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A Photographic Guide to the Gelasian (Early Pleistocene) Mollusca of Southeastern North Carolina

2021

Waccamaw Mollusca Review Copy Pt. II: Truncatelloidea, Vanikoroidea, Calyptraeidae, Cypraeoidea, Personidae, Ficidae & Xenophoridae

Timothy Campbell

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*A Photographic Guide to the
Gelasian (Early Pleistocene)
Mollusca of
Southeastern North Carolina*

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Review Copy Pt. II:
Truncatelloidea, Vanikoroidea,
Calyptraeidae, Cypraeoidea,
Personidae, Ficidae &
Xenophoridae

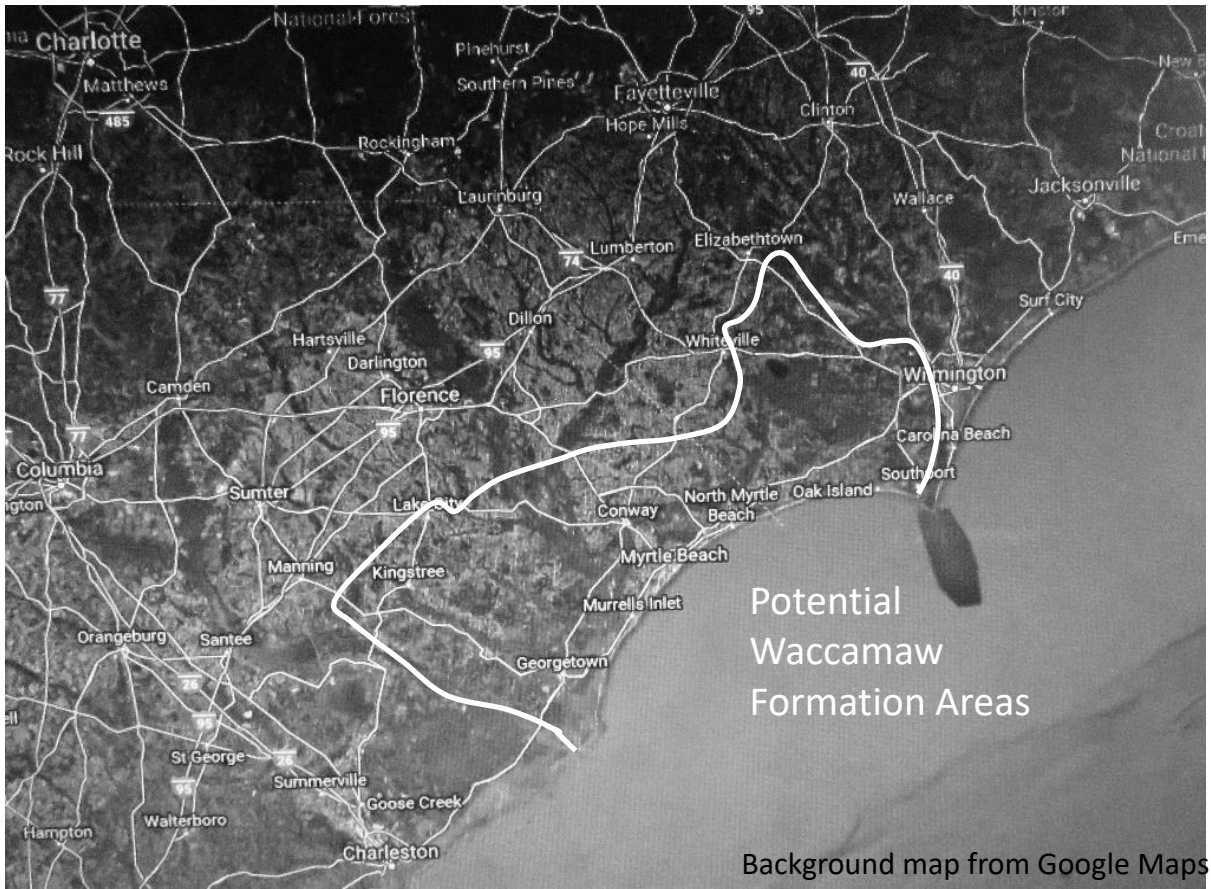
Introduction

Location

The Lower Waccamaw Formation contains a rich basal Pleistocene (early Gelasian, 2.4-2.0 million years old) fauna with an extreme abundance and diversity of mollusks (>90% of the fossils and 900+ species, of which I illustrate 743) in addition to various echinoderms, arthropods, annelids, corals, bryozoans, and vertebrates. Based upon the ranges of the extant species, the climate seems to have been warmer than today. This diverse subtropical fauna can be found in patches in southeastern North Carolina and northeastern South Carolina. It is roughly equivalent to the modern fauna of central South Carolina to North Florida, however, there was dramatic faunal turnover about 1.7 MYA and the modern Carolinian fauna is much more similar to the modern Caribbean fauna than the Waccamaw Formation fossils are to equivalent age Caribbean faunas.

Fossils have been known from the Lower Waccamaw Formation since prehistory. Although the first scientific study was Tuomey and Holmes, 1856, no single monograph exists.

Roughly 40% of the species are extant. The species derive from multiple habitats, including 30-50 m sandy-bottom shelf, cementing bivalve reef, 10-20 m sandy-bottom shelf, surf to subtidal, saltmarsh, muddy-bottom sound, inlet, and freshwater to brackish.



Rissooidea & Elachisinidae



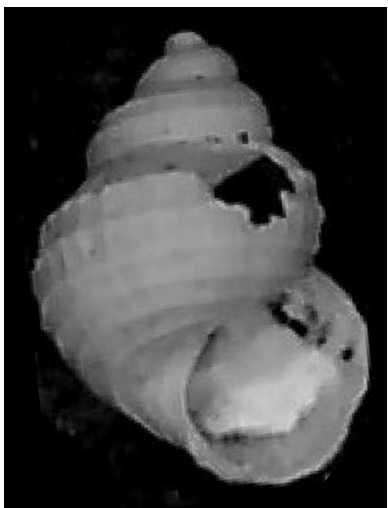
Schwartziella floridana
(Olsson & Harbison, 1953)

Broken
3.5 mm
Taller



Schwartziella harpa
(Gardner, 1948)

2.3 mm
Shorter



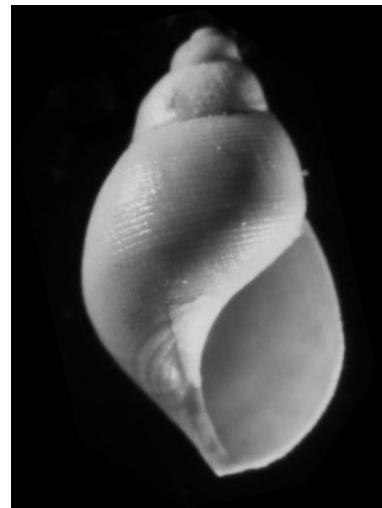
Alvania lipeus
(Dall, 1892)

1.3 mm
Highly distinctive shape



Zebinella sp.

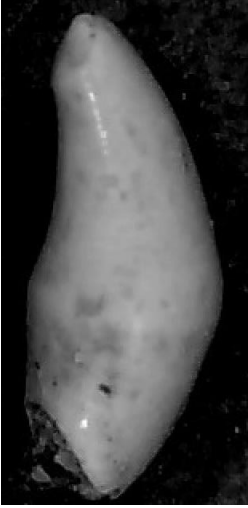
3.1 mm; 3.2 mm
Highly distinctive shape



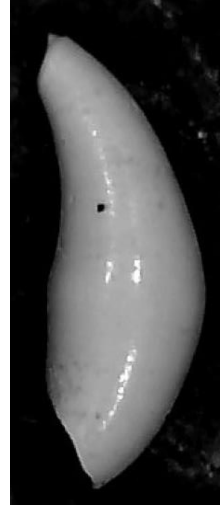
Elachisina geraea
(Dall, 1892)

2.2 mm
Highly distinctive shape

Meioceras & Caecum (Caecum)



Meioceras cingulatum
Dall, 1892
2.3 mm
Expansion in center



Meioceras nitidum
Stimpson, 1851
2.3 mm
Highly distinctive shape



Caecum condylum
Moore, 1969
3.5 mm
Very long

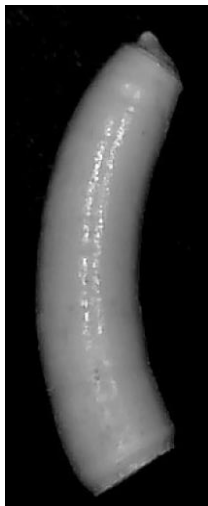


Caecum cf. donmoorei
Mitchell-Tapping, 1979
2.2 mm
Large annulations with
broad interspaces



Caecum cf. regulare
Carpenter, 1858
2 mm
Smaller, with many fine
annulations of consistent size

Caecum (*Brochina*)



Caecum cf. circumvolutum
de Folin, 1867
4.2 mm
Smooth; Broad



Caecum flemingi
Gardner & Aldrich, 1919
2.4 mm
Smooth; pointed mucro

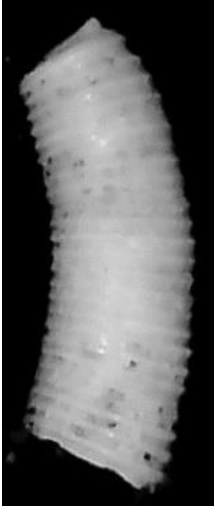


Caecum johnsoni
Winkley, 1908
1.8 mm
Smooth; Flat mucro;
Slightly flared aperture



Caecum cf. subornatum
de Folin, 1867
2 mm
Similar to *C. johnsoni*, but with
faint annulations near aperture.

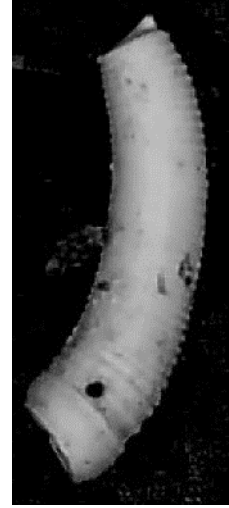
Caecum (*Elephantulum*)



Caecum cf. compactum
Dall, 1892
1.5 mm
Fine annulations with
narrow interspaces



Caecum cooperi
S. Smith, 1862
2.5 mm; 4 mm
8-10 ridges;
Central thorn-like mucro



Caecum floridanum
Stimpson, 1851
2.8 mm
Many fine annulations expanding
with growth; slightly raised mucro



Caecum ibex
Dall, 1892
4.7 mm; 6.5 mm
Fine Ridges

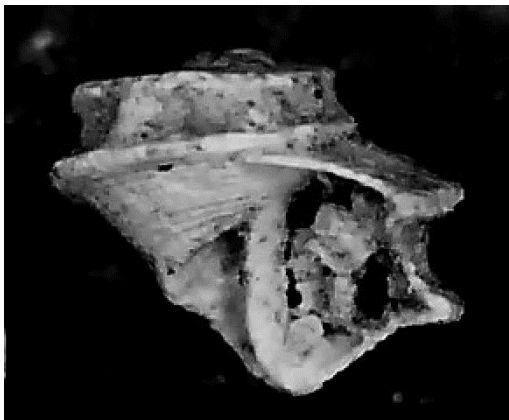


Caecum pulchellum
Stimpson, 1851
1.8 mm
Distinctive gap and clump in
annulations near aperture



Caecum tortile
Dall, 1892
3.2 mm
Twisted ridges

Aorotrema & Cochliolepis



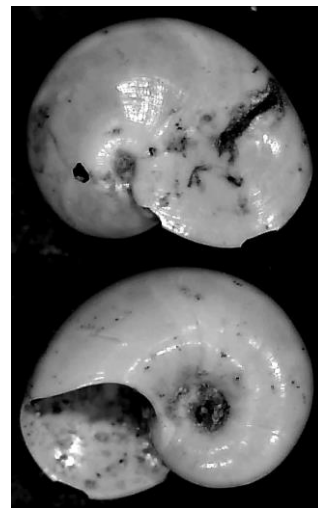
Aorotrema cistrionium

(Dall, 1889)

Broken

1.9 mm

Highly distinctive shape



Cochliolepis n.sp.

3 mm

Spire goes under final whorl

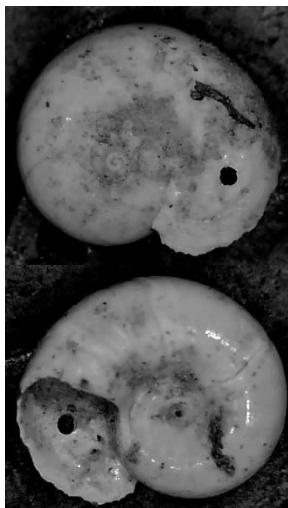


Cochliolepis holmesii

(Dall, 1889)

4.2 mm

Distinct suture



Cochliolepis nautiliformis

(Holmes, 1860)

3.8 mm

Flattened suture



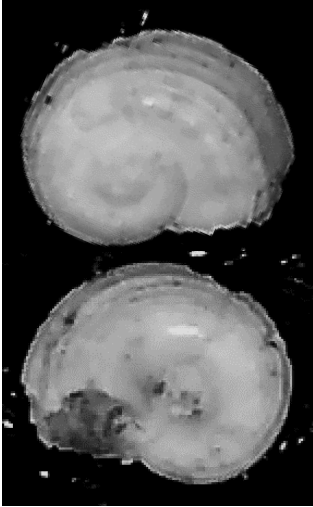
Cochliolepis cf. *virginica*

Pilsbry in Olsson & Harbison, 1953

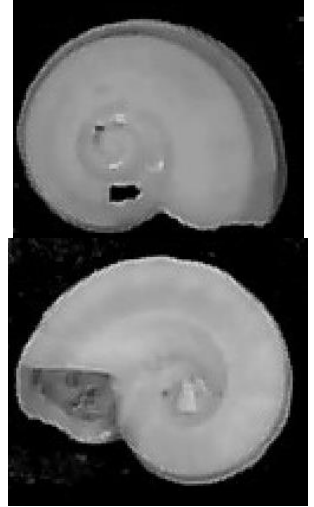
5.2 mm

Raised spire

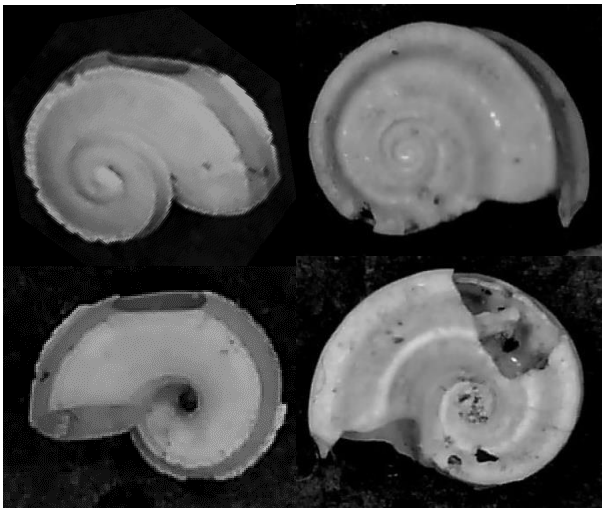
Cyclostremiscus I



Cyclostremiscus n. sp.
0.8 mm
Small; very flat



Cyclostremiscus sp.
0.9 mm
3 carinae; Small

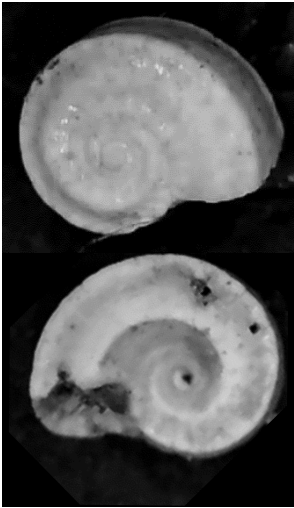


Cyclostremiscus bartschi
(Mansfield, 1930)
Juvenile; Adult
0.7 mm; 1.9 mm
2 carinae; small

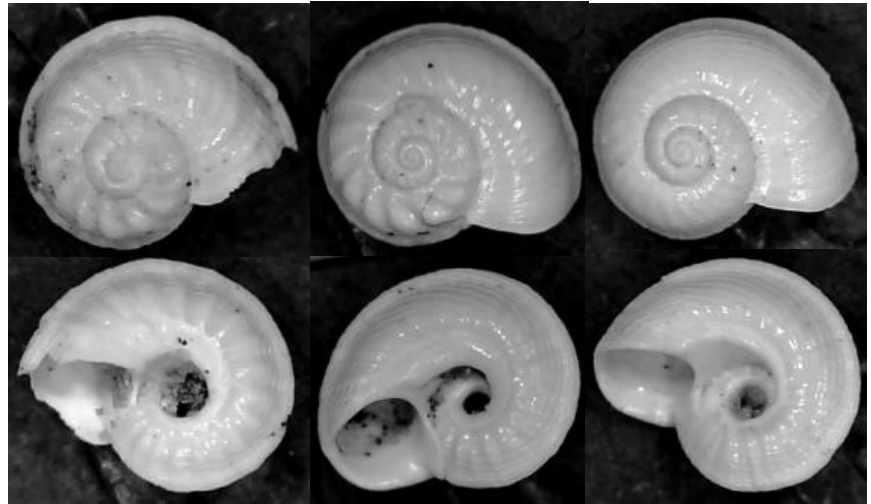


Cyclostremiscus schmidti
(Olsson, 1916)
2.2 mm
Pointed aperture

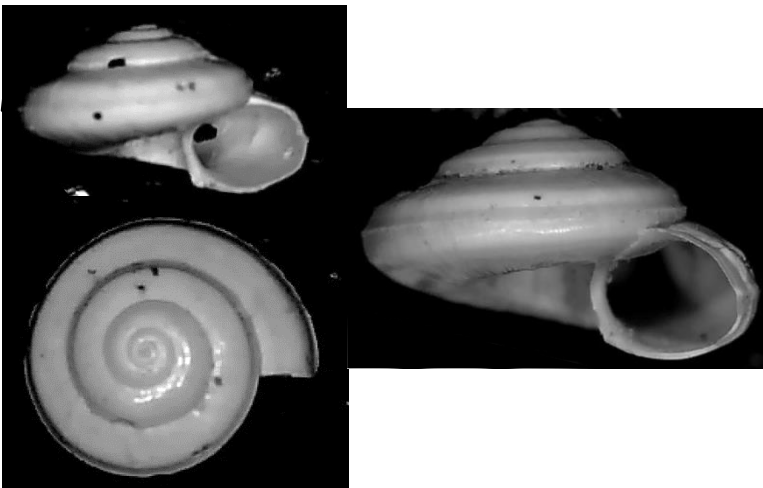
Cyclostremiscus II, Episcynia, & Tornus



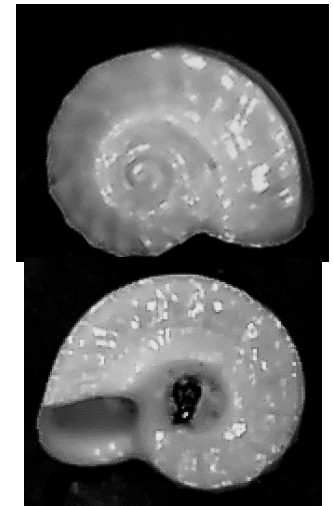
Cyclostremiscus olssoni
Pilsbry, 1953
1.7 mm
Squared off



Cyclostremiscus undula var. I, II & III
(Dall, 1896)
1.8mm; 2.3 mm; 2.1 mm
Curved axial ridges

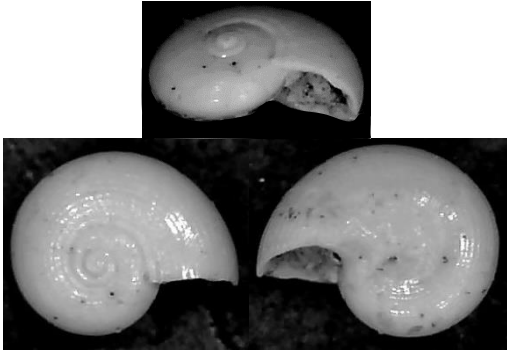


Episcynia inornata
(d'Orbigny, 1842)
3.5 mm; 4.8 mm
1 keel; Glossy smooth



Tornus cf. schrammii
(P. Fisher, 1857)
1 mm
Highly distinctive sculpture

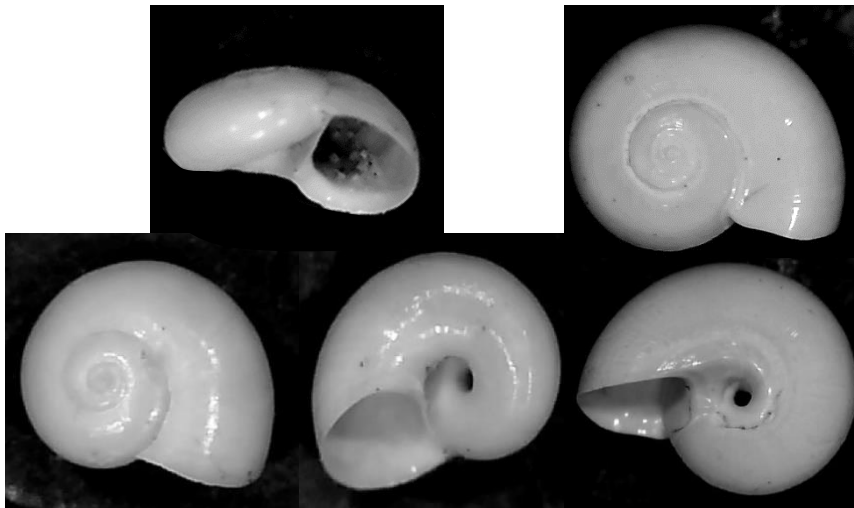
Solariorbis



Solariorbis cf. antillensis
de Jong & Coomans, 1988
1.3 mm
Small umbilicus; Fine striations



Solariorbis basilissus
Pilsbry in Olsson & Harbison, 1953
2 mm
Open umbilicus; Stronger striations

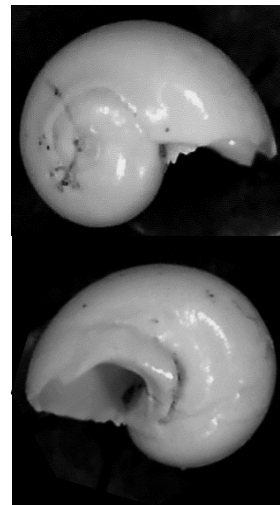


Solariorbis opistelotus
(Dall, 1892)
1.3 mm; 3.1 mm
Open umbilicus; Rounded; Smooth

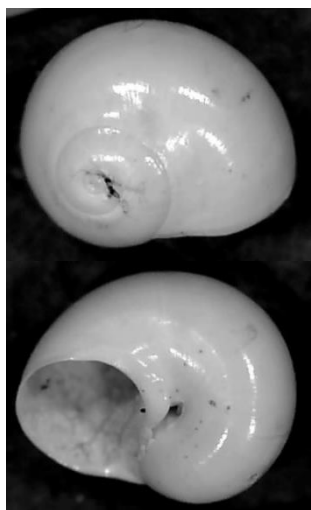
Teinostoma I



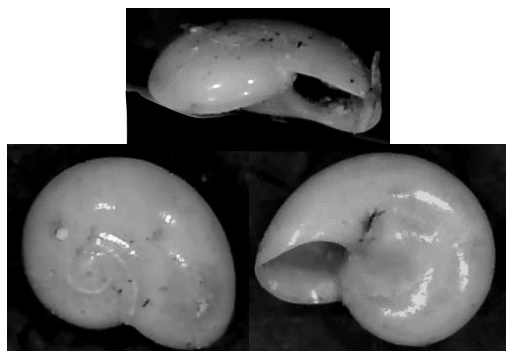
Teinostoma n. sp.
1.9 mm
Indented spire



Teinostoma sp.
Broken
1.7 mm
Hook-shaped umbilical plug

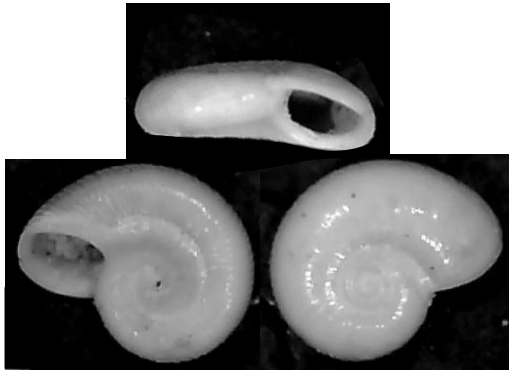


Teinostoma alexanderi
(Olsson, 1916)
2.2 mm
Tectonatica-like *Teinostoma*



Teinostoma avunculus
Pilsbry in Olsson & Harbison, 1953
1.8 mm
Rounded spire; Faint suture

Teinostoma II



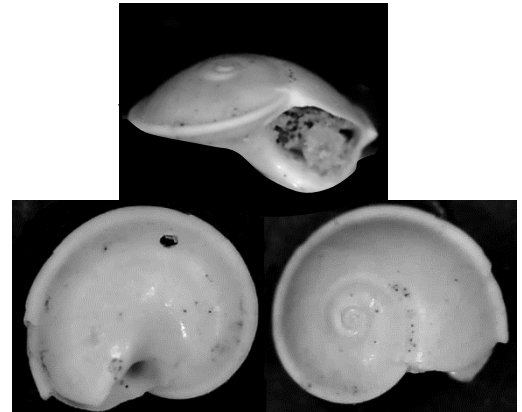
Teinostoma bushae

(Olsson, 1916)

1.4 mm; max 1.6 mm

Flat; Sculptured umbilicus;

Fine axial lines

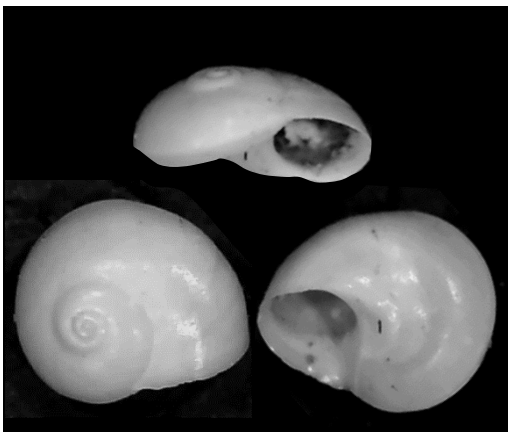


Teinostoma goniogyrus

Pilsbry & McGinty, 1945

2.4 mm

Very strong keel

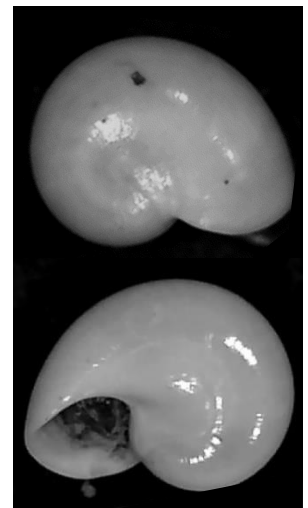


Teinostoma lenticulare

(H. C. Lea, 1843)

2.4 mm

Strong keel; Rounded



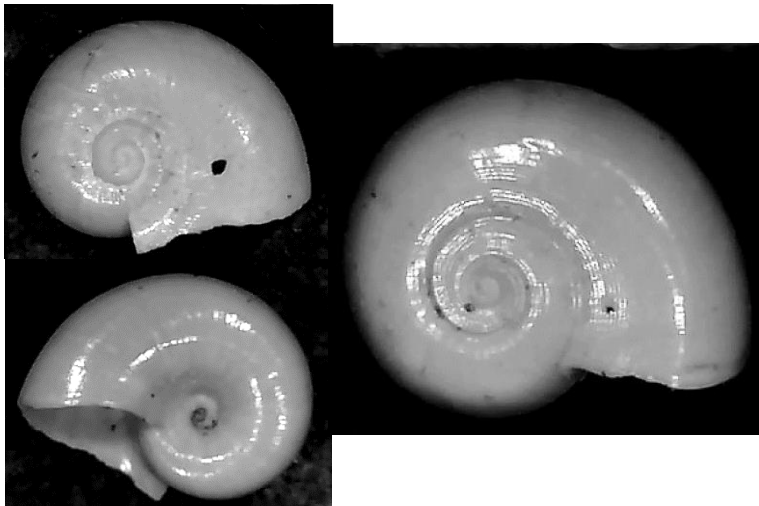
Teinostoma umbilicata

(H. C. Lea, 1843)

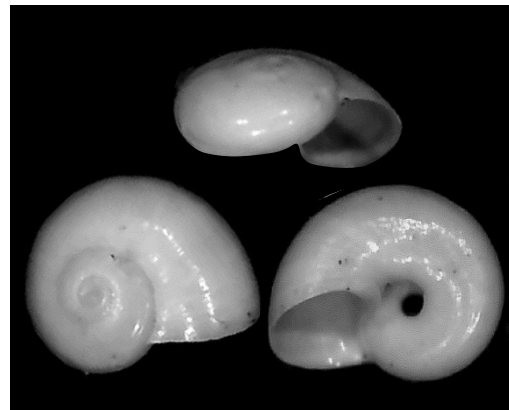
1.4 mm

Small; Very smooth;
Spire covered by callus

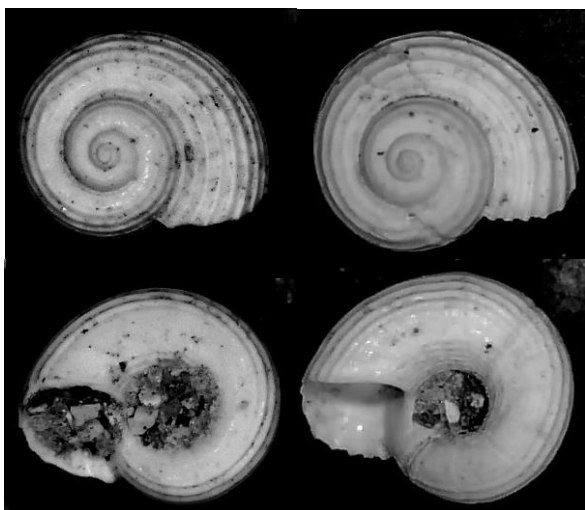
Vitrinellidae



Vitrinella sp.
2.1 mm; 3 mm
Less open umbilicus; Even flatter



Vitrinella lipara
(H. C. Lea, 1843)
1.3 mm
Open umbilicus; Flatter



Circulus sp.
2.8 mm; 3.3 mm
Stronger spiral sculpture

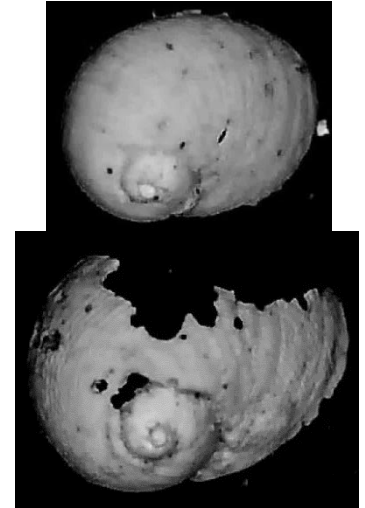


Circulus liratus
(Verrill, 1882)
2.5 mm
Spiral sculpture

Vanikoridae



Macromphalina hanseni
Ward & Blackwelder, 1987
1.8 mm
Highly distinctive shape

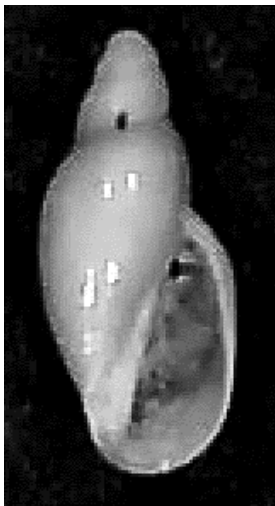


Macromphalina pierroti
Gardner, 1948
2.3 mm; 2.9 mm
Highly distinctive shape

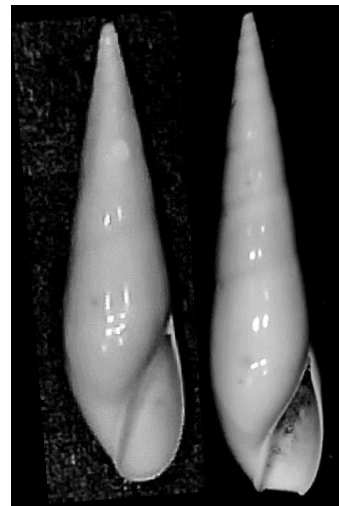


Megalomphalus duplinensis
(Dall, 1892)
Juvenile
1.2 mm
Highly distinctive sculpture

Ersilia & *Eulima*



Ersilia stancyki
Warén, 1980
1.0 mm
Highly distinctive shape



Eulima n. sp.
5.3 mm; 10 mm
3 whorls in protoconch



Eulima sp.
6.5 mm; 6.5 mm
Narrower;
Angle in body whorl



Eulima biconica
(Gardner, 1948)
3.8 mm; 7.6 mm
Smaller aperture; Broader

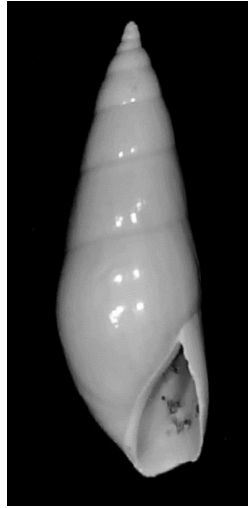


Eulima dalli
(Gardner & Aldrich, 1919)
6.3 mm; 9.5 mm
5 whorls in protoconch

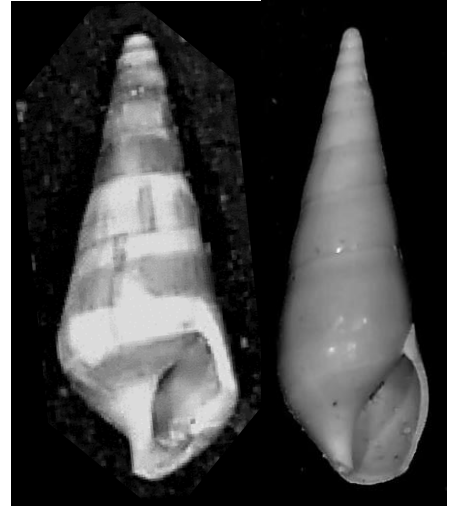
Eulimostraca & *Melanella* I



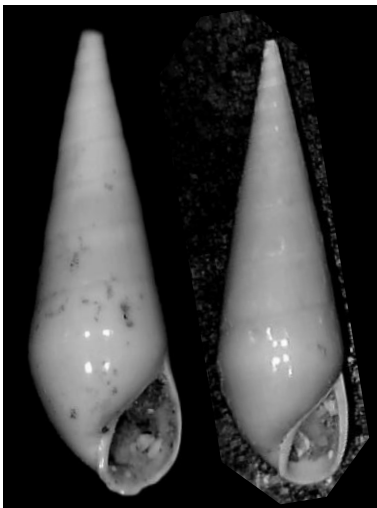
Eulimostraca sp.
2 mm; 2.8 mm
Convex whorls



Melanella n. sp.
5.8 mm
Tall body whorl;
Narrow protoconch



Melanella sp. 1
Juvenile
2.7 mm; 5 mm
Curved Spire;
Narrower than *M. angulata*



Melanella sp. 2
Juvenile; Broken
6.5 mm; 7 mm; max ~12 mm
Concave spire



Melanella sp. 3
Broken
14 mm; max ~17 mm
Large; Very smooth



Melanella angulata
(A. Adams, 1861)
Broken; Broken
4.9 mm; 9 mm
More angular; Narrower

Melanella II & Niso

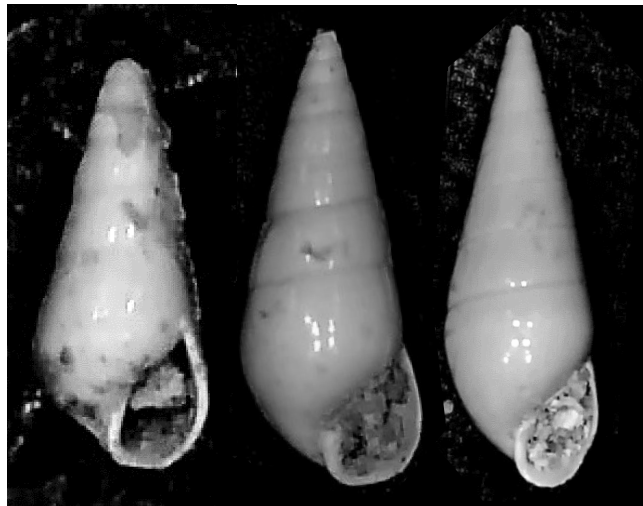


Melanella hypsella
(Verrill & Bush, 1900)

Broken

7.3 mm

Tall final whorl; Broad protoconch

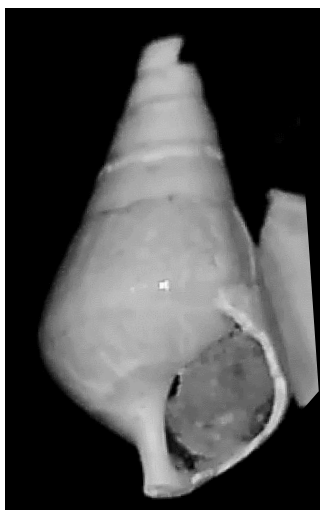


Melanella cf. magnoliana
(Gardner & Aldrich, 1919)

Broken

1.6 mm; 5.5 mm; 9.4 mm

Evenly rounded final whorl



Melanella nisoformis
Olsson & Harbison, 1953

Broken

5.2 mm

More angular; Broader



Niso aeglees

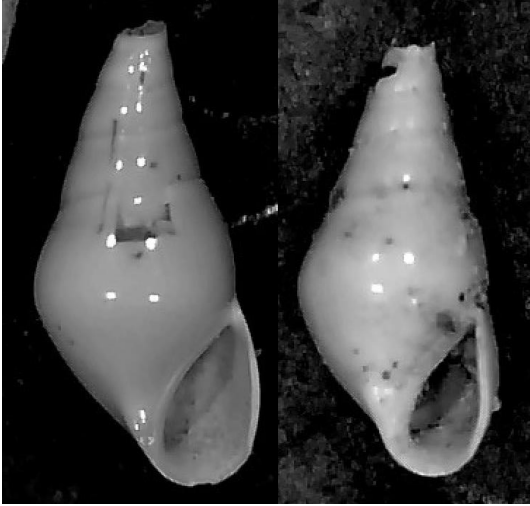
Bush, 1885

Broken

12 mm; max ~17 mm

Open umbilicus

Parvioris & *Vitreolina*



cf. Parvioris sp.
2.1 mm; 2.2 mm
Convex whorls



Vitreolina arcuata
(C. B. Adams, 1850)
Broken
2.1 mm
Bends clockwise



Vitreolina bermudenzi
(Pilsbry & Aguayo, 1933)
2.2 mm
Bends counter-clockwise



Vitreolina cf. colini
Espinosa & Ortea, 2006
1.2 mm
Straight, broad



Vitreolina conchita
(Olsson & Harbison, 1953)
1.6 mm
Straight, narrow

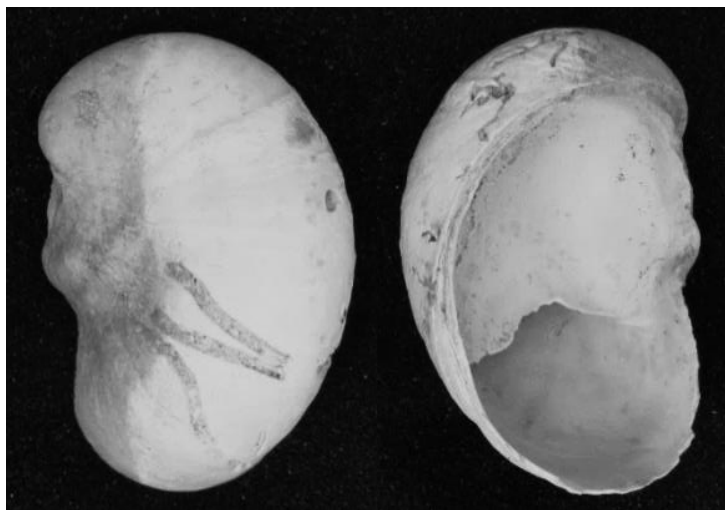
Crepidula



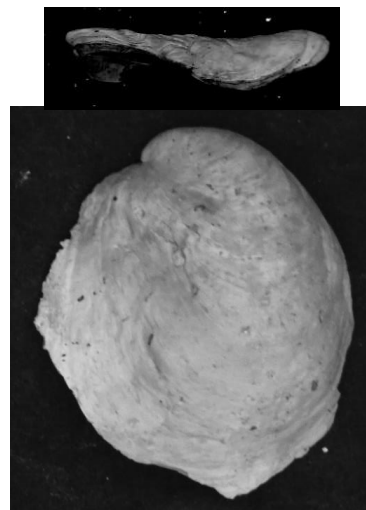
Crepidula cf. cymbaeformis
(Conrad, 1844)
46 mm
Narrow



Crepidula convexa
Say, 1822
6.7 mm
Small; Highly convex

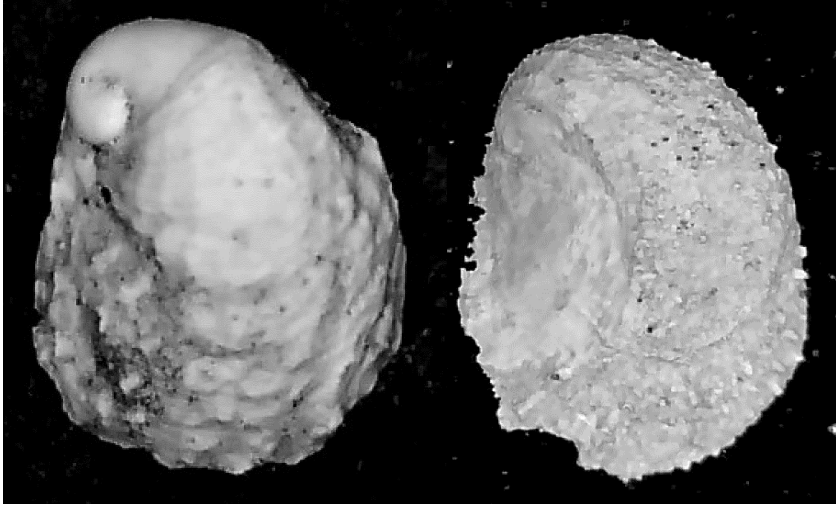


Crepidula fornicata
(Linnaeus, 1758)
64 mm
Common *Crepidula*



Crepidula plana
Say, 1822
26 mm; 39 mm; max ~50 mm
Flat

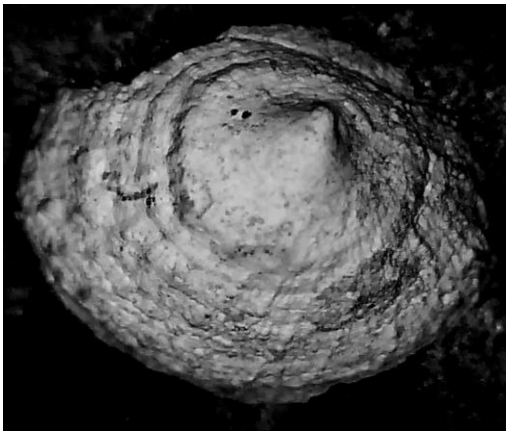
Calyptraeidae II & Eratoidea



Bostrycapulus aculeatus
(Gmelin, 1791)
Juvenile; Adult
1.8 mm; 19 mm; max ~24 mm
Sculptured



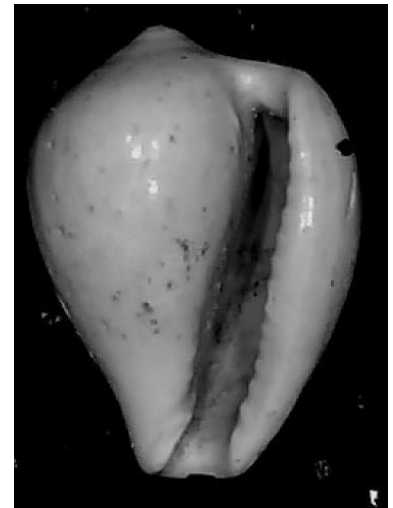
Calyptraea concentricum
(H.C. Lea, 1843)
5.5 mm
Small; Hemispherical



Crucibulum sp.
14 mm
Tall



Crucibulum multilineatum
(Conrad, 1841)
11 mm; 12 mm; max ~22 mm
Flatter



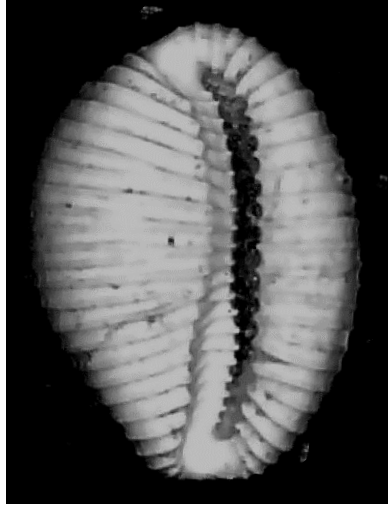
Hespererato maugariae
(Gray, 1832)
5.8 mm
Distinctive Shape

Triviidae



Cleotrivia cf. leucosphaera
(Schilder, 1931)

7.3 mm
Shorter



Niveria suffusa
(Gray, 1827)

9.4 mm
24 lines on right



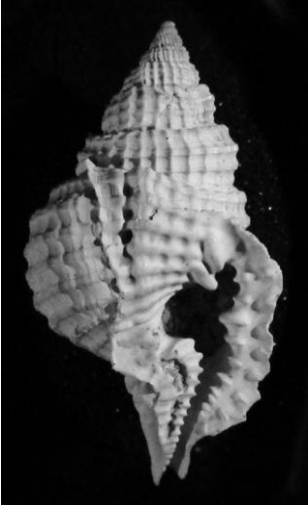
Pusula sp.

10 mm
One branching line on left

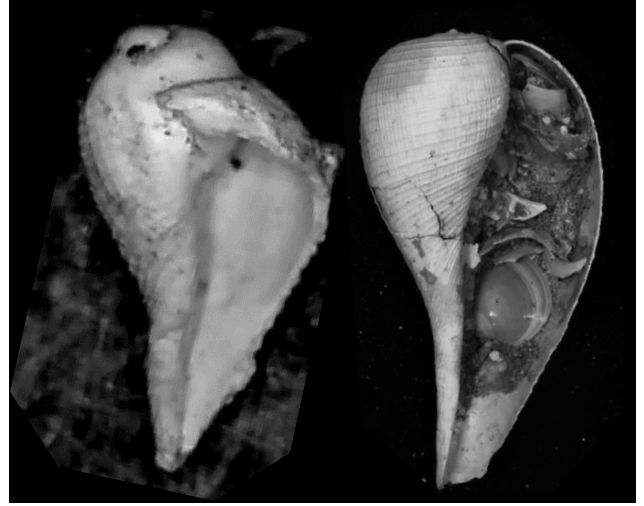


Pusula cf. floridana
(Oisson & Harbison, 1953)
10 mm; 11 mm; 11 mm
18 lines on right

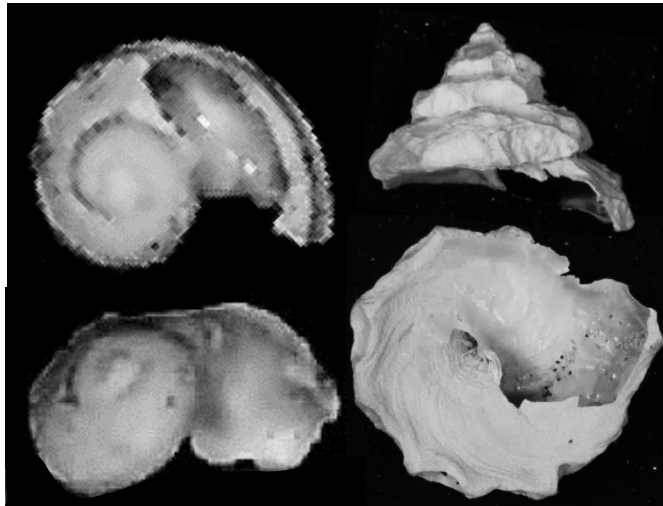
Personidae, Ficidae & Xenophoridae



Distorsio cf. clathrata CS
(Lamarck, 1816)
63 mm
Highly distinctive shape



Ficus papyratis
(Say, 1822)
Juvenile; Adult
6.2 mm; 96 mm; max ~170 mm 2LM
Highly distinctive shape



Xenophora conchyliophora
(Born, 1780)
1 mm wide; 0.65 mm tall;
34 mm wide; 25 mm tall LM
Highly distinctive shape