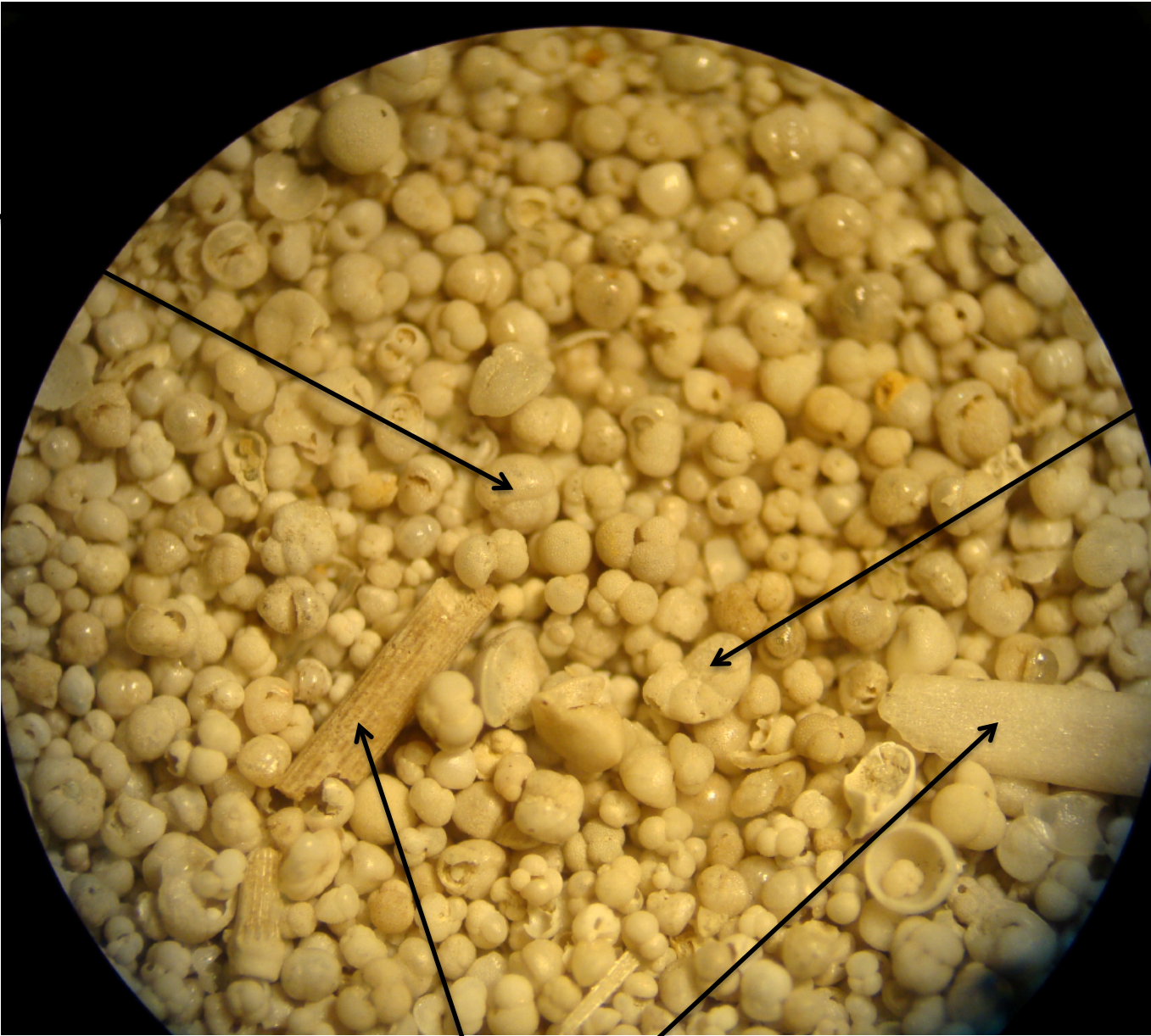
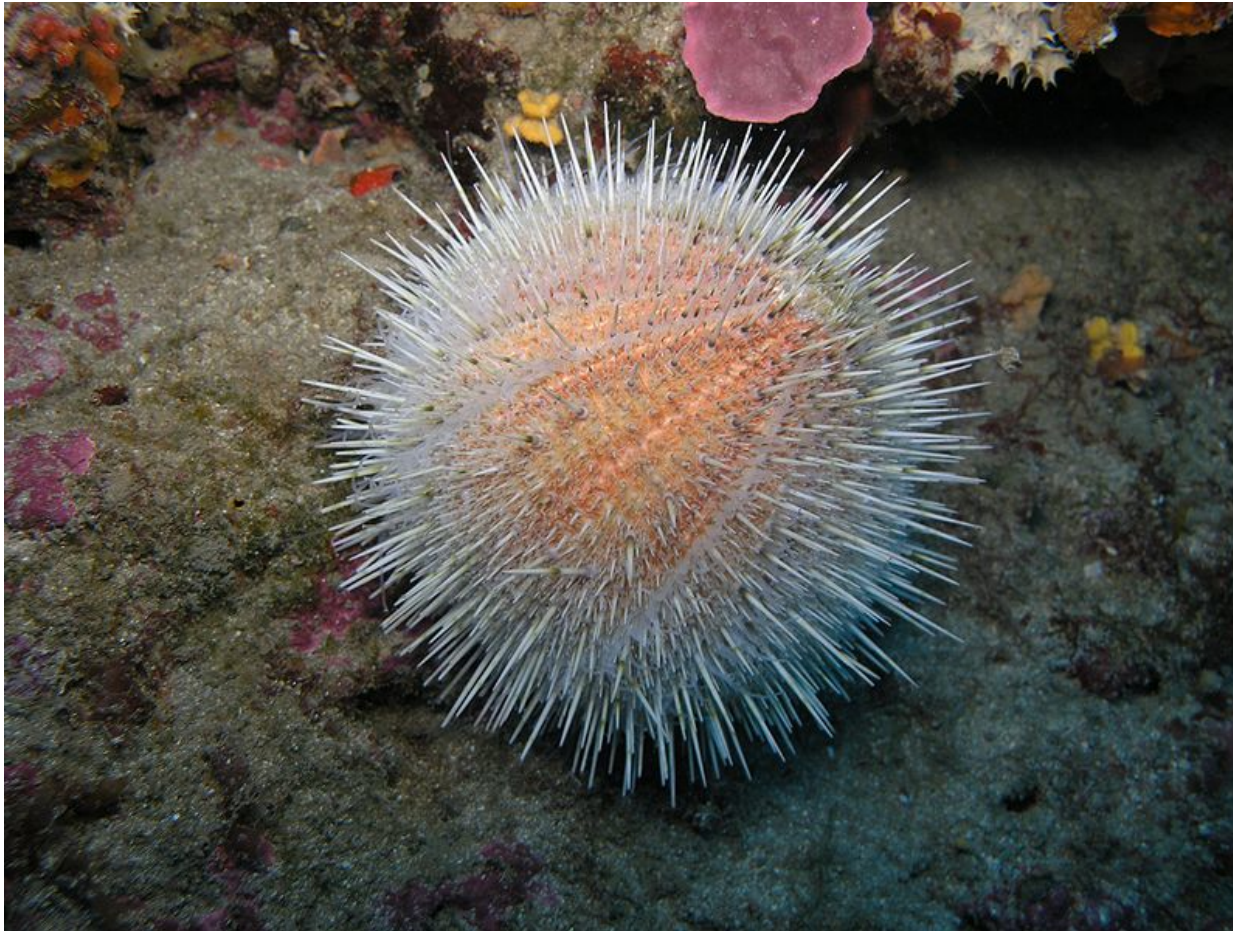


Foraminifera
(planktonic)



Foraminifera
(benthic)

Sea urchin (echinoid) spines



Sea urchin (echinoid) with spines attached

Echinoid spines are distinctive in their character. They are 1-2 mm across and usually have ribs that run lengthwise along the spine. These ribs and the shiny surface of the spines are useful in separating them from similarly shaped, articulate-algal segments

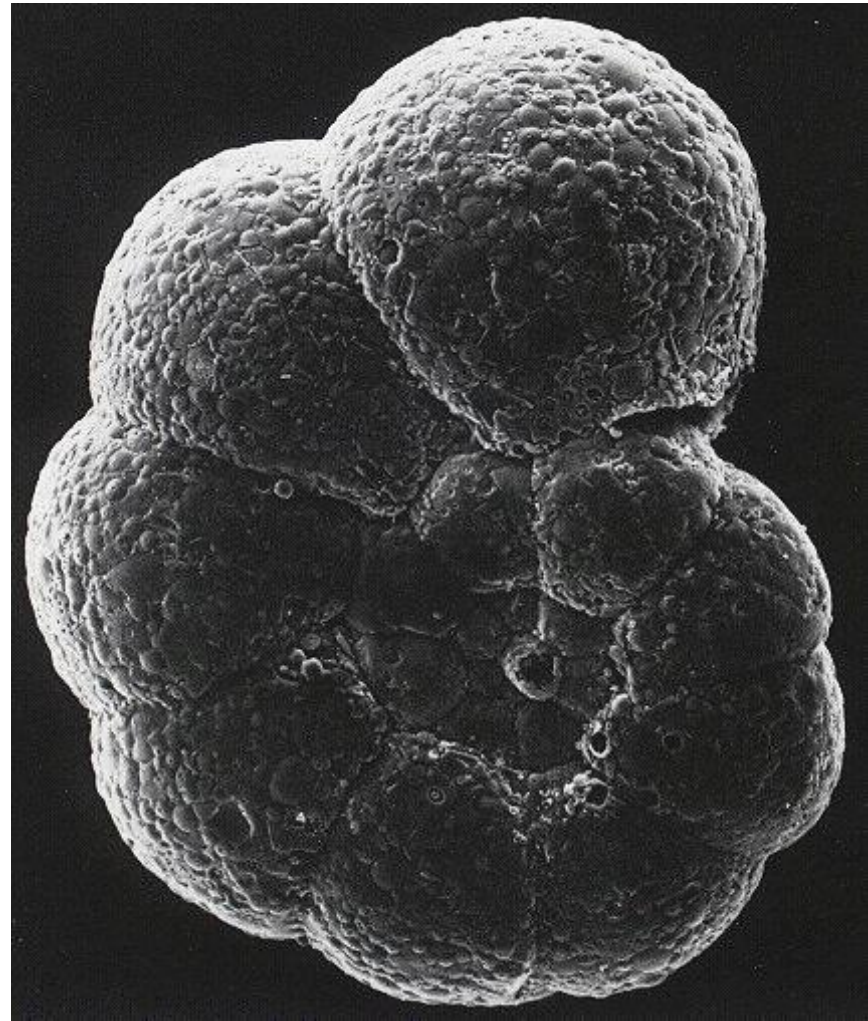
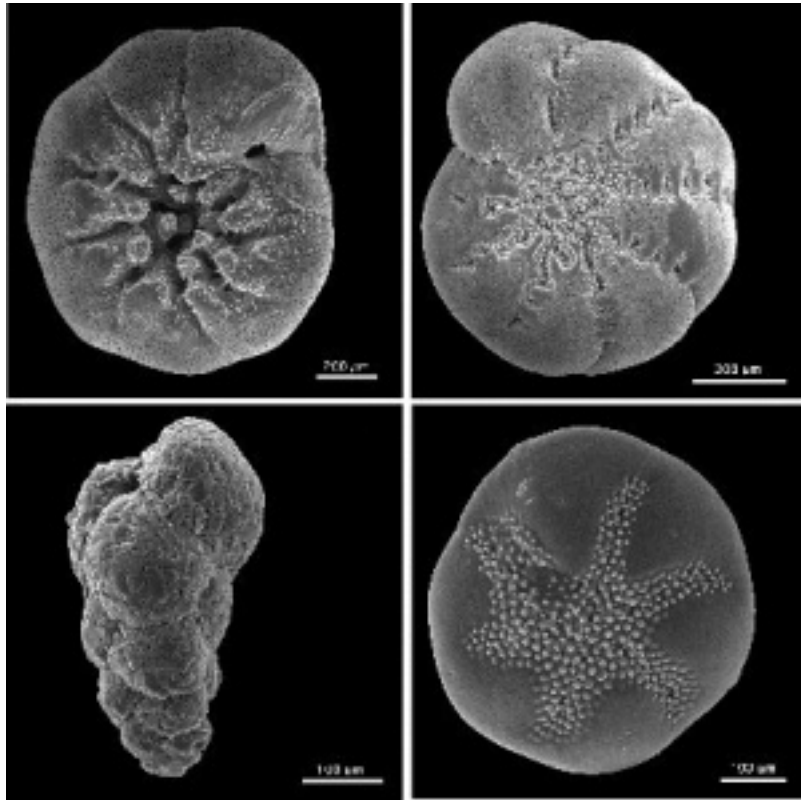


Some samples will contain fragments of the sea urchin shell. Look for diagnostic features.

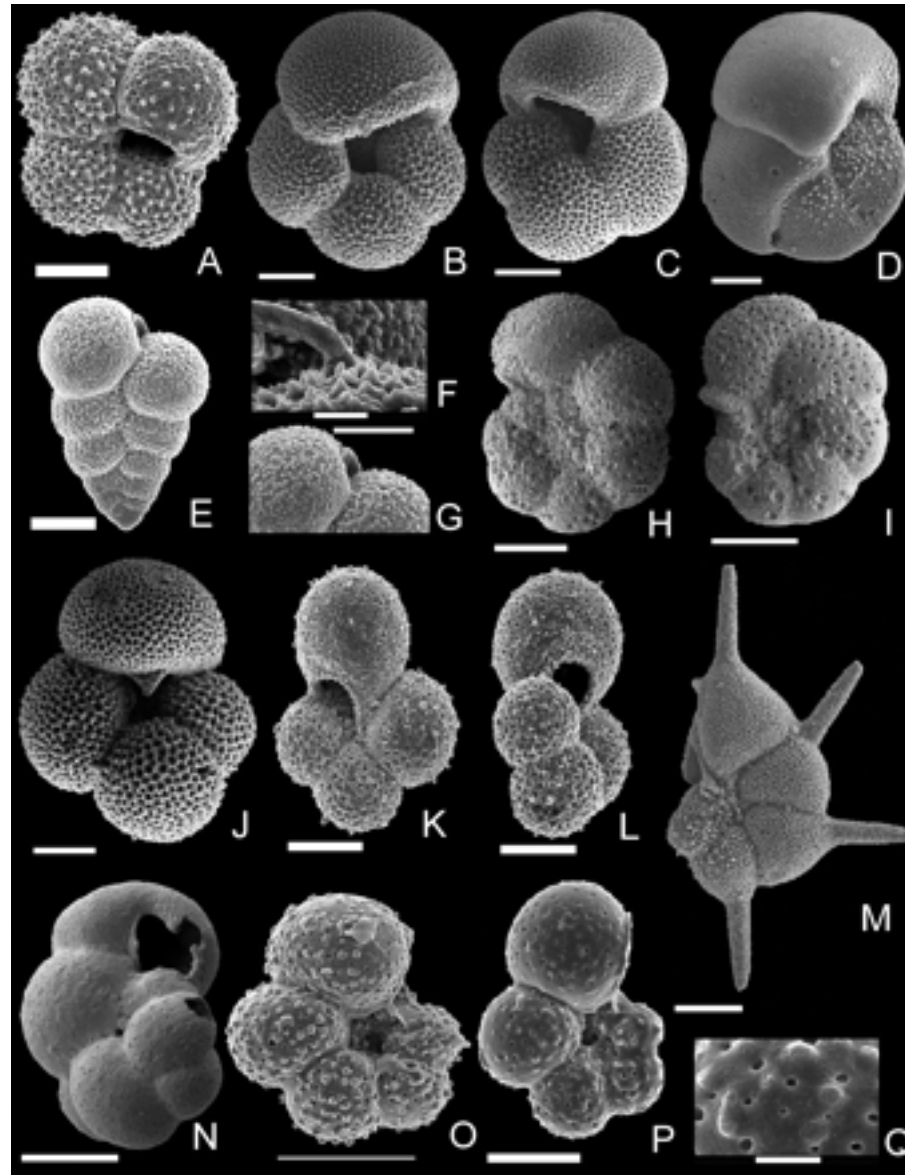


Examples of some benthic foraminifera you might see in the samples.

Forams are commonly less than a millimeter in diameter, but larger individuals do occur. Benthic forams are more common in shallow, sandy areas, and certain species can be tied to specific environments. Their thicker tests adapt them to life in shifting sands, in contrast to planktonic varieties that have thinner shells to facilitate floating in the water column.



More examples of benthic forams. Scanning electron microscope (SEM) images. There are thousands of species of foraminifera with diverse shapes.



Examples of planktonic foraminifera. Note the globular shape designed for floating.

Benthic
foram

Clear
quartz

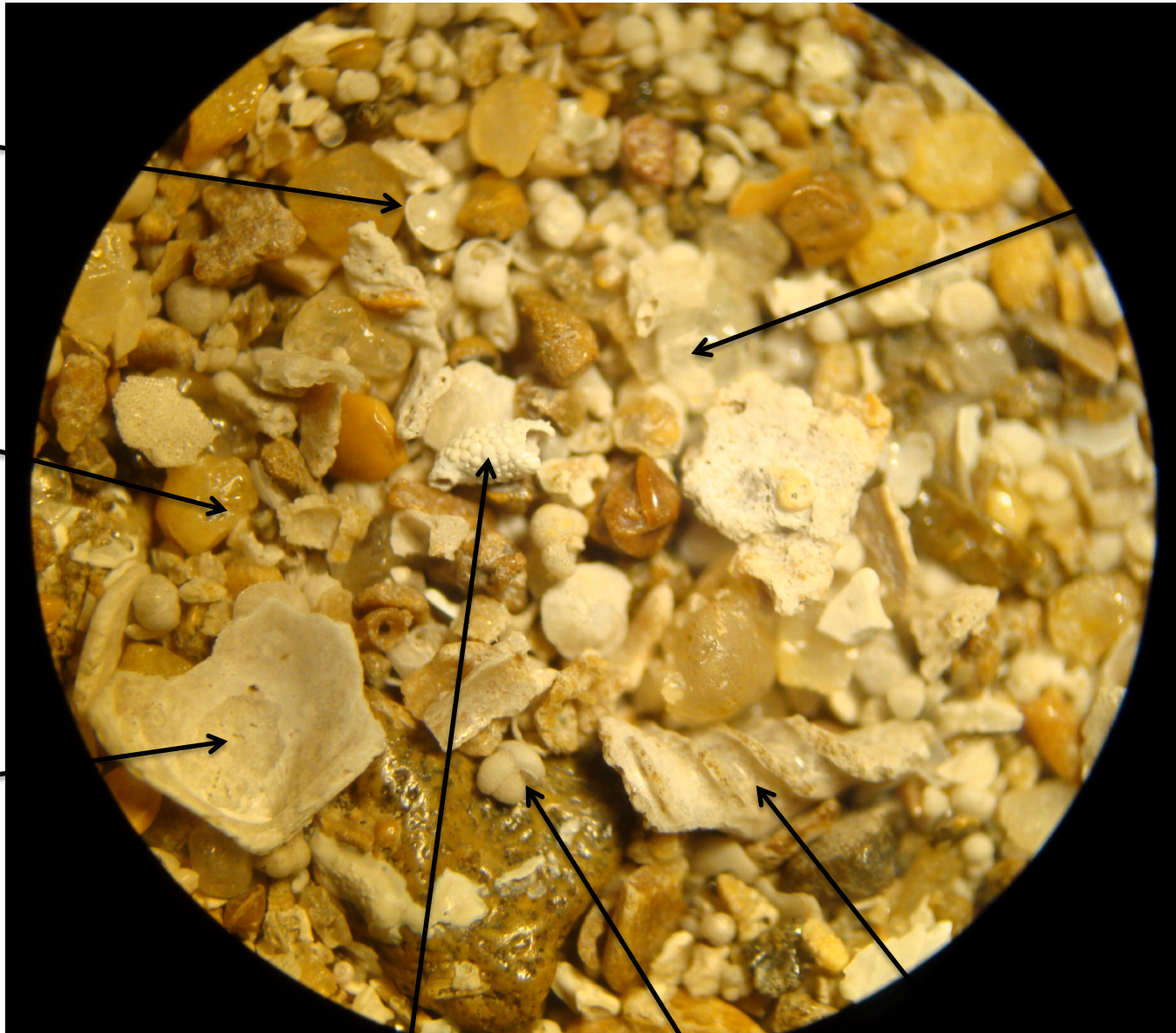
Iron-stained
quartz

Bivalve
fragment

Possible sea urchin fragment
or part of a crab

Foram

Gastropod fragment
(note coiling)



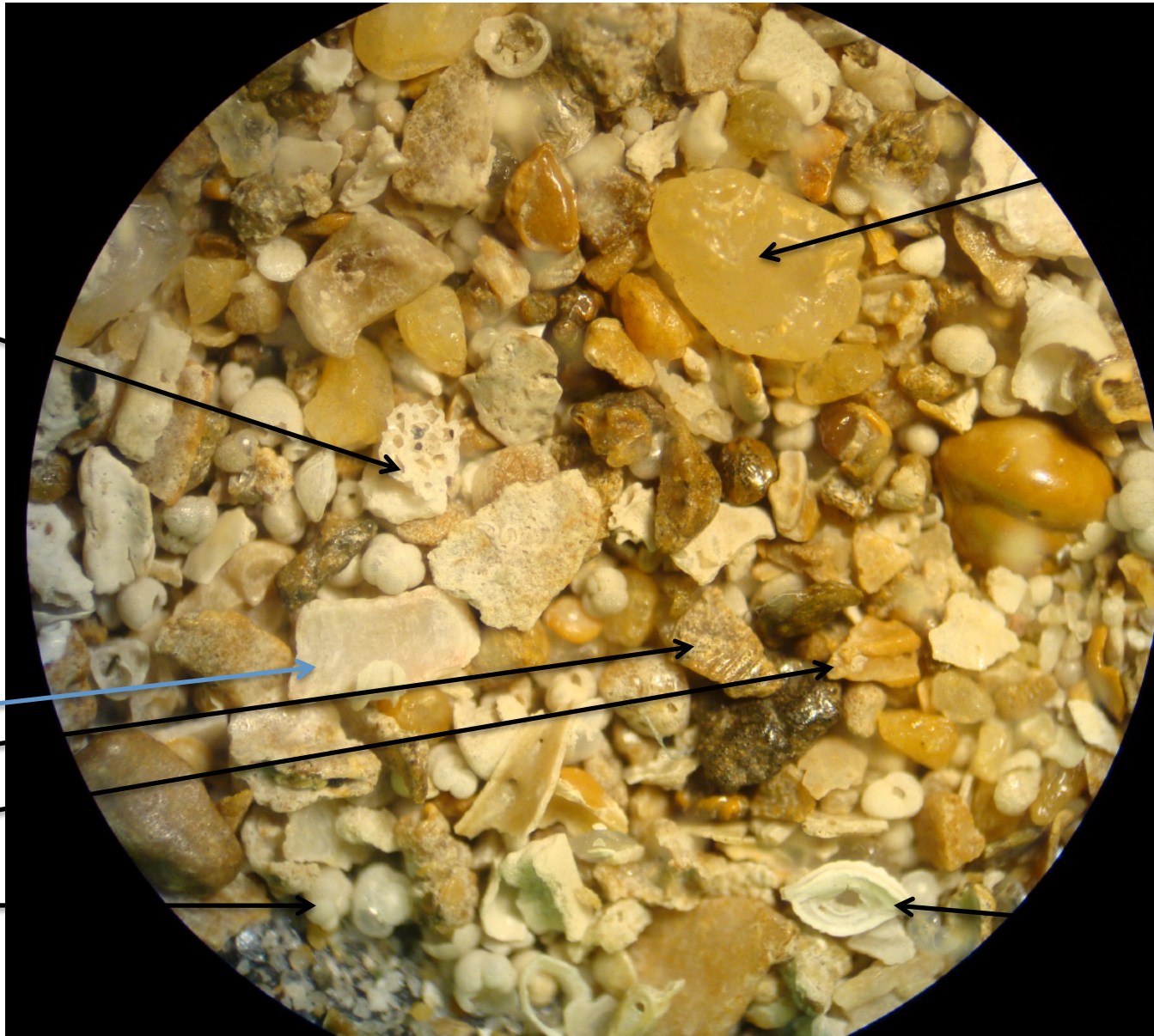
Bryozoan
(note zooids)

quartz

Bivalve
fragments

Planktonic
foram

Benthic
foram



Examples of gastropods.



Without careful examination, small bits of forams and gastropods (coiled molluscs) may be confused with one another, either in hand specimen or thin section. The key to discriminating between the two is the segmentation of the foram body cavity into chamber. Gastropods contain a single, coiled shell cavity, while forams have numerous and separate chambers.

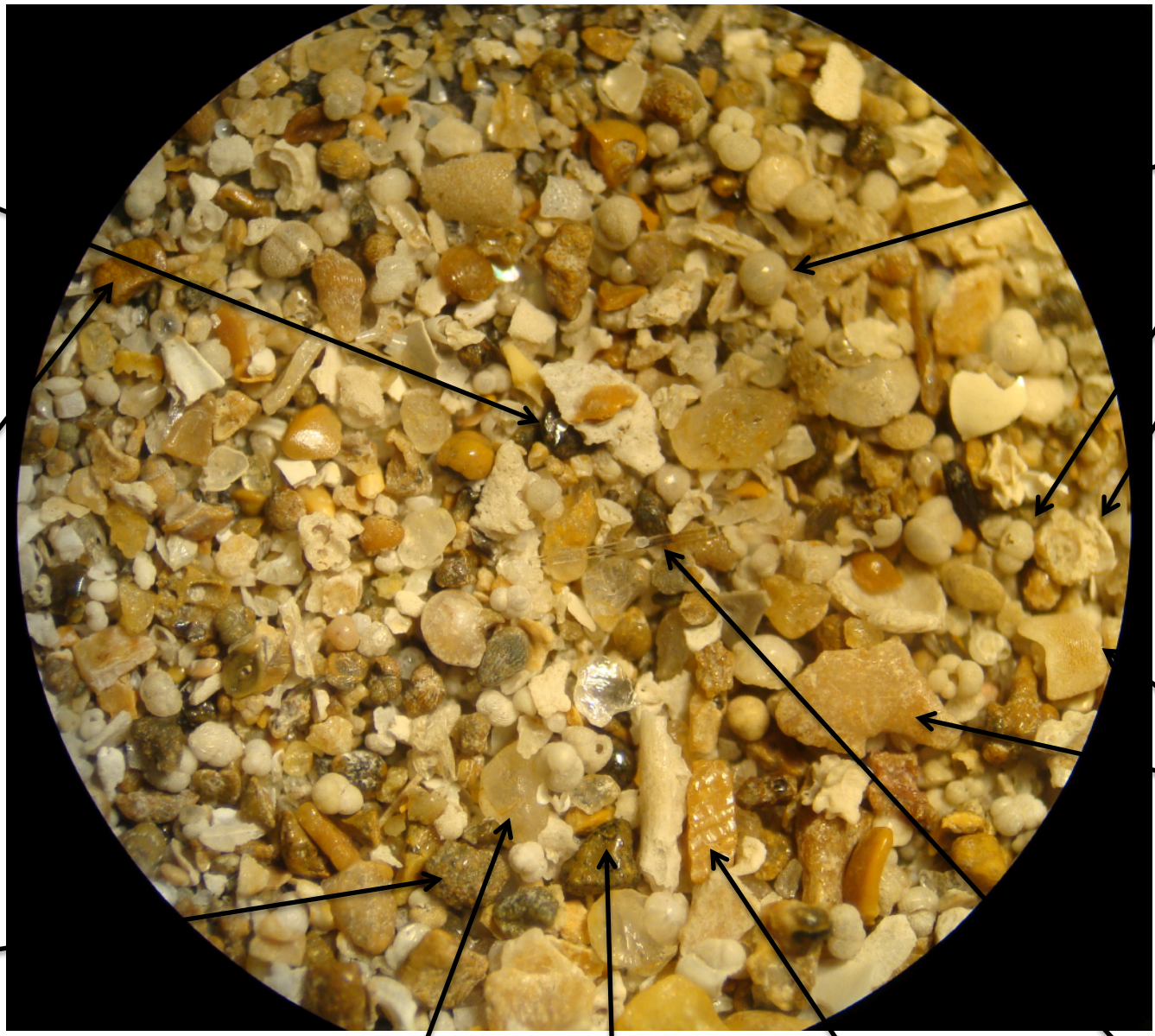


Examples of bivalves from a beach. Imagine what They look like when they're broken up.

Heavy mineral grain

Possible sandstone fragment

Possible sandstone fragment



foram

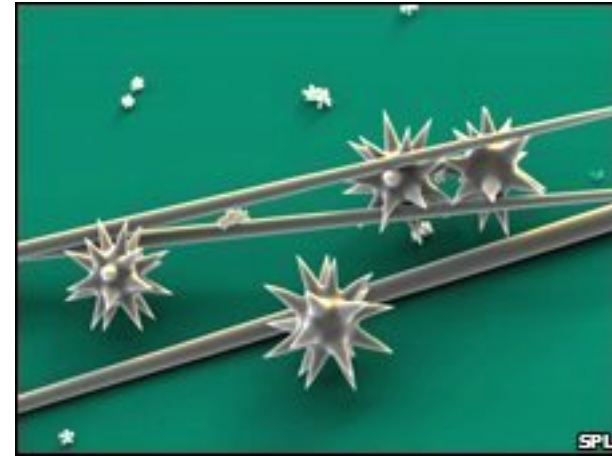
bivalve

quartz

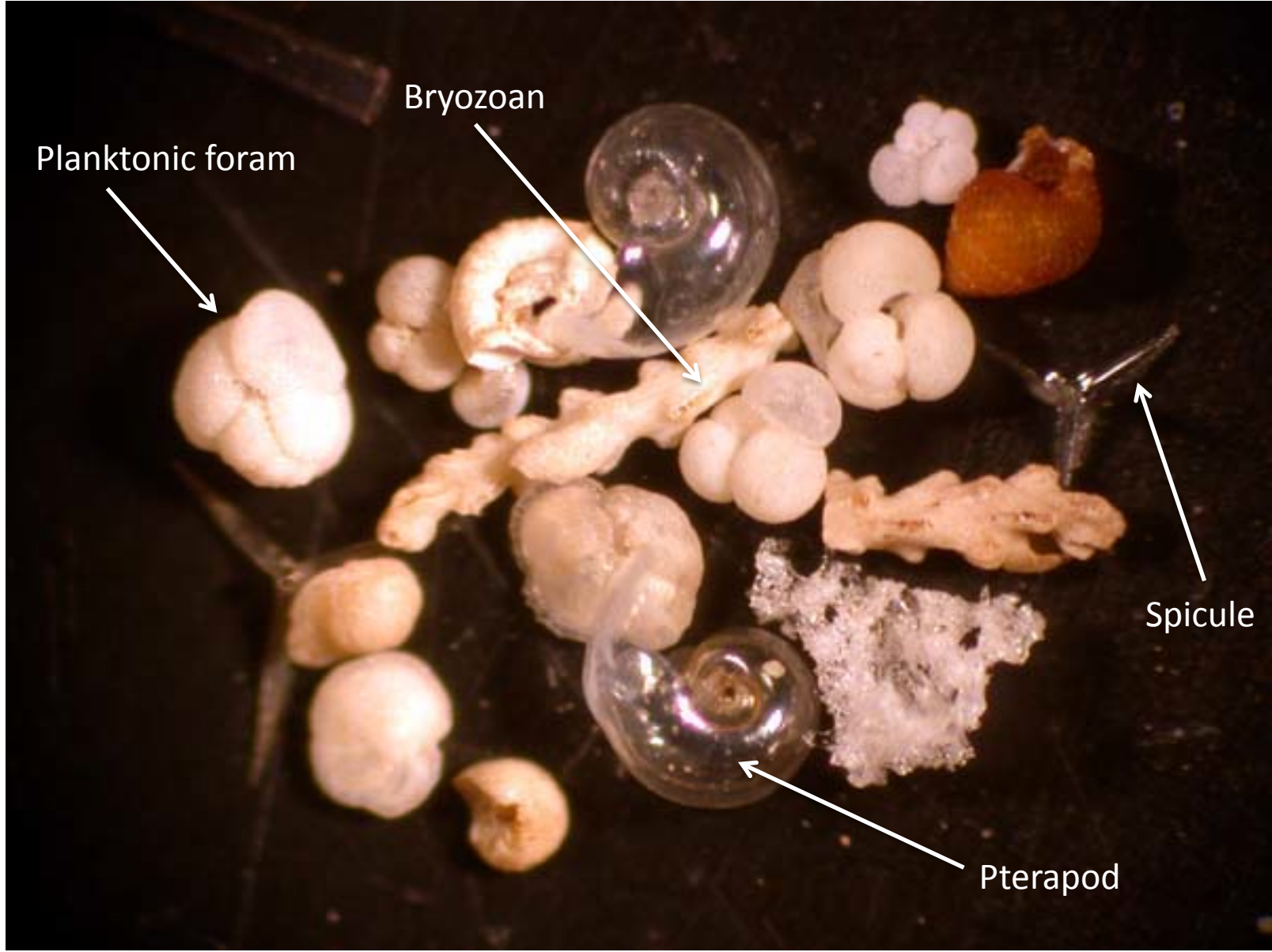
Volcanic rock Fragment ?

bivalve

Sponge spicule
(long, glass-like needle
made of silica)



Examples of siliceous sponge spicules (building blocks of sponges).

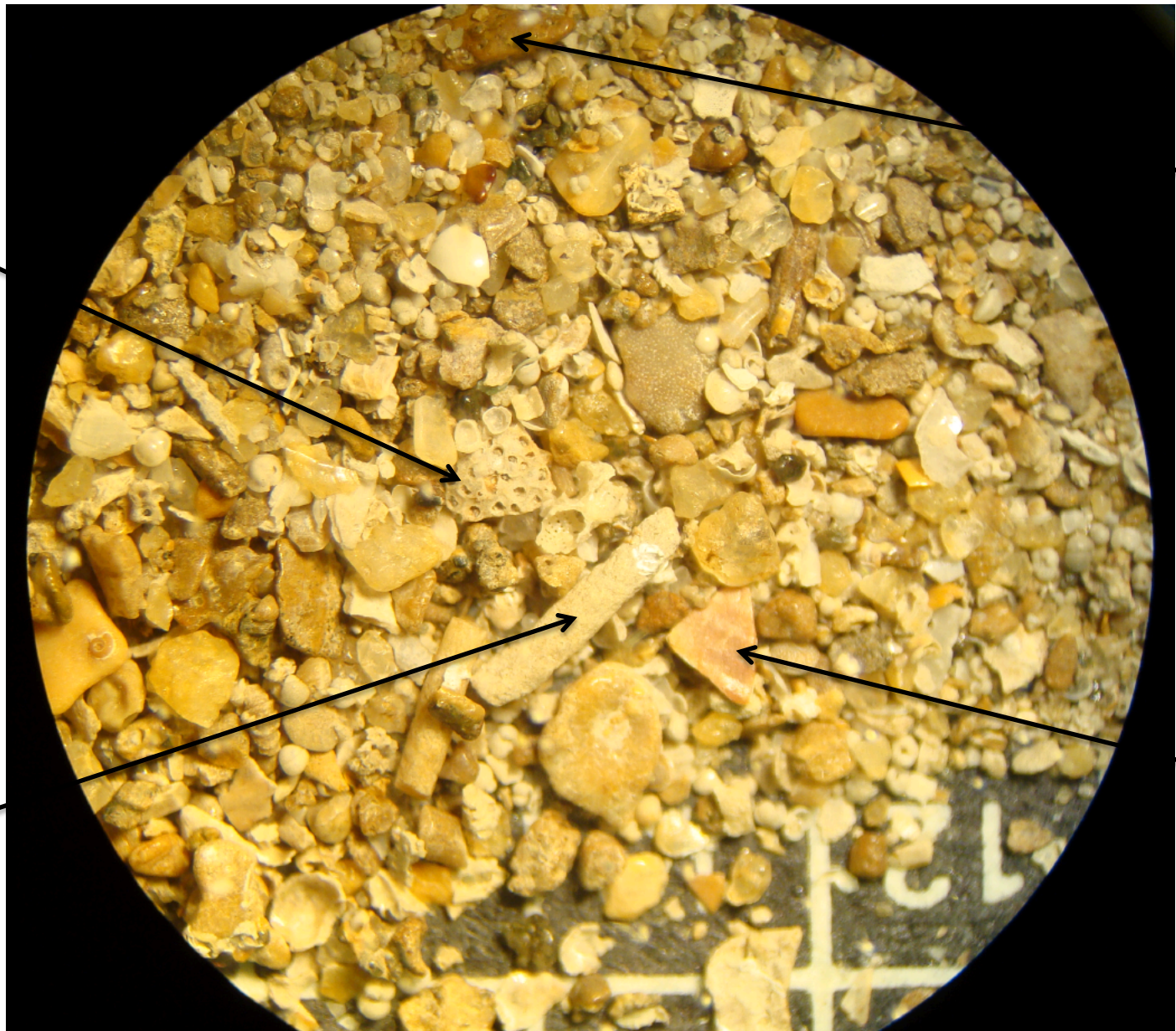


bryozoan

Shale
fragment

Sea urchin
spine

Bivalve
fragment

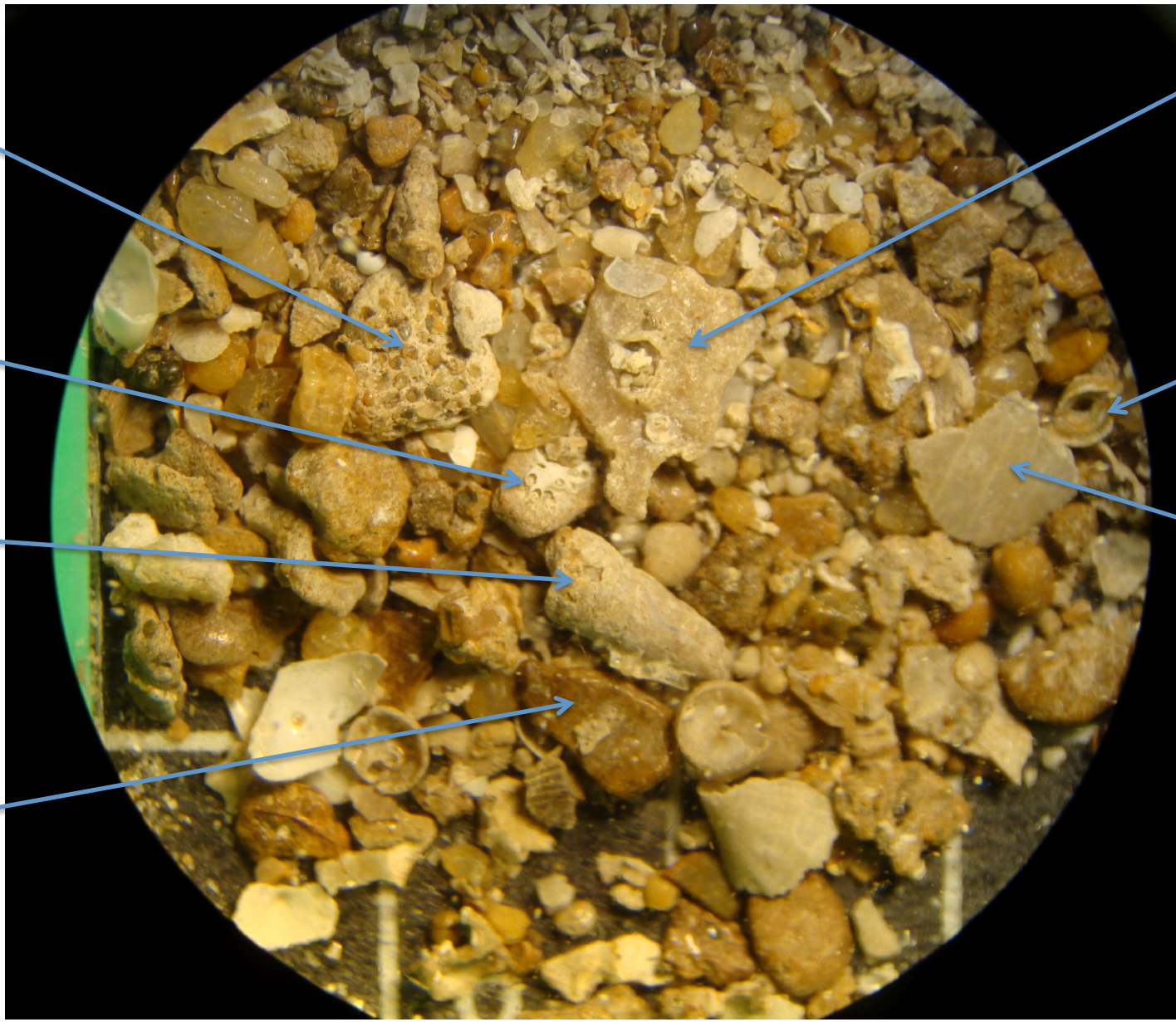


Sandstone fragment

Bryozoan and sandstone fragment

Gastropod fragment

Shale fragment

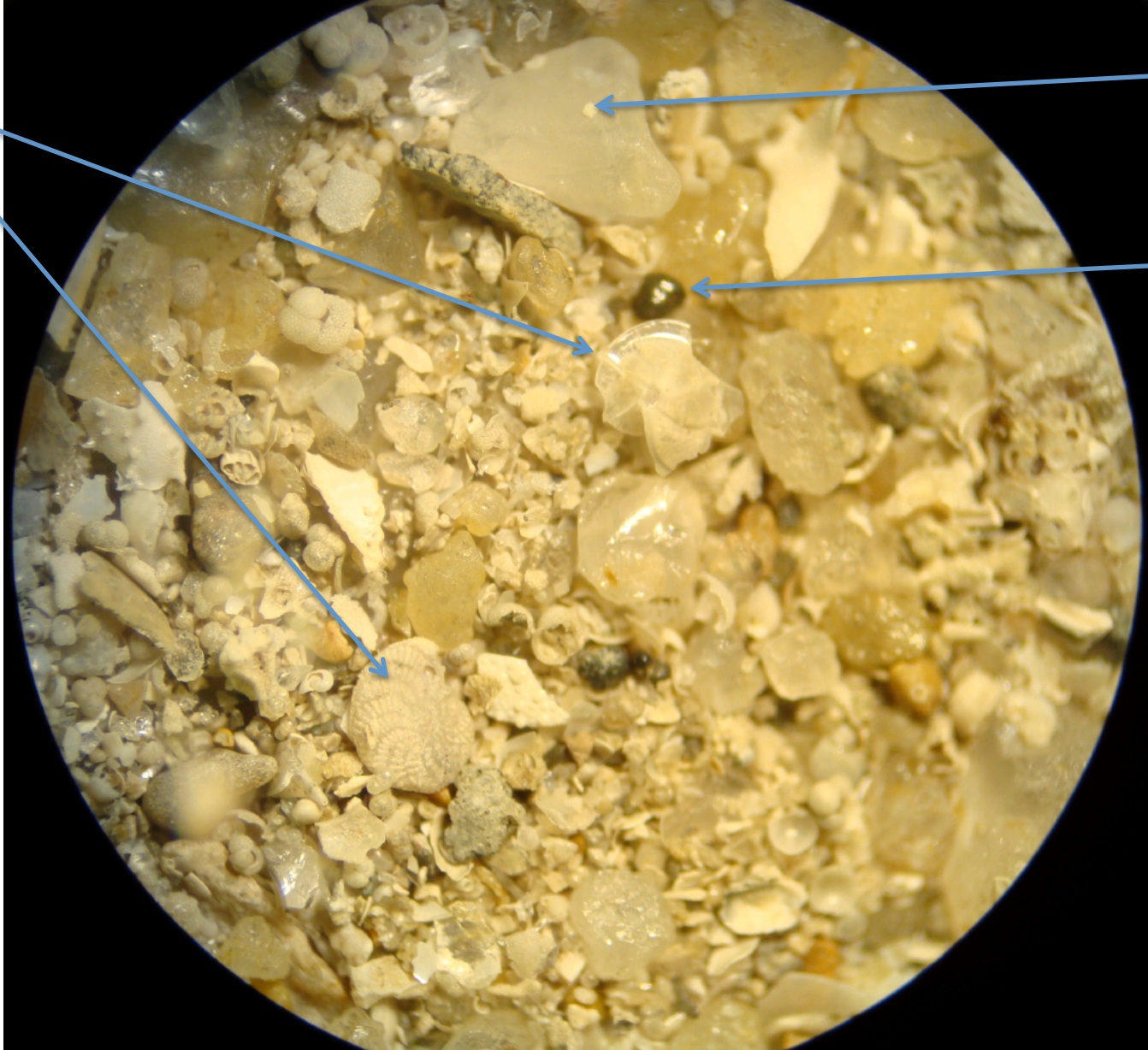


Bivalve fragment

Benthic foram

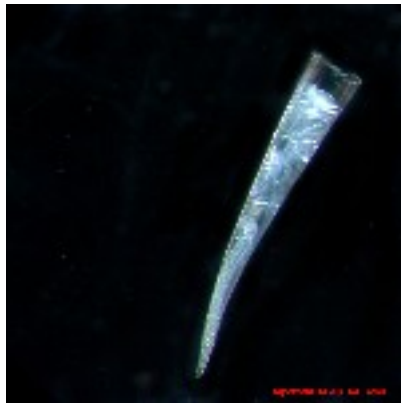
Bivalve fragment

Foram



Quartz

Heavy
mineral
grain

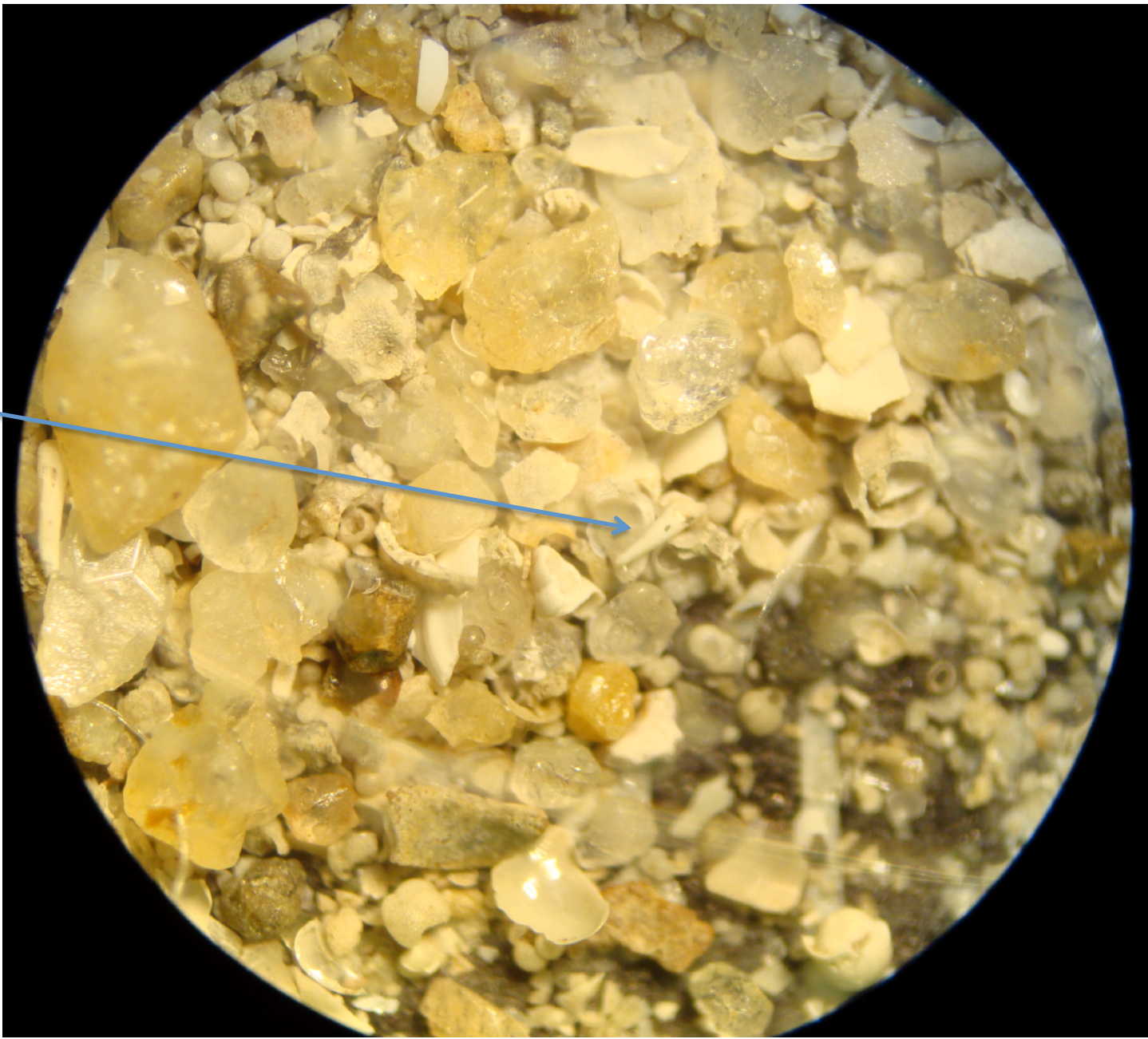


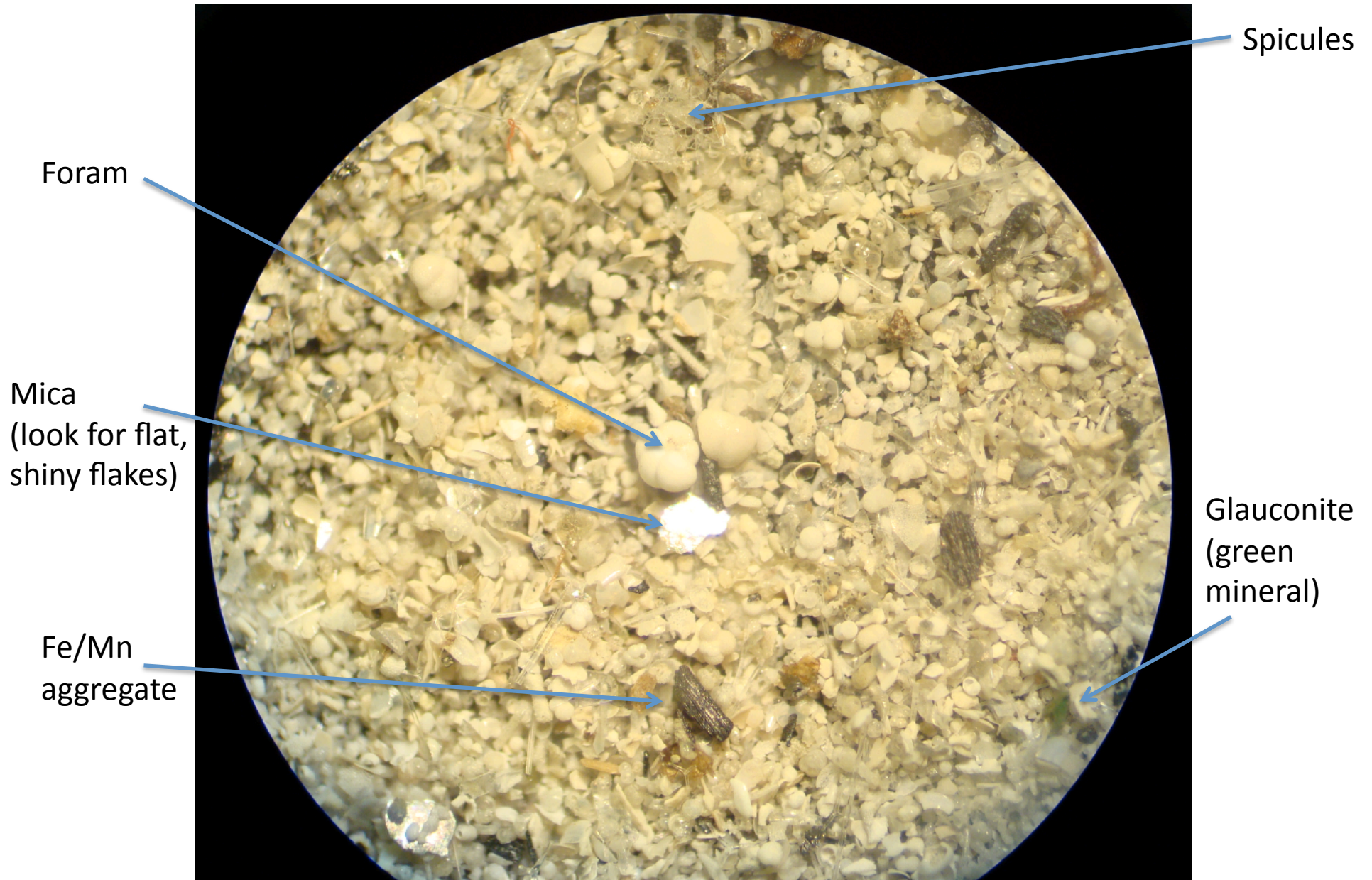
Examples of pteropods (little marine crustaceans with translucent shells that are also known as sea butterflies or flapping snails). These planktonic gastropods spend their lives floating and swimming, and can be carried along in ocean currents.



Pteropod shells

Pterapod
(cone-shape)





Spicules

Foram

Mica
(look for flat,
shiny flakes)

Fe/Mn
aggregate

Glauconite
(green
mineral)



Coral fragments and gastropods

Coral fragments in hand specimens are massive and blocky with a whitish opaque-to-translucent surface.



Glauconite



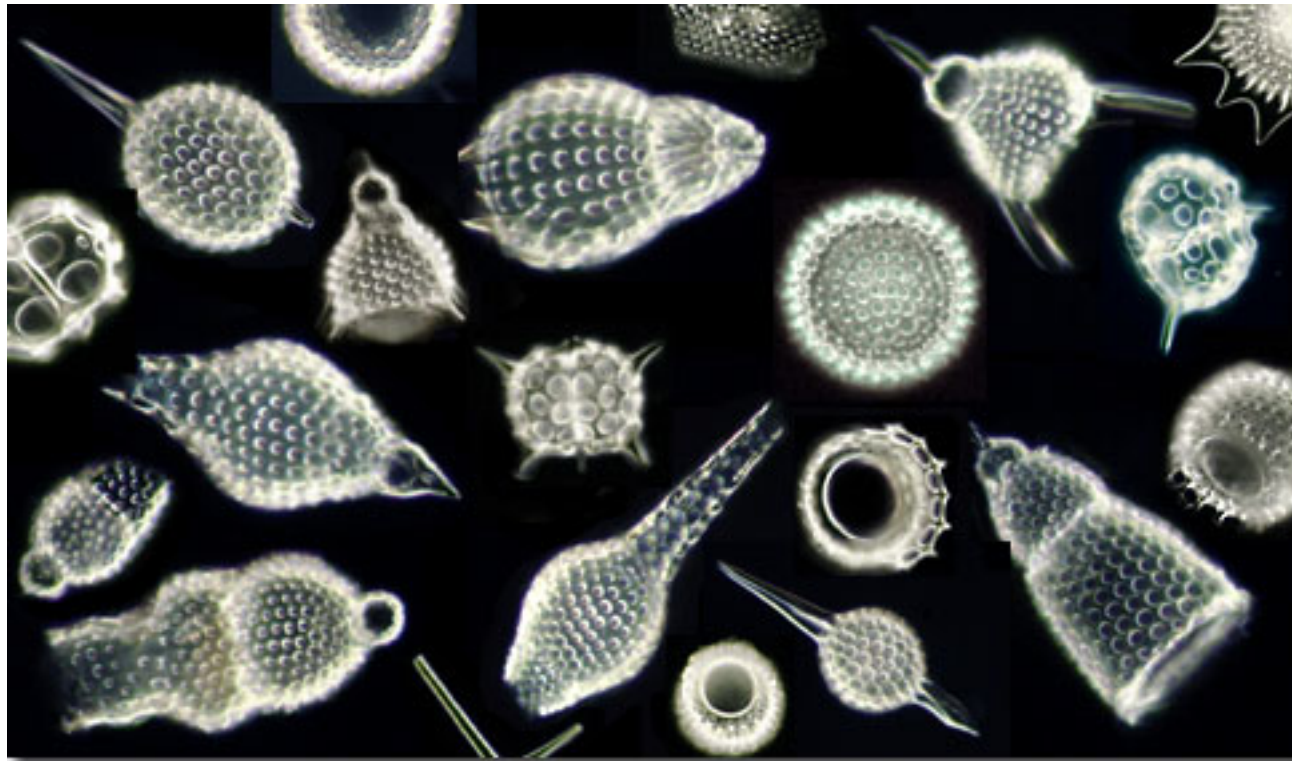
Ooids



Quartz sand



Volcanic rock fragments



Radiolarians