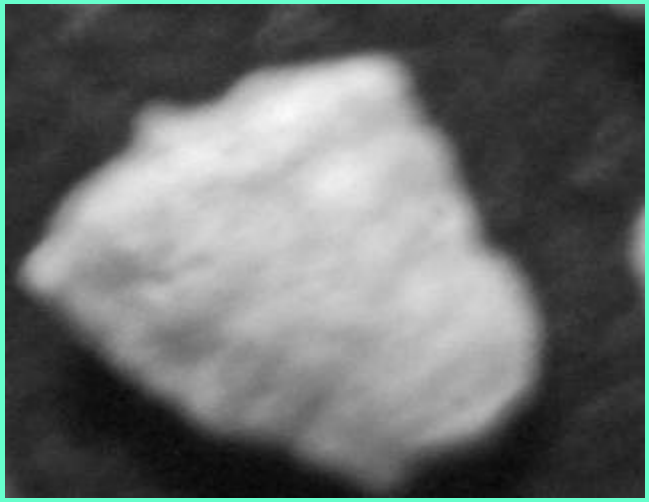
Textularia agglutinans



Textularia mayori

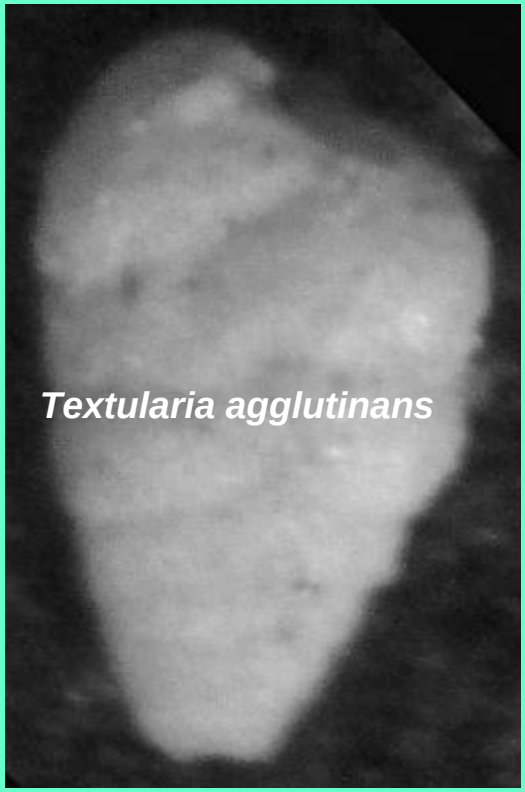


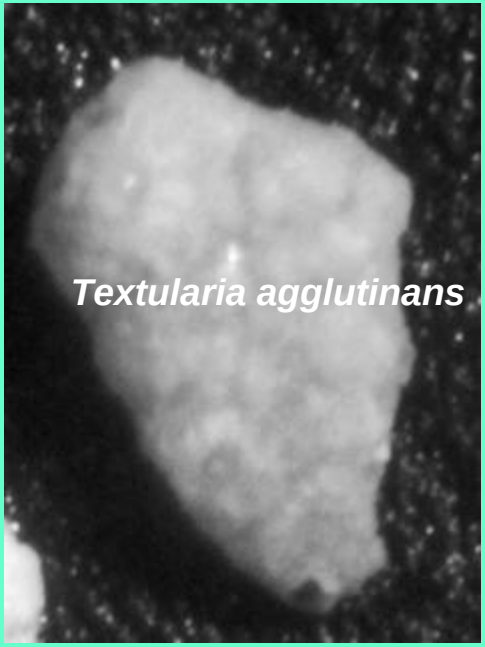


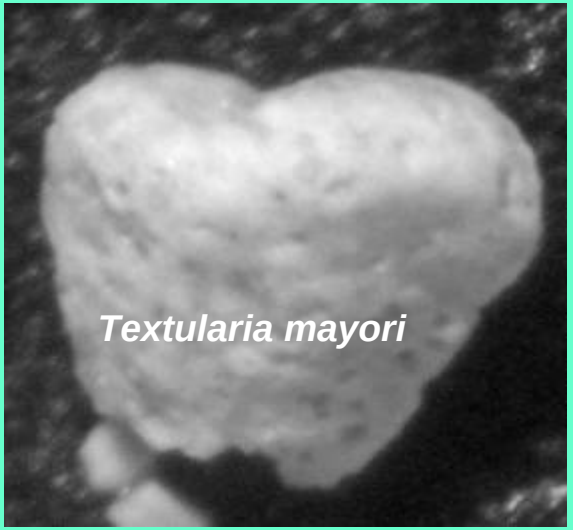


Bigenerina floridana

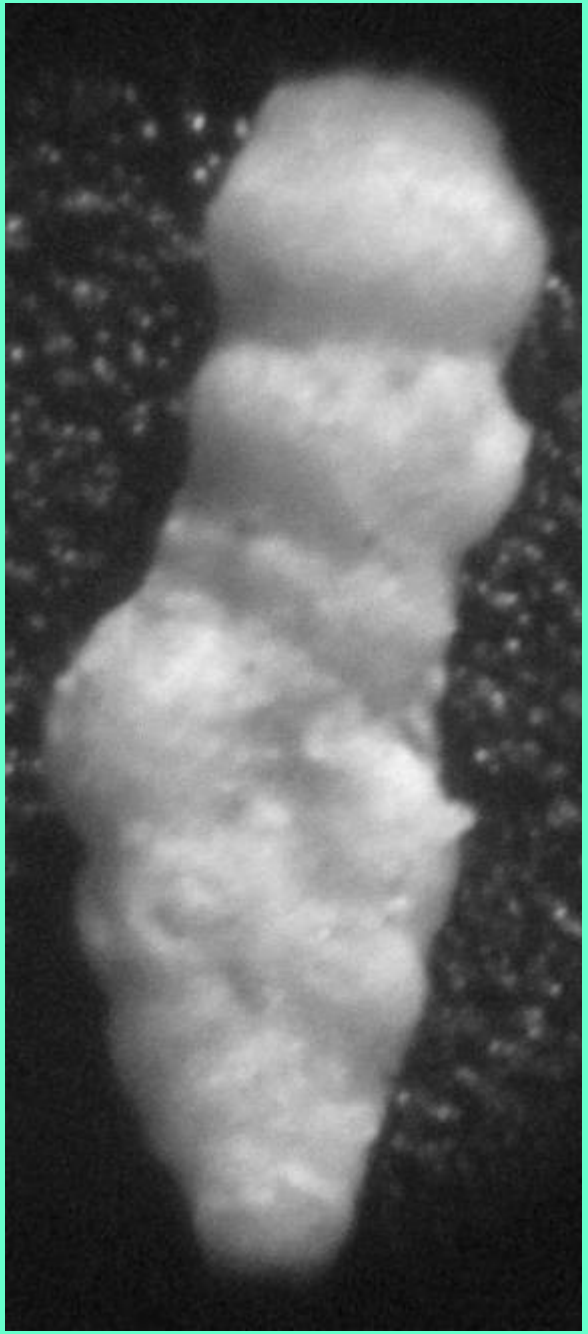
see next slide

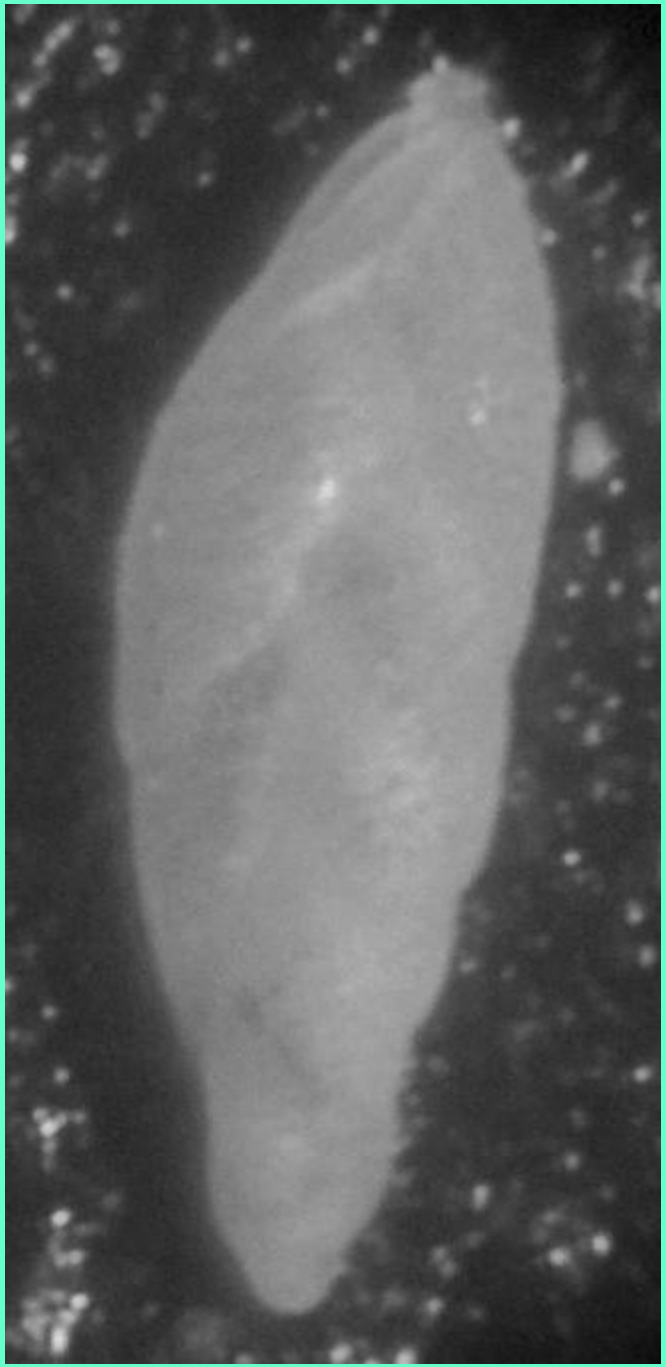




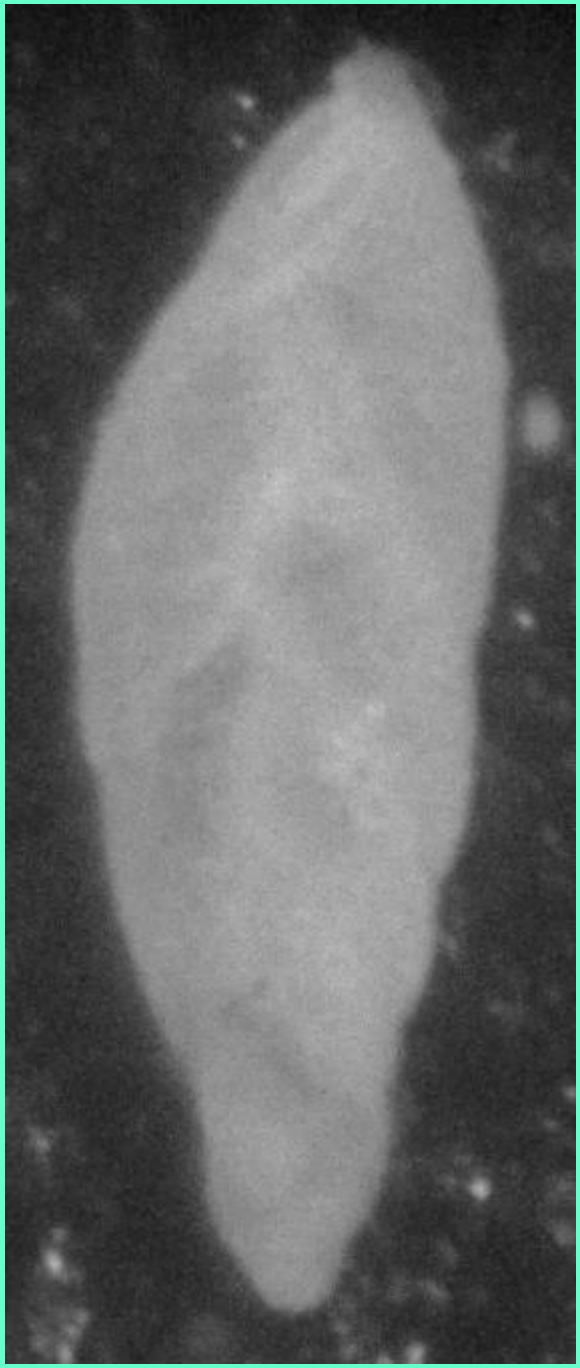


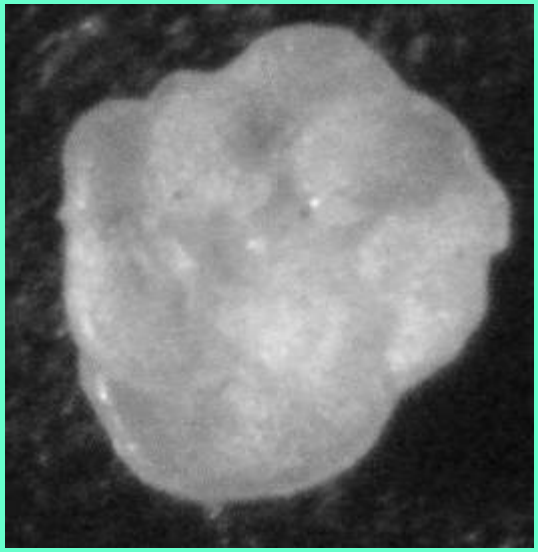
Bigenerina floridana

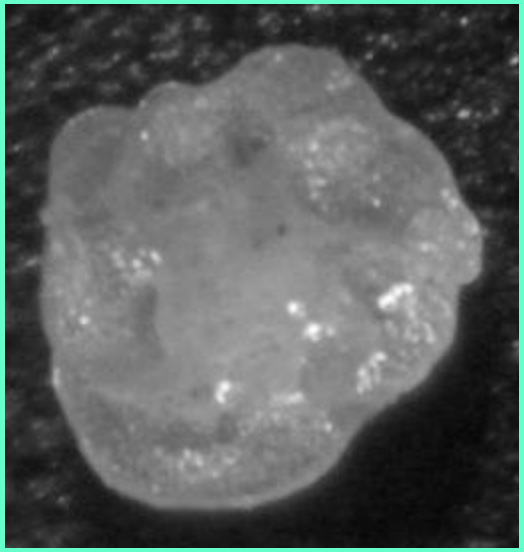




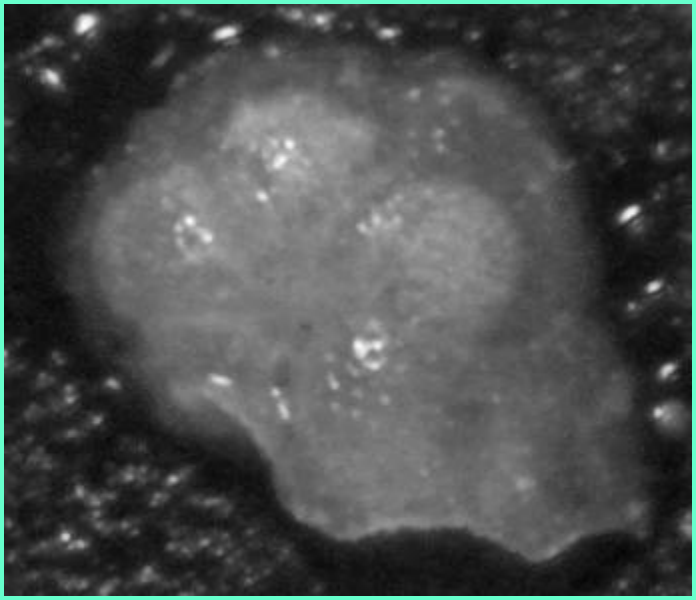
Fursenkoina pontoni

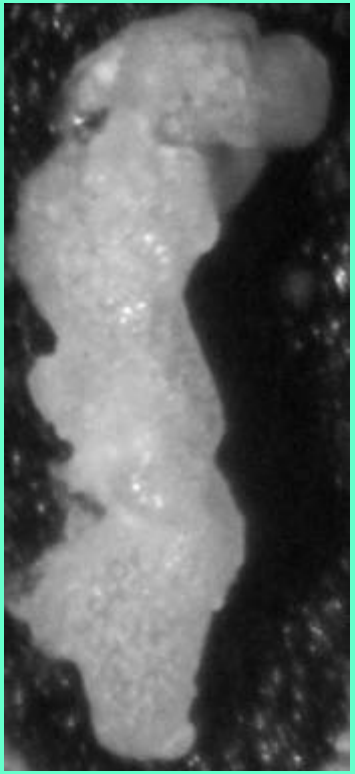




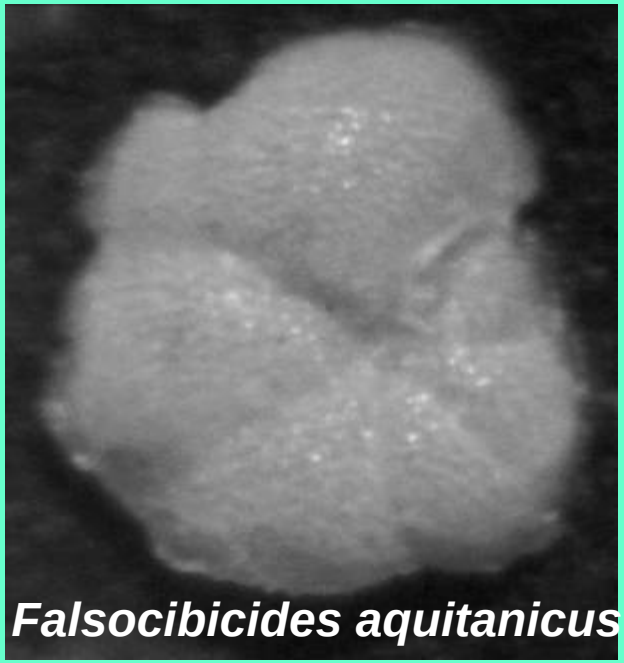


Planorbulina mediterranensis

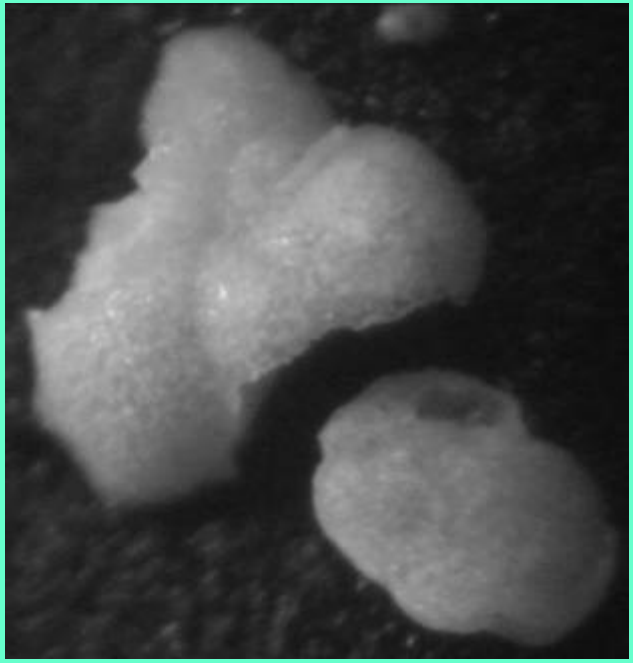




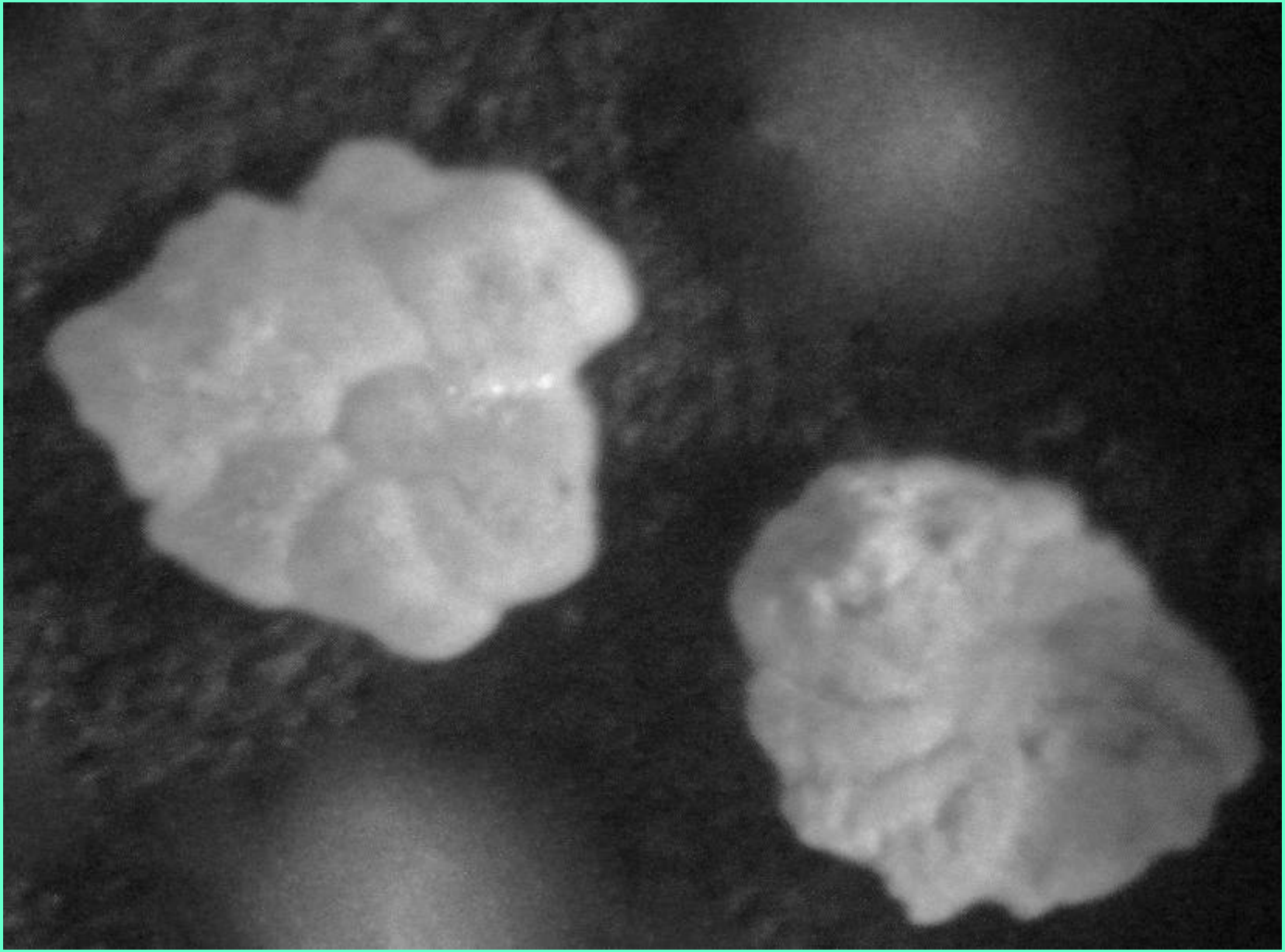
Usually attached to marine grasses

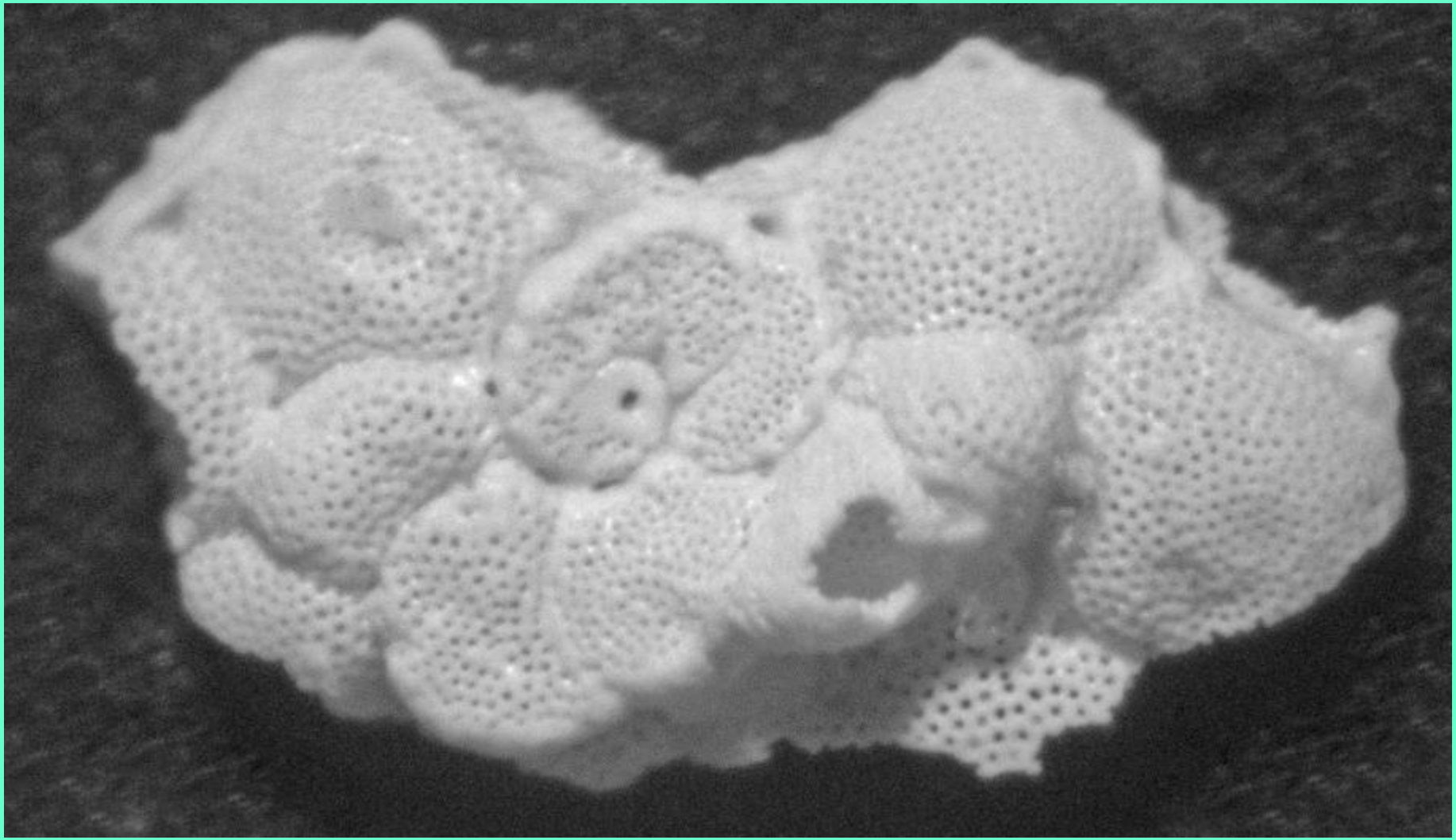


Falsocibicides aquitanicus

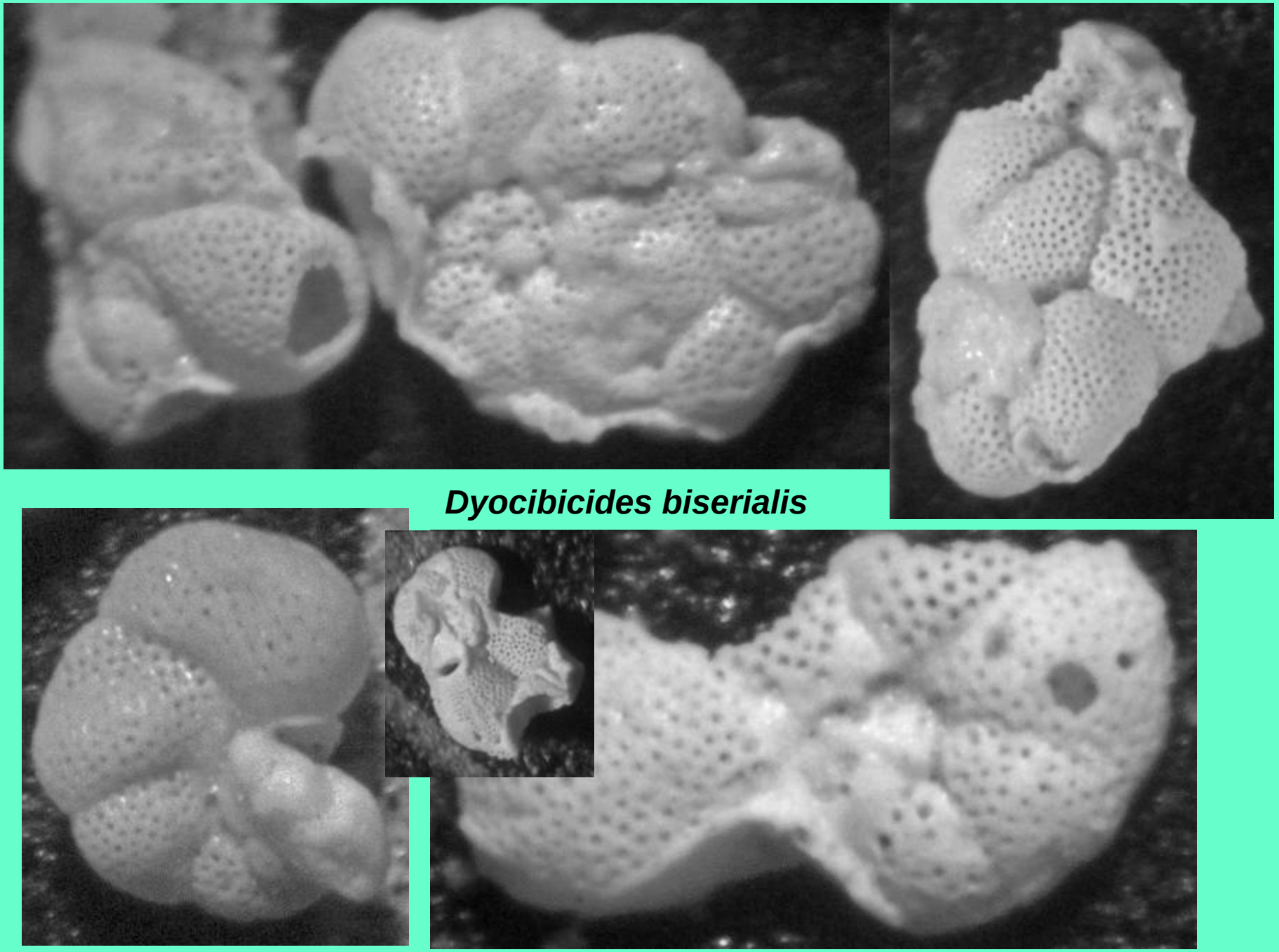


‘Cibicides’ lobatula

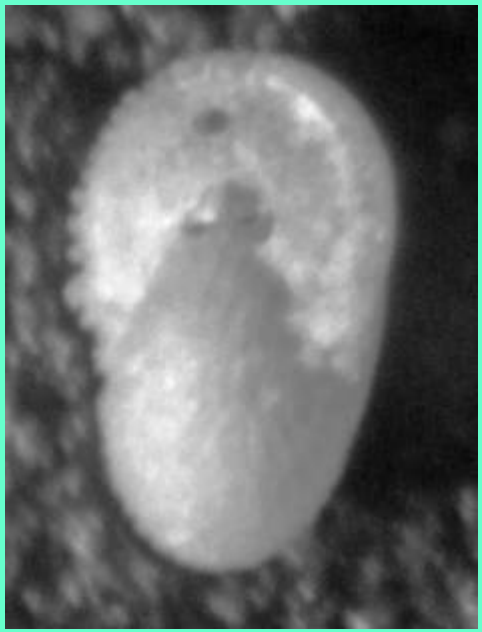


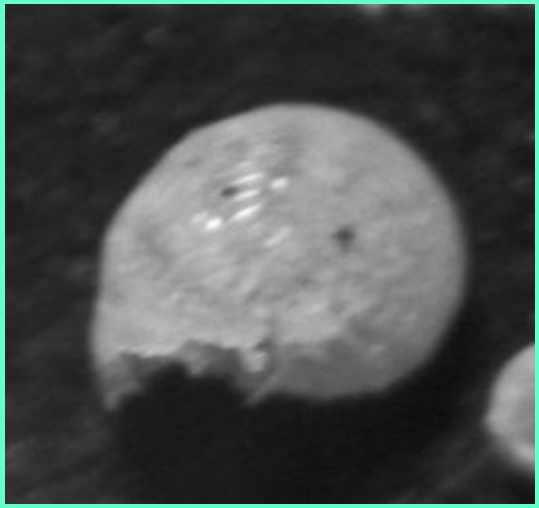


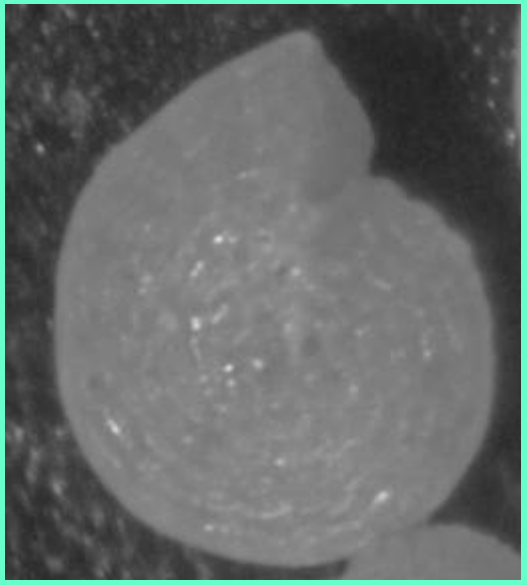
Dyocibicides biserialis



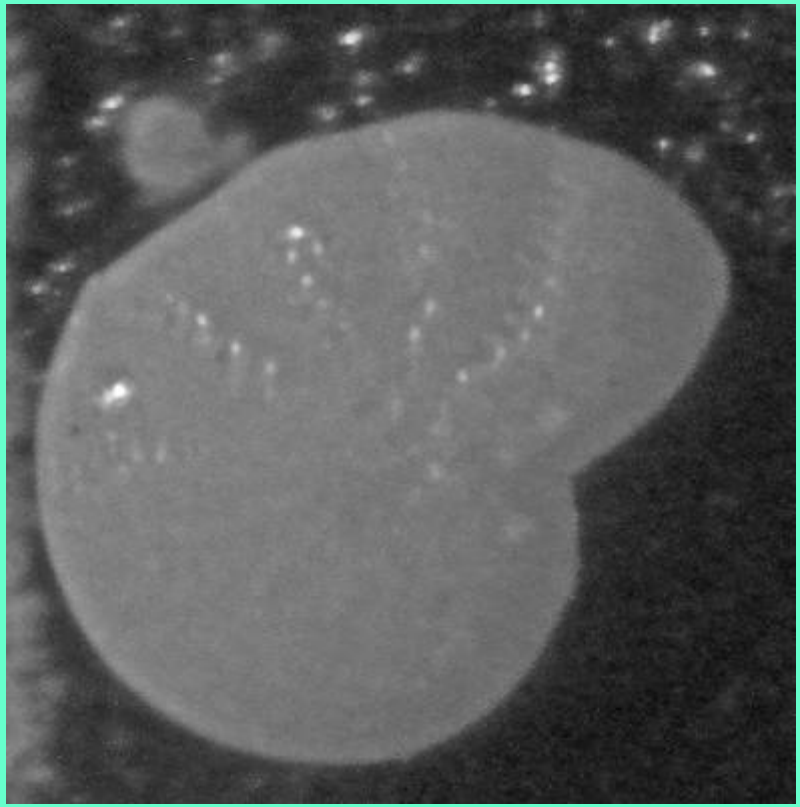
Dyocibicides biserialis

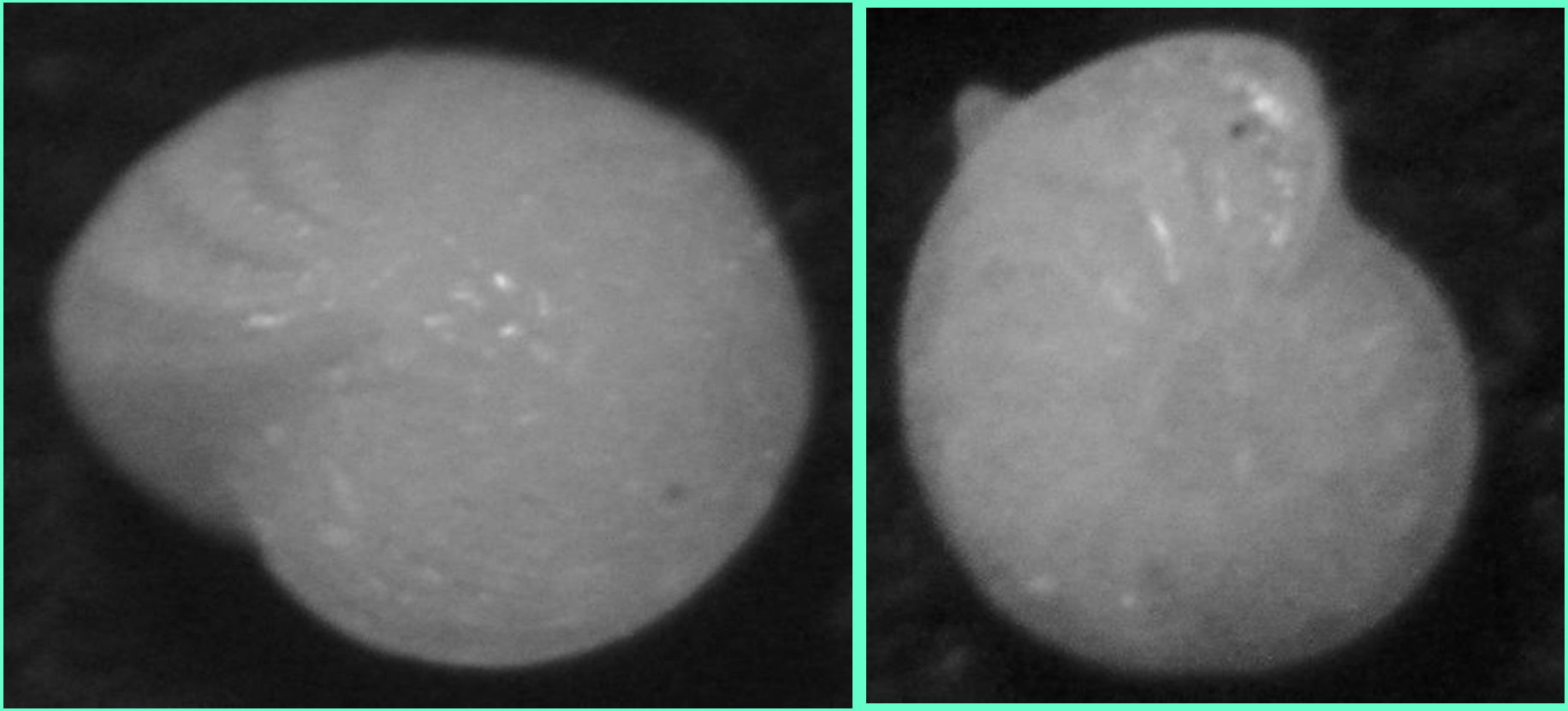




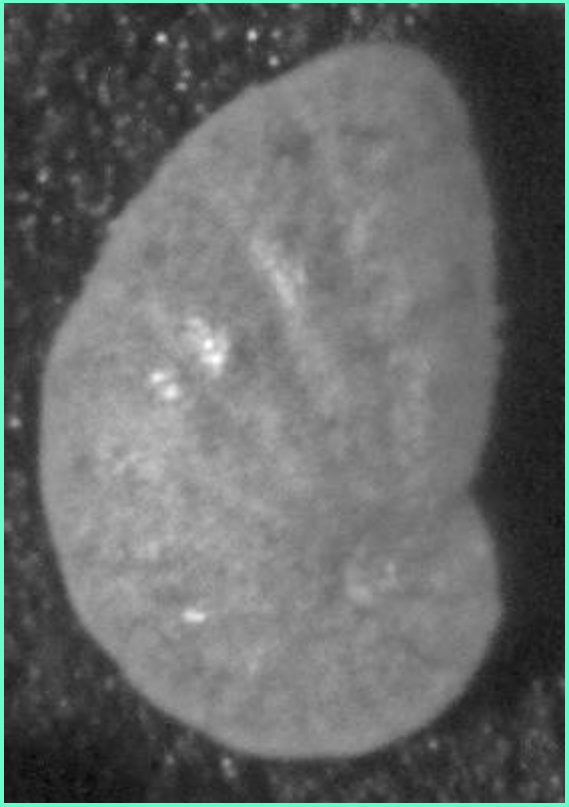


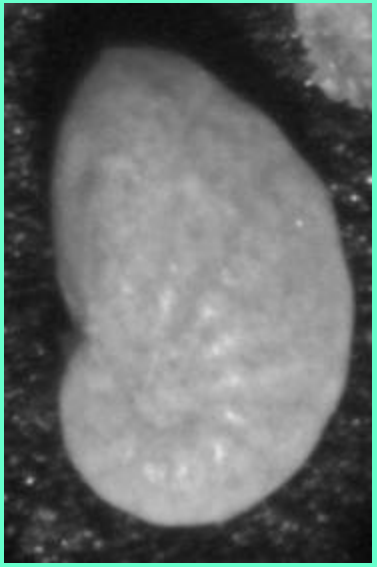
Elphidium chipolensis

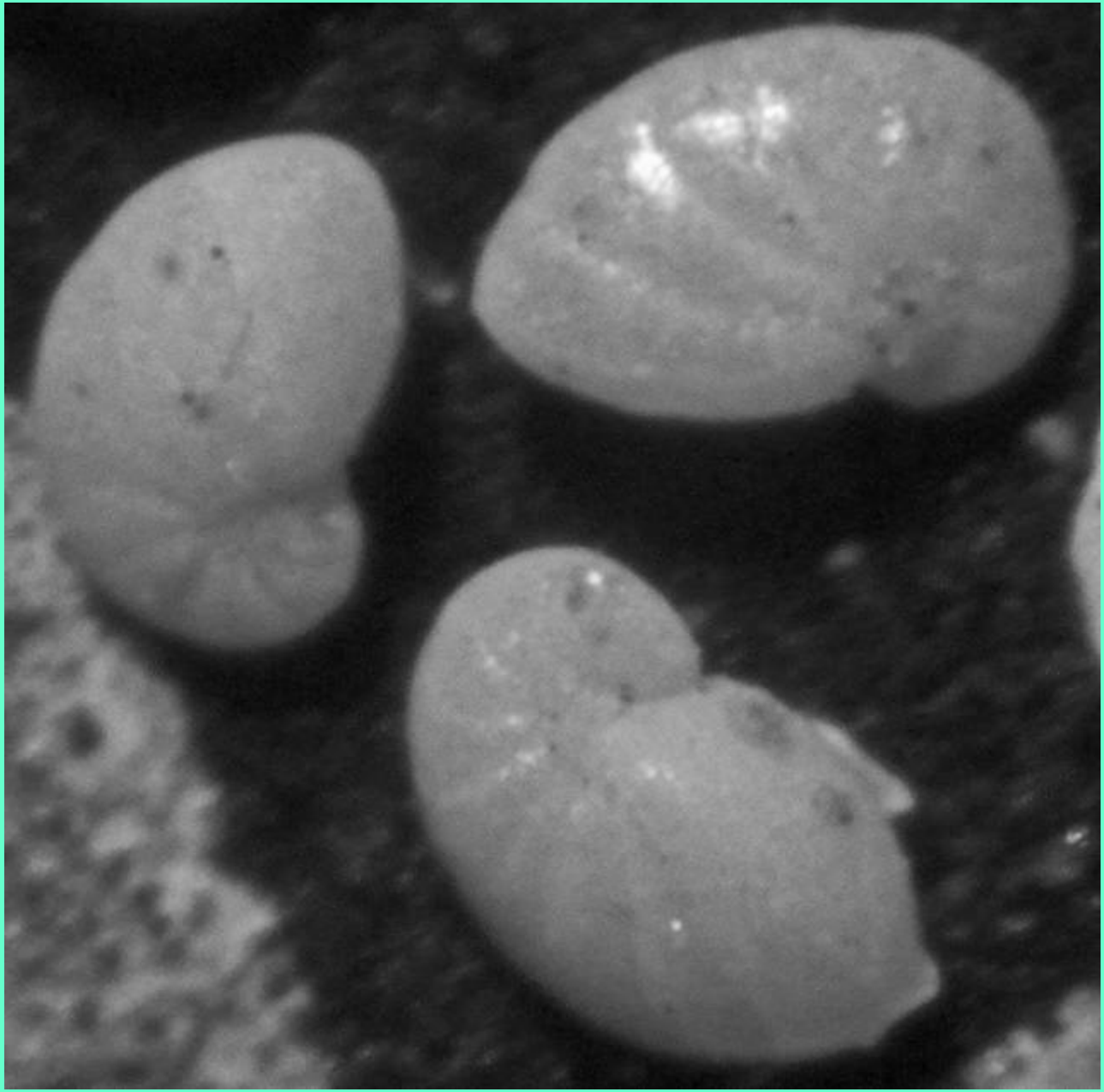




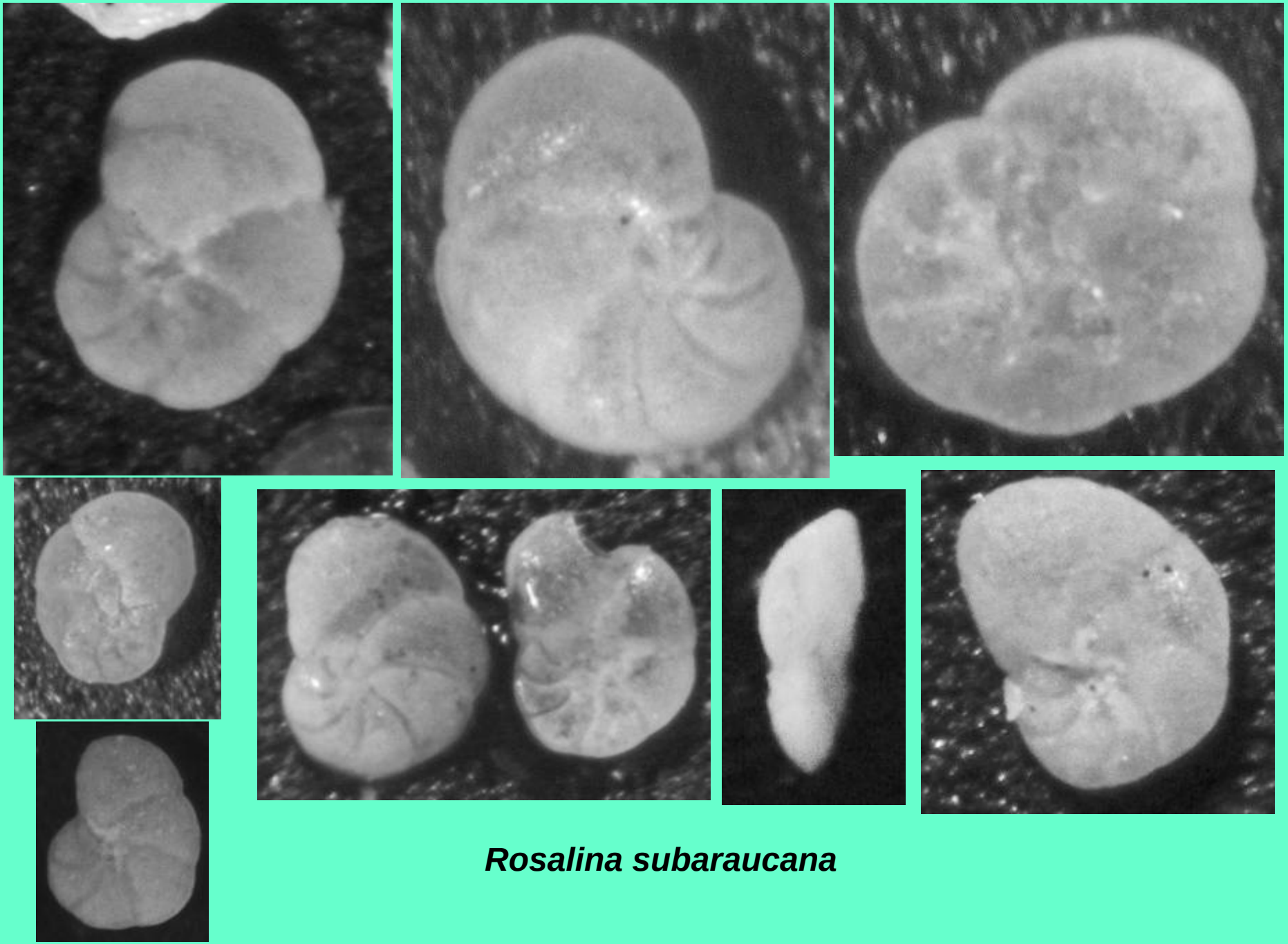
Elphidium fimbriatulum







Nonionoides grateloupi

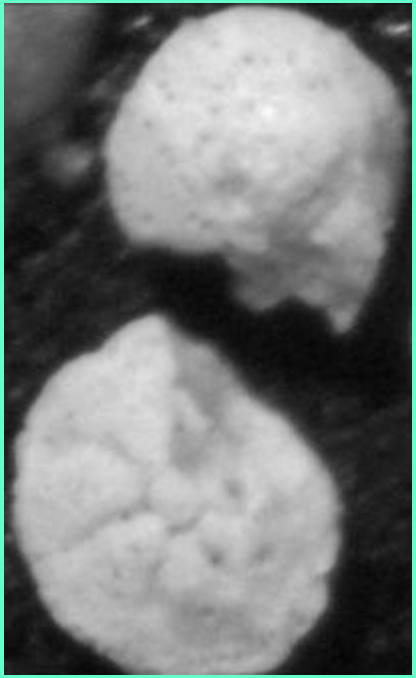


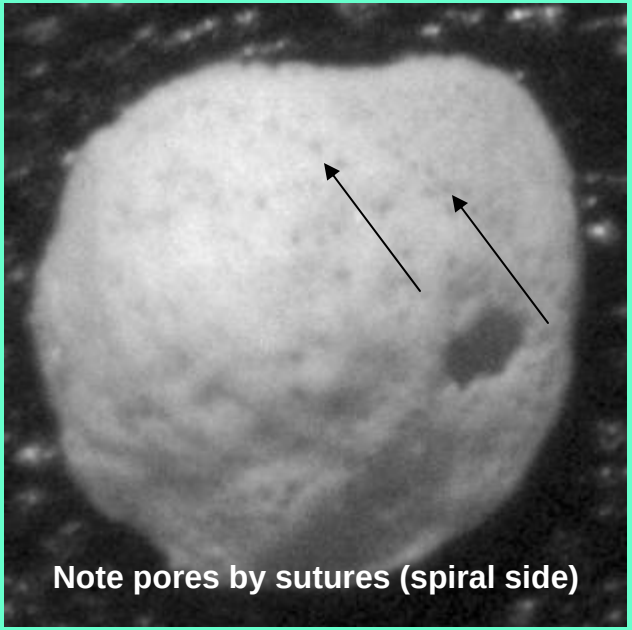
Rosalina subaraucana

Brizalina marginata

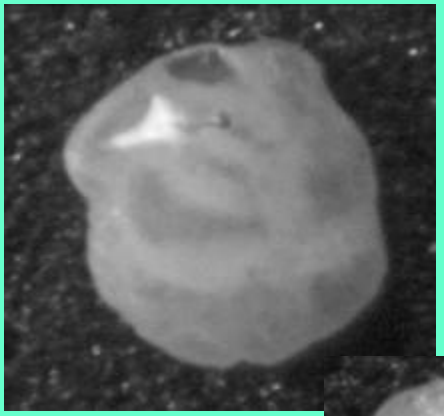
Discorbis rosea

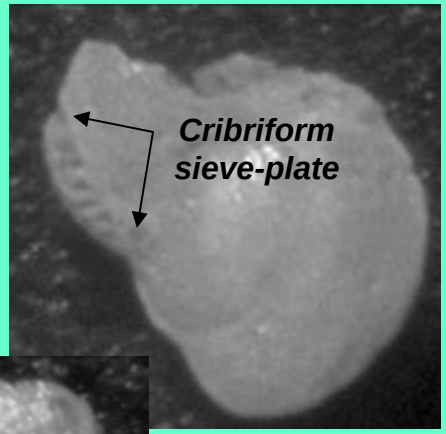
Modern red specimen

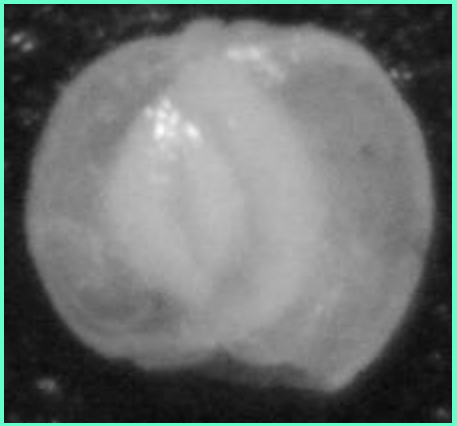


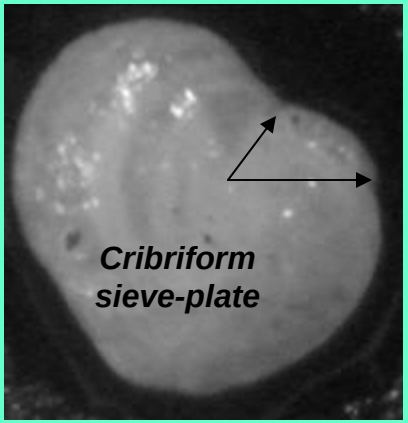


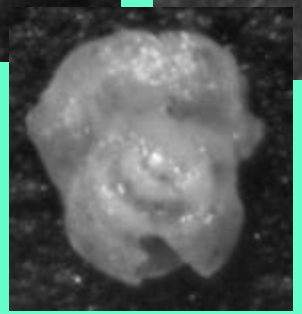
Note pores by sutures (spiral side)



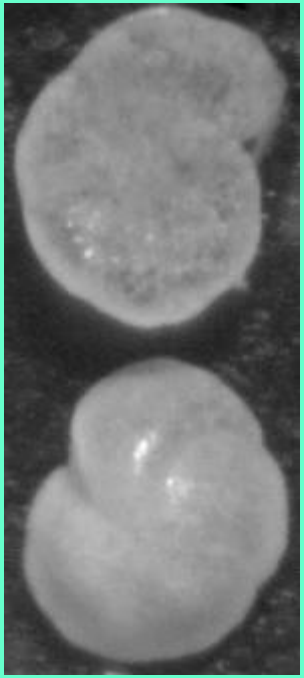


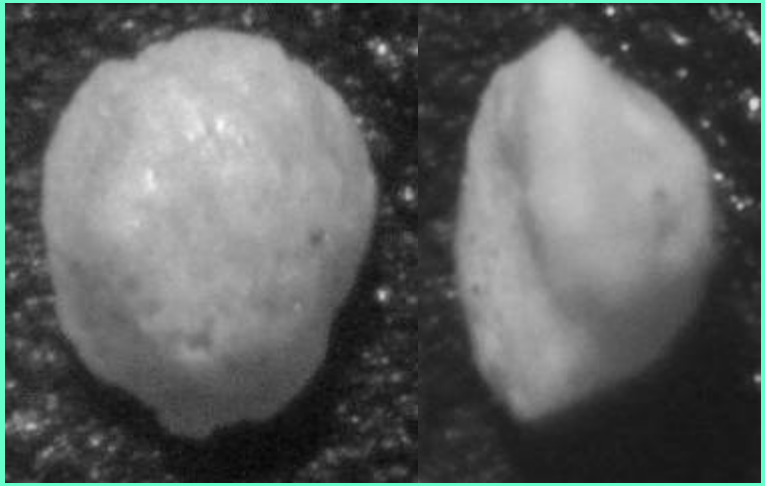




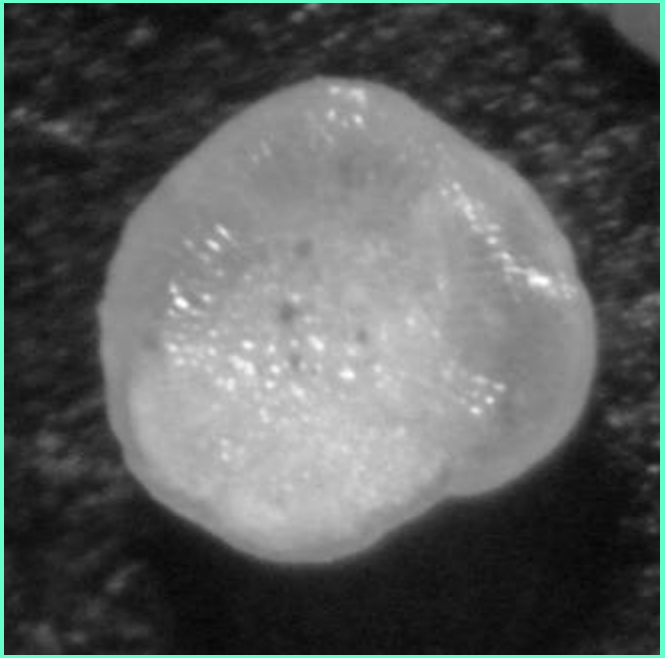


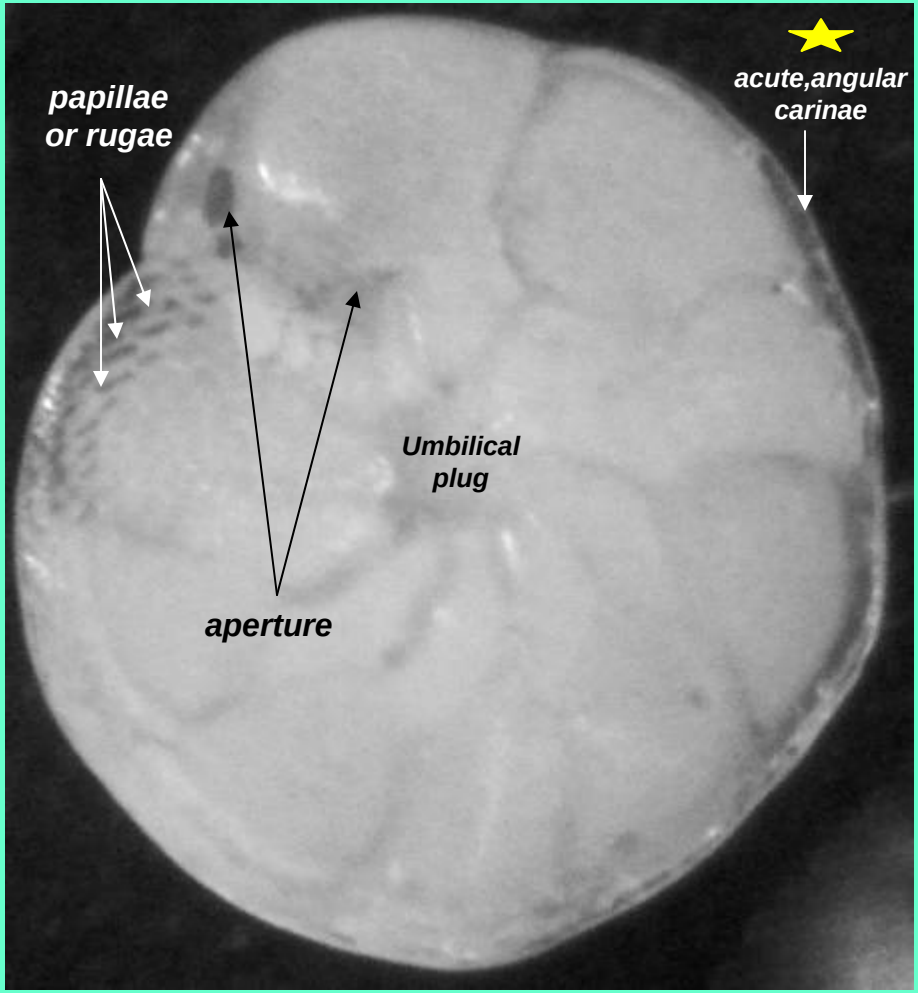
Family **Hauerinidae cf**
Hauerina bradyi



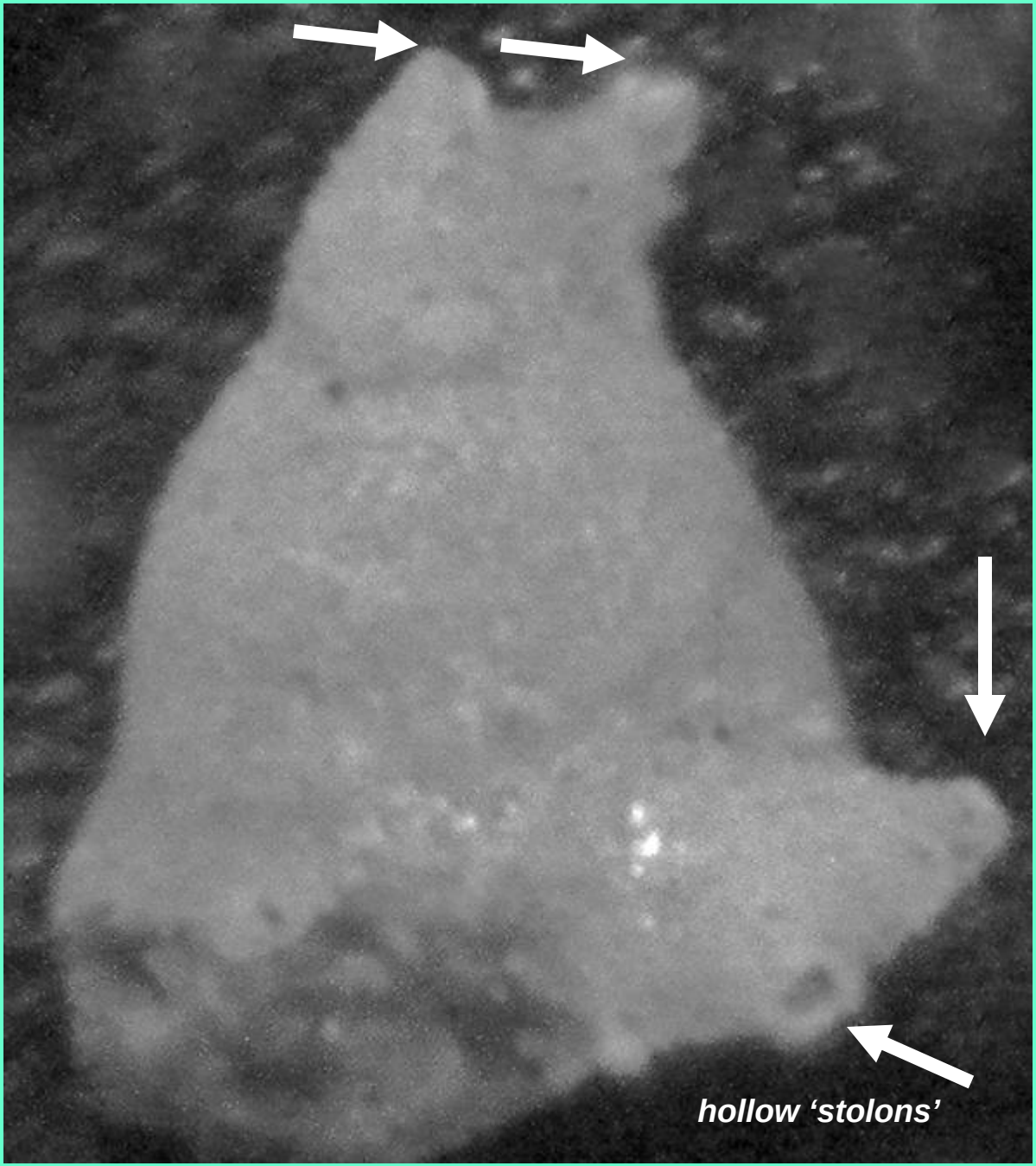


Glabratellina albida



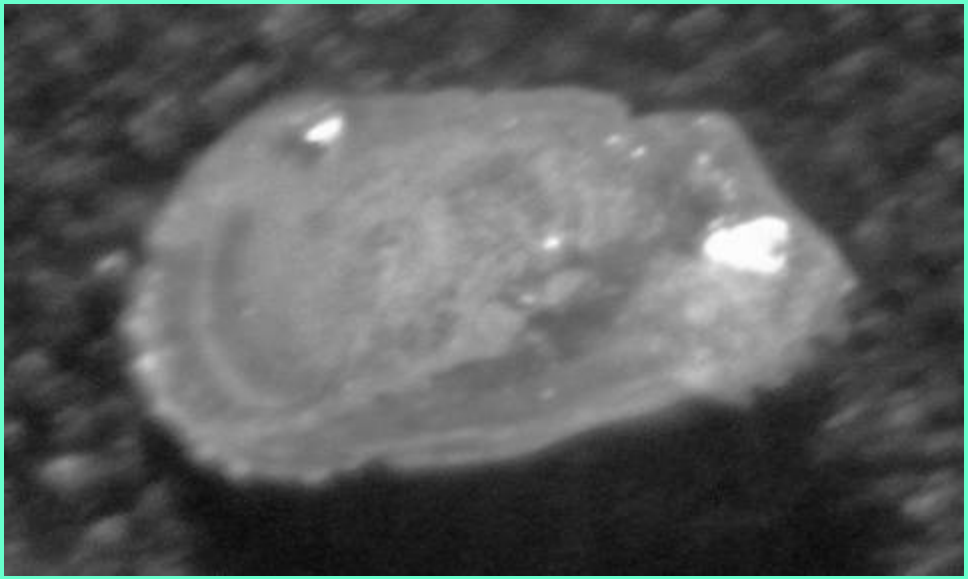


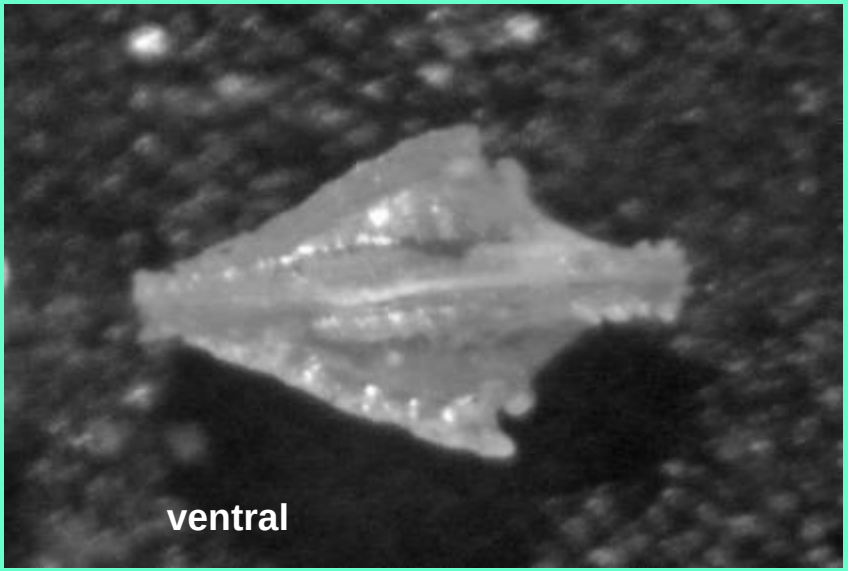
Amphistegina chipolensis

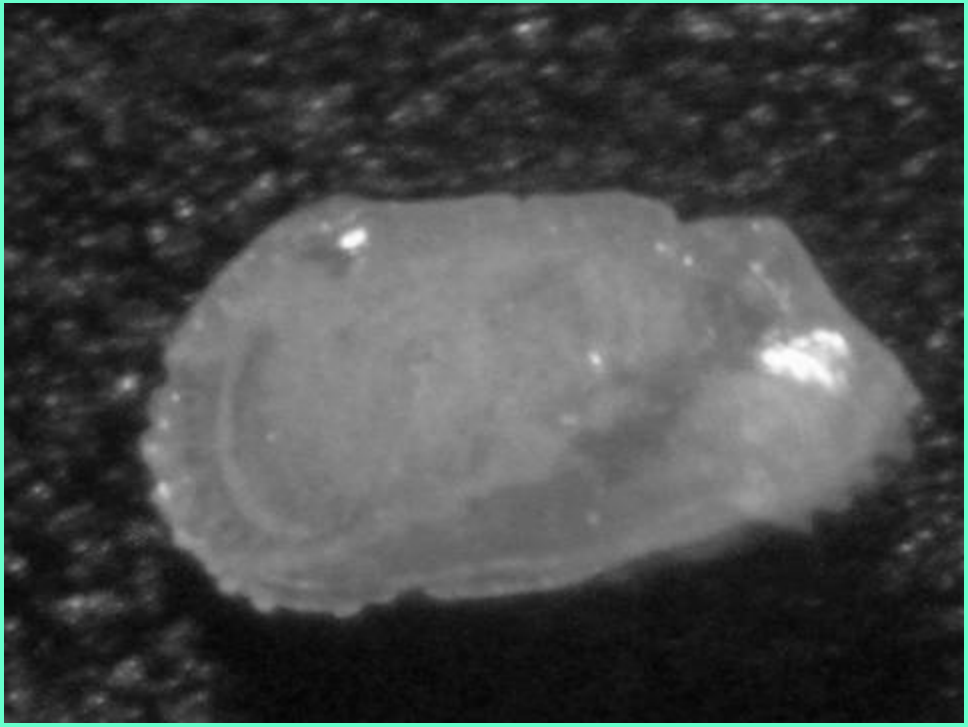


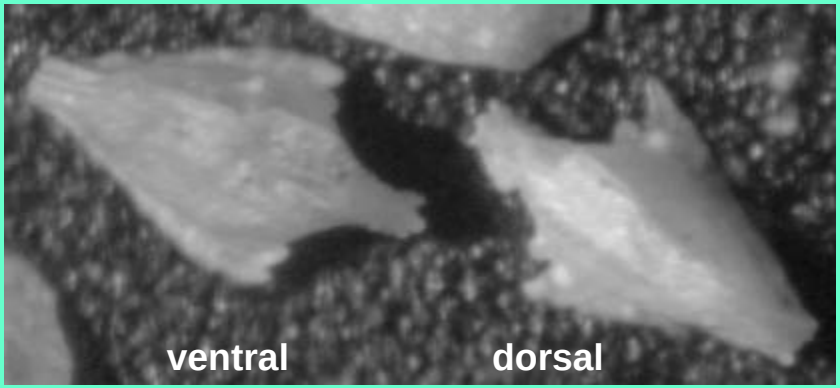
Ramulina sp.

Ostracoda

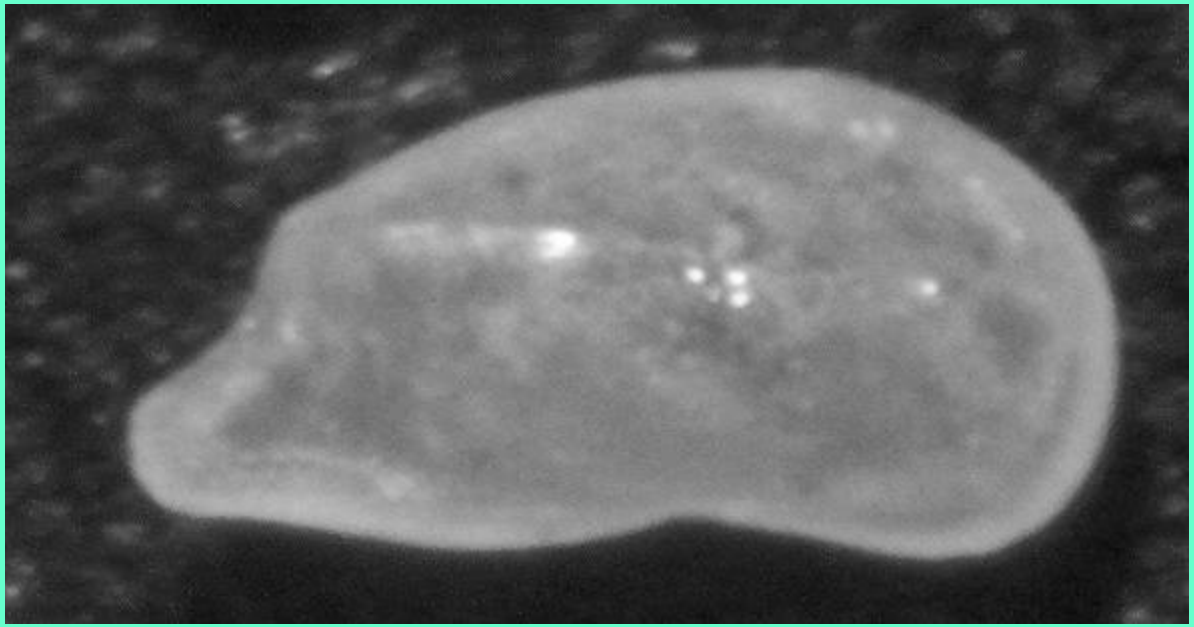


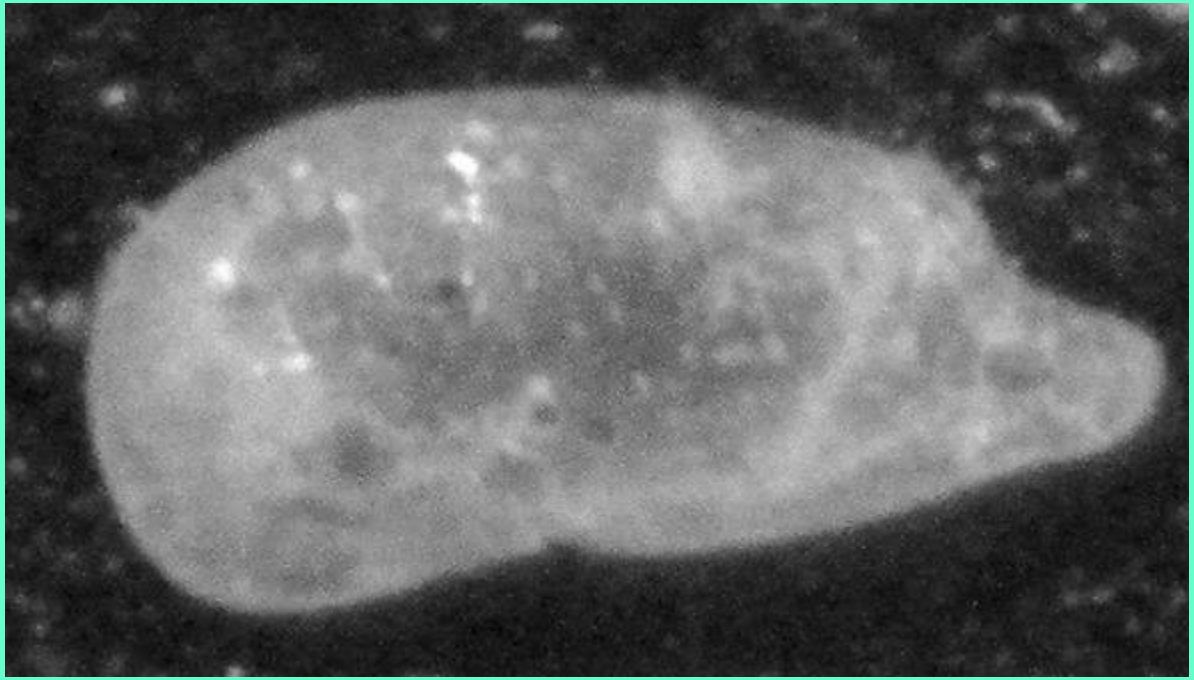






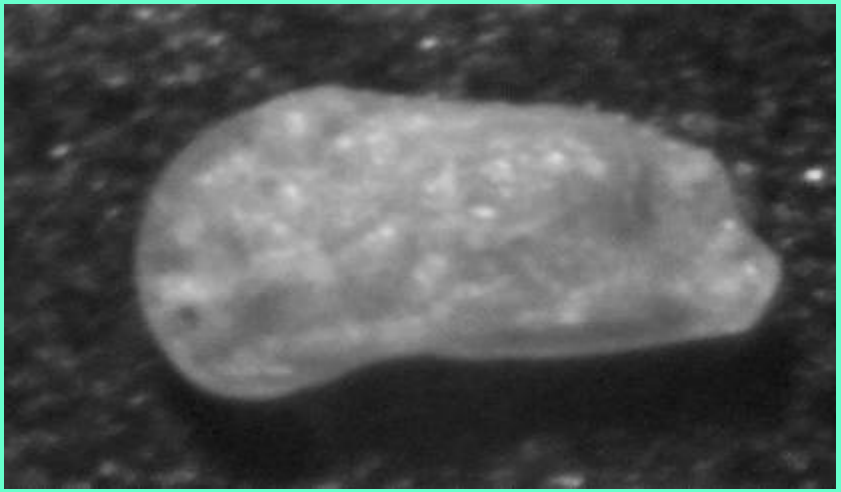
Pterygocythereis cornuta americana

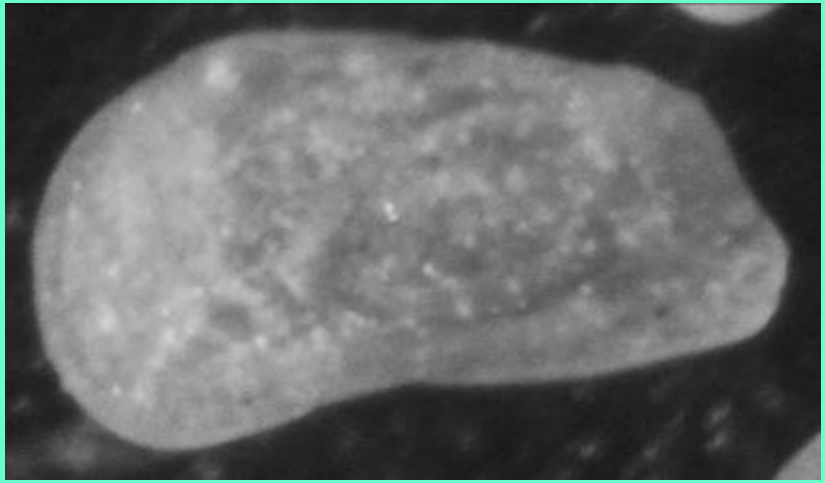


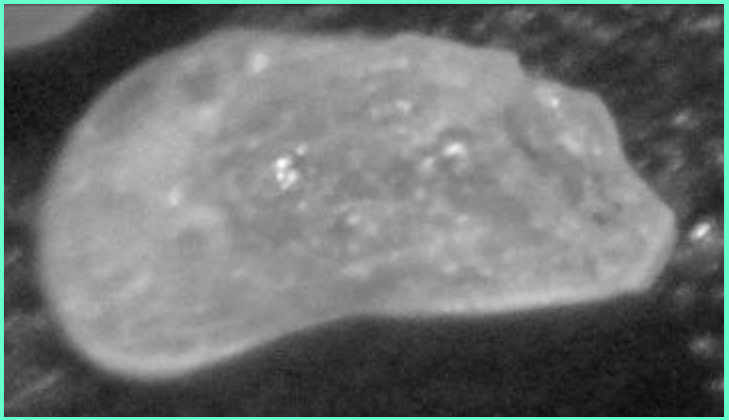


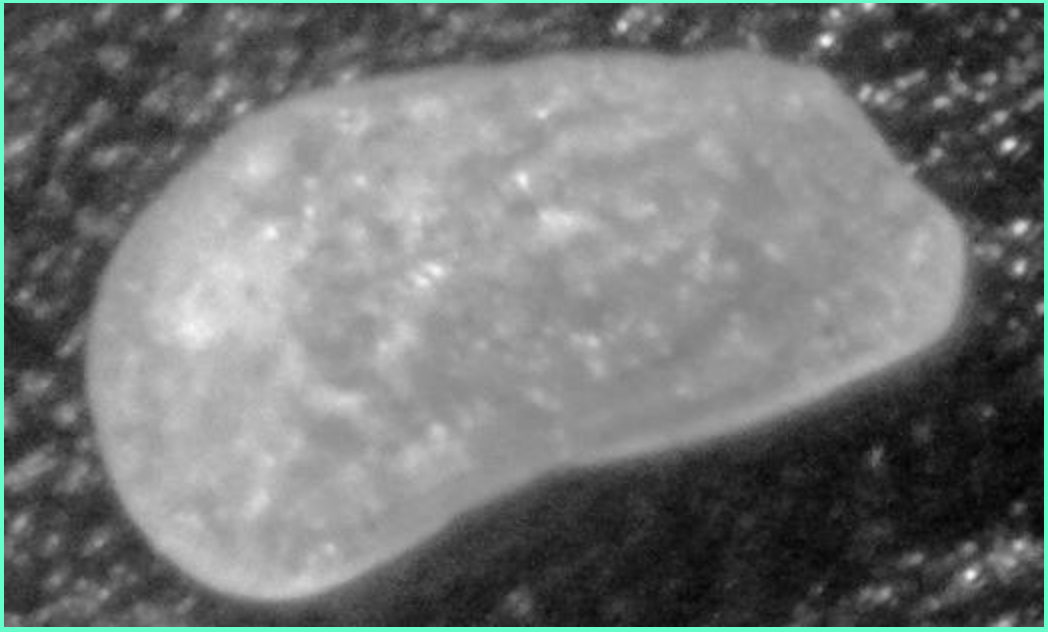
Caudites sp.

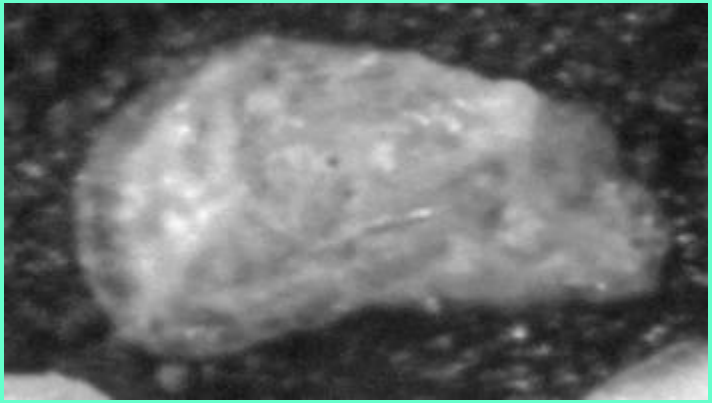
Caudites chipolensis

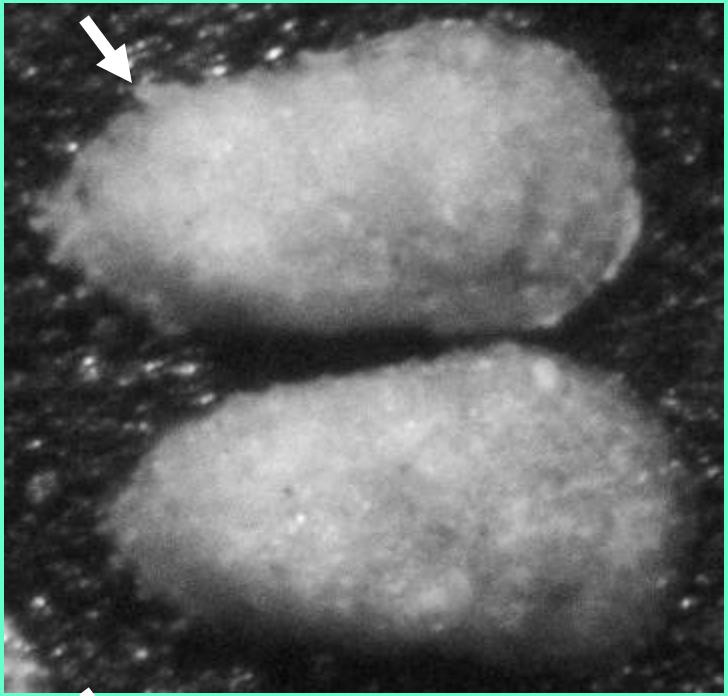


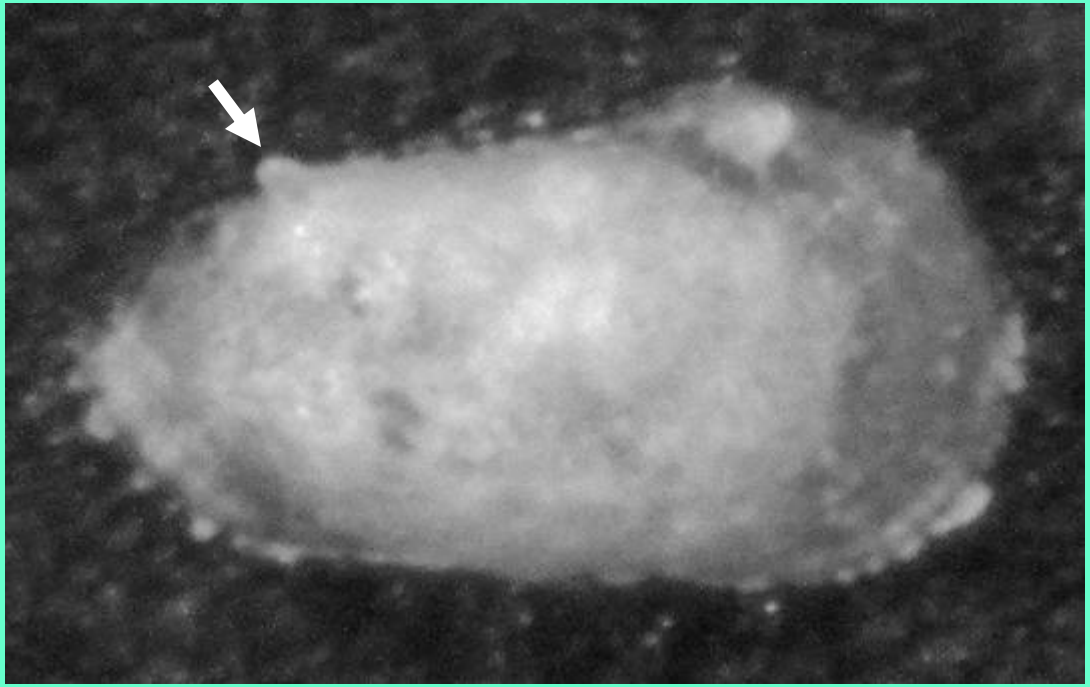


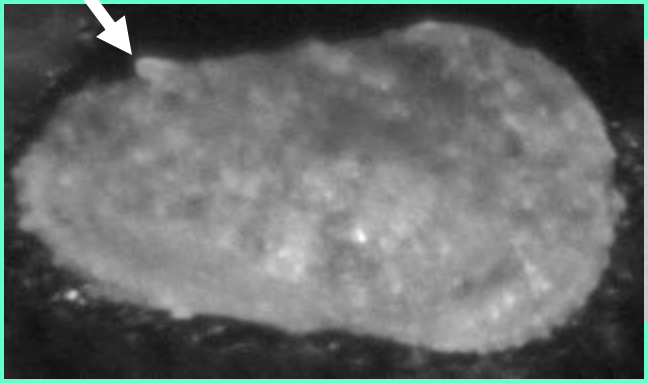


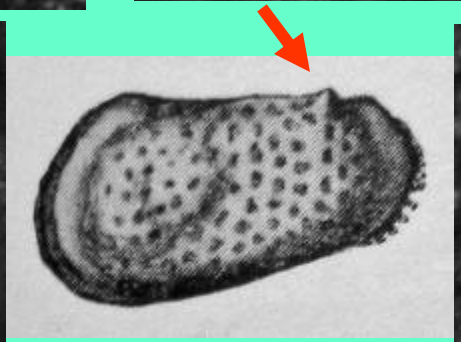




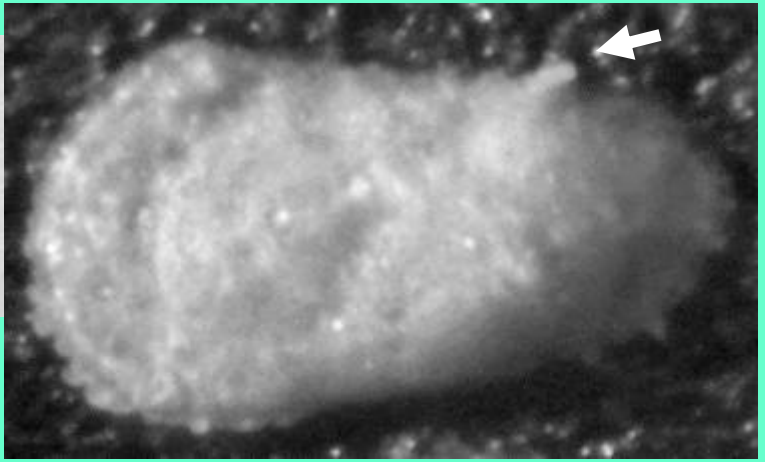






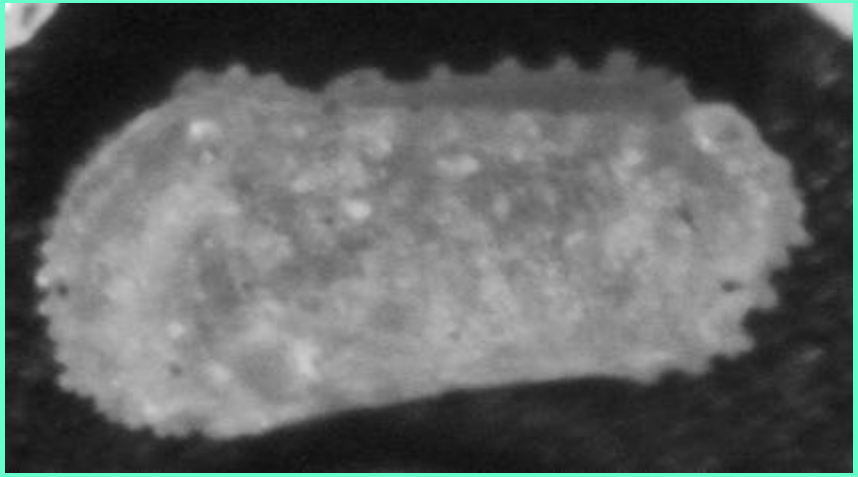


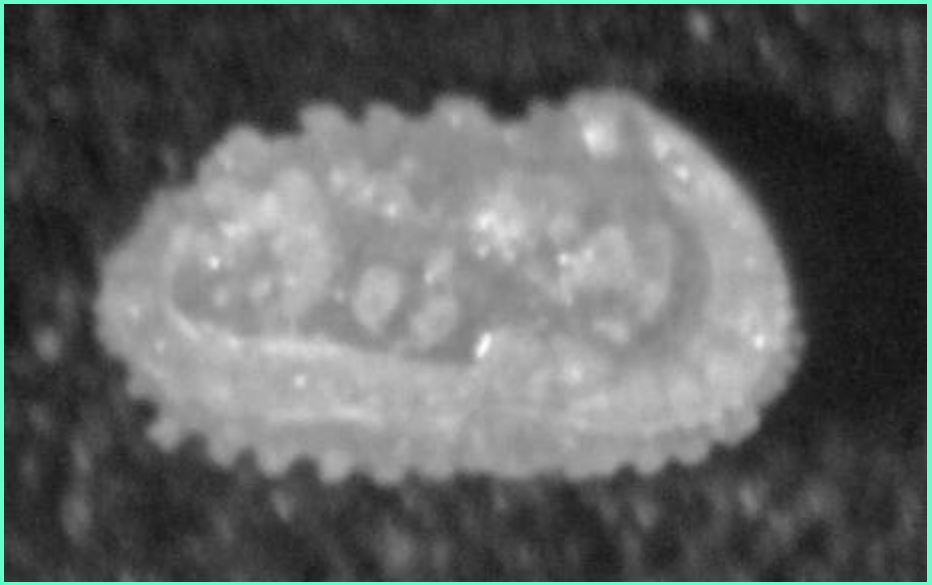
Ulrich&Bassler, Mio.of Md., 1904



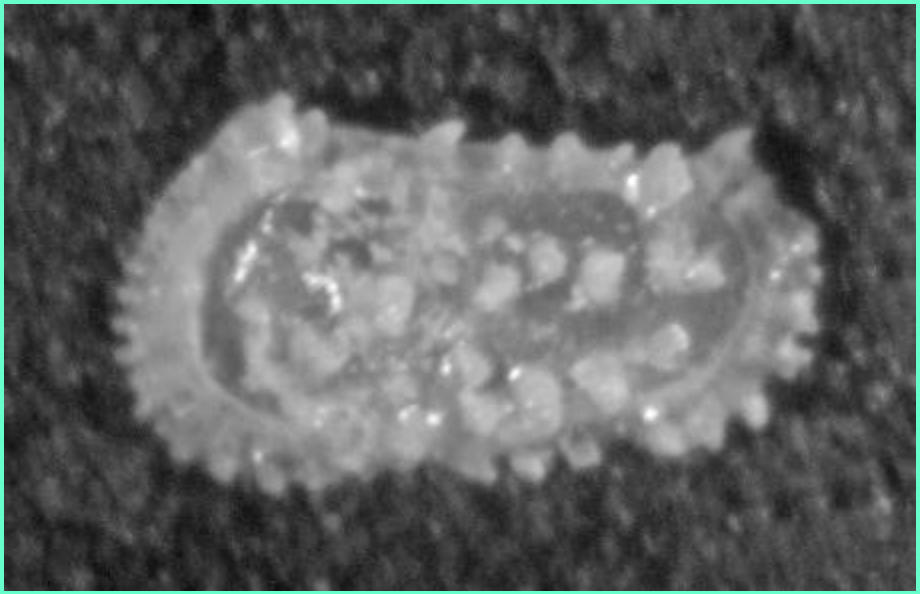
Trachyleberis dorsicornis

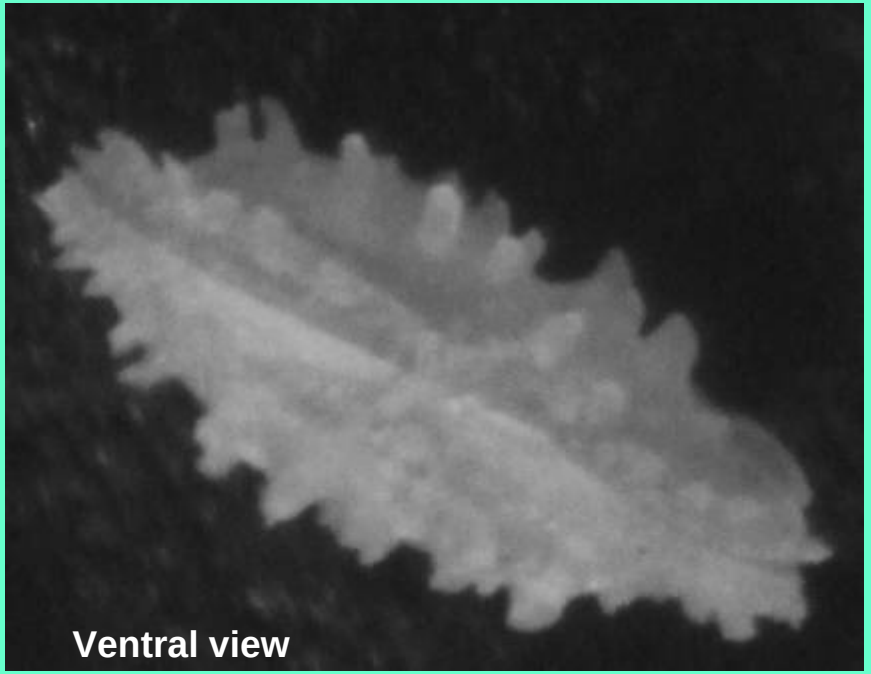
(=Cythere dorsicornis)

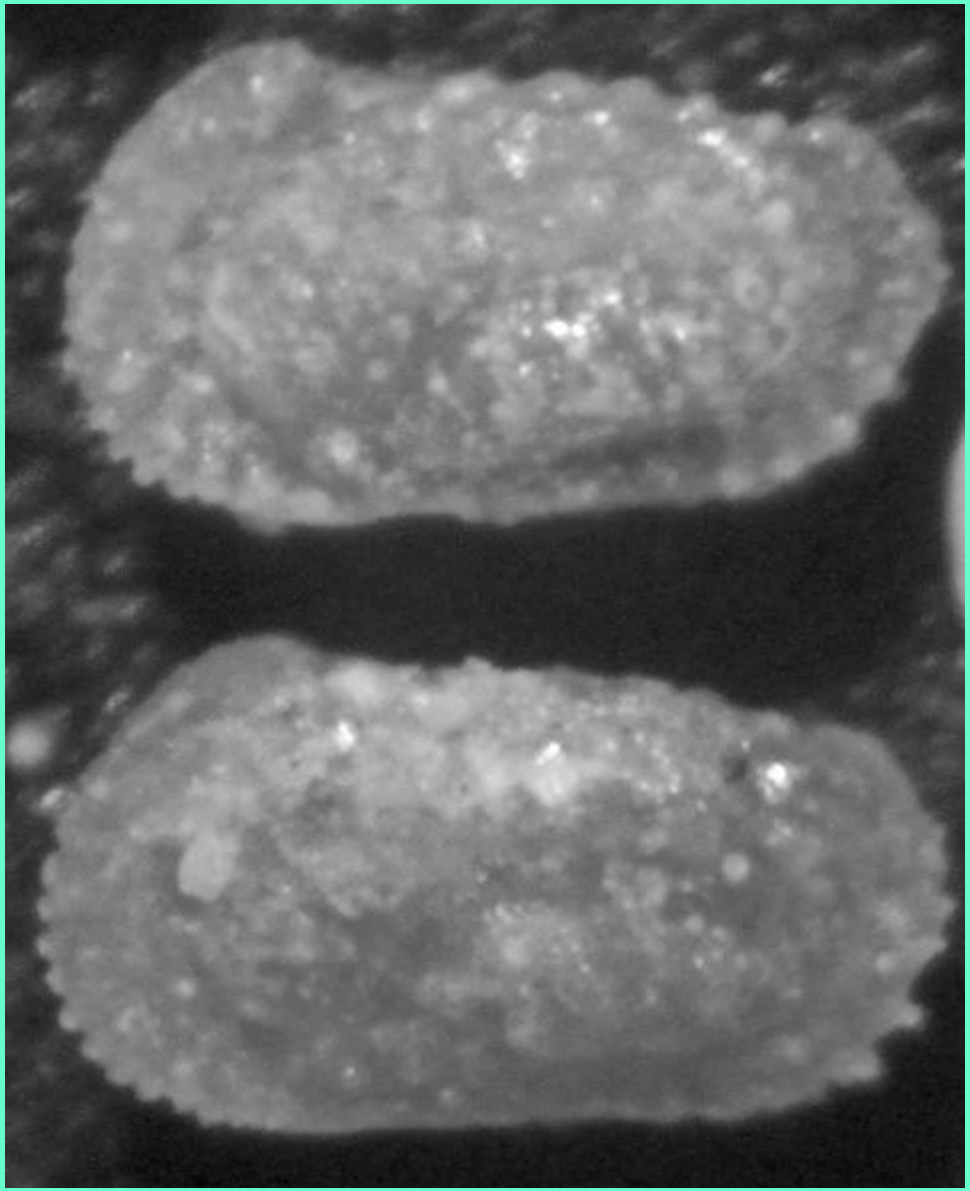


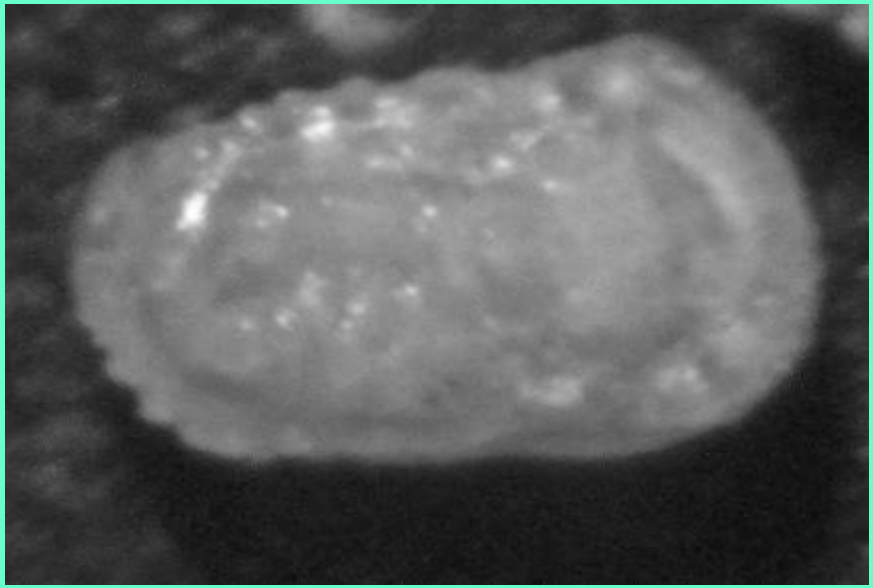


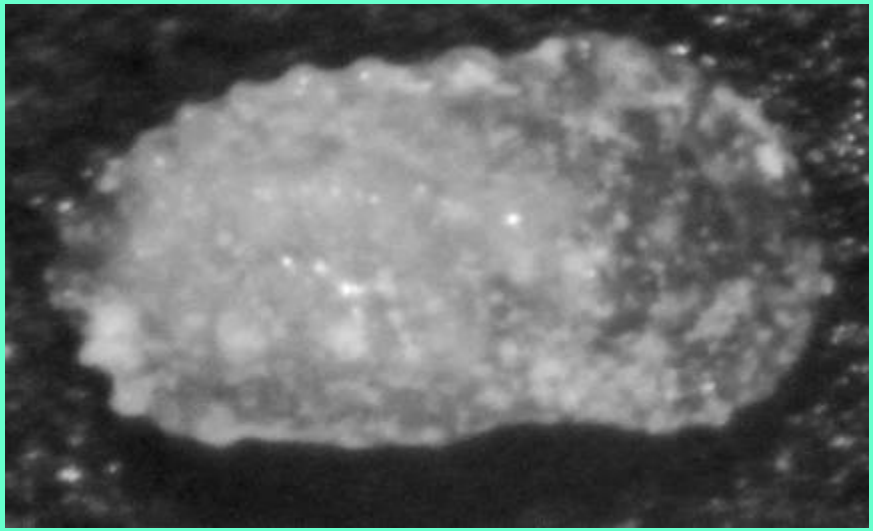
Actinocythereis exanthemata





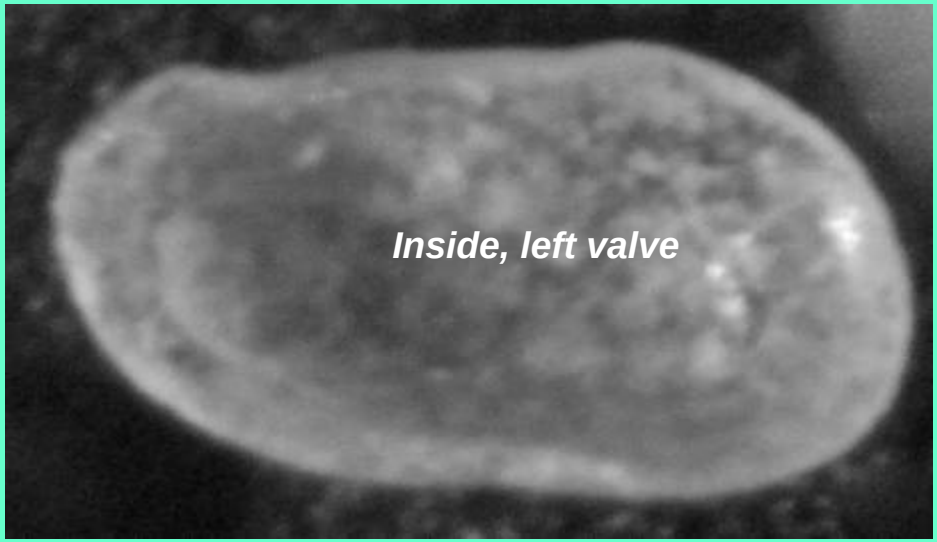




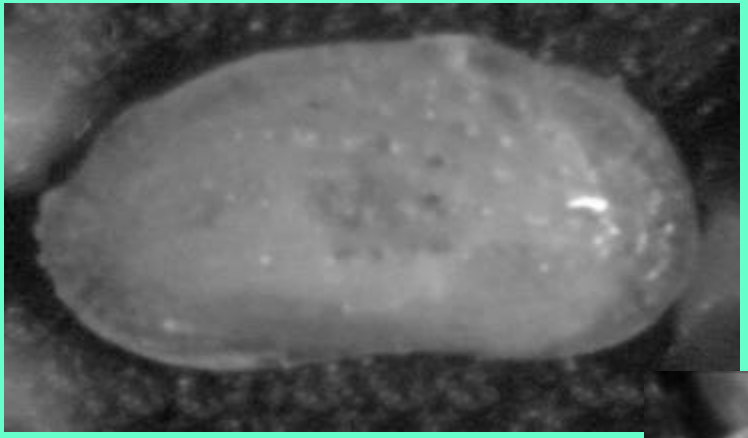


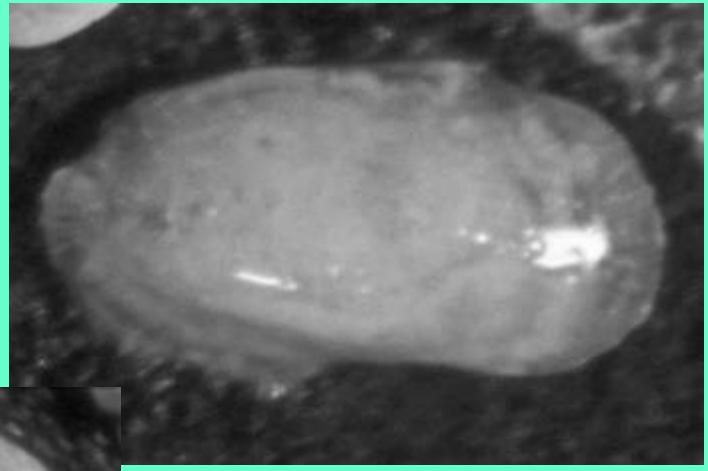
Actinocythereis exanthemata

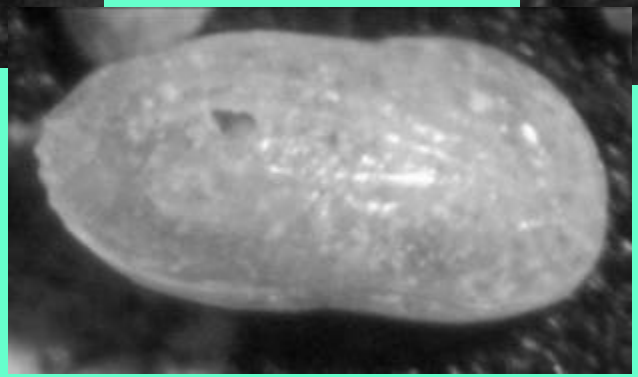
Protocytheretta calhounensis

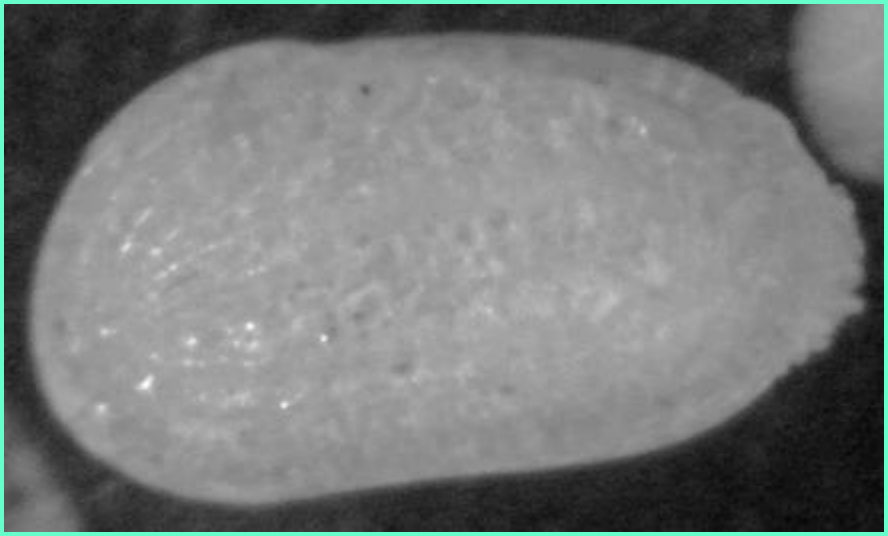


Inside, left valve

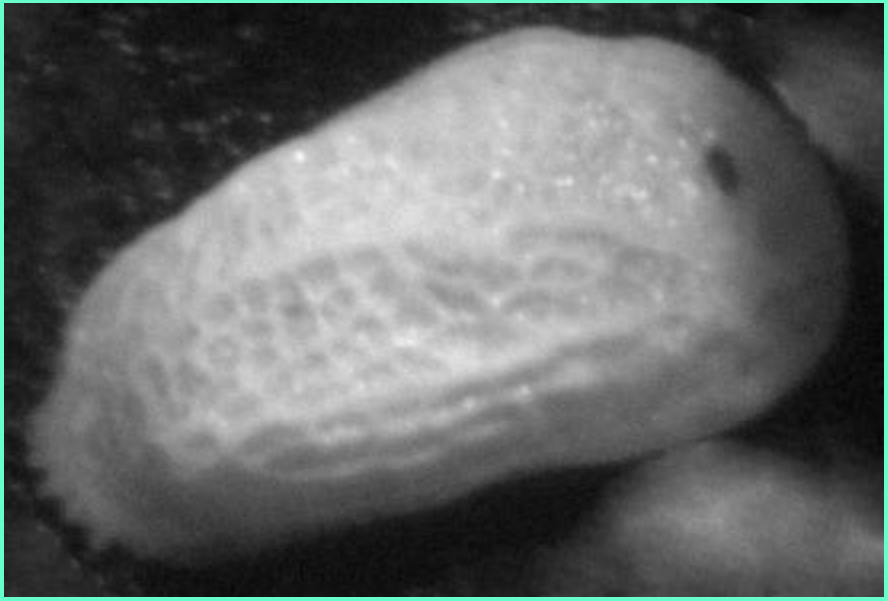


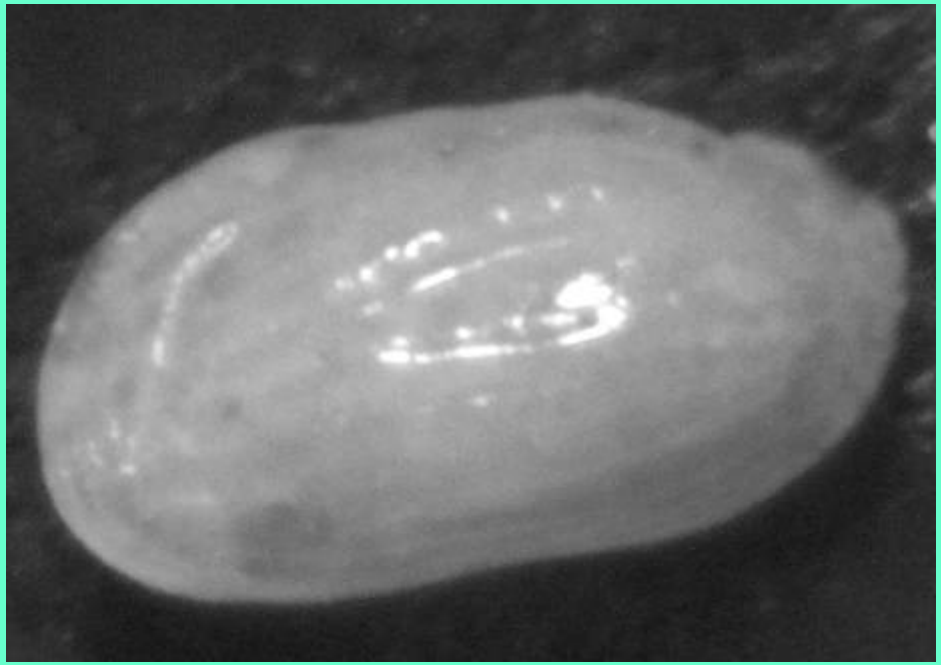




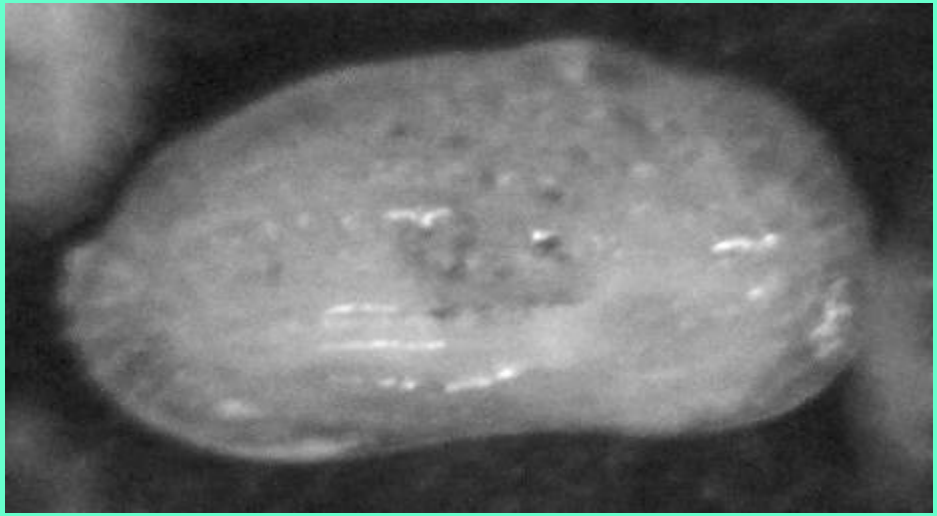


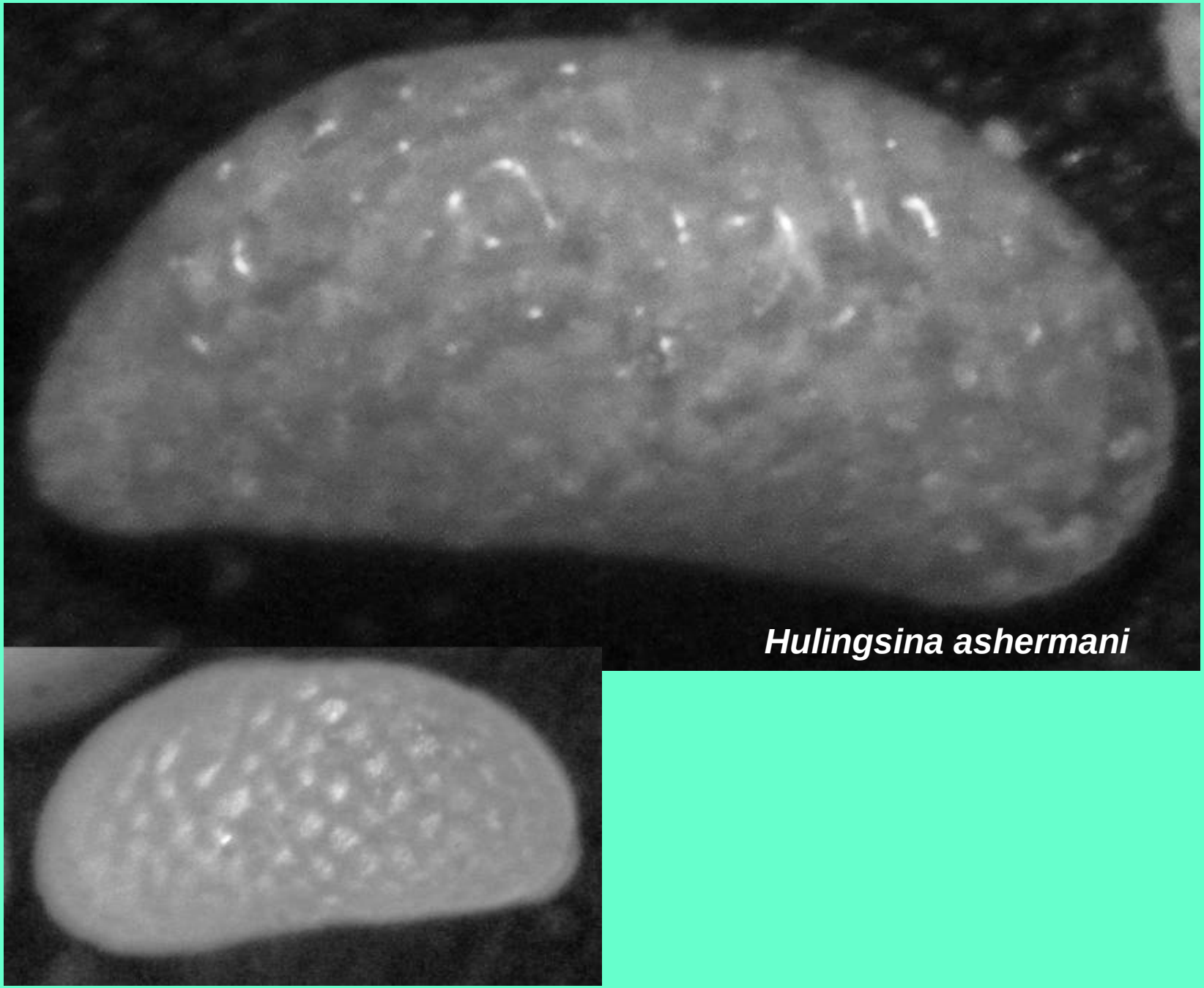
Protocytheretta karlana



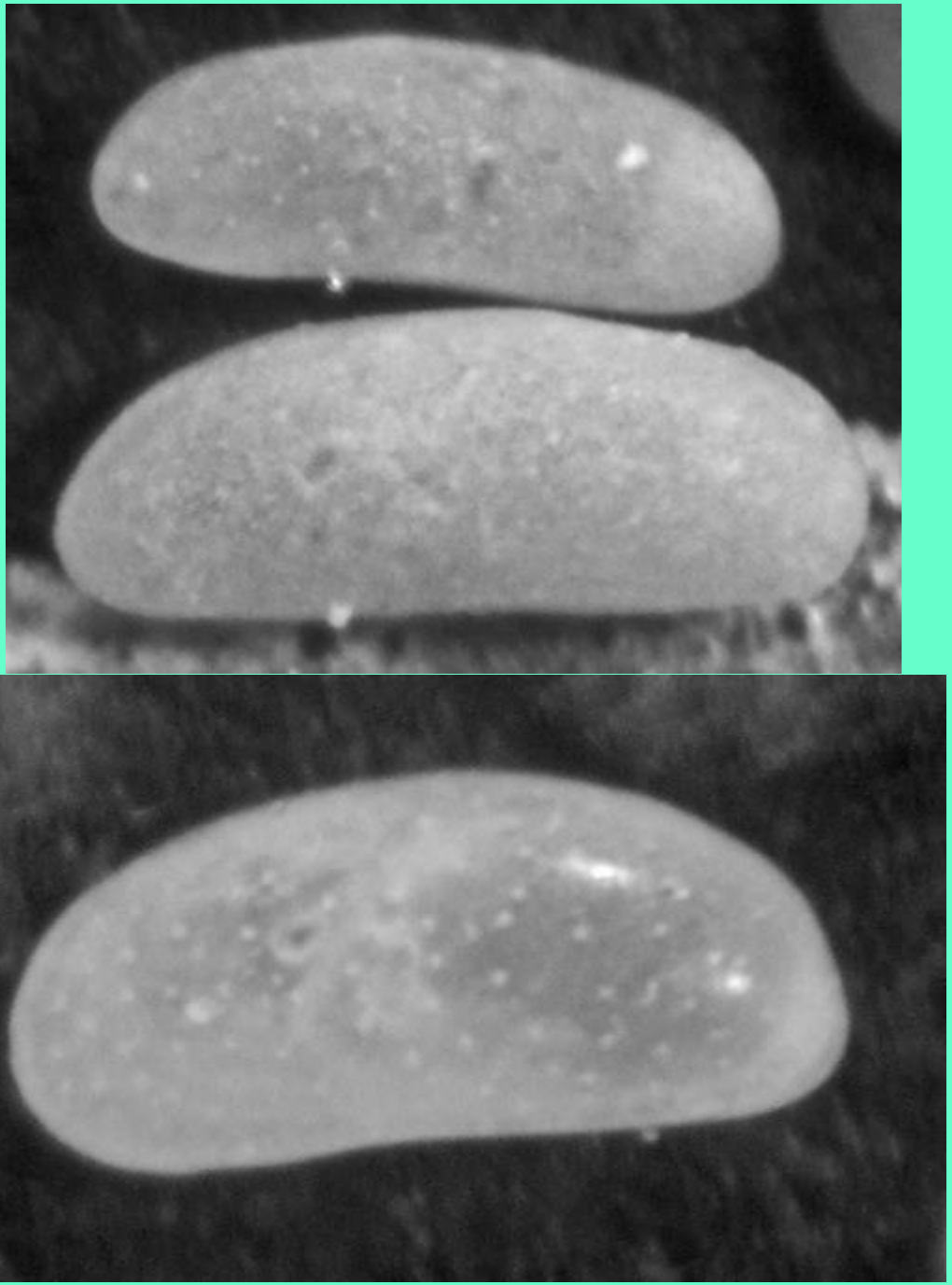


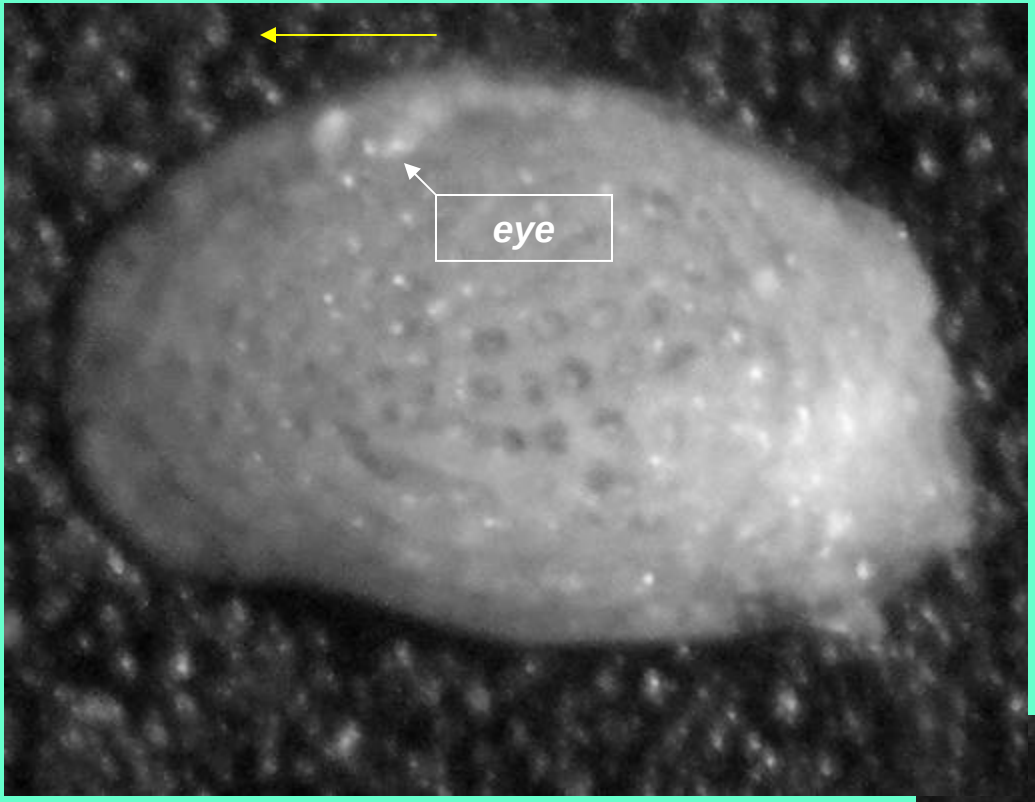
Protocytheretta sahnii

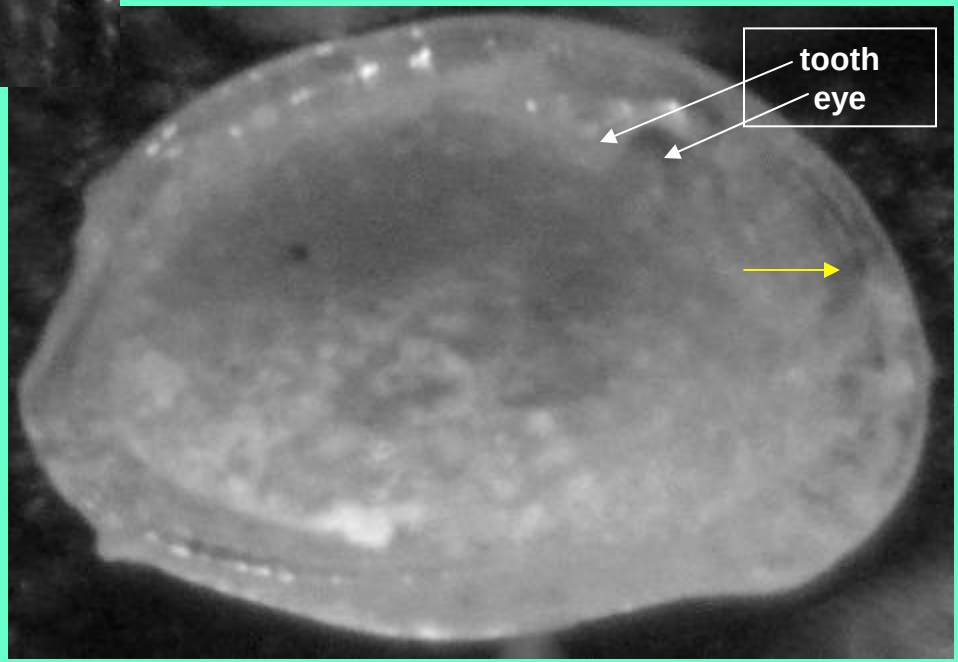



Hulingsina ashermani

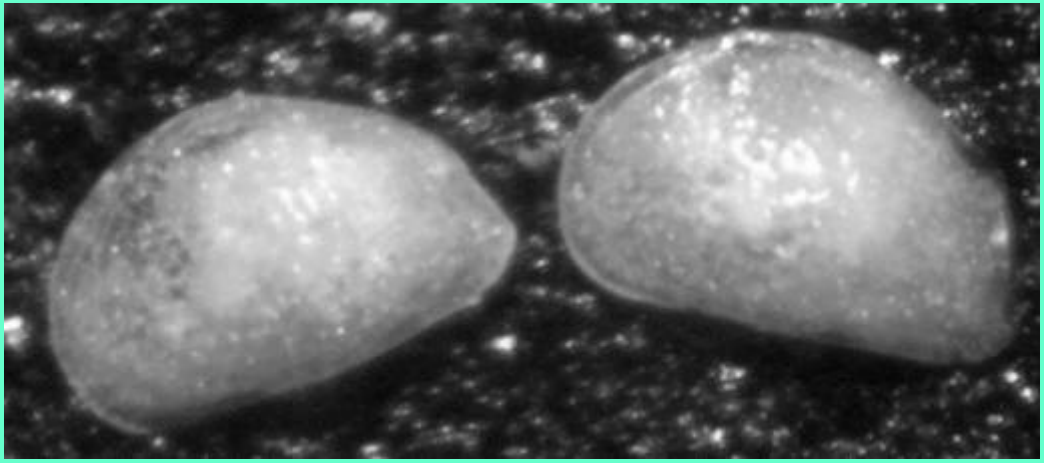
Hulingsina spp.



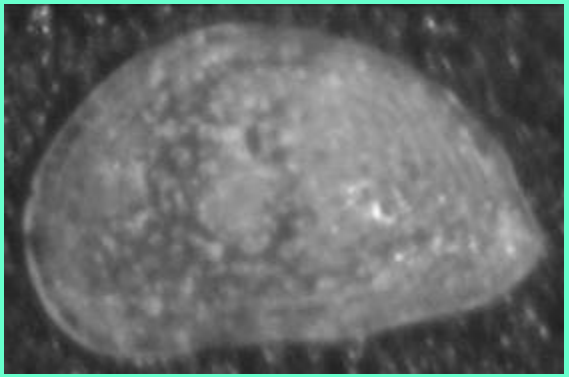


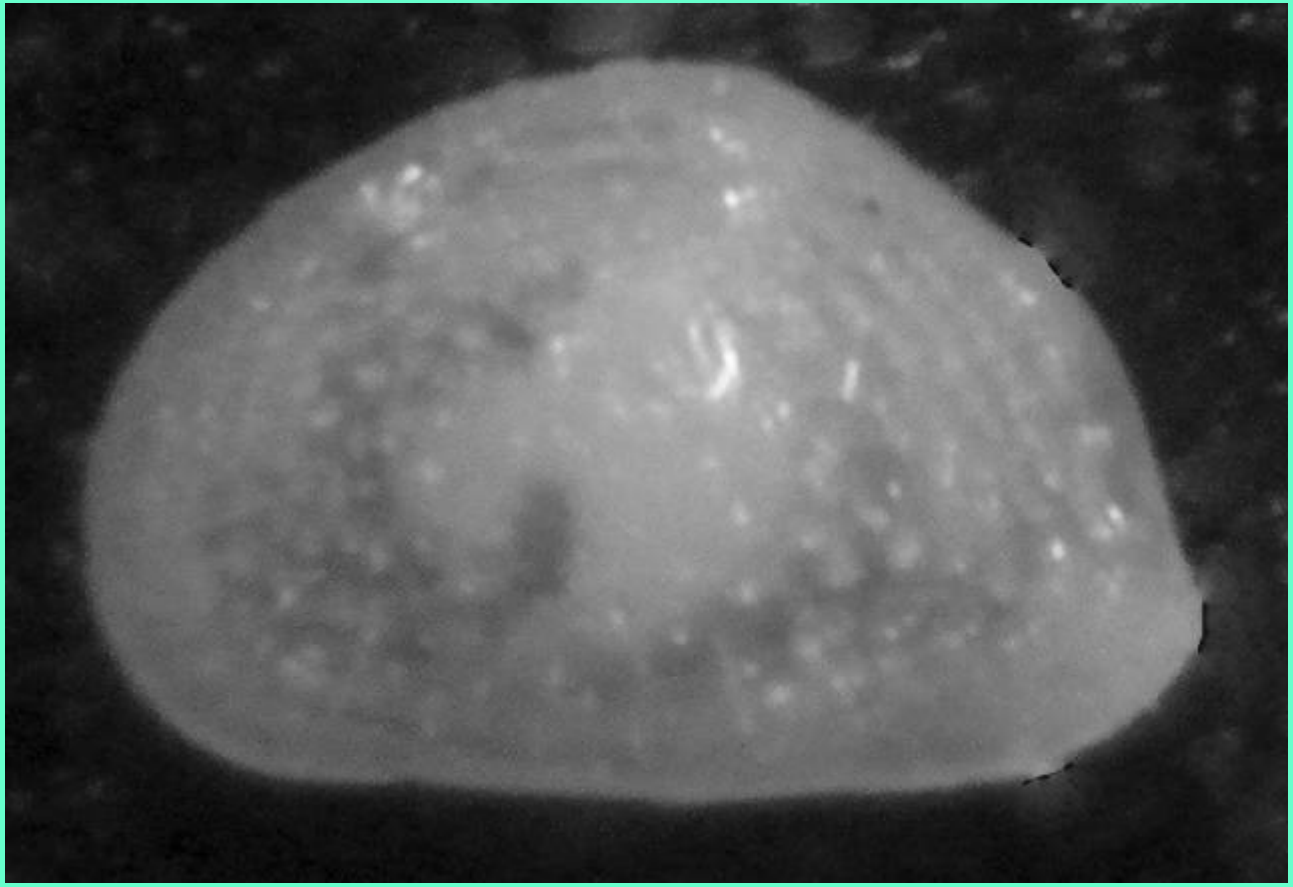


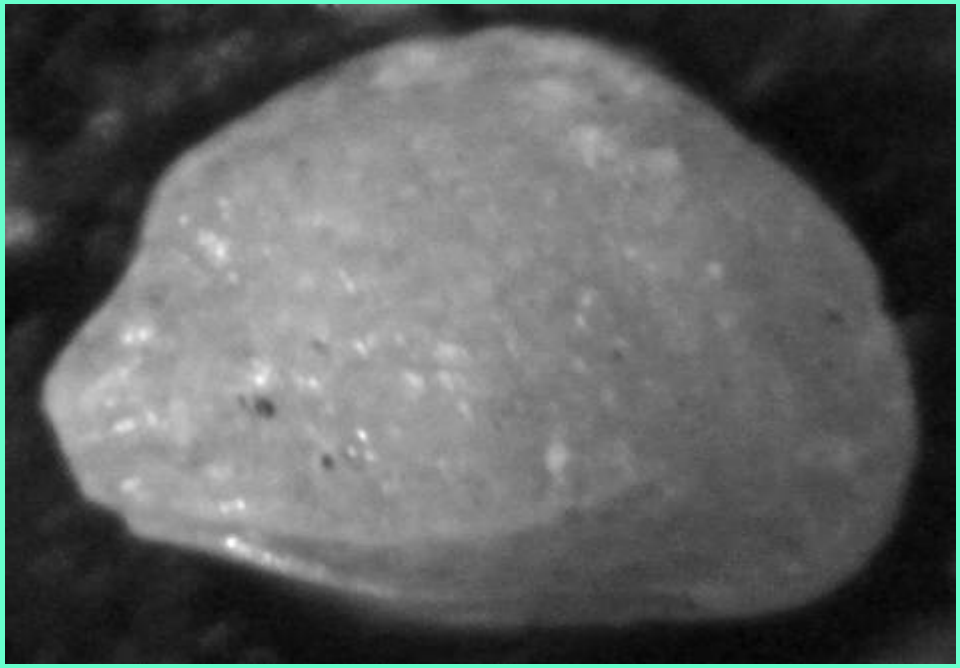
Cytheropteron wardensis

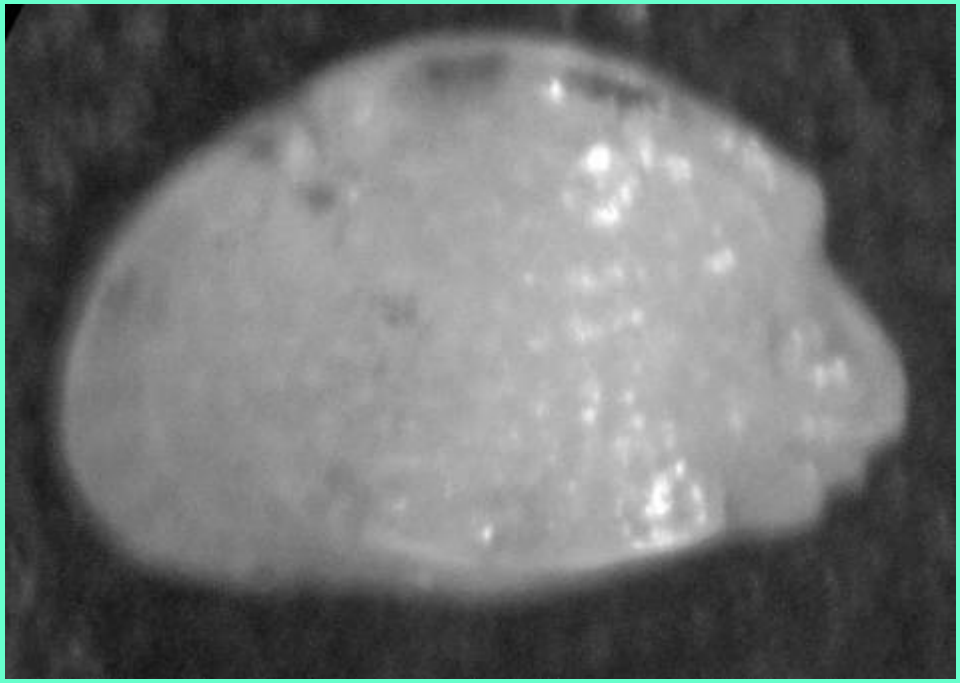


Aurila amygdala

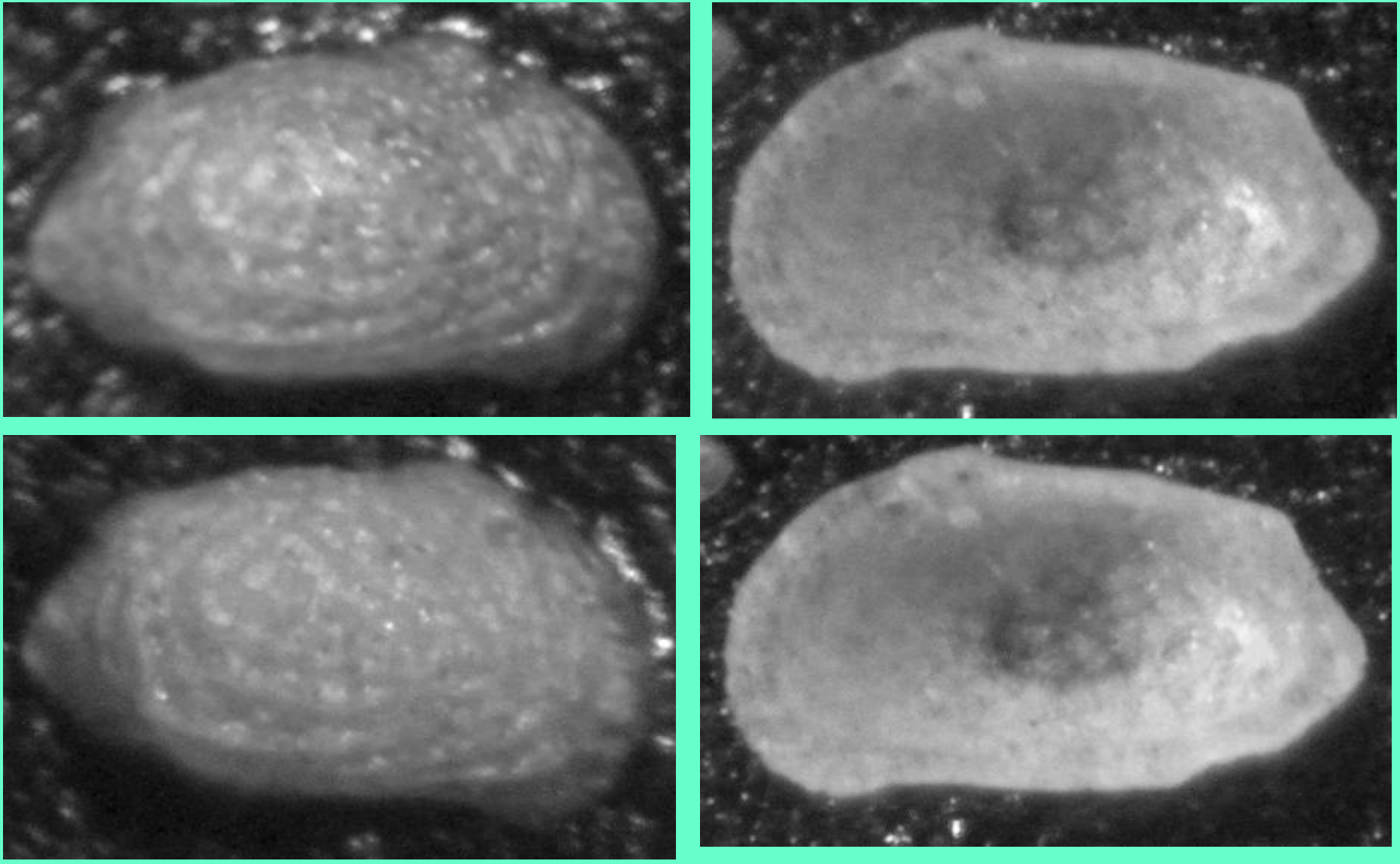




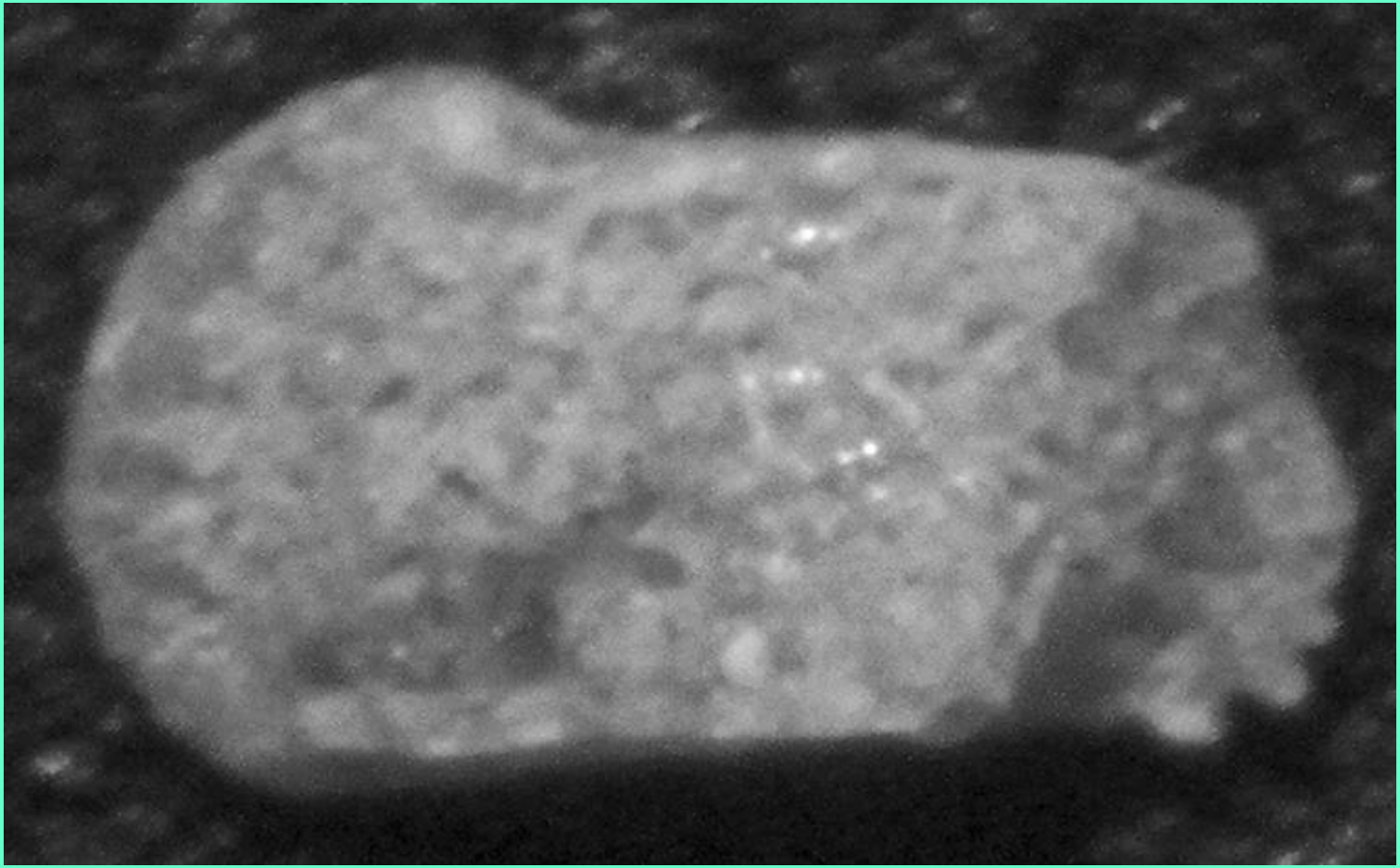




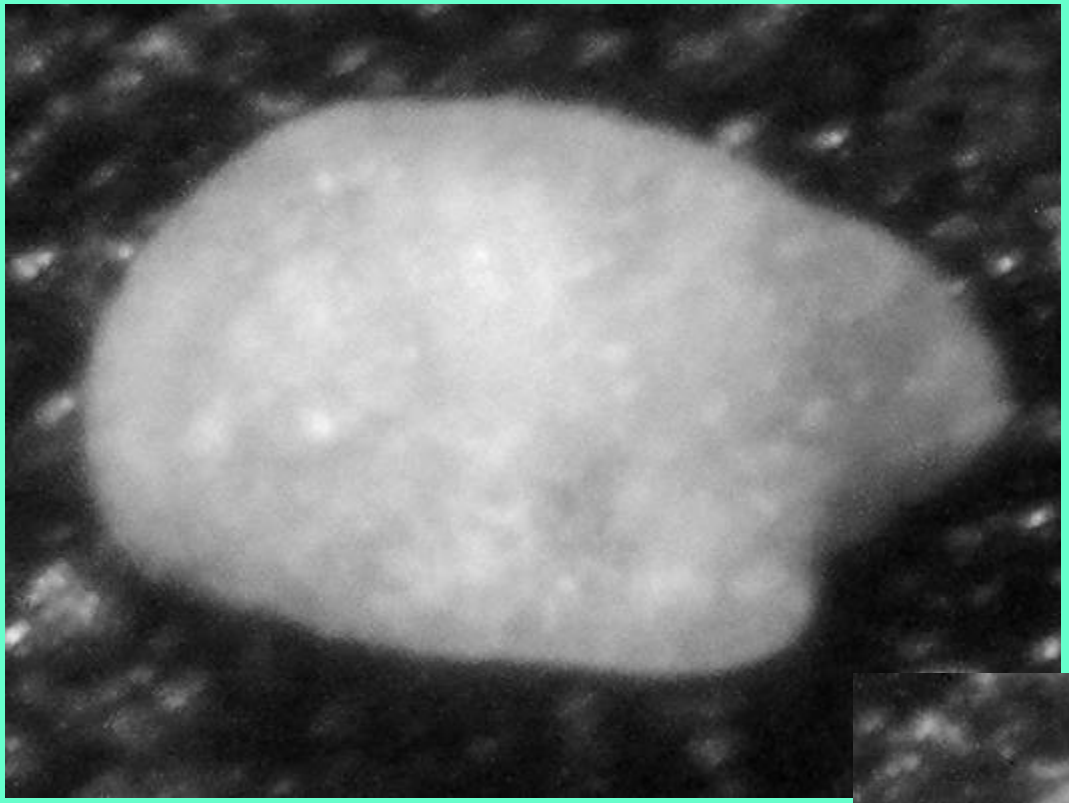
Cytheropteron wardensis

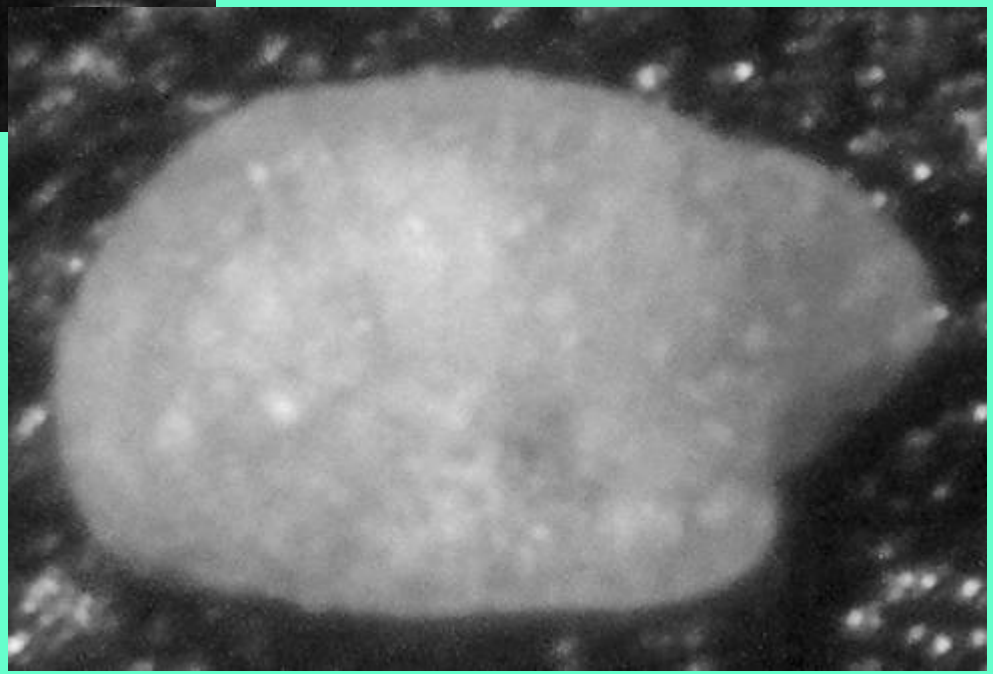


Muellerina* cf *ohmerti

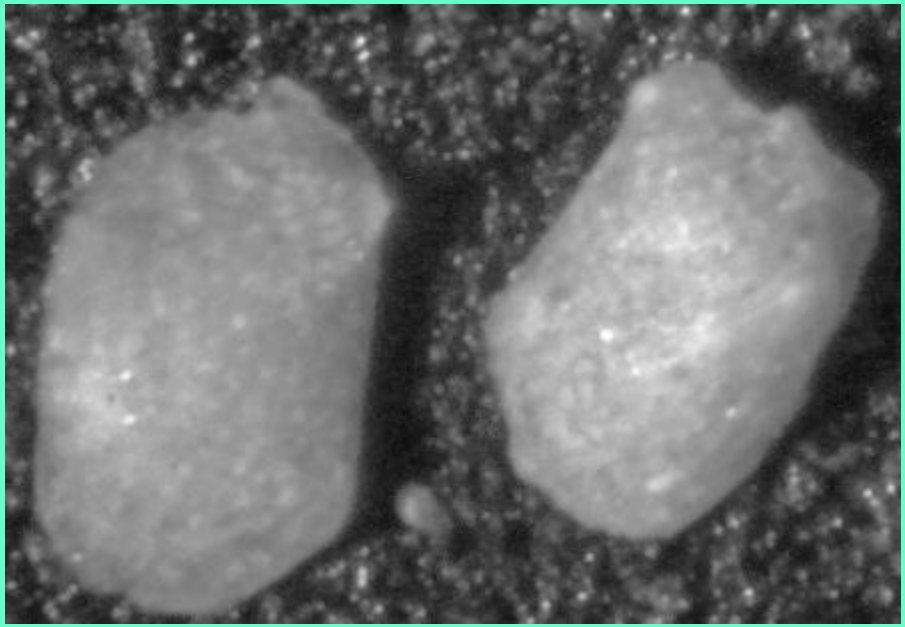


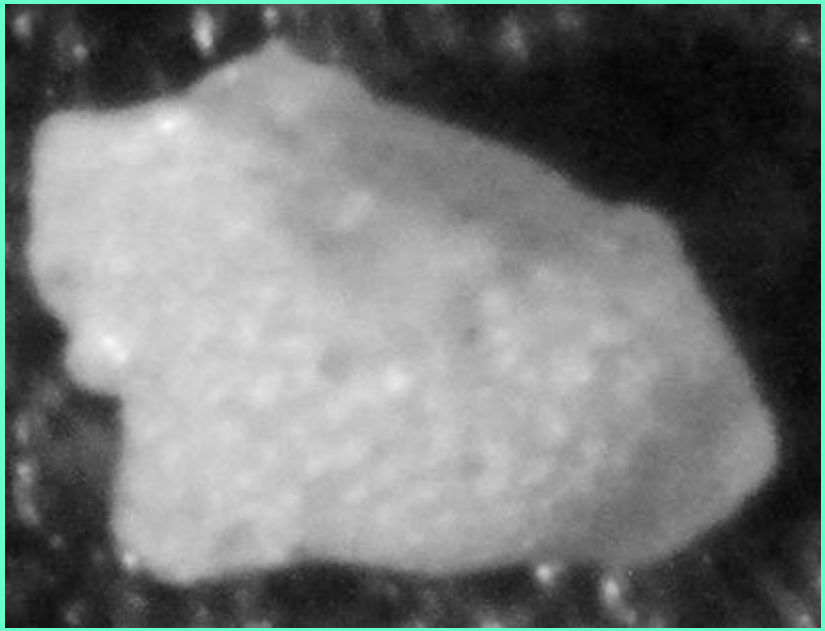
Murrayina howei



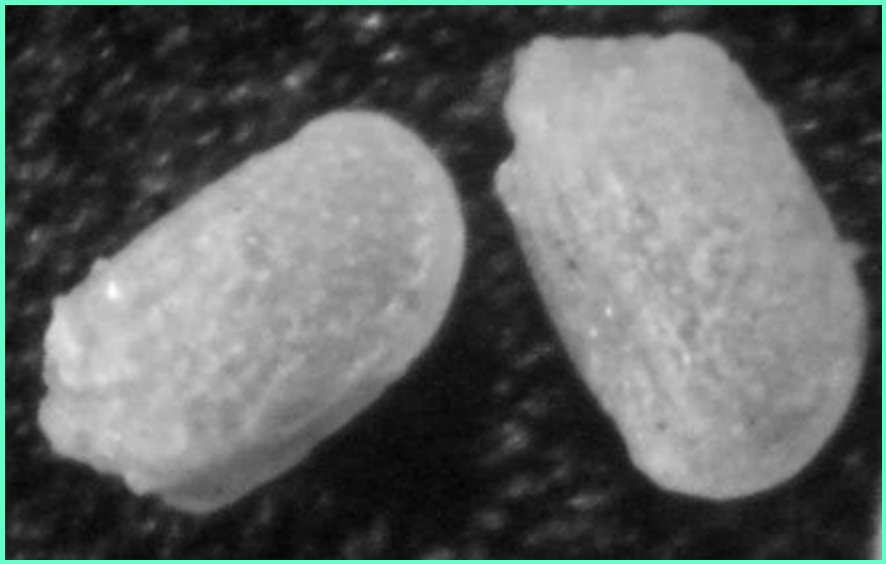


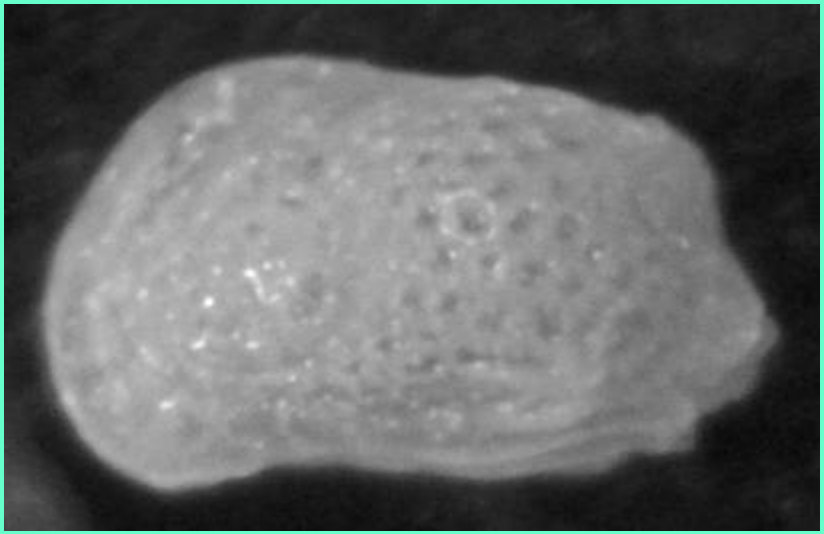
Cytheropteron talquinensis





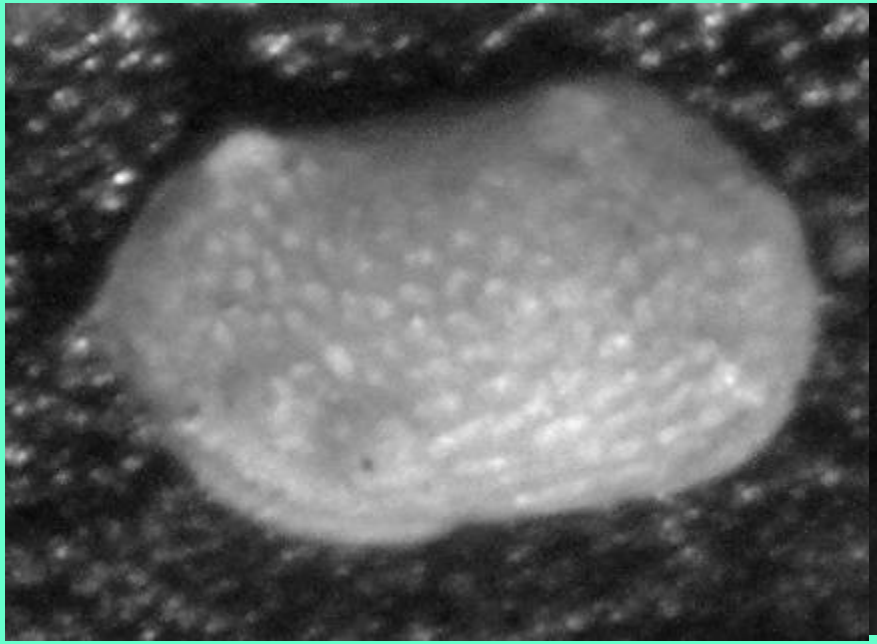
Loxocorniculum* cf *tricornatum

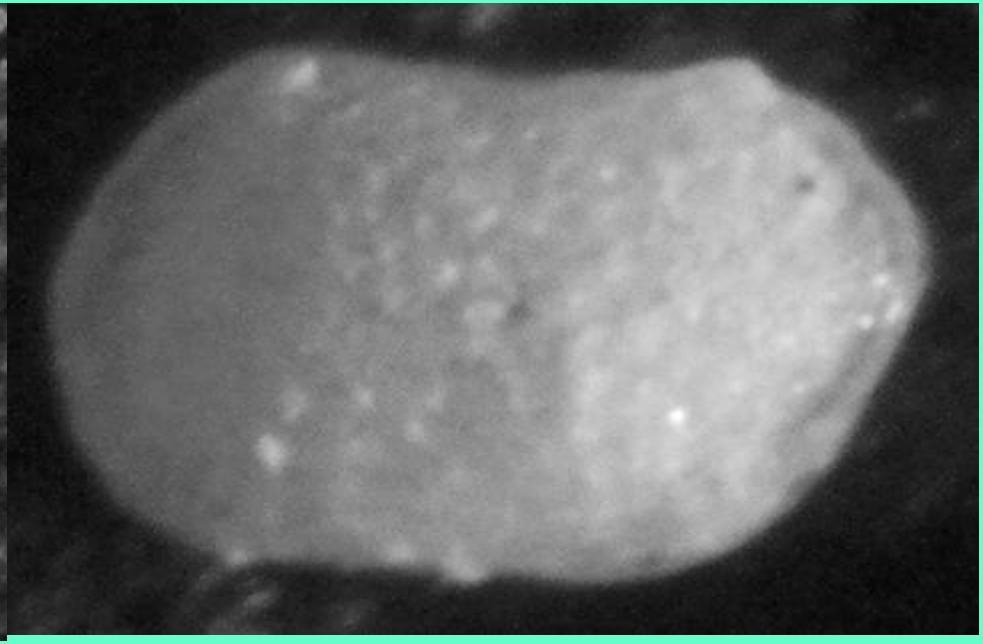


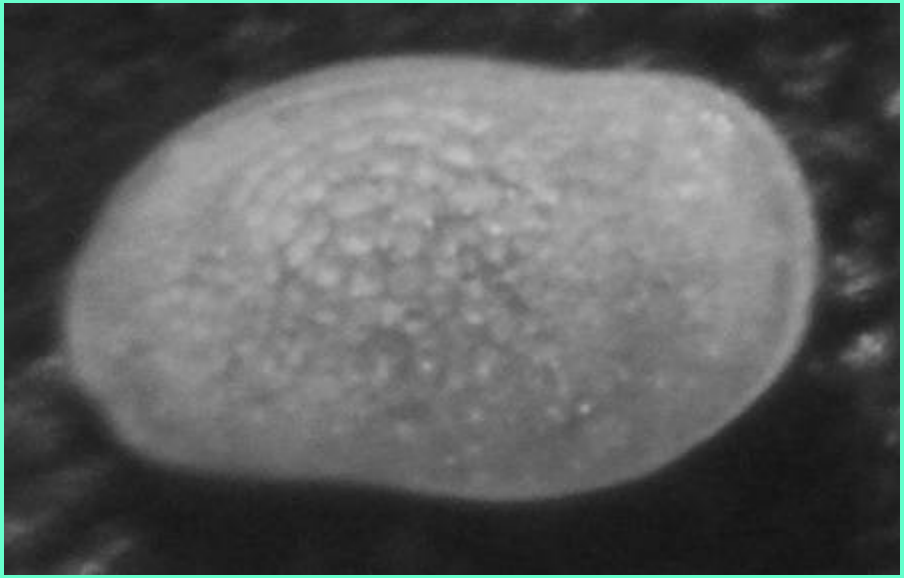


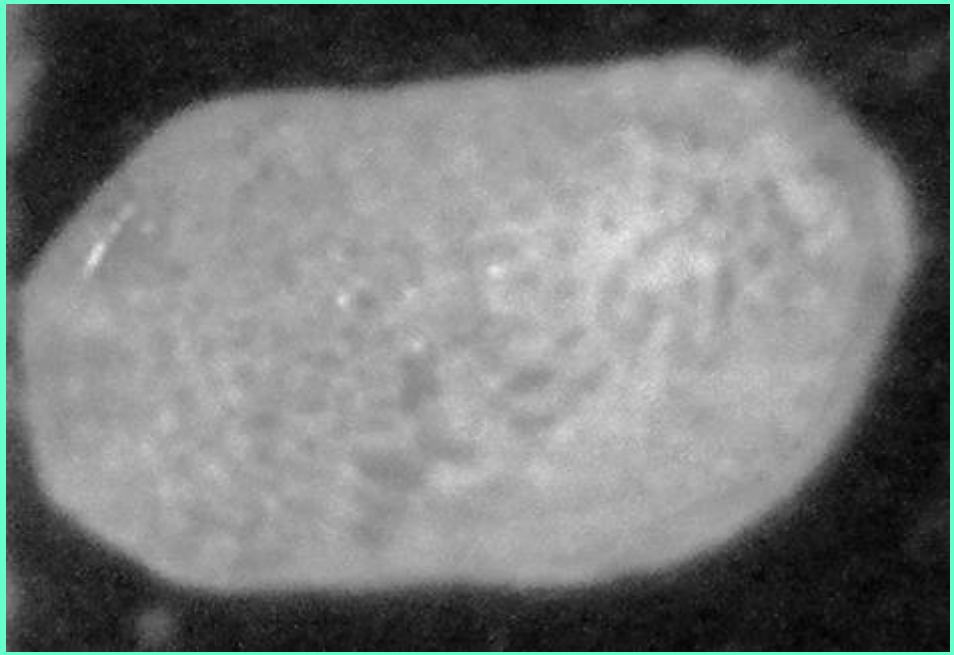
Muellerina sp.

Loxoconcha alumbluffensis

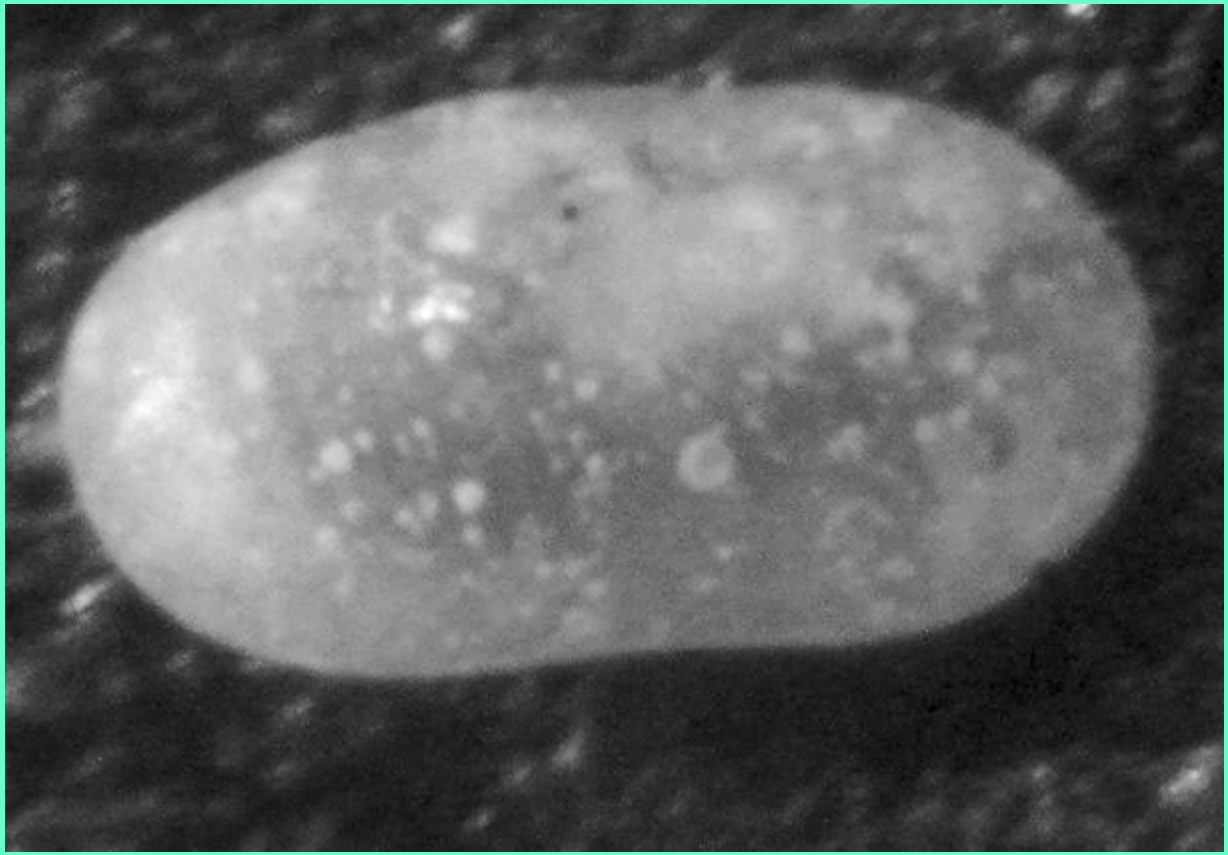




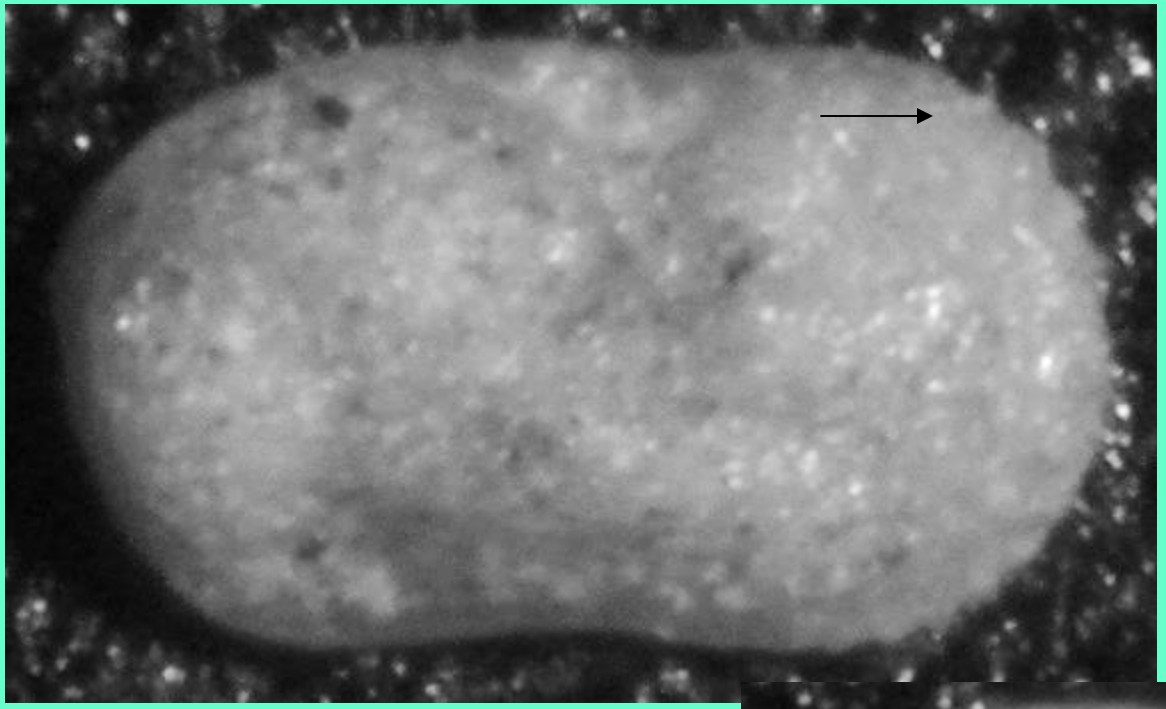




Loxoconcha spp.

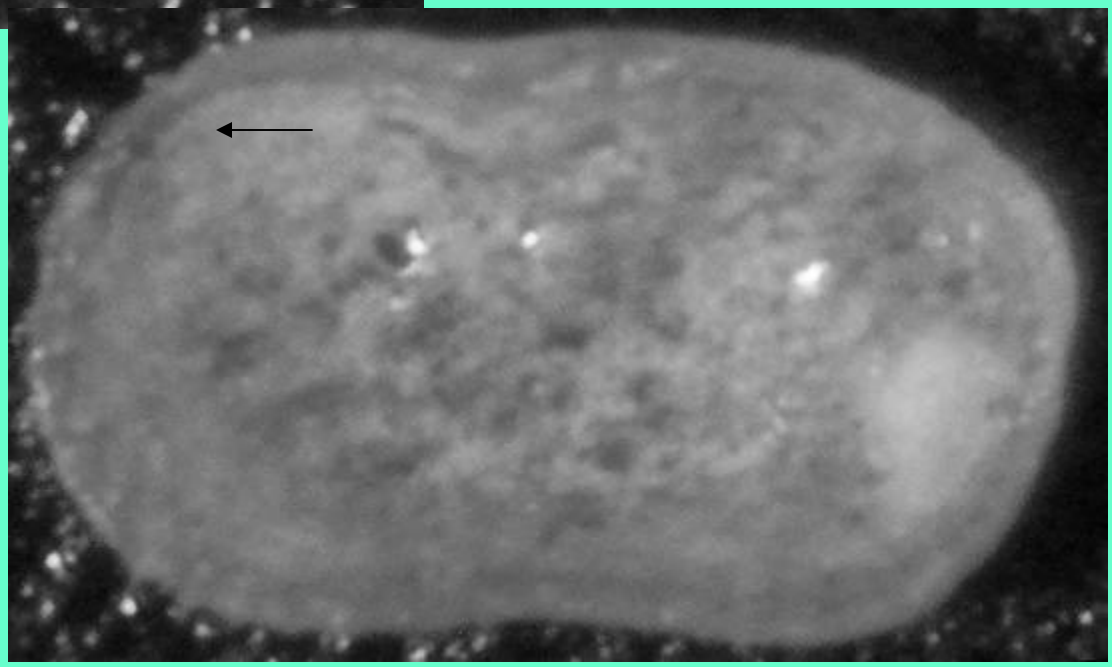


Cytherella chipolensis

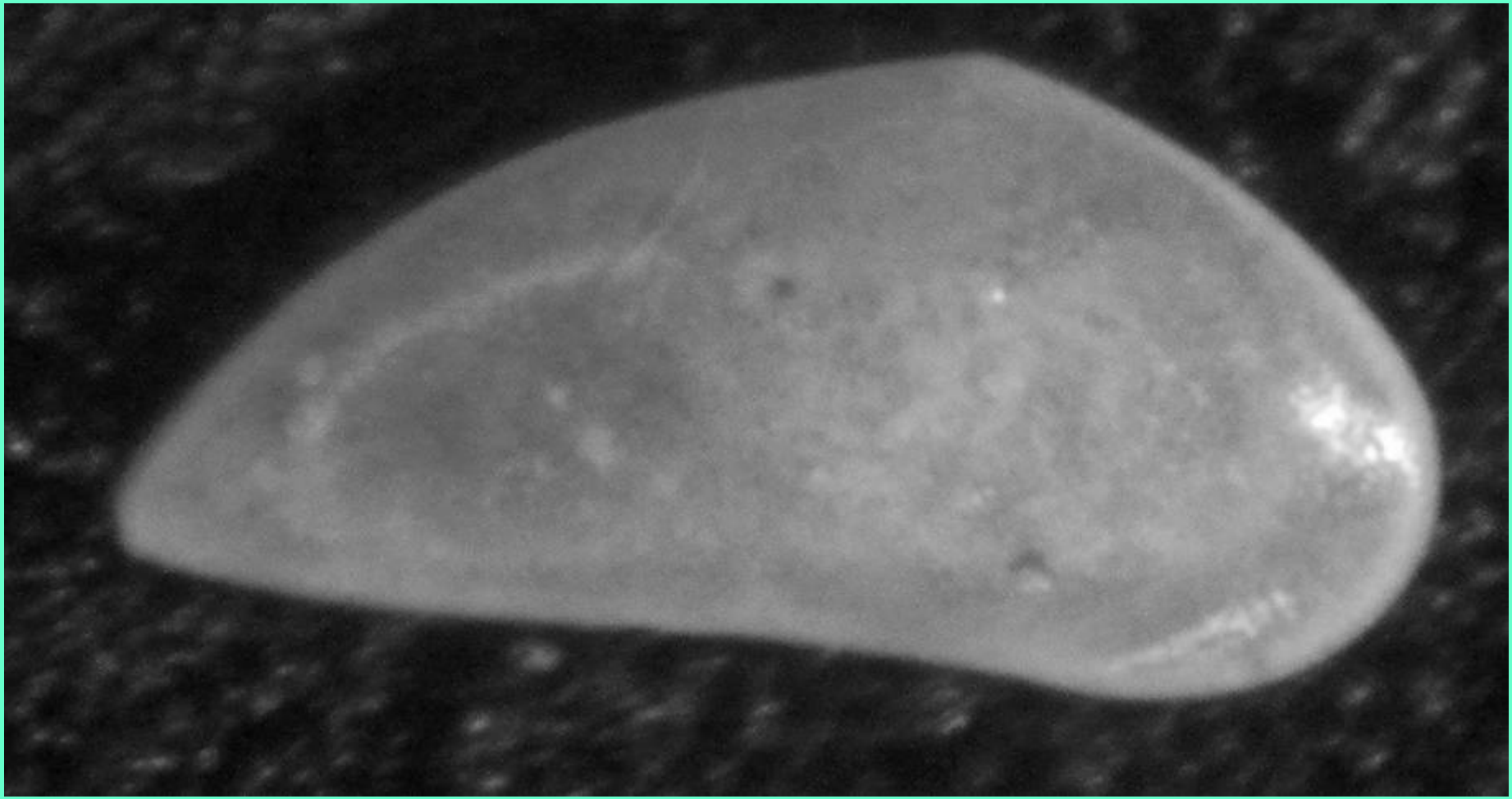


Cytherelloidea vernoni

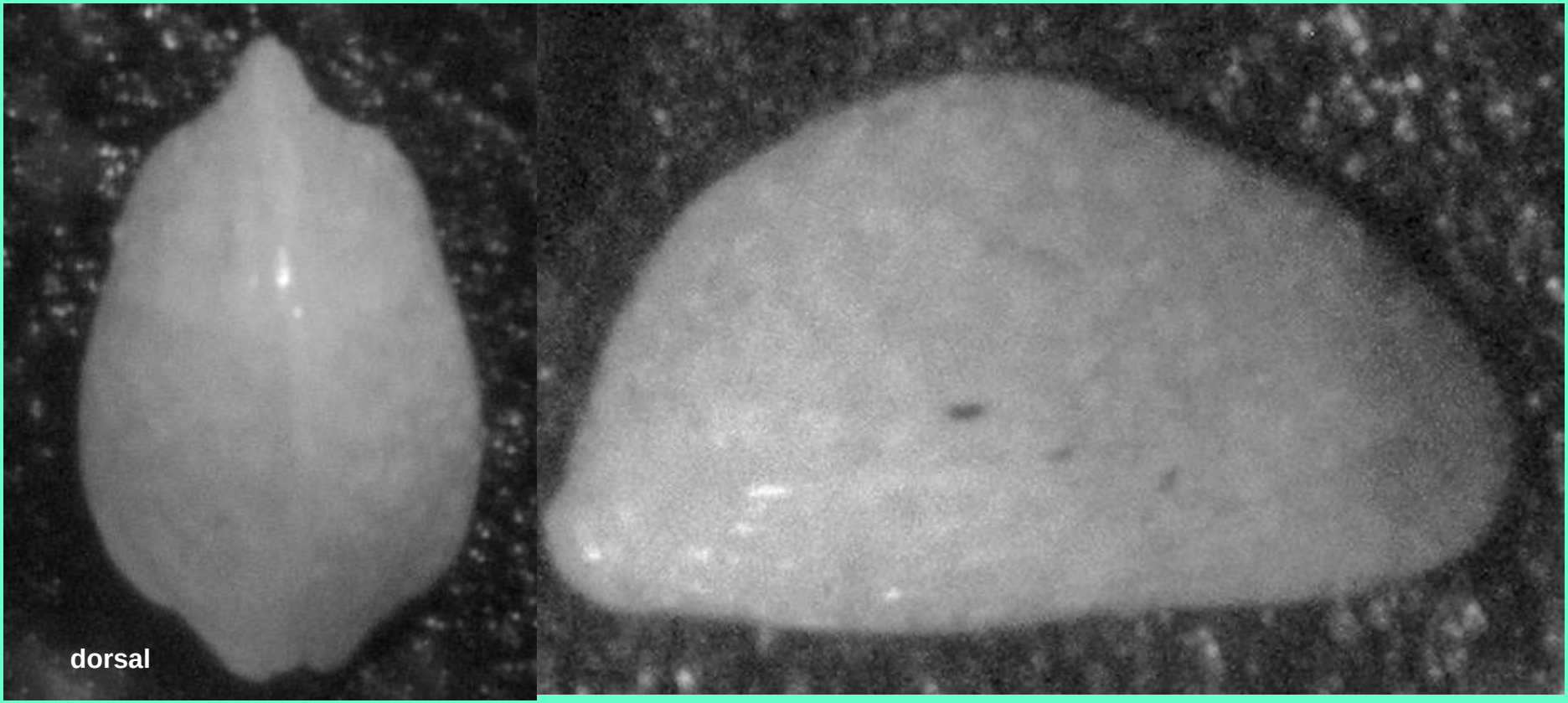
internal



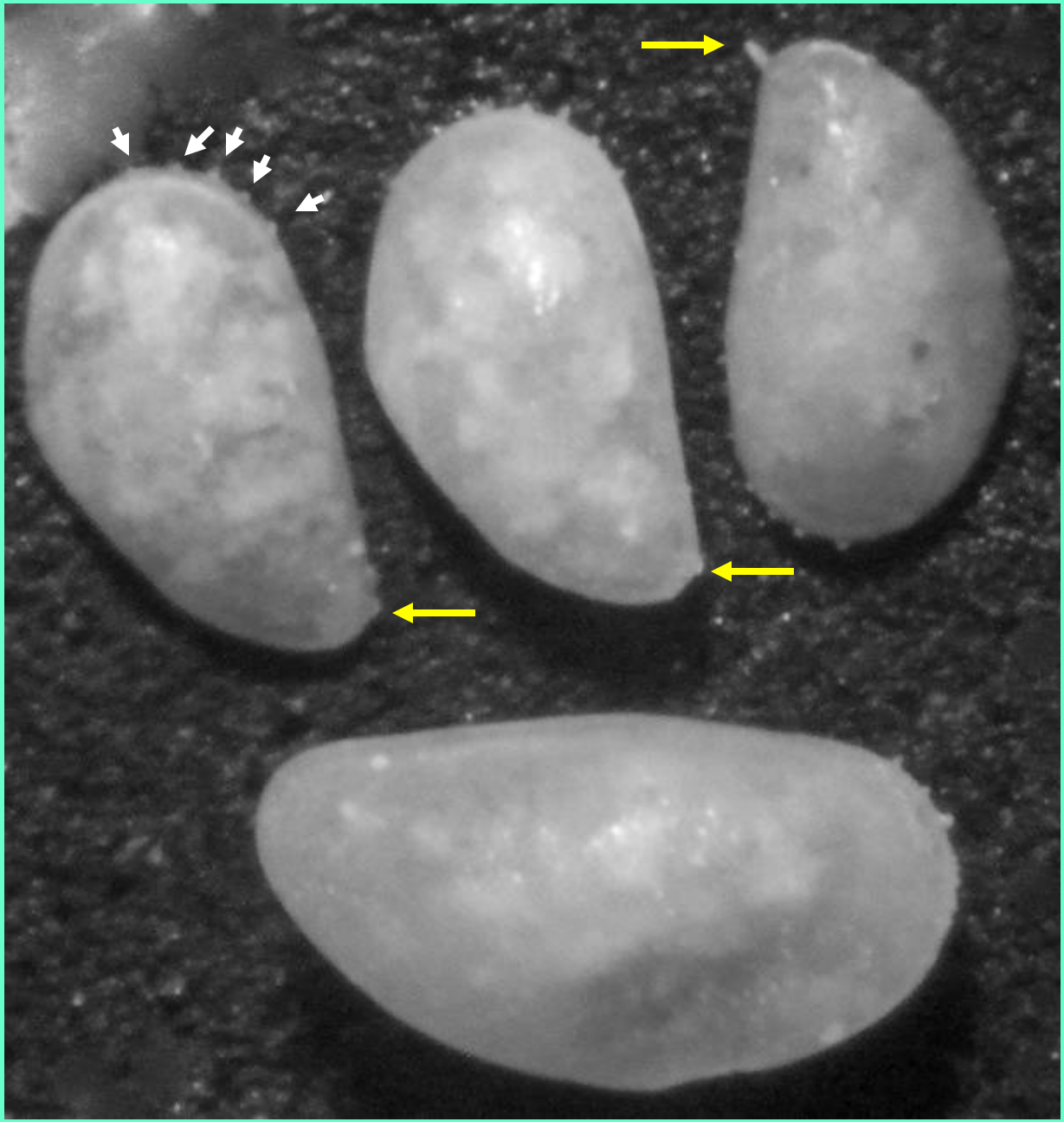
external



Paracypris choctawhatcheensis

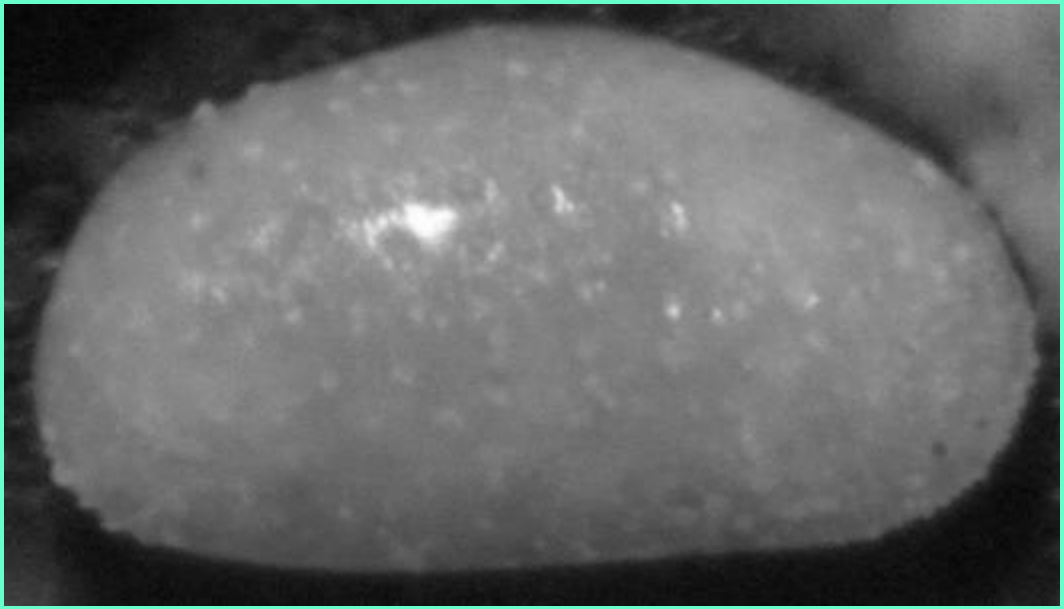


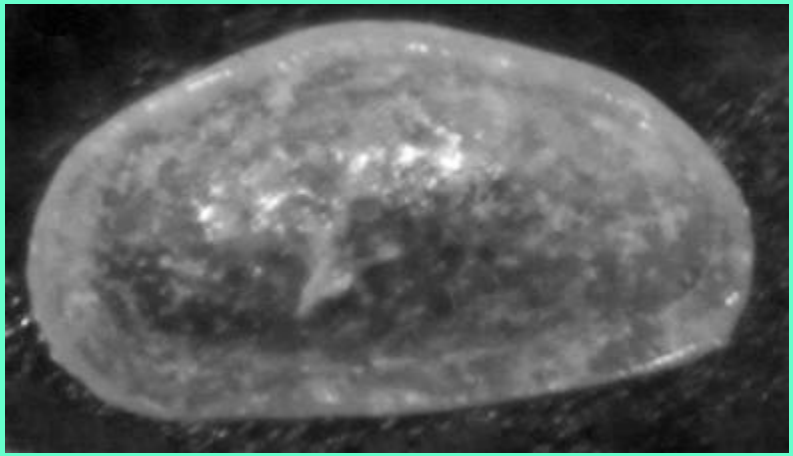
Xestoleberis choctawhatcheensis



Cytheridea waltonensis

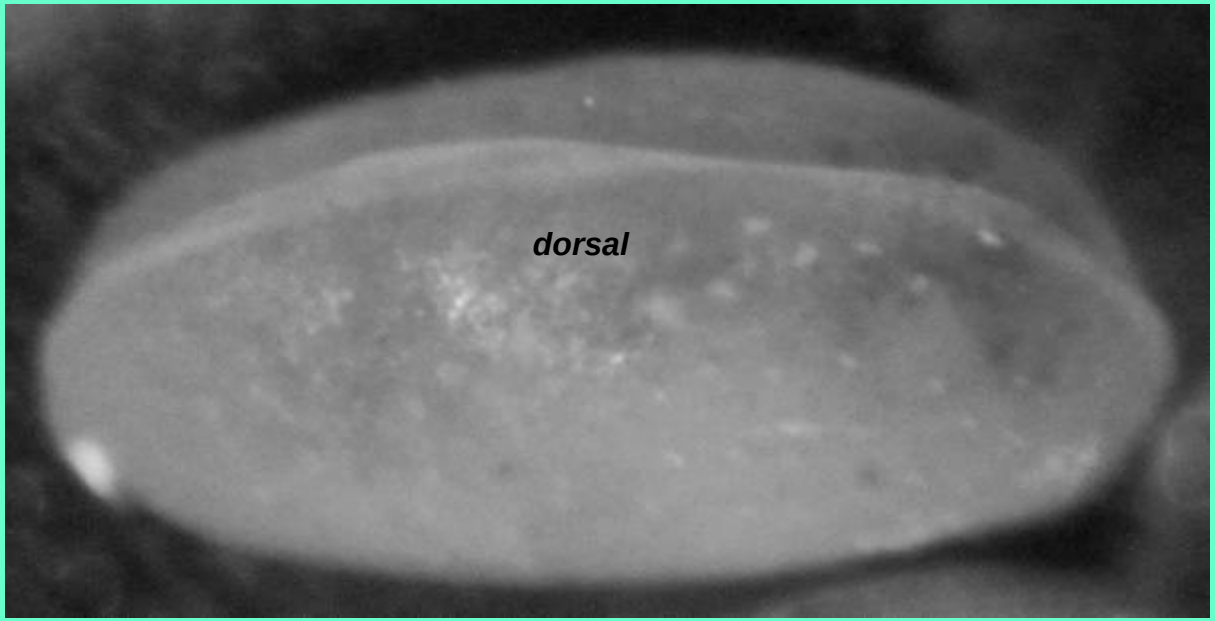
4-5 anterior spines & 1 posterior spine

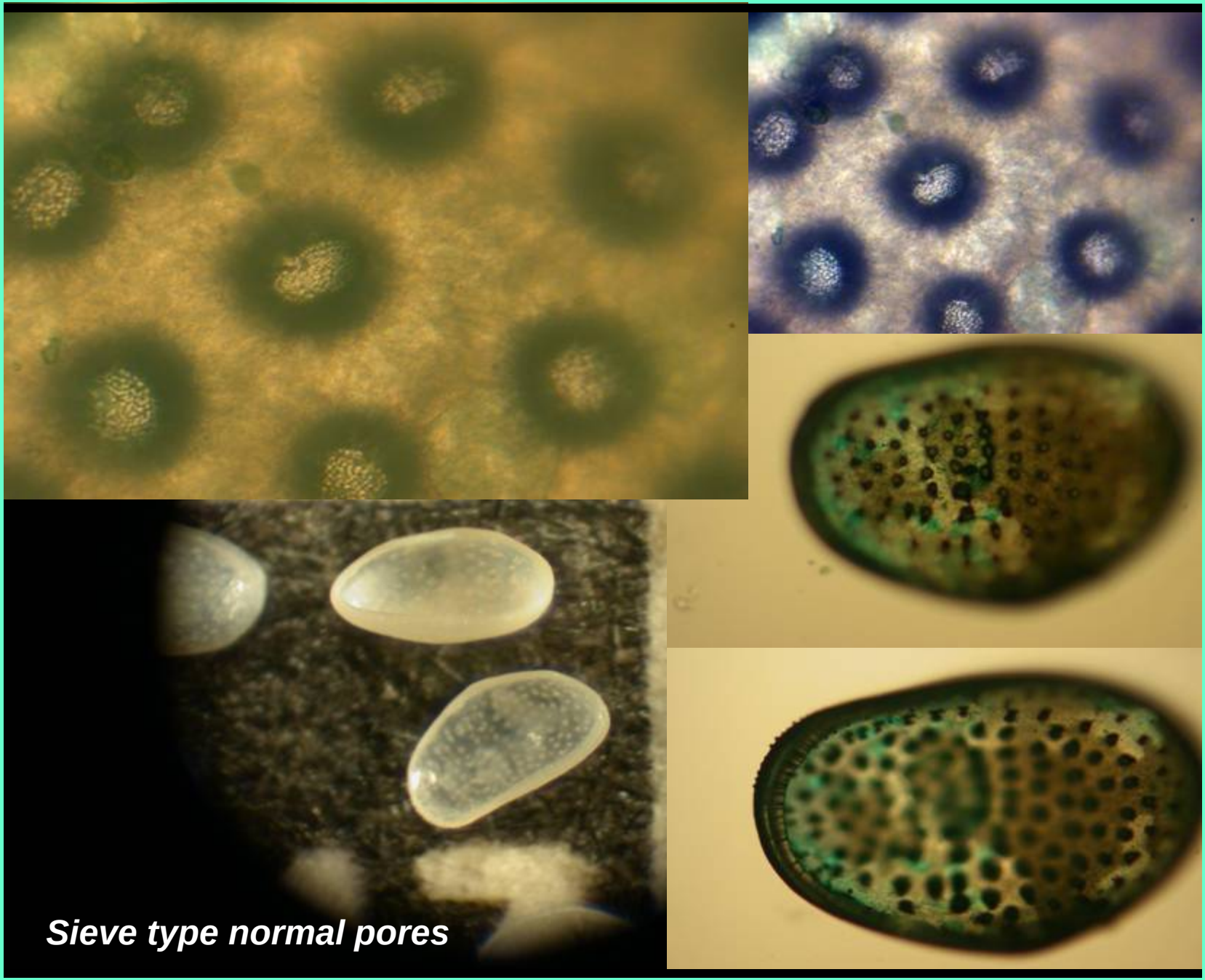


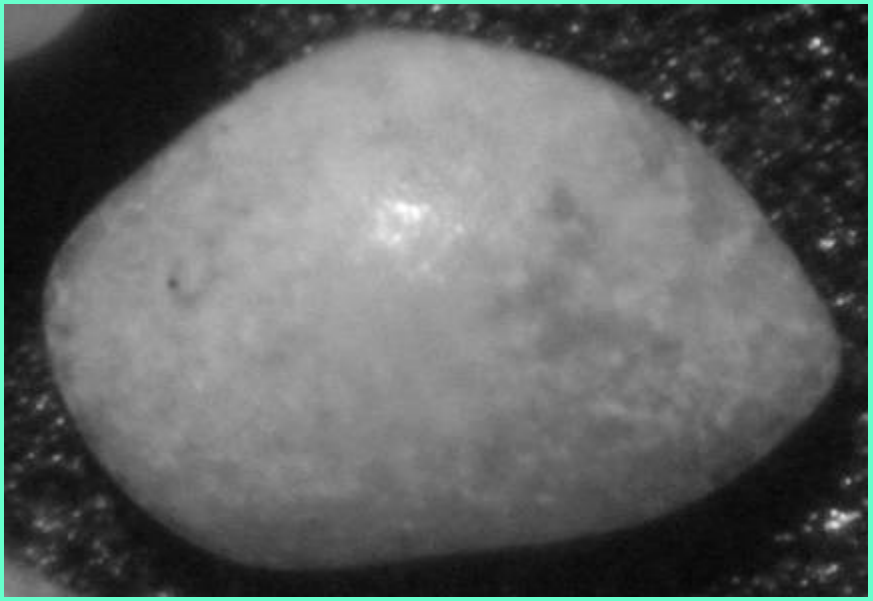


Internal, rt. valve

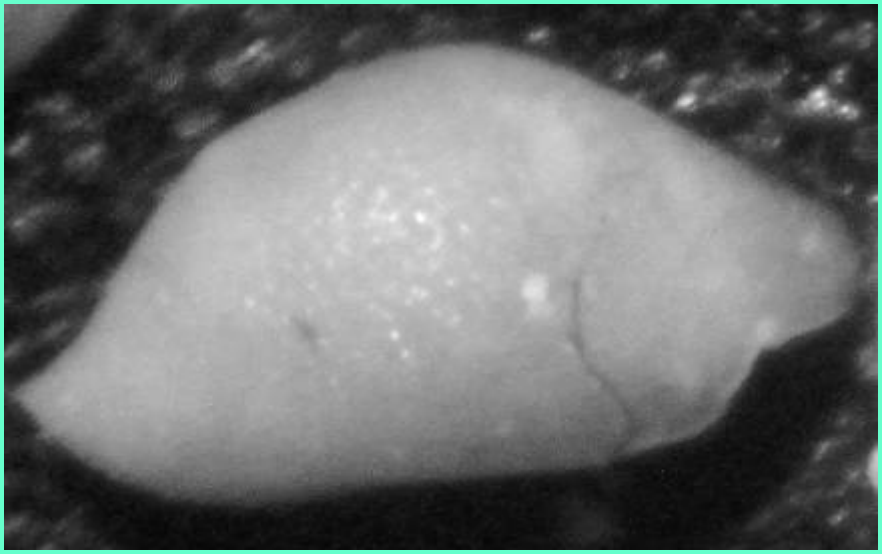
Peratocytheridea 'bassleri'



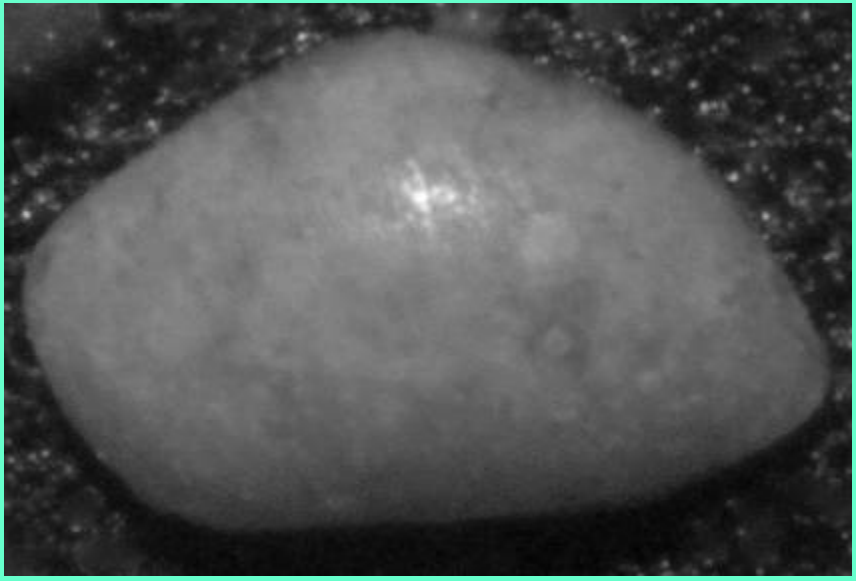

Sieve type normal pores

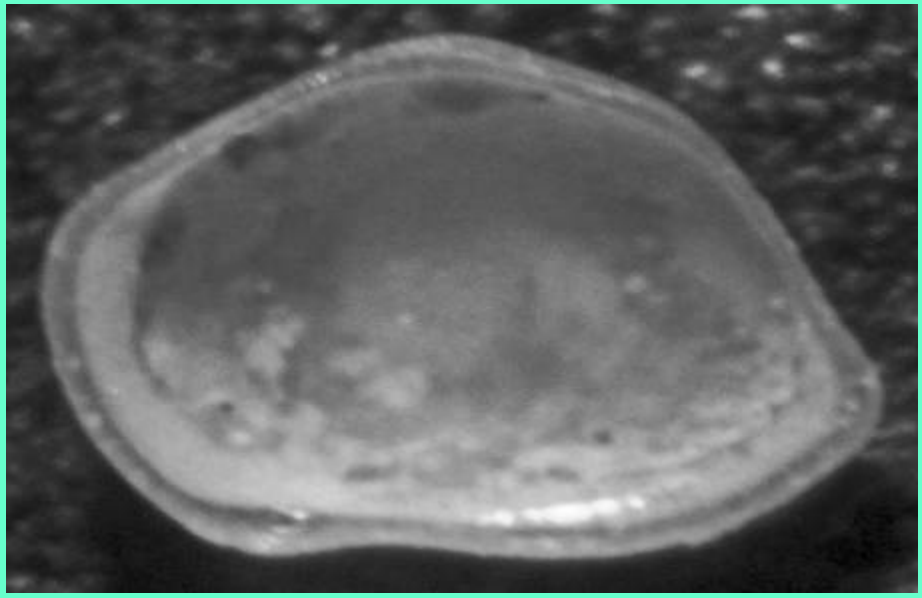


Bairdoppilata triangularis



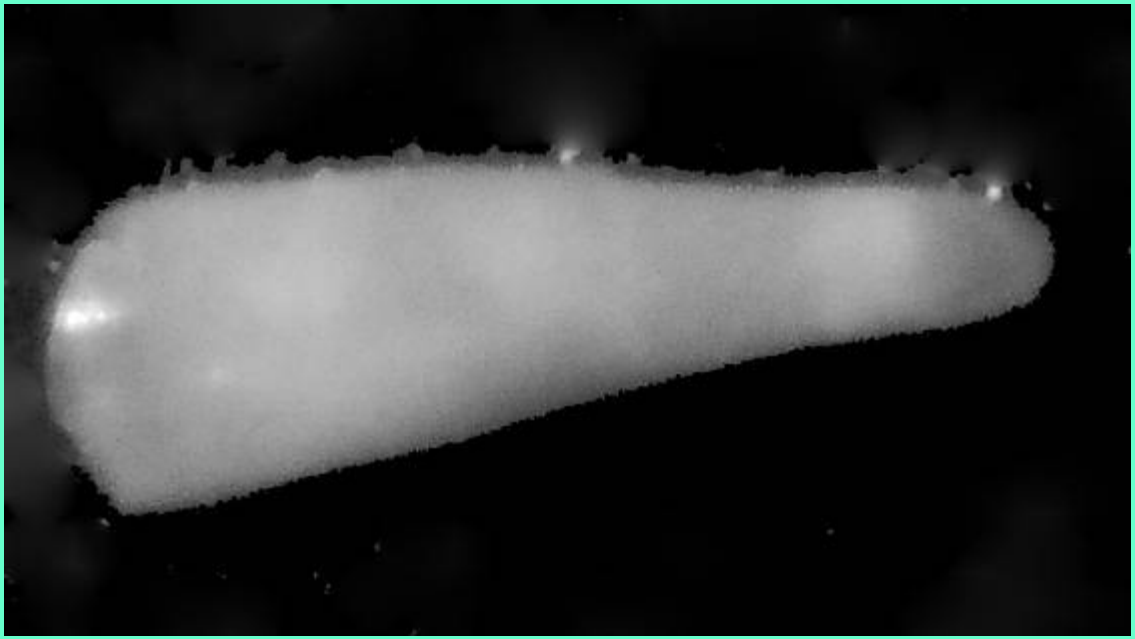
Bairdoppilata willisensis





Early Miocene (Chipola Fm.) Harley Creek site,
'Pteropod': Cavoliniidae: cf *Creseis sp.*

This is an aragonitic gastropod shell



Specimen - 550 microns long

CHIPOLA Fm. General Observations

- Average temperature was more like Cancun, Mexico
- Shelf break was near (High #'s of Planktonic Forams) 18 million years ago
- Inner Carbonate Shelf environment – no glauconite or phosphate grains
- Very small siliclastic (quartz / mica) component – little terrigenous input
- Very shallow sunlit water but near wave base (Codiacean green calcareous algae – *Halimeda*) - fine clastics winnowed
- At Farley Creek the environment was a back reef 'grass' bed type
- Forams are a major sediment component – especially *Amphistegina, Schlumbergerina* and the *Cyclobiculina (='Sorites'), Laevipeneroplis* complex…mostly zooxanthellate! Miliolids also dominant.
- Very few reef building corals; solitary corals rare.
- As Cushman said in FGS B4 & B9 many of the forams are still extant today in south Florida.
- Planktonic Foram biostratigraphic index fossils constrain age to Burdigalian stage (late early Miocene): *Catapsydrax & Globigerenella obesa* overlap
- Deposition in a Transgressive marine setting
- 46 species of Forams, 22 species of Ostracods (68 total) in 6,000 picked microfossils

Specimens at FMNH at UF

OSTRACODA: (v=valves, c=carapaces)

1 *Cytherella chipolensis Puri,1953 (3c, 2v)*
2 *Pterygocythereis cornuta americana (Ulrich & Bassler), 1904 (5c,1v)*
3 *Trachyleberis dorsicornis (Ulrich & Bassler), 1904 (4v)*
4 *Cytheropteron talquinensis Puri,1953 (1c)*
5 *Cytherelloidea vernoni Sexton,1951 (1v)*
6 *Cytheropteron wardensis Puri,1953 (1c,2v)*
7 *Actinocythereis exanthemata (Ulrich & Bassler), 1904 (11c,2v)*
8 *Cytheridea waltonensis (Stephenson), 1938 (3v)*
9 *Hulingsina ashermani (Ulrich & Bassler), 1904 (7v)*
#10 *Bairdoppilata willisensis Puri, 1953 (3c,3v)*
#11 *Muellerina cf ohmerti Hazel, 1983 (1v)*
#12 *Caudites chipolensis Puri, 1953 (1c)*
#13 *Bairdoppilata triangulata Edwards, 1944 (3v)*
#14 *Xestoleberis choctawhatcheensis Puri, 1953 (1c)*
#15 *Aurila amygdala (Stephenson), 1944 (2c, 3v)*

Codiacean Algae – Green Calcareous Algae - CHLOROPHYTA

Halimeda sp. Important depth indicator, along with zooxanthellate larger forams

Gastrpoda: Pteropoda

? Creseis sp.

FORAMINIFERA:

1 *Fursenkoina pontoni (Cushman, 1932)*
2 *Spiroloculina spinata cf var. chipolensis (Cushman,1932) 7 tests*
3 *Cyclorbiculina compressa (d'Orbigny, 1839) 6 juvenile tests*
4 *Dyocibicides biserialis Cushman & Valentine, 1930*
5 *Cyclorbiculina compressa (d'Orbigny,1839) 7 adult fragments*
6 *Cyclorbiculina compressa (d'Orbigny,1839) 9 adult fragments*
7 *Rosalina subaraucana (Cushman, 1922) 20 tests*
8 *Discorbis rosea (d'Orbigny, 1826) 11 tests*
9 *Bigenerina floridana Cushman & Ponton 1932 1 test*
#10 *Clavulina tricarinata (d'Orbigny) 1839 1 test*
#11 *Elphidium chipolensis Cushman, 1920) 17 tests*
#12 *Nonionoides grateloupi (d'Orbigny, 1826) 12 tests*
#13 *Amphistegina chipolensis Cushman & Ponton 1932* 25 tests
#14 *Textularia gramen (d'Orbigny, 1846) 13 tests*
#15 *Triloculina fitterei Acosta, 1940*
#16 *Globulina gibba d'Orbigny, 1826*
#17 *Quinqueloculina crassa d'Orbigny 5 tests*
#18 *Pyrgo denticulata (HB Brady, 1884) 2 tests*
#19 *Laevipeneroplis proteus (d'Orbigny, 1839) 7 tests*
#20 *Archais cf angulatus (Fichtel & Moll, 1803) 5 tests*
#21 *Archais cf angulatus (Fichtel & Moll, 1803) 1 test*
#22 *Elphidium fimbriatulum (Cushman, 1918) 11 tests*
#23 *Articulina advena (Cushman, 1922) 2 tests*
#24 *Hauerina bradyi Cushman, 1917; 9 tests*
#25 *Glabratellina albida (McCulloch, 1977) 6 tests*