

Gardner-Webb University

Digital Commons @ Gardner-Webb University

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

2021

Waccamaw Mollusca Review Copy Pt. 6: Heterobranchia

Timothy Campbell

Follow this and additional works at: <https://digitalcommons.gardner-webb.edu/early-pleistocene-mollusca-photographic-guide>



Part of the [Marine Biology Commons](#)



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

Timothy Campbell

Review Copy Pt. VI:
Heterobranchia

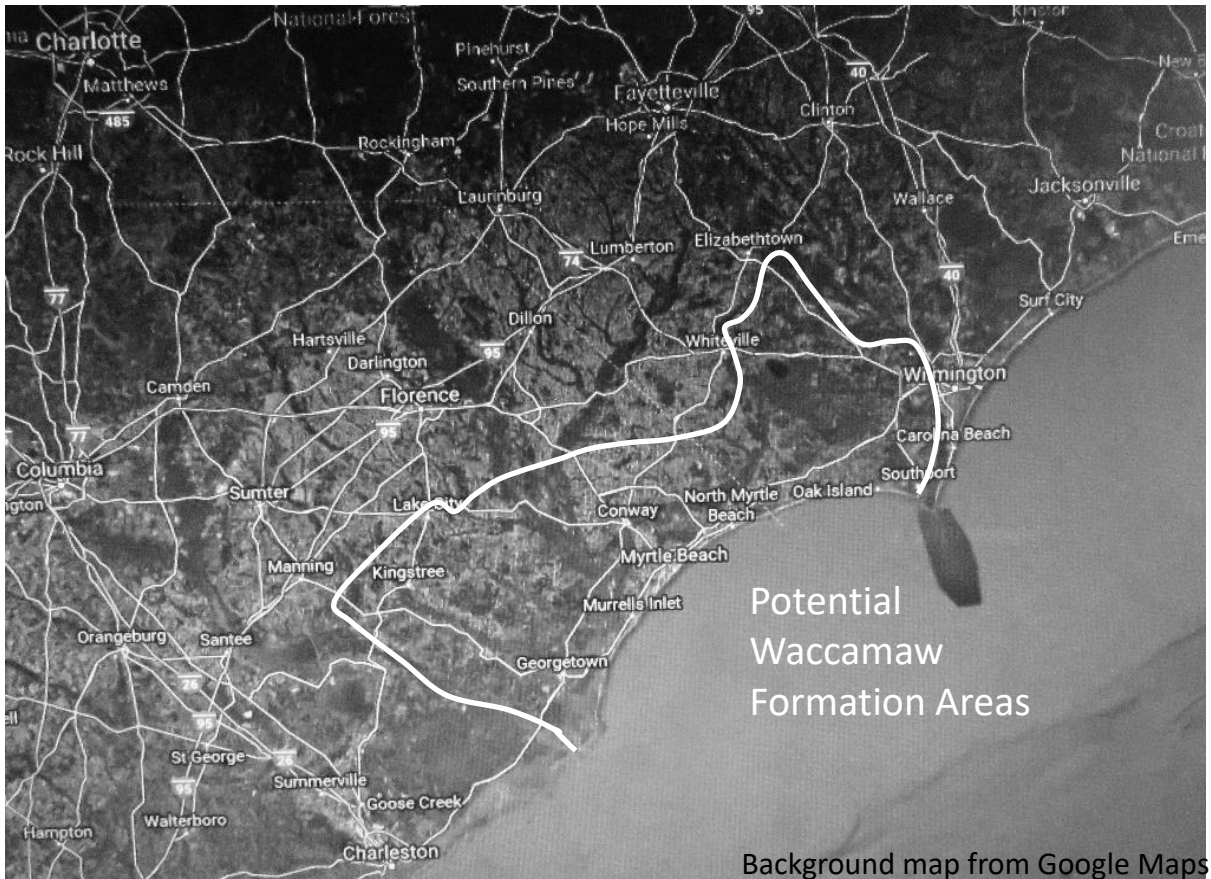
Introduction

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.



Murchisonellidae & Architectonicida



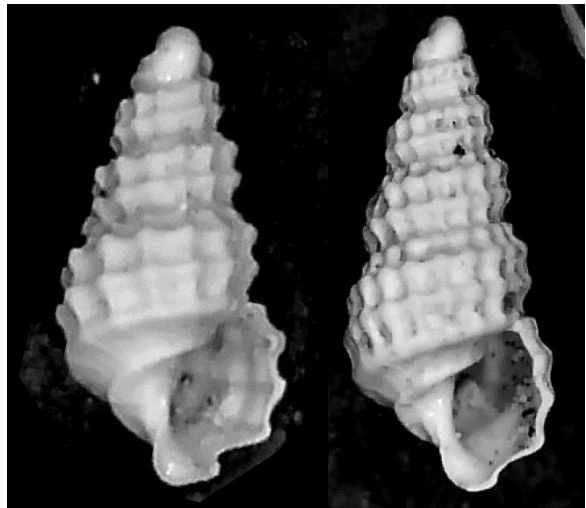
Heterobranchia ? incertae sedis
1.6 mm
Highly distinctive shape



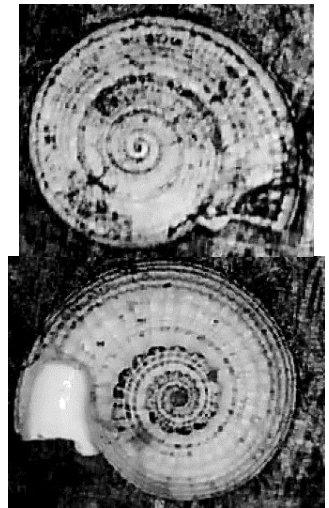
Ebala sp.
Broken
2.2 mm
Fine incised spiral lines;
Faint axial growth lines



Henrya n. sp.
1.6 mm
<1 whorl protoconch;
Very small

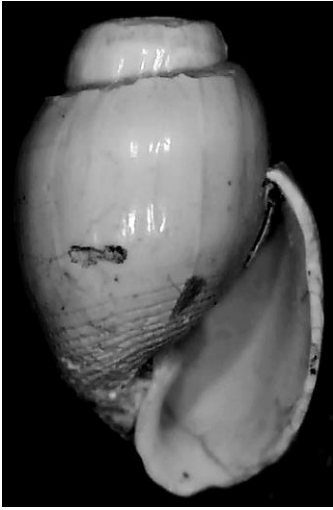


Mathilda cf. agria
(Dall, 1889)
Juveniles
1.9 mm; 2.4 mm
Sideways protoconch



Pseudotorinia retifer
(Dall, 1892)
7.2 mm
Completely flat spire

Retusidae



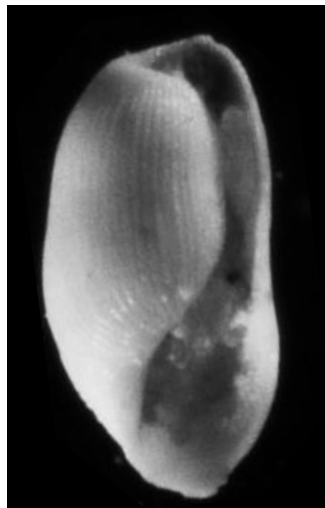
Acteon cf. candens
Rehder, 1939
Broken
7 mm
Highly distinctive shape



Ringicula floridana
Dall, 1889
2.3 mm
Faint spiral striations

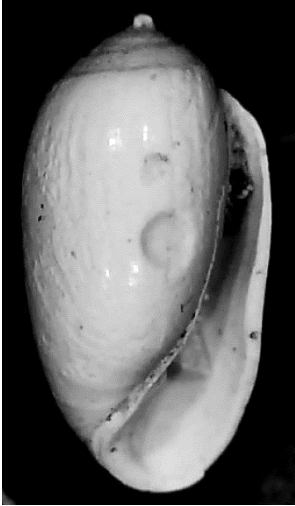


Ringicula cf. guppyi
Dall, 1889
1.3 mm
Narrower

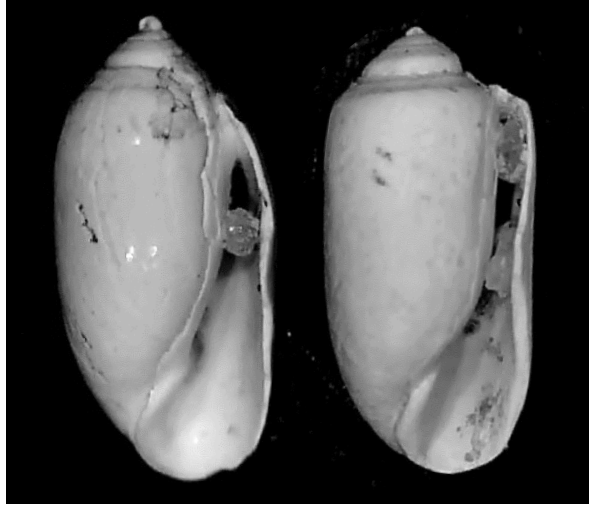


Retusa sulcata
(d'Orbigny, 1841)
1.05 mm
Highly distinctive shape

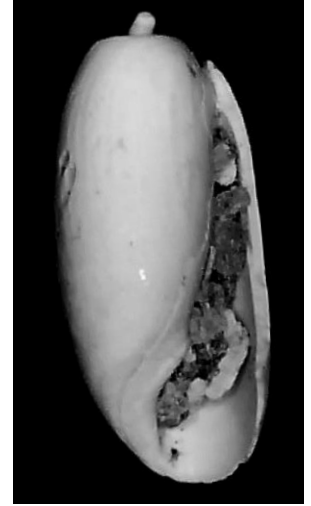
Tornatinidae



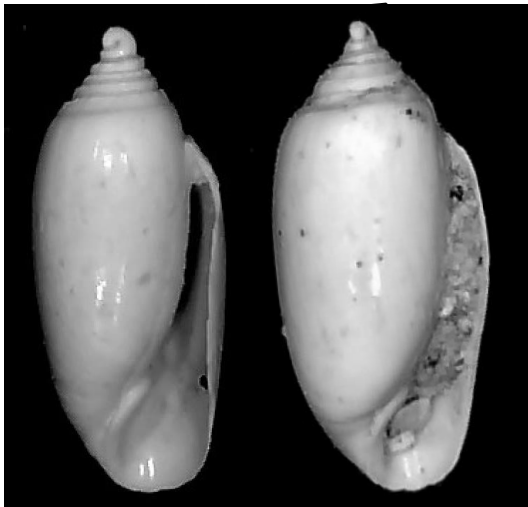
Acteocina canaliculata
(Say, 1826)
4 mm
Smaller protoconch



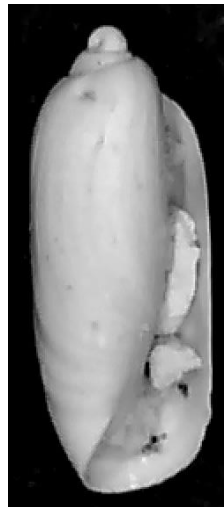
Acteocina candei var. 1 & var. 2
(d'Orbigny, 1842)
4.4 mm; 5 mm
Larger protoconch



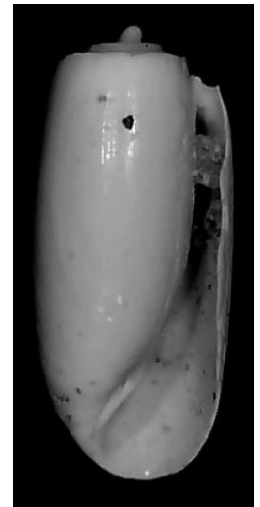
Acteocina cf. sphalera
Olsson & Harbisson, 1953
4.8 mm
More rounded



Acteocina vaughni
Gardner, 1948
3.8 mm; 4.1 mm
Highly distinctive shape

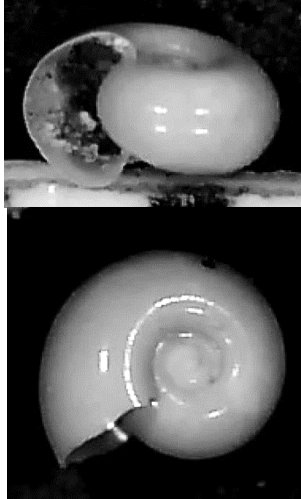


Acteocina cf. inconspicua
(Olsson & McGinty, 1958)
2.9 mm
Highly distinctive shape



Acteocina lepta
Woodring, 1928
4.5 mm; max ~6.2 mm
Highly distinctive spire

Pteropoda



Limacina sp. cf. *atlanta*

Mörch, 1874

1.1 mm

Sinistral; Distinctive Shape



Creseis clava

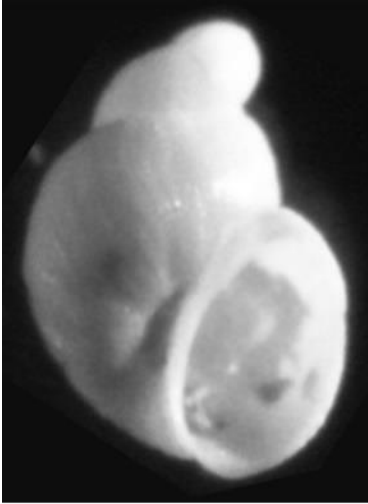
(Rang, 1828)

Broken

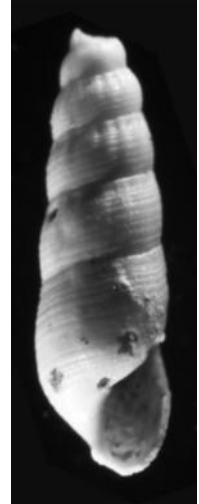
1.9 mm; 2.1 mm

Highly distinctive shape

Pyramidellidae I



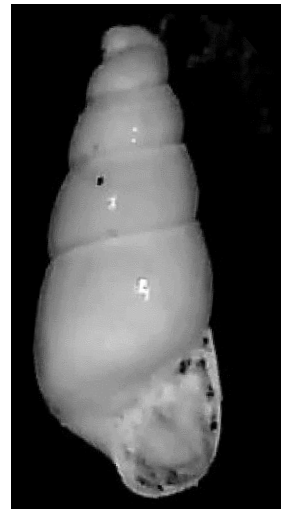
Pyramidellidae incertae sedis 1
0.8 mm
Highly distinctive shape



Pyramidellidae incertae sedis 2
Broken
3.1 mm
Faint axial sculpture



Sayella sp. 1
2 mm
Smooth; More convex spire



Sayella sp. 2
2 mm
Smooth; Slightly convex spire

Pyramidellini



Locklinia fargoii
Bartsch, 1955
3.2 mm
Smooth; Columellar Folds



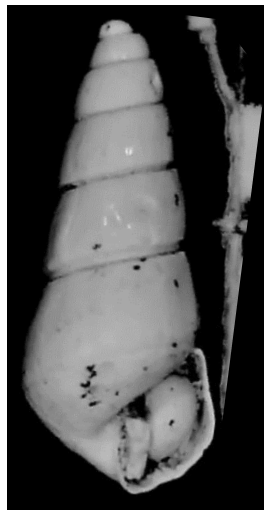
Locklinia pliocena
Bartsch, 1955
5.8 mm
Smooth; Broader



Petitilla sp. 1
2.6 mm
Smooth; Convex spire



Longchaeus sp.
2.7 mm
Very small

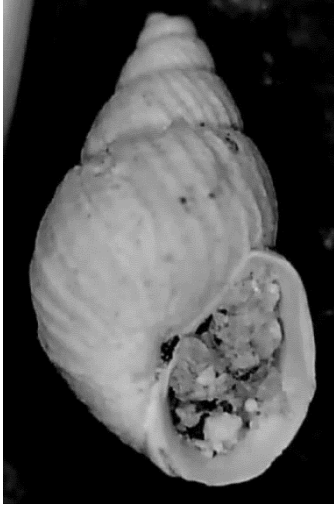


Longchaeus simplex
(H. C. Lea, 1843)
4 mm
Highly distinctive shape

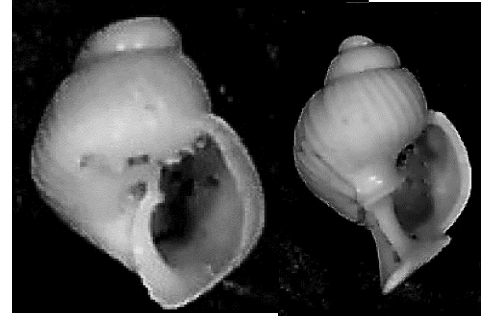
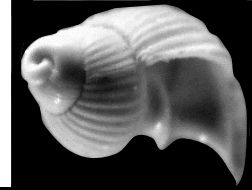


Petitilla sp. 2
2.4 mm
Smooth; Convex-sided

Odostomiini I



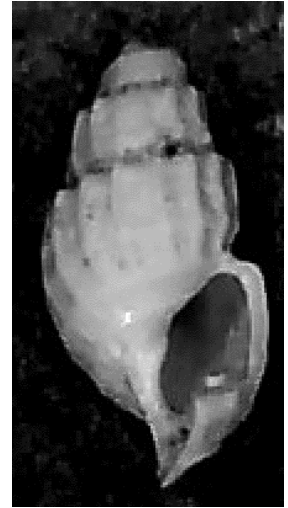
Odostomiini n. gen. 1 n. sp.
2.7 mm
Taller spire



Odostomiini n. gen. 2 n. sp.
Broken
1 mm; 1.4 mm; max ~3 mm
Rounded spire



Menestho cf. millium
(H. C. Lea, 1843)
1.6 mm; 2.2 mm
Highly distinctive sculpture

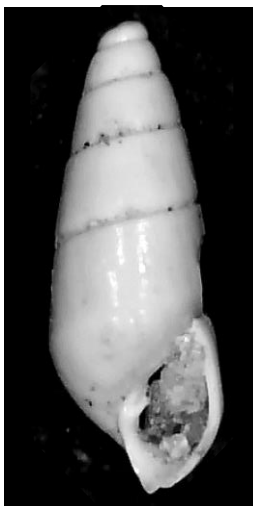


cf. Mumiola sp.
1.7 mm
Highly distinctive sculpture

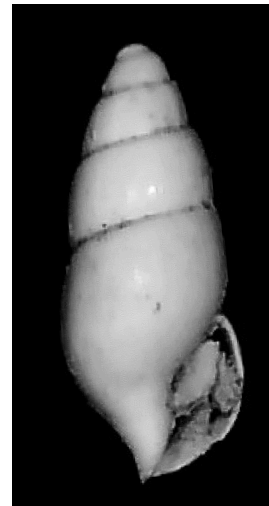
Eulimastoma I



Eulimastoma sp. 1
4.2 mm
Tall body whorl



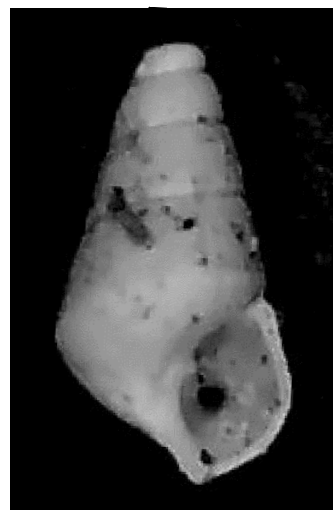
Eulimastoma sp. 2
3.1 mm
Very narrow; Angled whorl



Eulimastoma sp. 3
Broken
2.9 mm
Less narrow; Angled whorl

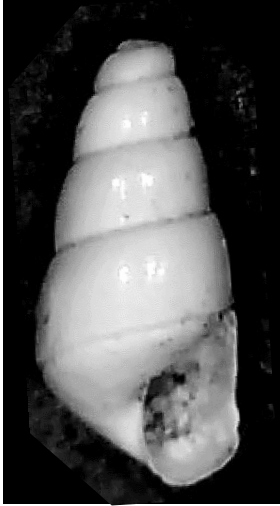


Eulimastoma cf. *canaliculatum*
(C. B. Adams, 1850)
2.1 mm
Strongly tapered body whorl

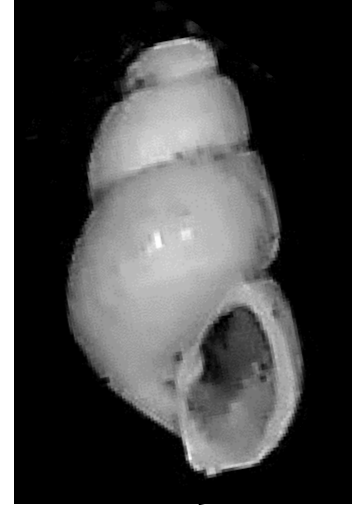


Eulimastoma cf. *pocahontasae*
(Henderson & Bartsch, 1914)
1.4 mm
Tapered body whorl

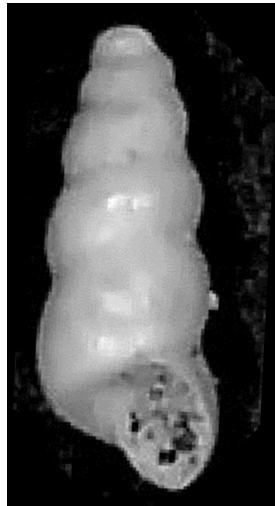
Eulimastoma II



Eulimastoma cf. harbisonae
Bartsch, 1955
1.9 mm
Slightly convex whorls

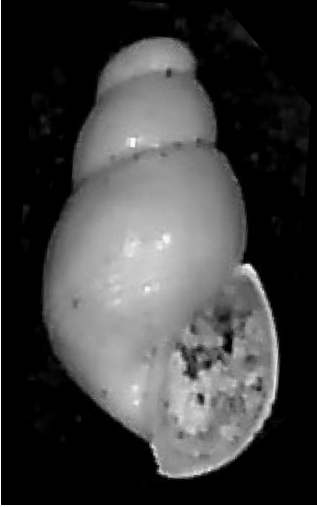


Eulimastoma heilprini
Bartsch, 1955
1.3 mm
Convex whorls



Eulimastoma olssoni
Bartsch, 1955
1.2 mm
Highly distinctive shape

Ondina I



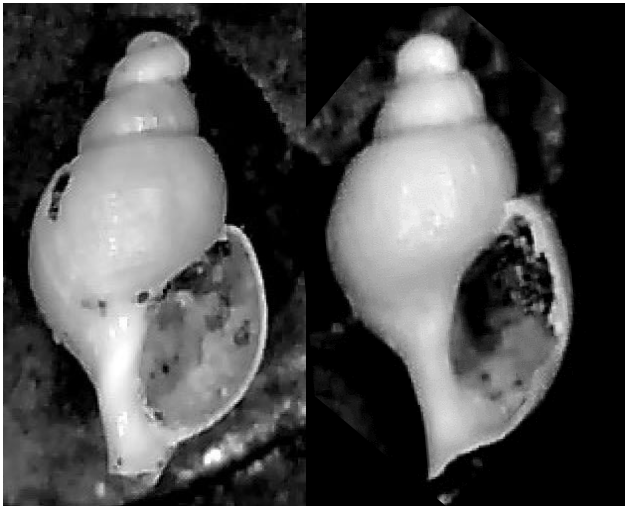
Ondina sp. 1
1.8 mm
Faint spiral striations;
Somewhat tall body whorl



Ondina sp. 2
1.4 mm
Faint spiral striations:
Smaller



Ondina sp. 3
1.8 mm; max ~3 mm
Faint spiral striations;
Tall body whorl



Ondina sp. 5
1.2 mm; 1.6 mm
Faint spiral striations;
Large protoconch



Ondina sp. 7
3.1 mm
Faint spiral striations;
Convex-whorled

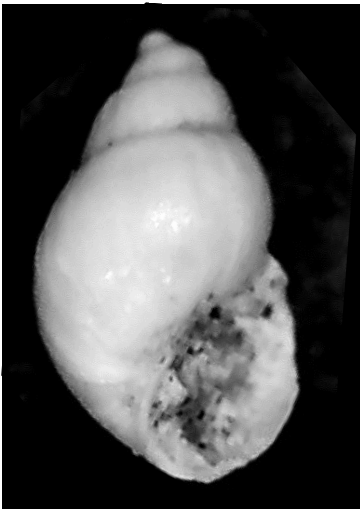
Ondina II



Ondina sp. 4
1.9 mm
Faint spiral striations;
Moderate-sized body whorl



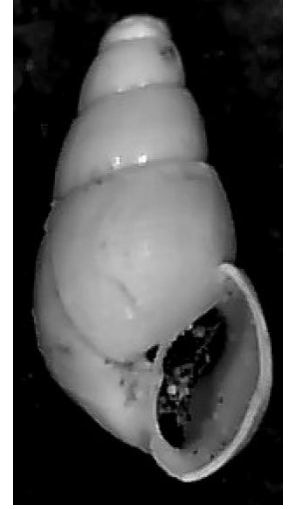
Ondina sp. 6
1.8 mm
Faint spiral striations;
Flat-topped; Broad



Ondina emeryi
(Bartsch, 1955)
1.8 mm
Faint spiral striations;
Broad

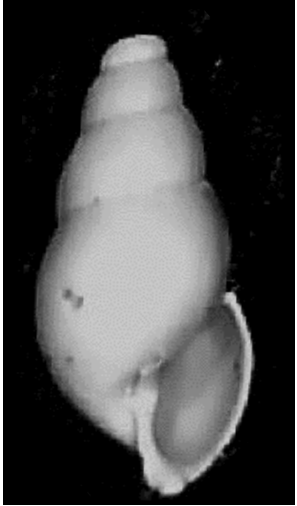


Ondina cf. *pomeroyi*
(Bartsch, 1955)
3.1 mm
Faint spiral striations
Tapered body whorl



Ondina cf. *wilcoxi*
(Bartsch, 1955)
1.9 mm
Faint spiral striations;
Narrow

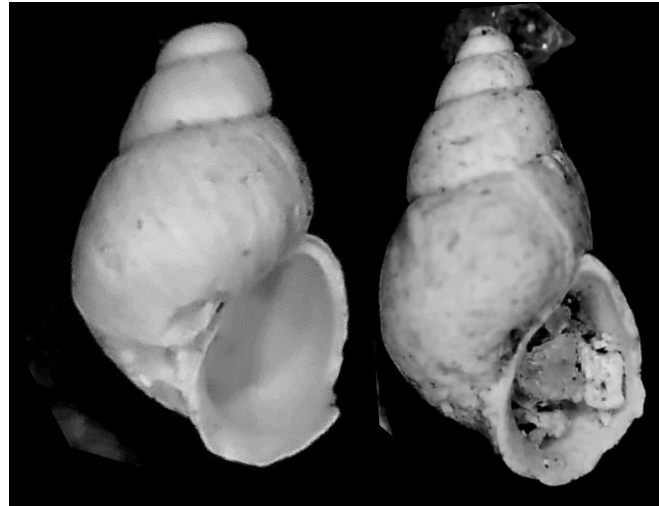
"*Odostomia*"



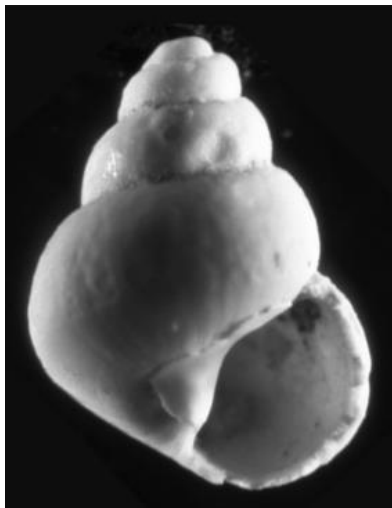
"Odostomia" sp. 1
1.9 mm
Taller



"Odostomia" johnsoni
Bartsch, 1955
2.8 mm
Even broader



"Odostomia" acutidens
(Dall, 1884)
1.7 mm; 3.2 mm
Broader



"Odostomia" sp. 2
2.4 mm
Very Broad; Convex spire



"Odostomia" burnsi
Bartsch, 1955
1.1 mm
Highly distinctive shape



"Odostomia" cf. nicoli
Bartsch, 1955
1.3 mm
Smaller

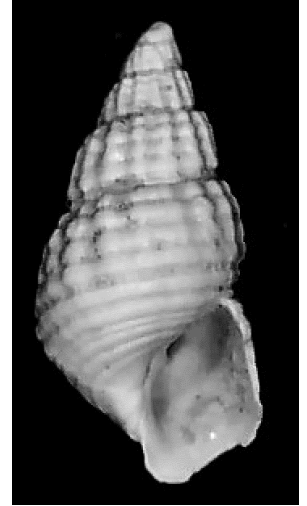
Chrysallida I



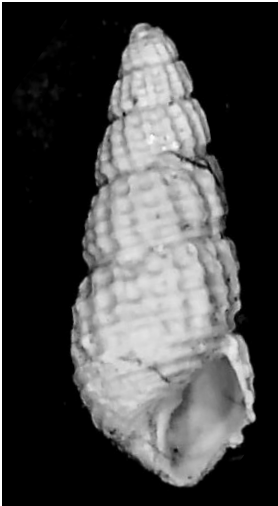
Chrysallida sp.
1.3 mm
Juvenile
Large protoconch



Chrysallida archeri
Bartsch, 1955
2.7 mm
Tapering spire



Chrysallida cf. *dalli*
Bartsch, 1955
3.4 mm
Stronger axial ribs



Chrysallida pilsbryi
Bartsch, 1955
2.9 mm
More cancellate



Chrysallida simpsoni
Bartsch, 1955
3.2 mm
Very wide suture

Chrysallida II & *Egila*



Chrysallida cf. theta
(Campbell, 1993)
2.2 mm
Flat protoconch



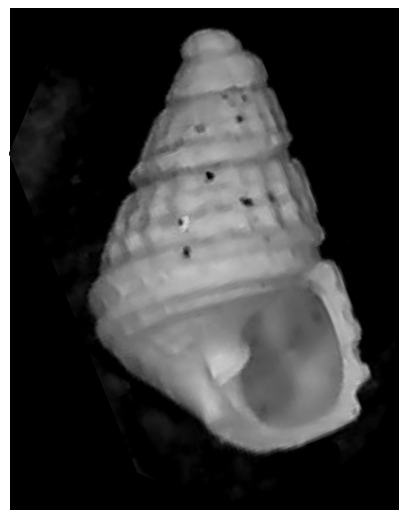
Chrysallida cf. vaughani
Bartsch, 1955
4.1 mm
Spiral ridge in suture



Chrysallida weberi
Bartsch, 1955
Normal; Large
3.3 mm; 6.6 mm
Narrow suture



Chrysallida cf. woodringi
Bartsch, 1955
Broken
5.1 mm
Broad spiral ribs



Egila gordonae
(Bartsch, 1955)
1.4 mm
Smaller; Broader

Salassiina & *Cyclostremella*



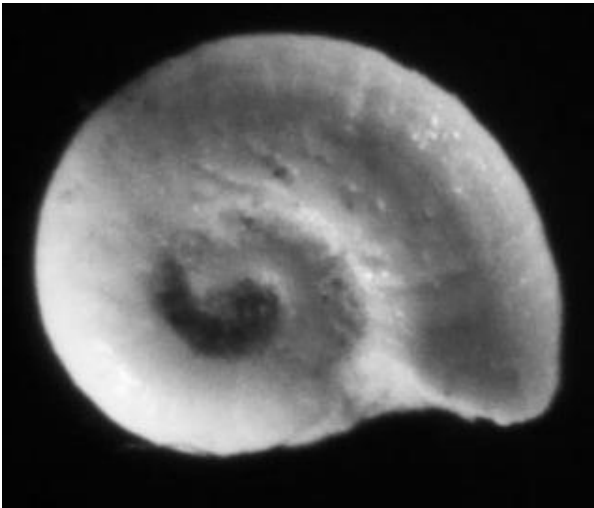
Salassiina incertae sedis
3.8 mm
Highly distinctive sculpture



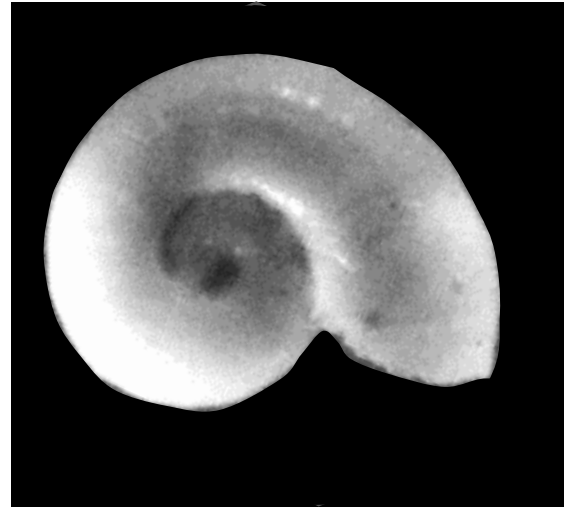
Salassia n. sp.
2.9 mm
Highly distinctive sculpture



Trabecula balchi
(Bartsch, 1955)
Broken
2 mm
Highly distinctive sculpture



Cyclostremella cf. humilis
Bush, 1897
0.92 mm
More whorls



Cyclostremella magnoliana
Olsson, 1916
1.4 mm
Protoconch underneath

Strioturbonilla I

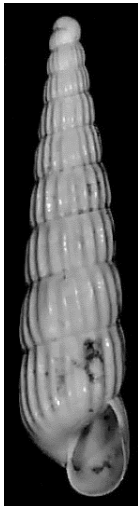


Strioturbonilla cf. subula

(H. C. Lea, 1843)

2.7 mm; 5.6 mm; max ~7.5 mm

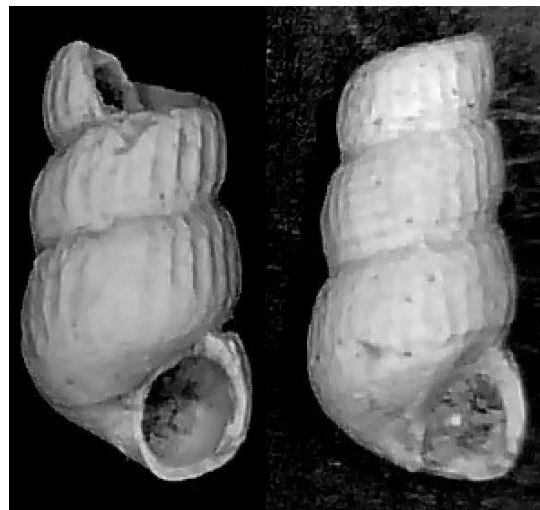
Fainter axial ridges



Strioturbonilla sp. 1

5.7 mm

Stronger axial ridges



Strioturbonilla sp. 4

Broken

3 mm; 3.5 mm

Faint sculpture; Flat whorls

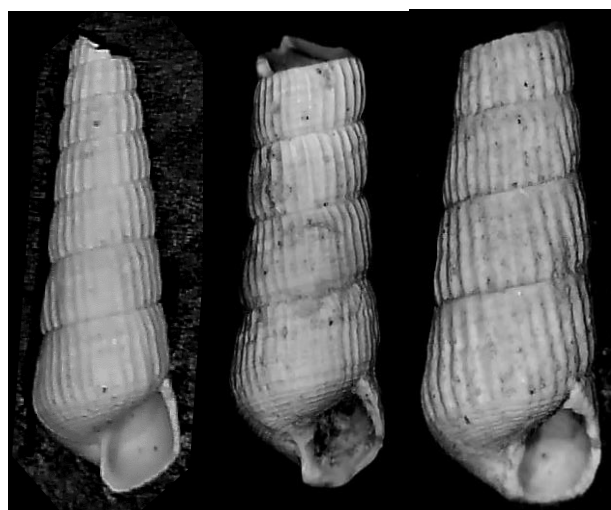


Strioturbonilla sp. 2

Broken

7 mm; 8.5 mm; 9 mm

18-20 axial ridges



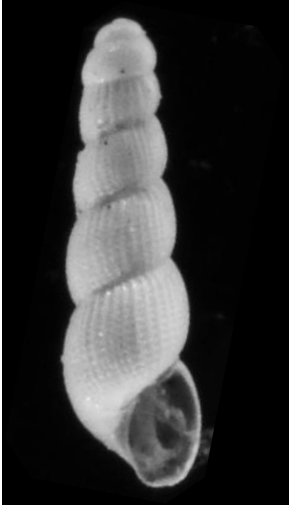
Strioturbonilla sp. 3

Broken

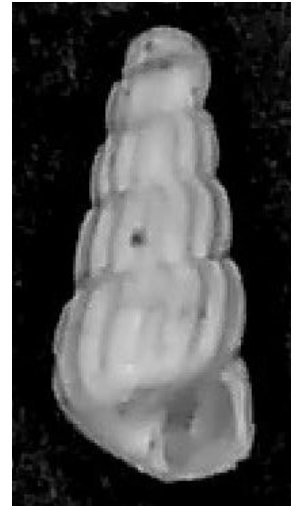
6.8 mm; 7 mm; 7 mm

26-34 axial ridges

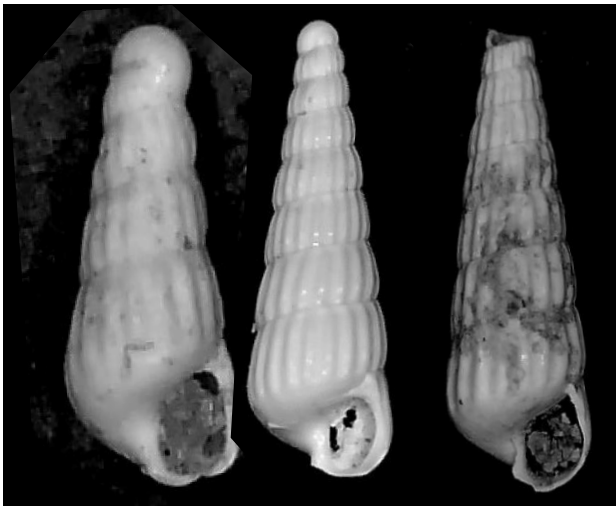
Turbonillina II



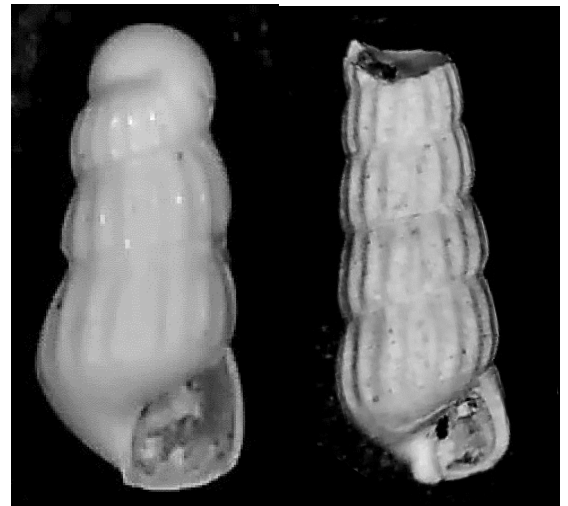
Strioturbonilla n. sp.
Broken
1.35 mm; max ~1.5 mm
Cancellate; Tiny



Turbolidium cf. *uniliratum*
(Bush, 1899)
Juvenile
1.2 mm
Small protoconch



Chemnitzia sp. 1
Juvenile; Juvenile; Broken
1.9 mm; 4 mm; 5.2 mm
Slightly curved spire



Chemnitzia sp. 2
Juvenile; Broken
1.4 mm; 4 mm
Broad; Large protoconch

Chemnitzia II



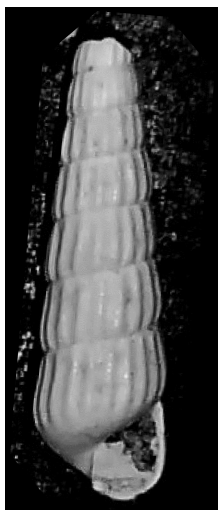
Chemnitzia sp. 3
Subadult; Broken
4.5 mm; 4.7 mm
Tapering, curved spire



Chemnitzia sp. 4
Broken
5 mm
16-20 axial ridges



Chemnitzia sp. 5
Broken; Broken
4.1 mm; 11.2 mm
Shouldered whorls



Chemnitzia sp. 6
Broken
5.8 mm
16 fine axial ridges



Chemnitzia sp. 7
Broken
2.8 mm
14-16 axial ridges;
Columnar

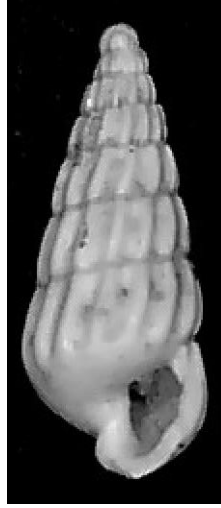


Chemnitzia sp. 10
Broken
6 mm
Faint, broad axial ribs

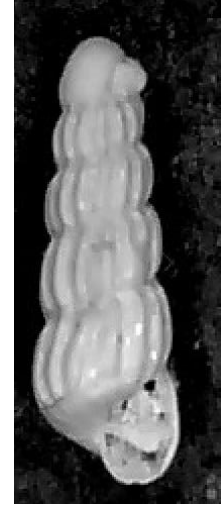
Chemnitzia III



Chemnitzia sp. 8
3.8 mm; 6 mm
Tapering;
Very small protoconch



Chemnitzia sp. 9
2.8 mm
Extremely broad



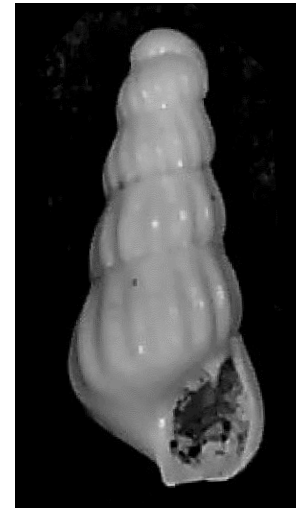
Chemnitzia cf. *alcmena*
(Bartsch, 1955)
Subadult
1.5 mm
Curved axial ridges



Chemnitzia atlasi
(Bartsch, 1955)
Juvenile; Broken
2.2 mm; 9 mm
12-14 axial ridges

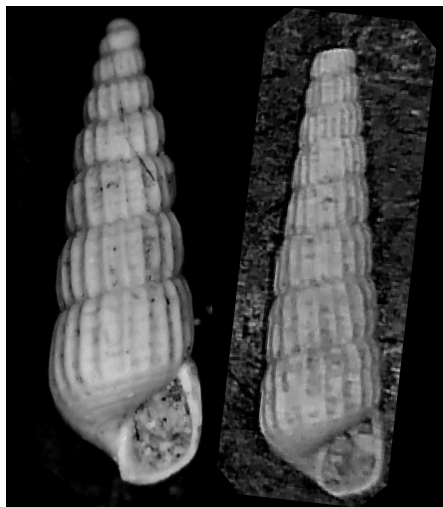


Chemnitzia cf. *cerberusi*
(Bartsch, 1955)
Broken; Broken
3 mm; 10 mm
Flattened body whorl



Chemnitzia cf. *geryoni*
(Bartsch, 1955)
Juvenile
1.5 mm
Weaker axial ridges

Pyrgiscina I



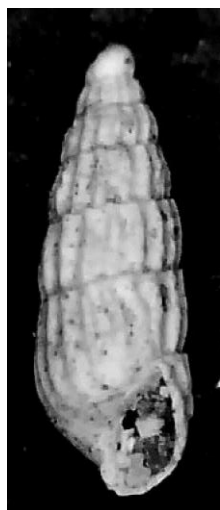
Houbricka sp. 1
 Juvenile; Broken
 3.8 mm; 8.8 mm
 Spiral and stronger axial sculpture



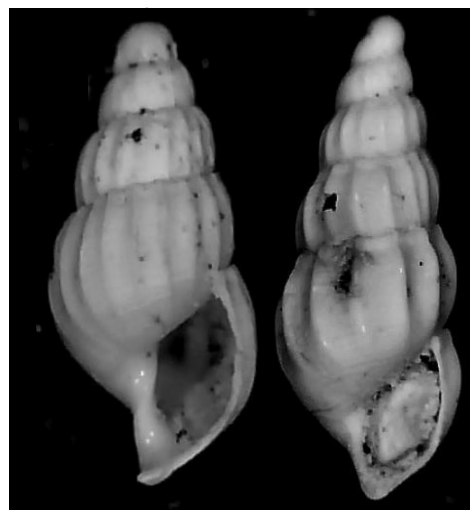
Houbricka sp. 2
 Subadult; Subadult; Broken
 4.3 mm; 4.3 mm; 6.5 mm
 Flatter body whorl



Bartschella n. sp.
 6.2 mm
 Strong cancellate sculpture



Striopyrgus n. sp.
 Juvenile ?
 2.8 mm
 Rounded spire

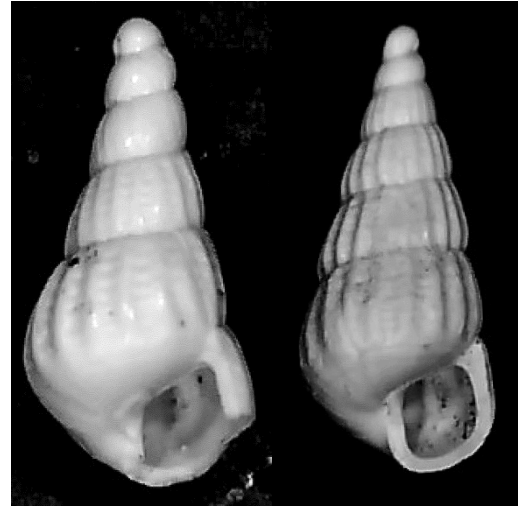


Ugarteia n. sp.
 Juvenile; Subadult ?
 2.1 mm; 3.2 mm
 Broad axial interspaces

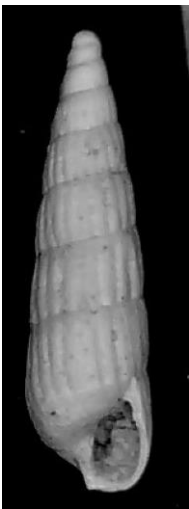
Mormula



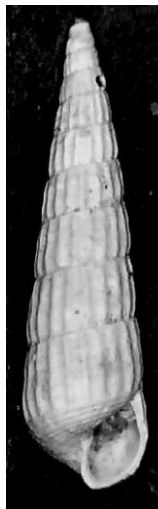
Mormula sp.
 Juvenile; Broken
 2 mm; 5.2 mm
 Broader



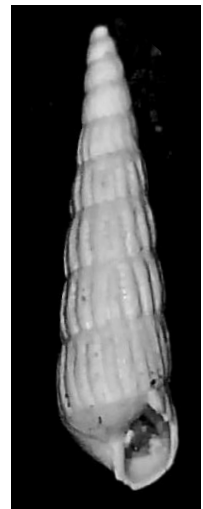
Mormula gardnerae
 Bartsch, 1955
 Juvenile; Subadult
 2.1 mm; 3.5 mm
 Concave spire



Mormula cf. *harrisi*
 Bartsch, 1955
 Juvenile
 4.3 mm
 14 axial ribs



Mormula mansfieldi
 Bartsch, 1955
 9.6 mm
 Straighter-spired

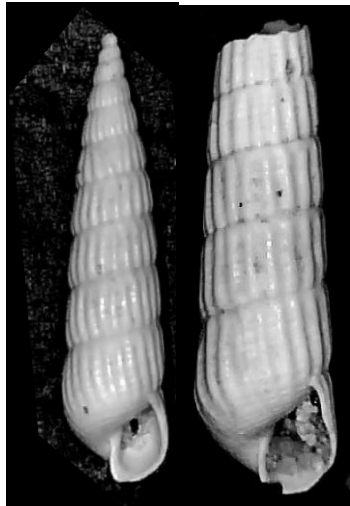


Mormula cf. *robertsoni*
 Bartsch, 1955
 Juvenile
 4.3 mm
 16 axial ribs; Narrow

Pyrgiscus



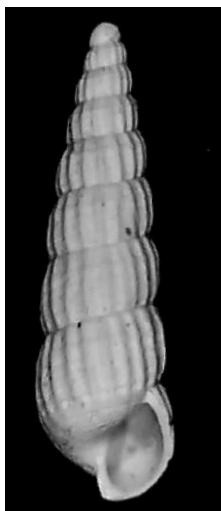
Pyrgiscus sp. 1
Juvenile; Broken
2.1 mm; 3.4 mm
Cancellate sculpture



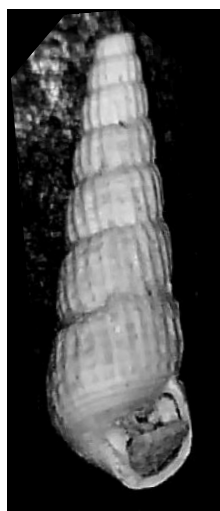
Pyrgiscus sp. 2
Subadult; Broken
7.2 mm; 6 mm
Spiral and axial sculpture;
Taller body whorl



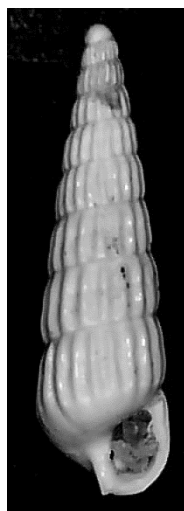
Pyrgiscus sp. 3
Broken; Broken
3.2 mm; 3.2 mm
Broader; Tapering



Pyrgiscus sp. 4
Subadult ?
4.3 mm
Rounded whorls



Pyrgiscus sp. 5
Broken
4.3 mm
Rounded whorls

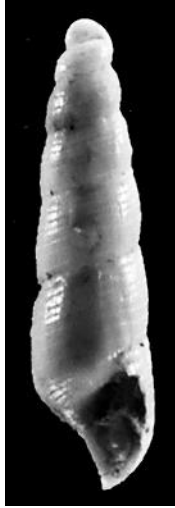


Pyrgiscus cf. *silenusi*
Bartsch, 1955
Subadult
4.5 mm
Faint spiral lines



Pyrgiscus *zethusi*
Bartsch, 1955
Subadult; Subadult
5.8 mm; 6 mm; max ~8.5 mm
Slightly curved spire

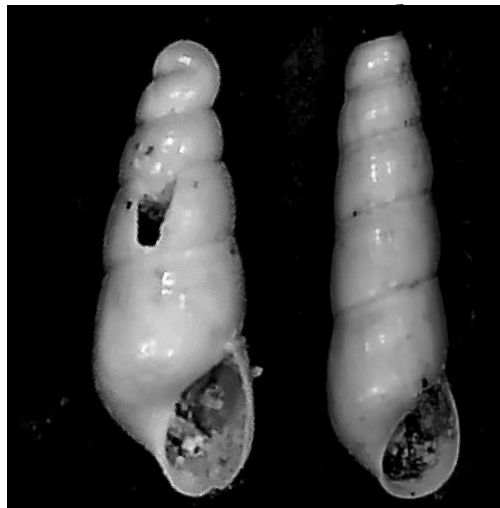
Eulimellini



Careliopsis cf. styliformis
(Mörch, 1875)

2.6 mm

Faint spiral sculpture



Eulimella pinellasi

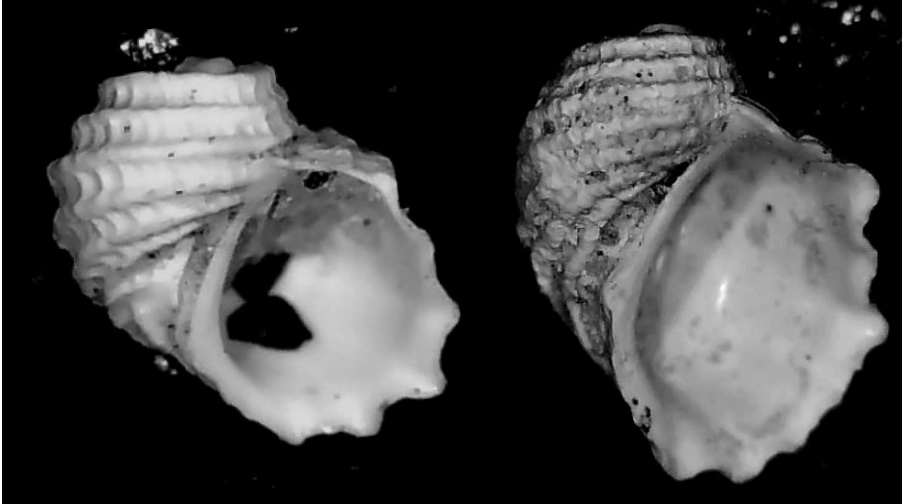
Bartsch, 1955

Juvenile; Broken

1.9 mm; 3.5 mm

Smooth

Amathinidae



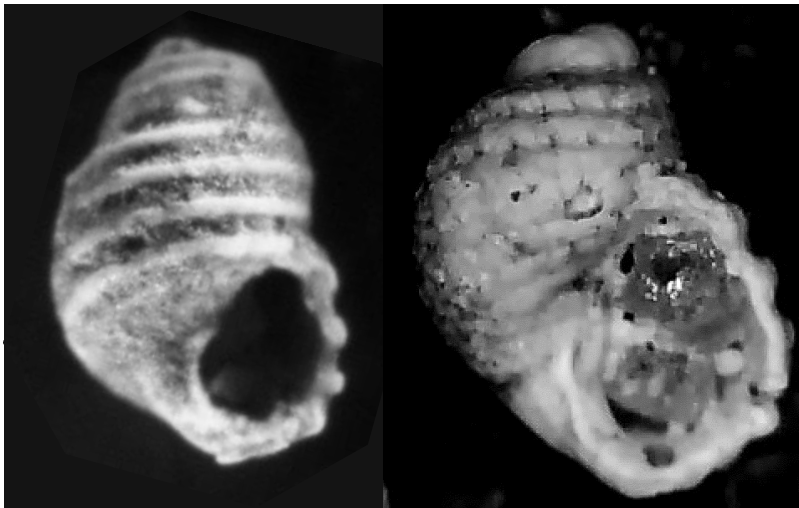
Carinorbis lyra

(Conrad, 1834)

Juvenile; Subadult

3 mm tall; 6.3 mm tall; max ~12 mm tall

Highly distinctive shape



Iselica globulosa

(H. C. Lea, 1843)

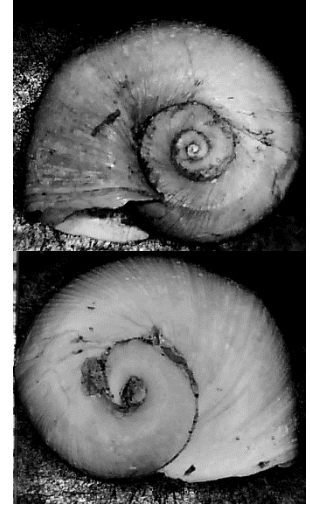
1 mm; 1.9 mm

Highly distinctive shape

Hygrophila & Ellobiidae



Physidae incertae sedis
 Tiny Juvenile
 1.2 mm (Adult ~30-50 mm)
 Highly distinctive shape



Planorbella cf. conanti
 (Dall, 1890)
 Subadult
 11 mm Sh
 Highly distinctive shape



Ellobiidae incertae sedis
 3.8 mm; 4.7 mm
 Highly distinctive shape