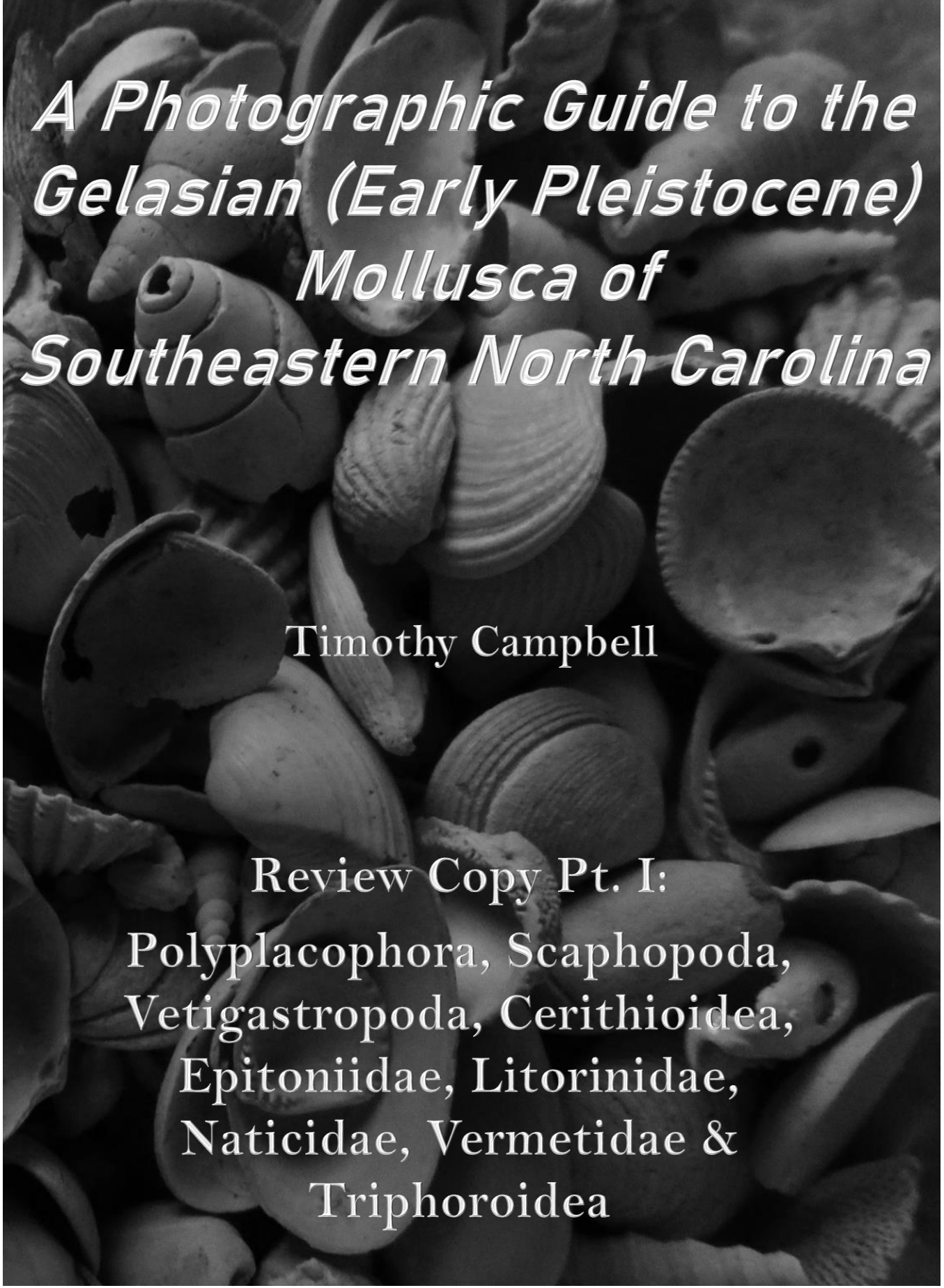
2021

Waccamaw Mollusca Review Copy Pt. I: Polyplacophora, Scaphopoda, Vetigastropoda, Cerithoidea, Epitoniidae, Litorimidae, Naticidae, Vermetidae & Triphoroidea

Timothy Campbell



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

Timothy Campbell

Review Copy Pt. I:

Polyplacophora, Scaphopoda, Vetigastropoda, Cerithioidea, Epitoniidae, Litorinidae, Naticidae, Vermetidae & Triphoroidea

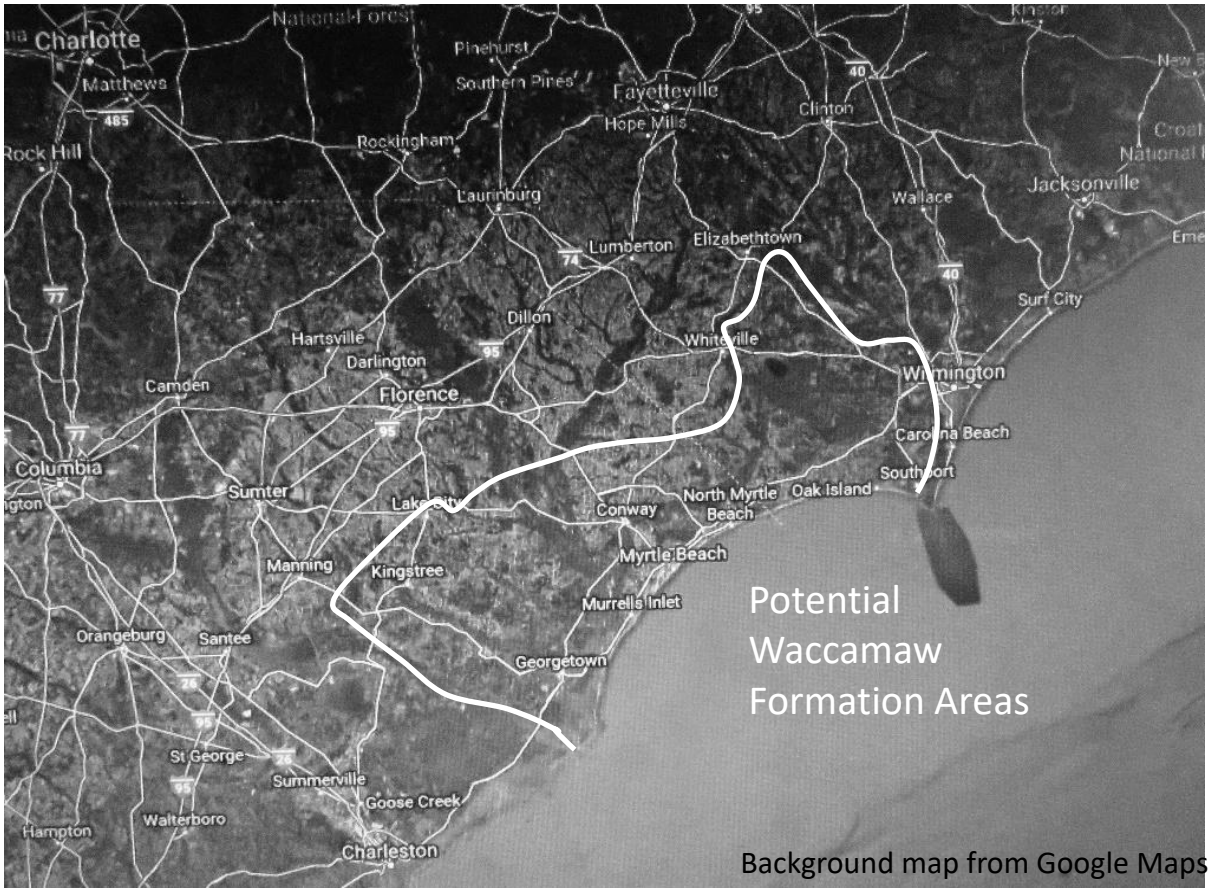
Introduction

Location

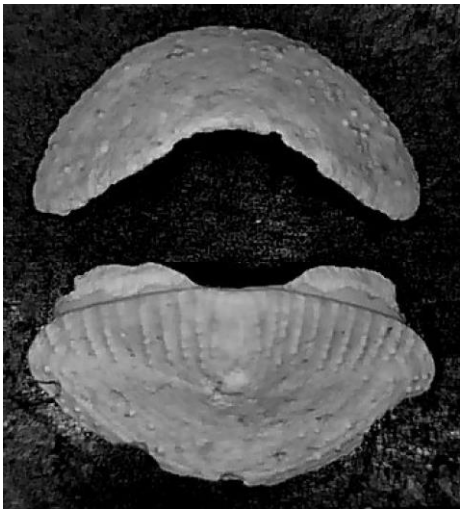
The Lower Waccamaw Formation contains a rich basal Pleistocene (early Gelasian, 2.4-2.0 million years old) fauna with an extreme abundance and diversity of mollusks (>90% of the fossils and 900+ species, of which I illustrate 743) in addition to various echinoderms, arthropods, annelids, corals, bryozoans, 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.

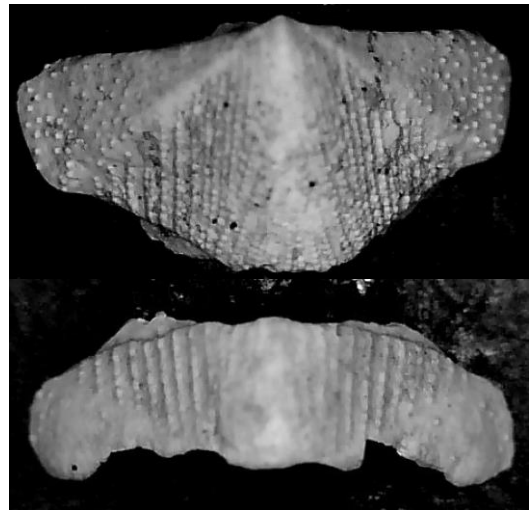
Roughly 40% of the species are extant. The species derive from multiple habitats, including 30-50 m sandy-bottom shelf, cementing bivalve reef, 10-20 m sandy-bottom shelf, surf to subtidal, saltmarsh, muddy-bottom sound, inlet, and freshwater to brackish.



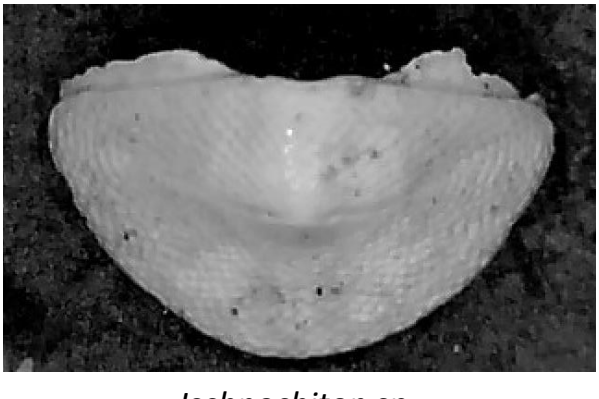
Polyplacophora



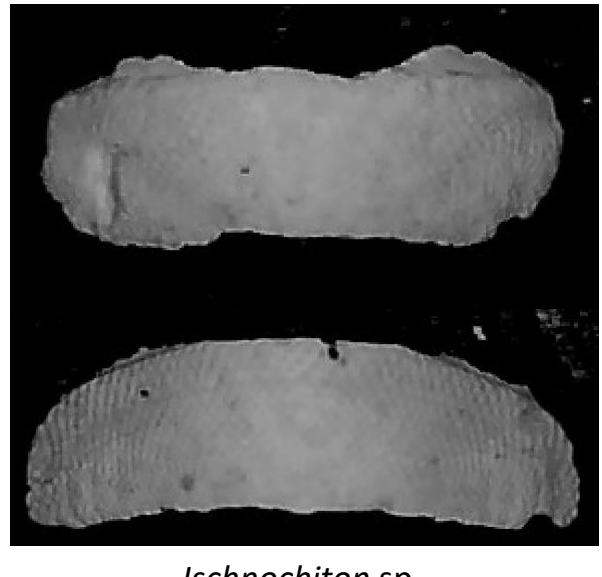
Chaetopleura apiculata
(Say, 1834)
Terminal plates
5.6 mm; 5.8 mm
Bumps; Striations



Chaetopleura apiculata
(Say, 1838)
Typical plates
8.5 mm; 6.7 mm; max 10 mm
Linear striations



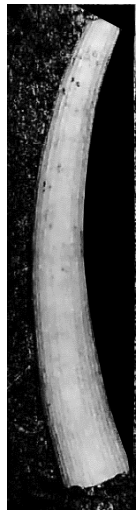
Ischnochiton sp.
Terminal Plate
2.5 mm
Dents



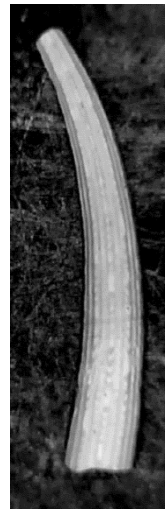
Ischnochiton sp.
Typical plate
2.8 mm; 3.1 mm
Radial striations

Scaphopoda

Antalis sp.
14 mm
8 axial striations



Antalis cf. cerata
(Dall, 1881)
18 mm
20 axial striations



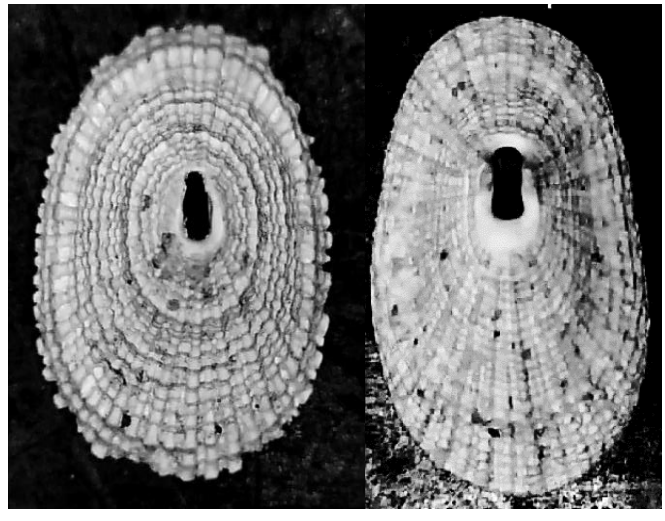
Paradentalium cf. waccamawense
(Gardner, 1948)
22 mm
12-14 axial striations

Graptacme cf. lepta
(Bush, 1885)
Broken
3.7 mm; 4.3 mm
Sloping sides

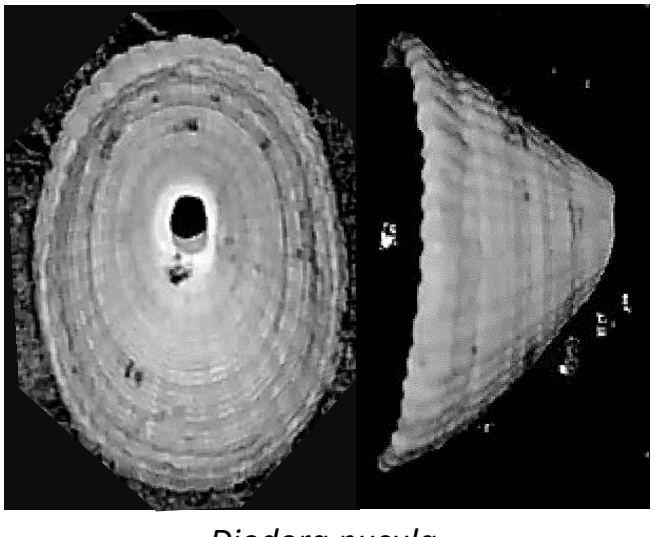
Polyschides tetraschistus
(Watson, 1879)
8.5 mm
4 deep indents;
Fine circular lines

Fissurellidae

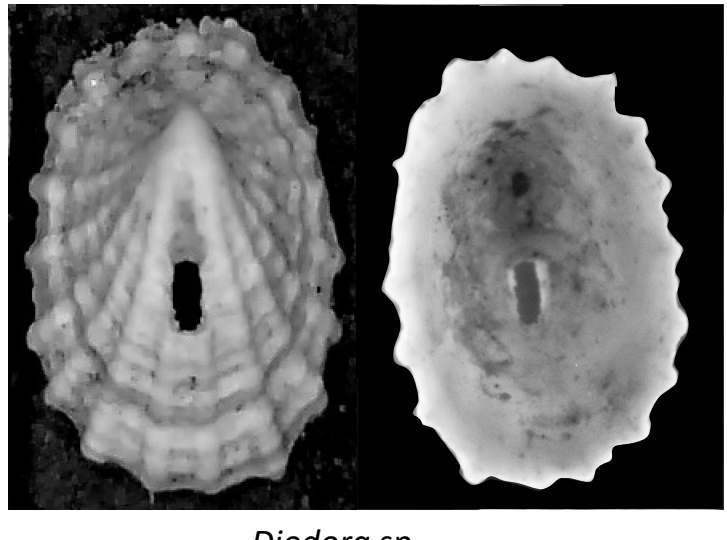
Diodora caloosaensis
(Dall, 1892)
13.5 mm; 29 mm; max ~33 mm 2LM
Rounded; Bilobed hole



Diodora carditella petasa
Olsson & Harbison, 1953
8.5 mm; 21 mm
Elongate; Bilobed hole

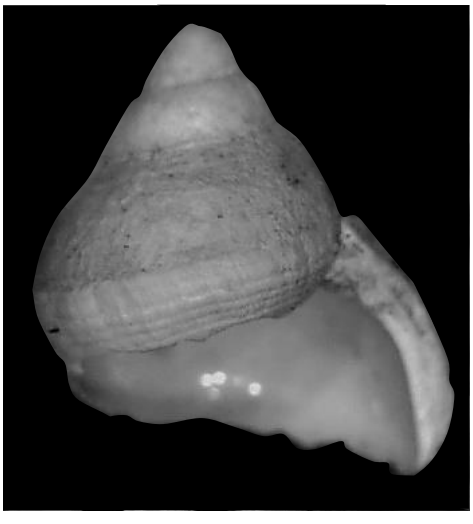


Diodora nucula
(Dall, 1892)
4.3 mm
Very Tall; Small

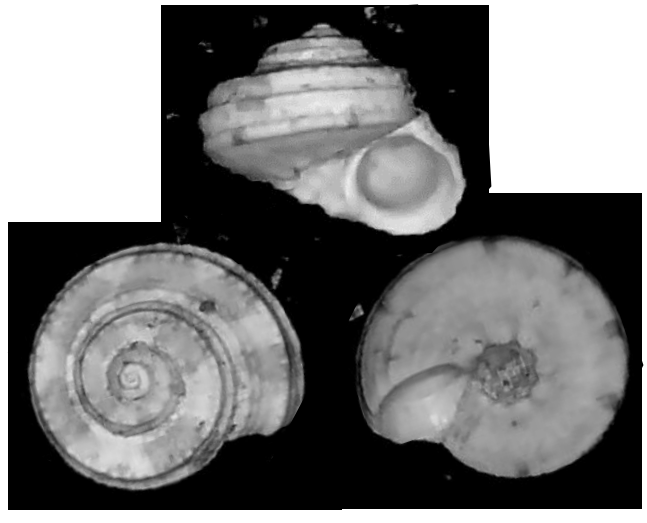


Diodora sp.
Juvenile
1.95 mm
Off-center hole

Trochoidea I



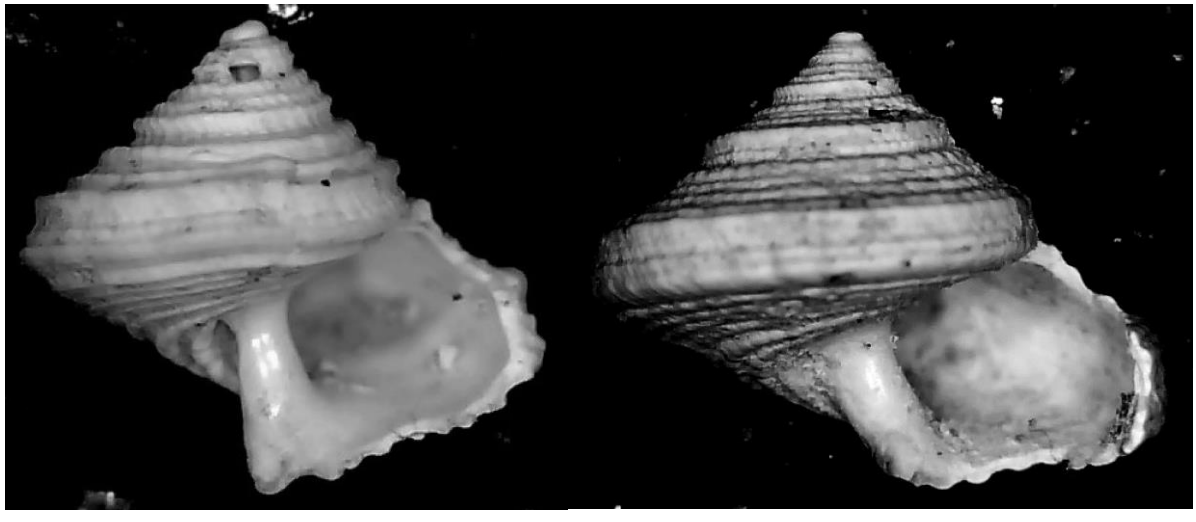
Trochoidea *incertae sedis*
4 mm
Highly distinctive shape



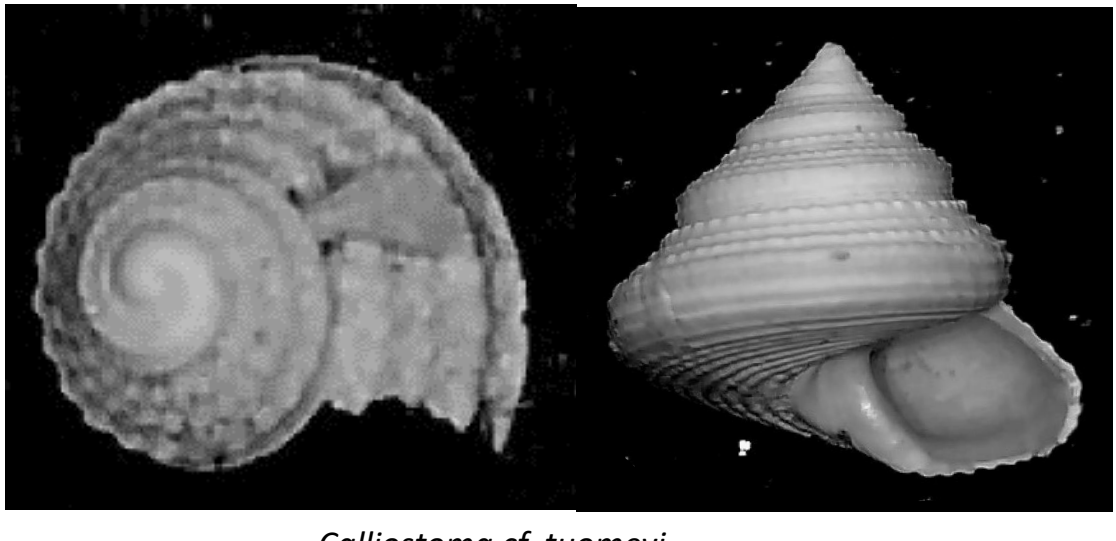
Arene cf. pergemma
(Gardner, 1948)
4.9 mm
Flatter; Larger umbilicus; 6 color bands

Arene tricarinata
(Stearns, 1872)
5.7 mm
Taller; Smaller umbilicus; 3 color bands

Calliostomatidae I

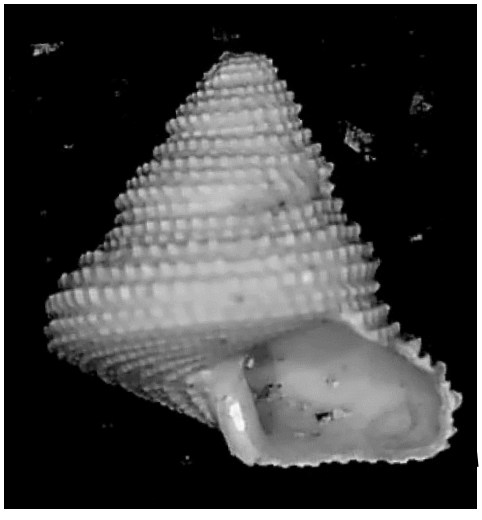


Calliostoma cf. carolinense
Gardner, 1948
4.3 mm; 9 mm
Juvenile; Subadult
More spiral sculpture



Calliostoma cf. tuomeyi
Olsson, 1914
Juvenile; Adult
1.45 mm; 13.5 mm; max 16 mm
Flatter; Beaded sculpture

Calliostomatidae II



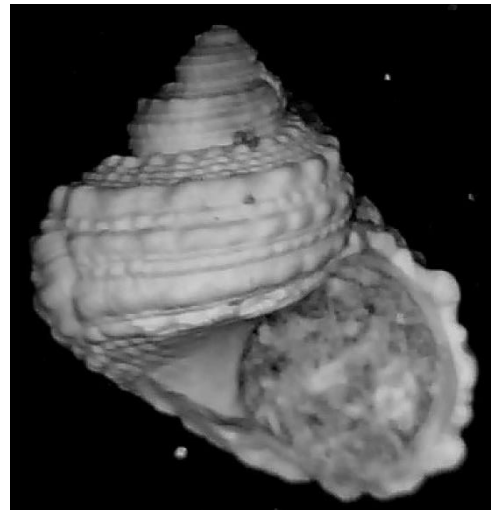
Calliostoma cf. euconulum
Olsson & Harbison, 1953
6 mm
Taller; Beaded sculpture

Calliostoma cf. jujuconulum
Olsson & Harbison, 1953
16 mm
More rounded spire

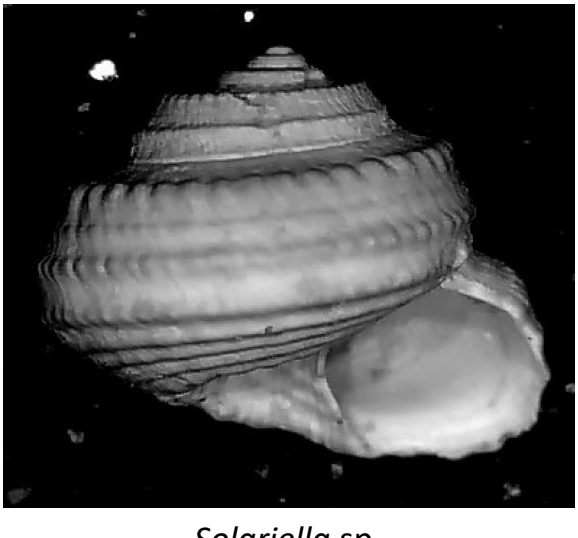
Calliostoma willcoxianum
Dall, 1892
3.8 mm; 16 mm
Taller; Smoother-spired

Trochoidea IV

Calliostoma cf. yucatecanum
Dall, 1881
5.2 mm
Juvenile
Very Flat;
Widely spaced spiral sculpture



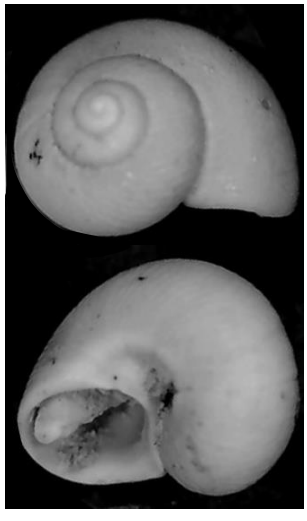
Turbo castanea ayersi
Olsson, 1967
16 mm; max ~35 mm Sh
Highly distinctive shape



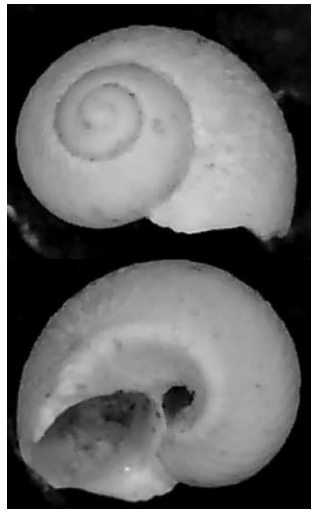
Solariella sp.
9 mm
Taller

Solariella gemma
(Tuomey & Holmes, 1856)
7.5 mm
Beaded sculpture; Open umbilicus

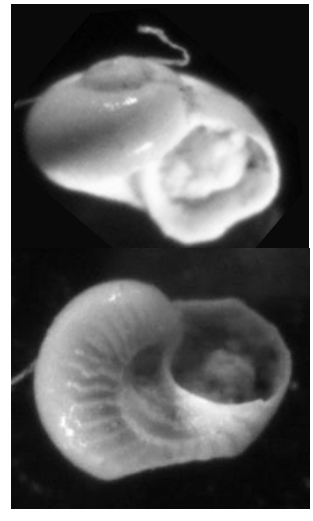
Didianema & *Skenea*



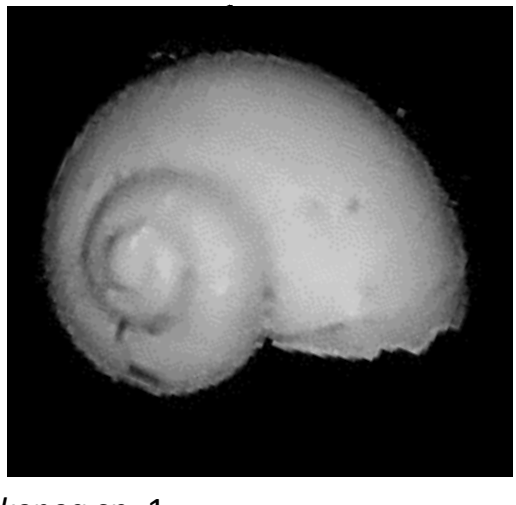
Didianema carolinae
Gardner, 1948
2 mm
More whorls in protoconch;
Weaker umbilical carina



Didianema duplinensis
(Dall, 1890)
1.5 mm
More whorls in protoconch;
Stronger umbilical carina



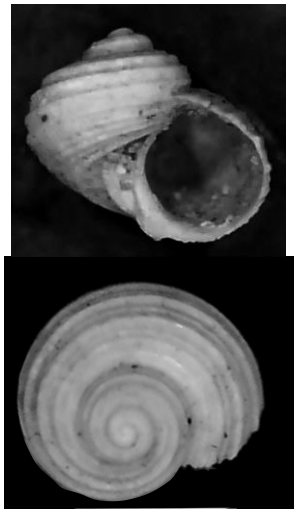
Skenea harrisii
(Olsson, 1916)
Juvenile
0.7 mm
Striations and umbilical keel



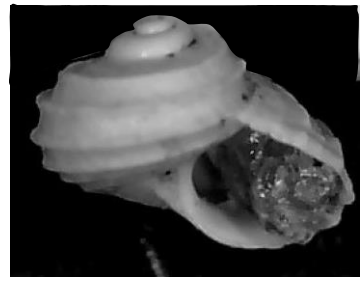
Skenea sp. 1
1.2 mm
Fewer whorls in protoconch; Smooth

Skenea sp. 2
1.3 mm
Fewer whorls in protoconch;
Faint Axial Lines

Parviturbo & Conradiidae



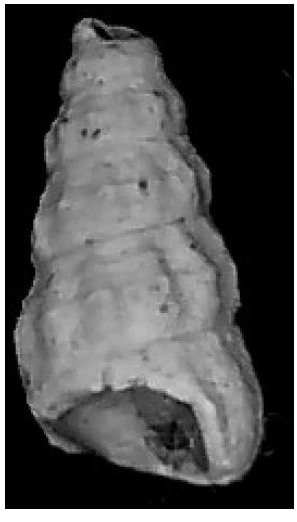
Parviturbo sp. 1
1.7 mm
Broader striations



Parviturbo sp. 2
1.6 mm
Flatter

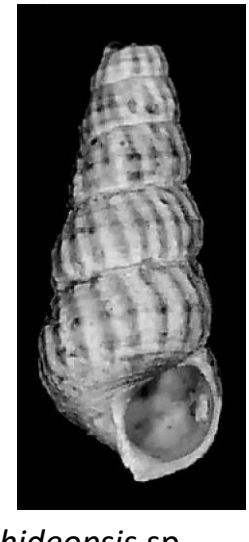
Gelasinostoma elegantula
(Dall, 1892)
Subadult
2 mm
Finer striations

Cerithioidea I



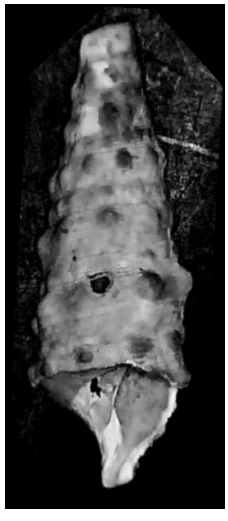
Cerithioidea *incertae sedis*
Broken
2.2 mm
Stronger axial sculpture

Potamididae *incertae sedis*
5.5 mm
Highly distinctive sculpture

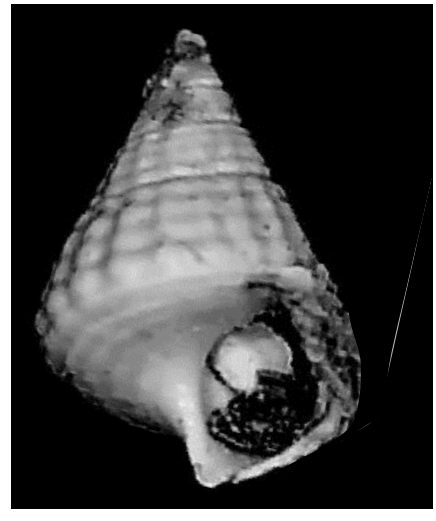


Cerithideopsis sp.
Broken
3.9 mm
Highly distinctive sculpture

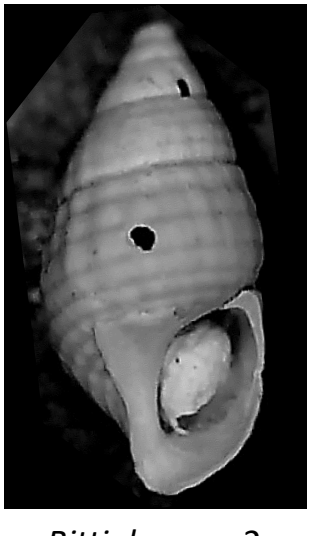
Cerithiidae



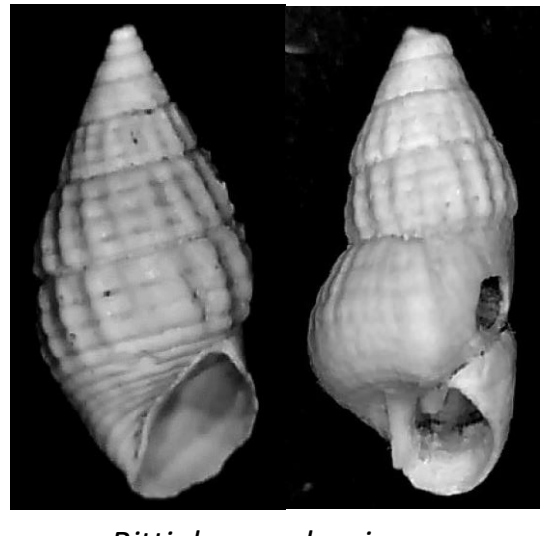
Cerithium vicinia
Olsson & Harbison, 1953
27 mm LM
Highly distinctive sculpture



Bittiolum sp. 1
Juvenile ?
2.6 mm
Broader



Bittiolum sp. 2
2.9 mm
Smoother



Bittiolum podagrinum
(Dall, 1892)
4 mm; 4.5 mm
Common *Bittiolum*

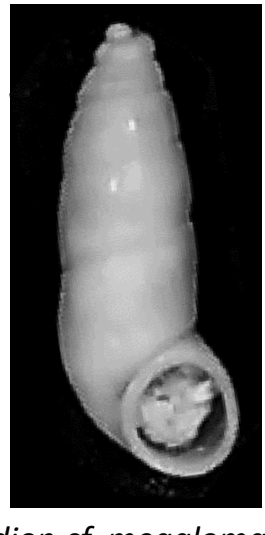
Scaliolidae & Pickworthiidae

Alabina sp. 1
2.3; 2.8 mm
Smaller aperture

Alabina sp. 2
4 mm
Stronger sculpture

Finella sp.
4.2 mm; 4.5 mm
Smooth-sided; Narrower

Finella cf. adamsii
(Dall, 1889)
4.5 mm
Larger aperture



Pelycidion cf. megalomastoma
(Olsson & McGinty, 1958)
1.3 mm
Highly distinctive shape

Turritella

Turritella cf. fluxionalis
Rogers & Rogers, 1837
Subadult
22 mm; max ~34 mm
Fine spiral sculpture

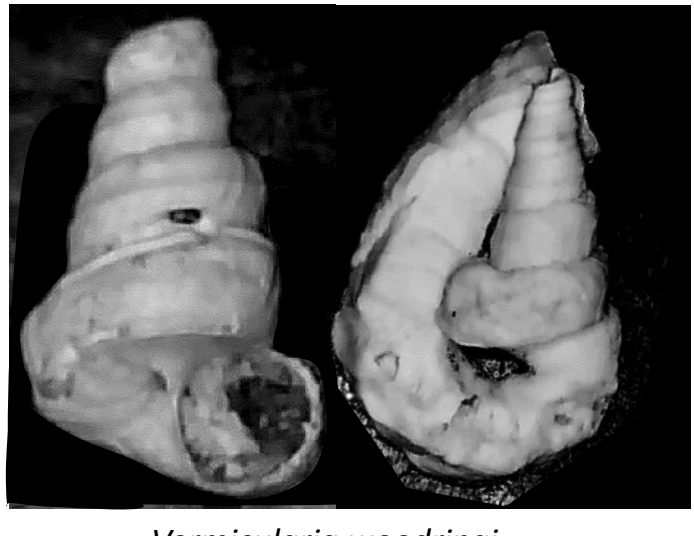
Turritella perexilis
Conrad, 1873
24 mm
Common *Turritella*

Turritella perexilis var. 1
Conrad, 1873
13 mm
Common *Turritella*

Turritella perexilis var. 2
Conrad, 1873
21 mm
Common *Turritella*

Vermicularia

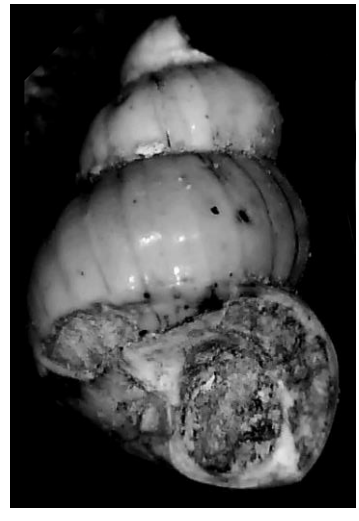
Vermicularia weberi
Olsson & Harbison, 1953
Juveniles
23 mm; 18 mm
Distinctive suture



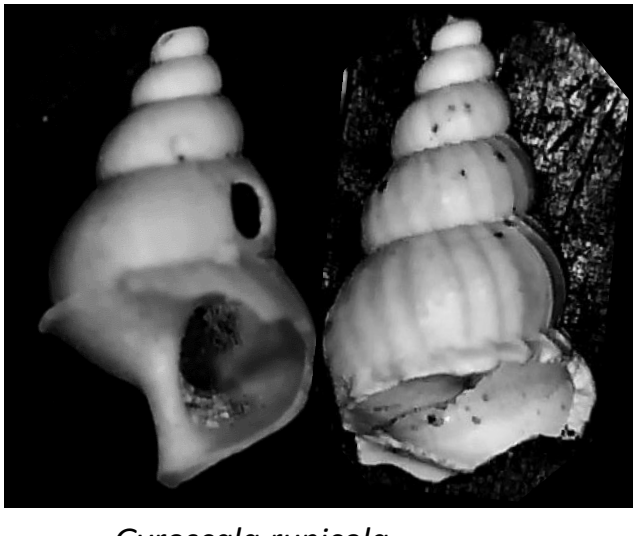
Vermicularia woodringi
Olsson & Harbison, 1953
Juveniles
10.5 mm; 13 mm
Broader

Epitoniidae I

Cycloscala echinaticosta
(d'Orbigny, 1842)
1.7 mm
Very small protoconch



Depressiscala sp.
Broken
6 mm
Close to smooth



Gyroscala rupicola
(Kurtz, 1860)
Broken
3.8 mm; 7 mm
Broad; Fine spiral sculpture

Opalia cf. debouryi
(Dall, 1890)
17 mm
9 broad axial ribs
Very lrge

Opalia cf. pumilio
(Mörch, 1875)
4.5 mm; 4.7 mm
Uneven axial ribs

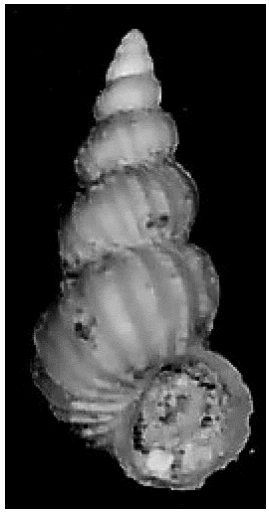
Epitonium I

Epitonium fargoi
Olsson & Harbison, 1953
Juvenile
3 mm; max ~4 mm
10-12 blade-like axial ribs

Epitonium cf. foliaceicosta
(d'Orbigny, 1842)
Subadult; Broken
5.2 mm; 7 mm
8-10 blade-like axial ribs

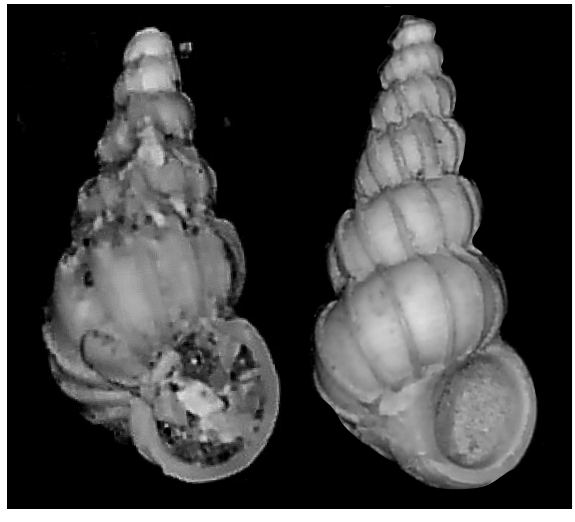
Epitonium cf. albidum
(d'Orbigny, 1842)
Juvenile; Broken
3.9 mm; 9.5 mm
12-14 small blade-like axial ribs

Epitonium II



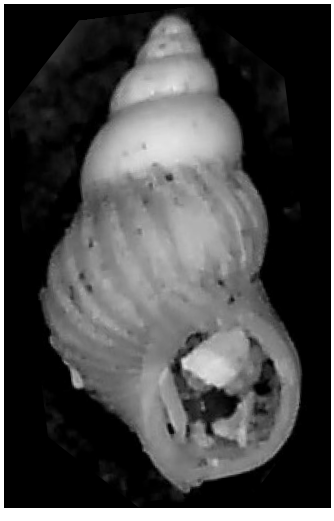
Epitonium aff. aciculum
(H. C. Lea, 1843)
Juvenile
2.6 mm
Very narrow; Blade-like ribs

Epitonium cf. aciculum
(H. C. Lea, 1843)
Juvenile; Broken; Broken
5 mm; 7 mm; 8 mm
18-22 fine axial ribs
Very fine spiral sculpture



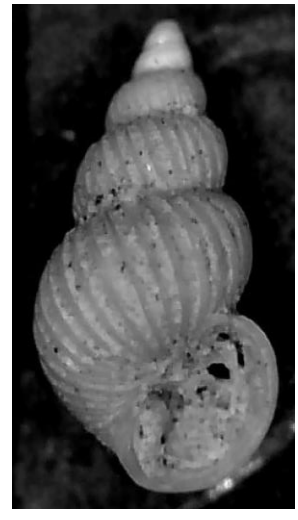
Epitonium duplinianum
(Olsson, 1916)
Juvenile; Adult
3 mm; 9.6 mm
12-14 fine axial ribs;
Fine spiral sculpture

Epitonium III & Littorinidae



Epitonium cf. fasciatum
Gardner, 1948
Juvenile
1.5 mm
Broad Protoconch

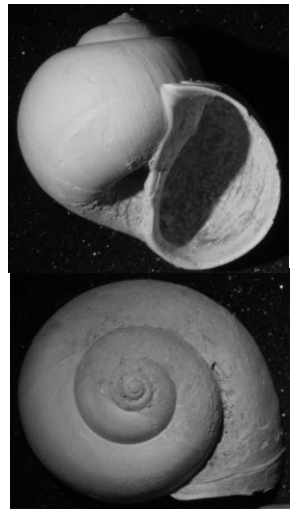
Epitonium cf. candeanum
(d'Orbigny, 1842)
Subadult
4.2 mm; max 5.5 mm
14 axial ribs



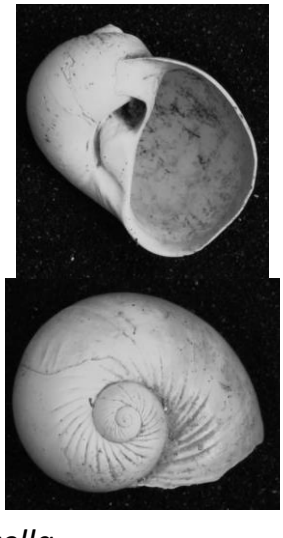
Epitonium cf. curtum
(Emmons, 1858)
Juvenile
2.4 mm
20-24 very fine axial ribs

Littoraria cf. carolinensis
(Conrad, 1863)
Broken
12 mm; 16mm; max ~24 mm
Highly distinctive shape

Euspira & Naticarius



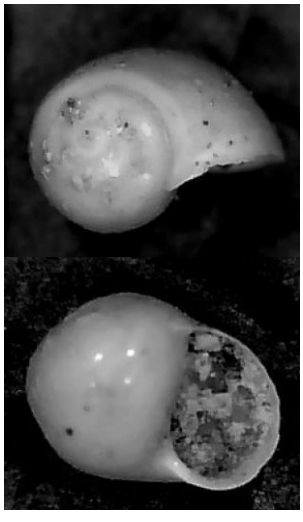
Euspira sayana
(Campbell, 1993)
50 mm tall, 53 mm wide OD
Strong suture



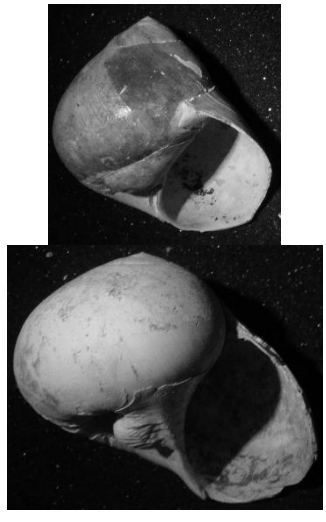
Naticarius plicatella
(Conrad, 1863)
36 mm; max 41 mm tall, 34 mm; max 39 mm wide
Plications radiating from suture

Naticarius plicatella
(Conrad, 1863)
Operculum
36 mm
Highly distinctive shape

Naticidae II



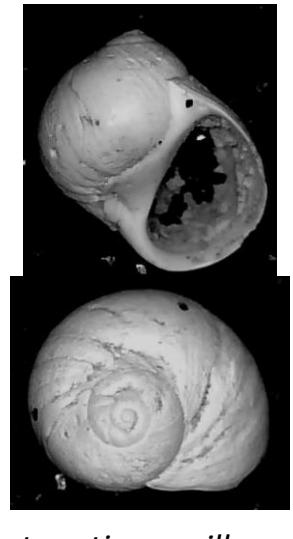
Neverita duplicata ?
(Say, 1822)
1.6 mm
Tiny juvenile
Rapidly expanding whorls



Neverita duplicata
(Say, 1822)
Apertural view—Male; Female
55 mm; 64 mm tall OD
Close to plugged umbilicus

Neverita duplicata
(Say, 1822)
Apical view—Male; Female
56 mm; 83 mm wide OD
Close to plugged umbilicus

Sigatica carolinensis
(Dall, 1889)
3.6 mm tall, 3.8 mm wide
Spiral Striations



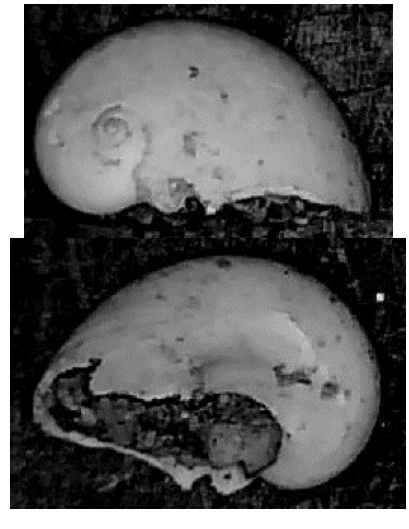
Tectonatica pusilla
(Say, 1822)
Apertural view
7 mm tall, 6.3 mm wide
Small; Taller

Sinum

Sinum multiplicatum
(Dall, 1892)
34 mm
Many fine spiral lines;

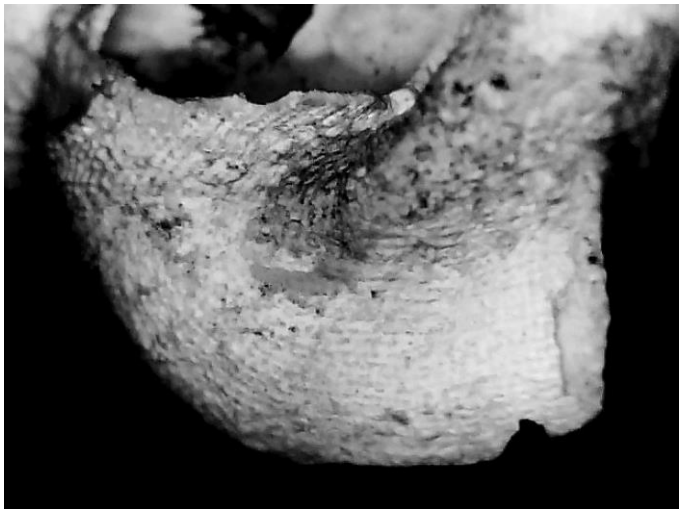
Sinum perspectivum
(Say, 1831)
42 mm OD
Broader spiral lines;
Juvenile Flatter

Sinum multiplicatum
(Dall, 1892)
4.5 mm
Fine striations; Taller

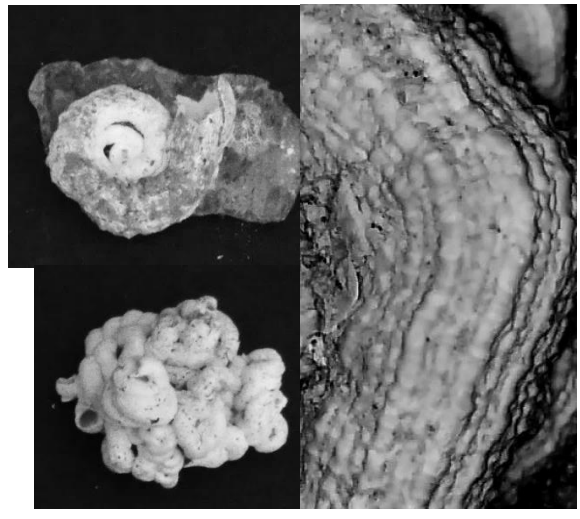


Sinum perspectivum
(Say, 1831)
6.6 mm
Flatter

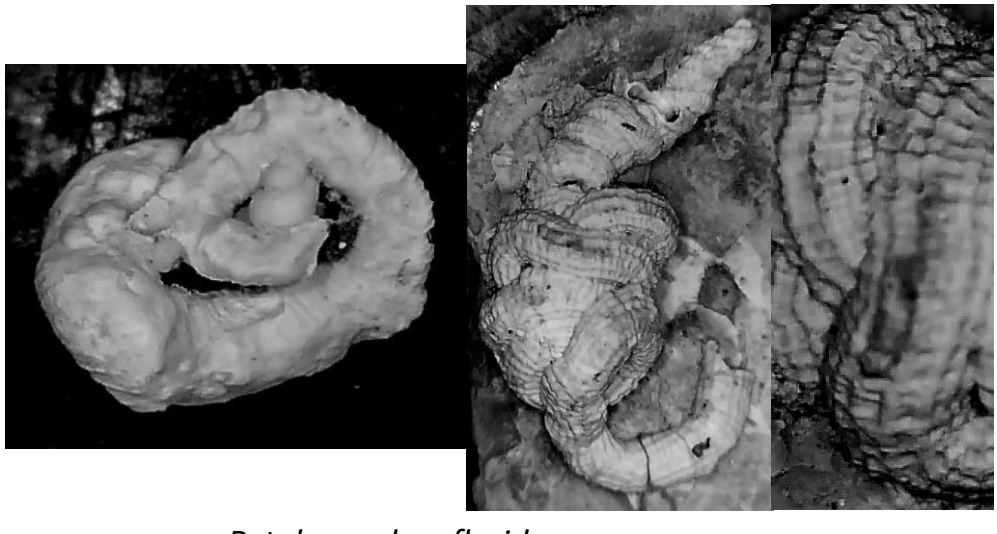
Vermetidae



Vermetidae *incertae sedis*
View 10 x 13 mm
Highly variable shape
Very fine sculpture

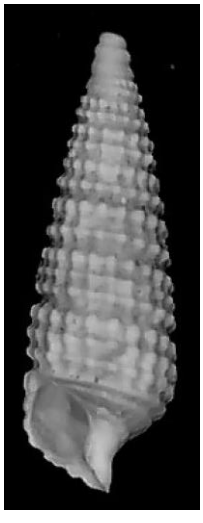


Thylacodes granifer
(Say, 1824)
Enlarged View 9 x 4.9 mm
Highly variable shape
Highly distinctive sculpture

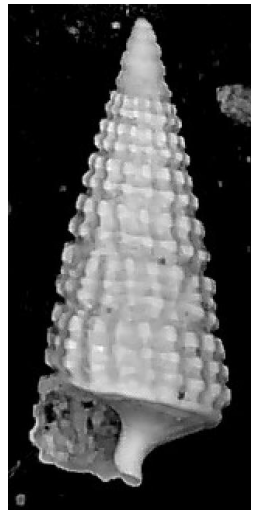


Petaloconchus floridanus
Olsson & Harbison, 1953
3 x 3.6 mm; Enlarged View 9 x 4 mm
Highly variable shape
Highly distinctive sculpture

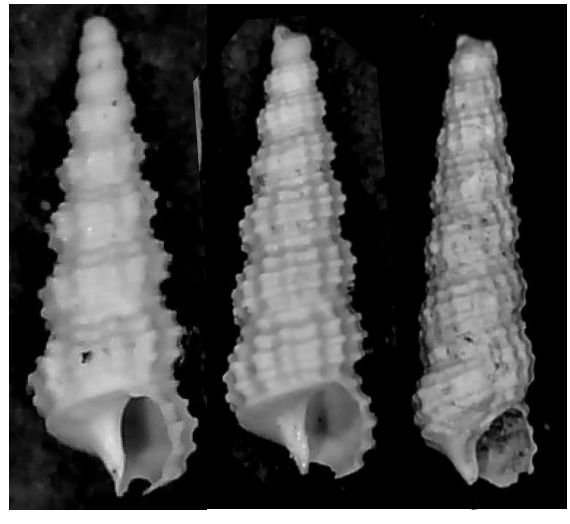
Triphoridae, Newtoniellidae & *Seila*



Marshallora sp.
4 mm
Sinistral; Narrower



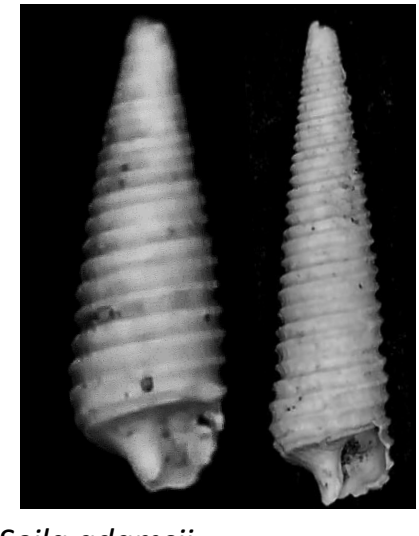
Marshallora submonilifera
(d'Orbigny, 1852)
Subadult
3.5 mm
Sinistral; Conical



Metaxia cf. rugulosa
(C. B. Adams, 1850)
Subadult; Broken; Broken
2.2 mm; 2.5 mm; 4.6 mm
Convex whorls

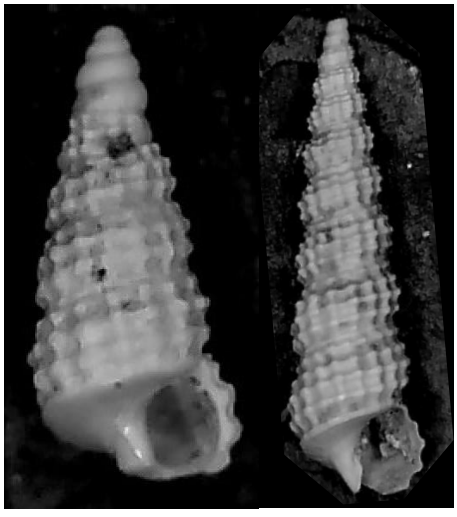
Cheirodonta dupliniana
(Olsson, 1916)
Broken
4.2 mm; 4.4 mm
Sinistral; curved spire

Retilaskeya persubulata
(Gardner, 1948)
8.7 mm
Highly distinctive sculpture

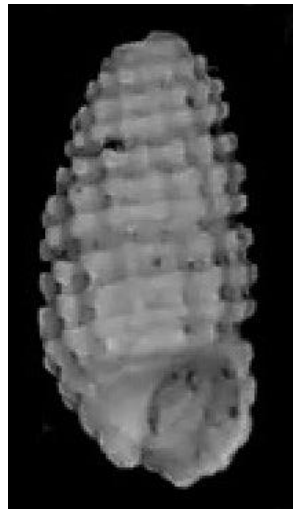


Seila adamsii
(H. C. Lea, 1845)
Juvenile
3 mm; 8.5 mm; max. ~15 mm
Spiral sculpture

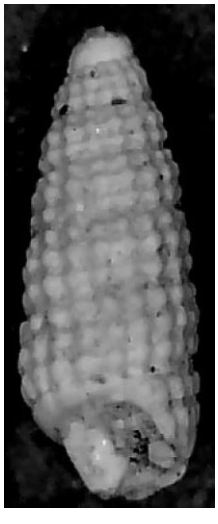
Cerithiopsis



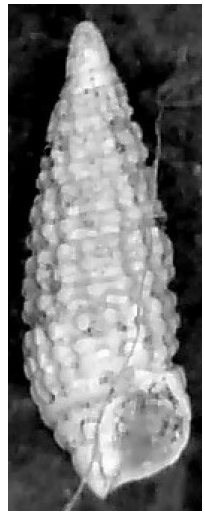
Cerithiopsis sp.
1.8 mm; 4.5 mm
Tall, Convex whorls



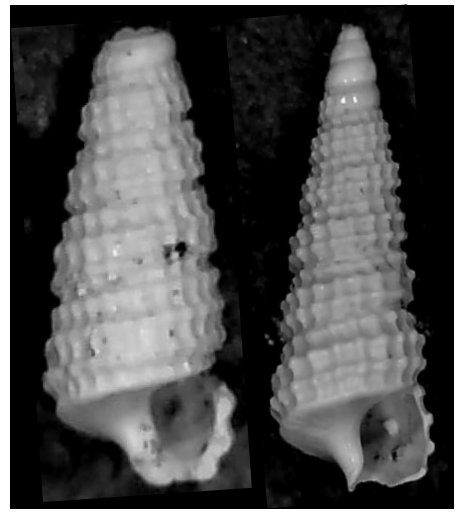
Cerithiopsis brassica
Olsson & Harbison, 1953
Juvenile, Broken
1.2 mm
Small and broad



Cerithiopsis dauca
Olsson & Harbison, 1953
Broken
2.2 mm
Spacing between top and middle ridges in whorl increases with age



Cerithiopsis maisana
Olsson & Harbison, 1953
2.5 mm
Evenly-spaced spiral ridges



Cerithiopsis scariphus
Dall, 1892
Juvenile; Broken
2 mm; 3 mm
One spiral ridge in indent