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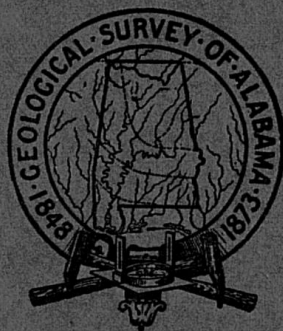
Alabama Museum of Natural History

The Terrestrial Shell-Bearing Mollusca of Alabama

BY

BRYANT WALKER

Published in Co-operation with the Museum of Zoology,
University of Michigan



1928

The

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BRYANT WALKER

Published in Co-operation with the Geological Survey of Alabama
and the Alabama Museum of Natural History

ANN ARBOR, MICHIGAN

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ALEXANDER G. RUTHVEN,
Director of the Museum of Zoology,
University of Michigan.

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THE TERRESTRIAL SHELL-BEARING MOLLUSCA OF ALABAMA

BY BRYANT WALKER

INTRODUCTION

This paper is based mainly upon the collections made by the late Herbert H. Smith between 1903 and 1920. I have included also such other records as I have found in the literature and such as are in the collections of the Alabama State Museum, Dr. George H. Clapp and myself. I am also indebted to Mrs. L. H. MacNeill for a complete catalogue of all the Alabama species in Mr. MacNeill's collection.

Mr. Smith began to collect for Dr. Clapp in 1903. In 1904 he organized a "Syndicate" for the systematic prosecution of the work. This is first consisted of Mr. T. H. Aldrich, Dr. George H. Clapp, Dr. H. A. Pilsbry and the writer. Dr. Pilsbry dropped out in 1906 and his place was taken by the late John B. Henderson, Jr. In 1908 Mr. Aldrich retired and the work for that year was carried on by Dr. Clapp, Mr. Henderson and myself. The Syndicate ceased to function at the end of that year and after that time Mr. Smith collected land shells for Dr. Clapp and the Alabama State Museum until his death in 1920.

I doubt whether any other state in the Union has been worked more thoroughly and systematically than Alabama, by Mr. Smith's assiduous collecting. He not only personally collected over a very large part of the state, both north and south, but through local collectors, many of them trained by him, he reached into many localities that he did not personally visit.

In addition to the extensive series illustrating the distributional features of the fauna, he discovered the following new species and varieties:

Polygyra barbata Clapp
Polygyra brevipila Clapp
Polygyra brevipila cherokeeensis Clapp
Polygyra cohuttensis Clapp
Polygyra decepta Clapp
Polygyra herberti Walker
Polygyra inflecta approximans Clapp
Polygyra smithii Clapp
Anguispira alternata crassa Clapp
Anguispira alternata palustris Clapp
Anguispira alternata smithi Walker
Anguispira cumberlandiana alabama Clapp

Omphalina pilsbryi Clapp
Vitrea aldrichiana Clapp
Vitrea cumberlandiana Clapp
Vitrea conecuhensis Clapp
Vitrea lewisiana Clapp
Vitrea pilsbryana Clapp
Vitrea radiatula circumstriata Taylor
Vitrea smithi Walker.
Vertigo alabamensis Clapp
Vertigo alabamensis conecuhensis Clapp
Carychium nannodes Clapp

The land snail fauna of Alabama is derived mainly from two sources, from the north and the south.

The following species (25) so far as known are peculiar to the state:

Polygyra barbata
Polygyra brevipila
Polygyra brevipila cherokeensis
Polygyra decepta
Polygyra herberti
Polygyra sargentiana
Polygyra smithii
Anguispira alternata crassa
Anguispira alternata macneilli
Anguispira alternata palustris
Anguispira alternata smithi
Anguispira cumberlandiana alabama
Gonyodiscus clappi

Omphalina pilsbryi
Zonitoides lateumbilicata
Vitrea aldrichiana
Vitrea conecuhensis
Vitrea cumberlandiana
Vitrea pilsbryana
Vitrea smithi
Vertigo alabamensis
Vertigo alabamensis conecuhensis
Vertigo wheeleri
Pupisoma macneilli
Carychium nannodes

With the exception of *Pupisoma macneilli*, the affinities of all these species are with the northern fauna.

The center of distribution of the northern fauna is the Appalachian Plateau of eastern Tennessee. From there the species have spread out north, west and south. Many of them have obtained a wide range through the northern states. Some of these have a general distribution throughout Alabama. Such are:

Polygyra clausa
Polygyra inflecta
Polygyra palliata
Polygyra tridentata
Pupoides marginatus
Gastrocopta armifera
Gastrocopta contracta
Gastrocopta corticaria
Gastrocopta pentodon
Gastrocopta pentodon gracilis
Gastrocopta procera
Gastrocopta procera riparia
Gastrocopta tappaniana
Vertigo milium
Vertigo ovata
Strobilops aenea
Strobilops affinis
Strobilops labyrinthica
Strobilops virgo
Gonyodiscus perspectivus

Vallonia pulchella
Punctum pygmaeum
Helicodiscus parallelus
Haplotrema concava
Mesomphix laevigata
Gastrodonta demissa
Gastrodonta intertexta
Gastrodonta ligera
Zonitoides arboreus
Zonitoides minusculus
Vitrea indentata
Vitrea milium
Vitrea radiatula
Euconulus c. polygyratus
Euconulus sterkii
Succinea avara
Succinea ovalis
Carychium exiguum
Carychium exile

Others are rare and local. Such as:

Gonyodiscus c. anthonyi
Columella edentula

Omphalina cuprea
Omphalina friabilis
Succinea concordialis

Still others extend only into the northern part of the state, viz.:

Polygyra albolabris
Polygyra appressa
Polygyra elevata
Polygyra fraudulenta
Polygyra hirsuta
Polygyra monodon fraterna
Polygyra profunda

Polygyra zaleta
Gastrocopta clappi
Vertigo gouldii
Gastrodonta suppressa
Vitrea multidentata
Euconulus fulvus
Cochlicopa lubrica appalachicola

The follow

Alabama:

Polygyra troost
Polygyra appres
Polygyra obstri
Polygyra rugeli
Polygyra spinos
Polygyra stenot
Praticolella lawe

While the

Polygyra andrei
Polygyra appres
Polygyra barbig
Polygyra christi
Polygyra clarkii
Polygyra downii
Polygyra edgari
Polygyra labros
Polygyra obstri
Polygyra pilula
Polygyra triden
Polygyra wheate

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Such are:

Polygyra cereola
Polygyra cereola
Polygyra cereola
Polygyra espilod
Polygyra maxill
Polygyra pustul
Polygyra vannon
Polygyra vannon
Praticolella jeju
Praticolella mob
Pupoides modicu

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Polygyra albol
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The following eastern Tennessee species have a general distribution in Alabama:

<i>Polygyra troostiana</i>	<i>Omphalina kopnodes</i>
<i>Polygyra appressa perigrapta</i>	<i>Gastrodonta gularis</i>
<i>Polygyra obstricta carolinensis</i>	<i>Gastrodonta interna</i>
<i>Polygyra rugeli</i>	<i>Vitrea capsella</i>
<i>Polygyra spinosa</i>	<i>Vitrea carolinensis</i>
<i>Polygyra stenotrema</i>	<i>Vitrea cryptomphala</i>
<i>Praticolella lawae</i>	

While the following are restricted to the northern part:

<i>Polygyra andrewsæ normalis</i>	<i>Vallonia perspectiva</i>
<i>Polygyra appressa sculptior</i>	<i>Anguispira cumberlandiana</i>
<i>Polygyra barbiger</i>	<i>Punctum blandianum</i>
<i>Polygyra christyi</i>	<i>Helicodiscus fimbriatus</i>
<i>Polygyra clarkii</i>	<i>Gastrodonta acerra</i>
<i>Polygyra downieana</i>	<i>Gastrodonta colisella</i>
<i>Polygyra edgariana</i>	<i>Gastrodonta lasmodon</i>
<i>Polygyra labrosa</i>	<i>Zonitoides elliottii</i>
<i>Polygyra obstricta</i>	<i>Vitrea andrewsæ</i>
<i>Polygyra pilula</i>	<i>Vitrea petrophila</i>
<i>Polygyra tridentata tennesseensis</i>	<i>Vitrea sculptilis</i>
<i>Polygyra wheatleyi</i>	<i>Vitrea wheatleyi</i>

The southern fauna cantons in Florida and southern Georgia and from there has spread westward and along the Gulf coast into southern Alabama. Such are:

<i>Polygyra cereolus febigeri</i>	<i>Gastrocopta contracta climeana</i>
<i>Polygyra cereolus septemvolva</i>	<i>Gastrocopta pellucida</i>
<i>Polygyra cereolus volvoxis</i>	<i>Gastrocopta pellucida hordeacella</i>
<i>Polygyra espiloca</i>	<i>Gastrocopta rupicola</i>
<i>Polygyra maxillata</i>	<i>Strobilops floridanus</i>
<i>Polygyra pustula</i>	<i>Strobilops hubbardi</i>
<i>Polygyra vannostrandii</i>	<i>Euglandina rosea</i>
<i>Polygyra vannostrandii alabamensis</i>	<i>Succinea campestris</i>
<i>Praticolella jejuna</i>	<i>Succinea floridana</i>
<i>Praticolella mobiliana</i>	<i>Rumina decollata</i>
<i>Pupoides modicus</i>	<i>Opeas gracile</i>
	<i>Truncatella bilabiata</i>

The following southern species range north throughout the state:

<i>Polygyra albolabris major</i>	<i>Vertigo oscariana</i>
<i>Polygyra auriformis</i>	<i>Vertigo oralis</i>
<i>Polygyra leporina</i>	<i>Vertigo rugosula</i>
<i>Polygyra monodon aliciae</i>	<i>Zonitoides singleyanus</i>
<i>Polygyra pustuloides</i>	<i>Euconulus chersinus</i>
	<i>Helicina orbiculata</i>

Thus of the 185 species and varieties recognized in this paper 150 belong to the northern fauna and 35 to the southern.

In the matter of synonymy I have in all cases given references to the original description and to all Alabama citations that I have found in the literature. Where the species are included in Binney's "Manual" I have included a reference to that work as those interested in the earlier synonymy will find there full details.

The name in parenthesis under the figures is not that of the original describer of the species, but of the author whose figure is copied. Where no name is given, the figure is original.

Class GASTROPODA

Subclass STREPTONEURA

Order PROSOBRANCHIATA

Suborder TÆNIOGLOSSA

Family TRUNCATELLIDÆ

Animal with a very long, muscular, annulated snout; tentacles with long, triangular and short; eyes sessile, placed generally on the upper surface of the neck and behind the base of the tentacles; central tooth of the radula triangular, with a series of basal denticulations; lateral tooth large, multicuspid; marginal teeth curved, narrow, multicuspid.

Shell more or less elongated, subcylindrical, truncated when adult; aperture oval; peristome continuous, thickened; operculum oval, paucispiral with an excentric nucleus.

Genus TRUNCATELLA Risso

Shell imperforate, but with an umbilical groove, cylindrical, turreted, truncated when adult, shining, striate or costulate; aperture oval, entire; peristome continuous, simple or double, sometimes reflected; operculum corneous, subspiral, with an excentric nucleus.

Animal with a short foot, rounded at both ends; tentacles short, acute, triangular; eyes sessile, placed behind the tentacles on the upper part of the neck; snout very long, bilobed. Radula as in the family.



FIG. 1. Radula of *Truncatella* (Troschel).

Type: *T. truncatula* Dr.



FIG. 2. Animal of *Truncatella* (Binney).

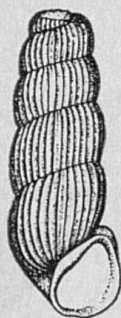


FIG. 3. *T. bilabiata* (Pilsbry).

Truncatella bilabiata Pfeiffer

Truncatella bilabiata Pfeiffer, Wieg. Arch., I, 1840, p. 253; Moench, Auric. Viv., 1856, p. 192; Pilsbry, Trans. Conn. Acad., X, 1900, p. 56, pl. LXII, fig. 12.

Original Description: Testa cylindracea, solidula, nitida, carnea, longitudinaliter confertim costulata; anfract. 4.5; sutura profunda; apertura oblique ovali; peristome incrassato, duplicato. Long. 2.5, diam. .75 lin.

Type Locality: Right bank of the Canimar River, Cuba.

Alabama Record:

Mobile Co.; Mobile.

Pfeiffer's more elaborate description in the *Monographia* may be translated as follows: Shell subrimate, cylindrical, slender, solid, opaque, brown, costate, ribs subarcuate, elevated, obtuse, equally spaced; suture deep, simple; remaining whorls 4.5 to 5, convex, the last scarcely longer than the others, thick and subcompressed at the base; aperture vertical, oval, scarcely angulated above; peristome double, the outer white, thick, expanded, passing into the basal carina, the inner continuous, only slightly expanded. Length 5.5, diam. 1.75. Length of aperture 1.5 mm.

"A strong, continuous crest behind the basal and outer lips. Ribs fine and close, 25-30 on the last whorl." (H. A. P.)

• Suborder RHIPIDOGLOSSA

Family HELICINIDÆ

Animal with a moderately long snout, truncated at the extremity; tentacles long, slender, pointed, with eyes placed on their outer bases on a slight swelling; foot elongated, truncate in front and narrow behind; radula long, narrow, with numerous longitudinal series of teeth, arranged 00, 4, 1, 4, 00. No jaws.

Shell turbate, heliciform, globose or depressed; aperture triangularly semioval, entire; lip arcuate; interior partitions absorbed; operculum corneous or calcareous, semicircular or semioval, non-spiral, with concentric lines of growth from the columellar margin.

Genus *Helicina* Lamarck

Shell imperforate, turbate, globose or depressed, flattened and callous at the base; spire short; whorls not numerous; aperture triangular or semioval, entire; peristome simple, straight or reflected, often dilated at the base of the shell; columella, callous, straight; operculum semioval, testaceous or corneous.



FIG. 4. Animal of *H. orbiculata* (Binney).

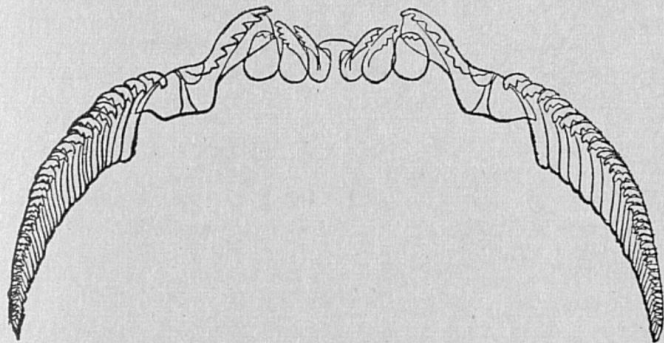


FIG. 5. Radula of *H. orbiculata* (Troschel).

Animal as in the family.



FIG. 6.
Operculum
of *H. orbiculata*.

Radula with teeth arranged 00, 4, 1, 4, 00. Centrals small, apex broad, reflected; first and second laterals broader, rounded at base, apex recurved, denticulated; third lateral suboval, apex recurved, denticulated; fourth lateral large, long, narrow capitate, liform, apex recurved, denticulated, marginals numerous, long narrow, apex recurved, denticulated.

Helicina orbiculata (Say)

Oligyra orbiculata Say, Jour. A. N. S. P., I, 1818, p. 283; Lewis, Ala. F. W. & L. Shells, 1876, p. 25.

Helicina orbiculata W. G. Binney, L. & F. W. Shells, III, 1865, p. 108, fig. 217; Sargent, Nautilus, VI, 1892, p. 72; Hinkley, *Ibid.*, XX, 1906, p. 34; Wheeler, *Ibid.*, XXV, 1912, p. 123.



FIG. 7. *H. orbiculata*
(Binney).

Original Description: "Shell subglobular; spire not prominent, but more than convex; lateral line somewhat convex; whorls five; obsolete striated across, regularly rounded; color pale greenish, yellowish, or slightly tinged with reddish, particularly on the body, and margined above by an obsolete white line; on the middle of the body a white vitta revolves, sometimes obscure or wanting; aperture acute above, regularly rounded at the base, and extending from the centre of revolution or base of the column to an equal distance between the base and the apex of the spire; base of the columella slightly projecting into an obtuse angle; exterior lip whitish, reflected. Length one-fifth of an inch." (Say.)

Type locality: Mouth of River St. John, Florida.

Alabama Records:

Baldwin Co.; Week's Bay; Point Clear.
Bibb Co.; Pratt's Ferry.
Chambers Co.; Langdale.
Clarke Co.; Thomasville; Bashi Creek,
Thomasville; Suggsville; Jackson.
Conecuh Co.; Evergreen.
Dale Co.; Pinckhard.
DeKalb Co.; Valley Head; Fort Payne.
Etowah Co.; Keener.
Geneva Co.; High Bluff.
Jackson Co.; Bridgeport; Gunter Mt.,
Woodville; Sand Mt., Pisgah; Stevenson;
Princeton.
Lauderdale Co.; Florence.
Mobile Co.; Mobile.
Montgomery Co.; McGee's Station.
Randolph Co.; Roanoke; Wadley.
St. Clair Co.; Whitney.

Talladega Co.; Three Island Shoals; Fort
William Shoals.
Walker Co.; Forks of Warrior.

Barbour Co.; Elamville.
Blount Co.; Blount Springs.
Cherokee Co., 10 mi. S. E. of Centre.

Cullman Co.; Cullman.
Dallas Co.; Pleasant Hill; Selma.
Elmore Co.; Wetumpka; Noble's Ferry.
Franklin Co.; Burleson; Russellville.
Greene Co.; Boligee.
Jefferson Co.; Squaw Shoals; Hamilton;
Montevallo.

Madison Co.; Gurley; Huntsville; Monte
Sano.

Monroe Co.; Monroe; Claiborne.
Perry Co.; Hamburg.
Shelby Co.; Montevallo.

Sumter Co.; Epes; Livingston; Mosco
Bluff.

Tuscaloosa Co.; Indian Creek; Hagler's
Mill; Tuscaloosa.

Wilcox Co.; Pine Hill; Camden; Gaston
burg.

Foot edge
wide, short,
never elevated
lip.

Genitalia
inserted directly
or flagellum;

1. Atrium.
2. Penis.
3. Prepuce.
4. Vagina.
5. Spermatheca.

SUBCLASS EUTHYNEURA

ORDER PULMONATA

SUBORDER STYLOMMATOPHORA

I. SIGMURETHRA

SUPERFAMILY HOLOPODA

FAMILY HELICIDÆ

Foot edges without pedal grooves; sole undivided; marginal teeth with wide, short, squarish basal-plates and one or several cusps, the outer cusp never elevated on middle cusp. Shell usually with an expanded or reflexed lip.

SUBFAMILY POLYGYRINÆ PILSBRY

Genitalia without any accessory organs on the female side; vas deferens inserted directly on the well developed long penis, which has no epiphallus or flagellum; no dart sack or mucus glands; no diverticulum on spermatheca

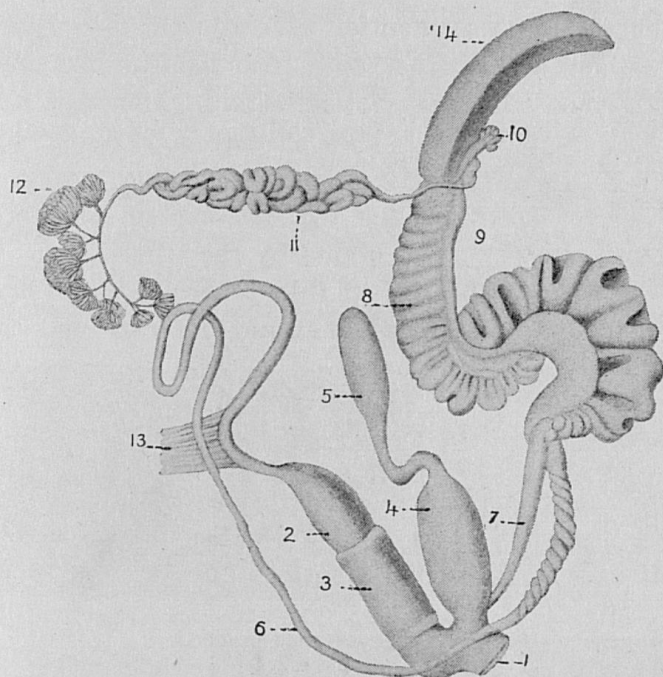


FIG. 8. Genitalia of *P. albolabris* (Simpson).

- | | | |
|-----------------|------------------|---------------------------|
| 1. Atrium. | 6. Vas deferens. | 11. Hermaphroditic duct. |
| 2. Penis. | 7. Free oviduct. | 12. Hermaphroditic gland. |
| 3. Prepuce. | 8. Uterus. | 13. Penis retractor. |
| 4. Vagina. | 9. Spermatheca. | 14. Albumen gland. |
| 5. Spermatheca. | 10. Talon. | |

duct; eggs small and numerous. Jaw solid, ribbed or smooth; marginal teeth with more than one cusp. Shell with lip thickened within, expanded or reflexed; the embryonic whorls not distinctly differentiated.

GENUS POLYGYRA SAY

Shell helicoid, varying from globose or depressed-globose to lens-shaped or planorboid; the periphery carinated or rounded; umbilicus either open or closed. Surface striated or hirsute; corneous, yellow or brown, generally unicolored, but sometimes with many bands, the most constant being supra-peripheral, the others when present being wholly indefinite in number and position. Lip well reflexed; aperture typically obstructed by three teeth; one parietal, two upon the lip; but any or all teeth often wanting.

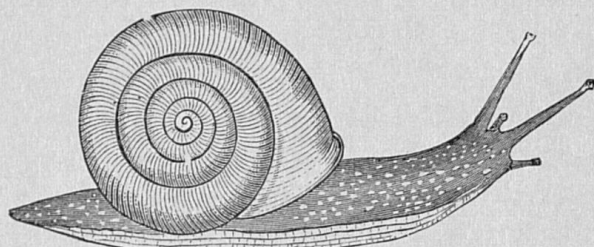


FIG. 9. Animal of *P. albolabris* (Binney).

Animal heliciform, the mantle sub-central, foot rather long and narrow. No pedal grooves. Surface rather coarsely and irregularly granulated, the granulations finer posteriorly; back with a pair of indistinct grooves extending from mantle to facial area; sides of foot, and sides of top of tail without any distinct, oblique or longitudinal lines, irregularly granulated; tail rounded above, obtuse behind. Genitalia simple.

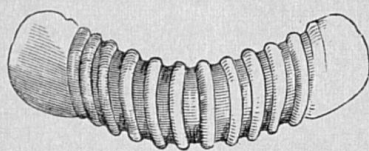


FIG. 10. Jaw of *P. albolabris* (Binney).

Jaw arcuate, solid and strong, sculptured with seven to twenty convex ribs; cutting edge without median projection, but denticulated by the ribs.

Radula generally with tricuspid centrals and bicuspid laterals and marginals, the

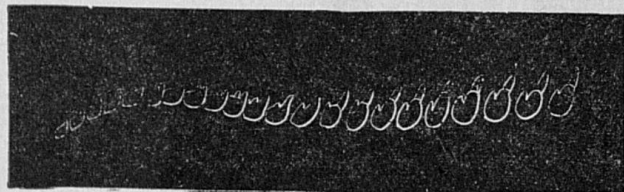
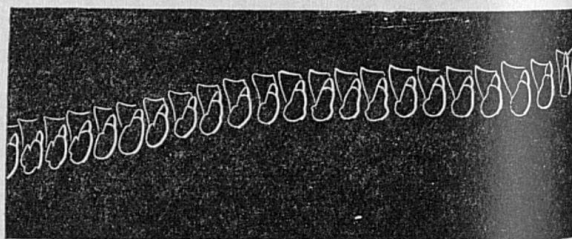


FIG. 11. Radula of *P. albolabris* (Binney).

side cusps v
or cutting p

I. Aperture
lus a
II. Aperture
III. Aperture
whorl

Shell dep
tangential d
or ear-shape
parietal wal

Polygyra septem



FIG. 12. *P. septemvolva* (E)

regularly ro
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Helix febigeri L

Polygyra febigeri

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Original

pale or reddis

side cusps well developed; in some species, however, there are no side cusps or cutting points whatever on any of the teeth.

Key to Sections of Polygyra

- I. Aperture kidney-shaped or ear-shaped, the lip continued in an elevated v-shaped callus across the parietal wall.....*Polygyra* s.s.
- II. Aperture lunate, oblique; outer lip expanded.....*Triodopsis*
- III. Aperture narrow, basal; outer lip reflexed, not expanded beyond the contour of body whorl.....*Stenotrema*

SECTION POLYGYRA s.s.

Shell depressed; umbilicated, or having a curved groove caused by the tangential deviation of the last whorl. Aperture somewhat kidney-shaped or ear-shaped, the lip continued in an elevated v-shaped callus across the parietal wall; outer lip having two teeth or none.

Polygyra cereolus septemvolva Say

Polygyra septemvolva Say, Jour. A. N. S. P., I, 1818, p. 278; W. G. Binney, Manual, 1885, p. 376, fig. 412.



FIG. 12. *P. cereolus septemvolva* (Binney).

Original Description: "Shell much depressed, discoidal; spire not prominent; whorls seven, perfectly lateral, compressed, depressed, and marked with conspicuous lines and grooves above, a projecting carina on the upper edge of the body whorl, beneath which the lines and grooves are obsolete; aperture subreniform, not contracted; lips equal, elevated, outer one reflected, regularly rounded so as to describe two-thirds of a circle; pillar-lip projecting inwards, into an angle or tooth, which is concave beneath; beneath the four exterior volutions equally prominent, transverse diameters equal to those of the upper surface; umbilicus central, moderate, attenuated to the apex so as to exhibit the remaining volutions.

"Breadth, female, two-fifths—male, three-tenths of an inch." (Say.)

Type Locality: Not specified. "Inhabits Georgia and East Florida."

Alabama Record:

Mobile Co.; Mobile.

Distinguished from its associated varieties by its large size and from the typical form by the absence of the internal lamella.

Polygyra cereolus febigeri (Bland)

Helix febigeri Bland, Am. Jour. Conch., II, 1866, p. 373, pl. XXI, fig. 10.

Polygyra febigeri W. G. Binney, Manual, 1885, pp. 381, 486, fig. 415; Lewis, Ala. F. W. & L. Shells, 1876, p. 29; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, p. 375.

Original Description: "Shell umbilicate, orbicular, flat, thin, shining, pale or reddish horn-colored, with rather distant rib-like striae above, finely



FIG. 13. *P. cereolus febigeri* (Binney).

Alabama Record:

Mobile Co.; Mobile.

Dr. Pilsbry (Man. Conch., IX, p. 73) refers this form as a synonym to var. *volvaxis*, but Dr. Clapp (*in litt.*) considers it sufficiently distinct for recognition.

"In *febigeri* there is no such excavation below the angle of the periphery as prevails, more or less, in the other above-named (*P. cereolus* Muhl., *septemvolva* Say, *volvaxis* Parr., and *carpenteriana* Bld.) continental species." (Bland.)

Polygyra cereolus volvaxis (Parreyss)

Helix volvaxis "Parreyss" Pfeiffer, Symbolae, III, 1864, p. 80.

Polygyra cereolus volvaxis W. G. Binney, Manual, 1885, p. 378.

Original Description: "T. umbilicata, orbiculato-convexa, tenuis, rufo-cornea, pellucida, regulariter costulato-striata; spira brevissima, convexa; anfr. 7, convexi, regulariter ac-crescentes, ultimus reliquis superne vix latior, angulatus, infra angulum inflatus, striatus, nitidus; umbilicus latus, regularis, anfractu ultimo latissimo, reliquis regulariter decreescentibus; apertura majuscula, reniformis; perist. intus callosum, reflexum, marginibus callo brevi, triangulari, dentiformi junctis. Diam. 8-9, alt. 4 mm." (Pfeiffer.)

Binney's translation (slightly amended) of the above is as follows: "Shell umbilicated, orbicularly convex, thin, reddish horn-colored, pellucid, with regular rib-like striae; spire very short, convex; whorls 7, convex, regularly increasing, the last scarcely larger above than the rest, angular, below the angle inflated, striated, and shining; umbilicus large, regular, in which the whorls regularly decrease, excepting the last, which is very broad; aperture rather large, kidney-shaped; peristome thickened within, reflected, its terminations joined by a short, triangular tooth-like callus."

Type Locality: Georgia.

Alabama Records:

Baldwin Co.; Point Clear; Week's Bay.
Monroe Co.; Claiborne.

Mobile Co.; Mobile; Alabama Port.
Washington Co.; Healing Springs.

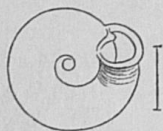


FIG. 14. *P. cereolus volvaxis* (Binney).

Helix auriformis



FIG. 15. *P. auriformis* (Binney).

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Alabama

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Dallas Co.; Sel
Greene Co.; Bo
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Monroe Co.; M
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St. Clair Co.; V
Talladega Co.;

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County.

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Helix espiloca '
arate, p. 69
Polygyra espiloca
Binney, Ma

Original

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Polygyra auriformis (Bland)*Helix auriformis* Bland, Ann. N. Y. Lyc. Nat. Hist., VII, 1858, p. 37, text fig.*Polygyra auriformis* W. G. Binney, Manual 1885, p. 363, fig. 396; Lewis, Ala. F. W. & L. Shells, 1876, p. 38; Johnson & Pilsbry, Nautilus, XI, 1897, p. 72; Cat., 1898, p. 8; Wheeler, Nautilus, XXVI, 1912, p. 15.FIG. 15. *P. auriformis* (Binney).

Original Description: "Shell perforate, above depressed, with rib-like striae, beneath inflated, convex, almost smooth, and with microscopic spiral lines; white or brown horn color, thin; spire very short; whorls 5.5 to 6, rather flat, the last deflected, and shortly turned outwards from the preceding whorl, constricted, scarcely scrobiculate; aperture subhorizontal, ear-shaped, contracted; peristome acute, continuous, the margins joined by a short linguiform fold, entering within the aperture; the right margin with an obtuse submarginal lamella, and the base with an oblique sinuous, tooth-like fold.

"Diam. maj. 11.5, min. 10, alt. 6 mm.

"Diam. maj. 9, min. 8, alt. 4.5 mm." (Bland.)

Type Locality: Not specified.

Alabama Records:

Baldwin Co.; Foley; Magnolia Springs; Week's Bay.

Choctaw Co.; Silas.

Dallas Co.; Selma.

Greene Co.; Boligee.

Marengo Co.; Uniontown; Demopolis.

Monroe Co.; Monroe.

Perry Co.; Hamburg.

St. Clair Co.; Whitney.

Talladega Co.; Childersburg.

Clay Co.; Cragford.

Elmore Co.; Wetumpka.

Madison Co.; Monte Sano.

Mobile Co.; Mobile; Irvington; Saraland.

Montgomery Co.; Barachias.

Shelby Co.; Calera.

Sumter Co.; Livingston; Epes.

Tuscaloosa Co.; Northport.

A characteristic species of the southern region, generally distributed in the southern part of the state and extending as far north as Madison County.

"The pale and white varieties are, I believe, from Alabama; my figure is taken from one of them, the shells are heavier, and the parietal fold especially is more developed." (Bland.)

Polygyra espiloca (Ravenel)

Helix espiloca "Ravenel" Bland, Ann. N. Y. Lyc. Nat. Hist., VII, 1860, p. 115 (separate, p. 69), pl. IV, figs. 1-2.

Polygyra espiloca Lewis, Ala. F. W. & L. Shells, 1876, p. 28; W. G. Binney, Manual, 1885, p. 366, fig. 398.

Original Description: "Shell perforate, above slightly convex, beneath convex, striated, reddish-horn colored, thin, with very short hairs; spire scarcely elevated; whorls 5, rather convex, the last deflected and turned outwards from the preceding one, scrobiculate, constricted, grooved within the umbilical

FIG. 16. *P. espiloca* (Binney).

region; aperture very oblique, subreniform, contracted; peristome acute, continuous, the margins joined by a lamella, excavated above, and produced into a tongue-shaped tooth; the right margin having a broad hooked lamella, and the base an erect lamelliform tooth produced into and recurved within the aperture.

"Diam. maj. 9, min. 8, alt. 4 mm.

"Diam. maj. 7, min. 6, alt. 3 mm. var. *minor*." (Bland.)

Type Locality: Sullivan's Island, South Carolina.

Alabama Record:

Mobile Co.; Mobile.

"This species is certainly distinct from the others of the group. In the form of the parietal process, it is intermediate between *H. postelliana* and *H. avara*, but most like the latter; the teeth on the peristome are very similar to those in the former, but beneath it is less inflated, the umbilical region is wider, showing more of the penultimate whorl, and it is hirsute." (Bland.)

Polygyra pustula (Ferussac)

Helix pustula Ferussac, Ferussac & Deshayes, Hist. Nat. Moll., I, 1820, pl. 78, fig. 1; Bland, Ann. N. Y. Lyc. Nat. Hist., VI, 1858, p. 346 (separate, p. 36), fig. 1.

Polygyra pustula Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, pp. 382, 486, fig. 416.



+

FIG. 17. *P. pustula* (Binney).

Original Description: "Testa orbiculato-depressa, tenui striata, anguste umbilicata; umbilico obtuso; rufa vel pallide cornea; anfractibus angustis, convexiusculis, sutura depressa conjunctis, ultimo basi convexiore prope aperturam deflexo, coarctato; apertura angusta, arcuata, obliqua; marginibus reflexis, basi dente medioeri, linguiformi, conjunctis; labro bidentato, dentibus approximatis inaequalibus." (Ferussac & Deshayes.)

Binney's description is as follows: "Shell umbilicated, orbicularly depressed, minutely striated, reddish or pale horn-color, hirsute; spire scarcely elevated; whorls 4.5, flattened, gradually increasing, the last more convex below, deflected at the aperture, constricted behind the peristome; umbilicus broad, pervious, with a deep groove marked within the shell by an internal revolving, ridge-like lamella, branching from a stout, transverse, internal tubercle; aperture very oblique, narrow, sinuously lunate; peristome sinuous, white, thickened, acute, somewhat reflected, its terminations joined by a two-forked, elevated, acutely pointed lamina, the basal margin with two approximated acute denticles, the columellar termination entering and somewhat covering the umbilicus.

"Greater
Type Locality
Alabama

Baldwin Co.; Mobile Co.; E.

"The grooved species, and the one of his figure. Darien shell, but its presence at the base of the developed transverse lamella runs in a groove. This is by a sinus or

"The hirsute. The outer edge deep rose color

A species of southwest corner

Helix pustuloides



+

FIG. 18. *P. pustuloides* (Binney).

ally increasing, constricted, impressed; umbilicus, showing centric, with er upper angle of reflexed, with rated by a deep

"Diam. maj.

Type Locality

"Greater diameter 5, lesser 4, height 2.5 mm."

Type Locality: Texas.

Alabama Records:

Baldwin Co.; Magnolia Springs; Point Clear.

Conecuh Co.; Evergreen.

Mobile Co.; Mobile.

"The groove within the umbilicus is a very marked feature in Ferussac's species, and though not referred to in the description is distinctly shown in one of his figures; it is entirely wanting in *H. leporina*, and also in the Darien shell (*pustuloides*). This groove is not only an external character, but its presence modifies the internal structure of the shell. On opening the base of the last whorl immediately behind the aperture, a strongly developed transverse tubercle is seen within, from which a strong ridge-like lamella runs round the umbilical opening, corresponding in extent with the groove. This tubercle, and the extension of it, are entirely disconnected by a sinus or channel from the floor of the penult whorl.

"The hirsute character of this species is not alluded to by any author. The outer edge of the peristome in specimens from St. Augustine, is of a deep rose color." (Bland.)

A species of the southern region, which has been reported only from the southwest corner of the state.

Polygyra pustuloides (Bland)

Helix pustuloides Bland, Ann. N. Y. Lyc. Nat. Hist., VI, 1858, p. 350 (separate, p. 40), fig. 2; Sargent, Nautilus, VI, 1892, p. 77.

Polygyra pustuloides Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 383, fig. 417; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 375; Johnson & Pilsbry, Nautilus, XI, 1897, p. 72; Cat., 1898, p. 8; Wheeler, Nautilus, XXVI, 1912, p. 15.



FIG. 18. *P. pustuloides* (Binney).

Original Description: "Shell widely umbilicate, planorboid, thin rufus or pale horn-colored, delicately striated, with thin sparingly hirsute epidermis; spire scarcely elevated; whorls 4-4.5, slightly convex, gradually increasing, the last subangular at the periphery, at the aperture gibbous, constricted, suddenly deflexed, beneath devious; suture rather deeply impressed; umbilicus wide, equal to one-third of the larger diam. of the shell, showing all, but especially the penult whorl; aperture oblique, crescentic, with erect, oblique, white parietal lamelliform tooth, joined to the upper angle of the aperture by a slightly arcuate, filiform callus; peristome reflexed, with margins approaching, and having two dentiform lobes separated by a deep fissure.

"Diam. maj. 5.5, min. 4.5, alt. 2.5 (mm.)." (Bland.)

Type Locality: Darien, Georgia.

Alabama Records:

Baldwin Co.; Point Clear.
Bibb Co.; Blocton.
Chambers Co.; Langdale.

Chilton Co.; Clanton.
Clarke Co.; Thomasville; Jackson.
Cullman Co.; Cullman.
Elmore Co.; Wetumpka.
Fayette Co.; Forks of Sipsey.

Jackson Co.; Princeton; Stevenson; Woodville.
Jefferson Co.; Valley Creek Station; Birmingham.

Lauderdale Co.; Florence.

Madison Co.; Gurley; Huntsville; Monte Sano.

Marengo Co.; Demopolis.

Mobile Co.; Mobile; Mt. Vernon.

Perry Co.; Hamburg.

Shelby Co.; Calera; Montevallo; Weduska Shoals.

St. Clair Co.; Whitney; Gallant; Greensport; Ten Island Shoals.

Talladega Co.; Horseblock Mountain; Three Island Shoals.

Tuscaloosa Co.; Holt; Duncanville; Tuscaloosa; Hagler.

Wilcox Co.; Gastonburg; Pine Hill; Camden; Alberta.

Barbour Co.; Elamville.

Blount Co.; Blount Springs.

Cherokee Co.; Terrapin Creek; 10 mi. S.E.
of Centre.

Choctaw Co.; Silas.

Conecuh Co.; Evergreen.

Dallas Co.; Pleasant Hill; Selma.

Etowah Co.; Big Wills Valley.

Franklin Co.; Burleson.

Macon Co.; Tuskegee.

Marion Co.; Winfield.

Montgomery Co.; McGee's Station.

Randolph Co.; Wadley; Roanoke.

"*H. pustuloides* is intermediate in size between *H. pustula* and *H. leporina*—is less globose than the former, and more sparingly hirsute. It differs widely from both in the character of the umbilicus—the aperture is much like that of *pustula*, but more narrow than that of *leporina*. The inferior tooth on the peristome is more developed laterally than in *H. pustula*—indeed it has a somewhat bifid appearance, in which respect it is more allied to *leporina*.

"The *fulcrum* in *H. pustuloides* is of the same nature as that in *H. leporina*, but less developed, and with the outer edge entire." (Bland.)

Of general distribution in all parts of the state.

Polygyra leporina (Gould)

Helix leporina Gould, Proc. B. S. N. H., III, 1848, p. 39; Bland, Ann. N. Y. Lyc. Nat. Hist., VI, 1858, p. 348 (separate, p. 39).

Polygyra leporina Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 266, fig. 284; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 375; Hinkley, Nautilus, XX, 1906, p. 34.



FIG. 19.
P. leporina
(Binney).

Original Description: "T. parva, lenticulari, lucida, rufescente, cornea, piluscula, leviter striata, vix perforata; spira depressa, anfr. 5, convexiusculis, ultimo superne subangulato; regione umbilicali, excavato; apertura lunata, labro incumbentem, reflexo, roseo, dentes duos albos sinum amplectentes gerente: lamella columellari obliqua, alba, erecta, acuta, rectangulari, callo lineari superne ad angulum aperturæ juncta. Diam. 1/5; alt. 1/8 poll." (Gould.)

Binney's more elaborate description is as follows: "Shell with a partially covered umbilicus, depressed, orbicular, thin, reddish horn-color, delicately

striated, and, v. pressed, comp. angular at its u with a minute, stome incumber expanded teeth by a quadrate, upper angle of like tubercle, w

"Great diar

Type Local

Alabama Re

Barbour Co.; Ela
Clarke Co.; Jacks
Greene Co.; Bolig
Lauderdale Co.;
Mobile Co.; Mobil
Sumter Co.; Epes
Tuscaloosa Co.; T
Walker Co.; June
Washington Co.;

"Intermedia
either. It is le
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stead of by an
latter it differs
but the umbil
(Gould.)

"*H. leporina*
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the groove whic

"Within an
'crum,' extendin
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H. monodon Ra
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Polygyra plicata S
1876, p. 29; J
Nautilus, XX
Polygyra hazardi V
Nat. Hist., XI
Helix hazardi Blar

Original De
slightly elevate

striated, and, when fresh, having a delicate down on its surface; spire depressed, composed of five slightly convex whorls, the last of which is obtusely angular at its upper portion; base convex, excavated at the umbilical region, with a minute, partially covered umbilicus; aperture oblique, lunate; peristome incumbent, rose-colored, reflexed, bearing on its dilated basal edge two expanded teeth, separated by a deep, narrow fissure, its terminations joined by a quadrate, erect, oblique lamella, whose upper edge is joined to the upper angle of the aperture by a thread-like callus; an internal, fulcrum-like tubercle, with uneven outer edge, on the base of the shell.

"Great diameter 6, lesser 5.5; height 3 mm."

Type Locality: Mississippi and Arkansas.

Alabama Records:

Barbour Co.; Elamville.	Choctaw Co.; Silas; Black Bluff.
Clarke Co.; Jackson.	Conecuh Co.; Evergreen.
Greene Co.; Boligee.	Jefferson Co.; Squaw Shoals.
Lauderdale Co.; Florence.	Marengo Co.; Marengo Co.
Mobile Co.; Mobile; Mt. Vernon.	Pickens Co.; Coalfire.
Sumter Co.; Epes; Livingston; York; Sucarnocree Creek.	
Tuscaloosa Co.; Tuscaloosa; Holt; Elrod.	
Walker Co.; Junction of Lost and Wolf creeks.	
Washington Co.; Calvert.	

"Intermediate between *H. hirsuta* and *H. inflecta*, though smaller than either. It is less globose than *hirsuta*, while the aperture is much the same, except that the sinus of the lip is formed by the projection of two teeth instead of by an emargination, in this resembling *H. inflecta*. From the latter it differs in the columellar tooth. It resembles *H. pustula* still more, but the umbilical region wants the peculiar channel of that species. (Gould.)

"*H. leporina* is larger than *H. pustula*, less elevated, the whorls are less convex, the incremental striae less numerous and distinct, and the aperture is wider. The umbilicus is more nearly covered by the lip, and is without the groove which prevails in Ferussac's species.

"Within and near the aperture, there is what may be called the '*fulcrum*,' extending from the floor of the last to that of the penultimate whorl, and approaching in character to, but less strongly developed, than that in *H. monodon* Rack. The outer edge of this *fulcrum* is uneven,—in one of my specimens somewhat denticulated." (Bland.)

Polygyra plicata Say

Polygyra plicata Say, Jour. A. N. S. P., II, 1821, p. 161; Lewis, Ala. F. W. & L. Shells, 1876, p. 29; Johnson & Pilsbry, Nautilus, XI, 1897, p. 83; Cat., 1898, p. 9; Wheeler, Nautilus, XXV, 1912, p. 123.

Polygyra hazardi W. G. Binney, Manual, 1885, p. 267, fig. 285; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 374.

Helix hazardi Bland, Ann. N. Y. Lyc. Nat. Hist., VI, 1858, p. 291, pl. IX, figs. 27-30.

Original Description: "Shell convex beneath, depressed above, spire slightly elevated; whorls five, compressed, crossed by numerous raised,



FIG. 20.
P. plicata
(Binney).

equidistant lines, which form grooves between them; aperture subreniform, labrum reflected, regularly arcuated, describing two-thirds of a circle; within two toothed, teeth not separated by a remarkable sinus; labrum with a profound duplicature, which terminates in an acute angle at the centre of the aperture; beneath exhibiting only two volutions, of which the external one is slightly grooved near the suture. Breadth one-fourth of an inch." (Say.)

Type Locality: Alabama.

Alabama Records:

Bibb Co.; Pratt's Ferry.
Cullman Co.; Cullman.
Franklin Co.; Burleson; Russellville.
Jackson Co.; Stevenson; Princeton.
Lauderdale Co.; Florence.

Marion Co.; Bear Creek.
Pickens Co.; Ligon's Spring.

Colbert Co.; Tuscumbia.
Fayette Co.; Forks of Sipsey River.

Jefferson Co.; Valley Creek, Adger.
Madison Co.; Gurley; Huntsville; Monte Sano.
Mobile Co.; Mobile.
Tuscaloosa Co.; Indian Creek.

"This species is about the same size as *P. avara*, but, besides other characters, it is sufficiently distinguished by the acute fold of the labrum" (Say.)

"This shell may be distinguished from *fatigiata* Say and *troostiana* Lea independently of the absence of the carina, by its smaller size, and more particularly by the different form, relative size, and position of the teeth. In those species the superior tooth on the peristome is transverse, compressed, and larger than the inferior one, from which it is separated by a 'remarkable sinus,' distinctly visible on looking into the aperture; the inferior tooth is obtuse. Immediately behind the peristome, the position of the teeth is marked by small shallow pits, giving the character to the last whorl designated by Shuttleworth '*scrobiculato-constrictus*,'—the striae run over the whorl up to the peristome. In *H. hazardi*, the two teeth on the peristome are of the same character as the superior one in *fatigiata* and *troostiana*,—the inferior tooth is, however, the largest, and so partially conceals the lower margin of the superior one as to obstruct the view into the aperture, and give no appearance of separation 'by a remarkable sinus.' Both the teeth are more deeply seated than in the other species. The nature of the scrobiculation behind the peristome in *H. hazardi* alone sufficiently distinguishes it from its allies. The space behind the peristome, and between it and the curved pit, showing the seat of the superior tooth is convex and smooth, the striae not extending over it. This species has, in common with *fatigiata* Say and *troostiana* Lea, a thin, brown, but more sparingly hirsute epidermis. I have noticed the tubercle within the last whorl, near the aperture, in *fatigiata* and *troostiana*, but no such process exists in the species now under consideration. In *H. hazardi*, the inferior

tooth of the labrum forming a whitish leaving a narrow at its extremity tion of this lam

Polygyra dorfeuil-



FIG. 21.
P. dorfeuil-
liana
(Binney).

Jackson Co.; Wood Coosa River, Alabama.

"This species one large tooth differs from the and having large and square, with nearly obstructed apertures. The is nearly smooth. "*H. dorfeuil-* preceding species on the upper surface than in *hazardi* having only very

"The particles more nearly of this species the than the superior nearly equally them into the three nearly square 'separated by a and less reflected without any aperture (Bland.)

tooth of the labrum, at its inner end, is continued back within the aperture, forming a white erect lamella on the floor of the whorl, parallel with, and leaving a narrow sinus between it and the inner wall, to which it is joined at its extremity, about 2.5 mm. from the edge of the peristome. The position of this lamella can be seen through the shell." (Bland.)

Polygyra dorfeuilliana Lea

Polygyra dorfeuilliana Lea, Trans. Am. Phil. Soc., VI, 1838, p. 107, pl. XXIV, fig. 118; W. G. Binney, Manual, 1885, p. 374, fig. 410.

Helix dorfeuilliana Bland, Ann. Lyc. Nat. Hist. N. Y., VI, 1838, p. — (separate, p. 18); Sargent, Nautilus, VI, 1892, p. 77.



FIG. 21.
P. dorfeuil-
liana
(Binney).

Original Description: "Shell above obtusely conical, below somewhat inflated, shining, horn-color; longitudinally striate, widely umbilicate; whorls six; aperture lunate, three-toothed.

"Diam. .3, length .2 of an inch." (Lea.)

Type Locality: Ohio. (Erroneous.)

Alabama Records:

Jackson Co.; Woodville.
Coosa River, Alabama.

"This species has, like *Polygyra fatigiata* (Say) and *P. plicata* (Say), one large tooth on the left lip and two smaller ones on the right lip. It differs from the first in not being carinate, from the last in being larger and having larger striae. In *dorfeuilliana* the tooth on the left lip is large and square, with an indentation in the centre. The view into the mouth is nearly obstructed by the teeth, leaving, to appearance, three nearly square apertures. The superior part of the shell is striate, while the inferior part is nearly smooth, and exhibits two volutions." (Lea.)

"*H. dorfeuilliana* Lea differs materially in its characters from the three preceding species (*fatigiata*, *troostiana* and *plicata* (*hazardi*)); the striae on the upper surface are not so well defined as in *troostiana*, but more so than in *hazardi*, while the base is more smooth than in either of them, having only very delicate striae, with microscopic impressed spiral lines.

"The parietal tooth is quadrate,—the two teeth on the right lip are more nearly of the same size and form than in *fatigiata* and *troostiana*. In this species the inferior tooth is transverse, and in some specimens broader than the superior one, but has a somewhat pointed apex,—both are very nearly equally deeply seated, but so far apart as to allow a view between them into the aperture, leaving, as Mr. Lea expresses it, 'to appearance three nearly square apertures.' Say would have described the two teeth as 'separated by a remarkable sinus.' The peristome of this is more thickened and less reflected than in the other species,—behind it is deeply constricted, without any appearance of pits showing the position of the teeth within." (Bland.)

This species must be considered a very doubtful member of the fauna of Alabama. The localities cited are from W. G. Binney and Sargent. I have not been able to verify either.

Pilsbry and Ferriss (Pr. A. N. S. P., 1906, p. 538) after a careful discussion of the evidence conclude:—"It seems, therefore, doubtful whether its range extends east of the Mississippi at all; and until some definite eastern Mississippian locality for it is put on record, we are disposed to erase Ohio, Kentucky, Tennessee and Alabama from the ascertained range of the species."

Polygyra troostiana Lea

Polygyra troostiana Lea, Trans. Am. Phil. Soc., VI, 1838, p. 107, pl. XXIV, fig. 114; W. G. Binney, Manual, 1885, p. 268, fig. 286; Hinkley, Nautilus, XX, 1906, p. 34; Wheeler, *ibid.*, XXV, 1912, p. 123.

Helix troostiana Bland, Ann. N. Y. Lye. Nat. Hist., VI, 1858, p. 288 (separate, p. 12), pl. IX, figs. 21-23.



FIG. 22.
P. troostiana
(Binney).

Original Description: "Shell above nearly flat, below somewhat inflated, horn-colored, longitudinally striate, widely umbilicate; whorls six; aperture lunate three-toothed.

"Diam. .4, length .2 of an inch." (Lea.)

Binney's description is as follows: "Shell rimately umbilicate, discoidal, slightly convex above, flattened below, obtusely carinated, with separated, strong, rib-like striae throughout (some of the striae extend over the carina on to the base of the shell, without being carried into the umbilicus), hirsute, russet horn-colored, spire not much elevated; whorls 5.5, flattened, the last more convex, descending at the aperture, grooved behind the peristome, with a smoother bulge below plane, widely rimated, and ending in a small umbilicus; aperture oblique, subreniform, very much contracted, far within on the base of the outer whorl, with a small, detached, erect, rounded tubercle; peristome white, thickened, continuous, ends approached, joined by an excavated emarginate, somewhat flexuose, slightly entering, tongue-like, heavy callus the basal margin with a submarginal, obtuse, stout denticle, right margin with a more deeply seated broader denticle.

"Greater diameter 9, lesser 8, height, 3 mm."

Type Locality: Tennessee.

Alabama Records:

Calhoun Co.; Choctolocco Mts., Germania Spring.
Cherokee Co.; Craig Mountain.
Clebune Co.; Dugger Mountain.
Lauderdale Co.; Cedar Island, Florence; Florence.
Madison Co.; Huntsville; Gurley; Normal; Monte Sano.
Mobile Co.; Saraland.

"This species same size, and large solid too on the right lip much, these be whorls. In the (Lea.)

"*H. troostiana* separate it with hirsute epidermis as *H. fatigata*

This is a species northern country is far separated

In a recent land, Mobile Co. know where else

It is now re

Shell varying perforate; surface less deflexed in two on the lip absent.



FIG. 23. *P. tridentata* (Binney).

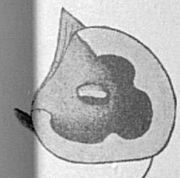


FIG. 24. *P. tridentata* (Pilsbry).

"This species strongly resembles *P. dorfeuilliana*, being nearly of the same size, and possessing most of its characters. It differs, however, in the large solid tooth on the left lip being more angular, and in the two teeth on the right lip being somewhat differently placed. In the striae it differs much, these being larger, much better defined, and passing entirely over the whorls. In the umbilicus it is wider, and shows more of the two whorls." (Lea.)

"*H. troostiana* is very closely allied to *H. fatigiata* Say, from which I separate it with some hesitation. In its fresh state it has a thin, sparingly hirsute epidermis. This species has the same tubercle within the last whorl as *H. fatigiata*." (Bland.)

This is a species of the Cumberland region, which has been found in the northern counties of the state. A single record by Clapp from Mobile Co. is far separated from the northern localities.

In a recent letter Dr. Clapp writes in regard to his citation from Saraland, Mobile Co.: "It is a single example, which is not typical, but I do not know where else to put it."

It is now recognized as being quite distinct from *P. fatigiata* Say.

SECTION TRIODOPSIS RAFINESQUE

Shell varying from depressed to globose-conoidal, umbilicate or imperforate; surface generally striated; whorls 5-6, the last wider, more or less deflexed in front. Aperture lunate, typically obstructed by three teeth, two on the lip, one on the parietal wall, but any or all of the teeth often absent.

Polygyra tridentata (Say)

Helix tridentata Say, Nich. Encyc. Ed. I, 1816, pl. II, fig. 1; Sargent, Nautilus, VI, 1892, p. 77.

Triodopsis tridentata Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 291, fig. 312.

Polygyra tridentata Johnson & Pilsbry, Nautilus, XI, 1897, p. 84; Cat., 1898, p. 10; Wheeler, Nautilus, XXVI, 1912, p. 15.

Original Description: "Shell depressed, spire very little raised, brownish or horn-color; whorls five, crossed by numerous raised, equidistant, acute lines, separated by regular grooves; aperture lunate, three toothed; teeth placed triangularly, one on the pillar lip situated diagonally; outer lip abruptly contracting the aperture, widely reflected and white, furnished with two of the teeth resembling projecting angles. Umbilicus moderate.

"Half an inch wide." (Say.)

Type Locality: Not specified. "Inhabits the middle states."



FIG. 23. *P. tridentata* (Binney).



FIG. 24. *P. tridentata* (Pilsbry).

Alabama Records:

Bibb Co.; Pratt's Ferry; Pratt Creek, Blocton.
 Blount Co.; Blount Springs. Cherokee Co.; Gorge of Little River.
 Clay Co.; Pyriton. DeKalb Co.; Valley Head.
 Elmore Co.; Noble's Ferry, Elmore. Etowah Co.; Black Creek Falls.
 Fayette Co.; Fayette Court House; Fayette; Forks of Sipsey.
 Franklin Co.; Burleson.
 Jackson Co.; Princeton; Stevenson; Woodville.
 Jefferson Co.; Henry Ellen; Squaw Shoals; Warrior.
 Lauderdale Co.; Florence. Madison Co.; Gurley; Monte Sano;
 Marion Co.; Bear Creek; Hamilton. Matthews Hill, Huntsville.
 Randolph Co.; Roanoke; Wadley. Mobile Co.; Mobile.
 St. Clair Co.; Gallant. Shelby Co.; Gurnee.
 Tuscaloosa Co.; Holt; Indian Creek; Tuscaloosa.

Walker Co.; Forks of Warrior; Junction of Lost and Wolf creeks.

This common and well-known species has a general range over the northern part of the state. A single record from Mobile is the only one from the southern portion.

Polygyra tridentata tennesseensis Walker & Pilsbry

Polygyra tridentata tennesseensis Walker & Pilsbry, Proc. A. N. S. P., 1902, p. 422.

Original Description: "A very distinct form of *P. tridentata* characterized by its large size, depressed *complanata*-like form, but closely and regularly striated. The lip is that of the typical *tridentata*, with rather small marginal teeth. Of twenty specimens the smallest was 19 and the largest 24 mm. in diam., the average being 22.5. Only two were less than 21." (Walker & Pilsbry.)

Type Locality: South side of the French Broad River below Paint Rock just over the line in Tennessee.

Alabama Records:

Bibb Co.; Pratt's Ferry. Jackson Co.; Sand Mountain.
 Shelby Co.; Gurnee. Talladega Co.; Horseblock Mountain.
 Tuscaloosa Co.; Tuscaloosa; Holt. Walker Co.; South end of county.

The shells from Gurnee; Tuscaloosa; Holt and Walker County are marked "?" by Smith. I have not seen specimens.

Polygyra fraudulenta Pilsbry

Triodopsis fallax Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 292, fig. 314.



FIG. 25. *P. fraudulenta* (Binney).

Helix fallax Sargent, Nautilus, VI, 1892, p. 77.

Polygyra tridentata fraudulenta Pilsbry, Proc. A. N. S. P., 1894, p. 50, pl. I, fig. 6.

Polygyra fraudulenta Hinkley, Nautilus, XX, 1906, p. 34; Wheeler, Nautilus, XXV, 1912, p. 123.

Original Description: "In its typical development this variety is a compact shell of a reddish-brown color (varying to white in some localities); the spire is low-convex, composed of six closely coiled whorls, the last being notably

deflexed in front strongly "di-

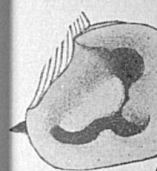


FIG. 26. *P. fraudulenta* (Pilsbry).

*Type Locality**Alabama Records*

Bibb Co.; Wood-
 Cleburne Co.; L-
 Cullman Co.; L-
 DeKalb Co.; S-
 Etowah Co.; K-
 Jackson Co.; S-
 Lauderdale Co.;

This species generally figured differentiated by "The tooth-
dopsis fallax
 its typical development
 My figure of the species type.
 Generally

Helix vannastrata
Triodopsis vannastrata

Original Description

of the aperture is more decided a smaller umbilicus connects internally distinct from, "The measurement 12.5, lesser diameter 10, 1
Type Locality

deflexed in front and strongly constricted behind the lip. The aperture is strongly "dished" or basin-shaped; the outer lip bears a broad tongue-shaped inflected tooth, situated at the position of the periphery of the shell. The middle of the basal lip bears a small squarish tubercle, which is often laterally compressed. The parietal wall bears an elevated oblique blade, which is typically almost straight and never much curved.

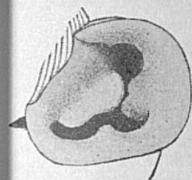


FIG. 26. *P. fraudulentula* (Pilsbry).

"Alt. 8.33, diam. 16.33 mm." (Pilsbry.)

Type Locality: Morgan Co., W. Va., opposite Hancock, Maryland.

Alabama Records:

Bibb Co.; Woodstock.

Cherokee Co.; 10 mi. s. e. of Center; Slackland.

Cleburne Co.; Dugger Mt., Piedmont.

Cullman Co.; Logan's Spring; Wilhites.

DeKalb Co.; Slackland; Fort Payne; Valley Head.

Etowah Co.; Keener.

Franklin Co.; Burleson; Russellville.

Jackson Co.; Stevenson; Princeton; Limrock; Woodville.

Lauderdale Co.; Florence.

Madison Co.; Huntsville; Gurley; Monte Sano.

This species was for many years taken for Say's *Helix fallax* and was generally figured as that species by the earlier authors. It was finally differentiated by Dr. Pilsbry in 1894.

"The tooth on the outer lip is generally bifid. Binney's figures of *Triodopsis fallax* (Manual, fig. 314) represent a form of this subspecies, but not its typical development." (Pilsbry.)

My figure No. 25 is a copy of Binney's figures, which is the usual aspect of the species as found in collections. Figure No. 26 is a copy of Pilsbry's type.

Generally distributed in the northern part of the state.

Polygyra vannostrandi (Bland)

Helix vannostrandi Bland, Ann. N. Y. Lyc. Nat. Hist., XI, 1875, p. 200.

Triodopsis vannostrandi W. G. Binney, Manual, 1885, p. 294, fig. 316.

Original Description: "This species is in form and character of the aperture very nearly allied to *introferens* (*fallax*), but is more decidedly costate, more convex at the base, with a smaller umbilicus, and without the internal tubercle. It connects *introferens* (*fallax*) and *vultuosa* with, but is quite distinct from, *fallax* (*fraudulenta*).

"The measurements of a specimen with 6.5 whorls are: Greater diameter 12.5, lesser 11; height, 7 mm. Of a specimen with 6 whorls: Greater diameter 10, lesser 8; height, 5 mm." (Bland.)

Type Locality: Aiken, South Carolina.



FIG. 27.
P. vannostrandi
(Binney).

Alabama Record:

Barbour Co.; Elamville.

A species of the southern Atlantic states, which has ranged west into Barbour County.

Polygyra vannostrandi alabamensis Pilsbry

Polygyra alabamensis Pilsbry, Nautilus, XVI, 1902, p. 30.

Polygyra vannostrandi alabamensis Pilsbry, Nautilus XXVI, 1912, p. 80.



FIG. 28. *P. vannostrandi alabamensis*.

Original Description: "Shell depressed, about like *P. vannostrandi* in general contour, yellowish brown, glossy, finely rib-striate above and below; umbilicate. Spire low dome-shaped. Whorls about 6, *very closely coiled*, the last having the periphery situated high; a trifle deflexed in front.

Aperture oblique, lunate; peristome white, narrowly reflexed, thickened within, the outer lip bearing a small, squarish tubercle, bent inward; basal lip bearing a marginal tubercle, abrupt on its outer, sloping or buttressed on its inner side. Parietal lamella short, erect, a trifle curved. Alt. 6, diam. $11\frac{1}{2}$ mm." (Pilsbry.)

Type Locality: Auburn, Alabama.

Alabama Records:

Barbour Co.; Elamville.
Calhoun Co.; Ten Island Shoals.
Chambers Co.; Langdale.
Cherokee Co.; 10 m. S. E. of Centre; 6 m. W. of Cave Spring, Ga.
Chilton Co.; Butting Ram Shoals; Clanton; Duncan's Riffle.
Clay Co.; Pyriton.
Dale Co.; Pinckhard.
Elmore Co.; Wetumpka.
Etowah Co.; Black Creek Falls.
Lee Co.; Auburn.
Macon Co.; Tuskegee.
Pike Co.; Troy.
Randolph Co.; Roanoke; Wadley.
Shelby Co.; Calera.
St. Clair Co.; Lock 3, Coosa River; Lock 4, Coosa River; Greensport.
Talladega Co.; Three Island Shoals; Ft. William Shoals.

"The aperture is exceedingly similar to that of *P. inflecta*, from which this species differs in the sculpture, closely coiled whorls and open umbilicus. *P. vannostrandi* has differently proportioned teeth and less closely coiled whorls." (H. A. P.)

In writing of *P. vannostrandi* Pilsbry (Naut., XXVI, p. 80) says: "*P. v. alabamensis* and another variety, with a decidedly wider umbilicus, but still unnamed, replace typical *vannostrandi* in Alabama. Neither is so distinct as to be startling."

Apparently restricted to the eastern part of the state as it has not been reported from west of the Cahaba River.

Helix rugeli Shu



FIG. 29. *P. rugeli* (Binney).

strictus; apert. aperturali intr. dextro dente m. dente minore t.

"Diam. ma. Binney's tr. vex, with gran. obtuse; whorls strongly contra. tongue-shaped, thickened, its tooth (whose p. pit), the basal denticle."

Type Localities:

Alabama Records:
Barbour Co.; Elamville.
Blount Co.; Blount.
Clay Co.; Pyriton.
Conecuh Co.; Ever.
Etowah Co.; Keen.
Jackson Co.; Prin.
Lee Co.; Auburn.
Macon Co.; Tuske.
Madison Co.; Mon.
Marion Co.; Hami.
Shelby Co.; Calera.
Talladega Co.; H.
Tuscaloosa Co.; H.

"It is in mo. would be mista. of the upper to. guishes it." (I.

A common s. the extreme sou.

Polygyra rugeli (Shuttleworth)

Helix rugeli Shuttleworth, Bern. Mittheil., 1852, p. 198; Sargent, Nautilus, VI, 1892, p. 77.

Triodopsis rugeli Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 290, fig. 311.

Polygyra rugeli Wheeler, Nautilus, XXV, 1912, p. 34.



FIG. 29. *P. rugeli* (Binney).

Original Description: "Testa obtecte perforata, orbiculato-convexa, granulato-striata, parce setosa, corneo-cerea; spira brevis, obtusa; anfr. 5.5, convexiusculi, ultimus antice subito deflexus, ad aperturam valde contractus; apertura depressa, dente valido linguiformi flexuoso in pariete aperturali intrante coarctata; perist. reflexum, intus callosum, margine dextro dente magno obtuso profunde immerso extus subserobiculato, basali dente minore transverso submarginali instructo.

"Diam. maj. 13, min. 11.5, alt. 6.25 mm." (Shuttleworth.)

Binney's translation is as follows: "Shell imperforate, orbicularly convex, with granulate striations and few hairs, waxen horn-color; spire short, obtuse; whorls 5.5, rather convex, the last suddenly falling in front and strongly contracted at the aperture; aperture depressed, narrowed by a tongue-shaped, flexuose, strong parietal denticle; peristome reflected, within thickened, its right termination with a large, obtuse, very deeply seated tooth (whose position is marked on the exterior of the shell by a groove or pit), the basal terminus furnished with a smaller, transverse, submarginal denticle."

Type Locality: Tennessee.

Alabama Records:

Barbour Co.; Elamville.	Bibb Co.; Bibb Co.
Blount Co.; Blount Springs.	Calhoun Co.; Anniston.
Clay Co.; Pyriton; Cragford.	DeKalb Co.; Valley Head; Sand Mountain; Fort Payne.
Conecuh Co.; Evergreen.	Franklin Co.; Burleson; Russellville.
Etowah Co.; Keener.	
Jackson Co.; Princeton; Stevenson; Woodville.	
Lee Co.; Auburn.	Montgomery Co.; Montgomery.
Macon Co.; Tuskegee.	Marengo Co.; Demopolis.
Madison Co.; Monte Sano.	Mobile Co.; Mobile.
Marion Co.; Hamilton.	Randolph Co.; Roanoke; Wadley.
Shelby Co.; Calera; Wilsonville; Montevallo; Helena; Gurnee.	
Talladega Co.; Horseblock Mountain; Fort William Shoals.	
Tuscaloosa Co.; Hagler.	

"It is in most respects similar to the preceding species (*inflecta*), and would be mistaken for it unless the aperture be examined. The position of the upper tooth of the peristome far within the aperture at once distinguishes it." (Binney.)

A common species and of general distribution, except, apparently, in the extreme southern counties.

Polygyra inflecta (Say)

Helix inflecta Say, Jour. A. N. S. P., II, 1821, p. 153; Sargent, Nautilus, VI, 1892, p. 77.
Triodopsis inflecta Lewis, Ala. F. W. & L. Shells, 1876, p. 29;
 W. G. Binney, Manual, 1885, pp. 289, 487, 488, fig. 310;
 Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 380.
Polygyra inflecta Johnson & Pilsbry, Nautilus, XI, 1897, p. 93;
 Cat., 1898, p. 11; Hinkley, Nautilus, XX, 1906, p. 34;
 Wheeler, *ibid.*, XXV, 1912, p. 123.



FIG. 30. *P. inflecta*
(Binney).

Original Description: "Spire convex; volutions five, wrinkled across; suture not profoundly impressed; aperture straight; labrum reflected, bidentate, teeth separated by a profound sinus, the superior tooth inflected; behind the lip a profound groove, which abruptly contracts the aperture in that part, so that although the lip is reflected, yet its edge is not more prominent than the general exterior surface of the body whorl; at the base the lip is adpressed and covers the umbilicus; labrum with a large, prominent, oblique, lamelliform tooth; umbilicus closed.

"Greatest transverse diameter nearly nine-twentieths of an inch." (Say.)

Type Locality: Lower Missouri.

Alabama Records:

Baldwin Co.; Magnolia Springs; Foley; Bay Minette.	Calhoun Co.; Ten Island Shoals.
Barbour Co.; Elamville.	Cherokee Co.; Pleasant Gap; Poole's
Blount Co.; Blount Springs.	Island; 10 mi. s. e. of Centre; Slack-
Chambers Co.; Langdale.	land.
Bibb Co.; Eoline; Pratt's Ferry; Wood-	
stock; Blacton.	
Chilton Co.; Mountain Creek; Clanton.	Cullman Co.; Sand Mt., Wilhites; Cullman
Choctaw Co.; Black Bluff; Moscow; Silas.	Dallas Co.; Selma; Pleasant Hill.
Clarke Co.; Thomasville; Jackson; Grove Hill.	Elmore Co.; Wetumpka.
Colbert Co.; Tuscumbia.	Etowah Co.; Keener; Gadsden.
Crenshaw Co.; Searight.	Fayette Co.; Fayette.
Dale Co.; Pinckhard.	
DeKalb Co.; Valley Head.	
Conecuh Co.; Evergreen; Banks of Sepulga	
River.	
Franklin Co.; Russellville; Burleson.	
Geneva Co.; High Bluff; Choctahatchee River.	
Greene Co.; Boligee.	
Jackson Co.; Stevenson; Princeton; Woodville; Pisgah; Paint Rock.	
Jefferson Co.; Adger; Squaw Shoals; Jansen's old mill, Cahaba River.	
Lauderdale Co.; Florence.	Lee Co.; Auburn.
Madison Co.; Huntsville; Normal; Gurley; Monte Sano.	
Marengo Co.; Marengo Co.	Marion Co.; Bear Creek.
Mobile Co.; Mobile; Mt. Vernon; Alabama Port; Saraland.	
Monroe Co.; Drewery.	Montgomery Co.; McGee's Station.
Perry Co.; Marion; Hamburg.	Pike Co.; S. E. corner near Pea River.
Randolph Co.; Wadley.	Shelby Co.; Calera; Montevallo.
St. Clair Co.; Greensport; Gallant; Whitney; Ten Island Shoals.	
Sumter Co.; Epes; Livingston; Moscow Bluff.	

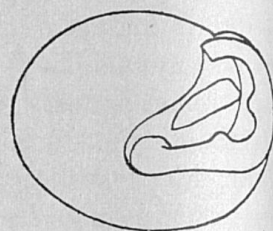


FIG. 31. *P. inflecta*
(Clapp).

Polygyra inflecta



FIG. 32. *P. inflecta*
mans (Clapp).

"A considerable and while this is greater than

"Greater c

"

"

"

"A specimen son, Fig. 31."

Type Locality

Alabama Records

Marengo Co.; Marion
Perry Co.; Marion
Tuscaloosa Co.;

Polygyra inflecta

Original Description

the last whorl
having the um
found the shel

"The major cal form, from

"Six exam

Talladega Co.; Three Island Shoals; Fort William; Ft. William Shoals.

Tallapoosa Co.; Yates.

Tuscaloosa Co.; Tuscaloosa; Hagler; Indian Creek; Duncanville; Holt; Vance; Wawah.

Walker Co.; Forks of Warrior; S. end of Co.

Wilcox Co.; Camden; Gastonburg; Pine Hill; Alberta.

One of the most common and generally distributed species of the state. There is great variation in size.

Polygyra inflecta approximans Clapp

Polygyra inflecta approximans Clapp, Nautilus XIX, 1905, p. 74, pl. III, fig. 6.

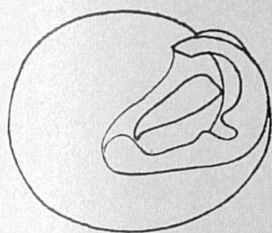


FIG. 32. *P. inflecta approximans* (Clapp).

Original Description: "Differs from typical *inflecta* in the closely approximated lip teeth, the space between them measuring only about $\frac{1}{2}$ mm. in width, while in the typical form it measures 1 mm. and over. The aperture is also wider, in proportion to its length, and less rounded in front; body-whorl narrower at the aperture, not swollen back of the lip. In other characters like the type—whorls about $4\frac{1}{2}$.

"A considerable proportion of the shells have the umbilicus partly open, and while this can hardly be considered a specific character the proportion is greater than in any lot of *inflecta* I have seen.

"Greater diam. $7\frac{1}{2}$, lesser $6\frac{1}{2}$, alt. $4\frac{1}{2}$ mm.

" " 8, " 7, " 5 "

" " $8\frac{1}{2}$, " $7\frac{1}{2}$, " $4\frac{3}{4}$ "

" " $8\frac{3}{4}$, " $7\frac{3}{4}$, " 5 "

"A specimen of *P. inflecta* from Jackson, Ala., is figured for comparison, Fig. 31." (Clapp.)

Type Locality: Marion, Alabama.

Alabama Records:

Marengo Co.; Marengo.

Perry Co.; Marion; Hamburg.

Tuscaloosa Co.; Hagler.

Polygyra inflecta mobilensis Clapp

Polygyra inflecta mobilensis Clapp, Nautilus, XXVIII, 1915, p. 128.

Original Description: "It differs from the type in being flatter, with the last whorl less swollen beneath, the teeth small and weak, and in always having the umbilicus *partly uncovered*; white to light-horn-color but when found the shells are covered with a black, *very* adhering coating.

"The majority of the shells have about one-half whorl less than the typical form, from Mobile, as shown by measurements below.

"Six examples, the largest to the smallest, measure:

Gr. diam.	11.5,	alt.	6	mm.,	whorls	5.
"	11.5,	"	5.75	"	"	4.5.
"	10.5,	"	5.5	"	"	4.5.
"	10.5,	"	5	"	"	4.5.
"	10.25,	"	5	"	"	4.75.
"	10,	"	5.25	"	"	4.5.

"Five typical shells from Mobile measure:

Gr. diam.	10.75,	alt.	6.75	mm.,	whorls	5.
"	10.75,	"	6.5	"	"	5.
"	10.5,	"	6	"	"	5.
"	10.5,	"	6	"	"	5.
"	10,	"	6.25	"	"	5."

Type Locality: Mobile, Alabama.

Alabama Records:

Mobile Co.; Mobile; Dauphine Island.

Polygyra smithii Clapp

Polygyra smithii Clapp, Nautilus, XIX, 1905, p. 73, pl. III, figs. 1-4; Wheeler, Nautilus, XXV, 1912, p. 124.

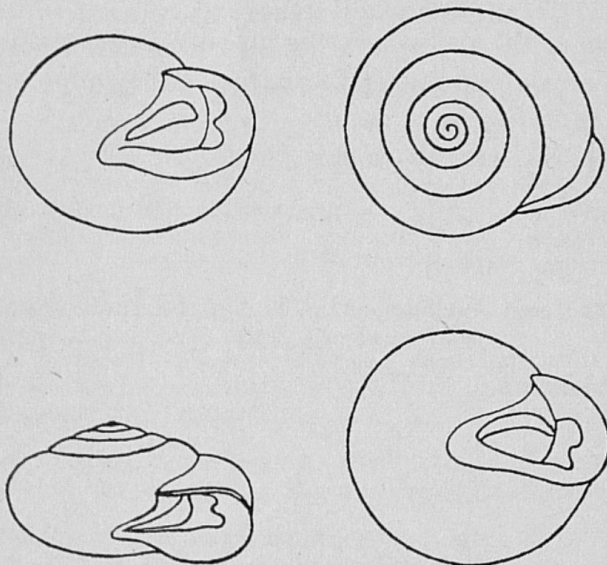


FIG. 33. *P. smithii* (Clapp).

its first third; rounded, swollen and very deeply constricted back of the peristome, sharply descending in front; upper half of the aperture, viewed from the under side, forming a half circle; below the periphery almost straight, so that the whole effect is like a human ear; lip wide, white, concave above and flat below, at the periphery a wide, flat entering tooth, basal lip straight, slightly thickened on the upper margin; parietal wall bearing a large, high, very slightly curved tooth extending from the lip-tooth to the

Original Description:

"Shell imperforate, depressed, thin, horn-color, densely covered with elevated, epidermal processes, giving the shell a scaly appearance, the hairs following the weak growth lines; embryonic whorls sculptured with elongate granules; spire low, convex, rounded, sutures well impressed, whorls about 5.5; body-whorl obtusely carinated above the periphery in

axis, a thin wa
the lip.

"Gr. diam.

" "

" "

" "

" "

"The first

erable series, t

Type Loca

Altitude about

Alabama R

Cherokee Co.; Cr

Jackson Co.; Ste

Madison Co.; M

Smithers Mo

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Restricted

Helix profunda S



FIG. 34. *P. pr*
(Binney)

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labrum reflect

slightly projec

profound, exhi

"Transvers

Type Loca

souri banks."

Alabama R

Jackson Co.; Pri

This widely

Jackson Count

axis, a thin wash of whitish callus connecting the upper and lower ends of the lip.

"Gr. diam. 16.5, lesser 14, alt. 10 mm.

" " 15.5, " 13.5, " 9 mm.

" " 15, " 13, " 8.5 mm.

" " 14.5, " 12.5, " 8.25 mm.

" " 13.5, " 11.75, " 7.5 mm.

"The first and last measurements given are the extremes of a considerable series, the average size being about 15 mm." (Clapp.)

Type Locality: Monte Sano, about 5 miles east of Huntsville, Alabama. Altitude about 1,600 feet.

Alabama Records:

Cherokee Co.; Craig Mountain.

Jackson Co.; Stevenson; Sand Mountain, Fabins; Princeton.

Madison Co.; Monte Sano, Huntsville; Huntsville; Gurley; Keel Mountain, Gurley; Smithers Mountain.

Named after the discoverer, the late Herbert H. Smith. "While bearing a striking resemblance to an overgrown *P. inflecta*, it is readily separated by the character of the hairs and the absence of the basal lip-tooth; it is also close to *P. subpalliat*a, but is apparently most closely related to *P. inflecta*." (G. H. C.)

Restricted to the northern part of the state.

Polygyra profunda (Say)

Helix profunda Say, Jour. A. N. S. P., II, 1821, p. 160.

Mesodon profundus W. G. Binney, Manual, 1885, p. 318, fig. 342.

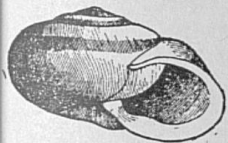


FIG. 34. *P. profunda* (Binney).

Original Description: "Shell pale horn-color; spire convex, very little elevated; whorls five, regularly rounded, and wrinkled transversely; body whorl with a single revolving rufous line, which is almost concealed on the spire by the suture, but

which passes for a short distance above the aperture; aperture dilated; labrum reflected, white, and excepting near the superior angle, flat; a slightly projecting callus near the base, on the inner edge; umbilicus large, profound, exhibiting all the volutions to the apex.

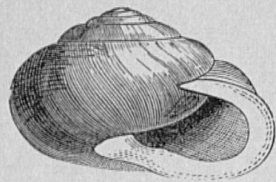
"Transverse diameter nineteen-twentieth of an inch." (Say.)

Type Locality: Not specified. "Inhabits Ohio, Mississippi and Missouri banks."

Alabama Records:

Jackson Co.; Princeton; Stevenson.

This widely distributed northern species has, as yet, been found only in Jackson County.

Polygyra albolabris (Say)*Helix albolabris* Say, Nich. Enyc., II, 1817, pl. I, fig. 1.*Mesodon albolabris* W. G. Binney, Manual, 1885, pp. 298 & 489, fig. 319; Lewis, Ala. F. W. and L. Shells, 1876, p. 29.FIG. 35. *P. albolabris* (Binney).

Original Description: "Shell thin, fragile; convex, imperforated; with six volutions, whorls obtusely wrinkled across, and spirally striated with very fine impressed lines, a little waved by passing

over the wrinkles, both becoming extinct towards the apex, which is perfectly smooth; aperture lunated, not angulated at the base of the column, but obtusely curved, lip contracting the mouth abruptly, widely reflected, flat and white.

"Length of the column three-fifths of an inch; breadth one inch." (Say.)

Type Locality: Not specified.

Alabama Records:

Bibb Co.; Woodstock.	Blount Co.; Blount Springs.
Calhoun Co.; Anniston.	Chambers Co.; Langdale.
Cherokee Co.; Pleasant Gap; 6 m. west of Cave Spring, Ga.	
Clay Co.; Pyriton.	Cleburne Co.; Dugger Mountain.
DeKalb Co.; Fort Payne; Valley Head; Sand Mountain.	
Etowah Co.; Keener.	Franklin Co.; Burleson.
Jackson Co.; Stevenson; Princeton; Woodville.	
Jefferson Co.; Valley Creek, 6 m. north of Adger.	
Lauderdale Co.; Florence.	Lee Co.; Auburn.
Madison Co.; Huntsville; Normal; Gurley; Monte Sano.	
Marion Co.; Bear Creek.	St. Clair Co.; Shoal Creek; Gallant.
Shelby Co.; Calera.	Talladega Co.; Horseblock Mountain.
Randolph Co.; Roanoke; Wadley.	Tallapoosa Co.; Tallapoosa Co.
Walker Co.; Forks of Warrior.	

This species is generally distributed through the northern part of the state, but it has not been reported south of Bibb and Lee counties. It is not likely to be mistaken for any other of the Alabama *Polygyras* except, perhaps, *P. zaleta*, but it is larger, proportionately more depressed, usually without the prominent parietal tooth characteristic of that species and has a dull surface, while that of *zaleta* is shining and polished. This peculiarity according to Clapp (Naut., XXX, p. 140) "is due to the fact that between and on the ribs of *albolabris* are fine, vertical wrinkles in the epidermis." This feature also occurs in var. *major*, but is lacking in vars. *alleni* and *fuscolabris*.

Occasional specimens of *albolabris* have a small, parietal tooth, but this is an individual variation and has no varietal significance.

Mesodon albolabris
Mesodon albolabris
Surv. Ark., I,
Polygyra albolabris

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Type Local
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Polygyra albolabris
Polygyra fuscolabris

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Type Local
Alabama R

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Cleburne Co.; Du
Elmore Co.; Wet
Franklin Co.; Li
Jackson Co.; Wo
Madison Co.; Mo

Polygyra albolabris alleni (Wetherby)

Mesodon albolabris and var. *minor* Wetherby, Jour. Cin. Soc. Nat. Hist., IV, 1881, p. 10.

Mesodon albolabris var. *alleni* and var. *minor* "Wetherby," Sampson, Ann. Rep. Geol. Surv. Ark., II, 1893, p. 189.

Polygyra albolabris alleni "Wetherby," Pilsbry, Proc. A. N. S. P., 1893, p. 197.

Original Description: "Specimens of the average size have the spire very much depressed, the aperture correspondingly elongated transversely, and the surface very highly polished. The reflection of the peristome is much narrower, so rendered by its being somewhat folded.

"There were also, in one of the packages, a var. *minor* of the same species, having the same characters, though somewhat exaggerated. The lip of this variety is very narrow." (Wetherby.)

Type Locality: Eureka Springs, Carroll Co., Arkansas.

Alabama Record:

Jackson Co. (Pilsbry, l. c.).

Pilsbry (l. c.) writes: "Varying in size and color almost as much as the eastern form of the species, but in a broad view distinguishable from the latter by one, several or all of the following characters: The shell is thinner, more depressed and more glossy; the spiral lines and other minute sculpture are weaker; the lip is narrower, rounded rather than flat, with a weaker less angular rib within; the low basal tooth is frequently more distinctly defined. Distribution, west of the Mississippi from southern Minnesota to Arkansas, and eastward in the south to Jackson County, in northern Alabama."

He also lists it from Decherd, Franklin County, in middle Tennessee, near the Alabama boundary, and from Chattanooga, Tennessee.

Polygyra albolabris fuscolabris Pilsbry

Polygyra albolabris fuscolabris Pilsbry, Proc. A. N. S. P., 1903, p. 200.

Polygyra fuscolabris Wheeler, Nautilus, XXV, 1912, p. 123.

Original Description: "The shell is very large, alt. 19, diam. 34 mm., to alt. 21, diam. 38 mm.; depressed, glossy and finely striate, as in *alleni* with the aperture more oblique and the lip narrower than in *albolabris* of the same size. The basal lip bears a low, flat-topped, wide tooth near the columella, and the outer lip is tinted fleshy-brown (fading in cabinet specimens). Whorls $5\frac{1}{2}$." (Pilsbry.)

Type Locality: Woodville, Alabama.

Alabama Records:

Calhoun Co.; Anniston.

Cleburne Co.; Dugger Mountain.

Elmore Co.; Wetumpka.

Franklin Co.; Little Bear Creek, Nauvoo.

Jackson Co.; Woodville; Princeton; 12 m. N. W. of Stevenson.

Madison Co.; Monte Sano; Gurley; Huntsville.

"*P. a. fuscolabris* bears such a relation to *alleni* as *major* to *albolabris* or var. *normalis* to typical *P. andrewsae*." (H. A. P.)

Fuscolabris is characterized by its depressed form, glossy, shining surface and usually by the more or less tinted outer lip, but that is a variable feature and even in fresh specimens is entirely lacking. Clapp (Naut., XXX, p. 140) states that the dull surface of typical *albolabris* is "due to the fact that between and on the ribs of *albolabris* are fine, vertical wrinkles in the epidermis." These minute wrinkles do not occur in *fuscolabris*.

Polygyra albolabris major (Binney)

Helix major Binney, Jour. B. S. N. H., I, 1837, p. 473, pl. XII; Terr. Moll. II, 1851, p. 96, pl. I.

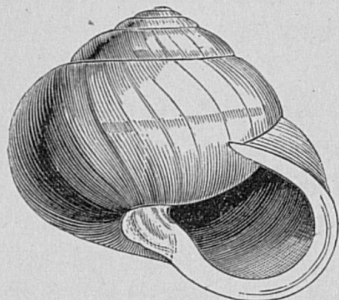


FIG. 36. *P. albolabris major* (Binney).

Mesodon major Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 297, fig. 318.
Helix albolabris major Sargent, Naut., VI, 1892, p. 77.
Polygyra albolabris major Johnson & Pilsbry, Naut., XI, 1897, p. 94; Cat., 1898, p. 12.

Original Description: "Shell convex, ventricose: epidermis uniform yellowish or brownish horn color: whorls six, with numerous, coarse, parallel striae: the body whorl very large and turgid: suture deeply marked: aperture rounded, contracted by the lip, and small in proportion to the size of the shell: lip white, thickened, reflected, inner margin near the base of the shell projecting, more or less prominent: umbilicus covered: base thickened with a testaceous callus in old specimens.

"Greatest transverse diameter one inch and a half." (Binney.)

Type Locality: Not specified.

Alabama Records:

Barbour Co.; Elamville.
Cherokee Co.; Pleasant Gap.
Crenshaw Co.; Searight.
Jackson Co.; Stevenson; Woodville.
Talladega Co.; Horseblock Mountain.

Chambers Co.; Langdale.
Conecuh Co.; Evergreen.
Elmore Co.; Wetumpka.
Marion Co.; Bear Creek.

According to Binney (*l. c.*) it differs from *albolabris* in the following particulars: "It is much more globose, of a coarser and more solid texture, and the striae of increase are much more raised and prominent, so much so, indeed, as to leave distinct grooves between them. The longitudinal striae, so distinct on that shell, are either wanting or very indistinct. The aperture is smaller in proportion to the size of the shell, less flattened towards the plane of the base, and more rounded. The pillar lip, and umbilicus are in many cases covered with a smooth and shining, semi-transparent, testaceous callus. The margin of the lip is thickened, and less widely, and less abruptly reflected, and there is often a prominent tooth-like process on the

inner and upper epidermis is glossy.

This is a common exception of the eastern half of the state differs from the more or less in the more or less.

There is considerable variation in the larger Alabama in the Jour. B. Moll. (copied a Alabama measures 35.58 x 26.425 age of .7415. that of his T. M.

I have seen Binney's figure it measures 37.5 x 37.5 collection is originally the specimen of the coast region.

Helix zaleta Binney
Mesodon exoleta



FIG. 37. *P. zaleta* (Binney).

fine, parallel striae; suture white; lip, the plane of the base; lip tooth; umbilicus covered with a smooth and shining, semi-transparent, testaceous callus.

"Greatest transverse diameter one inch and a half." (Binney.)

Type Locality: Not specified.

Alabama Records:

Bibb Co.; Bibb Co.
Colbert Co.; Tusculum
Elmore Co.; Wetumpka.

inner and upper side of the margin near the umbilicus. The color of the epidermis is generally much darker." (Binney.)

This is a characteristic species of Georgia and Florida and, with the exception of one record from Marion Co., is apparently restricted to the eastern half of the state. It has the dull surface of typical *albolabris*, but differs from that form in its larger size, more inflated shape and, especially, in the more or less prominent tooth on the basal lip near the columella.

There is considerable variation in size and the elevation of the spire, but the larger Alabama specimens are quite typical. Binney's original figure in the Jour. B. S. N. H. measures (*ex icone*) 40 x 25 mm. That in the Terr. Moll. (copied above) 39 x 25 mm. The largest of eight selected shells from Alabama measures 40.25 x 30.5 mm.; the smallest 32 x 27 mm., average 35.58 x 26.425 mm. The axial index ranges from .657 to .844, with an average of .7415. The axial index of Binney's B. S. N. H. figure is .625 and that of his T. M. figure is .641.

I have seen no shells from Alabama which at all resemble W. G. Binney's figure in the Manual, which is evidently quite out of drawing, as it measures 37.5 x 34 mm. with an axial index of .907. He gives the dimensions as 37.5 x 26 mm. The only specimen that at all approaches it in my collection is one without locality, which measures 41 x 31.5 mm. Apparently the species in Alabama is rather smaller than the typical form from the coast region.

Polygyra zaleta (Binney)

Helix zaleta Binney, Jour. B. S. N. H., I, 1837, p. 492, pl. XX.

Mesodon exoleta Lewis, Ala. F. W. & L. Shells, 1876, p. 29; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 386.

Mesodon exoletus W. G. Binney, Manual, 1885, p. 309, fig. 331.

Helix exoleta Sargent, Nautilus, VI, 1892, p. 77.

Polygyra exoleta Hinkley, Nautilus, XX, 1906, p. 34.

Polygyra zaleta Wheeler, Nautilus, XXV, 1912, p. 123.

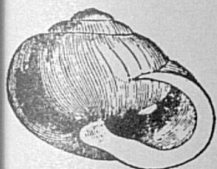


FIG. 37. *P. zaleta* (Binney).

Original Description: "Shell convex, somewhat ventricose; epidermis of a uniform, yellowish brown, or russet-color; whorls between five and six, with fine, parallel striae crossing them obliquely; body whorl large and ventricose; suture well marked and distinct; aperture rounded, contracted by the lip, the plane of the aperture making a considerable angle with the plane of the base; lip white, reflected; pillar-lip with a prominent, white, oblique tooth; umbilicus covered.

"Greatest transverse diameter, about one inch." (Binney.)

Type Locality: Not specified.

Alabama Records:

Bibb Co.; Bibb Co.
Colbert Co.; Tuscumbia.
Elmore Co.; Wetumpka.

Blount Co.; Blount Springs; Warrior.
DeKalb Co.; Fort Payne; Valley Head.
Etowah Co.; Gadsden; Keener.

Franklin Co.; Burleson.

Jackson Co.; Johnson Cove, Pisgah; Stevenson; Princeton; Pisgah; Woodville.

Jefferson Co.; Trafford; Squaw Shoals.

Lauderdale Co.; Florence.

Madison Co.; Monte Sano; Huntsville;
Gurley.

Shelby Co.; Yellowleaf Creek, Wilsonville.

St. Clair Co.; Gallant.

Tuscaloosa Co.; Hagler; Holt; University;
Tuscaloosa.

Walker Co.; Forks of Warrior.

"Though resembling *H. albolabris* in many respects, it differs in general aspect, and in many observable particulars. It is smaller, more convex, and the body whorl is more ventricose than in that species. The reflected lip is less broad and flat, and is sometimes a little grooved. The aperture is more round, and the plane of the mouth, instead of being flattened in the direction of the plane of the base, is much more upright, making a considerable angle with the base of the shell. Attention to these differences will enable one to distinguish the shells, even before the tooth is added. In those individuals where the tooth is wanting, there is often a slight deposition of testaceous matter in its place, not distinguishable without close observation." (Binney.)

Another characteristic feature of this species is the smooth, polished surface, this according to Clapp (Naut., XXX, p. 140) is due to the fact that it lacks the "fine, vertical wrinkles in the epidermis" found in *albolabris*.

This common northern species is generally distributed through the northern part of the state, ranging as far south as Elmore County.

Polygyra palliata (Say)

Helix palliata Say, Jour. A. N. S. P., II, 1821, p. 152; Bland, Ann. N. Y. Lye. Nat. Hist., VII, 1861, p. 441 (separate, p. 110).

Triodopsis palliata Lewis, Ala. F. W. & L. Shells, p. 29; W. G. Binney, Manual, 1885, p. 284, fig. 303.

Polygyra palliata Hinkley, Nautilus, XX, 1906, p. 34; Wheeler, *ibid.*, XXV, 1912, p. 123.

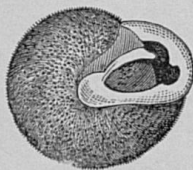


FIG. 38. *P. palliata* (Binney).

Original Description: "Shell depressed, with elevated lines, forming grooves between them; epidermis fuscous, rugose with very numerous minute tuberculous acute prominences; volutions five, depressed above, beneath rounded, forming an obtuse angle exteriorly, which is more acute near the termination of the labrum; umbilicus covered with a white callus; aperture contracted by the labrum; labrum widely reflected, white, two profound, obtuse sinuses on the inner side above the middle, forming a prominent distinct tooth between them, and a projecting angle near the middle of the lip; labium with a large, prominent, white tooth, placed perpendicularly to the whorl, and obliquely to the axis of the shell, and nearly attaining the umbilical callus.

"Length of four-fifths of

Type Locality
Alabama River

Greene Co.; Boli
Lauderdale Co.;
Mobile Co.; Mob

"The natural specific character of the former the epidermis; the suture; the last aperture." (Binney.)

This character of the dermis, is apparent in the state, extending

Helix obstricta Say



FIG. 39. *P. obstricta* (Binney)

Original Description:

grooves between the depressed above the umbilicus covered with a white callus.

"Breadth of the aperture."

Type Locality

Alabama River

Jackson Co.; Woodville;
Madison Co.; Gurley.

"*H. obstricta*"

The epidermis is covered with fine lines between the volutions. It has elevated, rounded, and carinated, the suture as in *H. palliata*. The form of the lip." (Bland.)

"Length of the column seven-twentieths of an inch. Greatest breadth, four-fifths of an inch." (Say.)

Type Locality: Illinois.

Alabama Records:

Greene Co.; Boligee.
Lauderdale Co.; Florence.
Mobile Co.; Mobile.

Jackson Co.; Stevenson.
Madison Co.; Huntsville.
Tuscaloosa Co.; Tuscaloosa.

"The nature of the epidermis and sculpturing are the only constant specific characters which distinguish *H. palliata* from *H. obstricta*. In the former the epidermis has 'numerous minute tuberculous acute prominences'; the striae are close together, and somewhat irregular in development. In the typical form the whorls are convex, with a well impressed suture; the last whorl is obtusely angulated in front of, but not behind the aperture." (Bland.)

This characteristic northern species, distinguished by its hirsute epidermis, is apparently restricted to the northern and western part of the state, extending south to Mobile.

Polygyra obstricta (Say)

Helix obstricta Say, Jour. A. N. S. P., II, 1821, p. 154; Bland, Ann. N. Y. Lyc. Nat. Hist., VII, 1861, p. 446 (separate, p. 115); Sargent, Nautilus, Vi, 1892, p. 77.



Triodopsis obstricta Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 286, fig. 305.

Polygyra obstricta Hinkley, Nautilus, XX, 1906, p. 34; Wheeler, *ibid.*, XXV, 1912, p. 124.

Original Description: "Shell depressed, with elevated lines forming grooves between them; epidermis pale brownish, naked; volutions five, depressed above, beneath rounded, with an acute, projecting carina; umbilicus covered with a white callus, indented; mouth resembling that of *H. palliata*."

"Breadth nearly one inch." (Say.)

Type Locality: Ohio.

Alabama Records:

Jackson Co.; Woodville; Princeton.
Madison Co.; Gurley; Monte Sano.

Lauderdale Co.; Florence.
Talladega Co.; Weduska Shoals.

"*H. obstricta* Say differs from *H. palliata* in the following particulars: The epidermis is free from 'tuberculous prominences,' but has raised spiral lines between the costae on the upper and lower surfaces of the shell. It has elevated, rigid, distant costae, the whorls are subexserted and acutely carinated, the carina of the upper whorls compressed, and overlapping the sutures as in *H. cumberlandiana* Lea. The umbilicus, as in the most carinated form of *H. palliata*, is not always entirely covered by the reflected lip." (Bland.)

With the exception of a single record from Talladega Co., this species is apparently restricted to the most northern tier of counties.

Polygyra obstricta caroliniensis (Lea)

Helix caroliniensis Lea, Trans. Am. Phil. Soc., IV, 1831, p. 102, pl. XV, figs. 33a-c.

Triodopsis obstricta (pars)
W. G. Binney, Manual,
1885, p. 286.

Helix obstricta var. Bland,
Ann. N. Y. Lyc. Nat.
Hist., VII, 1861, p. 446
(separate, p. 116).

Helix obstricta caroliniensis
Pilsbry, Man. Conch.,
VIII, 1892, p. 153, pl.
50, figs. 8-10.

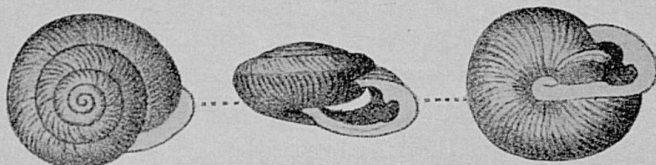


FIG. 40. *P. obstricta caroliniensis* (Pilsbry).

Polygyra obstricta caroliniensis Johnson & Pilsbry, Nautilus, XI, 1897, p. 95; Cat., 1898, p. 13; Wheeler, Nautilus, XXV, 1912, p. 124.

Original Description: "Shell depressed above, inflated below, obliquely striated, fuscous, imperforate; whorls five; spire very obtuse; aperture contracted; outer lip white, broad and reflected, furnished with two teeth, the inferior one long and lamellar, the superior one small and conical; columella with an elevated incurved tooth; base of the columella much impressed.

"Diam. fourteen-twentieths, length seven-twentieths of an inch." (Lea.)

Type Locality: Cheraw, South Carolina.

Alabama Records:

Blount Co.; Blount Springs.	Cherokee Co.; Poole's Id., Gabriel; Slack-
Chambers Co.; Langdale.	land; Maple Grove.
Calhoun Co.; Anniston.	
Chilton Co.; Higgins' Ferry; 3 m. above Yellowleaf Creek.	
DeKalb Co.; Fort Payne, Lookout Mt.	Elmore Co.; Wetumpka.
Etowah Co.; Gadsden; Keener.	Franklin Co.; Burleson.
Jackson Co.; Stevenson; Princeton; Woodville; Limerock.	
Jefferson Co.; Squaw Shoals; Warrior.	Lauderdale Co.; Florence.
Macon Co.; Tuskegee.	Madison Co.; Huntsville; Monte Sano.
Mobile Co.; Mobile.	Montgomery Co.; Red River.
Randolph Co.; Wadley.	St. Clair Co.; Whitney; Greensport.
Talladega Co.; Three Mile Shoals; Fort William; Ft. William Shoals; Horseblock Mountain.	
Tuscaloosa Co.; Tuscaloosa; Holt.	
Walker Co.; Forks of Warrior; Junction of Lost and Wolf creeks; S. end of county.	

"Whorls more convex, the last obtusely angulated in front of, but very little behind the aperture." (Bland.)

Generally distributed in the northern two-thirds of the state, but apparently rare in the southern part, the only record being from Mobile.

Polygyra sargentiana (Johnson & Pilsbry)

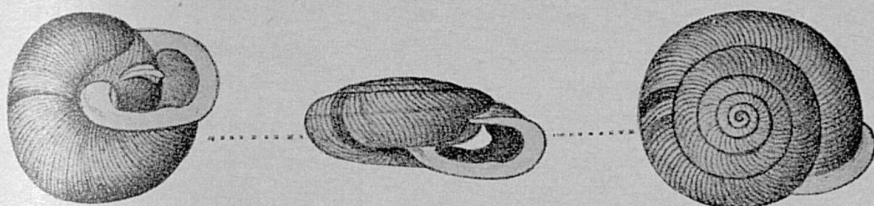
Helix sargenti Johnson & Pilsbry (non Bland), Naut., VI, 1892, p. 8.

Helix sargentiana Pilsbry, Man. Conch., VIII, 1892, p. 153, pl. 50, figs. 1-5; Sargent Naut., VI, 1892, p. 77.

Helix appressa



FIG. 42. *P. sargentiana* (Binney)

FIG. 41. *P. sargentiana* (Pilsbry).

Polygyra sargentiana Johnson & Pilsbry, Naut., XI, 1897, p. 95; Cat., 1898, p. 13; Wheeler, Naut., XXV, 1912, p. 124.

Original Description: "Shell depressed, imperforate, lens-shaped, carinated. Surface strongly rib-striate, the striation disappearing toward the center of the base; under a lens the surface between the rib-like striae is seen to be finely granulated. The aperture is wide, oblique; lip broadly reflexed, flattened, the basal lip bearing a long lamella, as in *H. appressa*. Upon the parietal wall there is a strong, high curved tooth, like that of *H. elevata*, but longer. There are six whorls. The color is light russet above, paler or whitish below.

"Alt. 11, diam. 24 mm.

"Alt. 12, diam. 24 mm.

"Alt. 9, diam. 22 mm." (Johnson & Pilsbry.)

Type Locality: Woodville, Alabama.

Alabama Records:

Jackson Co.; Woodville; Princeton; Paint Rock.

Madison Co.; Vincent Mt., Gurley; Gurley; Monte Sano.

"This species differs from *H. appressa* in its larger size, stronger striation, the granulated instead of spirally striate microscopic sculpture, the strong carination, etc. It is allied in shape and sculpture to *H. carolinien-sis* Lea, but differs in totally lacking the upper lip tooth, in being flatter, more concave below, etc. The young shells differ markedly from young *H. appressa*, being flatter above, acutely carinated, and broadly umbilicated." (J. & P.)

Wheeler reports a smooth form as being common at Gurley.

Restricted to the northern part of the state in Jackson and Madison counties.

Polygyra appressa (Say)

Helix appressa Say, Jour. A. N. S. P., II, 1821, p. 151; Sargent, Nautilus, VI, 1892, p. 77; Pilsbry, Man. Conch., VIII, 1892, p. 153, pl. 50, figs. 6-7.

Triodopsis appressa W. G. Binney, Manual, 1885, p. 287, fig. 306; Lewis, Ala. F. W. & L. Shells, 1876, p. 29; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 379; Hinkley, Nautilus, XX, 1906, p. 34.

Polygyra appressa Wheeler, Nautilus XXV, 1912, p. 124.

FIG. 42. *P. ap-
pressa* (Binney).

Original Description: "Shell depressed, brownish horn color; whorls five, depressed, forming an angle on the ex-

ternal one, more acute near the superior angle of the labrum, with numerous transverse, elevated, equidistant lines, with interstitial grooves; umbilicus covered over with calcareous matter, but concave within; aperture moderate; labrum dilated, reflected, white, margined with brownish; near the base appressed to the body whorl, and covering the umbilicus; a slight projecting, dentiform angle on the inner middle; labrum with a strong, prominent, oblique, compressed, white tooth, which gradually slopes and becomes obsolete towards the umbilicus. Breadth three-fifths of an inch." (Say.)

Type Locality: Not specified. Inhabits the banks of the Missouri (Council Bluffs) and Ohio (Galiopolis).

Alabama Records:

Cherokee Co.; Craig Mountain.	Lauderdale Co.; Florence.
Jackson Co.; Stevenson; Woodville.	Mobile Co.; Mobile.
Madison Co.; Huntsville; Monte Sano.	
Shelby Co.; Montevallo.	

The typical form of this species, with the exception of a single record from Mobile Co., is apparently restricted to the northern part of the state, while the variety *perigrapta* is generally distributed in all parts. The typical form is smaller than the variety and lacks the spiral, incised lines.

Polygyra appressa perigrapta Pilsbry

Polygyra appressa perigrapta Pilsbry, Nautilus, VII, 1894, p. 140; Wheeler, Nautilus, XXV, 1912, p. 124.

Original Description: "Surface striate and having crowded, microscopic, spiral, incised lines, especially beneath; outer lip with no upper tooth; parietal tooth short, not connecting with the columella." (Pilsbry.)

Type Locality: Woodville, Alabama.

Alabama Records:

Baldwin Co.; Baldwin Co.	Bibb Co.; Woodstock; Eoline.
Barbour Co.; Elamville.	Blount Co.; Blount Springs.
Calhoun Co.; Anniston.	Chambers Co.; Langdale.
Cherokee Co.; 10 mi. S. E. of Centre; Poole's Island; Pleasant Gap; Slackland.	Choctaw Co.; Bladon Springs; Silas.
Chilton Co.; Yellowleaf Creek.	Clay Co.; Pyriton.
Clarke Co.; Thomasville; Jackson.	Conecuh Co.; Evergreen.
Cleburne Co.; Dugger Mountain, Piedmont.	Dale Co.; Pinckhard.
Crenshaw Co.; Searight.	DeKalb Co.; Fort Payne; Valley Head.
Dallas Co.; Selma.	Etowah Co.; Gadsden.
Elmore Co.; Wetumpka.	Franklin Co.; Russellville; Burleson.
Fayette Co.; Fayette.	Greene Co.; Boligee.
Geneva Co.; High Bluff; Hartford.	Mobile Co.; Mobile; Mt. Vernon.
Jackson Co.; Woodville; Princeton; Stevenson; Sand Mt., Pisgah; Limrock; Pisgah.	Perry Co.; Perry Co.
Jefferson Co.; Squaw Shoals.	Shelby Co.; Yellowleaf Creek, Wilsonville; Calera.
Marion Co.; Bear Creek; Hamilton.	
Montgomery Co.; Montgomery.	
Randolph Co.; Roanoke; Wadley.	
St. Clair Co.; Ten Island Shoals; Greensport.	
Sumpter Co.; Livingston; Moscow Bluff.	

Talladega Co.; Three Island Shoals; Horseblock Mountain; Fort William Shoals.
 Tallapoosa Co.; Yates. Wilcox Co.; Pine Hill; Alberta; Gaston-
 Walker Co.; Forks of Warrior. burg.
 Tuscaloosa Co.; Duncanville; Holt; Hag-
 ler; Tuscaloosa.

Generally distributed over the entire state. Characterized by the incised spiral sculpture, which is not present in the typical form.

Polygyra appressa sculptior Chadwick

Polygyra appressa sculptior Chadwick, Nautilus, XIII, 1899, p. 54.

Original Description: "Surface *costulate* above, horn-colored inclining to reddish chestnut, becoming smoother and greenish beneath, entirely covered with a fine *spiral granulation*; upper lip-tooth obsolete; parietal tooth as in typical *appressa*. Diam. 14-18 mm.; alt. 7-9 mm." (Chadwick.)

Type Locality: Scott Co., Virginia.

Alabama Records:

Jackson Co.; Stevenson.

Madison Co.; Huntsville.

Polygyra elevata (Say)

Helix elevata Say, Jour. A. N. S. P., II, 1821, p. 154; Sargent, Nautilus, VI, 1892, p. 77.
Mesodon elevata Lewis, Ala. F. W. & L. Shells, 1876, p. 29;
 Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 385.
Mesodon elevatus W. G. Binney, Manual, 1885, pp. 306, 490,
 fig. 328.

Original Description: "Shell pale horn-color, spire elevated; whorls seven regularly rounded; umbilicus none; aperture somewhat angulated; labrum dilated, reflected, pure white, at base adpressed to the body whorl, abruptly narrowed on the inner edge beneath the middle, and continuing thus narrowed to the superior termination, leaving a projecting angle behind the middle; labium with a large, robust, very oblique, subarquated, pure white tooth.

"Greatest breadth seven-eighths of an inch. Column nine-sixteenth of an inch." (Say.)

Type Locality: Cincinnati, Ohio.

Alabama Records:

Franklin Co.; Burleson.
 Lauderdale Co.; Cedar Island, Florence.
 Madison Co.; Gurley.
 Walker Co.; Walker Co.

Jackson Co.; Stevenson; Princeton; Wood-
 ville.
 Marion Co.; Bass Creek.

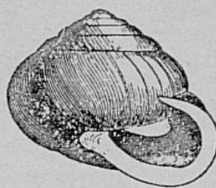


FIG. 43. *P. elevata*
 (Binney).

This common northern species is restricted to the northern part of the state, extending south as far as Walker County.

Polygyra clarkii (Lea)

Helix clarkii Lea, Proc. A. N. S. P., 1858, p. 41.

Mesodon clarkii W. G. Binney, Manual, 1885, p. 307, fig. 329; Lewis, Ala. F. W. & L. Shells, 1876, p. 29.

Original Description: "Testa superne rotundata, inferne plano-convexa, regulariter striata, bruneo-cornea, imperforata, uno-dentata; anfractibus septenis, oblique striatis; apertura lunata, subdilata; labro albido, reflexo, inferne calloso; columella in medio uno-dentata, ad basim impressa.

"Diam. .51, length .37 inch." (Lea.)

To supplement the original meagre description, I add that of W. G. Binney: "Shell imperforate, globosely rounded, regularly and finely striated, reddish horn-color; spire obtusely conic; whorls 7, convex, with delicate incremental striae, the last one very globose and rounded below; aperture lunate; peristome white, thickened, reflected, its basal termination quite heavy and covering the umbilicus entirely; one elongated, white denticle on the parietal wall of the aperture.

"Greater diameter 14, lesser 13; height 9 mm."

Type Locality: Tuskee Cove, Cherokee Co., North Carolina.

Alabama Record:

Listed by Lewis from the state, but without any definite locality. It has not been found by any of the recent collectors.

Polygyra andrewsæ normalis Pilsbry

Mesodon andrewsi W. G. Binney, Manual, 1885, p. 301, fig. 322½.

Polygyra andrewsæ normalis Pilsbry, Proc. A. N. S. P., 1900, p. 123.

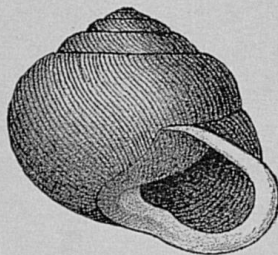


FIG. 45. *P. andrewsæ normalis* (Binney).

Original Description: "Typical *P. andrewsæ* will, of course, be restricted to the small Roan Mountain race first described and well represented by Mr. Binney's figures (Man. Amer. Land Shells, fig. 321). For the larger, more solid, yellowish brown or slightly greenish form, with a wider lip and a more or less distinct prominence (hardly a tooth) on the columella, the varietal name *normalis* may be used. Largest of a series of seventy-five (from the type locality), 34½ mm. diam.; smallest, 29 mm.; average of the entire lot 31½ mm. Seventy-five per cent. of the shells measure 31-33 mm. diam." (Pilsbry.)

Type Locality: Cade's Cove, Blount County, Tennessee.

Alabama Records:

Calhoun Co.; Dugger Mountain, Piedmont.
Cherokee Co.; Little River Gorge, Lookout Mountain.



FIG. 44.
P. clarkii
(Binney).

Clay Co.; Py
DeKalb Co.
Franklin Co.
Jackson Co.;
Marion Co.;
Talladega Co.
Tallapoosa Co.

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but can u
radula and
of typical
General
Tallapoosa

Helix thyrid
Mesodon thy
W. & L.
W. G. B.
p. 313,
Bull. M.
1901, p.
Helix thyrid
VI, 1892
Polygyra thy

Original
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an inch."

Type L
Alabama

Baldwin Co.;
Bibb Co.; Bl
Blount Co.; F
Chambers Co.
Cherokee Co.;
Chilton Co.; I
Clarke Co.; T
Coneuh Co.;
DeKalb Co.;
Etowah Co.;
Geneva Co.;
Jackson Co.;
Jefferson Co.;
Lauderdale Co.
Macon Co.; T
Marion Co.; F
Monroe Co.; I
Perry Co.; H
Pike Co.; Pea
Shelby Co.; C
St. Clair Co.;

Clay Co.; Pyriton.

DeKalb Co.; Lookout Mountain; Valley Head; 3 m. e. of Valley Head.

Franklin Co.; Burleson; Bear Creek, Burleson.

Jackson Co.; Woodville.

Marion Co.; Bear Creek; Hamilton.

Talladega Co.; Horseblock Mountain.

Tallapoosa Co.; "Tallapoosa County."

Large specimens of this form resemble *P. albolabris major* very much, but can usually be distinguished by the shells: the characters of the radula and genitalia, however, are entirely different and agree with those of typical *andrewsæ*.

Generally distributed in the northern part of the state as far south as Tallapoosa County.

Polygyra thyroidus (Say)

Helix thyroidus Say, Jour. A. N. S. P., I, 1817, p. 123.

Mesodon thyroides Lewis, Ala. F.

W. & L. Shells, 1876, p. 29;

W. G. Binney, Manual, 1885,

p. 313, fig. 335; Gratacap,

Bull. Mus. Nat. Hist., XIV,

1901, p. 327.

Helix thyroides Sargent, Nautilus,

VI, 1892, p. 77.

Polygyra thyroides Wheeler, Nautilus, XXV, 1912, p. 124.

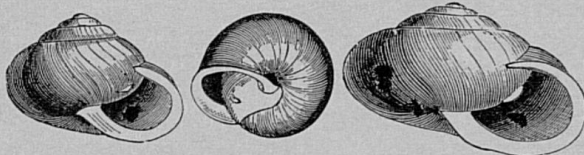


FIG. 46. *P. thyroidus* (Binney).

Original Description: "Shell thin, fragile, convex, umbilicate; whorls five, obtusely wrinkled, or rather with equidistant, gradually elevated, obtuse lines; and spirally striate, with minute, impressed lines; lip widely reflected, white and flat before, partially concealing the umbilicus; pillar-lip furnished with a very oblique tooth. Breadth four-fifths to nine-tenths of an inch." (Say.)

Type Locality: Not specified.

Alabama Records:

Baldwin Co.; Baldwin Co.	Barbour Co.; Elamville.
Bibb Co.; Blocton; Pratt's Ferry; Eoline; Woodstock.	
Blount Co.; Blount Springs; Warrior.	Calhoun Co.; Ten Island Shoals.
Chambers Co.; Langdale.	
Cherokee Co.; Poole's Island; Pleasant Gap; Slackland.	
Chilton Co.; Duncan's Riffle; Clanton; Butting Ram Shoals.	
Clarke Co.; Thomasville; Jackson.	Clay Co.; Pyriton.
Conecuh Co.; Evergreen; Herbert.	Dallas Co.; Pleasant Hill; Selma.
DeKalb Co.; Fort Payne; Valley Head.	Elmore Co.; Wetumpka; Elmore.
Etowah Co.; Keener; Gadsen.	Franklin Co.; Burleson; Russellville.
Geneva Co.; Hartford.	Greene Co.; Boligee.
Jackson Co.; Stevenson; Princeton; Woodville; Sand Mt., Pisgah.	
Jefferson Co.; Squaw Shoals; Valley Creek; Trafford; Warrior.	
Lauderdale Co.; Florence.	Lee Co.; Auburn.
Macon Co.; Tuskegee.	Madison Co.; Huntsville; Gurley; Monte Sano.
Marion Co.; Hamilton; Bear Creek.	
Monroe Co.; Drewery.	Mobile Co.; Mobile; Chastang; Irvington.
Perry Co.; Hamburg.	Montgomery Co.; Catoma Creek.
Pike Co.; Pea River, S. E. corner.	Pickens Co.; Coalfire.
Shelby Co.; Calera; Gurnee; Montevallo.	Randolph Co.; Roanoke; Wadley.
St. Clair Co.; Gallant; Whitney.	Sumter Co.; Epes; Livingston.

Talladega Co.; Horseblock Mountain; Fort William Shoals.
 Tuscaloosa Co.; Duncanville; Hagler; Holt; Indian Creek; University; Tuscaloosa.
 Walker Co.; Forks of Warrior. Washington Co.; Calvert.
 Wilcox Co.; Pine Hill; Gastonburg; Alberta.

This common northern species has a general distribution over the entire state.

Helix bucculenta Gould, Proc. B. S. N. H., III, 1848, p. 40.

Mesodon bucculenta Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 315, fig. 336.

The form of this species described by Gould as *Helix bucculenta*, which is quite prevalent through the southern states from Georgia to Texas and characterized by its small size, usually imperforate and without a parietal tooth has been figured from "Alabama" by Binney and has been reported from the following localities in the state:

Choctaw Co.; Naheala Landing; Silas.	Dallas Co.; Selma.
Conecuh Co.; Evergreen.	Jackson Co.; Bass; Stevenson.
Greene Co.; Boligee.	Mobile Co.; Mobile.
Madison Co.; Gurley.	Sumter Co.; Epes; Livingston.
Shelby Co.; Montevallo.	

Pilsbry (Proc. A. N. S. P., 1900, p. 452) remarks: "I can find neither geographic nor conchological boundaries for *bucculenta* well enough defined to warrant its retention."

Fig. 47 is a copy of Binney's figure 336, which he states is drawn from Alabama examples.

Polygyra clausa (Say)

Helix clausa Say, Jour. A. N. S. P., II, 1821, p. 154; Sargent, Nautilus, VI, 1892, p. 77.
Mesodon clausus W. G. Binney, Manual, 1885, pp. 315, 491, fig. 338.
Mesodon clausa Lewis, Ala. F. W. & L. Shells, 1876, p. 29; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 388.
Polygyra clausa Johnson & Pilsbry, Nautilus, XI, 1897, p. 95; Cat, 1898, p. 13; Hinkley, Nautilus, XX, 1906, p. 34; Wheeler, Nautilus, XXVI, 1912, p. 15.



FIG. 48.
P. clausa
 (Binney).

Original Description: "Shell fragile, slightly perforated, subglobular, yellowish horn color, above convex; whorls four or five; aperture slightly contracted by the lip; lip reflected, flat, white nearly covering the umbilicus.

Greatest breadth from one-half to three-fifths of an inch." (Say.)

Type Locality: Illinois.

Alabama Records:

Choctaw Co.; Black Bluff.	Dallas Co.; Pleasant Hill; Selma.
Elmore Co.; Wetumpka.	Greene Co.; Boligee.
Jackson Co.; Princeton; Stevenson; Woodville.	Lauderdale Co.; Florence.
Jefferson Co.; Squaw Shoals.	Madison Co.; Gurley; Monte Sano.
Macon Co.; Tuskegee.	Montgomery Co.; Barachias; Montgomery.
Marengo Co.; Demopolis.	Catoma Creek; McGee's Station.
Perry Co.; Hamburg.	Sumter Co.; Epes; Livingston.
Wilcox Co.; Griggs' Landing.	



FIG. 47.
P. bucculenta
 (Binney).

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Helix wheatley



FIG. 49.
P. wheatley
 (Binney).

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 Type L
 Alabam

Chilton Co.;
 Alabama.

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 subquadra

A northern species which has a general distribution through the northern part of the state, ranging as far south as Choctaw and Wilcox counties.

Polygyra wheatleyi (Bland)

Helix wheatleyi Bland, Ann. N. Y. Lyc. Nat. Hist., VII, 1860, p. 119 (separate, p. 72), pl. IV, figs. 7-8.

Mesodon wheatleyi Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 311, fig. 332.



FIG. 49.
P. wheatleyi
(Binney).

Original Description: "Shell imperforate, depressed, conoid-globose, thin, reddish horn-colored with numerous rib-like striae, and microscopic granulations with very short hairs; spire shortly conoid; suture deeply impressed; whorls 5.5, rather convex, the last rounded, slightly depressed at the aperture, constricted; base convex, excavated in the umbilical region; aperture oblique, lunate, with a small parietal tooth-like tubercle; peristome acute, rose-colored, equally angularly reflected, appressed at the columella.

"Diam. maj. 14, min. 12, alt. 7 mm." (Bland.)

Type Locality: Cherokee Co., North Carolina.

Alabama Records:

Chilton Co.; Yellowleaf Creek. (Clapp.)
Alabama. (Lewis.)

"This interesting species is in form and size most like the small variety of *H. mitchelliana* Lea, or, the parietal tooth considered, an imperforate specimen of *H. bucculenta* Gould, but is especially distinct from both in its rufous color, granulated and hirsute surface, and excavated umbilical region." (Bland.)

A common species of the mountains of eastern Tennessee, which seems to have turned up in the centre of the state. It is very unfortunate that Lewis gave no definite locality for the species in his list.

Polygyra herberti, n. sp.

Shell umbilicate, conoid-globose, thin, light yellowish-horn color, surface rather closely, finely and irregularly striate above with irregular, weak, oblique granules between the striae, apical whorls nearly smooth, striae on the base stronger; spire somewhat obtusely elevated; sutures well impressed; whorls five, convex, the last rising as it approaches the aperture and then obliquely descending to the lip, behind which it is deeply constricted; base slightly flattened and excavated around the umbilicus, which is round and deep; aperture oblique, subquadrate, with a heavy, low, wide, curved parietal tooth,

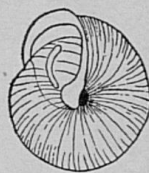


FIG. 50.
P. herberti.

extending from near the umbilicus to slightly within the lip; peristome acute, not reflected above, where it is nearly straight and joins the body whorl at nearly right angles, the outer and basal margins obliquely and narrowly expanded, the latter becoming rounded as it approaches the umbilicus, where it is expanded and half covers it.

Greater diam. 9.4; lesser 8.7; alt. 6.4 mm.

Type Locality: Spur of Sand Mountain overlooking Greasy Cove, St. Clair Co., Alabama.

The unique type of this species was collected by the late Herbert H. Smith, after whom it is named, and is in the collection of the Alabama State Museum.

In a general way this species resembles a quite small *P. wheatleyi*, but differs in sculpture, in the open umbilicus, the shape of the aperture and the character of the lip.

Polygyra christyi (Bland)

Helix christyi Bland, Ann. N. Y. Lyc. Nat. Hist., VII, 1860, p. 117, pl. IV, figs. 5-6.
Mesodon christyi W. G. Binney, Manual, 1885, p. 308, fig. 330; Lewis, Ala.

F. W. & L. Shells, 1876, p. 29.

Original Description: "Shell imperforate, depressed, rather solid, with numerous oblique rib-like striae, dark horn-colored; spire short, obtuse; whorls 4.5, rather convex, the last descending at the aperture, slightly angular at the periphery, constricted, above gibbous; base convex, excavated in the middle; aperture depressed, with a strong oblique lamelliform parietal tooth; peristome reflected, with a white callus within.

"Diam. maj. 10, min. 8, alt. 4.5 mm." (Bland.)

Type Locality: Cherokee Co., North Carolina.

Alabama Record: Alabama.

Listed by Lewis without any definite locality. It has not been found by any of the recent collectors.

Polygyra downieana (Bland)

Helix downieana Bland, Ann. N. Y. Lec. Nat. Hist., VII, 1861, p. 420, pl. IV, figs. 23-24.
Mesodon downieana W. G. Binney, Manual, 1885, p. 317, fig. 340.



FIG. 52.
P. downieana
 (Binney).

Original Description: "Shell umbilicate, umbilicus nearly covered, subglobose, thin, subpellucid, with obsolete rib-like striae, decussated with crowded microscopic spiral lines, greenish horn-colored; spire short, obtuse; whorls five, convex, the last tumid, anteriorly somewhat gibbous, scarcely descending, constricted; aperture oblique, lunate-oval; perist. white, labiate, reflected, right margin expanded, columellar margin angularly dilated, nearly covering the umbilicus.



FIG. 51.
P. christyi
 (Binney).

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Type L
 Alabama
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 DeKalb Co.;
 Jackson Co.;
 St. Clair Co.

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Carocolla spi
Stenotrema s
Stenotrema s
 Gratacap
Helix spinos
 p. 105.
Polygyra spi
 1898, p.
 XXV, 19

Original
 imperforate
 whorls six
 guarded by
 lated near
 "Diam.

Type L
 Alabama

Blount Co.; F
 Dallas Co.; S
 Elmore Co.;
 Franklin Co.;
 Jackson Co.;
 Jefferson Co.
 Madison Co.;
 Marengo Co.;
 Perry Co.; P
 Talladega Ca
 Tuscaloosa Co
 Wilcox Co.; C

"Diam. maj. 10.5, min, 9.5, alt. 6 mm." (Bland.)

Type Locality: University Place, Franklin Co., Tennessee.

Alabama Records:

Blount Co.; Blount Springs. Cullman Co.; Sand Mountain; Cullman; Wilhites.
DeKalb Co.; Ridges W. of Venaga; Sand Mountain, Valley Head; Valley Head.
Jackson Co.; Sand Mountain, Pisgah.
St. Clair Co.; Gallant.

A Tennessee species, apparently restricted to the north-eastern part of the state.

SECTION STENOTREMA RAFINESQUE

Shell small, compact, imperforate or umbilicate; sub-globose, globosely depressed or lens-shaped, the periphery varying from rounded to acutely keeled, surface dull, smooth, generally hirsute. Whorls 5-6, closely revolving, the last suddenly deflexed in front. Aperture basal, narrow, obstructed by an oblique, blade-like parietal tooth, parallel to the reflexed basal, the latter often notched in the middle. Last whorl generally having in its last fourth a short, transverse, internal partition on the axis.

Polygyra spinosa (Lea)

Carocolla spinosa Lea, Trans. Am. Phil. Soc., IV, 1831, p. 104, figs. 35a-c.

Stenotrema spinosa Lewis, Ala. F. W. & L. Shells, 1876, p. 29.

Stenotrema spinosum W. G. Binney, Manual, 1885, pp. 273, 486, fig. 289;

Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 376.

Helix spinosa Sargent, Nautilus, VI, 1892, p. 77; *ibid.*, VIII, 1895, p. 105.

Polygyra spinosa Johnson & Pilsbry, Nautilus, XI, 1897, p. 96; Cat., 1898, p. 14; Hinkley, Nautilus, XX, 1906, p. 34; Wheeler, *ibid.*, XXV, 1912, p. 124.



FIG. 53.
P. spinosa
(Binney).

Original Description: "Shell lenticular, thin, diaphanous, imperforate; carina acute and armed with minute spines; whorls six; spire nearly planular; aperture linear, being guarded by a long tooth on the columella; outer lip irregularly thick, angulated near the superior termination.

"Diam. eleven-twentieths, Length four-twentieths of an inch." (Lea.)

Type Locality: Claiborne, Alabama.

Alabama Records:

Blount Co.; Blount Springs.	Chilton Co.; Duncan's Riffle.
Dallas Co.; Selma.	DeKalb Co.; Valley Head; Fort Payne.
Elmore Co.; Wetumpka.	Etowah Co.; Keener.
Franklin Co.; Burleson; Russellville.	
Jackson Co.; Princeton; Stevenson; Sand Mt., Pisgah; Woodville.	
Jefferson Co.; Squaw Shoals.	Lauderdale Co.; Florence; Killen.
Madison Co.; Huntsville; Gurley; Normal; Monte Sano.	
Marengo Co.; Marengo Co.	Mobile Co.; Mobile.
Perry Co.; Perry Co.	St. Clair Co.; Gallant.
Talladega Co.; Three Island Shoals; Fort William.	
Tuscaloosa Co.; Tuscaloosa; Holt.	Walker Co.; Forks of Warrior.
Wilcox Co.; Gastonburg.	

Generally distributed in rocky regions, apparently wanting in the southern and eastern part of the state.

Polygyra labrosa (Bland)

Helix labrosa Bland, Ann. N. Y. Lyc. Nat. Hist., VII, 1861, p. 430, pl. IV, fig. 12.
Stenotrema labrosa Lewis, Ala. F. W. & L. Shells, 1876, p. 29.
Stenotrema labrosum W. G. Binney, Manual, 1885, p. 274, fig. 290.
Polygyra labrosa Johnson & Pilsbry, Nautilus, XI, 1897, p. 96; Cat., 1898, p. 14.



FIG. 54. *P. labrosa* (Binney).

Original Description: "Shell imperforate, lenticular, carinated, the carina somewhat obsolete behind the aperture, solid, with curved striae, dark brown colored beneath the epidermis, thin epidermis with prostrate hairs; spire convex-conoid, obtuse; whorls 5.5, rather convex

the last deflexed, constricted, the base inflated, and sculptured beneath the epidermis with numerous impressed spiral lines; the aperture very oblique, narrowly ear-shaped, contracted by a strong linguiform tooth extending along the entire parietal wall; peristome callus, somewhat reflected, the margins joined by a sinuous callus, the basal margin thickened, inwardly much dilated, with a deep and wide notch in the middle.

"Diam. maj. 12.5, min. 10, alt. 6.5 mm." (Bland.)

Type Locality: Not specified.

Alabama Records: Listed from "Alabama" by Lewis and Binney and from "Northern Alabama" by Johnson & Pilsbry, but without any definite localities. It has not been found by any recent collectors.

"The thickened and reflected peristome, and deep wide notch, sufficiently distinguish *H. labrosa* from *H. edgariana*. The notch in the latter, situated in the centre of the aperture as in *H. stenotrema*, is in a measure obsolete but in *H. labrosa* it is strongly developed, and nearer to the outer edge of the peristome as in *H. hirsuta*. The form of the parietal tooth of my species is like that of *H. hirsuta*, while *H. edgariana* is in that particular more like that of *H. stenotrema*." (Bland.)

Polygyra edgariana (Lea)

Carocolla edgariana Lea, Proc. Am. Phil. Soc., II, 1841, p. 31.
Helix edgariana Bland, Ann. N. Y. Lyc. Nat. Hist., VII, 1861, p. 428 (separate, p. 105).
Stenotrema edgariana Lewis, Ala. F. W. & L. Shells, 1876, p. 29.
Stenotrema edgarianum W. G. Binney, Manual, 1885, p. 274, fig. 291; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 377.
Polygyra edgariana Johnson & Pilsbry, Nautilus, XI, 1897, p. 96; Cat., 1898, p. 14.

Original Description: "Shell nearly flat above, beneath convex, reddish-brown, irregularly striate, imperforate;



FIG. 55.
P. edgariana (Binney).

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 the middle

"Diam.

Type L

Alabam

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"H. edg

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H. spinosa

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Helix barbig
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Stenotrema b

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Polygyra bar

Cat., 189

Original

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slightly but

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(Redfield.)

Type Lo

Alabama

Bibb Co.; Wo

Cherokee Co.;

spire short; sutures scarcely impressed; whorls five, flattened; aperture very narrow; columella furnished with a long lamellar tooth; lip thickened, in the middle notched.

"Diam. .40, length .20 inch." (Lea.)

Type Locality: Cumberland Mountains, Tennessee.

Alabama Record: Listed from Alabama, but without any definite locality, by Lewis, Gratacap and Johnson & Pilsbry.

"*H. edgariana* differs from *H. spinosa* in the following particular: it is smaller, more elevated, and more convex beneath. In form the parietal tooth is most like that of *H. stenotrema*, while that of *H. spinosa* is more nearly allied to that usually prevailing in *H. hirsuta*. The whorls of *H. spinosa* are flattened and exserted, the carinated edges of all being seen, but in *H. edgariana* the upper whorls are rather convex, and defined by a well marked suture. Traces of hairs rarely exist at the base of *H. spinosa*, and no scars indicating their presence are visible on dead or denuded shells, whereas in *H. edgariana* there are distant short prostrate hairs, with strongly marked scars on the shell. Fresh or young specimens have no doubt the cilia, as in *spinosa*." (Bland.)

Polygyra barbiger (Redfield)

Helix barbiger Redfield, Ann. N. Y. Lyc. Nat. Hist., VI, 1856, p. 171, pl. IX, figs. 4-5-7.

Stenotrema barbigerum W. G. Binney, Manual, 1885, p. 276, fig. 293.

Stenotrema barbiger Lewis, Ala. F. W. & L. Shells, 1876, p. 29.

Polygyra barbiger Johnson & Pilsbry, Nautilus, XI, 1897, p. 96; Cat., 1898, p. 14; Hinkley, Nautilus, XX, 1906, p. 35.



FIG. 56.
P. barbiger
(Binney).

Original Description: "Shell imperforate, sharply carinate, rather thin, dark horn-colored, or brown; the upper surface has the epidermis raised into acute striae, which, at the suture and carina, are produced into short bristles; these epidermidal striae are sometimes seen beneath, but less distinctly, being often obsolete in the mature shell; basal surface convex, but indented in the umbilical region; spire slightly convex, whorls five and a half, rather flat, the last one suddenly but slightly deflected; aperture very oblique, transverse, ear-shaped, narrowed by a rather slender tongue-shaped tooth, which extends nearly across the whole width of the aperture; peristome callous, margins slightly but distinctly reflected, and thickened within, basal margins lightly arcuate, but entire. Diam. maj. 10 mm. Diam. min. 9 mm. Alt. 6 mm." (Redfield.)

Type Locality: Habersham Co., Georgia.

Alabama Records:

Bibb Co.; Woodstock.

Blount Co.; Blount Springs.

Cherokee Co.; Pleasant Gap; 10 mi. S. E. of Centre.

Clay Co.; Pyriton.
 Jefferson Co.; Bessemer; Squaw Shoals.
 Madison Co.; Monte Sano.
 Randolph Co.; Roanoke; Wadley.
 St. Clair Co.; Ragland Road, Beaver Creek Mountain.
 Talladega Co.; Gorge of Cheawha Creek.
 Tuscaloosa Co.; Squaw Shoals; Indian Creek; Holt; Tuscaloosa.
 Walker Co.; Forks of Warrior.

Franklin Co.; Burleson.
 Lauderdale Co.; Florence.
 Marion Co.; Bear Creek; Hamilton.
 Shelby Co.; Gurnee.

Apparently restricted to the northern half of the state as it has not been reported south of Bibb County.

Polygyra stenotrema (Ferussac)

Helix stenotrema "Ferussac" Pfeiffer, Symbolae, II, 1842, p. 39; Bland, Ann. N. Y. Lyc. Nat. Hist., VII, 1861, p. 327 (separate, p. 104); Sargent, Nautilus, VI, 1894, p. 77; *ibid.*, VIII, 1895, p. 105.



Stenotrema stenotrema Lewis, Ala. F. W. & L. Shells, 1876, p. 29.

Stenotrema stenotremum W. G. Binney, Manual, 1885, p. 277, fig. 294; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 377.

Polygyra stenotrema Wheeler, Nautilus, XXV, 1912, p. 124.



FIG. 57.
P. stenotrema
 (Binney).

Original Description: "T. imperforata, depressiuscula, minutim striata, corneo-fusca; sutura impressa; anfr. 5, minutim striata, corneo-fusca; sutura impressa; anfr. 5, somewhat convex, the last anteriorly gibbous, angularly deflected; aperture irregularly transversely lunar, almost linear, contracted by a long, stout, elevated lamelliform tooth along the whole length of the parietal wall, furnished far within, on the base of the last whorl with a transverse tubercle springing from the axis; peristome scarcely expanded above, thickened by a heavy, regularly curving callus, its basal margin with a small notch."

"Diam. 12, altit. 7 mm." (Pfeiffer.)

Binney's description is as follows: "Shell imperforate, globose, diaphanous, reddish, hirsute, convex above, inflated below; spire elevated; whorls 5, somewhat convex, the last anteriorly gibbous, angularly deflected; aperture irregularly transversely lunar, almost linear, contracted by a long, stout, elevated lamelliform tooth along the whole length of the parietal wall, furnished far within, on the base of the last whorl with a transverse tubercle springing from the axis; peristome scarcely expanded above, thickened by a heavy, regularly curving callus, its basal margin with a small notch."

Type Locality: Indiana.

Alabama Records:

Baldwin Co.; Saraland.
 Calhoun Co.; Anniston; Choctaw Mts., Germania Springs; Duggar Mt., Jacksonville.
 Cherokee Co.; Gorge of Little River; 10 m. S. E. of Centre; Pleasant Gap; Slackland.
 Indian Mountains; Cap Rock, Sandford Spring; Craig Mountain.
 Chilton Co.; Yellowleaf Creek.
 Choctaw Co.; Bladen Springs; Black Bluff; Sibo.
 Clarke Co.; Jackson; Grove Hill; Thomasville; Culpepper.
 Cleburne Co.; Dugger Mt., Piedmont.
 Coosa Co.; Butting Ram Shoals.
 Dallas Co.; Pleasant Hill.
 DeKalb Co.; Fort Payne; Valley Head; Sand Mountain; Lookout Mountain.
 Elmore Co.; Wetumpka.
 Bibb Co.; Blocton.
 Conecuh Co.; Evergreen.
 Cullman Co.; Wilhites.
 Fayette Co.; Fayette Court House.

Jackson Co.
 Paint R.
 Jefferson Co.
 Lauderdale Co.
 Madison Co.
 Mobile Co.
 Randolph Co.
 Shelby Co.
 St. Clair Co.
 Sumter Co.;

Tuscaloosa Co.
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 Wilcox Co.;

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 Cullman Co.

DeKalb Co.;
 Etowah Co.;
 Jefferson Co.
 Madison Co.
 Perry Co.; I

St. Clair Co.
 Tuscaloosa Co.

Genera
 but has no

Jackson Co.; Princeton; Stevenson; Woodville; Sand Mt., Pisgah; Sand Mt., Fabins; Paint Rock.

Jefferson Co.; Squaw Shoals; Valley Creek, Adger.

Lauderdale Co.; Florence.

Macon Co.; Tuskegee.

Madison Co.; Huntsville; Gurley; Monte Sano.

Mobile Co.; Mobile; Mt. Vernon.

Perry Co.; Marion.

Randolph Co.; Wadley.

Shelby Co.; Cahaba River Valley; Shelby; Gurnee; Weduska Shoals.

St. Clair Co.; Gallant; Whitney; Greensport.

Sumter Co.; Livingston; Epes.

Talladega Co.; Horseblock Mountain;

Three Island Shoals; Ft. William Shoals.

Tuscaloosa Co.; Holt; Indian Creek; Vance; Junction of North and Black Warrior Rivers.

Wilcox Co.; Gastonburg; Camden; Pine Hill; Alberta.

An abundant, wide-spread and extremely variable species. It is probable that several well defined local races can be recognized, whenever the typical form is definitely established.

Polygyra stenotrema seminuda Clapp

Polygyra stenotrema seminuda Clapp, Nautilus, XVIII, 1904, p. 86.

Original Description: "In the Proceedings of the Academy of Natural Sciences, 1900, p. 129, Dr. Pilsbry defines *P. stenotrema* var. *nuda* as follows: 'Surface without hairs or their scars; other characters of typical *stenotrema*.'

"Among the shells collected by Mr. Herbert H. Smith in Central Alabama is a variety of *stenotrema*, which differs from *nuda* in having very short, widely spaced hairs, in other particulars agreeing with var. *nuda*. As it appears to be a 'connecting link,' I have called it var. *seminuda*. In size it varies from 5.75 x 8 to 7 x 10 mm., the average diameter being 9 to 9.5 mm.; color from greenish-white, almost albino, to dark reddish-brown." (Clapp.)

Type Locality: Bangor, 4 miles north of Blount Springs, Blount Co., Alabama.

Alabama Records:

Bibb Co.; Blocton.

Choctaw Co.; Silas.

Cullman Co.; Sand Mountain, Wilhites.

DeKalb Co.; Sand Mountain; Gorge of Little River; Valley Head.

Etowah Co.; Keener.

Jefferson Co.; Valley Creek, Adger.

Madison Co.; Huntsville; Gurley.

Perry Co.; Marion.

St. Clair Co.; Calera; Cahaba River Valley.

Tuscaloosa Co.; Tuscaloosa; Hagler; Nagler.

Blount Co.; Bangor; Blount Springs.

Clarke Co.; Grove Hill; Pine Hill;

Thomasville; Yellow Bluff.

Dallas Co.; Pleasant Hill.

Jackson Co.; Bass; Sand Mountain;

Princeton.

Lauderdale Co.; Florence.

Mobile Co.; Mobile; Mt. Vernon.

Shelby Co.; Gurnee.

Generally distributed in the northern and western portions of the state, but has not, as yet, been found east of the Coosa and Alabama rivers.

Polygyra stenotrema subglobosa Pilsbry

- Polygyra stenotrema subglobosa* Pilsbry, Man. Conch., VIII, 1892, p. 152, pl. 50, figs. 26-27; Johnson & Pilsbry, Nautilus, XI, 1897, p. 96; Cat., 1898, p. 14.
Polygyra subglobosa Hinkley, Nautilus, XX, 1906, p. 35.
Helix stenotrema globosa Sargent, Nautilus, VI, 1892, p. 77.
Polygyra stenotrema exodon Pilsbry, Proc. A. N. S. P., 1900, p. 129.

FIG. 58. • *P. stenotrema subglobosa* (Pilsbry).

Original Description: "Spire lower than in typical *stenotrema*, and color horn-brown, lips much developed, the distal end of the parietal lamella being curved and produced inward, the basal lip having a corresponding sinus, and on its outer margin there is a small tooth. A short buttress from the parietal lamella connects with the outer termination of the lip." (Pilsbry.)

Type Locality: Woodville, Alabama.

Alabama Records:

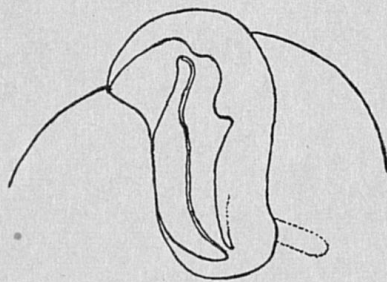
DeKalb Co.; Gorge of Little River; Fort Payne, Lookout Mountain.
 Jackson Co.; Woodville; Stevenson; Paint Rock; Princeton; Limrock.
 Lauderdale Co.; Florence. Madison Co.; Gurley; Rainbow Mt., Huntsville.
 Tuscaloosa Co.; Tuscaloosa. Wilcox Co.; Gastonburg.

Northern and western parts of the state, extending as far south as Wilcox County.

"Outer lip with a deep notch for the reception of the outer end of the deeply incurved parietal lamella, a distinct tooth outside of the notch; fulcrum long; form depressed; pale colored." (Pilsbry.)

Polygyra barbata Clapp

Polygyra barbata Clapp, Nautilus, XVIII, 1904, p. 85.

FIG. 59. *P. barbata*.

Original Description: "At first glance this species would be readily taken for *P. stenotrema* and as it may exist in some collections under that name it can best be described by comparison with that well known and widely distributed species.

"Viewed from above, the difference is at once apparent, as *barbata* has stiff hairs about $\frac{1}{2}$ mm. in length, which are widely spaced, and the diagonal series cross the lines of growth at nearly a right angle. The upper half of the outer lip is well reflected, not appressed as in *stenotrema*, and there is a distinct constriction back of it. From below the difference is still more striking, as the width of the mouth in *barbata* is fully double that of *stenotrema*; in *barbata* the width, measured from the top of the tooth to the edge

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of the lip just below the notch, is 1 mm., while in *stenotrema* of the same size it is only about $\frac{1}{2}$ mm. The lamelliform tooth is more sinuous and less massive. The flattened upper lip, which is markedly concave, has a well pronounced tooth just opposite the upper end of the abruptly truncated parietal tooth. The "fulcrum," which is plainly visible through the shell, is the most pronounced feature, as it is 3 mm. in length, extending from the axis fully half way across the body-whorl. Embryonic whorls polished and obsoletely ribbed, while in *stenotrema* they are *granulated*. The granulated embryonic whorls of *stenotrema* and its allies would seem to make the section *Stenotrema* of at least subgeneric value, although the almost smooth apex of *barbata* indicates that there is some variation in the group. The young of *barbata* are umbilicate. In size there is a wide variation in this species but in all other particulars the characters are absolutely constant.

"Greater diam. 11, lesser 10, altitude 7 mm.

"Greater diam. 10, lesser 9, altitude $6\frac{1}{2}$ mm.

"Greater diam. 8, lesser $7\frac{1}{2}$, altitude $5\frac{1}{2}$ mm.

"The average diameter is 9 to 10 mm. Whorls about $5\frac{1}{2}$." (Clapp.)

Type Locality: The flood-plain of the Tallapoosa River near the Montgomery Road about five miles southeast of Wetumpka, Alabama.

Alabama Records:

Cherokee Co.; Poole's Island, Coosa River.

Elmore Co.; Wetumpka.

Lauderdale Co.; Lock 6, Florence; Muscogee Shoals, Florence.

Apparently rare and local in its distribution.

Polygyra brevipila Clapp

Polygyra (Stenotrema) brevipila Clapp, Nautilus, XX, 1907, p. 110, pl. V, figs. 1-4.

Original Description: "Shell imperforate, globose, thin, light reddish-horn color; *densely hirsute with fine, short hairs*. Whorls five, those of the

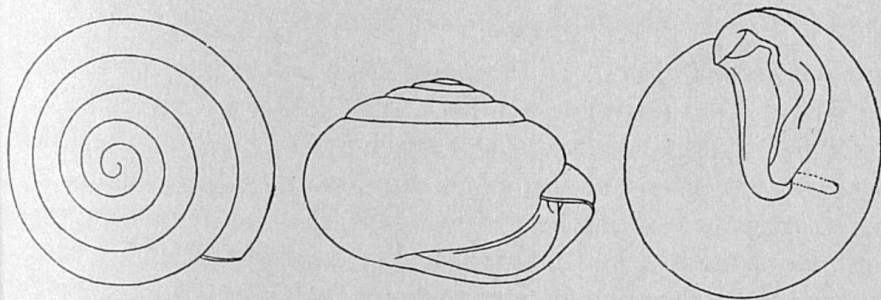


FIG. 60. *P. brevipila* (Clapp).

spire convex with a well impressed suture; the body-whorl *very convex*, equally rounded above and below, *deeply* impressed in the umbilical region,

abruptly deflected at the aperture and contracted behind the lip. Aperture transverse, narrow, *widening anteriorly*; parietal tooth large, strong but narrow, erect, with the sides nearly at right angles to the whorl and projecting beyond the lip, with which it is not parallel, *but diverges for three-fourths of its length*, when it is abruptly bent inward and downward, terminating opposite the second notch in the lip, its distal or outer extremity connected with the end of the peristome by a ridge of callus, the axial end *sweeping around and 'pocketing'* the basal end of the lip; outer lip reflected back against the body-whorl, but with its *sharp edge free from the whorl its entire length*; very much thickened along its inner edge, which forms a raised margin around the wide notch, and a well developed tooth or fold beyond it, after which the margin is incurved around the outer extremity of the parietal tooth. *Fulcrum long.*

"An average shell measures, diam. $8\frac{1}{2}$, alt. 6 mm. The largest seen measures 9×6 , and the smallest $7\frac{3}{4} \times 5\frac{3}{4}$ mm." (Clapp.)

Type Locality: Horseblock Mountain, Talladega Co., Alabama.

Alabama Records: Only record as above.

"This is one of the most striking species of the *Stenotrema hirsuta* group and differs from all others in having a *continuous free lip*; the lip notch is also of an entirely different type, as it will be noticed by a reference to the figures that the notch is *not* an indentation in the center of the lip, but the lip forms a curve from the columellar end to the highest part of the notch when it is suddenly deflected and bent forward. The parietal tooth differs in being more perpendicular to the body-whorl, *not bent toward the lip*, as in *stenotrema*, where the tooth is very convex on its outer side and concave on the side next the lip, which it frequently overhangs. On looking into the aperture, through the notch, the whole of the long fulcrum can be plainly seen." (G. H. C.)

Polygyra brevipila cherokeeensis Clapp

Polygyra brevipila cherokeeensis Clapp, Nautilus, XXX, 1916, p. 3.

Original Description: "Differs from typical *brevipila* by its uniformly smaller size and darker color. In both these respects it resembles *cohabitans*, for which it might be taken at first sight; but the form and details of apertural structures are almost exact reproductions, in miniature, of *brevipila*. At present, it seems better to regard the new form as a sub-species of *brevipila*, though a well marked one. The fact that it has been found in two localities, twenty miles apart, shows that it is not merely a dwarfed local variety. It should be remembered that nearly all of the species of *Stenotremes* are markedly constant in size, even when they have a wide geographic range.

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Jackson Co.;

Mt., Pisg

Jefferson Co.;

Madison Co.;

Marion Co.;

Tuscaloosa Co.

"Diam. 7 mm., alt. 5 mm.; whorls 5." (Clapp.)

Type and Only Recorded Alabama Locality: Near Pleasant Gap, Cherokee Co., Alabama. In a shady but dry ravine on the mountain side, about 1,200 ft., generally under stones.

"A single specimen was found near Cave Spring, Floyd Co., Ga., about 20 miles N. E. of the Alabama locality.

"*Polygyra brevipila*, *cherokeensis* and *cohuttensis* form an interesting and very natural group, differing from *stenotrema*, *hirsuta* and their allies by the continuous free lip and the shape of the lip notch. Other common characters are the fine, closely-set hairs and very convex, rounded body-whorl. The fulcrum is long. The known localities are all in the southern extension of the Allegheny mountain range, from N. W. Georgia to central Alabama. All the species occur in wooded, but rather dry ravines on mountain sides, and they commonly conceal themselves by clinging to the lower sides of stones. *Polygyra brevipila* was collected in such a ravine, about 2,000 ft. above sea level; *cohuttensis* at about 1,500 ft.; and *cherokeensis* at 1,200 ft." (G. H. C.)

Polygyra hirsuta (Say)

Helix hirsuta Say, Jour. A. N. S. P., I, 1817, p. 17; Sargent, Nautilus, VI, 1892, p. 77, *Stenotrema hirsuta* Lewis, Ala. F. W. & L. Shells, 1876, p. 29.
Stenotrema hirsutum W. G. Binney, Manual, 1885, p. 278, fig. 295.
Polygyra hirsuta Johnson & Pilsbry, Nautilus, XI, 1897, p. 96; Cat., 1898, p. 14; Wheeler, Nautilus, XXV, 1912, p. 124; *ibid.*, XXVI, 1912, p. 15.

FIG. 61.

P. hirsuta
(Binney).

Original Description: "Shell subglobose, brownish, imperforated, covered with short, numerous rigid hairs; whorls five, but little rounded; suture distinct; aperture very narrow, almost closed by an elongated lamelliform tooth, situated on the pillar-lip, and circularly joined to the outer lip at the base. Outer lip reflected back upon the whorl, and incorporated with it near the base, with a deep sinus in the middle. Beneath, one quarter of an inch." (Say.)

Type Locality: Not specified.

Alabama Records:

Bibb Co.; Woodstock; Pratt's Ferry.
 Blount Co.; Blount Springs.

Etowah Co.; Keener.
 Fayette Co.; Fayette.

Jackson Co.; Bass; Woodville, Paint Rock; Sand Mt., Pisgah; Princeton.

Jefferson Co.; Valley Creek, Adger.

Madison Co.; Huntsville; Gurley; Monte Sano; Lauderdale Co.; Killen.

Marion Co.; Hamilton.

Tuscaloosa Co.; Holt.

Shelby Co.; Montevallo; Shelby.

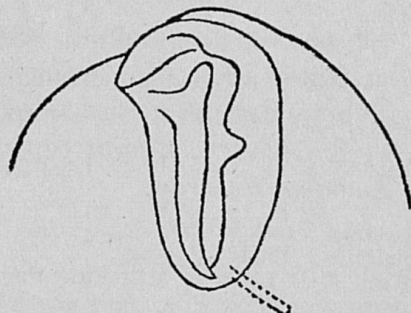


FIG. 62. *P. hirsuta* (Clapp).

abruptly deflected at the aperture and contracted behind the lip. Aperture transverse, narrow, *widening anteriorly*; parietal tooth large, strong but narrow, erect, with the sides nearly at right angles to the whorl and projecting beyond the lip, with which it is not parallel, *but diverges for three-fourths of its length*, when it is abruptly bent inward and downward, terminating opposite the second notch in the lip, its distal or outer extremity connected with the end of the peristome by a ridge of callus, the axial end *sweeping around and 'pocketing'* the basal end of the lip; outer lip reflected back against the body-whorl, but with its *sharp edge free from the whorl its entire length*; very much thickened along its inner edge, which forms a raised margin around the wide notch, and a well developed tooth or fold beyond it, after which the margin is incurved around the outer extremity of the parietal tooth. *Fulcrum long.*

"An average shell measures, diam. $8\frac{1}{2}$, alt. 6 mm. The largest seen measures 9×6 , and the smallest $7\frac{3}{4} \times 5\frac{3}{4}$ mm." (Clapp.)

Type Locality: Horseblock Mountain, Talladega Co., Alabama.

Alabama Records: Only record as above.

"This is one of the most striking species of the *Stenotrema hirsuta* group and differs from all others in having a *continuous free lip*; the lip notch is also of an entirely different type, as it will be noticed by a reference to the figures that the notch is *not* an indentation in the center of the lip, but the lip forms a curve from the columellar end to the highest part of the notch when it is suddenly deflected and bent forward. The parietal tooth differs in being more perpendicular to the body-whorl, *not bent toward the lip*, as in *stenotrema*, where the tooth is very convex on its outer side and concave on the side next the lip, which it frequently overhangs. On looking into the aperture, through the notch, the whole of the long fulcrum can be plainly seen." (G. H. C.)

Polygyra brevipila cherokeensis Clapp

Polygyra brevipila cherokeensis Clapp, Nautilus, XXX, 1916, p. 3.

Original Description: "Differs from typical *brevipila* by its uniformly smaller size and darker color. In both these respects it resembles *cohuttensis*, for which it might be taken at first sight; but the form and details of apertural structures are almost exact reproductions, in miniature, of *brevipila*. At present, it seems better to regard the new form as a sub-species of *brevipila*, though a well marked one. The fact that it has been found in two localities, twenty miles apart, shows that it is not merely a dwarfed local variety. It should be remembered that nearly all of the species of *Stenotremes* are markedly constant in size, even when they have a wide geographic range.

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Alabama

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Etowah Co.;
Fayette Co.;
Jackson Co.;
Mt., Pisg
Jefferson Co.;
Madison Co.;
Marion Co.; F
Tuscaloosa Co.

"Diam. 7 mm., alt. 5 mm.; whorls 5." (Clapp.)

Type and Only Recorded Alabama Locality: Near Pleasant Gap, Cherokee Co., Alabama. In a shady but dry ravine on the mountain side, about 1,200 ft., generally under stones.

"A single specimen was found near Cave Spring, Floyd Co., Ga., about 20 miles N. E. of the Alabama locality.

"*Polygyra brevipila*, *cherokeensis* and *cohuttensis* form an interesting and very natural group, differing from *stenotrema*, *hirsuta* and their allies by the continuous free lip and the shape of the lip notch. Other common characters are the fine, closely-set hairs and very convex, rounded body-whorl. The fulcrum is long. The known localities are all in the southern extension of the Allegheny mountain range, from N. W. Georgia to central Alabama. All the species occur in wooded, but rather dry ravines on mountain sides, and they commonly conceal themselves by clinging to the lower sides of stones. *Polygyra brevipila* was collected in such a ravine, about 2,000 ft. above sea level; *cohuttensis* at about 1,500 ft.; and *cherokeensis* at 1,200 ft." (G. H. C.)

Polygyra hirsuta (Say)

- Helix hirsuta* Say, Jour. A. N. S. P., I, 1817, p. 17; Sargent, Nautilus, VI, 1892, p. 77,
Stenotrema hirsuta Lewis, Ala. F. W. & L. Shells, 1876, p. 29.
Stenotrema hirsutum W. G. Binney, Manual, 1885, p. 278, fig. 295.
Polygyra hirsuta Johnson & Pilsbry, Nautilus, XI, 1897, p. 96; Cat., 1898, p. 14; Wheeler, Nautilus, XXV, 1912, p. 124; *ibid.*, XXVI, 1912, p. 15.

Fig. 61.

P. hirsuta
 (Binney).

Original Description: "Shell subglobose, brownish, imperforated, covered with short, numerous rigid hairs; whorls five, but little rounded; suture distinct; aperture very narrow, almost closed by an elongated lamelliform tooth, situated on the pillar-lip, and circularly joined to the outer lip at the base. Outer lip reflected back upon the whorl, and incorporated with it near the base, with a deep sinus in the middle. Beneath, one quarter of an inch." (Say.)

Type Locality: Not specified.

Alabama Records:

Bibb Co.; Woodstock; Pratt's Ferry.
 Blount Co.; Blount Springs.
 Etowah Co.; Keener.
 Fayette Co.; Fayette.
 Jackson Co.; Bass; Woodville, Paint Rock; Sand Mt., Pisgah; Princeton.
 Jefferson Co.; Valley Creek, Adger.
 Madison Co.; Huntsville; Gurley; Monte Sano; Rainbow Mt., Huntsville.
 Marion Co.; Hamilton.
 Tuscaloosa Co.; Holt.

Lauderdale Co.; Killen.
 Shelby Co.; Montevallo; Shelby.

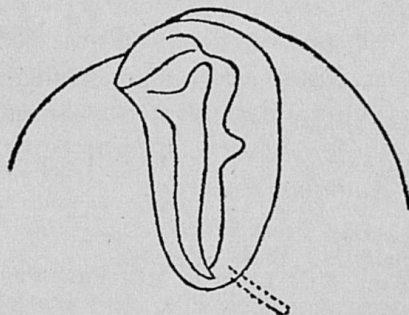


FIG. 62. *P. hirsuta* (Clapp).

Wheeler states that the form from Monte Sano differs constantly from typical *hirsuta* by its smaller size and pronounced apertural features.

This common northern species is restricted to the northern counties of the state, extending as far south as Bibb County.

Polygyra decepta Clapp

Polygyra decepta Clapp, Nautilus, XIX, 1905, p. 25, text figure.

Original Description: "By comparison with *hirsuta* the following differences will be noted: Lip broader and more rounded at the top so that when the shell is viewed from below, the body-whorl joins it in a regular curve instead of forming an obtuse angle; parietal tooth hooked at the outer end and curving into the aperture, the lip being deeply recessed around it; lip-notch narrow and sinuous with a well raised margin which projects above the level of the parietal tooth; width of aperture, measured from back of lip to edge of parietal callus across the lip-notch, more than half the length, while in *hirsuta* it is less; parietal tooth not quite joining lip at basal margin; internal tubercle short and *completely covered* by the lip so that it is not visible through the base of the shell. The parietal tooth is connected to the base of the lip by a slight buttress and there is a well developed tooth-like process on the lip, but these characters are common to most of the species of this group. Color and hairs about the same as in *hirsuta*.

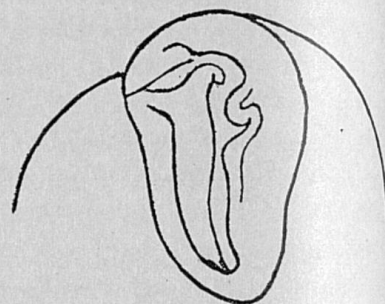


FIG. 63. *P. decepta* (Clapp).

"The outline figures bring out the differences better than the description, *decepta* being drawn from the type and *hirsuta* from Blount Springs shell.

"Type: Greater diam. 7, lesser $6\frac{1}{2}$, alt. $4\frac{3}{4}$ mm., whorls 5.

"Greater diam. $6\frac{1}{4}$, lesser $5\frac{3}{4}$, alt. $4\frac{1}{2}$ mm., whorls $4\frac{2}{3}$.

"These measurements show the extreme variation in size." (Clapp.)

Type Locality: Blount Springs, Alabama.

Alabama Records:

Bibb Co.; Pratt's Ferry.

Blount Co.; Blount Springs.

DeKalb Co.; Lookout Mt., Fort Payne.

Jackson Co.; Woodville; Stevenson; Princeton.

Madison Co.; Huntsville; Monte Sano; Little Mt., and Matthews Hill, Huntsville; Gurley.

Jefferson Co.; Squaw Shoals.

Tuscaloosa Co.; Holt; Tuscaloosa.

Calhoun Co.; Dugger Mt., Jacksonville.

Etowah Co.; Keener.

Shelby Co.; Gurnee; Montevallo.

Walker Co.; Forks of Warrior.

Restricted to the northern part of the state, like *hirsuta*.

Polygyra pilula Pilsbry*Polygyra hirsuta pilula* Pilsbry, Proc. A. N. S. P., 1900, p. 132.

Original Description: "Smaller than typical *hirsuta*, with more elevated spire; whorls nearly 5, the last with well rounded periphery, surface beset with rather long, curved hairs. Parietal tooth sinuous, connected with the peripheral end of the outer lip by a callous ridge. Basal lip 3-toothed, the median notch much deeper than in *hirsuta*, with raised edges, the outer tooth small.

"Alt. 4.5, diam. 6 mm.

"The smallest specimens measure, alt. 4, diam. 5.5 mm." (Pilsbry.)

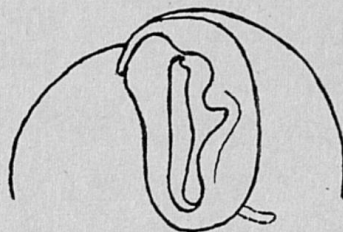
Type Locality: Thunderhead Mountain, North Carolina.

Alabama Records:

Jackson Co.; Paint Rock; Princeton.

Madison Co.; Monte Sano; Smithers' Mountain; Gurley.

"This form is not only smaller and more globular than *P. hirsuta*, but the armature of the basal lip is different. The median notch is much deeper, and instead of being a mere notch in a straight calloused edge, it appears as a deep sinus between two wide, irregular teeth." (H. A. P.)

FIG. 64. *P. pilula*.*Polygyra maxillata* (Gould)

Helix maxillata Gould, Proc. B. S. N. H., III, 1818, p. 38.

Stenotrema maxillata Lewis, Ala. F. W. & L. Shells, 1876, p. 29.

Stenotrema maxillatum W. G. Binney, Manual, 1885, p. 280, fig. 296;

Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 378.

Polygyra maxillata Johnson & Pilsbry, Nautilus, XI, 1897, p. 96; Cat., 1898, p. 14.

FIG. 65. *P. maxillata* (Binney).

Original Description: "T. parva, globoso-lenticulari, pallide castanea, solidula, *H. hirsutae* simili, apertura lineari, labro reflexo, praeter emarginationem inconspicuum dente obsoleto divisam integro, fauce lamellam sicut maxillam pone labrum gerente; lamella columellari recta, superne bifurcata.

"Diam. $\frac{1}{4}$ poll." (Gould.)

Binney's description is as follows: "Shell imperforate, globose-conic, rather solid, completely covered with short hairs, chestnut-colored; spire convex-conoid, apex obtuse; whorls 5, rather convex, gradually increasing, the last anteriorly deflected, constricted, subinflated below; aperture oblique, linear, almost closed by a broad, jaw-shaped denticle within the peristome; peristome thickened, its terminations joined by a stout, erect parietal callus, the right margin subrectilinear, arched, angularly merging

into the very heavy basal margin; within the base of the shell is a transverse tubercle."

Type Locality: Tennessee.

Alabama Records:

Chambers Co.; Langdale.
Conecuh Co.; Evergreen; Herbert.
Lee Co.; Auburn.
Perry Co.; Lookout Mountain.
Shelby Co.; Montevallo.

Choctaw Co.; Black Bluff.
Dallas Co.; Selma.
Monroe Co.; Monroe; Claiborne.
Randolph Co.; Roanoke.
Wilcox Co.; Pine Hill.

"This shell, which is smaller and somewhat more globose than *H. hirsuta*, is well characterized by its partially bifurcated pillar tooth, and by the peculiar jaw-like plate, almost concealed behind the inflexed lip, within the fauces." (Gould.)

Apparently restricted to the southern two-thirds of the state, as it has not been reported from north of Shelby and Randolph counties nor west of the Black Warrior River.

Polygyra monodon aliciae (Pilsbry)

Helix monodon aliciae Pilsbry, Man. Conch., VIII, 1893, p. 152.

Polygyra fraterna aliciae Pilsbry & Ferriss, Proc. A. N. S. P., 1906, p. 542; Wheeler, Naut., XXV, 1912, p. 124.

Original Description: "Extremely globose, elevated, closely coiled, imperforate or nearly so." (Pilsbry.)

Type Locality: Lake Charles, Louisiana.

Alabama Records:

Barbour Co.; Elamville.
Choctaw Co.; Moscow Bluff.
Dallas Co.; Pleasant Hill; Safford.
Greene Co.; Boligee.
Madison Co.; Gurley; Huntsville; Monte Sano.
Marengo Co.; Marengo Co.
Perry Co.; Marion.
Sumter Co.; Black Bluff; Epes; Livingston.
Tuscaloosa Co.; Elrod.

Bibb Co.; Eoline.
Dale Co.; Pinehard.
Franklin Co.; Russellville; Burleson.
Macon Co.; Tuskegee.

Mobile Co.; Chastang; Mobile.
Pickens Co.; Coalfire.



FIG. 66. *P. monodon aliciae*.

Generally distributed over the state.

"This form is typically small and elevated with a very convex base, narrowly perforate axis, and 5.5 to 6 whorls. The degree of elevation varies a good deal. The fulcrum is long and strongly notched above and below. The basal lip has a more or less strongly developed flange on its face, somewhat as in *P. vultuosa*, with a notch where it ends at the columella. Specimens of the type lot from Lake Charles, La., measure from 5 x 7 mm. to 5.7 x 7.8 mm." (Pilsbry & Ferriss.)

Polygyra monodon fraterna (Say)*Helix fraterna* Say, Long's Exp., II, 1824, p. 257, pl. XV, fig. 3.*Stenotrema monodon fraternum* W. G. Binney, Manual, 1885, p. 281, fig. 299.(1) *Stenotrema monodon* Lewis, Ala. F. W. & L. Shells, 1876, p. 29; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 378.FIG. 67. *P. monodon fraterna* (Binney).

Original Description: "Shell convex, brownish horn color, minutely hirsute; whorls five, rounded; umbilicus partly or entirely closed by the termination of the labrum; region of the umbilicus indented; aperture much contracted by the labrum; labrum reflected, white, unarmed; its outer edge not projecting beyond the curve of the whorl; its inferior angle extends to the centre of the base of the shell, labium with a strong, prominent, compressed, white tooth. Breadth one-third of an inch." (Say.)

Type Locality: Pennsylvania.*Alabama Records*:

Barbour Co.; Elamville.

Clarke Co.; Jackson; Thomasville.

Madison Co.; Matthews Hill, Huntsville.

Mobile Co.; Mobile; Chestang.

St. Clair Co.; Whitney.

Chambers Co.; Langdale.

Elmore Co.; Wetumpka.

Perry Co.; Marion.

Sumter Co.; Black Bluff.

There is great variation in size in this form and in the umbilicus, which is either entirely closed or more or less open.

"All of the larger kind (*fraterna*) at Epes, Sumter Co., were found in woods along the edge of the river flood plains, sometimes within the flood limits. At Livingston, Sumter Co., I got only the large form, in every case along the edge of alluvial or swampy ground or on alluvial land. As far as my memory serves, the larger form was found in such situations in other parts of the state. Both forms are quite common in the "Black Belt" over soft limestone. The large one is found in all parts of the state, except, perhaps, in the extreme southern counties, but it is generally rare except in the Black Belt." (H. H. S.)

Generally but not abundantly throughout the state.

GENUS PRATICOLELLA v. MARTENS

Shell of the ordinary *Helix* shape; narrowly umbilicated, globose, shining, opaque white, horn colored or yellowish with translucent corneous and brownish spiral bands. Aperture lunate-rounded, slightly oblique, lip narrowly reflexed, dilated at the columellar insertion, sometimes thickened within.

Genitalia: Female organs as in *Polygyra*, without dart sac, mucus glands

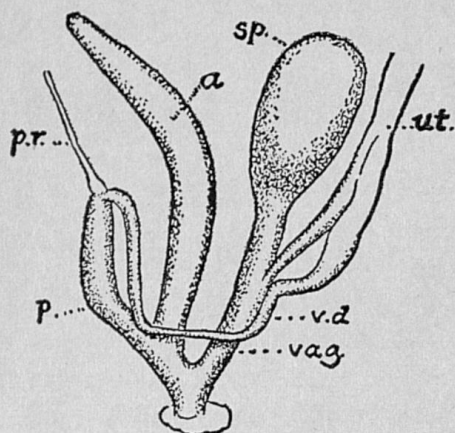


FIG. 68. Genitalia of *P. jejuna* (Pilsbry).

yond the basal-plates, ectocones shortly reflected with long cutting points. Laterals similar, but lacking entocones. Marginal teeth low, wide, the mesocone and ectocone both bifid.

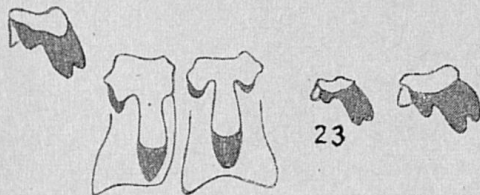


FIG. 70. Radula of *P. mobiliana* (Binney).

Original Description: "Shell subglobular, glabrous, pale reddish brown; volutions five, slightly wrinkled, regularly rounded; spire convex; suture rather deeply impressed; aperture dilate lunate; labrum a little incrassated within, not reflected; umbilicus open, small.

Breadth rather more than one-fifth of an inch." (Say.)

Type Locality: Not specified, but probably at the Cow Fort on the St. John River, Florida.

Alabama Record: "Alabama." (Lewis.)

A southern species, which has not been detected by recent collectors.

Praticolella lawæ (Lewis)

Helix (*Mesodon*) *lawi* Lewis, Proc. A. N. S. P., 1874, p. 118, text fig.

Mesodon lawi W. G. Binney, Manual, 1885, p. 317, fig. 341.

Praticolella lawæ Vanatta, Proc. A. N. S. P., 1915, p. 197, fig. 10

Original Description: "Shell umbilicated, subglobose; epidermis pale corneous, thin and delicately striate; spire but a little elevated; suture quite

or other accessory organs; spermatheca oval, its duct simple and very short. Penis large, the vas deferens inserted at its apex. At the lower third of the penis is inserted a large, club-shaped appendix, opening into the penis by a narrow aperture.

Jaw arcuate without median projection, sculptured with numerous broad, crowded ribs, denticulating both margins.

Radula having the central teeth tricuspid, mesocones with a long reflection, the cutting points projecting to or be-

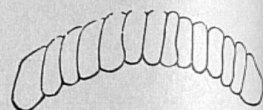


FIG. 69. Jaw of *P. griseola* (Binney).

Praticolella jejuna (Say)

Helix jejuna Say, Jour. A. N. S. P., II, 1821, p. 158.

Mesodon jejuna Lewis, Ala. F. W. & L. Shells, 1876, p. 29.

Mesodon jejunus W. G. Binney, Manual, 1885, p. 390, fig. 425.

Praticolella jejuna Pilsbry, Nautilus, XX, 1906, p. 32.

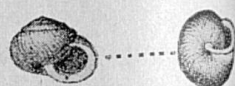


FIG. 71. *P. jejuna* (Pilsbry).

distinctly impressed; whorls nearly five, the last a little expanded and then conspicuously contracted as it approaches the peristome; peristome white, reflected, rather narrow, scarcely thickened, the margin being somewhat sharp; aperture well rounded, elliptically lunate, scarcely less in area than the unexpanded portion of the last whorl, and scarcely modified by the presence of a narrow, slightly curved, slightly elevated lamellar tooth on the parietal wall; umbilical region but a little impressed; umbilicus narrow, deep and scarcely contracted by the proximity of the reflected lips; base somewhat convex. Greater diameter 5.9, lesser 5.3, alt. 3.5 mm." (Lewis.)

Type Locality: Hayesville, Clay Co., North Carolina.

Alabama Records:

Bibb Co.; Woodstock.

DeKalb Co.; Sand Mt., Fort Payne; Look-out Mt., Valley Head.

Mobile Co.; Irvington; Mobile.
Shelby Co.; Gurnee; Calera; Helena.

Randolph Co.; Roanoke.

Talladega Co.; Horseblock Mountain.

Tuscaloosa Co.; Vance.

"This species has a pustulate apex and a parietal tooth." (Vanatta.)

A species of North Carolina and Georgia, which ranges southwesterly across the state from DeKalb County to Mobile County and into Mississippi.

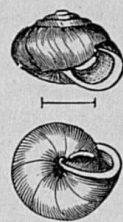


FIG. 72. *P. lawae*
(Binney).

Praticolella mobiliana (Lea)

Helix mobiliana Lea, Proc. Am. Phil. Soc., II, 1841, p. 82.

Mesodon mobiliana Lewis, Ala. F. W. & L. Shells, 1876, p. 29; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 389; W. G. Binney, Terr. Moll., V, 1878, p. 336, fig. 219, pl. VIII, fig. H.

Mesodon jejunus (pars) W. G. Binney, Manual, 1885, pp. 390, 492, fig. 426.

Praticolella mobiliana Vanatta, Proc. A. N. S. P., 1915, p. 195.



FIG. 73.

P. mobiliana
(Binney).

Original Description: "Shell subglobose, reddish horn colour, shining, perforate; spire short, obtuse; sutures impressed; whorls six, convex; aperture lunate; lip reflexed.

"Diam. .30, Length .25 of an inch." (Lea.)

Type Locality: Mobile, Alabama.

Alabama Records:

Baldwin Co.; Magnolia Springs; Foley.
Mobile Co.; Mobile.

Washington Co.; Calvert.

"There is a rather deep groove behind the lip, which is reddish. The umbilicus is small." (Lea.)

"In *M. mobiliana* there are 6 whorls, the last whorl is remarkably constricted and gibbous at the aperture, more tumid at the base and with a smaller umbilicus than in *jejunus*. The microscopic spiral lines on the

embryonic whorls of the latter are absent in the former. The peristome at its junction with the penultimate whorl is sharp, not reflected nor thickened, but elsewhere reflected, thickened by a whitish callus within, the edge of which forms a distinct portion of the peristome and has an obsolete tooth-like development near the columella. The aperture is more lunate than in *jejunus*." (W. B. Binney.)

A southern species, which has been found only in the southwestern part of the state.

FAMILY BULIMULIDÆ

Shell varying from well developed, oblong, ovate, conic or cylindrical, and capable of containing the retracted soft parts, to *Succinea*-like, or depressed, few whorled, and incapable of containing the soft parts. External characters of animal as in *Helicidæ*. Genitalia rather simple, the penis with or without a flagellum or an accessory gland or "appendix." Jaw composed of vertical or oblique imbricating plates, sometimes forming a triangular median piece, composed of one or several plates, or sometimes by thickening of the plates having an odontognathous appearance. Radula fundamentally as in *Helicidæ*, but variously modified.

GENUS BULIMULUS LEACH

Shell varying from ovate-conic to oblong, columnar or lanceolate; umbilicate or imperforate; aperture with the lip thin, generally not expanded;



FIG. 74. Jaw of *B. dealbatus* (Binney).



FIG. 75. Radula of *B. dealbatus* (Binney).

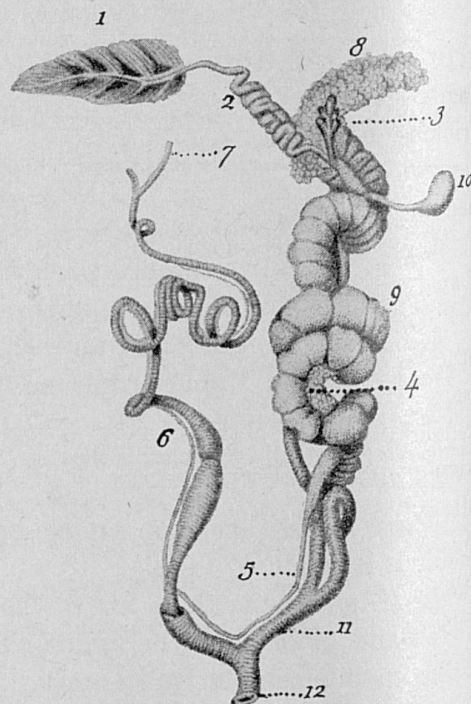


FIG. 76. Genitalia of *B. dealbatus* (Binney).

columella expanded, rather straight, sometimes with a callous fold within. Apical whorls either smooth, vertically costulate or wrinkled, or with the wrinkles interrupted and broken into granules; never sculptured with spiral and vertical raised striae forming a minute grating.

Radula substantially as in the normal, terrestrial *Helicidae*.

Jaw composed of rather few plates with vertical, narrowly free lateral edges not sufficiently converging to form a triangular area of shortened plates in the middle.

Genitalia without accessory organs or appendages.

SUBGENUS ORTHOTOMIUM CROSSE AND FISCHER

Shell umbilicate or rimate, varying from ovate-globose to cylindrical or pillar-shaped; never with spiral color-markings; with the initial 1.5 to 2 whorls sculptured with vertical riblets, the interspaces often minutely striate spirally; a decided apical dimple or pit.

Bulimulus dealbatus (Say)

Helix dealbata Say, Jour. A. N. S. P., II, 1821, p. 159.

Scutalus dealbatus Lewis, Ala. F. W. & L. Shells, 1876, p. 30.

Bulimulus dealbatus W. G. Binney, Manual, 1885, pp. 401, 496, fig. 441; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 398; Hinkley, Nautilus, XX, 1906, p. 35; Johnson & Pilsbry, *Ibid.*, XI, 1898, p. 106; Cat., 1898, p. 16; Wheeler, Nautilus, XXV, 1912, p. 124; Pilsbry, Man. Conch., XI, 1897, p. 128, pl. 17, fig. 1; pl. 18, figs. 27-30, 48.

Original Description: "Shell conical, oblong, thin and fragile, somewhat ventricose; volutions, 6-7, wrinkled across, wrinkles more profound and acute on the spire; spire elevated, longer than the aperture, subacute; aperture longer than wide, labrum not reflected; umbilicus small and profound.

"Length more than three-fourths of an inch, breadth nine-twentieths of an inch." (Say.)

Pilsbry's description is as follows: "Shell umbilicate, ovate-conic, thin; corneous brown streaks which are slightly translucent alternating with opaque cream-white or light brown ragged streaks, either tint sometimes predominating. Sculpture of slight growth-wrinkles generally becoming stronger and more regular on the spire, the nepionic 1.75 whorls typically with subobsolete fine longitudinal riblets, almost smooth. Whorls about 6.5, convex. Aperture about half the shell's length, ovate, corneous and white inside, the peristome acute, unexpanded, generally slightly thickened, or with a rib within. Columellar margin dilated. Columella regularly concave.



FIG. 77.
B. dealbatus
(Binney).

"Alt 20, diam. 11-12, alt. of aperture 10-11 mm."

Type Locality: Not specified. "Alabama and the banks of the Mississippi."

Alabama Records:

Choctaw Co.; Black Bluffs, Tombigbee River.

Cleburne Co.; Dugger Mountain.

Dallas Co.; Selma.

Greene Co.; Boligee; Eutaw.

Little Mt., Matthews Hill, Huntsville.

Madison Co.; Little Mt. and Matthew's

Hill; Huntsville; Monte Sano.

Marengo Co.; Marengo Co.

Mobile Co.; Mobile.

Montgomery Co.; McGee's Station; Bar-

chias; Montgomery.

Perry Co.; Hamburg; Uniontown.

Sumter Co.; Livingston; Epes.

Wilcox Co.; Camden.

A well known southern species probably of general distribution, but more abundant in the southern part of the state.

GENUS DRYMÆUS ALBERS

Shell generally of lighter structure and brighter color than in *Bulimulus*. With the exception of one aberrant subgenus, all of the species have a characteristic pattern of apical sculpture, consisting of minute pits arranged with great regularity in spiral and vertical lines.

The external anatomy and genital system are similar to that of *Bulimulus*.

Jaw strongly arched, thin and flexible, composed of many narrow plaits, narrowly imbricating, and obliquely converging toward the median line, usually leaving a triangular plait or several short, wedge-shaped plaits in the middle. The lower or cutting margin is often more or less serrate.

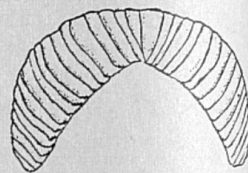


FIG. 78. Jaw of *D. acervatus* (Pilsbry).

Radula rather broad with a great number of teeth. Lateral teeth oblique, tricuspid, the ento- and meso-cones more or less united basally; the ectocones become split upon the outer laterals and the marginal teeth. The rachidian tooth varies widely from tricuspid to unicuspid. In general, the lateral and marginal series of teeth are scarcely differentiated, all the side teeth being practically of one type.

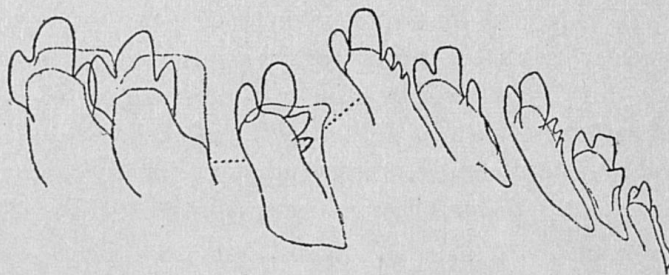


FIG. 78. Radula of *D. acervatus* (Pilsbry).

Drymæus multilineatus (Say)*Bulimus multilineatus* Say, Jour. A. N. S. P., V, 1825, p. 120.*Bulimulus multilineatus* W. G. Binney, Manual, 1885, p. 404, fig. 443; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 398.

FIG. 80.

D. multilineatus (Binney). "Length less than seven-tenths of an inch. Greatest breadth less than seven-twentieths of an inch." (Say.)*Type Locality*: Southern part of East Florida.*Alabama Record*:

"Alabama?" (Gratacap.)

This species of southern Florida is doubtfully cited by Gratacap from Alabama. It has not been found there by any of the recent collectors and the citation is probably erroneous.

FAMILY ACHATINIDÆ

Holopod, sigmurethrous snails with the central tooth of the radula very narrow (with few exceptions), its cusp small or absent, the side teeth tricuspid or bicuspid. Jaw generally striated. Genitalia with no accessory organs. Kidney two or three times the length of the pericardium. Pulmonary vein without large branches. Shell ovate, turreted or cylindric, well developed and capable of containing the entire soft parts; the columella frequently truncated below.

SUBFAMILY STENOGYRINÆ

Shell turreted or cylindric, unicolored or having darker streaks, rarely if ever zigzag-striped. No internal lamellae; axis slender, solid or nearly so.

GENUS RUMINA RISSO

Shell perforate, cylindric or tapering, 4 to 7 whorls remaining in adults in which the summit is truncate and closed by a spiral convex septum; about 8 to 10 whorls having been lost by successive breakages. Aperture subvertical, ovate, the outer lip simple, obtuse; columella vertical, slightly concave, continuous with the basal lip; columellar margin reflexed. Apex globular, smooth, fine striae appearing on the third whorl; young shells with concave lateral outlines.

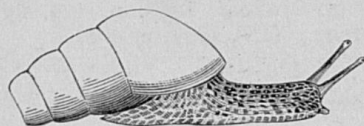


FIG. 81. Animal of *R. decollata* (Binney).

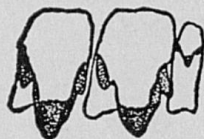


FIG. 83. Radula of *R. decollata* (Pilsbry).

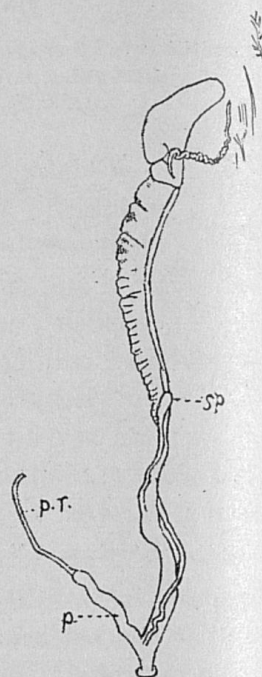


FIG. 82. Genitalia of *R. decollata* (Pilsbry).

Animal heliciform, blunt before, pointed behind; mantle posterior, thin protected by a shell; respiratory and anal orifices on the right of the mantle, under the peristome; generative orifice behind the right eye-peduncle; no locomotive disk; no caudal mucus pore.

Genitalia: The penis is a rather slender sac with terminal retractor and vas deferens, the latter imbedded in its integument. The vagina is longer than the penis; the duct of the spermatheca short.

The jaw as arcuate, with rather weak vertical striae.

The radula has a narrow, tricuspid central tooth, and tricuspid laterals. The marginal teeth are formed by suppression of the entocone, being thus bicuspid.

Rumina decollata (L.)

Helix decollata Linnæus, Syst. Nat. (X), 1758, p. 773.

Stenogyra decollata W. G. Binney, Manual, 1885, p. 456, figs. 471, 499.

Rumina decollata Pilsbry, Man. Conch., XVII, 1905, p. 212, pl. 53, fig. 70; H. H. Smith, Nautilus, XXVI, 1912, p. 4.

Original Description: "H. testa imperforata subturrita: spira multilato-truncata, apertura obovata." (Linnæus.)

Pilsbry's description is as follows: "Shell narrowly rimate, cylindric or cylindric-tapering, truncate and closed by a spiral convex plug at the summit; rather thin, glossy, pale flesh-tinted or whitish, the young light brown. Surface irregularly striate, distinctly so below the suture, more or less



FIG. 84. *R. decollata* (Binney).

malleate, and usually showing some spiral lines of vertical punctures. 4 to 6 whorls usually remain in adults; they are but slightly convex. Aperture ovate, the outer lip simple, more or less thickened within; columella vertical, nearly straight, its edge reflexed above, almost closing the minute umbilical crevice. Length 30, diam. 11-12 mm."

Type Locality: Not specified.

Alabama Record:

Mobile Co.; Mobile.

This well known European species has been introduced by commerce into several of the southern seaports.

GENUS OPEAS ALBERS

Shell small, thin, turrit, usually perforate, with large, obtuse, rounded apex and convex or flattened whorls, corneous or yellowish. Embryonic whorls smooth. Aperture small, ovate, the outer lip thin, usually arched forward, columella straight or concave, not sinuous, the columellar lip reflexed, curving into the basal lip and not toothed or truncate below.

The jaw is low, wide, with attenuated, blunt ends, and a wide, slightly produced median projection.



FIG. 85. Jaw of *O. gracile* (Binney).

The lingual membrane is long and narrow. The central tooth has a very small, high, narrow base of attachment, the lower outer angles generally somewhat expanded. The reflected portion is very small, and

bears a short, stout median cusp and two very small side cusps. Lateral teeth very much larger than the centrals. Basal plate about as high as wide, upper edge squarely reflected, the reflection is very large, and bears one stout median cusp, extending almost to the lower edge of the basal plate; there is also an outer, much smaller side cusp, and a less developed, sometimes subobsolete inner side cusp. The marginals have several cusps formed by the bifurcation of the entocone and ectocone; the second cusp from the inner side is the largest.

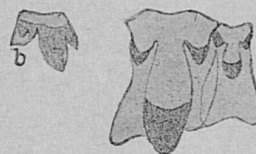


FIG. 86. Radula of *O. gracile* (Binney).

Opeas gracile (Hutton)

Bulimus gracilis Hutton, Jour. As. Soc. Bengal, III, 1834, pp. 84, 93.

Opeas gracile Pilsbry, Man. Conch., VXIII, 1906, p. 198, pl. 28, fig. 70; H. H. Smith, Nautilus XXV, 1912, p. 114.

Stenogyra subula W. B. Binney, Manual, 1885, p. 426, figs. 469, 470, 473.

Original Description: "Shell transparent, thin and pale-colored or rather colorless; spire gradually tapering; whorls 12, body-whorl equal to the two preceding ones. Aperture longer than broad, semi-ovate; pillar-



FIG. 84.
B. decollata
(Binney).

lip straight and slightly reflected; right lip edged. Length 6.5 lines." (Hutton.)

Type Locality: Mirzapur, Ceylon.

Alabama Records:

Baldwin Co.; near Mobile.

Mobile Co.; Mobile.

"*Opeas gracile* is probably the most widely distributed land snail in the world." (Pilsbry.) Introduced by commerce into several of the southern seaports.

"It is perforate, slender, and regularly, straight tapering to the small, obtuse apex, pale-yellowish corneous, without much gloss. The moderately and regularly convex whorls are very distinctly, arcuately striate. The suture is usually a trifle irregular, and often quite distinctly crenulate, and the surface below is more or less distinctly puckered. The aperture is long, rhombic-ovate, and the collumellar margin is widely reflexed.

"Its chief characters are the straight, high spire, very equable and moderate convexity of the whorls, the distinct, arcuate striation, usually appearing a little puckered below the suture, and the long aperture." (Pilsbry.)



FIG. 87.
O. gracile
(Binney).

SUPERFAMILY AULACOPODA PILSBRY

FAMILY ZONITIDÆ

Animal entirely covered with an external, more or less shining shell, with or without caudal mucus pore; foot-margin wide and sole frequently tripartite, defined by a pedal groove; ovotestis imbedded in the liver; marginal teeth with narrow, elongated basal plates and either unicuspid and thorn-shaped by the suppression of side cusps, or bicuspid by elevation of outer on middle cusps.

SUBFAMILY ZONITINÆ PILSBRY

♀ System lacking dart-sack and its accessories.

GENUS OMPHALINA RAFINESQUE

Shell umbilicate, globosely depressed, thin, striated or wrinkled above, smooth below, reddish horn-color, lighter below, shining; aperture large, lunar-ovate; peristome simple, straight, acute, extremities approaching, that of the columella subreflected. Embryonic whorls smooth, and the penial retractor muscle terminal on the penis, which does not extend beyond it in a flagelliform blind sac.

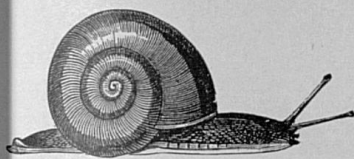


FIG. 88. Animal of *O. cuprea*
(Binney.)

Animal (of *O. cuprea*) nearly twice as long as diameter of the shell, blackish or bluish-black; darkest on the head, neck and eye-peduncles; eye-peduncles short in proportion to the length of the animal and set widely apart. Respiratory foramen in the angle formed by the junction of the peristome with the body whorl. Base of foot whitish, the locomotive band defined by two very fine lines or furrows. A double marginal furrow runs along the side of the foot from the head nearly to the posterior, where it passes upwards and joins that from the opposite side, leaving posteriorly a flattened, rounded extremity, somewhat prominent and glandular, in the centre of which is a longitudinal sinus, fissure or mucus pore.

Jaw very arcuate, of almost uniform breadth, ends blunt; anterior surface with transverse striae; concave margin simple, with a well-developed, blunt, median projection.



FIG. 89.
Jaw of *O. cuprea*
(Binney).

The penis is a rather short stout sac, with the retractor muscle (*xr. p.*) inserted at its apex, and attached distally to the floor of the lung. Internally the distal half of the cavity of the penis is densely, finely and rather sharply granulated; the opening of the vas deferens is near the apex of the cavity, and is not provided with a papilla. The lower portion of the vas deferens (*v. d.*) is enormously swollen; and for a short distance from its insertion it is firmly bound to the penis itself.

The vagina (*vag.*) is curiously swollen near the base. The spermatheca (*sp.*) is large, subglobular, and together with its rather long duct, is bound firmly to the oviduct. The albumen gland (*a. gl.*) is uncommonly large.

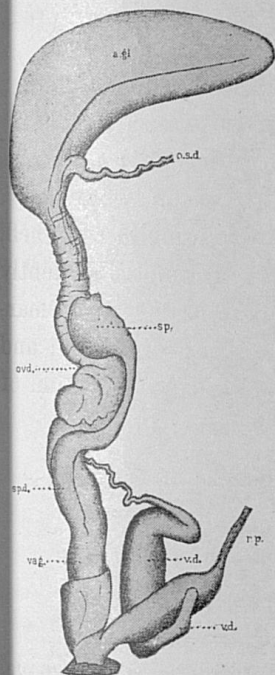
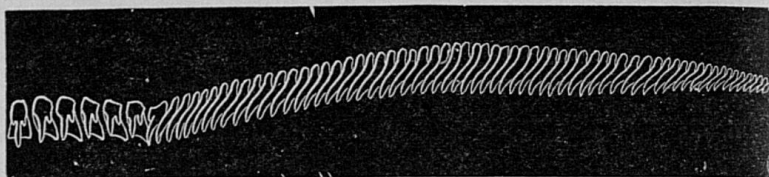


FIG. 90. Genitalia of *O. cuprea* (Pilsbry).

Dentition: centrals with base of attachment longer than wide, with lateral expansions at the corners of the lower margins; laterals of the same type as the centrals, but rendered asymmetrical by the suppression of the inner, lower, lateral expansion of the base of attachment and the inner side-cusp and cutting point; marginals with narrow, lengthened basal plates, either unicuspid and thorn-like or bicuspid by elevation of outer middle cusp.

FIG. 91. Radula of *O. cuprea* (Binney).*Omphalina cuprea* Rafinesque

Omphalina cuprea Rafinesque, Enumeration and Account, &c., 1831, p. 3; Pilsbry, Proc. A. N. S. P., 1911, p. 471.

Zonites fuliginosus W. G. Binney, Manual, 1885, p. 207, fig. 217; Sargent, Nautilus, VI, 1892, p. 76.

Omphalina fuliginosa Pilsbry, Proc. A. N. S. P., 1894, p. 14, pl. I, fig. 5; Hinkley, Nautilus, XX, 1906, p. 35.

Original Description: "Suboval, 4 spires, smooth, brittle, diaphanous coppery, shining, opening very large." (Rafinesque.)

Binney's description is as follows: "Shell thin, depressed on the upper surface, epidermis dark, approaching to chestnut-color, sometimes almost black, shining and wrinkled; whorls 4.5, rapidly increasing, with irregular, oblique wrinkles, the last whorl very voluminous and expanding transversely towards the aperture; suture very little impressed; aperture very oblique, ample, lunate-ovate, within pearly or iridescent; peristome simple, thin, brittle with a light, testaceous deposit within, the two terminations approaching each other very nearly, that of the columella somewhat reflected; umbilicus deep, not much expanded. Greater diameter 26, lesser 22, height 13 mm."

Type Locality: Kentucky.

Alabama Records:

Cherokee Co.; Pleasant Gap; 10 mi. S. of Centre; Sandford Springs; Craig Mountain.	Franklin Co.; Burleson.
Cleburne Co.; Dugger Mt., Piedmont.	Jackson Co.; Limrock; Woodville.
Conecuh Co.; Evergreen.	Lauderdale Co.; Florence.
DeKalb Co.; Hookout Mountain.	Madison Co.; Monte Sano; Matthews Hill and Little Mt., Huntsville.
	Marion Co.; Hamilton.

This characteristic northern species, with the exception of a single record from Conecuh Co., is apparently restricted to the northern part of the state. It differs from its associated species by its less inflated shape and wider umbilicus.

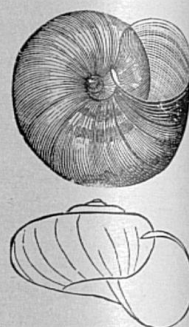
Omphalina friabilis (W. G. Binney)

Helix friabilis W. G. Binney, Proc. A. N. S. P., 1857, p. 187.

Omphalina friabilis Lewis, Ala. F. W. & L. Shells, 1876, p. 27.

Zonites friabilis W. G. Binney, Manual, 1885, p. 203, fig. 219.

Original Description: "Shell very globose, transparent, brittle, thin, shining, reddish; spire very short, conic; whorls four, convex, lightly

FIG. 92. *O. cuprea* (Binney).

wrinkled, rapidly increasing, the last very large and ventricose; suture moderate; aperture circular, equally high and broad, within bluish and slightly thickened by a very thin white callus; perist. simple, sharp, thin at its junction with the body whorl, violet colored and reflected, so as to cover a portion of the small and deep umbilicus; the parietal wall of the aperture is covered by a light violet colored callus. Diam. maj. 26; min. 20; alt. 13 mm." (Binney.)

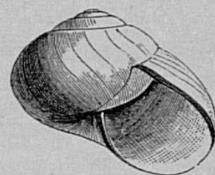


FIG. 93. *O. friabilis* (Binney).

Type Locality: Not specified. "Habitat: on the banks of the Wabash and Illinois."

Alabama Records:

Perry Co.; Perry Co.

"Alabama" (Lewis).

A Mississippi Valley species that has thus far been only definitely recorded from Perry Co.

"Belongs to the same group as *H. fuliginosa* Binney—but readily distinguished from that and all described species by its transparent, globular shell, ventricose body-whorl, and circular aperture." (Binney.)

Omphalina kopnodes (W. G. Binney)

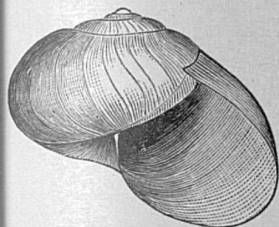


FIG. 94. *O. kopnodes* (Binney).

Helix kopnodes W. G. Binney, Proc. A. N. S. P., 1857, p. 186.

Omphalina capnodes Lewis, Ala. F. W. & L. Shells, 1876, p. 27.

Zonites capnodes W. G. Binney, Manual, 1885, pp. 205, 406, figs. 215-216; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 341.

Omphalina kopnodes Johnson & Pilsbry, Nautilus, XI, 1898, p. 128; Cat., 1898, p. 24; Pilsbry, Proc. A. N. S. P., 1911, p. 474, pls., XXXVII, fig. 1, XXXVIII, figs. 3, 5.; Wheeler, Nautilus, XXV, 1912, p. 124.

Original Description: "Shell depressed-

globose, wrinkled, below smooth; spire short, depressed; suture moderate; whorls five, rapidly increasing, the last very ventricose and large, sometimes marked with coarse revolving lines; aperture large, round, lip simple, acute, ends approached, joined by a slight deposition of brownish callus over the parietal wall, reflected at the small and deep umbilicus. Diam. maj. 35; min. 28; alt. 13 mm." (Binney.)

Type Locality: Alabama.

Alabama Records:

Cherokee Co.; 10 m. S. E. of Centre.

Dallas Co.; Dallas Co.

Jackson Co.; Stevenson; Paint Rock; Woodville; Princeton; Pisgah.

Madison Co.; Huntsville; Monte Sano; Gurley.

Perry Co.; Uniontown.

Talladega Co.; Horseblock Mountain.

Clarke Co.; Jackson; Suggsville.

Elmore Co.; Wetumpka.

Shelby Co.; Montevallo.

Tuscaloosa Co.; Holt.

"It is a much larger and more globose shell than *H. fuliginosa* Binney, with a smaller umbilicus, more rounded and larger aperture, and more ventricose body whorl; its color is also lighter." (Binney.)

Generally distributed across the state from the northeast to the southwest, but has not been recorded from the extreme northwestern nor southeastern counties.

Omphalina pilsbryi Clapp

Omphalina pilsbryi Clapp, Nautilus, XVIII, 1904, p. 30; Wheeler, Nautilus, XXVI, 1912, p. 15; Pilsbry, Proc. A. N. S. P., 1911, p. 474, text fig. 2, pls. XXXVII, fig. 6, XXXVIII, fig. 7.

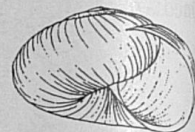


FIG. 95. *O. pilsbryi*

Original Description: "Shell about the size and general contour of *O. fuliginosa*; umbilicate, color rich reddish-chestnut with a dull satiny luster above, smoother and more polished below. Striae of growth fine and close, crossed by microscopic granules in spiral series like beads, giving the upper surface a dull luster; below the granules are obsolete and the surface polished. Apex *smooth*, and in all adult specimens seen denuded of the epidermis. Whorls 5.5, rather flattened and slowly increasing, the last whorl very much wider, more than double the width of the preceding one, almost round, no flattening on the base. Aperture oblique, circular. No thickening of the lip, which is darker than the balance of the shell.

"Greater diameter 27, lesser 23.5, altitude 17.5 mm. Oblique height of the aperture 14, width 14 mm.

"Greater diam. 24, lesser 21, alt. 14.5 mm." (Clapp.)

Type Locality: Wetumpka, Alabama.

Alabama Records:

Barbour Co.; Pea River, west of Elamville.
Bibb Co.; Bibb Co.
Blount Co.; Blount Springs.
Chambers Co.; Langdale.
Choctaw Co.; Silas.

Crenshaw Co.; Searight.
Cherokee Co.; Centre; Craig Mountain.
Conecuh Co.; Evergreen; Sepulga River.
DeKalb Co.; Valley Head.
Dale Co.; Pinckhard.

Elmore Co.; Wetumpka.
Franklin Co.; Russellville.
Jefferson Co.; Warrior; Squaw Shoals.
Macon Co.; Tuskegee.
Madison Co.; Monte Sano; Normal;
Smithers Mt., Huntsville.
Perry Co.; Marion.
Shelby Co.; Montevallo; Calera.
Walker Co.; Forks of Warrior.

"From above this shell has much the appearance of the large granulated variety of *O. laevigata* found with it, but it lacks the close ribs of that species, and the embryonic whorls are *smooth*, while in *laevigata* they are *sharply ribbed*. On the base the resemblance is less striking, as *laevigata* has a very small umbilicus, the base is flattened, and the internal white thickening makes the base several shades lighter than the upper surface." (G. H. C.)

Generally distributed throughout the state.

GENUS MESOMPHIX ("RAFINESQUE") BECK

Shell like *Omphalina*, except that it is more depressed, with a much smaller umbilicus and the embryonic whorls are ribbed or striate radially in most species.

External anatomy as in *Omphalina*. Genitalia differing from *Omphalina* by the development of a flagelliform gland terminal on the penis. The epiphallus is distinctly differentiated from the vas deferens. Vaginal gland wanting. Jaw reddish-brown or black, very opaque, with a small median projection.

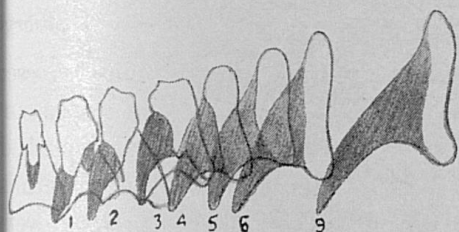


FIG. 96. Radula of *M. laevigata* (Binney).

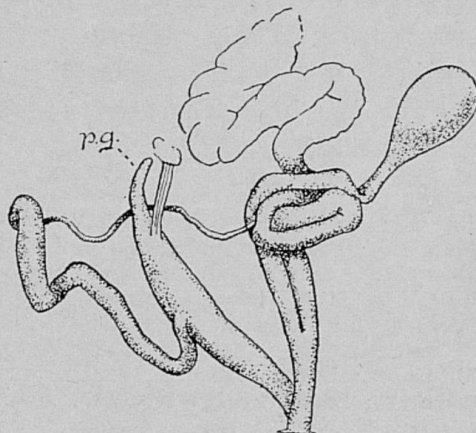


FIG. 97. Genitalia of *M. laevigata monticola* (Pilsbry).

Radula with the basal plate of the central tooth contracted in the middle; lateral teeth few, 0-4. Marginal teeth as in *Omphalina*.

SUBGENUS MESOMPHIX s.s.

Embryonic whorls radially striate. No lateral teeth; central tooth with a single small cusp. The flagelliform gland of the penis very short.

Type *M. laevigata*.

Mesomphix laevigata Beck

Helix laevigata Ferussac, Hist. Moll, I, 1832, p. 94, pl. 82, fig. 6.

Mesomphix laevigata Beck, Index Moll., 1837, p. 7; Pilsbry, Proc.

A. N. S. P., 1911, p. 480; Wheeler, Nautilus, XXV, 1912, p. 125.

Omphalina laevigata Lewis, Ala. F. W. & L. Shells, 1876, p. 28;

Hinkley, Nautilus, XX, 1906, p. 35.

Zonites laevigatus W. G. Binney, Manual, 1885, p. 209, fig. 220;

Sargent, Nautilus, VI, 1892, p. 76; Gratacap, Bull. Am.

Mus. Nat. Hist., XIV, 1901, p. 343.

Original Description: "Testa perforata, depressa, tenui, luteocornea, superne minute costulato-striata, basi convexiuscula, sub-lævigata, spira vix elevata; anfractibus planiusculis; ultimo elato, antice non de-

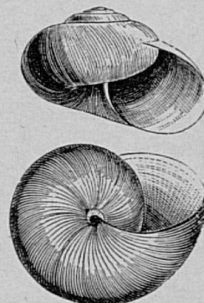


FIG. 98.
M. laevigata
(Binney).

scendente, apertura ampla, late lunari, intus caerulescente; peristomate acuto, recto, marginibus conniventibus, columellari vix dilatato, reflexiusculo. Diam. 20, alt. 14 mm." (Ferussac.)

Binney's description is as follows. "Shell somewhat convex, oftener depressed; epidermis greenish horn-color, shining, thin; whorls 5, rather flattened, rapidly enlarging, with beautiful and regular oblique striae and revolving microscopic lines, the last whorl expanding towards the aperture, not descending; aperture transverse, broadly lunar, ample, with a testaceous deposit within; peristome thin, acute, straight, extremities approaching, its lower extremity inserted into the center of the base and somewhat reflected; base smooth, perforate. Greater diameter 18, lesser 15, height 9 mm."

Type Locality: Kentucky.

Alabama Records:

Baldwin Co.; Magnolia Springs. Barbour Co.; Pea River, W. of Elamville.
 Bibb Co.; Eoline; Pratt's Ferry; Woodstock.
 Blount Co.; Blount Springs; Warrior.
 Calhoun Co.; Ten Island Shoals; Anniston. Chambers Co.; Langdale.
 Choctaw Co.; Jacksonville.
 Cherokee Co.; Pleasant Gap; Poole's Island, Coosa River; Coosa River near Ga. line; Slackland; Maple Grove; Ridge W. of Sandford Spring.
 Chilton Co.; Butting Ram Shoals. Choctaw Co.; Silas.
 Clarke Co.; Bash Creek, 5 m. S. W. of Thomasville; Jackson; Thomasville.
 Clay Co.; Pyriton. Cleburne Co.; 4 m. S. of Piedmont.
 Conecuh Co.; Evergreen.
 Cullman Co.; Sand Mt., Wilhites; Wilhites Station.
 Dale Co.; Pinckhard. Dallas Co.; Selma; Pleasant Hill.
 DeKalb Co.; Valley Head; Gorge of Little River; Lookout Mountain.
 Elmore Co.; Wetumpka; Tallapoosa River, 4 m. S. of Wetumpka; 7 m. S. E. of Wetumpka.
 Etowah Co.; Black Creek Falls; Gadsden; Keener.
 Fayette Co.; Forks of Sipsey; Fayette. Franklin Co.; Burleson; Russellville.
 Geneva Co.; High Bluff; Choctahatchee River.
 Greene Co.; Boligee.
 Jackson Co.; Stevenson; Woodville; Princeton; Paint Rock; Pisgah; Sand Mt., Pisgah.
 Jefferson Co.; Squaw Shoals; Valley Creek, Adger; Red Mt., Birmingham; Trafford.
 Lauderdale Co.; Florence. Lee Co.; Auburn.
 Macon Co.; Tuskegee.
 Madison Co.; Gurley; Monte Sano; Huntsville; Smithers Mt.; Matthew's Hill, Huntsville.
 Marion Co.; Bear Creek; Hamilton. Mobile Co.; Alabama Port; Mt. Vernon; Mobile.
 Monroe Co.; Drewery; Suggsville; Claiborne. Montgomery Co.; McGee's Station.
 Perry Co.; Hamburg; Marion.
 Pike Co.; S. E. corner. Randolph Co.; Roanoke; Wadley.
 Shelby Co.; Yellowleaf Creek, 4 m. S. of Wilsonville; Gurnee.
 St. Clair Co.; Gallant; Mt. Chandler; Whitney; Ten Island Shoals; Greensport.
 Sumter Co.; Epes; Livingston.
 Talladega Co.; Three Island Shoals; Horseblock Mountain.
 Tuscaloosa Co.; Tuscaloosa; Duncanville; Hagler; Holt; Indian Creek; Wawah.
 Walker Co.; Junction of Lost and Wolf creeks; Forks of Warrior; S. end of Co.
 Wilcox Co.; Camden; Pine Hill; Alberta.

A very abundant and variable species of general distribution.

Mesomphix laevigata latior (Pilsbry)

Omphalima laevigata latior Pilsbry, Pr. A. N. S. P., 1900, p. 135.

Mesomphix laevigata latior Pilsbry, Proc. A. N. S. P., 1911, p. 482; Wheeler, Nautilus, XXV, 1912, p. 125.

Original Description: "Broad and depressed, more broadly excavated around the umbilicus than the typical form, the last whorl wider, its width at aperture (measured above) one-third the diameter of the shell, and far smoother than in *laevigata*, being wrinkled irregularly, but without the close, deeply cut and subregular ribstriae of the typical form of that species. Aperture oval-lunate, far wider than high. Color yellowish green. Alt. 13.5, diam. 24 mm., or as large as 14 x 27 mm." (Pilsbry.)

Type Locality: Tallassee Ford, Little Tennessee River, Monroe Co., Tennessee.

Alabama Records:

DeKalb Co.; Fort Payne, Lookout Mountain. Madison Co.; Monte Sano.

"A large, flattened and very green form, in which the rib striae are obsolete on the last whorl, and the aperture decidedly oval. *O. l. latior* has an elegant microscopic sculpture, which gives the upper surface a somewhat silky lustre." (Pilsbry, 1900.)

"The sculpture of the embryonic 1.5 whorls is coarser than in *laevigata*; then 1.5 striate whorls follow, after which the striae weaken to low irregular wrinkles. The last 1.5 whorls have fine granules in spiral lines, as in the Great Smoky Mountain *monticola*." (Pilsbry, 1911.)

Mesomphix laevigata monticola Pilsbry

Mesomphix laevigata monticola Pilsbry, Proc. A. N. S. P., 1911, p. 480, text-figs. 6-7; pl. XXXVII, fig. 10.

Original Description: "The shell is more glossy on the upper surface than *M. laevigata*, the striae less deeply cut and less regular, covered with a much more minute, less distinct, microscopic granulation. Smaller than typical *laevigata* and more depressed, green throughout.

"Alt. 11.5, diam. 20.5 mm.; 4.75 whorls." (Pilsbry.)

Type Locality: Sugar Cove, Blount Co., Tennessee.

Alabama Record:

Talladega Co.; Horseblock Mountain.

GENUS VITREA FITZINGER

Shell small, thin, fragile, shining, hyaline, smooth, convexly depressed, last whorl not descending at the aperture, umbilicate or imperforate; aperture lunate; peristome thin and sharp.



FIG. 99. Animal
of *V. cellaria*
(Binney).

Animal black or bluish-black on the upper part, lighter, and sometimes wholly white, posteriorly. Foot long and narrow. Jaw arcuate, ends attenuate, pointed or rounded; concave margin with a median rounded projection.

Dentition as in *Omphalina*.

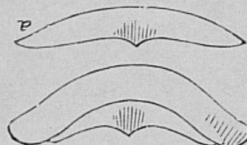


FIG. 100. Jaw of *V. cellaria* (Binney).

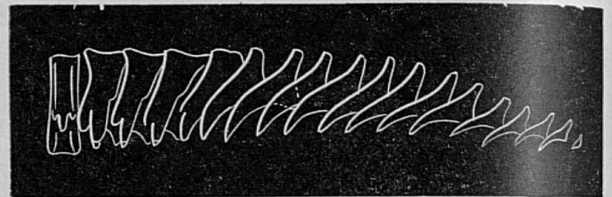


FIG. 101. Radula of *V. cellaria* (Binney).

Ovotestis light brown or whitish, slightly coherent; hermaphrodite duct thickest in the middle, slightly convolute proximally, terminating in a simple vesicula seminalis; albumen gland linguiform; oviduct narrow above and more ample below; prostate very conspicuous, of granular appearance and variable width; spermatheca broadly oval, the duct about double the length of the vesicle, doubly flexed and gradually widening below; free oviduct long and thick; vas deferens very slender at first, but abruptly enlarges and then diminishes in caliber as it approaches the penis-sheath; epiphallus slightly fusiform, its junction with the penis-sheath indicated by a slight constriction; the penis-sheath slightly, but gradually widened below; penial retractor terminal; atrium short. (Taylor.)

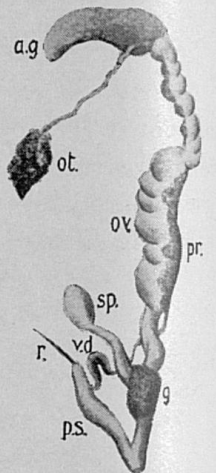


FIG. 102.
Genitalia of *V. cellaria*
(Taylor).

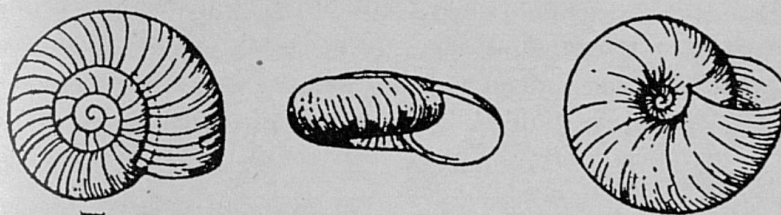
a. g. albumen gland; g. vaginal gland; ot. ovotestis; ov. oviduct; pr. prostate; ps. penis sheath with distal epiphallus; r. penial retractor; sp. spermatheca; v. d. vas deferens.

SECTION VITREA s. s.

Shell smooth and polished; spiral lines, when present, very minute.

Vitrea cumberlandiana Clapp

Original Description: "Shell widely umbilicated, flattened, very slightly convex above and below, glossy, thin and translucent, light horn color regularly but lightly sculptured across the whorls by curved, closely set radiating impressed lines parallel with the lines of growth which are very faint; spire flattened; suture shallow; whorls about 4, rapidly increasing, the last


FIG. 103. *V. cumberlandiana* (Clapp).

Vitrea cumberlandiana Clapp, Nautilus, XXXIII, 1919, p. 8, upper text figs.

descending at the aperture which is elongate-oval flattened above, lip very slightly reflected at the columellar insertion; umbilicus wide, displaying all the whorls and contained about 4 times in the diameter of the shell.

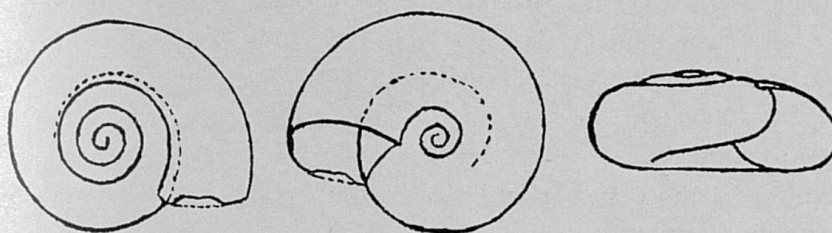
"Greater diameter 3, lesser 2.5, altitude 1.25 mm." (Clapp.)

Type and only Recorded Alabama Locality: Cumberland Plateau near Stevenson, Jackson Co., Alabama.

"At first glance this species may be taken for immature *V. radiatula* as the general shape and the sculpture of impressed radiating lines are the same, but it is uniformly small with the same number of whorls, the sculpture is weaker and the shell more flattened. Under high magnification there is merely the faintest trace of impressed spiral sculpture. It is much smaller than *Polita rhoadsi*." (G. H. C.)

Vitrea lewisiana Clapp

Vitrea lewisiana Clapp, Nautilus, XXI, 1908, p. 129, upper text figures; Wheeler, Nautilus, XXV, 1912, p. 125.


FIG. 104. *V. lewisiana* (Clapp).

Original Description: "Shell small, depressed, widely, perspective-ly umbilicate, all whorls showing to the apex, umbilicus contained about five times in the diameter of the shell; yellowish-white, translucent, the inner whorls showing through the body of the shell, highly polished; the delicate growth lines are very regularly spaced and close together, smooth below. Spire much flattened; sutures well impressed, margined; whorls 3.5, slightly convex, the last wide. Aperture oblong-lunate, depressed above, lower margin parallel with the base, lip simple.

"Gr. diam. 3.5, lesser 2.8, alt. 1.5 mm." (Clapp.)

Type Locality: Monte Sano, Huntsville, Alabama.

Alabama Records:

Blount Co.; Blount Springs.
Conecuh Co.; Evergreen.
Lauderdale Co.; Florence.
Mobile Co.; Mobile.
Chambers Co.; Langdale.

Elmore Co.; Wetumpka.
Madison Co.; Monte Sano; Huntsville;
Gurley.
Randolph Co.; Cragford; Roanoke.

"The color, and particularly the *very regular, close* lines of growth at once distinguish this shell from all other species. It is perhaps nearest to *V. dalliana*, but differs in color, shape and sculpture. In *dalliana* there is a very minute spiral sculpture, not mentioned in the original description, and only visible under a magnification of about 60 diameters." (G. H. C.)

Apparently has a general distribution over the state, but the recorded localities are few and scattered.

Vitrea petrophila (Bland)

Zonites petrophilus Bland, Ann. N. Y. Acad. Sci., II, 1883, p. 369; W. G. Binney, Manual, 1885, p. 223, fig. 238.

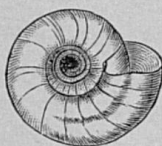


FIG. 105.

V. petrophila
(Binney).

Original Description: "Shell broadly umbilicate, depressed; subglobose, thin, shining, translucent, whitish, irregularly striated; suture moderately impressed; whorls 5.5 to 6, rather convex, the last more convex, not descending; umbilicus widely excavated externally, pervious; aperture roundly lunate; peristome simple, somewhat thickened, often rose-colored, the columellar margin slightly reflected. Diam., major 6, min. 5-5.5; Alt. fere 3 mm."

(Bland.)

Type Locality: The Cliffs, Knoxville, Tennessee.

Alabama Record:

Jackson Co.; Stevenson.

A species of the Cumberland Subregion, which has been reported only from Jackson County.

"This species is, in general form, nearly allied to *Z. arboreus*, but the color is different, the striae are more developed, and the umbilicus is much wider." (Bland.)

Vitrea radiatula (Alder)

Helix radiatula Alder, Trans. Nat. Hist. Soc. N. Burham, I, 1830, p. 38.

Omphalina viridula Lewis, Ala. F. W. & L. Shells, 1876, 28.

Zonites viridulus W. G. Binney, Manual, 1885, pp. 64, 478, fig. 21.

Zonites radiatulus Sargent, Nautilus, VI, 1892, p. 76.

Hyalinia radiatula Taylor, Mon. L. & F. W. Moll. Brit. Isles, Zonitidae, 1908, p. 87, figs. 128-134.

Hyalinia radiatula electrina Taylor, *ibid.*, p. 97, figs. 142-4.

Original Description: "Shell depressed, horn coloured, rather shining, transparent, regularly striated; with 3.5



FIG. 106.

V. radiatula
(Binney).

to 4 whorls, flattened at their junction with the inner ones, over which the striae appear continuous and strongly marked, giving the shell a radiated appearance under a magnifier; the outer whorl rather large in proportion to the rest; underside smooth without any whiteness; umbilicus moderately large; diameter 1.5 tenth of an inch." (Alder.)

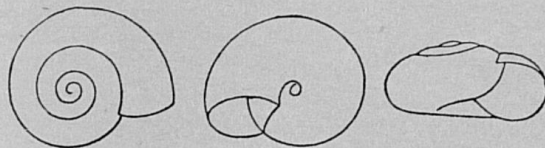


FIG. 107. *V. radiatula* (Taylor).

Type Locality: Not specified.

Alabama Records:

Choctaw Co.; Silas.

Jackson Co.; Princeton; Woodville.

Lauderdale Co.; Florence.

Mobile Co.; Mobile.

Franklin Co.; Burleson; Sherwood.

Jefferson Co.; Squaw Shoals; Valley Creek Station.

Madison Co.; Huntsville; Monte Sano; Gurley.

Randolph Co.; Roanoke.

Tuscaloosa Co.; Hagler; Duncanville; Tuscaloosa.

Walker Co.; Forks of Warrior; Junction of Lost and Wolf creeks.

This circumpolar species appears to have a general, though scattered distribution through the northern and western parts of the state, but it has not been, as yet, recorded from the south eastern counties.

In recent literature this species has generally been known as *V. hammonis* Strom, but there is considerable uncertainty as to the identification of Strom's species and, for that reason, I prefer to follow Taylor's example and call it by Alder's name, about which there is no uncertainty.

Taylor also separates the common amber-colored North American form "upon which the microscopic spiral striation is apparently absent or but faintly visible" as var. *electrina* Gould and calls the form "clearly exhibiting the deep and distinct revolving striae" var. *circumstriata*.

"In size, the depressed-conical shape of the upper surface, the number of whorls, and the rapid enlargement of the largest whorl, this shell corresponds with *Z. indentatus*. It differs in its darker, smoky horn-color, its constant umbilicus, its rather thick and shining peristome, and in its whitish wrinkles, which, instead of being remote, are crowded. From *arboreus* it differs in having one whorl less, the last one rapidly dilating, its apex not being depressed, its thinner structure and more glossy surface, and in its somewhat smaller umbilicus." (Binney.) Also, it may be added, in its less impressed suture.



FIG. 106.

V. radiatula
(Binney).

Vitrea radiatula circumstriata Taylor

Vitrea radiatula electrina circumstriata Taylor, L. & F. W. Moll. of British Isles, Zonitidae, 1908, p. 98, figs. 140 & 141; Wheeler, Nautilus, XXV, 1912, p. 125.



FIG. 108. *V. radiatula circumstriata* (Taylor).

Original Description: "It is, therefore, proposed to regard as strictly typical of the race (*electrina*), only those specimens possessing an amber-coloured shell and upon which the microscopic spiral striation is apparently absent or but faintly visible; . . . and to apply the term *circumstriata* to the shells clearly exhibiting the deep and distinct revolving striae, a feature especially characteristic of the specimens inhabiting the States east of the Appalachian range of mountains, and, according to the observations of Mr. G. H. Clapp, apparently culminating in Alabama." (Taylor.)

Type Locality: Wetumpka, Alabama.

Alabama Records:

Clarke Co.; Jackson.
Jackson Co.; Princeton.
Marion Co.; Hamilton.

Elmore Co.; Wetumpka.
Madison Co.; Monte Sano; Huntsville.
Mobile Co.; Mobile.

Vitrea wheatleyi (Bland)

Zonites wheatleyi Bland, Ann. N. Y. Acad. Sci., II, 1883, p. 368, fig. 1; W. G. Binney, Manual, 1885, p. 222, fig. 237; Sargent, Nautilus, VI, 1892, p. 76.
Vitrea wheatleyi Johnson & Pilsbry, Nautilus, XI, 1898, p. 130; Cat., 1898, p. 26.

Original Description: "Shell umbilicated, depressed, thin, shining, pellucid, brownish horn-colored, finely striated; spire subplanulate, suture slightly impressed; whorls little convex, the last more convex at the base, rapidly increasing at the aperture, scarcely descending; umbilicus pervious; aperture depressed, obliquely lunate; peristome simple, acute, the margins approximating, joined by a thin callus. Diam. major 5, min. 3.15, alt. 2 mm." (Bland.)

Type Locality: The Cliffs, Knoxville, Tennessee.

A species of the eastern Tennessee Region, which has thus far been reported only from Woodville, Jackson County.

"This species, *Z. wheatleyi*, is more nearly allied to *Z. viridulus* Mke. than to any other North American form, but differs from it, especially in



FIG. 109.
V. wheatleyi
(Binney.)

the form of aperture, in the descending last whorl, and in having a wider umbilicus." (Bland.)

SECTION STRIATURA MORSE

Shell small, striate, reticulated with impressed, spiral lines, thin, translucent, without teeth in the aperture.

Vitrea milium (Morse)

Helix milium Morse, Proc. B. S. N. H., VII, 1859, p. 28.

Zonites milium W. G. Binney, Manual, 1885, p. 66, fig. 23; Sargent, Nautilus, VI, 1892, p. 76.

Zonitoides milium Wheeler, Nautilus, XXV, 1912, p. 125.

Original Description: "Shell minute, transparent, shining; epidermis white, with a greenish tinge; distinctly and regularly striated above; whorls rounded, rapidly enlarging; suture very deeply impressed; spire slightly elevated; microscopic lines running parallel with the whorls, more conspicuous beneath; umbilicus quite large, deep, and showing all the volutions; outer lip sharp. Diam. 0.05, height 0.02." (Morse.)

Type Locality: Not specified, from several localities in Maine.

Alabama Records:

Baldwin Co.; Foley; Magnolia Springs.
Choctaw Co.; Silas.
DeKalb Co.; Valley Head.
Jackson Co.; Stevenson; Woodville.
Lauderdale Co.; Florence.
Mobile Co.; Mobile; Coden.
Sumter Co.; Epes.
Walker Co.; Forks of Warrior.

Chambers Co.; Langdale.
Conecuh Co.; Evergreen.
Elmore Co.; Wetumpka.
Jefferson Co.; Squaw Shoals.
Madison Co.; Huntsville; Monte Sano.
Randolph Co.; Wadley; Roanoke.
Tuscaloosa Co.; Hagler; Tuscaloosa.

The records indicate a general distribution over the state, but it is apt to be overlooked on account of its minute size.

"The peculiarities of the shell are its diminutive size, its rapidly enlarging and well rounded whorls, its deep and regular striations, which become obscure at the apex, and the microscopic lines running parallel with the whorls." (Morse.)

Vitrea milium meridionalis Pilsbry & Ferriss

Vitrea milium meridionalis Pilsbry & Ferriss, Proc. A. N. S. P., 1906, p. 152.

Original Description: "Similar to *V. milium* but larger, diam. about 1.75 mm., with nearly 3.5 whorls, the first one finely, *distinctly lirata spirally*, the last whorl with oblique wrinkles much coarser than in *milium*, more or less anastomosing, and fine spiral striæ, the latter distinct on the base.

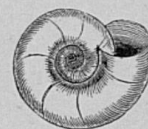


FIG. 110.
V. milium
(Binney).



FIG. 109.
V. wheatleyi
(Binney.)

"*V. milium* with the same number of whorls is smaller and more finely wrinkled, and in Maine and Ohio shells spirals on the first whorl are excessively weak or wanting, not deeply engraved to the tip, as in Texas shells." (Pilsbry & Ferriss.)

Type Locality: Along the Guadalupe River above New Braunfels, Texas.

Alabama Records:

Baldwin Co.; Baldwin Co.
Chambers Co.; Langdale.
Conecuh Co.; Evergreen.
Jackson Co.; Stevenson.
Madison Co.; Monte Sano.
Talladega Co.; Horseblock Mountain.

Blount Co.; Blount Springs.
Clarke Co.; Clarke Co.
DeKalb Co.; Valley Head; Lookout Mountain.
Lauderdale Co.; Florence.
Randolph Co.; Wadley.
Wilcox Co.; Alberta.

SECTION GLYPHYALINA VON MARTENS

Upper surface of the shell marked with sharply defined radial impressions.

Vitrea carolinensis Cockerell

Vitrea carolinensis Cockerell, Brit. Nat., 1893, p. 81?; Nautilus, XII, 1899, p. 120; Pilsbry, Proc. A. N. S. P., 1900, p. 139; Hinkley, Nautilus, XX, 1906, p. 35; Wheeler, Nautilus, XXV, 1912, p. 125.

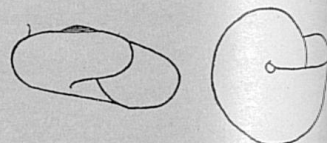


FIG. 111. *V. carolinensis*.

Original Description: "Max. diam. 10, alt. 5 mm., whorls 5. Pale horn, shiny, semitransparent, umbilical region somewhat whitened.

Surface of shell with strong transverse growth lines and distinct transverse grooved lines. The grooved lines are about 26 on the body whorl. Umbilicus small, narrow. Aperture obliquely large-lunate, the upper angle much smaller than the lower. Peristome not sinuate." (Cockerell.)

Type Locality: ?

Alabama Records:

Baldwin Co.; Magnolia Springs; Foley; Point Clear.
Barbour Co.; Pea River.
Blount Co.; Blount Springs.
Choctaw Co.; Silas.
Coffee Co.; Enterprise.
Cullman Co.; Sand Mountain.
DeKalb Co.; Valley Head.
Escambia Co.; Foshee.
Franklin Co.; Burleson.

Jackson Co.; Paint Rock; Stevenson; Sand
Lauderdale Co.; Florence.
Marion Co.; Winfield; Hamilton.
Monroe Co.; Monroe.
Randolph Co.; Roanoke.
St. Clair Co.; Gallant; Greenport.

Bibb Co.; Woodstock; Blockton.
Cherokee Co.; Poole's Island; Pleasant Gap.
Clarke Co.; Thomasville; Jackson.
Conecuh Co.; Herbert.
Dallas Co.; Pleasant Hill.
Elmore Co.; Wetumpka.
Fayette Co.; Fayette.
Greene Co.; Boligee.
Mt., Pisgah; Limrock; Princeton.
Madison Co.; Huntsville; Gurley; Monte Sano.
Mobile Co.; Mobile.
Perry Co.; Marion; Hamburg.
Shelby Co.; Calera.
Sumter Co.; Epes; Livingston.

Talladega Co.; Banks of Coosa; Horseblock Mountain.

Tuscaloosa Co.; Hagler; Tuscaloosa; Holt. Wilcox Co.; Gastonburg; Pine Hill; Washington Co.; Calvert. Alberta.

"This species has been discriminated from *V. sculptilis* in the published accounts, but it is much more closely allied to *V. indentata*. Indeed, it becomes an extremely difficult matter to separate the smaller forms of *carolinensis*, such as prevails in the Great Smoky Mountains, from *V. indentata*. There is, however, one usually decisive criterion: *V. carolinensis* when examined with a *very strong* hand-lens, or, better, a compound microscope with an enlargement of 25 or 50 diameters, shows a minute sculpture of *very even, close, clear-cut spiral engraved lines*. In *V. indentata* the same magnification only brings out an extremely weak striation or none; only rarely does it approach the condition of *V. carolinensis*.

"This micro-sculpture is so minute that an ordinary pocket lens, even a very good one, rarely reveals it. But I have seen very few specimens which could not be definitely referred either to *carolinensis* or *indentata* when examined with a compound microscope. The sculpture is visible only in the 'high-light' or point of reflection." (H. A. P.)

Generally distributed over the state.

Vitrea carolinensis wetherbyi Cockerell

Vitrea carolinensis wetherbyi Cockerell, Nautilus, XIV, 1901, p. 45; Walker & Pilsbry, Proc. A. N. S. P., 1902, p. 430.

Original Description: "A small type intermediate between *indentata* and *carolinensis* proper." (Cockerell.)

Type Locality: Not specified.

Alabama Records:

Barbour Co.; Elamville.

Lauderdale Co.; Killen.

Monroe Co.; Claiborne.

Sumter Co.; Livingston.

Geneva Co.; High Bluff.

Walker Co.; Junction of Lost and Wolf Creeks; Forks of Warrior.

Madison Co.; Monte Sano.

Montgomery Co.; Montgomery.

Tuscaloosa Co.; Duncanville; Tuscaloosa;

Hagler.

"A small race, ranging from 5.5 to 7 mm. in diameter. It is intermediate between typical *V. carolinensis* and *V. indentata*." (Walker & Pilsbry.)

Vitrea cryptomphala Clapp

Vitrea cryptomphala Clapp, Nautilus, XXIX, 1915, p. 25, fig. 1.

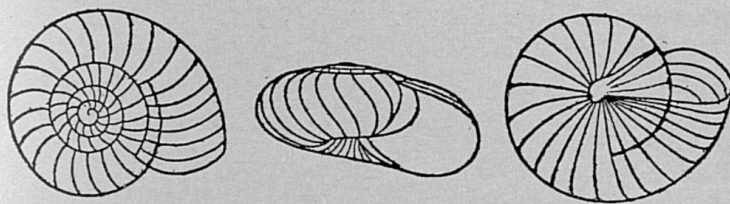


Fig. 112. *V. cryptomphala* (Clapp).

Original Descriptions: "Shell thin, polished, very light horn-color to white, generally white, translucent; whorls 5 to 5.5, those of the spire regularly increasing, the last widening very rapidly and doubling the diameter of the shell. Aperture broadly lunate, sutures well impressed, all whorls showing through the shell. Surface sculptured with rather evenly spaced, radiating grooves continued to the base as in *V. indentata* and *carolinensis*, there being from 23 to 34 on the body whorl. Micro-sculpture of even, close, clear-cut spiral engraved lines like those of *carolinensis*, best seen with a magnification of 25 diameters or over. Spire much depressed, almost flat, the termination of the last whorl slightly raised at the lip which is straight on the lower edge and well curved forward above, projecting about 1 mm. beyond the lower lip; at the columellar end the lip is thickened and joined to a *tongue-like callus which completely covers the umbilicus at all stages of growth*. There is a thin, microscopically granular parietal callus, as in *V. indentata*. Base of shell well rounded and less impressed in the umbilical region than *indentata* or *carolinensis*.

"Shell figured (Knox Co.) 5.1 x 4.2 x 2.1 mm., whorls 5, 23 grooves on body whorl.

"Largest, Knox Co., 5.7 x 4.8 x 2.7 mm., whorls, 5, 26 grooves on body whorl.

"Largest, Knoxville, 5.9 x 5.0 x 2.8 mm., whorls 5, 34 grooves on body whorl.

"Smallest, Knox Co., 2.1 x 1.9 x 1.1 mm., whorls 3, umbilicus completely covered." (Clapp.)

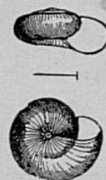
Type Locality: Knox Co., Tennessee.

Alabama Records:

Baldwin Co.; Foley.	Bibb Co.; Woodstock.
Blount Co.; Blount Springs.	Cherokee Co.; Pleasant Gap; Poole's
Chilton Co.; Clanton.	Island.
Cleburne Co.; Dugger Mt.; Piedmont.	Clarke Co.; Jackson, Thomasville.
DeKalb Co.; Fort Payne; Valley Head.	Conecuh Co.; Evergreen.
Elmore Co.; Wetumpka; Elmore; Noble's Ferry.	
Franklin Co.; Russellville; Sherwood.	Jackson Co.; Stevenson.
Lauderdale Co.; Florence.	Madison Co.; Gurley..
Mobile Co.; Mobile; Irvington.	Montgomery Co.; McGee's Station.
Shelby Co.; Calera.	Tuscaloosa Co.; Hagler; Indian Creek;
	Vance; Tuscaloosa.
Walker Co.; Junction of Lost and Wolf Creeks.	
Wilcox Co.; Alberta; Gastonburg.	

"At first I was inclined to consider this a variety of *V. carolinensis*, but the flatter spire, the umbilicus covered *at all stages of growth*, the less excavated umbilical region and the wider aperture indicates a good species. A sectioned shell shows the thickening of the columella, caused by the callus, clear to the apex." (G. H. C.)

A species of general distribution throughout the state.

Vitrea indentata (Say)*Helix indentata* Say, Jour. A. N. S. P., II, 1822, p. 372.*Omphalina indentata* Lewis, Ala. F. W. & L. Shells, 1876, p. 28.*Zonites indentatus* W. G. Binney, Manual, 1885, p. 62, fig. 15; Sargent, Nautilus, VI, 1892, p. 76; Ibid, VIII, 1895, p. 105.*Vitrea indentata* Wheeler, Nautilus, XXV, 1912, p. 125.FIG. 113. *V. indentata* (Binney).

Original Description: "Shell depressed, pellucid, highly polished; whorls four, with regular, distant, subsepidistant, impressed lines across, of which there are about twenty-eight to the body whorl, all extending to the base; suture not deeply indented; aperture rather large; labrum simple, terminating at its inferior extremity at the centre of the base of the shell; umbilicus none, but the umbilical region is deeply indented. Greatest width one-fifth of an inch." (Say.)

Type Locality: Not specified.**Alabama Records:**

Baldwin Co.; Magnolia Springs; Week's Bay; Point Clear.

Bibb Co.; Bibb Co.

Chambers Co.; Langdale.

Cherokee Co.; 10 m. S. E. of Centre; Ridge W. of Sandford Spring.

Clarke Co.; Jackson; Thomasville.

Chilton Co.; Clanton.

Cullman Co.; Cullman.

Conecuh Co.; Evergreen.

DeKalb Co.; Fort Payne.

Dallas Co.; Selma.

Jackson Co.; Princeton; Woodville.

Fayette Co.; Fayette.

Jefferson Co.; Squaw Shoals; Valley Creek, Adger; Henry Ellen.

Madison Co.; Monte Sano.

Mobile Co.; Mobile.

Monroe Co.; Brewry.

Randolph Co.; Roanoke.

Shelby Co.; Calera; Montevallo.

St. Clair Co.; Gallant; Ten Island Shoals.

Sumter Co.; Epes.

Talladega Co.; Horseblock Mountain.

Tuscaloosa Co.; Elrod; Holt.

Washington Co.; Calvert.

Wilcox Co.; Alberta; Gastonburg; Pine Hill.

Abundant and generally distributed, but it has not as yet been reported from the extreme northwestern or southeastern counties.

Vitrea sculptilis (Bland)*Helix sculptilis* Bland, Ann. N. Y. Lyc. Nat. Hist., VI, 1858, p. 279, pl. IX, figs. 11-13.*Omphalina sculptilis* Lewis, Ala. F. W. & L. Shells, 1876, p. 28.*Zonites sculptilis* W. G. Binney, Manual, 1885, pp. 218, 477, fig. 231.FIG. 114. *V. sculptilis* (Binney).

Original Description: "Shell scarcely perforate, suborbicular, subpellucid, pale horn color above, of lighter shade beneath, shining, with regular, subequidistant, impressed transverse lines, those on the last whorl extending over the periphery, and converging in the umbilical excavation; spire very little elevated, scarcely convex; whorls 7, planulate, the last rapidly increasing, equal at the aperture to 1/3 the diam. of the shell, beneath flattened, and little excavated in the umbilical region; suture lightly impressed; aperture

scarcely oblique, depressed, transverse, lunate; peristome simple, acute, sinuate, the columellar margin very rapidly and narrowly reflected over, and almost entirely covering the very small perforation.

"Diam. maj. 12.5, min. 11, alt. 5 mm." (Bland.)

Type Locality: The Anantehely Mountains, North Carolina.

Alabama Records:

Chambers Co.; Langdale.

Franklin Co.; Burleson.

Madison Co.; Gurley.

Shelby Co.; Calera.

DeKalb Co.; Valley Head.

Jackson Co.; Bridgeport.

Randolph Co.; Wadley; Roanoke.

A characteristic species of the Tennessee Mountains, which has thus far been found in a few scattering localities in the northern part of the state.

"In sculpture it is closely allied to *H. indentata* Say, of which it might almost be termed a gigantic variety, but the impressed striae are more numerous, and closer together." (Bland.)

SECTION PARAVITREA PILSBRY

Shell depressed or discoidal, perforate or narrowly umbilicate, composed of numerous closely coiled whorls, usually grooved radially above; thin and fragile; internally having obliquely radial laminae or rows or pairs of teeth, at intervals of a third of a whorl, some or all of them often wanting, especially in old individuals.

Genital system without dart sac. Radula with teeth of the central row tricuspid; two or three laterals on each side also tricuspid, the entocone raised high upon the mesocone, of which it forms a lateral spur. Marginal teeth of the usual simple and thornlike form.

Vitrea aldrichiana Clapp

Vitrea (Paravitrea) aldrichiana Clapp, Nautilus, XX, 1907, p. 109, pl. V, figs. 8-11.

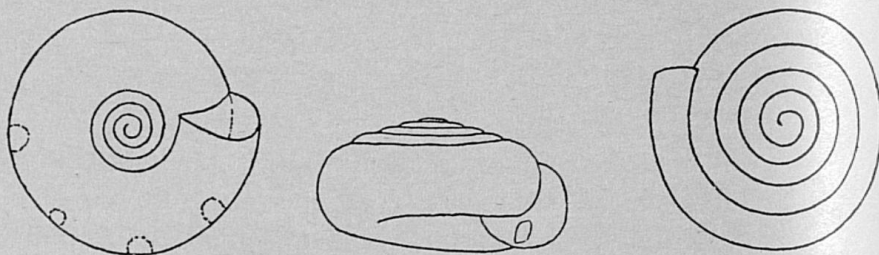


FIG. 115. *V. aldrichiana* (Clapp).

Original Description: "Shell small, widely, perspective umbilicate, flattened, slightly convex above and below, the periphery well rounded; greenish-white almost transparent, highly polished with very faint growth

lines and on the body whorl a few impressed lines spaced irregularly. Whorls five, those of the spire rounded at the well impressed suture; umbilicus contained about three times in the diameter of the shell and showing all of the volutions; peristome forming two-thirds of a circle; lip simple.

"Slightly below the periphery, and in the last half of the body-whorl are about four teeth which are longer, vertically, than wide, and, apparently, project at both the upper and lower ends; i. e., they are double pointed.

"Greater diam. 2, lesser 1.9, alt. 1 mm." (Clapp.)

Type Locality: Slope of the Cumberland Plateau in Jackson County, Ala., close to the state line, and about 2 miles S. E. of Anderson, Tennessee.

Alabama Records:

Jackson Co.; Type locality as above; Cove in Valley of Little Crow Creek; Bennett's Cove, near State Line.

Lauderdale Co.; Killen.

Vitrea andrewsæ (W. G. Binney)

Zonites andrewsi W. G. Binney, Ann. N. Y. Acad. Nat. Sci., I, 1879, p. 359, pl. XV, fig. D; Manual, 1885, p. 228, fig. 251.

Vitrea andrewsæ Pilsbry, Proc. A. N. S. P., 1903, p. 269, pl. XI, figs. 9-11b.

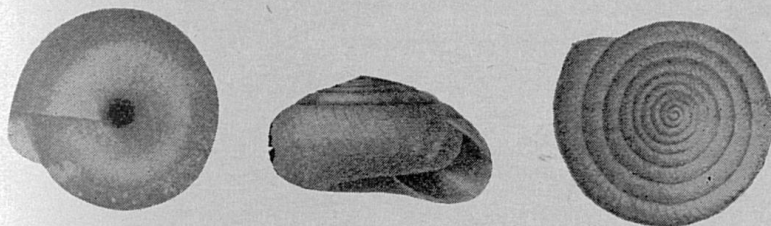


FIG. 116. *V. andrewsæ* (Pilsbry).

Original Description: "Compared with *Z. lasmodon*, it has fully 8 whorls, is 6.5 mm. in diameter, the umbilicus 1 mm. wide, whilst *lasmodon* with 7 whorls, is 7 mm. in diameter, with an umbilicus 2 mm. wide; the Roan Mountain shell has also five parallel lamellae, while *lasmodon* has only two, or at most three, and does not show the successive rows of lamellae which are characteristic of *andrewsi*, radiating from the centre.

"From *Z. significans* it differs in its larger size, greater number of whorls, much wider umbilicus, and in the character of its internal denticles, which are long and winding on the wall of the whorl; while in *significans* the denticles are simply erect and conical, with broad base. The same differences distinguish it from *multidentatus*, which is still smaller than *significans*, and has a much narrower umbilicus." (Binney.)

Type Locality: Roan Mountain, Mitchell Co., North Carolina.

Alabama Record: Lauderdale Co.; Keener.

This species of the Cumberland Subregion has thus far been reported only from Lauderdale County.

"Shell similar to *V. placentula* in general form and size, but the whorls increase more slowly, the last being narrower; thin and fragile, often sprinkled with buff dots. Teeth generally present, 3-5 being arranged in a radial row, or with several such rows within the basal wall, though the number of teeth may vary down to 10 in the adult stage, or less frequently at any stage of growth. Whorls 8 to 8.5 in adults, which measure 8 to 8 mm. diam.

"In some localities, as around Roan Mountain, teeth are almost invariably developed. In some other localities they are rare in adult shells, and developed in the young ones only. Such toothless individuals are separable from *V. placentula* by their slightly more fragile structure and greater number of narrower whorls." (Pilsbry.)

Vitrea capsella (Gould)

Helix rotula Gould, Proc. B. S. N. H., III, 1848, p. 38.

Helix capsella Gould, Terr. Moll., II, 1851, p. 239, pl. XXIXa, fig. 2.

Omphalina capsella Lewis, Ala. F. W. & L. Shells, 1876, p. 28.

Zonites capsella W. G. Binney, Manual, 1885, p. 221, fig. 234; Sargent, Nautilus, VI, 1892, p. 76.

Gastrodonta capsella Sargent, Nautilus, VIII, 1895, p. 105.

Vitrea capsella Johnson & Pilsbry, Nautilus, XI, 1898, p. 130; Cat., 1898, p. 36; Wheeler, Nautilus, XXV, 1912, p. 125; Pilsbry, Proc. A. N. S. P., 1903, p. 210, pl. XI, figs. 2-4, 4a-b.



FIG. 117. *V. capsella* (Pilsbry).

Original Description: "T. parva, discoidea, pellucida, nitida, electrina, *H. suppressæ* similis umbilico infundibuliformi profundo perforata; anfr. 6.5, vix convexis, striis distantibus superne impressis, sutura marginata; apertura semilunari, labro simplici, haud incrassato. Diam. $1/5$ poll." (Gould.)

Gould's English description in Terr. Moll., II, is as follows: "Shell quite small, planorboid, pellucid, glistening, amber-colored. Spire nearly plane, composed of about six and a half, closely revolving, flattened whorls. Surface with distant, impressed, radiating striae. Suture margined. Aperture narrow, semilunar; lip simple, not thickened by a callus within. Base perforated by a deep, rather small, funnel-shaped umbilicus."

Type Locality: Tennessee.

Alabama Records:

Blount Co.; Warrior.
 Choctaw Co.; Silas.
 Dallas Co.; Pleasant Hill.
 Jackson Co.; Woodville; Stevenson; Paint Rock; Princeton.
 Jefferson Co.; Warrior.
 Madison Co.; Gurley; Monte Sano; Huntsville.
 Mobile Co.; Mobile.
 Tuscaloosa Co.; Holt.
 Wilcox Co.; Gastonburg.
 Cherokee Co.; Pleasant Gap.
 Clarke Co.; Jackson.
 Etowah Co.; Keener.
 Lauderdale Co.; Florence.
 Randolph Co.; Wadley; Roanoke.
 Walker Co.; Forks of Warrior.

Generally distributed in the northern and western parts of the state, but not reported from the southeastern counties.

"The species differs from *V. significans* chiefly in the different contour of the adult shell; from *V. placentula* in the smaller size of the adults. The shell measures from 5 to nearly 6 mm. in diam., and has 6 to 7 whorls. Rarely, a young individual may be found with a pair or two of internal teeth, recalling the ancestral stock; but this stage is now passed through at an early age, or entirely skipped; and in the series I have examined, from southwestern Virginia, Kentucky, Tennessee and Alabama, toothed individuals are very unusual." (Pilsbry.)

The specimens figured by Pilsbry are from Woodville, Ala., collected by Sargent.

Vitrea capsella lacteodens Pilsbry

Hyalina significans Harper, Jour. Cin. Soc. Nat. Hist., IV, 1891, p. 258, figs. 2-2a.

Zonites significans Wetherby, Jour. Cin. Soc. Nat. Hist., IV, 1881, p. 328 (separate, p. 6); W. G. Binney, Manual, 1885, p. 228, fig. 250 (exclusive of quotations from Bland, etc.); Sterki, Nautilus, VII, 1893, pp. 16, 17.

Gastrodonta significans Pilsbry, Proc. A. N. S. P., 1900, p. 147.

Vitrea capsella Pilsbry (specimens from Tuskegee Mountain, Graham County, N. C.), Proc. A. N. S. P., 1900, p. 140.

Vitrea capsella lacteodens Pilsbry, Proc. A. N. S. P., 1903, p. 211, pl. XI, figs. 5-5a.

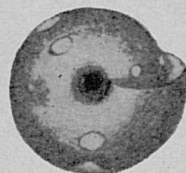
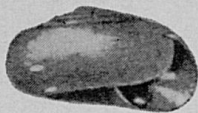


FIG. 118. *V. capsella lacteodens* (Pilsbry.)

Original Description: "The shell is similar to *V. capsella*, except that most specimens have from one to three pairs of tuberculate teeth within the last whorl. The sutures are a trifle less impressed, and the striation perceptibly closer. It differs from *V. significans* in the usual persistence of the pairs of teeth in the adult stage, and the median position of the periphery. In fully adult *significans* the periphery is subbasal, and there are no teeth.

"Alt. 2.6, diam. 5 mm.; whorls 6.5." (Pilsbry.)

Type Locality: "Ramp Cove," Tuskegee Mountain, North Carolina.

Alabama Records:

Cherokee Co.; Pleasant Gap; 10 miles S. E. of Center.
 Dallas Co.; Pleasant Hill.
 Jackson Co.; Stevenson.
 Wilcox Co.; Gastonburg.
 Elmore Co.; Wetumpka; Noble's Ferry.
 Mobile Co.; Mobile.

"It is not separable from *V. capsella* by any hard-and-fast character, but merely by the persistence of the pairs of teeth in most adult shells of any given lot. It is the general character of the specimens from any one place, and not the particular condition of each individual, that must be considered." (H. A. P.)

"I have an idea that in *lacteodens* the 'baby teeth' are not 'shed.'" (G. H. C.)

Vitreia conecuhensis Clapp

Vitreia (*Paravitrea*) *conecuhensis* Clapp, Nautilus, XXX, 1917, p. 138, pl. V, figs. 5-7.

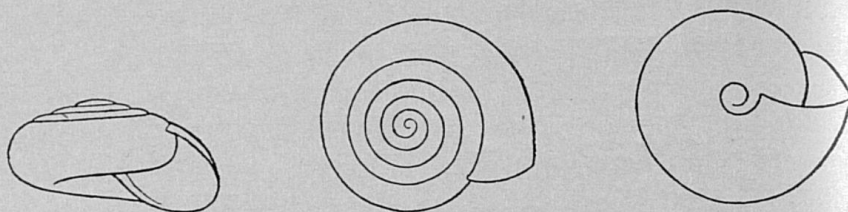


FIG. 119. *V. conecuhensis* (Clapp).

Original Description: "Shell thin, depressed, umbilicate, the umbilicus being about 1 mm. in diameter and showing all of the whorls; color light horn, highly polished; whorls 6, the first five closely coiled, the last rapidly expanding. Surface sculptured with spaced, unequal, radial grooves stopping at the periphery, which is slightly subbasal. Aperture subtriangular, lower lip slightly flattened and reflected where it joins the columella. Adult shells are toothless, but a young shell of 4.5 whorls, 2.75 mm. in diameter, shows a single pair of small tubercular teeth.

"Diameter 4.5, altitude 2.25 mm." (Clapp.)

Type and only Recorded Alabama Locality: Evergreen, Conecuh Co., Alabama.

"This species resembles *Vitreia simpsoni* Pils., but has about one more whorl in the same diameter; it is also less depressed and the basal lip is less flattened." (G. H. C.)

Vitreia (*Paravitrea*) *Smithi*, n. sp.

Shell thin, depressed, umbilicate, umbilicus round and deep and about .75 mm. in diameter; whitish horn color; polished; whorls 4.5 regularly increasing; suture well impressed; surface sculptured with spaced, unequal, radial grooves more numerous and closer together above and practically obsolete below the periphery; body whorl regularly rounded, somewhat flattened on the base;



FIG. 120. *V. Smithi*.

aperture oval, the upper and basal margins somewhat flattened, but rounded on the periphery.

Diameter 4.5, alt. 2.25 mm.

Type Locality: Sand Mountain near Pisgah, Jackson Co., Ala.

Type No. 85618, Coll. Walker. Paratype in the collection of Dr. George H. Clapp.

Only two specimens of this species were found by Mr. Smith. It is nearer to *V. conecuhensis* Clapp than to any other species and is of about the same size, but it differs in having fewer whorls, in the more depressed shape, the narrower umbilicus, the less closely coiled upper whorls and the regularly rounded and unexpanded body whorl.

Vitrea multidentata (Binney)

Helix multidentata Binney, Jour. B. S. N. H., III, 1840, p. 425, pl. XXII, fig. 5.

Zonites multidentatus W. G. Binney, Manual, 1885, p. 183, fig. 180.

Vitrea multidentata Wheeler, Nautilus, XXV, 1912, p. 125.

Original Description: "Shell depressed, sub-planulate above, very thin, pellucid; epidermis smooth, shining; whorls six, narrow, slightly convex, increasing but slowly in diameter, lines of growth hardly visible; suture impressed; aperture semi-lunate, narrow; lip acute; umbilicus very small, rounded, not exhibiting any of the volutions; base convex, indented around the umbilicus. Two or more rows of very minute, white teeth, radiating from the umbilicus, are seen through the shell, within the base of the last whorl. Greatest transverse diameter one-eighth of an inch." (Binney.)

Type Locality: Not specified.

Alabama Records:

Jackson Co.; Stevenson.

Lauderdale Co.; Florence.

Madison Co.; Monte Sano; Huntsville.

This minute northern species has as yet been detected in only three of the northern counties of the state.

Vitrea pilsbryana Clapp

Vitrea (*Paravitrea*) *pilsbryana* Clapp, Nautilus, XXXIII, 1919, p. 9, lower text figs.

Original Description: "Shell widely umbilicate, elevated, convex above, flattened below, thin, translucent, highly polished when immature but becoming more opaque and yellowish in adults, light horn color, sculptured with unequally spaced radial grooves stopping at the periphery which is rather high; suture well impressed; whorls about 8 very closely coiled and

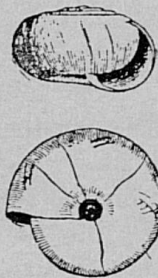
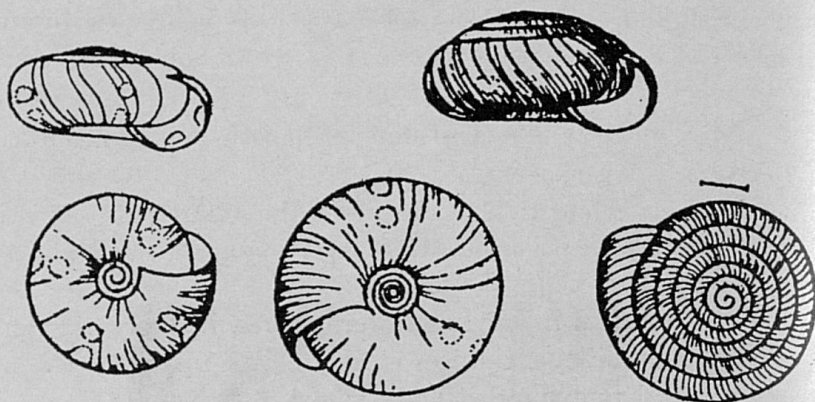


FIG. 121. *V. multidentata* (Binney).

FIG. 122. *V. pilsbryana* (Clapp).

slowly increasing, the last flattened above and below; lip simple, very slightly reflected where it joins the columella, ends united by a thin callus; umbilicus wide, contained a little more than 3 times in the diameter of the shell, and showing all of the apex.

"There are 3 or 4 pairs of large, tubercular, sometimes slightly oval teeth, visible through the base of the shell at all stages of growth and in immature shells the upper teeth are visible from above. The upper teeth, which are slightly below the periphery, are the larger, more elevated and round at the top. The lower teeth are about centrally located on the base and are flattened on top. When four pairs of teeth are present they are equally spaced at intervals of 90° and this appears to be the normal arrangement as only a few shells show three pairs which are spaced from 100° to 120° . The single fully adult shell (figured) appears to have but 2 pairs of teeth, but the shell is a dead one and quite opaque. Two young shells, 1.5 mm. diameter with 3.5 whorls and 2.5 mm. diameter, with 4.5 whorls, each have 3 pairs of teeth.

"Greater diameter 5, lesser 4.5, altitude 2 mm." (Clapp.)

Type Locality: The Cumberland Plateau, 3 miles north of Anderson, Franklin Co., Tennessee.

Alabama Record: Jackson Co., 3 miles southeast of Anderson, Tennessee.

"This species belongs to the same group as *V. capsella lacteodens* and *V. andrewsæ*. It differs from both by the smaller size and *wider umbilicus* and from *andrewsæ* by the tubercular teeth arranged in pairs." (G. H. C.)

GENUS EUCONULUS REINHARDT

Shell imperforate or very narrowly perforate, turbinate, arcti-spiral; whorls 5-6, rather convex; aperture depressed-lunar; the penultimate whorl strongly excided, somewhat oblique. Peristome simple, with margins separated.

Animal bluish-black on the head, neck and eye-peduncles, lighter on the sides and base; foot very narrow, thread-like, a distinct caudal mucus-pore.

Jaw arcuate, ends attenuated; anterior surface smooth, concave margin smooth, with an obtuse median projection.



FIG. 123. Jaw of *Euconulus* (Binney).

Dentition as usual in the family, but is peculiar in the bifurcation of all the marginal teeth.

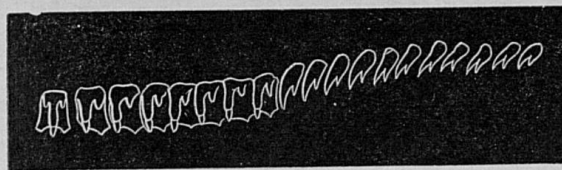


FIG. 124. Dentition of *Euconulus* (Binney).

Genital system with a deeply pigmented ovotestis; hermaphrodite duct sinuate; albumen gland large and linguiform; uterus distinctly sacculated; free oviduct short and direct; penis-sheath short and cylindrical, somewhat glandular, thickened below, and attenuated above, where the vas deferens enters, and the slender penial retractor and the short flagellum are affixed; the spermatheca is globular, with a thin and fairly long duct.

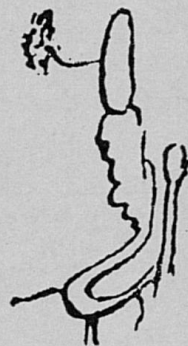


FIG. 125. Genitalia of *E. fulvus* (Lehman).

Euconulus chersinus (Say)

Helix chersina Say, Jour. A. N. S. P., II, 1821, p. 156.

Zonites fulvus W. G. Binney, Manual, 1885, pp. 67, 479, fig. 26.

Zonites (Conulus) fulvus Gratacap, Bull. N. Y. Lyc. Nat. Hist., XIV, 1901, p. 351.

Conulus chersinus Pilsbry, Nautilus, XII, 1899, p. 116.

Euconulus chersinus Wheeler, Nautilus, XXV, 1912, p. 125.



FIG. 126. *E. chersinus*.

Original Description: "Shell subglobose-conic, pale yellowish white, pellucid, convex beneath; volutions about six, wrinkles not distinct; spire convex-elevated; suture moderate; body whorl slightly carinated on the middle; mouth nearly transverse, unarmed, the two extremities nearly equal; labrum simple; umbilicus none. Breadth one-tenth

of an inch." (Say.)

Type Locality: Sea Islands of Georgia.

Alabama Records:

Baldwin Co.; Week's Bay; Foley; Magnolia Springs.

Barbour Co.; Elamville.

Bibb Co.; Eoline.

Blount Co.; Blount Springs.

Cherokee Co.; Pleasant Gap; Dugger Mt.,

Piedmont.

Calhoun Co.; Ridge W. of Sandford Spring.

Chambers Co.; Langdale.

Choctaw Co.; Silas.

Dallas Co.; Selma.

Conecuh Co.; Evergreen.
 Etowah Co.; Attalla.
 Greene Co.; Boligee.
 Jefferson Co.; Squaw Shoals.
 Macon Co.; Tuskegee.

Madison Co.; Huntsville; Gurley; Monte Sano.

Marion Co.; Hamilton.

Montgomery Co.; McGee's Station.

Randolph Co.; Roanoke.

St. Clair Co.; Whitney.

Tuscaloosa Co.; Hagler; Vance; Duncanville;

Walker Co.; Forks of Warrior.

Washington Co.; Calvert.

Elmore Co.; Wetumpka.

Franklin Co.; Russellville; Burleson.

Jackson Co.; Princeton.

Lauderdale Co.; Florence.

Mobile Co.; Mobile.

Perry Co.; Marion; Hamburg; Uniontown.

Shelby Co.; Calera; Montevallo.

Sumter Co.; York; Livingston; Epes.

near Warrior River; Tuscaloosa.

Wilcox Co.; Pine Hill.

A species of general distribution.

"This is very much elevated, the height of fully mature examples exceeding the diameter, the general form being somewhat like that of an immature *Cerion*. Outlines of spire quite convex; whorls 6.5, appearing very closely coiled, as seen from above, the last only faintly angular, though in immature shells it is carinated. The base is quite convex and the umbilical perforation very narrowly open. The lunate aperture forms a less attenuated crescent than in the following variety (*trochulus*). Alt. 3, greatest diameter 2.8 mm." (Pilsbry.)

Euconulus chersinus dentatus (Sterki)

Conulus fulvus dentatus Sterki, Nautilus, VII, 1893, p. 4; Johnson & Pilsbry, Nautilus, XI, 1898, p. 131; Cat., 1898, p. 27.

Conulus chersinus dentatus Pilsbry, Nautilus, XII, 1899, p. 116.

Euconulus chersinus dentatus Wheeler, Nautilus, XXVI, 1912, p. 15.

Original Description: "(The shells) were most small, young and half-grown, and most of them showed 1-2-3 small, white, testaceous deposits in the base of the last whorl, at somewhat irregular intervals, roundish or elongate in a radial direction. They are not high, tooth-like, but quite distinct, whether seen through the shell or, if near enough, from the aperture inside, and recall the same feature in the smaller *Gastrodontas*, although I have never seen more than one tooth on the same radius. But, as said, in some they are in the form of radial bars, and when two or three are present they are always of the same character, either round or transverse. Two examples, mature or nearly so, but weathered and opaque, have at least one distinct round deposit each, about $1\frac{1}{2}$ volution above the aperture." (Sterki.)

Type Locality: Woodville, Alabama.

Alabama Records:

Chilton Co.; Clanton.

Clarke Co.; Thomasville.

DeKalb Co.; Valley Head.

Jackson Co.; Woodville; Princeton; Stevenson.

Madison Co.; Gurley; Monte Sano.

Shelby Co.; Calera.

Choctaw Co.; Silas.

Conecuh Co.; Evergreen.

Elmore Co.; Wetumpka.

Mobile Co.; Mobile.

Tuscaloosa Co.; Tuscaloosa; Holt; Hagler.

"Rather small, with the narrow whorls of the species, the last whorl containing 1 to 3 low, radial teeth, forming transverse barriers on the basal wall, and appearing when the shell is viewed from the base as white radial stripes. The radiating 'teeth' are of exactly the same type found in *Gastrodonta lamellidens* Pils.—a species of very different form." (H. A. P.)

Euconulus chersinus polygyratus (Pilsbry)

Conulus chersinus polygyratus Pilsbry, Nautilus, XII, 1899, p. 116.
Euconulus chersinus polygyratus Pilsbry and Ferriss, Proc. A. N. S. P., 1910, p. 133.

Original Description: "Similar to the preceding (*trochulus*), but less elevated, with narrower aperture; whorls over 6, very narrow, the last bluntly but decidedly angular in front, the angle above the middle of the whorl, base peculiarly sloping below the periphery; upper surface with the lustre of silk; base glossy, with a silky band around the upper margin. Alt. 2.2, diam. 3 mm., sometimes larger." (Pilsbry.)

Type Locality: Not specified. Hamilton, Ontario; Grand Rapids, Michigan.

Alabama Records:

Baldwin Co.; Magnolia Springs.
 Talladega Co.; Horseblock Mountain.

Jackson Co.; Stevenson.
 Tuscaloosa Co.; Hagler.

The few scattering records received extend diagonally from the northeastern to the southwestern corner of the state.

"Differs from typical *chersinus* and *trochulus* chiefly in the peculiar form of the base, produced by the high situation of the periphery, and the narrower aperture. The numerous narrow whorls readily distinguish it from *fulvus*." (Pilsbry.)

"Mr. Vanatta's study of the microscopic sculpture has shown that there is little real difference between *chersinus* and *polygyratus*, and we are now disposed to drop the latter as a synonym." (Pilsbry and Ferriss.)

Euconulus fulvus (Müller)

Helix fulva Müller, Verm. Hist., II, 1774, p. 56.

Zonites fulvus Sargent, Nautilus, VI, 1892, p. 76; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 351.

Euconulus fulvus Hinkley, Nautilus, XX, 1906, p. 35; Pilsbry and Ferriss, Proc. A. N. S. P., 1910, p. 132.

Hyalinia (Euconulus) fulva Taylor, Mon. L. & F. W. Moll. Brit. Isles, Zonitidæ, 1908, p. 118, pl. XV. 3 figs.



FIG. 128. *E. fulvus*.

Original Description: "Testa pellucida, glabra, striis subtilissimis confertis transversim striata, colore succini transparentis, pulchritudine & teneritate nulli fecunda. Carina anfractus majoris ac juncturae in adultis tantisper

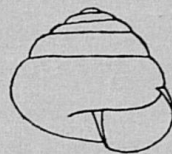


FIG. 127. *E. chersinus polygyratus*.

albert; haec albedo lumini pellucenti deberi videtur. Apertura arcuata, angusta. Labium album, acutum; Anfractus supra septem, subtus unicus. Nec umbilicus nec foramen in omni aetate; rudimentum tamen foraminuli, quale in *H. nemorali* nondum labio perfecte tectum, oculo armato conspicitur. In minoribus, sive junioribus, striae ac albedo minus conspicuae; anfractus 3-5, ac labium testae concolor." (Müller.)

Taylor's description is as follows: "Shell conic or pyramidal, thin, glossy, and semi-pellucid or horny; whorls 5-6, cylindrical, very slowly increasing in size, or rounded at the periphery, or may be bluntly angulated, finely but irregularly striate in the line of growth, with more or less distinct but very fine revolving lines at base; spire very prominent, but the apex obtuse; suture distinct and deep, base convex; umbilicus very small and sometimes not perceptible; aperture narrowly semi-lunar, peristome simple and slightly reflected at the umbilicus. Diam. 3.5; alt. 2.5 mm."

Type Locality: Fridrichsdal, Denmark.

Alabama Records:

Greene Co.; Boligee.
Perry Co.; Perry Co.

Jackson Co.; Woodville.
Tuscaloosa Co.; Holt.

It is very probable that all of the Alabama records for this species are really *chersinus*.

"In *E. fulvus* from the northeastern United States the first whorl has fine spiral striae and very indistinct traces of vertical (radial) striae, not seen in some but legible, though weak, in other examples. The upper surface of the last whorl has about 126 vertical striae in 1 mm., crossed by spiral striae. There are about 6 whorls." (Pilsbry and Ferriss.)

Euconulus sterkii (Dall)

Hyalina sterkii Dall, Proc. U. S. Nat. Mus., XI, 1888, p. 214, figs. 1-3; Nautilus, V, 1891, p. 10, text-figs.

Zonites sterkii Sargent, Nautilus, VI, 1892, p. 76.

Conulus sterkii Johnson & Pilsbry, Nautilus, XI, 1898, p. 131; Cat., 1898, p. 27.

Euconulus sterkii Wheeler, Nautilus, XXV, 1912, p. 125.

Original Description: "Shell minute, thin, yellowish translucent, brilliant, lines of growth hardly noticeable, spire depressed, four-whorled; whorls rounded, base flattened, somewhat excavated about the center, which is imperforate; aperture wide, hardly oblique, not very high, semilunate, sharp edged, the upper part of the columella slightly reflected; upper surface of the whorls roundish though the spire as a whole is depressed. Max. diameter 0.044 inch; alt. 0.026 inch." (Dall.)

Type locality: New Philadelphia, O.

Alabama Records:

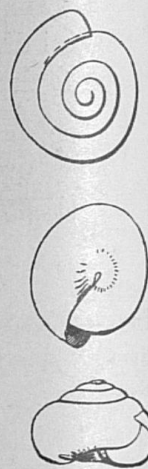


FIG. 129. *E. sterkii* (Dall).

Baldwin Co.; Magnolia Springs.
Choctaw Co.; Silas.
DeKalb Co.; Valley Head.
Jefferson Co.; Squaw Shoals.
Madison Co.; Huntsville; Monte Sano.
Randolph Co.; Wadley; Roanoke.

Chambers Co.; Langdale.
Conecuh Co.; Evergreen.
Jackson Co.; Stevenson; Sand Mt., Pis-
gah; Woodville.
Lauderdale Co.; Florence.
Mobile Co.; Mobile.

The records of this minute species, though scattering, indicate a general distribution over the state.

SUBFAMILY ARIOPHANTINÆ PILSBRY

♀ System bearing a long dart-sack, surmounted by one or more coronal glands, and usually containing a slender curved dart.

GENUS ZONITOIDES LEHMANN

Shell depressed or subdiscoidal, umbilicate, smooth or ribbed, striate or costulate, shining, pellucid, corneous, aperture obliquely lunate. No internal teeth or callous.

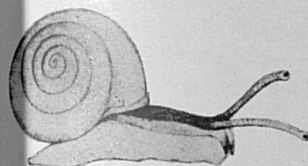


FIG. 130. Animal of *Z. arboreus* (Bartsch and Quick).

Tentacles and back of the animal ashy gray, sides of the foot of a much paler gray. The underside of the foot flesh colored, with an ashy tinge. Eyes black.

Jaw long, narrow, arcuate with the ends pointed or rounded, lower margin smooth, with a wide median impression.

Dentition as usual in the family.



FIG. 131. Jaw of *Z. arboreus* (Binney).

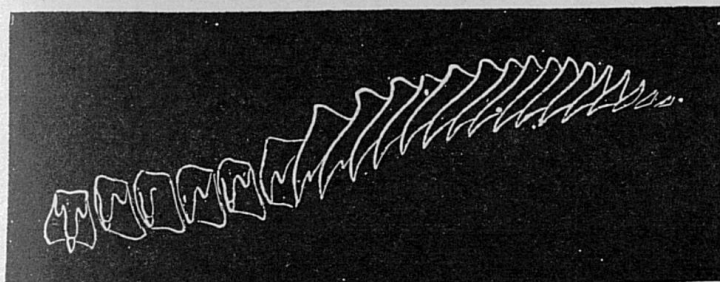


FIG. 132. Radula of *Z. arboreus* (Binney).

The ovotestis (1) is an inconspicuous leaf-shaped organ appressed to the liver. The hermaphroditic duct (2) is slender and long and connects with the accessory gland (3), which is closely attached to the albumen gland (4), which heads the oviduct. The oviduct (5) is a rather large and conspicuous organ terminating in the vagina (6) posteriorly. The vas

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abtus unicus.
a foraminuli,
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aspicuae; an-

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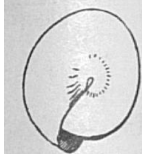


FIG. 129. *E. sterckii* (Dall).



FIG. 133. Genitalia of *Z. arboreus* (B. and Q.).

deferens is a slender cord which is attached to the oviduct for a greater part of its length, only the posterior fourth being free and this terminates in the penis sac (8). The dart sac (9) is about one and one-half times as long as the penis sac and bears the two inconspicuous coronal glands (10) at its summit. The vesicula seminalis (11) is a small organ joined to the vagina at about the anterior third by a very long duct. The cloaca (12) is a short thick-walled tube. The dart sac retractor muscle (13) connects the dart sac with the duct of the seminal vesicle at the base of the penis.

SECTION ZONITOIDES S.S.

Surface polished.

Zonitoides nitidus (Müller)

Helix nitida Müller, Hist. Verm., II., 1774, p. 32.

Zonites nitidus W. G. Binney, Terr. Moll., V, 1878, p. 113, pl. III, fig. A (radula); Manual, 1885, p. 60, fig. 12.

Original Description: "Testa nitida, pellucida, substriata, limace foeta, nigra; vacua brunnea: Anfractus quatuor vel quinque, subtus unicus, Apertura larga, lunata; margo acutus. Diam. 1-4 lin." (Müller.)

Binney's description is as follows: "Shell orbicular, depressed, moderately convex above and concave below, thin, shining, uniform brownish horn-color, with delicate striæ of growth; whorls 5 or more, convex, separated by a deeply impressed suture, the outer one disproportionately large, somewhat declining as it approaches the aperture, and obtusely angular at the periphery, beneath excavated around a broad, crateriform umbilicus, in which the whorls are displayed to the apex; aperture oblique-lunate; peristome simple, its basal margin arcuate. Greater diameter 7.5, lesser 6, height 3.66 mm."

Type Locality: Fridrichsberg, Denmark.

Alabama Record: Baldwin Co. (Binney.)

This common circumpolar species was probably introduced into Baldwin County by commerce.

The radula figured by Binney (*l. c.*) was from a Baldwin County specimen.

Zonitoides arboreus (Say)

Helix arboreus Say, Nich. Encyc., II, 1817, pl. IV, fig. 4.

Omphalina arboreus Lewis, Ala. F. W. & L. Shells, 1876, p. 28.



FIG. 134. *Z. nitidus* (Binney).

- Zonites arborea* W. G. Binney, Manual, 1885, p. 61, fig. 13.
Zonites arboreus Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 347; Sargent, Nautilus, VI, 1892, p. 76.
Zonitoides arborea Hinkley, Nautilus, XX, 1906, p. 35.
Zonitoides arboreus Wheeler, Nautilus, XXV, 1912, p. 125.

Original Description: "Shell very thin, fragile, depressed, horn color, pellucid, very little convex; whorls four, irregularly wrinkled across; aperture sublunated, lip thin, brittle, junction with the body whorl acute; umbilicus large and deep. Length, one-tenth of an inch nearly; breadth nearly one-fifth." (Say.)

Type Locality: Not specified.

Alabama Records:

- | | |
|--|--|
| Baldwin Co.; Week's Bay; Foley; Point Clear; Magnolia Springs. | |
| Barbour Co.; Elamville. | Calhoun Co.; Piedmont. |
| Blount Co.; Blount Springs. | Chambers Co.; Langdale. |
| Bibb Co.; Eoline; Woodstock. | |
| Cherokee Co.; Pleasant Gap; 10 m. S. E. of Centre; Poole's Island. | |
| Chilton Co.; Maplesville; Clanton. | Choctaw Co.; Silas. |
| Clarke Co.; Thomasville; Jackson. | Cleburne Co.; Dugger Mt., Piedmont. |
| Conecuh Co.; Evergreen; Alcos. | Cullman Co.; Sand Mountain; Cullman. |
| Dallas Co.; Pleasant Hill. | DeKalb Co.; Fort Payne; Valley Head. |
| Elmore Co.; Wetumpka. | Escambia Co.; Forshee. |
| Etowah Co.; Keener. | Fayette Co.; Forks of Sipsey; Fayette. |
| Franklin Co.; Burleson; Russellville. | Geneva Co.; High Bluff. |
| Greene Co.; Boligee. | |
| Jackson Co.; Stevenson; Limrock; Princeton; Woodville. | |
| Jefferson Co.; Valley Creek Station; Squaw Shoals. | |
| Lauderdale Co.; Florence. | Lee Co.; Tuskegee. |
| Macon Co.; Tuskegee. | |
| Madison Co.; Huntsville; Gurley; Monte Sano; Matthews Hill, Huntsville. | |
| Marengo Co.; Demopolis. | Marion Co.; Winfield. |
| Mobile Co.; Mobile; Oak Grove; Magazine Point. | |
| Monroe Co.; Drewry; Monroe. | Montgomery Co.; Montgomery. |
| Perry Co.; Uniontown; Marion. | Randolph Co.; Wadley; Roanoke. |
| Shelby Co.; Calera. | St. Clair Co.; Whitney. |
| Sumter Co.; Epes; Livingston. | Talladega Co.; Three Island Shoals; |
| Tallapoosa Co.; Yates. | Horseblock Mountain. |
| Tuscaloosa Co.; Duncanville; Elrod; Hagler; Holt; Tuscaloosa; Vance; Squaw Shoals. | |
| Walker Co.; Forks of Warrior. | Washington Co.; Chatom. |
| Wilcox Co.; Gastonburg; Pine Hill; Alberta. | |

A very abundant and widely distributed species.

"In addition to the more obvious differences between this species and *Vitrea hammonis*, *Z. arboreus* under a glass of high power will be found to have the surface covered with numerous very fine, impressed revolving lines which are lacking in *hammonis*." (Pilsbry, Proc. A.N.S.P., 1902, p. 433.)

SECTION PSEUDOHYALINA MORSE

Surface closely striate, ribbed or costulate.



FIG. 135.
Z. arborea
(Binney).



FIG. 134.
Z. nitidus
(Binney).

Zonitoides elliotti (Redfield)*Helix elliotti* Redfield, Ann. N. Y. Lyc. Nat. Hist., VI, 1856, p. 170, pl. IX, figs. 8-10.*Omphalina elliotti* Lewis, Ala. F. W. & L. Shells, 1876, p. 28.*Zonites elliotti* W. G. Binney, Manual, 1885, p. 219, fig. 232.*Gastrodonta elliotti* Johnson & Pilsbry, Nautilus, XI, 1898, p. 132; Cat., 1898, p. 28.

FIG. 136.

Z. elliotti
(Binney).

Original Description: "Shell with a rather narrow umbilicus, depressed-orbiculate, with fine transverse striae, greenish horn-colored, hardly translucent, shining beneath; spire convex but not much raised; whorls five, rather convex, the last one sometimes very slightly depressed at the aperture; suture deeply impressed; aperture very oblique, lunate-circular, peristome a little sinuate, acute, but thickened within.

"Diam. maj. 9; diam. min. 8; alt. 4 mm." (Redfield.)

Type locality: Not specified. "Mountains of Georgia and North Carolina."

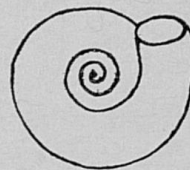
Alabama Records:

"Alabama" (Lewis).

"Northern Alabama" (Johnson and Pilsbry).

An abundant species in the mountains of Tennessee, Georgia and North Carolina, but for which we have as yet no definite locality in Alabama.

"It is larger and more solid than *H. arborea*, with a less spreading umbilicus and more oblique aperture. In general form, it is more like a large *H. indentata*. It may be most readily recognized by its transverse aperture, and thickened, somewhat sinuous lip." (Redfield.)

Zonitoides lateumbilicata (Pilsbry)*Gastrodonta (Pseudohyalina) lateumbilicata* Pilsbry, Nautilus, VIII, 1895, p. 102; Sargent, *ibid.*, p. 105.*Zonitoides lateumbilicata* Johnson & Pilsbry, Nautilus, XI, 1898, p. 131; Cat., 1898, p. 27.FIG. 137. *Z. lateumbilicata*.

Original Description: "Shell resembling *Ps. limatula* in color, texture and sculpture, but much depressed, the upper surface almost flat, last whorl of much smaller calibre, the umbilicus very much wider, shallow, its cavity widely open and saucer-shaped, very much as in *Helicodiscus lineatus*. Alt. 1.4, diam. 4.3 mm." (Pilsbry.)

Type Locality: Woodville, Alabama.

Alabama Records:

Jackson Co.; Woodville.

Lauderdale Co.; Florence.

Zonitoides minusculus (Binney)

- Helix minuscula* Binney, Jour. B. S. N. H., III, 1840, p. 435, pl. XXII, fig. 4.
Omphalina minuscula Lewis, Ala. F. W. & L. Shells, 1876, p. 28.
Zonites minuscula W. G. Binney, Manual, 1885, p. 63, fig. 18.
Zonitoides minuscula Hinkley, Nautilus, XX, 1906, p. 35.
Zonitoides minusculus Wheeler, Nautilus, XXV, 1912, p. 125.



FIG. 138.
Z. minus-
culus
 (Binney).

Original Description: "Shell minute, depressed-convex; epidermis whitish; whorls four, convex, not increasing rapidly in diameter; suture very distinctly impressed; aperture nearly circular; lip thin, acute; umbilicus large, not spread, deep, and exhibiting the volutions; base rounded, columella with a thin callus. Greatest transverse diameter less than one-eighth of an inch." (Binney.)

Type Locality: Not specified.

Alabama Records:

- | | |
|--|---|
| Baldwin Co.; Point Clear; Week's Bay. | Barbour Co.; Elamville. |
| Blount Co.; Blount Springs. | Chambers Co.; Langdale. |
| Coffee Co.; Enterprise. | Colbert Co.; Tuscumbia. |
| Conecuh Co.; Evergreen. | DeKalb Co.; Fort Payne; Valley Head. |
| Elmore Co.; Wetumpka. | Franklin Co.; Russelville; Burleson. |
| Green Co.; Boligee. | |
| Jackson Co.; Princeton; Stevenson; Sand Mt., Pisgah. | |
| Lauderdale Co.; Florence. | Madison Co.; Huntsville; Monte Sano. |
| Marengo Co.; Demopolis. | Mobile Co.; Mobile; Oak Grove; Coden; Magazine Point. |
| Montgomery Co.; Barachias; McGee's Station. | |
| Perry Co.; Hamburg; Uniontown. | Randolph Co.; Wadley; Roanoke. |
| Sumter Co.; Epes; Livingston. | Tuscaloosa Co.; Tuscaloosa; Hagler. |
| Walker Co.; Forks of Warrior. | Wilcox Co.; Alberta. |

This small species has a general distribution all over the state.

Zonitoides singleyanus (Pilsbry)

- Zonites singleyanus* Pilsbry, Proc. A. N. S. P., 1888, pl. XVII, fig. M.; *ibid.*, 1889, p. 84.
Zonitoides singleyanus Johnson & Pilsbry, Naut., XI, 1898, p. 131; Cat., 1898, p. 27.

Original Description: "Shell minute, broadly umbilicate, planorboid, the spire scarcely perceptibly exerted; subtranslucent, waxen white, shining, smooth; under a strong lens seen to be slightly wrinkled by growth-lines; whorls three, rather rapidly increasing, separated by well impressed sutures, convex, the apex rather large; body-whorl depressed, slightly descending, indented below around the umbilicus; aperture small, semilunar, oblique; peristome simple, acute. Umbilicus nearly one-third the diameter of the shell, wide, showing at the whorls. Alt. 1, diam. 2 mm." (Pilsbry.)

Type Locality: New Braunfels, Comal Co., Texas.

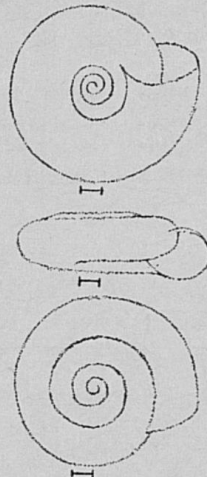


FIG. 139. *Z. singleyanus* (Pilsbry).

Alabama Records:

Jackson Co.; Stevenson; Woodville.
Wilcox Co.; Alberta.

Perry Co.; Hamburg.

Apparently a rare species in Alabama, but probably overlooked on account of its small size.

"Allied to *Z. minusculus*, but much more depressed, more shining, smoother, smaller, with broader umbilicus and a complete whorl less than *minusculus*." (Pilsbry.)

GENUS GASTRODONTA ALBERS

Shell subperforate or umbilicated, orbicularly convex or depressed, light horn-color, finely and obliquely striate, sometimes glassy; whorls 5-7, aperture lunate, base furnished with internal teeth, not reaching the margin, or thickened by an internal deposit of callous; peristome simple, acute.

Animal bluish-black or dark slate-color above, paler on the posterior extremity and base; foot narrow and long; eye-peduncles long and slender; a distinct locomotive disk; pedal grooves terminating in a longitudinal mucus pore. The prominent feature of the genitalia is the presence of a dart sac containing a long, curved, calcareous dart, situated upon the vagina; and this is the most important generic character. Dentition as usual in the family.



FIG. 140. Animal of *G. ligera* (Binney).



FIG. 141. Tail of *G. suppressa* (Binney).



FIG. 142. Jaw of *G. ligera*.

The genital bladder is small, oval, on a long, delicate duct, from about the middle of the length of which there is a connecting duct to the middle of the penis sac and a second duct to the apex of the dart sac. This last organ

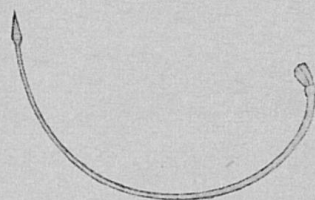


FIG. 143. Dart of *G. ligera* (Pilsbry).

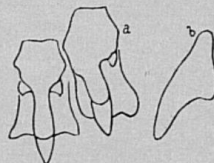


FIG. 144. Radula of *G. intertexta* (Binney).

is long, large at its junction with the vagina, tapering above, and furnished below its apex with an accessory, short, delicate, cylindrical gland, terminating in a small pyriform bulb. The dart is long, strictly arrow-shaped, with a pointed, en-

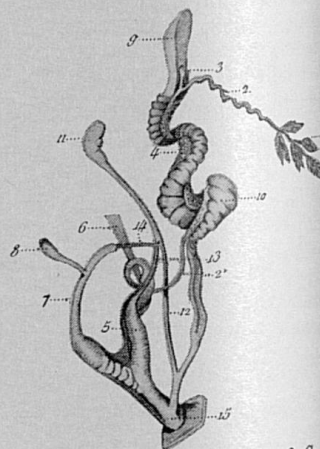


FIG. 145. Genitalia of *G. ligera* (Binney).

larged head and much thickened at the posterior termination. The penis sac is stout, short, receiving at its apex the vas deferens, on the commencement of which the retractor muscle is inserted.

Gastrodonta intertexta (Binney)

- Helix intertexta* Binney, Jour. B. S. N. H., III, 1840, p. 43, pl. XX, fig. 2.
Mesomphix intertexta Lewis, Ala. F. W. & L. Shells, 1876, p. 28.
Zonites intertextus W. G. Binney, Manual, 1885, p. 214, fig. 226;
 Sargent, Nautilus, VI, 1892, p. 76.
Gastrodonta intertexta Wheeler, Nautilus, XXVI, 1912, p. 15.

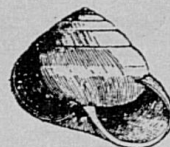


FIG. 146.
G. intertexta
 (Binney).

Original Description: "Shell sub-pyramidal; epidermis yellowish horn-color; whorls six to seven, with numerous fine, oblique striae, and very minute spiral striae, intersecting each other; outer whorl with a narrow, light-colored band, and an ill-defined brownish band below it; aperture rounded, a little transverse; lip thin, somewhat thickened within by a deposition of testaceous matter, slightly reflected at its junction with the base of the shell; umbilicus small, sometimes nearly obsolete; base whiter than the upper surface.

"Greatest transverse diameter about three-fourths of an inch."
 (Binney.)

Type Locality: Not specified.

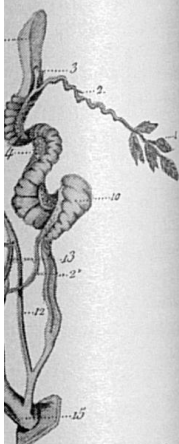
Alabama Records:

- | | |
|--|--|
| Baldwin Co.; Magnolia Springs. | Barbour Co.; Elamville. |
| Bibb Co.; Woodstock. | Blount Co.; Blount Springs. |
| Calhoun Co.; Anniston. | Chambers Co.; Langdale. |
| Cherokee Co.; 10 m. S. E. of Centre; Gorge of Little River. | Clay Co.; Pyriton. |
| Cleburne Co.; Dugger Mountain. | Dale Co.; Pinehard. |
| Clarke Co.; Jackson. | DeKalb Co.; Fort Payne; Valley Head; Lookout Mountain. |
| Conecuh Co.; Evergreen. | Etowah Co.; Keener; Attalla. |
| Dallas Co.; Pleasant Hill. | Franklin Co.; Burleson. |
| Elmore Co.; Wetumpka. | |
| Fayette Co.; Fayette; Forks of Sipsey. | |
| Jackson Co.; Stevenson; Princeton; Pisgah; Woodville. | |
| Jefferson Co.; Squaw Shoals; Valley Creek, Adger. | |
| Lauderdale Co.; Florence. | Lee Co.; Auburn. |
| Macon Co.; Tuskegee. | Madison Co.; Gurley; Huntsville; Monte Sano. |
| Marengo Co.; Demopolis. | Marion Co.; Bear Creek; Hamilton. |
| Mobile Co.; Irvington; Mobile. | Perry Co.; Marion. |
| Pike Co.; S. E. corner. | Randolph Co.; Roanoke; Wadley. |
| Shelby Co.; Calera; Yellowleaf Creek, Wilsonville. | |
| St. Clair Co.; Gallant; Ten Island Shoals; Riverside; Whitney. | |
| Sumter Co.; Livingston; Epes. | Talladega Co.; Three Island Shoals; Horseblock Mountain. |
| Tallapoosa Co.; Yates. | |
| Tuscaloosa Co.; Hagler; Vance; Wawah; Tuscaloosa. | |
| Walker Co.; Forks of Warrior. | Washington Co.; Calvert. |



FIG. 142. Jaw of *G. ligera*.

duct, from about to the middle of This last organ



Genitalia of *G. intertexta* (Binney).

A very common and generally distributed species throughout the state.

Gastrodonta acerra (Lewis)

Helix ligera acerra Lewis, Am. Jour. Conch., VI, 1871, p. 190, pl. 12, figs. 3-4.

Zonites acerra Lewis, Proc. A. N. S. P., 1875, p. 335.

Mesomphix acerra Lewis, Ala. F. W. & L. Shells, 1876, p. 28.

Gastrodonta acerra Sargent, Nautilus, VIII, 1895, p. 105; Johnson & Pilsbry, *ibid.*, XI, 1898, p. 132; Cat., 1898, p. 28; Wheeler, Nautilus, XXVI, 1912, p. 15.

Zonites demissus (pars) W. G. Binney, Manual, 1885, p. 213, fig. 224.



FIG. 147.

G. acerra
(Binney).

Original Description: "My shell has seven whorls and a fraction. Greater diameter 0.81 inch = 18 mm. Dr. Binney says of *ligera*—'greatest transverse diameter five-eighths of an inch (0.625), usually much less.' My shell

exceeds the maximum given by Dr. B., by about one-twelfth of an inch." (Lewis.)

Type Locality: Fork Creek, Blount Co., Tennessee.

Alabama Records:

Blount Co.; Blount Springs.

Cleburne Co.; Dugger Mt., Piedmont.

DeKalb Co.; Lookout Mountain; Little Wills Valley; Valley Head.

Elmore Co.; Wetumpka.

Madison Co.; Huntsville region.

Randolph Co.; Wadley.

Cherokee Co.; Pleasant Gap.

Jackson Co.; Stevenson; Princeton.

Montgomery Co.; Montgomery.

"The shell has a cubic capacity more than four times that of *demissus*, being less pale, usually more translucent, and the opaque portions have a decided canary-yellow tint." (Lewis, 1875.)

This is an abundant species in the Tennessee mountains, but in Alabama is apparently restricted to the northeastern portion.

Gastrodonta demissa (Binney)

Helix demissa Binney, Jour. B. S. N. H., IV, 1843, p. 361, pl. XVI, fig. 16.

Mesomphix demissa Lewis, Ala. F. W. & L. Shells, 1876, p. 28.

Zonites demissus W. G. Binney, Manual, 1885, p. 212, fig. 223; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 344.

Gastrodonta demissa Hinkley, Nautilus, XX, 1906, p. 35; Wheeler, *ibid.*, XXV, 1912, p. 125.

Original Description: "Shell depressed-convex; epidermis yellowish horn-color, shining; whorls six, with minute lines of growth; spire obtuse; suture impressed; body-whorl expanding very little towards the aperture; aperture transverse, not large, a white, testaceous deposit within; lip thin, acute; base rather flat, smooth; umbilicus very small; umbilical region a little impressed. Greatest transverse diameter rather more than three-eighths of an inch." (Binney.)

Type Locality: Western Pennsylvania.



FIG. 148.
G. de-
missa
(Binney).

Alabama Records:

Baldwin Co.; Foley; Magnolia Springs; Point Clear.
 Bibb Co.; Eoline; Woodstock; Pratt's Ferry.
 Blount Co.; Blount Springs. Choctaw Co.; Black Bluff; Moscow Bluff; Silas.
 Clarke Co.; Thomasville; Jackson. Conecuh Co.; Evergreen.
 Cullman Co.; Sand Mountain. Dallas Co.; Pleasant Hill; Selma.
 Elmore Co.; Wetumpka; Elmore. Franklin Co.; Burleson.
 Greene Co.; Boligee. Jackson Co.; Princeton.
 Jefferson Co.; Upper Cahaba River; Valley Creek, Adger; Squaw Shoals; Birmingham.
 Lauderdale Co.; Florence. Macon Co.; Tuskegee.
 Madison Co.; Huntsville; Normal; Monte Sano.
 Marengo Co.; Marengo Co. Mobile Co.; Mobile; Saraland.
 Monroe Co.; Drewry; Monroe. Montgomery Co.; McGee's Station; Montgomery.
 Perry Co.; Marion. Pickens Co.; Coalfire.
 Shelby Co.; Calera; Yellowleaf Creek, Wilsonville; Gurnee.
 St. Clair Co.; Gallant. Sumter Co.; Epes; Livingston.
 Talladega Co.; Three Island Shoals; Horseblock Mountain.
 Tuscaloosa Co.; Duncanville; Hagler; Holt; University; Tuscaloosa.
 Walker Co.; Forks of Warrior. Washington Co.; Calvert.
 Wilcox Co.; Pine Hill; Gastonburg.

A common and generally distributed species. It is distinguished from *G. ligera* by its more depressed form and smooth, shining surface.

Gastrodonta ligera (Say)

Helix ligera Say, Jour. A. N. S. P., II, 1821, p. 157.
Zonites ligerus W. G. Binney, Manual, 1885, p. 213, fig. 225; Sargent, Nautilus, VI, 1892, p. 76.
Gastrodonta ligera Wheeler, Nautilus, XXV, 1912, p. 125.

Original Description: "Shell subglobose, pale yellowish horn color, polished; body whorl pellucid, yellowish white, opaque beneath near the aperture; volutions rather more than six, all except the apical one, wrinkled across; spire convex, a little elevated; umbilicus very small; suture not deeply impressed; labrum not reflected. Greatest length three-tenths, oblique length less than nine-twentieths, transverse diameter less than eleven-twentieths." (Say.)

Type Locality: Missouri.

Alabama Records:

Choctaw Co.; Black Bluff. Conecuh Co.; Evergreen.
 Jackson Co.; Stevenson; Woodville. Lauderdale Co.; Florence.
 Madison Co.; Monte Sano; Huntsville. Mobile Co.; Alabama Point; Mobile.
 Shelby Co.; Montevallo. Tuscaloosa Co.; Tuscaloosa.

Apparently of local distribution through the northern and western part of the state, but not reported from the eastern counties.



FIG. 149.
G. ligera
 (Binney).



FIG. 148.
G. demissa
 (Binney).

Gastrodonta collisella Pilsbry

Gastrodonta collisella Pilsbry, Nautilus, IX, 1896, p. 123; Wheeler, Nautilus, XXV, 1912, p. 125.



FIG. 150.
G. collisella.

Original Description: "Shell rather solid, minutely perforate, above elevated and somewhat dome-shaped, below rather flattened, the periphery rounded. Surface glossy, especially beneath, the base being radially finely wrinkled, and with faint traces of spiral striation in the slightly excavated umbilical region; upper surface sculptured with irregular, arcuate wrinkle-riblets in the direction of growth-lines, and stronger toward the sutures. Whorls 7.5, slightly convex, separated by very shallow sutures, which, under the lens, seemed margined below by the partial transparency of the shell. Aperture mainly basal, lunate, with a lining of white callus a short distance within, heavier and bearing a small tooth on the columellar slope, and a rather short, white lamella toward the outer part of the base. Lip-edge thin and acute, suddenly expanded at the columellar insertion, half covering the umbilical perforation.

"Alt. 7, diam. 8.33 mm.

"Alt. 5.66, diam. 8.33 mm." (Pilsbry.)

Type Locality: Not specified. Probably Knoxville, Tennessee.

Alabama Records:

Jackson Co.; Paint Rock.

Madison Co.; Gurley; Monte Sano.

"Variation is observed in the height of spire and the degree of development and length of the basal lamella. It is most nearly allied to *G. ligera* and *G. cerinoidea*, being smaller than the former, with different aperture armature, and larger, duller and more elevated than the latter." (H.A.P.)

Gastrodonta gularis (Say)

Helix gularis Say, Jour. A. N. S. P., II, 1822, p. 156.

Ventridens gularis Lewis, Ala. F. W. & L. Shells, 1876, p. 28.

Zonites gularis W. G. Binney, Manual, 1885, p. 224, fig. 240; Sargent, Nautilus, VI, 1892, p. 77; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 351.

Gastrodonta gularis Johnson & Pilsbry, Nautilus, XI, 1898, p. 132; Cat., 1898, p. 28; Wheeler, Nautilus, XXV, 1912, p. 125.

Original Description: "Shell subglobose, pale yellowish horn color; polished, pellucid, beneath near the aperture whitish-yellow opake; volutions six or seven, with prominent, somewhat regular wrinkles; spire convex, a little elevated; suture moderate; labrum not reflected; throat far within upon the side of the labrum, bidentate; teeth lamelliform, of which one is oblique and placed near the middle, and the other less elongated placed near the base; umbilicus none. Breadth more than one-fourth of an inch." (Say.)



FIG. 151.
G. gularis
(Binney).

Type Locality: Not specified. "Inhabits Ohio and Pennsylvania."

Alabama Records:

Baldwin Co.; Baldwin Co.	Bibb Co.; Woodstock.
Blount Co.; Blount Springs.	Cherokee Co.; Pleasant Gap.
Choctaw Co.; Silas.	Conecuh Co.; Evergreen.
Dallas Co.; Pleasant Hill.	DeKalb Co.; Pleasant Hill; Lookout Mountain; Valley Head.
Fayette Co.; Forks of Sipsey.	Geneva Co.; High Bluff.
Jackson Co.; Stevenson; Princeton; Paint Rock; Sand Mt., Pisgah; Pisgah.	Jackson Co.; Stevenson; Princeton; Paint Rock; Sand Mt., Pisgah; Pisgah.
Jefferson Co.; Upper Cahaba River; Squaw Shoals; Valley Creek, Adger; Red Mt., Birmingham.	Jefferson Co.; Upper Cahaba River; Squaw Shoals; Valley Creek, Adger; Red Mt., Birmingham.
Lauderdale Co.; Florence.	Lee Co.; Auburn.
Madison Co.; Huntsville; Monte Sano; Matthews Hill, Huntsville.	Madison Co.; Huntsville; Monte Sano; Matthews Hill, Huntsville.
Mobile Co.; Mobile.	Marion Co.; Bear Creek; Hamilton.
Perry Co.; Perry Co.	Morgan Co.; Decatur.
St. Clair Co.; Gallant.	Randolph Co.; Roanoke; Wadley.
	Sumter Co.; Livingston.
Tuscaloosa Co.; Hagler; Indian Creek; Squaw Shoals.	Tuscaloosa Co.; Hagler; Indian Creek; Squaw Shoals.
Walker Co.; Forks of Warrior.	Wilcox Co.; Gastonburg; Pine Hill.

A common species of general distribution but apparently rare in the southeastern part of the state.

Gastrodonta gularis lawæ (W. G. Binney)

Zonites placentulus W. G. Binney, Terr. Moll. U. S., V., 1878, p. 124, fig. 44; pl. III, fig. L. (dentition) and remarks, but not the description.
Zonites lasmodon var. ? W. G. Binney, Ann. N. Y. Acad. Sci., I, 1879, pp. 358-362, pl. XV, fig. e.
Zonites lawi W. G. Binney, 1st Supp. to Terr. Moll. V., 1883, p. 142, pl. 2, fig. e; Manual, 1885, p. 221, fig. 235.
Gastrodonta gularis lawæ Walker & Pilsbry, Proc. A. N. S. P., 1902, p. 435, pl. XXV, figs. 10-12, 14-17.

Original Description: None, figured but not described.

"The shell is yellow, glossy, with moderately elevated, dome-like spire, composed of 8 closely coiled whorls; surface rather closely wrinkle-striate, the striae strongest near the suture, weaker below, where a few faint spiral striae may be traced. Last whorl rounded, hardly angular, even in front. *Umbilicus* wide, open, deep and well-like, the bases of the first whorls visible in its depth. Aperture small, irregularly lunate; peristome acute, strengthened within by a rather thin, diffused white callus, which becomes heavier within the columellar margin, making a slight convexity or low boss near the axis. Columellar margin somewhat straightened.

"Alt. 4.7, diam. 7.8 mm., width of umbilicus 1.3 mm." (Walker and Pilsbry.)

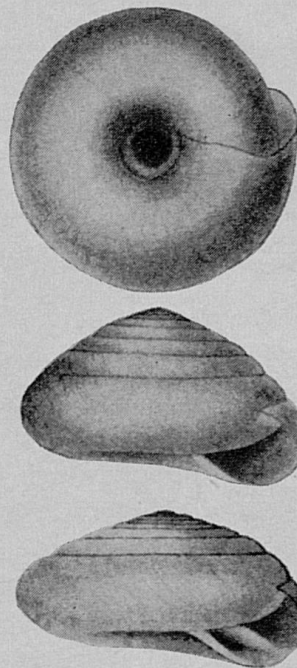


FIG. 152. *G. gularis lawæ* (Pilsbry).

FIG. 151. *G. gularis* (Binney).

Type Locality: Mountains of Tennessee and North Carolina.

Alabama Records:

Clay Co.; Pyriton.

Talladega Co.; Horseblock Mountain.

"The above description and figs. 10-12 represent the type shell, which differs from most other specimens in being without internal lamellae. Binney (Supplement, p. 143) mentions that "there is a variety in which is a heavy internal callous or plate-like tooth within the aperture," and this (figs. 14-17), is certainly the prevalent form in the localities collected at in 1901. These dentate specimens have the long, strong, arching basal lamella of *G. gularis cuspidata*.

"The form was given specific rank by Mr. Binney, but in our opinion it is merely a subspecies of the variable *G. gularis*, distinguished by the wider umbilicus, and the absence of teeth in some adult specimens. *G. gularis theloides* differs from *lawæ* by its very small umbilicus. In *G. lasmodon* the umbilicus is still wider. The size of the umbilicus varies a good deal in the North Carolina specimens. Thus in specimens from Paint Rock, measuring 8 mm. diam., the umbilicus is from 1 to 1.7 mm. wide.

"The young shells are always toothed, there being a long outer lamella, a shorter baso-columellar, and in early stages a small supra-peripheral plait. The umbilicus is broad and the periphery situated high on the last whorl. The shell figured measures 5 mm. diam." (W. & P.)

Gastrodonta suppressa (Say)

Helix suppressa Say, New Harm. Diss., II, 1829, p. 229.

Ventridens suppressa Lewis, Ala. F. W. & L. Shells, 1876, p. 28.

Zonites suppressus W. G. Binney, Manual, 1885, p. 225, fig. 241; Sargent, Nautilus, VI 1892, p. 77.

Gastrodonta suppressa Wheeler, Nautilus, XXV, 1912, p. 125.

Original Description: "Shell subglobose, depressed, pale horn color, polished, somewhat pellucid; body whorl opaque, whitish near the aperture; volutions six, wrinkled; within, a prominent tooth near the base, distant from the margin; labrum simple, umbilicus rather small, orbicular, profound; region of the umbilicus indented. Greatest breadth more than one-fifth of an inch." (Say.)

Type Locality: Germantown, Pennsylvania.

Alabama Records:

Bibb Co.; Woodstock.

DeKalb Co.; Valley Head.

Fayette Co.; Fayette; Forks of Sipsey.

Jefferson Co.; Upper Cahaba River.

Madison Co.; Gurley; Normal; Huntsville; Monte Sano.

Shelby Co.; Montevallo.

Tuscaloosa Co.; Wawah.

Calhoun Co.; Anniston.

Elmore Co.; Wetumpka.

Jackson Co.; Woodville.

Lauderdale Co.; Florence.

Talladega Co.; Banks of Coosa River; Horseblock Mountain.



FIG. 153. *G. suppressa* (Binney).

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Apparently of general distribution in the northern half of the state.

"I notice that the 'umbilicus small, orbicular, profound,' of Say, exists usually only in young specimens, it being oftener closed in the full grown shell, but not always so.

"It resembles the preceding species (*gularis*), but has one whorl less, is more depressed, and its base is more convex. The tooth in the aperture is sometimes so little prominent as to be hardly visible; at other times there are 3 teeth. The striae of growth are fine and crowded, and seem to be more nearly at right angles with the suture than is usual in other species." (Binney.)

Gastrodonta lasmodon (Phillips)

Helix lasmodon Phillips, Jour. A. N. S. P., VIII, 1842, p. 182; Binney, Terr. Moll., II, 1851, p. 245, pl. XXXVII, fig. 2.



Ventridens lasmodon Lewis, Ala. F. W. & L. Shells, 1876, p. 28.

Zonites lasmodon W. G. Binney, Manual, 1885, p. 227, fig. 244; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 352.

Gastrodonta lasmodon Johnson & Pilsbry, Nautilus, XI, 1898, p. 132; Cat., 1898, p. 28.

FIG. 154.

G. lasmodon
(Binney).

Original Description: "Shell moderately elevated, lenticular, rather thick; epidermis pale whitish horn color, smooth, shining; whorls eight, very faintly and obliquely striated; suture indistinct; aperture compressed, within a broad calcareous deposit, and one or two lamellar teeth following the direction of the whorls; lip acute; umbilicus moderately large, rounded and deep; base regularly rounded into the umbilicus. Transverse diameter seven-twentieths, height three-twentieths of an inch." (Phillips.)

Type Locality: Alabama.

Alabama Records: Cited by all of the authors mentioned above from "Alabama" or "Northern Alabama," but without any definite locality.

Gastrodonta interna (Say)

Helix interna Say, Jour. A. N. S. P., II, 1822, p. 155.

Ventridens interna Lewis, Ala. F. W. & L. Shells, 1876, p. 28.

Zonites internus W. G. Binney, Manual, 1885, pp. 229, 480, fig. 252; Sargent, Nautilus, VI, 1892, p. 77.

Gastrodonta interna Sargent, Nautilus, VIII, 1895, p. 105; Johnson & Pilsbry, *ibid.*, XI, 1898, p. 132; Cat., 1898, p. 28; Hinkley, Nautilus, XX, 1906, p. 35; Wheeler, *ibid.*, XXV, 1912, p. 125.



FIG. 155.

G. interna
(Binney).

Original Description: "Shell yellowish red; volutions six or eight; whorls with regular, equidistant, elevated, obtuse lines across them, separated by regular grooves; lines obsolete beneath; spire convex, little elevated; aperture very straight, transverse, less than one-half of the longitudinal diameter; labrum not reflected; within, upon the side of the labrum, two prominent, lamelliform teeth, of which the superior one is largest, and neither of them

attains the edge of the lip; region of the base of the columella much indented; umbilicus obsolete or wanting." (Say.)

Type Locality: Lower Missouri.

Alabama Records:

Bibb Co.; Eoline; Pratt's Ferry; Woodstock; Blocton.	Calhoun Co.; Anniston.
Blount Co.; Blount Springs.	Cherokee Co.; Pleasant Gap.
Chambers Co.; Langdale.	Clay Co.; Pyriton.
Choctaw Co.; Silas.	Cullman Co.; Sand Mountain; Cullman.
Cleburne Co.; Duggar Mt., Piedmont.	DeKalb Co.; 10 m. S. E. of Centre; Fort Payne; Valley Head; Sand Mt., Valley Head.
Etowah Co.; Black Creek Falls; Keener.	Fayette Co.; Forks of Sipsey; Fayette.
Franklin Co.; Russellville; Burleson.	Jackson Co.; Sand Mt., Pisgah; Stevenson; Limrock; Paint Rock; Princeton; Woodville.
Jefferson Co.; Upper Cahaba River; Cohort; Valley Creek, Adger; Henry Ellen; Squaw Shoals.	Lee Co.; Auburn.
Lauderdale Co.; Florence.	Marion Co.; Hamilton; Winfield; Bear Creek.
Madison Co.; Huntsville; Gurley; Monte Sano.	Perry Co.; Marion.
Marengo Co.; Demopolis.	Shelby Co.; Calera; Montevallo; Gurnee.
Mobile Co.; Mobile.	Tallapoosa Co.; Yates.
Randolph Co.; Roanoke; Wadley.	Tuscaloosa Co.; Indian Creek.
Talladega Co.; Horseblock Mountain.	
Tuscaloosa Co.; Hagler; Duncanville; Holt;	

A common species generally distributed in the northern and western parts of the state, but apparently lacking in the southeastern portion. The recorded distribution is almost exactly like that of *G. gularis*.

FAMILY ENDODONTIDÆ

Shell with opaque, brown coloring, or flammules, usually rib-striate, the lip thin, unexpanded and sharp. Foot margin defined by a pedal groove. Marginal teeth with wide, short and squarish basal plates, with one or several cusps, the outer cusp never elevated on the middle cusp.

SUBFAMILY ENDODONTINÆ PILSBRY

GENUS ANGUISPIRA MORSE

Shell rather large and solid, with convex spire and open umbilicus; whorls rounded or carinated at the periphery. Surface striate or rib-striate, obliquely flamed, unicolored or spirally banded; lip thin, simple.

Animal having a large foot, its length greater than the diameter of the shell, the tail rounded; sole without any traces of longitudinal divisions; the foot margins

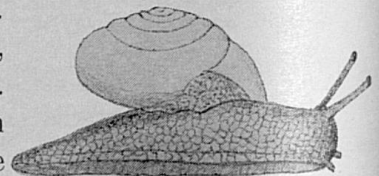


FIG. 156. Animal of *A. alternata* (Pilsbry).

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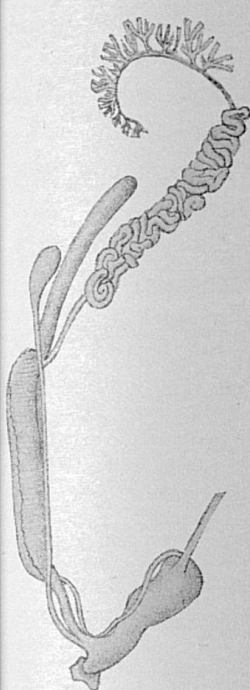


FIG. 157. Genitalia
of *A. alternata*
(Pilsbry).

having a wide border above, bounded by a distinct groove, the grooves meeting over the tail. Eyepeduncles long and slender, tentacles minute. Mantle edge thick.

Genital system simple, lacking accessory organs. Penis receiving the vas deferens and the retractor muscle at its summit. Spermatheca bulbous, its duct very long. Ovi-sperm duct very much convoluted, the ovo-testis consisting of small groups of large, club-shaped follicles.

Jaw strong and opaque, arcuate, with a slight or obvious median projection; surface rather faintly subvertically striated.



FIG. 158.

Jaw of
A. alternata

Radula: Central teeth having the mesocone long, side cusps small. Laterals having a large mesocone and a well developed ectocone; no endocone. Marginals similar, but with the basal plate short, as usual.

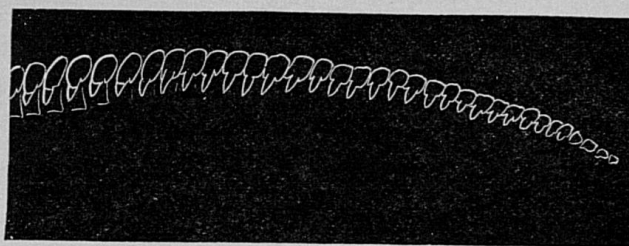


FIG. 159. Radula of *A. alternata* (Binney).

Anguispira alternata (Say)

Helix alternata Say, Nich. Encey., 1817, pl. I, fig. 2.

Type Locality: Middle States.

The typical, northern form of this species has not been found in Alabama. But there are five well marked forms, easily distinguishable from

the type and each other, which are entitled to varietal recognition. Dr. George H. Clapp had made a special study of the group before the writer began the preparation of this paper and it was a matter of congratulation on comparing notes to find that the results of our independent studies were in substantial accord. I have accordingly retained his MSS. names for the two varieties which he had named.

Anguispira alternata carinata (Pilsbry & Rhoads)

Pyramidula alternata carinata Pilsbry & Rhoads, Proc. A. N. S. P., 1896, p. 490.

Original Description: "Most Tennessee specimens of this species are

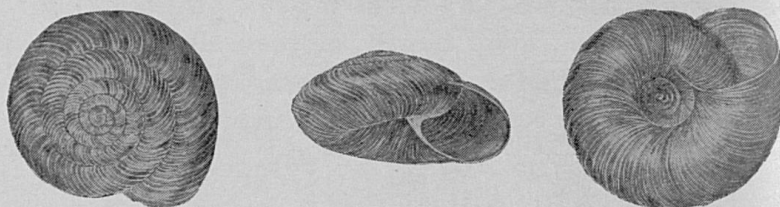


FIG. 160. *Anguispira alternata carinata*.

more coarsely and strongly ribbed than northern and western examples and there is often a more or less peripheral keel. The culmination of this type of shell is *P. alternata mordax*. The form called var. *carinata* contrasts with these, being very fine ribbed and distinctly carinated, and not at all of the *mordax* type." (P. & R.)

Type Locality: Emory River, Harriman, Tennessee.

Alabama Records:

Cherokee Co., Poole's Island, Coosa River; 10 miles S. E. of Centre; Slackland.
Etowah Co., Gadsden. Jackson Co., Princeton; Woodville.
Perry Co., Perry Co. Tuscaloosa Co., Indian Creek.

This is a characteristic form of the Cumberland Plateau ranging from western Pennsylvania through Tennessee into Alabama. In Alabama it extends from the northeastern counties, Jackson, Cherokee and Etowah, southwest as far as Tuscaloosa, Perry and Elmore counties.

In this form the periphery has a distinct, bluntly angulated, but not acute, carina; the earlier whorls are quite strongly ribbed, but the ribs diminish in strength on the penultimate whorl and the last whorl becomes finely and closely striate. The striae pass over the carina and continue into the umbilicus, but become much weaker below the carina and in fully mature specimens become sub-obsolete towards the aperture. The young shells are quite strongly carinated and somewhat excavated below the carina. Between the ribs is developed a fine vertical striation.

The specimen figured is from Stevenson, Alabama, and measures: diam. 20.9, alt. 12.6 mm.

"This is the common form of the hills in the Cumberland Plateau and found commonly among rocks, sometimes in rotten wood." (H. H. S.)

Anguispira alternata crassa Clapp, n. v.

Shell somewhat depressed, rather heavy for the genus; upper surface

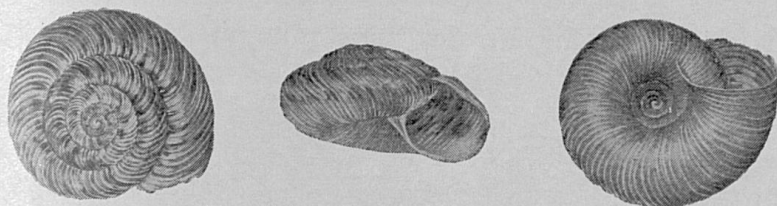


FIG. 161. *A. alternata crassa*.

with strong ribs, which pass uninterruptedly over the periphery and across the base into the umbilicus; whorls rounded, apparently very bluntly angulated, but this seems to be caused by the oblique turning of the ribs at the periphery as they pass towards the umbilicus; aperture nearly round, slightly flattened above. The microsculpture consists of fine vertical striae between the ribs, which are crossed by very fine, more or less irregular, spiral striae. The type measures, diam. 18, alt. 10.5 mm.

Type: No. 20695 Coll. Walker. Paratypes in the collections of Dr. George H. Clapp and the Alabama State Museum.

Type Locality: Wetumpka, Elmore Co., Alabama.

Alabama Records:

- | | |
|--|--|
| Baldwin Co., Hamilton; Baldwin Co. | Barbour Co., Elamville. |
| Bibb Co., Woodstock; Pratt's Ferry; Bibb Co. | |
| Blount Co., Blount Springs. | Chambers Co., Langdale. |
| Chilton Co., Maplesville. | Clarke Co., Jackson; Suggsville. |
| Clay Co., Pyriton. | Cleburne Co., Dugger Mt., N. of Piedmont. |
| Cullman Co., Wilhite. | Dale Co., Pinckhard. |
| Dallas Co., Selma. | DeKalb Co., Valley Head; Lookout Mt. |
| Etowah Co., Gorge of Black Creek; Keener. | |
| Fayette Co., Fayette; Forks of Sipsey. | Franklin Co., Burleson. |
| Jackson Co., Princeton; Jackson Co. | |
| Jefferson Co., Warrior; Valley Creek, Adger; Squaw Shoals. | |
| Lauderdale Co., Florence. | Madison Co., Huntsville; Monte Sano; Rainbow Mt. |
| Mobile Co., Saraland. | Perry Co., Hamburg. |
| Pike Co., S. E. corner, near Pea River. | Randolph Co., Roanoke; Wadley. |
| St. Clair Co., Whitney; Sand Mt., Gallant. | |
| Talladega Co., Horseblock Mt.; Lock 4, Coosa River; 5 m. above Lock 4. | |
| Tuscaloosa Co., Tuscaloosa; Holt; Yates; Duncanville. | |
| Walker Co., Forks of Warrior. | Wilcox Co., Pine Hill. |

This heavily ribbed form is nearest to *A. alternata costata* Lewis of the Tennessee Mountains. It differs in its rounded, not carinated, periphery

and in the character of the ribs, which are not as strong as in *costata* and do not stop at the periphery, but pass over it and across the base into the umbilicus.

It is the prevalent form in Alabama and has a general distribution over the entire state.

The strong sculpture is characteristic and easily differentiates it from the other varieties.

Anguispira alternata macneilli, n. v.

Shell relatively small, depressed, thin, quite highly colored, with reddish



FIG. 162. *A. alternata macneilli*.

spots rather than flames; body whorl rounded with rarely a slight appearance of angulation on the periphery; aperture nearly round; upper surface strongly ribbed, the ribs extending continuously over the base into the umbilicus, but are much weaker below and frequently bifurcate towards the periphery; the microsculpture consists of very fine striae between and parallel with the ribs. The type measures, diam. 15.2, alt. 8.3 mm.

Type: No. 38492, Coll. Walker. *Cotypes* in the collection of Dr. George H. Clapp.

Type Locality: Salco, Mobile Co., Alabama.

Alabama Records:

Barbour Co., Pea River, W. of Elamville.
Choctaw Co., Silas.
Mobile Co., Mobile.

Greene Co., Boligee.
Sumter Co., Epes; Livingston.

This very distinct, small variety is confined to the coastal region of the southern part of the state. It extends up the valley of the Tombigbee River as far north as Greene County.

It is closely related to a small form found at Wilmington and Smith Island, N. C., but differs in being more coarsely ribbed, with a less polished surface and also more depressed. The shells from Barbour County in their sculpture and texture approach the North Carolina form.

Anguispira alternata palustris Clapp, n. v.

This form is closer to *carinata* than to any other of the Alabama complex. It differs in the much finer striation of the upper surface which fades out below the periphery and in fully

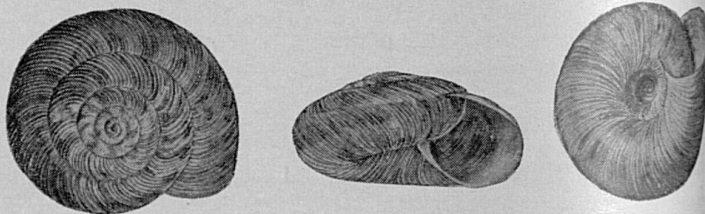


FIG. 163. *A. alternata palustris*.

mature examples becomes subobsolete towards the aperture, so that the base is practically smooth or only slightly striate; the body whorl is scarcely angulated and is rounded at the aperture. Immature shells are bluntly carinated on the periphery. The microsculpture consists of a fine vertical striation between the ribs, which is cut by very fine spiral striae. The type measures, diam. 23.1, alt. 12.6 mm.

Type: No. 24911 Coll. Walker. Paratypes in the collections of Dr. George H. Clapp and the Alabama State Museum.

Type Locality: Princeton, Jackson Co., Alabama.

Also: Stevenson; Sand Mountain, Pisgah, Jackson Co., and Florence, Lauderdale County.

This variety is characteristic of the low, swampy flood-plain of the Tennessee River and has not been found elsewhere. Hence the name. "Never found it above the flood-plain." (H. H. S.)

The shells from Florence are more carinated and in this resemble *carinata*, but they have the finer surface sculpture and the double (vertical and spiral) microsculpture characteristic of this form and undoubtedly belong here.

Anguispira alternata smithi, n. v.

? *Patula alternata mordax* W. G. Binney, Terr. Moll., V, 1878, p. 162, fig. 72; Sargent, Naut., VI, 1892, p. 77.

? *Patula alternata* W. G. Binney, Manual, 1885, p. 481.

? *Pyramidula alternata* var. Wheeler, Naut., XXVI, 1912, p. 16.

Shell depressed, sublenticular, carinated, strongly constricted below the

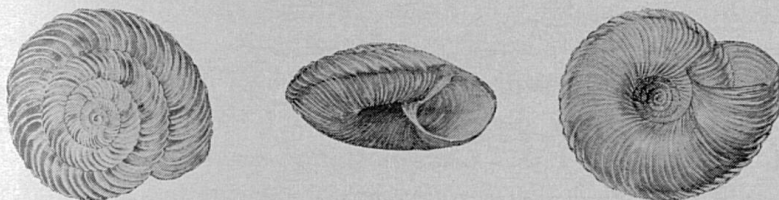


FIG. 164. *A. alternata smithi*.

carina; upper surface with strong ribs, which pass over the carina and continue uninterruptedly into the umbilicus; aperture angulated at the periphery. The microsculpture consists of fine, vertical striae between the ribs, crossed by very fine spiral striae. The type measures, diam. 17.6, alt. 9 mm.

Type: No. 24891 Coll. Walker. Paratypes in the collections of Dr. George H. Clapp and the Alabama State Museum.

Type Locality: Monte Sano, Huntsville, Jackson Co., Alabama.

This variety has thus far been found only on Monte Sano. It is quite closely related to the *mordax* of Shuttleworth and is possibly either a derivative from the same stock or the result of similar ecological conditions. It

differs from *mordax* in having the ribs on the upper surface more numerous, closer together and less pronounced, those of the base are much finer and frequently anastomose as they approach the umbilicus. This also occurs occasionally in *mordax*. The strong constriction just below the carina, which gives the latter a cord-like appearance and the sudden diminution in strength of the basal ribs below the carina are characteristic. In *mordax* the basal ribs are quite as strong as those of the upper surface. Named after the discoverer, the late Herbert H. Smith.

The shell from Stevenson, Jackson Co., figured by Binney (*l. c.*), that listed as *P. alternata mordax* by Sargent (*l. c.*) from Woodville and the *P. alternata* var. from Ward's Mt., Huntsville, mentioned by Wheeler (*l. c.*), are probably this form.

Anguispira cumberlandiana (Lea)

Carocolla cumberlandiana Lea, Proc. Am. Phil. Soc., I, 1840, p. 289.

Patula cumberlandiana W. G. Binney, Manual, 1885, p. 258, fig. 275; Sargent, Nautilus, VI, 1892, p. 77.

Pyramidula cumberlandiana Johnson & Pilsbry, Nautilus, XI, 1898, p. 140; Cat., 1898, p. 31; Wheeler, Nautilus, XXV, 1912, p. 125; *ibid.*, XXVI, 1912, p. 16; Clapp, *ibid.*, XXXIV, 1920, p. 24.

Original Description: "Testa lenticulata, carinata, striata, albida, fusco-notata, late umbilicata, ad carinam superne et inferne impressa; anfractibus quinis; apertura angulata, intus sulcata; labro acuto." (Lea.)

Binney's description is as follows: "Shell broadly umbilicated, lenticular, acutely carinated, rather thin, sculptured with coarse, acute rib-striae, of a pale yellowish or sometimes ash color, irregularly checked with radiating, waved brown blotches; spire depressed, of about five whorls, very slightly convex, but excavated towards the margin, which is acute, and with a marginal, impressed line on both sides of the edge; beneath somewhat less convex, but the striae less prominent, and its center excavated by a deep, broad umbilicus, one-third the diameter of the base, and exhibiting all the whorls to the apex; aperture rather wider than high, rendered somewhat rhomboidal by the acute carina; peristome simple, acute, its columellar extremity somewhat dilated and reflected. Greater diameter 15, lesser 13; height 5 mm."

Type Locality: Cumberland Mountains, Jasper, Tennessee.

Alabama Records:

Jackson Co.; Paint Rock; Woodville; Limrock.

Madison Co.; Vincent Mt., Gurley; Smither's Mt., Huntsville; Monte Sano.

"Both Lea and Binney failed to note that the ribs become much stronger on the carina, giving a saw-tooth effect.



FIG. 165.
A. cumberlandiana
(Binney).

"At Woodville, Jackson Co., Ala., Mr. H. E. Sargent found a form of *cumberlandiana* with slightly weaker ribs above and below and with the upper whorls less shouldered, but it is hardly distinct enough to be separated.

"In *cumberlandiana* there is a single row of small, faint, squarish, brown markings just below the carina on the base; in the Woodville shells these spots are larger and much darker." (Clapp.)

A characteristic species of the Cumberland Mountains, Tennessee, which ranges south in the mountains into Jackson and Madison counties.

Anguispira cumberlandiana alabama (Clapp)

Pyramidula cumberlandiana alabama Clapp, Nautilus, XXXIV, 1920, p. 25, pl. I, fig. 3.

Original Description: Differs from the type by its larger size, much

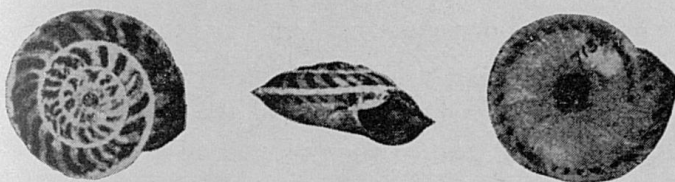


FIG. 166. *A. cumberlandiana alabama* (Clapp).

finer and flatter ribs and more convex shape; carina white, sharp, but less pinched than in the type and the ribs on the carina much lower and less accentuated. Ground color lighter than in the Sewanee shells (*cumberlandiana*) and markings darker. There is a single row of squarish flames just below the carina on the base. Umbilicus about one-fourth the diameter of the shell.

"Gr. diam. 21.75, less. 19.5, alt. 9.5 mm. Aper. 9.5 x 8 mm. Whorls 6. Type.

"Gr. diam. 21.25, less. 18.74, alt. 10 mm. Aper. 9 x 7 mm. Whorls 6. Huntsville." (Clapp.)

Type Locality: Gurley, Vincent Mountain, Madison Co., Ala.

Alabama Records:

Madison Co.; Vincent Mountain, Gurley; Huntsville; Smither's Mountain; Monte Sano.

GENUS GONYODISCUS FITZINGER

Shell rather small, depressed, with low but convex spire and open umbilicus. Apical 1.5 whorls smooth, the rest obliquely rib-striate, rather tubular, rounded or keeled at the periphery, unicolored or flamed with reddish. Aperture wide-lunate, lip simple.

Animal long and narrow, the foot white, head and back dusky blue. Sole equal in length to the diameter of the shell, undivided; margins of foot having a wide border, bounded by a distinct groove, the grooves meeting above the tail. Upper surface coarsely granulated. Eye-peduncles long and slender, from one-third to one-half as long as the foot.

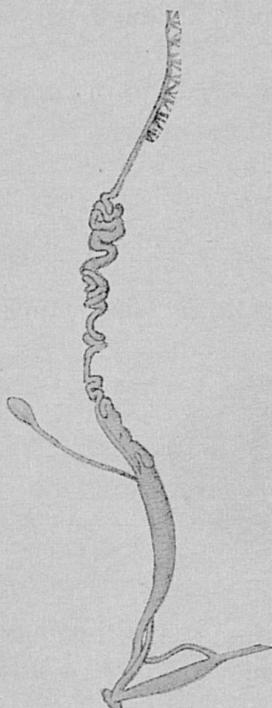


FIG. 168. Genitalia of *G. perspectivus* (Pilsbry).

Genital system lacking all accessory organs. The penis is short, having the retractor and the vas deferens inserted at its apex. Spermatheca small, situated upon a very long simple duct, which enters the vagina very low. At the base of the albumen gland there is a rather large talon. The albumen gland is small and adherent to the lower part of the hermaphrodite duct, the latter being large and very much convoluted.

The jaw arcuate, with a slight median projection, finely striated, the striæ subvertical diverging below toward the outer basal angles of the jaw.



FIG. 169. Jaw of *G. perspectivus* (Pilsbry).

Radula: Centrals having a long mesocone and small side cusps. Laterals having no entocone, the mesocone oblique, ectocone small. Marginals similar, but with short, broad basal-plates.



FIG. 170. Radula of *G. perspectivus* (Pilsbry).

Gonyodiscus clappi Pilsbry

Pyramidula sub-sp. nov. "Pilsbry," Wheeler, Naut., XXVI, 1912, p. 16.

Gonyodiscus clappi Pilsbry, Proc. A. N. S. P., 1924, p. 417, figs. 2a and 3a.

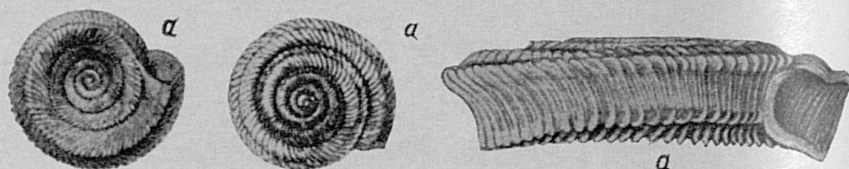


FIG. 171. *G. clappi* (Pilsbry).

"Shell rather thin, flat above, broadly concave beneath, with carina at the periphery and base; cartridge buff. Inner whorls are simple

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convex, but the last three are convex with a concavity near the periphery; the last whorl is squarish in section, strongly concave between the peripheral and basal keels, and having a circular impression inside of the basal keel. Sculpture: most of the first whorl is smooth; then very fine, slightly protractive striae appear, and below the suture short, weak traces of radial riblets, which become longer, crossing the whorl, after the first 1.5 whorls. There are also very fine and weak traces of strongly retractive striae over the sculpture described, mainly near the periphery. On the neanic whorls the radial riblets become strong, slightly curved, and retractive. On the last whorl these riblets are strong, crenulating the two keels, becoming weak and reduced to mere striae between them, with some additional short striae in their intervals. In the concave base the riblets are moderately strong. The aperture is quadrate, or rather, stirrup-shaped, with the angles produced at the keels, a flat margin between them, and opposite to that margin a concave parietal margin; upper and lower margins somewhat sigmoid. There is no internal thickening or callus.

"Height 2.3, diam. 7.4 mm.; 5.5 whorls." (Pilsbry.)

Type Locality and only Alabama Record: Jasper Point, a spur of the Cumberland Plateau, about 5 miles north to northeast of Gurley, Madison County.

"Found at one place only, in dry forest among limestone rocks, under leaves and sometimes under stones." (H. H. S.)

Gonyodiscus cronkhitei anthonyi (Pilsbry)

Helix striatella Anthony, Jour. B. S. N. H., III, 1840, p. 278, pl. III, fig. 2. Not Rang, 1831.

Patula striatella Lewis, Ala. F. W. & L. Shells, 1876, p. 28; W. G. Binney, Manual, 1885, p. 69, fig. 28.

Pyramidula cronkhitei anthonyi Pilsbry, Proc. A. N. S. P., 1906, p. 153.

Original Description: "Shell remarkably thin, somewhat depressed; of a very delicate horn color, transparent; whorls four, very finely striated transversely; spire scarcely elevated; suture moderate; aperture nearly round; labrum not reflected nor thickened. Umbilicus not remarkably large; in diameter not equal to the body whorl; transverse diameter one-fifth of an inch." (Anthony.)

Type Locality: Cincinnati, Ohio.

Alabama Records:

Greene Co.; Boligee.
"Alabama" (Lewis).

Mobile Co.; Mobile.

"This shell, well known under the preoccupied name *H. striatella* Anth., has typically a rounded periphery and moderately developed oblique and



FIG. 172.
G. cronkhitei anthonyi
(Binney).

sigmoid rib-striae, 4 or 5 in the space of a mm. on the front of the last whorl at the periphery. There are 3.5 to 3.75 whorls. Alt. 2.7, diam. 5.25 mm. (Pilsbry.)

Apparently restricted to the southern part of the state.

Gonyodiscus perspectivus (Say)

Helix perspectiva Say, Jour. A. N. S. P., I, 1817, p. 18.

Patula perspectiva Lewis, Ala. F. W. & L. Shells, 1876, p. 28; W. G. Binney, *Mamm.* 1885, p. 260, fig. 276; Sargent, *Nautilus*, VI, 1892, p. 77; *ibid.*, VIII, 1895, p. 105.

Pyramidula perspectiva Wheeler, *Nautilus*, XXV, 1912, p. 125.

Original Description: "Shell very much depressed, with about six whorls; whorls striated across, with raised, parallel, acute lines, forming strongly impressed sulcae between them. Umbilicus very large, resembling an inverted spire, in diameter at least equal to the breadth of the body whorl, and exhibiting distinctly all the volutions. Diameter three-quarters of an inch." (Say.)

Type Locality: Near Lake Erie.

Alabama Records:

Baldwin Co.; Week's Bay.	Bibb Co.; Eoline; Pratt's Ferry; Woodstock.
Blount Co.; Blount Springs.	Chambers Co.; Langdale.
Cherokee Co.; 10 m. S. E. of Centre.	Chilton Co.; Mapleville.
Choctaw Co.; Silas.	Clarke Co.; Thomasville.
Clay Co.; Pyriton.	Conecuh Co.; Evergreen.
Cullman Co.; Wilhites Station.	Dallas Co.; Selma.
DeKalb Co.; Valley Head.	Elmore Co.; Wetumpka.
Etowah Co.; Keener.	Franklin Co.; Burleson; Russellville.
Greene Co.; Greene Co.	Laurens Co.; Pishah; Woodville.
Jackson Co.; Princeton; Stevenson; Sand Mt.	Lauderdale Co.; Florence.
Jefferson Co.; Cohort; Valley Creek Station.	Madison Co.; Huntsville; Gurley; Vincent Mt., Gurley; Normal; Ward's Mt., Huntsville; Monte Sano.
Mobile Co.; Mobile.	Monroe Co.; Monroe; Drewry.
Perry Co.; Marion; Hamburg.	Randolph Co.; Roanoke; Wadley.
Shelby Co.; Calera; Yellowleaf Creek, Wilsonville.	Talladega Co.; Three Island Shoals.
St. Clair Co.; Greensport; Gallant.	Tuscaloosa Co.; Tuscaloosa.
Tallapoosa Co.; Yates.	
Wilcox Co.; Pine Hill; Gastonburg; Alberta.	
Co.; White Bluff, "postpleistocene." (Binney.)	

This common northern species has a general distribution over the state.

GENUS *HELICODISCUS* MORSE

Shell small, disk or coin-shaped, with flat spire and broad, shallow umbilicus. Whorls numerous, convex and closely coiled, spirally striated



FIG. 176.
G. per-
spectiva
(Binney.)

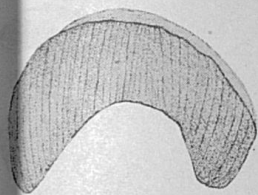
last whorl 5.25 mm. lirate, the last whorl having one or several pairs of tubercular teeth within, situated upon the outer-basal wall. Aperture lunate, lip thin, simple.

The shell lies perfectly flat upon the posterior end of the foot, the eye-peduncles standing nearly vertically; posterior end of the long and narrow foot conspicuously furrowed above, very short behind the mantle.



FIG. 174. Animal of *H. parallelus* (Binney).

Jaw arcuate, striate, the striae diverging somewhat from the median line; median projection inconspicuous.



Radula: Central tooth decidedly narrower than the laterals, its mesocone very short, side cusps minute. Laterals with large, square basal-plates, the mesocone as long as the basal-plate, entocone and ectocone equally developed, strong, with short cutting points. Marginals low, wide, the ectocone bifid or trifid.



FIG. 176. Radula of *H. parallelus* (Watson).

Helicodiscus fimbriatus Wetherby

Helicodiscus fimbriatus Wetherby, Jour. Cin. Soc. Nat. Hist., IV, 1881, p. 9; W. G. Binney, Manual, 1885, p. 262, fig. 278.

Original Description: "Shell light green color, discoidal or planiform, widely umbilicate, consisting of about five whorls, very gradually increasing in size. Aperture lunate, and oblique to the axis of the shell. Peristome subacute, slightly thickened, and darker than the rest of the shell, the outline somewhat sinuous when viewed from the side of the whorl. Spire planiform, not rising above the body whorl. Suture deeply and regularly impressed. Umbilicus exhibiting all the volutions. Whorls ornamented with from six to eight revolving ridges, terminating in a fringe-like projection of the epidermis, following this arrangement. Two or three of these ridges, on the upper surface of the body whorl, are often of such prominence as to give a fluted appearance. In old shells these epidermal fringes are sometimes worn away, leaving the ridges upon which they stood. Greater diameter 5, lesser 4.5, height 1.5 mm.



FIG. 177. *H. fimbriatus* (Binney).



"In some specimens as many as six teeth may be observed, none of which can be seen in the aperture." (Wetherby.)

Type Locality: Gorge of Tellico, Tennessee.

Alabama Record: Cherokee Co.; Pleasant Gap.

Helicodiscus parallelus (Say)

Planorbis parallelus Say, Jour. A. N. S. P., II, 1821, p. 164.

Helicodiscus parallelus Wheeler, Nautilus, XXV, 1912, p. 125.

Helix lineata Sargent, Nautilus, VI, 1892, p. 77.

Helicodiscus lineatus Lewis, Ala. F. W. and L. Shells, 1876, p. 28; W. G. Binney, Manual, 1885, p. 75, fig. 37; Sargent, Nautilus, VIII, 1895, p. 105.

Original Description: "Shell dextral, with very minute transverse wrinkles, and regular, revolving, equidistant, parallel, slightly elevated lines; spire a little convex; volutions four; aperture longer than wide; umbilicus exhibiting all the volutions. Breadth, less than 3-20 of an inch." (Say.)

Binney's description is as follows: "Shell widely umbilicated, discoidal; epidermis greenish; whorls about 4, visible on the base of the shell as well as above, with numerous equidistant, parallel, raised lines revolving upon them; suture much impressed; aperture remote from the axis, semi-lunate, narrow, not expanding; peristome acute, thin; umbilicus wide, forming a concave depression of the base, each volution visible to the apex; within the aperture, on the external circumference, are placed from 1 to 3 pairs of minute, conical, white teeth, the first pair in sight when looking into the aperture, the others more remote. Greater diameter 3.5, lesser 3, height 1.5 mm."

Type Locality: Upper Missouri.

Alabama Records:

Baldwin Co.; Point Clear; Magnolia Springs.	Barbour Co.; Elamville.
Blount Co.; Blount Springs.	Choctaw Co.; Silas.
Clarke Co.; Grove Hill.	Conecuh Co.; Evergreen.
Cullman Co.; Cullman.	Dallas Co.; Pleasant Hill; Selma.
Elmore Co.; Wetumpka.	Fayette Co.; Fayette; Forks of Sipsey.
Franklin Co.; Russellville; Burleson.	Greene Co.; Boligee.
Jackson Co.; Cumberland Plateau; Stevenson.	Princeton; Woodville.
Jefferson Co.; Squaw Shoals.	Lauderdale Co.; Florence.
Lee Co.; Auburn; Jester.	
Madison Co.; Huntsville; Gurley; Smithers' Mt., Huntsville; Monte Sano.	
Mobile Co.; Mobile.	Monroe Co.; Monroe.
Montgomery Co.; McGee's Station.	Perry Co.; Uniontown.
Randolph Co.; Roanoke.	Shelby Co.; Calera; Weduska Shoals.
St. Clair Co.; Shoal Creek; Whitney.	Sumter Co.; Epes.
Talladega Co.; Horseblock Mountain.	
Tuscaloosa Co.; Duncanville; Hagler; Holt; Tuscaloosa.	
Wilcox Co.; Gastonburg.	



FIG. 178. *Helicodiscus parallelus* (Binney).

This common and well known species has a general distribution over the state.

It was originally described from Philadelphia by Say as *Helix lineata*, but that name being preoccupied, Dr. Pilsbry has revived for it the *Planorbis parallelus* of Say, which was based upon specimens of the same species.

SUBFAMILY PUNCTINÆ MORSE

Jaw in numerous, distinct pieces, sometimes soldered together above, free and imbricated below. Marginal teeth quadrate.

GENUS PUNCTUM MORSE

Shell minute, thin, subdiscoidal, but with convex spire, openly umbilicated; unicolored; whorls about 4, convex, the apical 1.5 smooth, rather distinctly marked from the following whorls, which have oblique striae or irregular riblets and excessively fine spiral striae; the last whorl cylindrical, not descending in front. Aperture

lunate, rounded; lip simple, thin.

Jaw arcuate or horse-shoe shaped, composed of numerous separate rhomboidal plates, bound together by a thin transparent membrane, more or less overlapping, the outer imbricating over the inner plates; the median two or three plates slightly separated, not overlapping.

Radula rather long and narrow; teeth rather separated, not in the least overlapping, centrals tricuspid, the mesocone longest, but not as long as the narrow basal-plate, side cusps small. Lateral teeth having wider rhombic basal-plates and bicuspid, the mesocone having a longer cusp. Marginal teeth not differentiated in any way from the laterals, but becoming lower with shorter cusps.

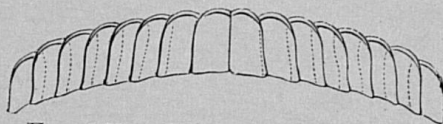


FIG. 179. Jaw of *P. pygmaeum* (Binney).

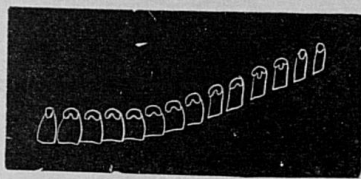


FIG. 180. Radula of *P. pygmaeum* (Binney).

Punctum blandianum Pilsbry

Punctum blandianum Pilsbry, Proc. A. N. S. P., 1900, p. 148, text fig. 1; Wheeler, Nautilus, XXVI, 1912, p. 16.

Original Description: "The umbilicus is much wider than in *P. pygmaeum*, its width contained between 2.66 and 2.75 times in the total diam. of

the shell. The aperture is smaller than in *P. pygmæum*. Whorls 3.5; color brown; surface-sculpture about as in *P. pygmæum*—very fine but rather sharp striae along the growth-lines and nearly obsolete spiral striae. The spire is low conoidal, about as in *P. pygmæum*.

"Alt. .6, diam. 1.15 mm." (Pilsbry.)

Type Locality: Cade's Cove, Blount Co., Tennessee.

Alabama Records:

Jackson Co.; Stevenson.

Lauderdale Co.; Florence.

Madison Co.; Monte Sano; Huntsville.

Punctum pygmæum (Draparnaud)

Helix pygmæa Draparnaud, Tabl. Moll., 1801, p. 93; Hist. Moll., 1805, p. 114, pl. VIII, figs. 8-10.

Microphysa pygmæa W. G. Binney, Manual, 1885, p. 71, fig. 31.

Punctum pygmæum Sargent, Nautilus, VI, 1892, p. 77; Wheeler, Bull. XXV, 1912, p. 125.

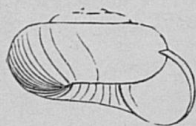


FIG. 182. *P. pygmæum* (Binney).

Original Description: "Coquille grisâtre, cendrée et d'un brun pale, aplatie, mais un peu convexe en dessus, finement et legerement stree, un peu transparente. Spire composee de quatre tours, qui augmentent graduellement. Suture profonde. Ouverture arrondie, semi-lunaire, et un peu plus large que haute. Peristome simple. Omphalic evase." (Draparnaud.)

Binney's description is as follows: "Shell umbilicated, subglobose, reddish horn-color, shining, marked with strong transverse striae and microscopic revolving lines, both most prominent near the umbilicus; whorls 3.5, convex, gradually increasing, the last broadly umbilicated; aperture subcircular, oblique; peristome simple, acute, its columellar extremity subreflexed. Greater diameter, 1.5 mm.; height, 1 mm."

Type Locality: Lyons, France.

Alabama Records:

Baldwin Co.; Foley.

Choctaw Co.; Silas.

Conecuh Co.; Evergreen.

Elmore Co.; Wetumpka.

Jefferson Co.; Squaw Shoals.

Madison Co.; Huntsville; Monte Sano.

Montgomery Co.; McGee's Station.

Shelby Co.; Calera.

Tuscaloosa Co.; Hagler; Tuscaloosa.

Chambers Co.; Langdale.

Cleburne Co.; Dugger Mt., Piedmont.

DeKalb Co.; Valley Head.

Jackson Co.; Princeton; Woodville.

Lauderdale Co.; Florence.

Mobile Co.; Mobile.

Randolph Co.; Roanoke; Wadley.

Sumter Co.; Livingston.

Walker Co.; Forks of Warrior.

This minute, but very characteristic species has apparently a general distribution over the state, but is apt to be overlooked on account of its small size.

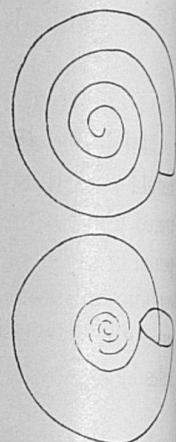


FIG. 181. *P. blanda* (Pilsbry).

SUPERFAMILY AGNATHOMORPHA

FAMILY OLEACINIDÆ

Holopoda with a pair of dorsal but no lateral furrows; no coherent jaw; radula armed with unicuspid thorn-shaped teeth; cerebral ganglia concentrated, the commissure very short. Genitalia haplogonous or with accessory penial organs. Shell elongate, never depressed, spiral, generally capable of containing the soft parts, the aperture narrow or small, the columella usually truncate or sinuous at the base. Oviparous, the elliptical egg-capsules hard-shelled, roughened and white.

GENUS EUGLANDINA CROSSE & FISCHER

Shell usually of large or moderate size, oblong, fusiform or ovate, typically with striate or decussate surface and without distinct varices; but in some forms the surface is smooth, and sometimes varices are present. Columella abruptly truncate at the base; outer lip unexpanded, simply arched forward or straight. Whorls 6 to 9.

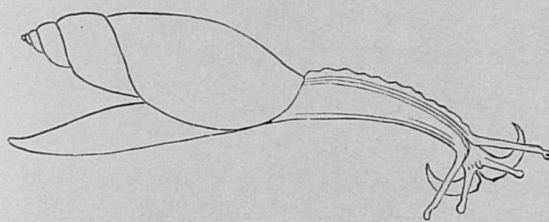


FIG. 183. Animal of *E. rosea* ($\frac{1}{2}$ nat. size) (Binney).

Animal heliciform, elongated, narrowed anteriorly; eye-peduncles long, having the eyes on the posterior face, behind the tips, which are deflected; tentacles half the length of the eye-peduncles, bulbous, and somewhat deflected at tip; one each side of the oral aperture is a retractile, palpiform appendage, attenuated at the tip and more or less recurved, nearly as long as the eye-peduncle, the bases separated by a fissure in front.

This genus is one of the simplest of the family in genitalia. The long penis has no flagellum. Its retractor muscle is terminal in the large typical species. There is no epiphallus distinctly differentiated from the vas deferens. The mantle over the liver has black markings. A crop is developed.

The radula is large, with V-shaped rows of teeth.

The narrow central tooth has a small cusp. The side teeth increase in size and then gradually decrease.

Euglandina rosea (Ferussac)

Helix rosea Ferussac, Prodrôme, Tabl. Syst. des An. Moll., 1921, p. 50.

Glandina truncata Lewis, Ala. F. W. & L. Shells, 1876, p. 27; W. G. Binney, Manual, 1885, p. 348, fig. 377; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 357; Hinkley, Nautilus, XX, 1906, p. 35.

Euglandina rosea Pilsbry, Man. Conch., XIX, 1907, p. 191.

Original Description: Not seen.

Binney's description is as follows: "Shell strong, ovate-fusiform, or ellipsoidal, obtuse at tip, of a pale ashy fawn-color, or rather alternately striped with ash-color and fawn-

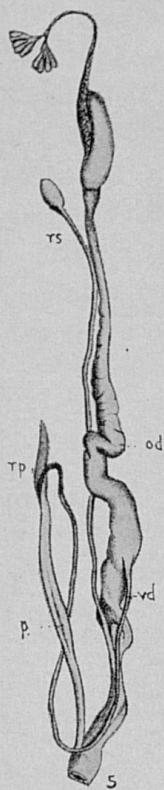


FIG. 184.
Genitalia of
Euglandina
(Pilsbry).

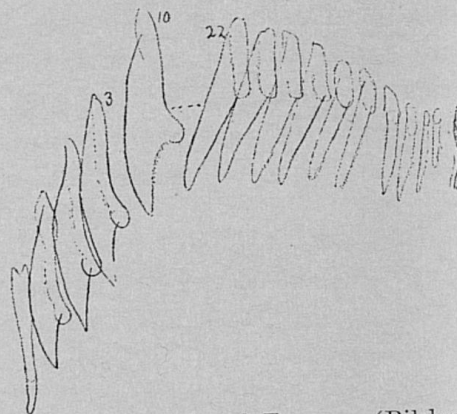


FIG. 186. Radula of *E. rosea* (Pilsbry).

color and more or less tinted rose-color, the surface shining and delicately fluted with longitudinal, raised, and rounded striae; whorls 6 or 7, moderately convex, the last constituting three-fourths the length of the shell, somewhat compressed at the middle, so as to become in a measure cylindrical, narrowing forward and rounded at the base; suture strongly marked, delicately crenulate; aperture about half the length of the shell, often more, and twice as long as broad, narrow, ovate-lunate, acute posteriorly, obtusely rounded anteriorly; peristome nearly rectilinear at its middle portion and springing somewhat forward; columella arched at its lower portion and decidedly truncate at base; throat salmon-colored; edge of peristome pale. Average length, 37 mm., often very much longer, even 100 mm.; breadth somewhat more than one-third the length."

Type Locality: ?

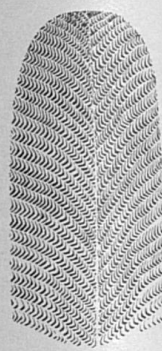


FIG. 185.
Radula of
E. rosea
(Binney).

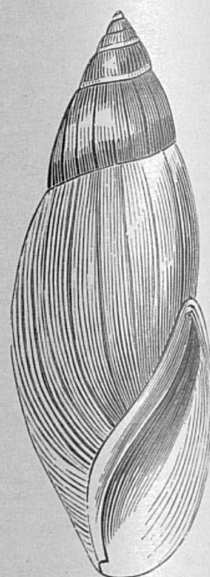


FIG. 187. *E. rosea*
(Binney).

Alabama Records:

Baldwin Co.; Magnolia Springs; Point Clear.	Barbour Co.; Elamville.
Bibb Co.; Bibb Co.	Choctaw Co.; Wood's Bluff; Black Bluff, Silas; Bladon Springs.
Clarke Co.; Jackson.	Crenshaw Co.; Patsaliga River.
Conecuh Co.; Herbert; Evergreen.	Dale Co.; Pinckhard.
Elmore Co.; Grandview, S. W. corner; Wetumpka; Mountain Creek, between Wetumpka and Calera.	Greene Co.; Boligee.
Geneva Co.; Geneva; Gillies' Mill Creek.	Macon Co.; Tuskegee.
Lee Co.; Auburn.	Montgomery Co.; McGee's Station; Barachias.
Mobile Co.; Mobile; Spring Hill.	Pike Co.; S. E. Corner near Pea River.
Perry Co.; Hamburg; Uniontown.	
Wilcox Co.; Pine Hill.	

This southern species is generally distributed in the south half of the state and extends as far north as Bibb Co., subfossil, according to Smith.

"This species is excessively variable, the extreme forms being more unlike in size, shape, texture, color and form of the columella than most acknowledged species of the genus. The sculpture, however, is much alike in all." (Pilsbry.)

FAMILY HAPLOTREMATIDÆ

Shell heliciform, depressed. Foot without pedal grooves or caudal mucus pore. Jaw ribless, with a median projection on the cutting margin. Radula with arcuate rows of teeth. Centrals short, rudimentary; marginals aculeate, with narrow basal plates.

GENUS HAPLOTREMA ANCEY

Shell thin, widely umbilicated, depressed, striate or wrinkled; unicolorous; whorls 4.5 to 5, the last broad, depressed, moderately deflexed in front; aperture obliquely ovate; peristome somewhat thickened, the margins approximating, the basal shortly reflexed; columella entire.

Animal heliciform; mantle posterior, covered with a shell; eye-peduncles long and slender; foot narrow, twice as long as diameter of shell, tail pointed, scarcely reaching behind the shell; respiratory and anal orifices on the right of the mantle under the peristome; generative orifice behind the right eye-peduncle; no distinct locomotive disk or caudal mucus pore.

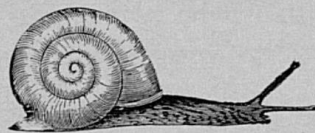


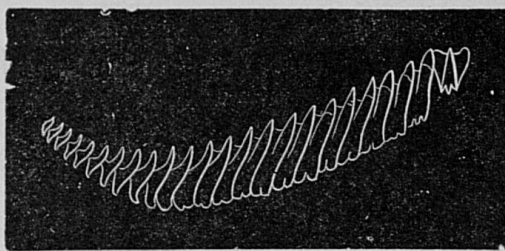
FIG. 188. Animal of *H. concava* (Binney).



FIG. 189.

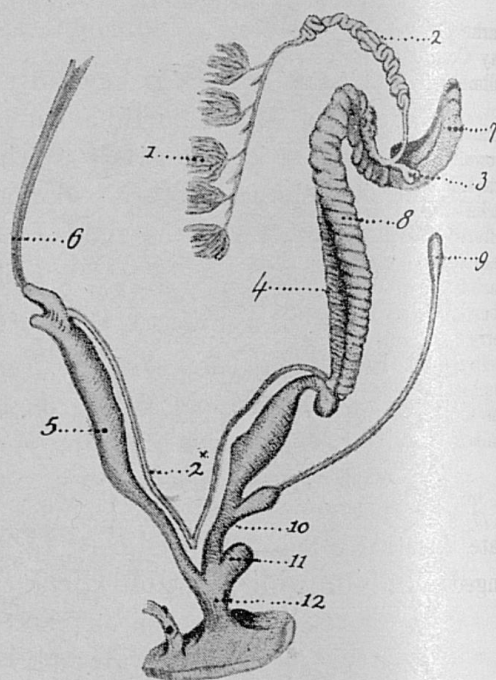
Jaw of *H. concava* (Binney).

Jaw crescentic, ends sharply pointed, anterior surface striated; cutting margin smooth, with a median projection. Radula with the rows of teeth arranged *en chevron*. Centrals very small, basal plate triangular, apex pointed forward, more or less truncated and incurved, lower lateral angles somewhat expanded, base incurved, uni or tricuspid; laterals wanting; marginals aculeate, with long, narrow basal plates.

FIG. 190. Radula of *H. concava* (Binney).

Penis long, clavate and bipartite at its summit; neck of the oviduct long, dilated at its lower part and strongly muscular and its internal surface presents a number of longitudinal rugæ; genital bladder is rather more than one-half the length of the oviduct; duct of the bladder at its termination dilates and is strongly muscular. Opening into the cloaca is a short, rounded muscular cavity, probably a dart sac.

According to H. B. Baker (Occ. Papers Mus. Zool., Univ. Mich., No. 156, 1924, pp. 14-15) *Circinaria*, the name by which this genus has been commonly known, can not be used for it, but *Haplotrema* Ancy must be substituted.

FIG. 191. Genitalia of *H. concava* (Binney).

1. Testicle. 2. Epididymis. 2^x Vas deferens. 3. Accessory gland of epididymis. 4. Prostate. 5. Penis. 6. Retractor penis. 7. Ovary. 8. Oviduct. 9. Genital bladder. 10. Vagina. 11. Dart sac? 12. Cloaca.

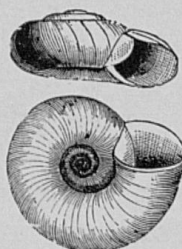
Haplotrema concava (Say)

Helix concava Say, Jour. A. N. S. P., II, 1821, p. 159.

Macrocyllis concava Lewis, Ala. F. W. & L. Shells, 1876, p. 27; W. G. Binney, Manual, 1885, p. 199, fig. 209; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 340.

Selenites concava Sargent, Nautilus, VI, 1892, p. 76.

Circinaria concava Hinkley, Nautilus, XX, 1906, p. 35; Wheeler, *ibid.*, XXV, 1912, p. 124.

FIG. 192.
H. concava
(Binney).

Original Description: "Shell much depressed, suborbicular, horn color, or whitish, immaculate; volutions five, irregularly wrinkled across, more convex beneath; suture distinctly impressed; umbilicus very large, exhibiting all the

volutions to the summit distinctly; aperture large, short; labrum towards the base very slightly and inconspicuously reflected." (Say.)

Type Locality: Not specified. "Inhabits Illinois and Missouri."

Alabama Records:

Baldwin Co.; Week's Bay. Bibb Co.; Bibb Co.
Blount Co.; Blount Springs. Calhoun Co.; Anniston.
Chambers Co.; Langdale.
Cherokee Co.; 10 m. S. E. of Center; Poole's Island, Coosa River; Slackland; Maple Grove.

Choctaw Co.; Silas.

Clarke Co.; Bashi Creek, 5 m. S. W. of Thomasville; Thomasville; Jackson.
Clay Co.; Pyriton. Cleburne Co.; Dugger Mt., Piedmont.
Cullman Co.; Wilhites. DeKalb Co.; Lookout Mountain; Valley Head.

Elmore Co.; 4 & 7 m. S. of Wetumpka.
Etowah Co.; Black Creek Falls; Keener; Gadsden.
Franklin Co.; Burleson. Greene Co.; Boligee.
Jackson Co.; Sand Mountain; Princeton; Stevenson; Woodville; Paint Rock.
Jefferson Co.; Squaw Shoals. Lauderdale Co.; Florence.
Madison Co.; Monte Sano; Hintsville; Gurley.
Marion Co.; Hamilton. Mobile Co.; Mobile.
Monroe Co.; Claiborne. Montgomery Co.; McGee's Station.
Perry Co.; Perry Co. Randolph Co.; Wadley.
Shelby Co.; Gurnee. St. Clair Co.; Whitney.
Sumter Co.; Epes. Talladega Co.; Horseblock Mountain.
Tuscaloosa Co.; Holt; Indian Creek; Tuscaloosa.
Walker Co.; Forks of Warrior. Wilcox Co.; Camden; Griggs' Landing.

This well-known carnivorous species has a general distribution over the state. In fully mature specimens the lip is slightly thickened and its edge tinged with reddish brown.

SUPERFAMILY ORTHURETHRA

FAMILY PUPILLIDÆ TURTON

Jaw smooth or finely striate, lower margin with or without a projection. Radula similar to that of the *Helicidæ*; central tooth of the same form and usually of the same size as the laterals, tricuspid; laterals bicuspid; marginals quadrate, wide, low, multicuspid.

Shell small or minute, oval, ovate, cylindric, turreted or conic and Helicoid; usually dextral, occasionally sinistral; usually imperforate, often perforate and sometimes umbilicate; peristome usually thickened, reflexed or reflected, occasionally simple and slightly or not expanded. Aperture usually with teeth (lamellæ and plicæ). These are typically six, but vary from none to a greater number.

The following is the nomenclature used by Pilsbry in the Manual of Conchology (XXIV, pp. vii-viii).

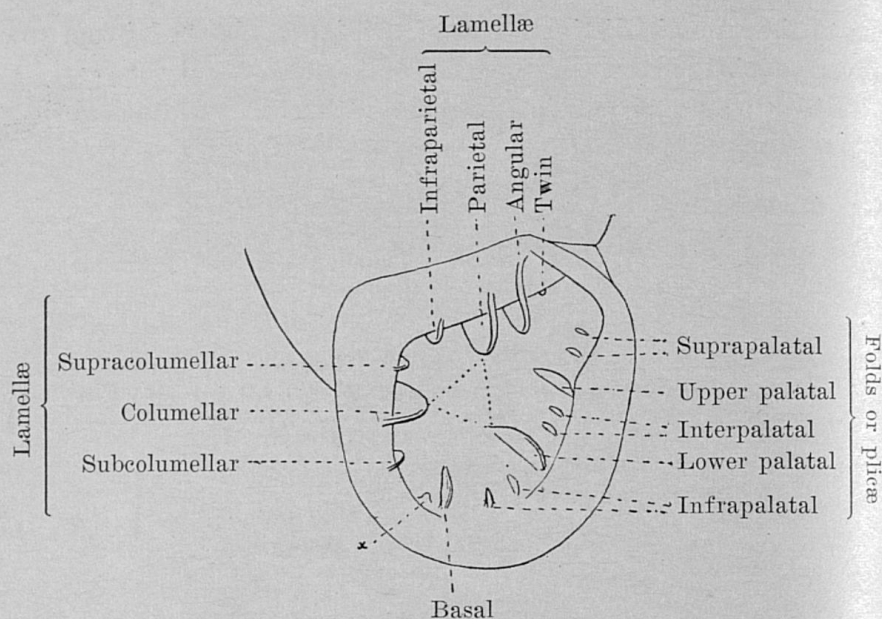


FIG. 193. Terminology of lamellæ and folds.

"The principal folds or teeth have definite positions and are homologous throughout the group.

"All teeth or laminæ upon the parietal and columellar margins are called *lamellæ*, whatever their shape; all within the outer lip are called *folds* or *plicæ*. In the following table the names of the secondary, usually variable teeth, are italicized.

"Upon the parietal wall	{	<i>Twin lamellæ, parallel lamellæ.</i>
		Angular lamella, <i>spiral lamella.</i>
		Parietal lamella.
		<i>Infraparietal lamella.</i>
"Upon the columella	{	<i>Supracolumellar lamella.</i>
		Columellar lamella.
		<i>Subcolumellar lamella.</i>
"Within the outer and basal margins	{	<i>Sutural and suprapalatal folds.</i>
		Upper palatal fold.
		<i>Interpalatal folds.</i>
		Lower palatal fold.
		<i>Infrapalatal folds.</i>
		Basal fold.

"The parietal and columellar lamellæ and the lower palatal fold usually are at the angles of an equilateral triangle, when the said fold is not deeply immersed. This is useful in fixing the identity of the plicæ, not always

clear in multidentate forms, or those in which there has been extensive reduction of teeth." (Pilsbry.)

SUBFAMILY GASTROCOPTINÆ PILSBRY

Pupillidæ with the lower tentacles developed, though generally short, the shell without lamellæ or plicæ in the neanic stage; typically having angular, parietal and columellar lamellæ and two or more palatal plicæ.

GENUS GASTROCOPTA WOLLASTON

Shell rimate or perforate, cylindric or ovate-conic, having angular and parietal lamellæ more or less completely united into one biramose, bifid, lobed or sinuous lamella (or rarely the angular lamella is wanting). Columellar lamella present; palatal folds developed (except in *G. corticaria*). Lip well expanded.

Foot short; tentacles are rather short but distinct. Sole not divided longitudinally.

SUBGENUS ALBINULA STERKI

Whitish-translucent Gastrocoptas having the inner end of the parietal lamella curved towards the periphery; angular lamella well developed, con-
rescent in varying degree with the parietal; the palatal plicæ stand upon a white palatal callous, and a suprapalatal plica is usually developed. Except in *G. armifera*, the columellar lamella is horizontal in front and curves towards the base within. The lip is thin and expanded.

Gastrocopta armifera (Say)

Pupa armifera Say, Jour. A. N. S. P., II, 1821, p. 162; W. G. Binney, Manual, 1885, p. 325, figs. 352-353; Sargent, Nautilus, VI, 1892, p. 77; Gratacap, Bull. Mus. Nat. Hist., XIV, 1901, p. 365.
Leucochila armifera Lewis, Ala. F. W. & L. Shells, 1876, p. 30.
Bifidaria armifera Hinkley, Nautilus, XX, 1906, p. 35; Wheeler, *ibid.*, XXV, 1912, p. 124.

Original Description: "Shell, dextral; oblong oval, or somewhat obtusely fusiform; suture distinct; whorls six, obsoletely wrinkled; aperture longitudinally subovate; exterior lip reflected, but not flattened, interrupted above by the penultimate whorl, and with five teeth, of which the superior one, and that which precedes the basal one, are smallest; labrum with an undulated lamelliform tooth, its anterior extremity little elevated, but elongated so as almost to join the superior extremity of the exterior lip.

"Length three-twentieths of an inch." (Say.)

Type Locality: Upper Missouri.

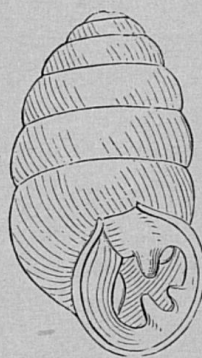


FIG. 194.
G. armifera
(Binney).

Alabama Records:

Choctaw Co.; Black Bluff; Moscow Bluff.	Clarke Co.; Thomasville.
Colbert Co.; Tuscumbia.	Dallas Co.; Pleasant Hill.
DeKalb Co.; Fort Payne; Valley Head.	Elmore Co.; Wetumpka.
Franklin Co.; Russellville; Burleson.	Greene Co.; Boligee.
Jackson Co.; Stevenson; Woodville.	Lauderdale Co.; Florence.
Madison Co.; Huntsville; Monte Sano.	Marengo Co.; Demopolis.
Mobile Co.; Mobile; Alabama Port; Magazine.	
Montgomery Co.; McGee's Station.	Perry Co.; Hamburg.
Shelby Co.; Calera.	Sumter Co.; Livingston; Epes.
Wilcox Co.; Gastonburg.	

This common and well known species has a general distribution all over the state. It is easily distinguished by its large size.

Gastrocopta armifera clappi (Sterki)

Bifidaria clappi Sterki, Nautilus, XXII, 1909, p. 108, pl. VIII, fig. 4.

Bifidaria clappi Wheeler, Nautilus, XXVI, 1912, p. 15.

Gastrocopta armifera clappi Pilsbry, Man. Conch., XXIV, 1916, p. 20, pl. 1, figs. 7-9.

Original Description: "Shell glossy, colorless to milky-whitish, perforate, cylindrical in the lower 3-4 whorls, conical or subconical above, with a rather acute apex; whorls 6.5 to 7.5, the upper ones rather narrow, the lower ones broader and less convex, the last moderately large, ascending at the aperture, somewhat narrow but rounded at the base, slightly flattened over the palate; surface shining, with slight irregular to subregular striae; aperture nearly oval, margins approximate; peristome everted, not thickened, but there is a slight to rather strong white callus in the palate; lamellae and plicae: parieto-angular distinctly complex, rather long, moderately elevated, connecting with the peristome near its outer upper terminus (much as in *B. armifera*), the spur of the parietal moderately large; columellar axial spiral, with the lower end nearer the aperture, and rather abrupt, or somewhat bifurcate; 'basal' (inferior columellar) slight or wanting; upper and lower palatals regular, an interpalatal in many specimens; suprapalatal wanting or quite small.

"Alt. 3.5-4 (rarely 3.2 to 3.4), diam. 1.9-2.1 mm.; aperture alt. 1.5, diam. 1.2 mm." (Sterki.)

Type Locality: Knoxville, Tennessee.

Alabama Records: Madison Co.; Gurley; Huntsville; Monte Sano.

"*B. clappi* is remarkable for its resemblance to some forms of *B. armifera* Say, for a variety of which it has been taken. The most tangible difference is in the shape of the columellar lamella. The shell averages somewhat smaller, the apex is more acute, the surface striae are finer and slighter, the lower palatal plica is always regular." (Sterki.)

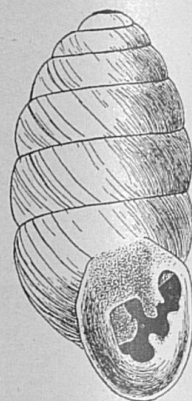


FIG. 195. *G. armifera clappi* (Sterki).

"The chief differential character of this race is in the shape of the columellar lamella. In a profile view (fig. 8) it is seen that the plane of the lamella is straight very nearly to the base, while in *armifera* the greatest projection forward is well above the base. The anterior branch of the columellar lamella, which is more or less apparent in *armifera*, is wanting in *clappi*, being concrescent with the lower end of the main lamella (compare figs. 4 and 8). In view of the variability of the columellar lamella in *armifera*, it does not appear to me that this small modification is of specific importance." (H. A. P.)

Gastrocopta contracta (Say)

Pupa contracta Say, Jour. A. N. S. P., II, 1821, 374; W. G. Binney, Manual, 1885, p. 327, fig. 353.5; Sargent, Nautilus, VI, 1892, p. 77.

Leucochila contracta Lewis, Ala. F. W. & L. Shells, 1876, p. 30.

Bifidaria contracta Hinkley, Nautilus, XX, 1906, p. 35; Wheeler, *ibid*, XXVI, 1912, p. 15.

Gastrocopta contracta Pilsbry, Man. Conch., XXIV, 1916, p. 22, pl. 2, figs. 9-12.

Original Description: "Shell dextral, short, subovate, white; apex obtuse; whorls five; umbilicus distinct; aperture regularly orbicular, complete, the lamina of the labium being elevated above the surface of the preceding whorl, and joining the extremities of the labia; labium with a large, elongated, prominent tooth, which is concave on the side towards the labrum; labrum bidentate, a large tooth or fold far within the throat, caused by a fold of the umbilicus; throat much contracted by the large tooth of the labrum into the form of a horse-shoe.

"Total length less than one-tenth of an inch." (Say.)

Type Locality: Occoquan, Virginia.

Alabama Records:

Baldwin Co.; Magnolia Creek.	Barbour Co.; Elamville.
Blount Co.; Blount Springs.	Chambers Co.; Langdale.
Clarke Co.; Jackson.	Conecuh Co.; Evergreen.
Dallas Co.; Pleasant Hill.	Franklin Co.; Russellville.
Greene Co.; Boligee.	
Jackson Co.; Princeton; Stevenson; Sand Mt.	Pisgah; Woodville.
Jefferson Co.; Squaw Shoals.	Lauderdale Co.; Florence.
Madison Co.; Huntsville; Gurley; Monte Sano.	
Mobile Co.; Mobile.	Montgomery Co.; McGee's Station.
Perry Co.; Hamburg.	Randolph Co.; Roanoke; Wadley.
Sumter Co.; Livingston.	Talladega Co.; Horseblock Mountain.
Tuscaloosa Co.; Hagler; Duncanville.	Walker Co.; Forks of Warrior.
Washington Co.; Twenty Mile Bluff.	Wilcox Co.; Pine Hill; Gastonburg.

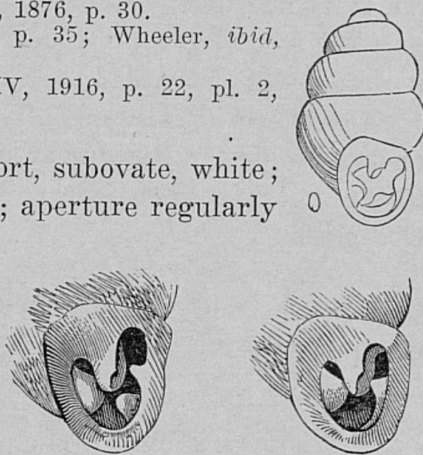


FIG. 196. *G. contracta* (Binney).

"This species is readily known by the conic shape, and peculiar aperture, nearly closed by the large teeth. There is some variation in the shape, some individuals being more shortly conic than that figured. Also in the prominence of the low ridge or crest behind the outer and basal lips, which varies from strong to very weak." (Pilsbry.)

Generally distributed over the state.

Gastrocopta contracta climeana (Vanatta)

Bifidaria contracta climeana Vanatta, Proc. A. N. S. P., 1911, p. 525, figs. 1-3.

Gastrocopta contracta climeana Pilsbry, Man. Conch., XXIV, 1916, p. 24, pl. 3, figs. 1, 4.

Original Description: "Shell similar to typical *contracta* Say, but the parietal tooth lacks the inner continuation, being L-shaped." (Vanatta.)

Type Locality: Anderson Landing, on the Sunflower River near the confluence with the Yazoo River, Sharkey Co., Miss.

Alabama Records: Elmore Co.; Shelby Co.; Calera.

"Southern United States: Gulf coastal plain from Alabama to Texas etc." (Pilsbry.)

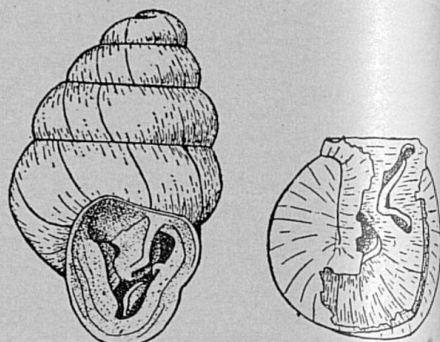


FIG. 197. *G. contracta climeana* (Vanatta).

SUBGENUS VERTIGOPSIS "COCKERELL" STERKI

Vertigopsis differs from *Sinalbinula* chiefly by the weakness of the parietal lamellæ, the angular being very small or wanting, and the parietal short and simple.

It is not directly related to other American groups of the genus, having evidently been derived from the Asiatic section *Sinalbinula*.



FIG. 198.
Animal
of *G. tappaniana*
(Binney).

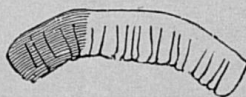


FIG. 199. Jaw of
G. tappaniana
(Binney).

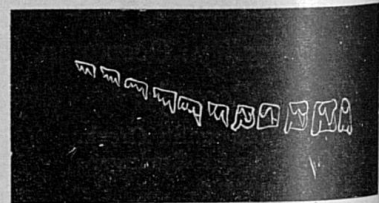
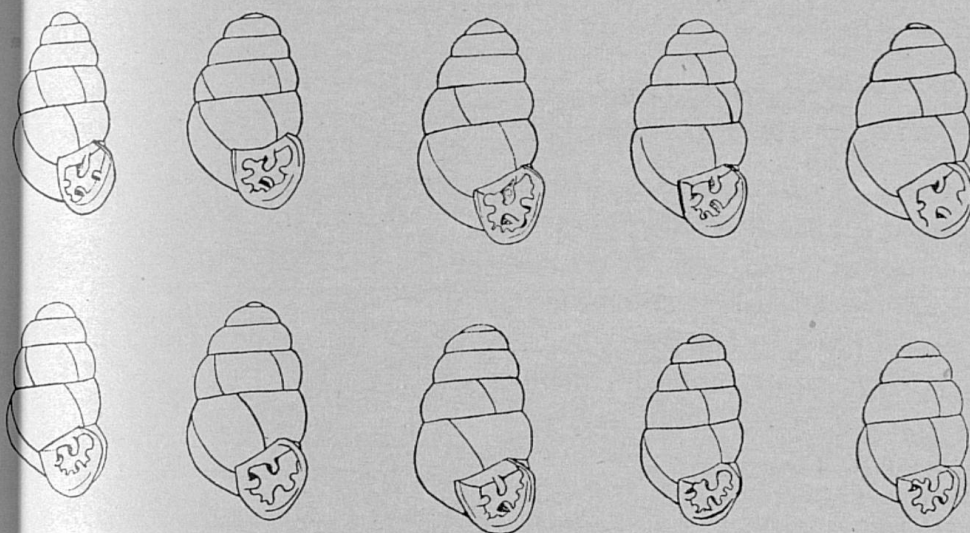


FIG. 200. Radula of *G. tappaniana* (Binney).

Animal black or blackish above, lighter below; foot moderately long; transverse fissure very distinct, the anterior portion having the mouth in the centre and bilobate in front.

Jaw slightly arcuate, of uniform breadth, ends blunt, anterior surface longitudinally striate, cutting edge minutely notched.

Radula: Centrals very narrow, tricuspid; laterals square, bicuspid; marginals serrate, the inner point much developed.

Gastrocopta pentodon (Say)*Vertigo pentodon* Say, Jour. A. N. S. P., II, 1822, p. 476.*Pupa curvidens* Sargent, Nautilus, VI, 1892, p. 77.*Bifidaria pentodon* Wheeler, Nautilus, XXVI, 1912, p. 15.*Gastrocopta pentodon* Pilsbry, Man. Conch., XXIV, 1916, p. 28, pl. 3, figs. 2, 3, 5-8; pl. 4; pl. V, figs. 28-41.FIG. 201. *G. pentodon*-(P. & V.).

Original Description: "Shell dextral, subovate, whitish horn color; apex obtuse, whorls five, glabrous, convex; suture not very deeply impressed; aperture semioval; labium two toothed, of which a single very prominent one is on the middle of the transverse portion or true labium, and the other is remote, much smaller, and placed in the basal angle of the columella; labrum regularly arquated, tridentate, tooth nearest the base very small, and placed near the smaller tooth of the columella, the two others larger, subequal; umbilicus distinct.

"Length less than one-tenth of an inch." (Say.)

Type Locality: Pennsylvania.

Alabama Records:

Baldwin Co.; Week's Bay; Magnolia Springs.

Chambers Co.; Langdale.

DeKalb Co.; Valley Head.

Franklin Co.; Russellville.

Jefferson Co.; Squaw Shoals.

Madison Co.; Huntsville; Monte Sano.

Montgomery Co.; McGee's Station.

Randolph Co.; Roanoke; Wadley.

Sumter Co.; Epes.

Tuscaloosa Co.; Hagler; Tuscaloosa.

Washington Co.; Twenty Mile Bluff.

Wilcox Co.; Pine Hill; Gastonburg; Alberta.

Blount Co.; Blount Springs.

Conecuh Co.; Evergreen.

Elmore Co.; Wetumpka.

Jackson Co.; Stevenson; Woodville.

Lauderdale Co.; Florence.

Mobile Co.; Mobile; Mt. Vernon; Coden.

Perry Co.; Hamburg.

Shelby Co.; Calera.

Talladega Co.; Horseblock Mountain.

Walker Co.; Forks of Warrior.

"This widely-spread species may be recognized by the small size, spermaceti or bluish-white color and simple parietal tooth, with lip-teeth arranged on a white callus rim." (Pilsbry.)

Generally distributed.

Gastrocopta pentodon gracilis (Sterki)

Pupa curvidens gracilis Sterki, Nautilus, II, 1890, p. 119; Sargent, *ibid.*, VI, 1892, p. 77.
Bifidaria pentodon gracilis Wheeler, Nautilus, XXVI, 1912, p. 15.

Gastrocopta pentodon gracilis Pilsbry, Man. Conch., XXIV, 1916, p. 31, pl. 4, figs. 16-27.

Original Description: "Long, slender, nearly cylindrical, with only 5 typical lamellæ, no accessory ones; the color is somewhat greenish, and in weathered specimens not so white as in the type." (Sterki.)

Type Locality: New Philadelphia, O.

Alabama Records:

Conecuh Co.; Evergreen.

Elmore Co.; Wetumpka.

Greene Co.; Hamburg.

Madison Co.; Huntsville; Monte Sano; Gurley.

Sumter Co.; Epes; Livingston.

DeKalb Co.; Valley Head; Big Wills Valley.

Jackson Co.; Woodville; Stevenson.

Wilcox Co.; Gastonburg.

"This is usually larger, more cylindric, with 5 teeth, though perfectly mature shells may have as few as 3 or as many as 6 or 7. It was originally described from New Philadelphia, Ohio, but those figured are from Alabama; figs. 16, 17, 21 to 27 from around Wetumpka; 18, 19 from Woodville; 20 from Big Wills Valley." (Pilsbry.)

Gastrocopta tappaniana (C. B. Adams)

Pupa tappaniana C. B. Adams, Thompson's History of Vermont, 1842, p. 158.

Bifidaria tappaniana Wheeler, Nautilus, XXV, 1912, p. 124.

Gastrocopta tappaniana Pilsbry, Man. Conch., XXIV, 1916, p. 33, pl. 3, fig. 9; pl. 5, figs. 42-53.

Original Description: "Shell very small, pale horn-color, translucent, tapering above the penultimate whorl; whorls a little more than five, convex, with a well impressed suture; aperture sub-orbicular (the penult whorl cutting off about one-third of the circle), about one-third of the length of the shell; margin sharp, with a narrow contraction in the submargin, beneath which is a thickening within on which are the labial teeth; teeth eight, five primary and three secondary; of the former the largest is on the penultimate whorl, the next largest on the left side of the aperture; at the base, beginning at the left hand, is a primary, then a secondary, a primary, a secondary, a primary and another secondary, extending nearly to the upper

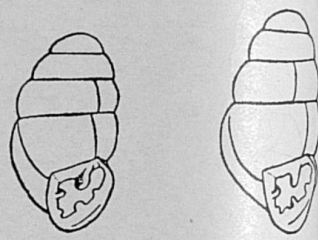
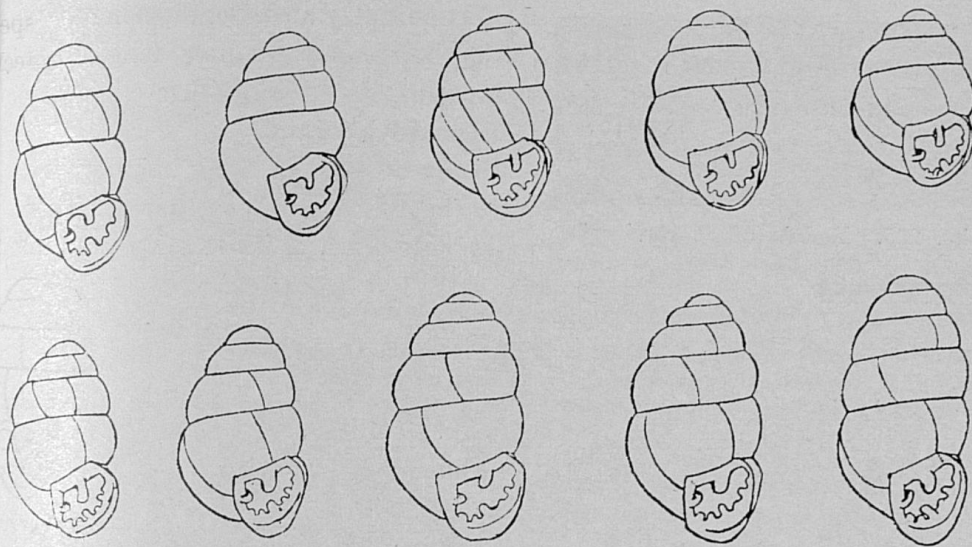


FIG. 202. *G. pentodon gracilis* (P. & V.).

FIG. 203. *G. tappaniana* (P. & V.).

extremity of the right margin; the last three primaries are not constant in size; umbilicus open. Length 0.08 inch; breadth 0.05 inch." (Adams.)

Type Locality: Not specified.

Alabama Records:

Baldwin Co.; Magnolia Springs.	Chambers Co.; Langdale.
Choctaw Co.; Silas.	Clarke Co.; Thomasville; Jackson.
Conecuh Co.; Evergreen.	DeKalb Co.; Valley Head.
Elmore Co.; Wetumpka.	Fayette Co.; Forks of Sipsey River.
Jackson Co.; Cumberland Plateau; Stevenson;	Princeton; Paint Rock.
Jefferson Co.; Henry Ellen.	Lauderdale Co.; Florence.
Madison Co.; Monte Sano; Huntsville;*	Marengo Co.; Demopolis.
Gurley.	
Mobile Co.; Mobile; Oak Grove.	Montgomery Co.; McGee's Station.
Perry Co.; Hamburg; Marion.	Shelby Co.; Calera.
Sumter Co.; Epes; Livingston.	Tuscaloosa Co.; University; Tuscaloosa.
Wileox Co.; Gastonburg; Pine Hill; Alberta.	

"The shell is larger than *pentodon*, markedly conic though obtuse; only one tooth on the parietal wall, usually 6 on the columellar, basal and outer margins, those on the latter standing on a strong rib." (H. A. P.)

SUBGENUS PRIVATULA STERKI

The shell is whitish, without palatal callous or folds, the columellar lamella minute, tubercular, angulo-parietal lamella small and straight, its crest bilobed.

Animal with the body as long as the shell; head, back and tentacles smoky or claret colored, posterior portion bluish; disk white, tail unevenly rounded, body coarsely granulated; eye-peduncles long and slender, eyes very large and conspicuous; tentacles short and obtuse.

FIG. 204. Jaw of *G. corticaria* (Binney).

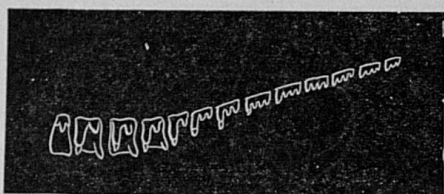


FIG. 205. Radula of *G. corticaria* (Binney).

Jaw slightly arcuate, tapering towards the pointed ends, centre longitudinally striate; cutting edge with a slight, broad median projection.

Radula: centrals long, narrow, tricuspid; laterals nearly square, bicuspid; marginals serrate, inner cusp prominent.

Gastrocopta corticaria (Say)

Odostomia corticaria Say, Nich. Encyc., IV, 1817, pl. IV, fig. 5.

Leucochila corticaria Lewis, Ala. F. W. & L. Shells, 1876, p. 30.

Pupa corticaria W. G. Binney, Manual, 1885, p. 330, figs. 355-356; Sargent, Nautilus, VI, 1892, p. 77.

Bifidaria corticaria Wheeler, Nautilus, XXVI, 1912, p. 15.

Gastrocopta corticaria Pilsbry, Man. Conch., XXIV, 1916, p. 52, pl. 10, figs. 1-4.

Original Description: "Shell dextral, cylindrical, obtuse at the apex; whorls five, not precipitately wrinkled or striate; aperture suborbicular, lip reflected; a single tooth on the pillar-lip, near the outer angle; inner angle with an angular projection resembling a second tooth, sometimes obsolete.

"Length about the tenth of an inch." (Say.)

Type Locality: Not specified.

Alabama Records:

Blount Co.; Blount Springs.

Clarke Co.; Thomasville.

DeKalb Co.; Valley Head.

Greene Co.; Boligee.

Lauderdale Co.; Florence.

Mobile Co.; Eight Mile Creek, Mobile; Whistler.

Randolph Co.; Roanoke.

Franklin Co.; Russellville.

Jackson Co.; Princeton; Stevenson; Woodville.

Madison Co.; Huntsville; Gurley; Monte Sano.

Sumter Co.; Epes.

"*G. corticaria* has the teeth more reduced than in any other *Gastrocopta*. The angular lamella is variable, sometimes rather well developed, sometimes minute, and scarcely united with the parietal lamella, and in some apparently mature shells it is entirely wanting. The very low columellar lamella runs vertically on the back of the rather large axis, and either turns outward in a short horizontal limb at the lower end, or a very low tubercle, visible from in front, stands in front of its lower end." (Pilsbry.)

Of general distribution over the northern and western part of the state, but has not been reported from the southeastern portion.

SUBGENUS GASTROCOPTA WOLLASTON

Shell rimate, cylindric or oblong-conic, having the angular and parietal lamellæ conerescent into a sinuous or bifid lamella; columellar lamella



FIG. 206. *G. corticaria* (Binney).

horizontal, short. Palatal folds not standing upon a callous ridge, the upper and basal sometimes wanting, the basal, when present, in the base of the aperture, not subcolumellar in position.



FIG. 207. Radula of *G. rupicola* (Binney).

Jaw low, wide, slightly arcuate; ends but little attenuated, blunt; no median projection to cutting edge.

Radula as usual in the genus. The cusps on the laterals, however, are very much stouter.

Gastrocopta rupicola (Say)

Pupa rupicola Say, Jour. A. N. S. P., II, 1821, p. 163; W. G. Binney, Manual, 1885, p. 328, fig. 354.

Leucochila rupicola Lewis, Ala. F. W. & L. Shells, 1876, p. 30.

Gastrocopta rupicola Pilsbry, Man. Conch., XXIV, 1916, p. 58, pl. 11, figs. 1-3, 5, 6.

Original Description: "Shell dextral, attenuated to an obtuse apex, white; whorls six, glabrous; suture deeply impressed; labrum bidentate; superior tooth lamelliform, emarginate in the middle, and at the anterior tip obtusely uniting with the superior termination of the labium; inferior tooth placed upon the columella, and extending nearly at a right angle with the preceding; labrum, tridentate, teeth placed somewhat alternately with those of the labium, inferior tooth situated at the base and immediately beneath the inferior tooth of the labium.

"Length about one-tenth of an inch." (Say.)

Type Locality: Fort Picolata, St. John River, Florida.

Alabama Records:

Baldwin Co.; Week's Bay; Point Clear; Magnolia Creek.
Mobile Co.; Mobile.

"This species tapers upwards much more than *G. procera*, which is sub-cylindric. In *G. rupicola*, the outer and basal margins of the peristome are spreading, broad, and conspicuously thickened by a heavy white callous within the sharp edge. The color varies from very pale brown to corneous, the surface being very finely, rather irregularly striate." (Pilsbry.)

A Floridian and West Indian species that has been detected only in the extreme southwestern corner of the state.

Gastrocopta procera (Gould)

Pupa procera Gould, Jour. B. S. N. H., III, 1840, p. 401, pl. III, fig. 12.

Bifidaria procera Hinkley, Nautilus, XX, 1906, p. 35; Wheeler, *ibid.*, XXV, 1912, p. 124.

Gastrocopta procera Pilsbry, Man. Conch., XXIV, 1916, p. 62, pl. 12, figs. 1-5.

Pupa rupicola (pars) W. G. Binney, Manual, 1885, p. 329.

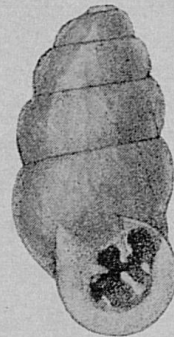


FIG. 208. *G. rupicola* (Pilsbry).

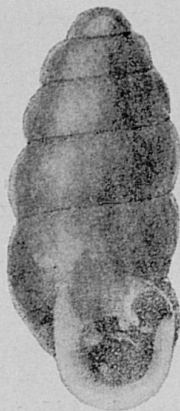


FIG. 209.
G. procera
(Pilsbry).

Original Description: "Shell elongated, ovate-cylindrical, obtuse at apex, of a brownish horn-color; whorls six, convex, the three anterior ones of nearly equal diameter, and the three posterior ones forming a very obtuse apex; suture deep; aperture semi-oval, rather longer than broad; lip brown, somewhat incumbent at the middle of the right side, unequally reflected, not flattened, and curving at an abrupt angle before it joins the preceding whorl; throat armed with five teeth; one on the middle of the transverse lip is compressed, stretching towards the junction of the outer lip, and emarginate at the middle, sometimes even bicuspid; a conical one on the pillar a little below its junction with the transverse lip, and sometimes there is a small denticle at the base of this; a smaller one at the anterior termination of the pillar; a small one, often wanting or inconspicuous without a large magnifier, about the middle of the outer lip; and the fifth, broad and considerably elevated, seen at the very depth of the cavity of the aperture as we look down into it, opposite to the tooth of the transverse lip; umbilicus small and open. Length 1/10 in.; breadth 1/30 in." (Gould.)

Type Locality: Baltimore, Md.

Alabama Records:

DeKalb Co.; Valley Head.
Greene Co.; Boligee.
Madison Co.; Huntsville; Monte Sano.
Mobile Co.; Mobile; Oak Grove.
Perry Co.; Uniontown; Marion; Hamburg.
St. Clair Co.; Whitney.
Tuscaloosa Co.; Tuscaloosa.

Elmore Co.; Wetumpka.
Lauderdale Co.; Florence.
Marengo Co.; Demopolis.
Montgomery Co.; Montgomery; Barachias.
Shelby Co.; Calera.
Sumter Co.; Epes; Livingston; York.
Wilcox Co.; Gastonburg.

"*G. procera* differs from *G. rupicola* by its dark color, tinted or dark-colored lip, and more cylindric shape. Both have the lip heavily calloused within, but in continental *G. rupicola* the callous is always white, and the shell very pale." (Pilsbry.)

Generally distributed.

Gastrocopta procera riparia Pilsbry

Gastrocopta procera f. *riparia* Pilsbry, Man. Conch., XXIV, 1916, p. 65, pl. 12, fig. 6.

Original Description: "Columellar lamella shorter, no callous or nodule below it. Teeth whitish, the palatals usually smaller than typical." (Pilsbry.)

Type Locality: Galveston, Texas.

Alabama Records:

DeKalb Co.; Big Will's Valley, Valley Head.
Shelby Co.; Calera.



FIG. 210. *G. procera*
riparia (Pilsbry).

Gastrocopta pellucida (Pfeiffer)*Pupa pellucida* Pfeiffer, Symbolae ad Hist. Hel., I, 1841, p. 46.*Gastrocopta pellucida* Pilsbry, Man. Conch., XXIV, 1916, p. 75, pl. 15, figs. 1-3, 5.

Original Description: "The shell is small, cylindric, sub-perforate, pellucid, glossy, pale yellowish, most minutely striate, the apex rather obtuse; whorls 5.5, a little convex; aperture oblong, toothed; two large teeth on the columella, 3 or 4 very minute teeth in the circuit, not reaching to the edge; peristome simple, a little reflected. Length $4/5$, diam. $2/5$ of a line." (Pfeiffer.)

Length 1.75, diam. 0.8 mm.; 5 whorls.

Type locality: Cuba.*Alabama Records:*

Mobile Co.; Mobile; Mobile Co.

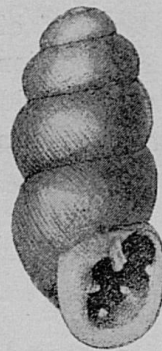


FIG. 211. *G. pellucida*
(Pilsbry).

"*G. pellucida* is cylindric-oblong, diameter almost equal at the last two whorls, those above tapering convexly to an obtuse apex. The color is 'corneous'—that is, an imperfectly transparent, very pale, grayish-buff, but on red soils the thin cuticle becomes stained, slightly cinnamon in some cases. The striation is well developed. The last whorl is strongly flattened over the lower palatal plica, and has no trace of a crest or ridge behind the lip. Peristome expanded, very slightly thickened within, corneous, the terminations remote. The angulo-parietal lamella is not very conspicuously bifid in front view. The columellar lamella is stout, horizontal, and has a small callous below its inner end, often not visible in a front view. The lower palatal plica is larger than the upper, and is placed a little deeper. Basal fold short but distinct.

"Length 1.7, diam. 0.75 mm.; nearly 5 whorls." (Pilsbry.)

This West Indian species has thus far been found only in Mobile County.

Gastrocopta pellucida hordeacella (Pilsbry)*Pupa hordeacella* Pilsbry, Proc. A. N. S. P., 1890, p. 44, pl. 1, figs. G-K.*Gastrocopta pellucida hordeacella* Pilsbry, Man. Conch., XXIV, 1916, p. 78, pl. 17, figs. 1-4; pl. XVI.

Original Description: "The shell is of a long-ovoid shape, smaller and more slender than *P. servilis* Gould, translucent, waxen-white, finely striate; the aperture is rounded, with a thin, expanded peristome. Within, there is on the parietal wall, an entering fold arising near the termination of the outer lip, its edge a trifle sinuous or nearly straight; the columella has a fold about in the middle. There is a tiny, deep seated fold on the base of the aperture, near the columella, an entering fold within the outer lip, equi-

Barachias.
York.

l or dark-
calloused
, and the

2, fig. 6.

G. procerus
(Pilsbry).

distant from the above-described parietal and columellar folds, and a tiny denticle above it. The columellar fold is not situated so high on the pillar as in *P. servilis*. The latter half of the body-whorl is flattened on the outer-lower portion, as the figure J. shows. There is a low wave-like ridge or 'crest' also, but scarcely visible in many specimens. Alt. 1.8, diam. .8 mm." (Pilsbry.)

Type Locality: New Braunfels, Texas.

Alabama Records:

Baldwin Co.; Week's Bay; Point Clear.
Mobile Co.; Mobile; Coden.

SUBFAMILY VERTIGININÆ PILSBRY

Pupillid snails without inferior tentacles.

Shells compact, oval, ovate or cylindric of quite small or minute size, usually 1.5 to 3 mm. long, from brown to amber or olivaceous color, having the 6 typical teeth of the family, or varying to none or to a greater number. The axis is perforate, but usually closed in the adult stage.

GENUS VERTIGO MULLER

Small, oval, oblong or ovate, compact Pupillids, the summit very blunt; usually glossy and some shade of brown. Aperture having the six typical teeth of Pupillidæ, none of them conerescent, part or all of them sometimes wanting; angular lamella not marginal when present. Outer lip straightened or bent inward in the middle.

Animal without inferior tentacles.



FIG. 214. Jaw of *V. ovata* (Binney).

Jaw more or less arched, ends but little attenuated blunt; anterior surface with delicate vertical striæ; cutting edge with a more or less developed median projection.

Radula long and narrow; centrals with basal plates higher than wide, subrectangular, tricuspid; laterals square or long and narrowing posteriorly, bicuspid or tricuspid, inner cusp slightly larger; marginals wide, low, with a broad, irregular, denticulated reflection.

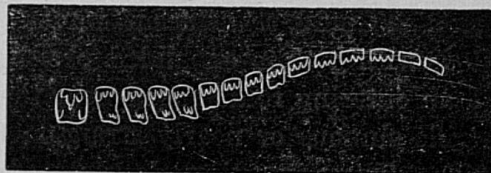


FIG. 215. Radula of *V. ovata* (Binney).



FIG. 212. *G. pellucida hordeacella* (Pilsbry).



FIG. 213. Animal of *Vertigo* (Leach).

SUBGENUS VERTIGO S.S.

Angular lamella, when present, standing free of the peristome, not emerging to the edge. Columellar lamella short, lamellar or toothlike, subhorizontal or inwardly ascending a little, sometimes absent.

Vertigo oralis Sterki

Vertigo rugosula ovulum Sterki (non Pfeiffer), Proc. A. N. S. P., 1890, p. 35.

Vertigo rugosula ovalis Pilsbry & Vanatta, Proc. A. N. S. P., 1900, p. 608 (error for *oralis*).

Vertigo rugosula oralis Pilsbry, Man. Conch., XXV, 1919, p. 78, pl. 8, figs. 5-7; Wheeler, Nautilus, XXVI, 1912, p. 15.

Original Description: "It is somewhat smaller (than *rugosula*) ovate, the striation and rugosity of the surface are less marked, and the inferior apertural (infraparietal) lamella is wanting; in turn it has in most examples a lamella at the base (between inferior columellar and inferior palatal) and the callus in the palatal wall is rather strong. The coloration of part of them is somewhat lighter. It cannot be confounded with *V. ovata* Say, its relations to the type of *rugosula* being evident, and in addition, *ovata* has been found with it. Nor can it be referred to *ventricosa*; it is larger and stronger, of much darker color, its surface is not so smooth and polished, it has 3 or even 4 lamellæ more, and the columella is longer." (Sterki.)



FIG. 216. *V. oralis* (Pilsbry).

Type locality: Volusia Co., Florida.

Alabama Records:

Elmore Co.; Wetumpka.

Madison Co.; Huntsville region.

Shelby Co.; Calera.

Wilcox Co.; Gastonburg.

Mobile Co.; Mobile.

Sumter Co.; York.

"It is generally stouter in figure than *V. rugosula*, but the contour varies widely. Some shells are very globose.

"Length 1.7, diam. 1.1 mm., 4.5 whorls. Wetumpka, Ala.

" 2.0, " 1.2 mm., 5 whorls. " "

" 1.6, " 1.1 mm.

Volusia Co., Fla.

" 1.9, " 1.15 mm.

" "

"The angular lamella is shorter than in *V. rugosula*, and it is not lower in front. The lip-point is more strongly developed in some specimens from Alabama (fig. 8) than in most of those from Florida (figs. 6-7). There is often a noticeable light-colored crest behind the lip." (H. A. P.)

Apparently of general distribution, but not, as yet, reported from the extreme northwestern and southeastern counties.

Dr. Sterki considers this species as distinct from *V. rugosula*.

Vertigo rugosula Sterki

Vertigo rugosula Sterki, Proc. A. N. S. P., 1890, p. 34; Pilsbry, Nautilus, IV, 1890, p. 39, pl. I, fig. 3; Man. Conch., XXV, 1919, p. 77, pl. 8, figs. 1-3; Wheeler, Nautilus, XXV, 1912, p. 124.

Original Description: "Related to *V. ovata* and *gouldii*, in shape more elongated than the latter, more cylindrical and somewhat larger. Apertural parts and lamellæ much like those of *ovata*, but the columella is decidedly longer and straighter, and the inferior columellar lamella is distinctly placed on it. Of a peculiar formation is the surface: of the 5 well rounded whorls, about one and a half of the upper are nearly smooth; the following with exception of the last are distinctively and regularly striated, the last very finely but distinctly rugose in the sense of the lines of growth; near the aperture again striated. Color, dark chestnut. Length 1.8 to 2, diam. 1.1 mm." (Sterki.)



FIG. 217. *V. rugosula* (Pilsbry).

Type Locality: Sullivan's Island, South Carolina.

Alabama Records:

Choctaw Co.; Silas.
Jackson Co.; Monte Sano.
Shelby Co.; Calera.
Tuscaloosa Co.; Hagler.

DeKalb Co.; Valley Head.
Madison Co.; Monte Sano.
Sumter Co.; Epes; Livingston; York.

"Besides the smaller size, darker color, and characteristic striation, which is much more regular and stronger than in *V. ovata*, this species differs by the shape of the angular lamella, which is rather long, low in front, rising inwardly. It emerges about as far as the parietal lamella, which is strong and quite long. The infraparietal lamella is a very small tubercle, as a rule, sometimes scarcely or not perceptible. The inner end of the upper palatal fold turns downward. Further differences are given by Dr. Sterki: "The last whorl is relatively smaller, the aperture is somewhat less broad; the crest and impressions over the palatal folds are less marked or wanting; the basal fold is situated higher on the columellar margin, in the position of a subcolumellar lamella, while in *V. ovata* it is basal."

"In profile view there is a slight prominence of the outer lip at the termination of a shallow depression, but it is far less developed than the 'auricle' of *V. ovata*." (H. A. P.)

Generally distributed from the northeastern to the southwestern part of the state, but not reported from the extreme northwestern and southeastern counties.

Vertigo alabamensis Clapp

Vertigo alabamensis Clapp, Nautilus, XXVIII, 1915, p. 137, pl. VI, figs. 6, 6a, 6b; Pilsbry, Man. Conch., XXV, 1919, p. 79, pl. 8, figs. 9, 13, 14.

FIG. 218. *V. alabamensis* (Pilsbry).

Original Description: "The shell is cylindrical, oval, perforate, convex, sutures well impressed, the last whorl somewhat tapering below, bulging above, and deeply constricted over the palatal folds, crest well marked. Lip well reflected, pale brown, and deeply constricted opposite the upper palatal, simple above the constriction, and with a strong callous or internal collar running down and connecting with the columella. Denticles 7, the parietal high, sinuous and deeply entering; angular strong, flat; upper palatal deep, very high in front and tapering to the rear, lower palatal very deeply seated, inner end back of the subcolumellar lamella, both palatals distinctly showing from the outside as white lines. Columellar lamella strong, flat; subcolumellar bifid, strong; basal fold distinct, set on the callous collar just below the subcolumellar lamella. Length 1.8, diam. 1.0 mm. Length of aperture 0.69, width 0.63 mm." (Clapp.)

Type and only Recorded Alabama Locality: Ravine near junction of North River with the Black Warrior, Tuscaloosa Co., Alabama.

"This is a peculiar species. The parietal lamella is very strongly developed, high and long. The angular lamella is far longer than usual in *Vertigo* and converges inwardly towards the parietal. The columellar lamella descends near its outer end and penetrates deeply. The 'subcolumellar' descends obliquely inward, its crest either emarginate or level (see fig. 9). It is apparently to be considered a basal fold, since the palatal callus extends to it. If this interpretation is correct, the tooth described as the basal must be an infrapalatal fold. It is usually a very low tubercle and very rarely 'distinct' as described and figured by Dr. Clapp. The palatal folds are very strongly developed, the upper a high lamina, the lower rising to a peak deep within." (H. A. P.)

Vertigo alabamensis conecuhensis Clapp

Vertigo alabamensis conecuhensis Clapp, Nautilus, XXVIII, 1915, p. 137, pl. VI, figs. 7-7a; Pilsbry, Man. Conch., XXV, 1919, p. 80, pl. 8, fig. 12.

Original Description: "At Evergreen, Conecuh Co., Ala., Mr. Smith found a variety, which differs from the type in being shorter and more globose with the teeth less strongly developed and the basal fold absent in all shells examined. Length 1.53, diam. 1.0 mm. Length of aperture 0.58, width 0.63." (Clapp.)

Type and only Recorded Alabama Locality: Evergreen, Conecuh Co., Ala.

"The size varies from 1.6×1.05 mm. to 1.5×1 mm." (H. A. P.)

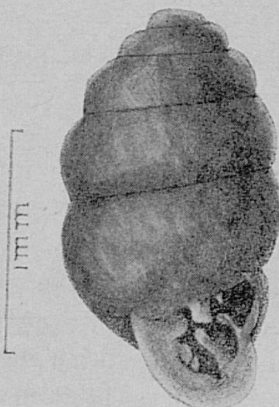


FIG. 218. *V. alabamensis* (Pilsbry).

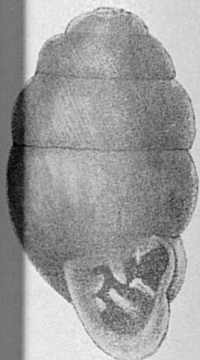
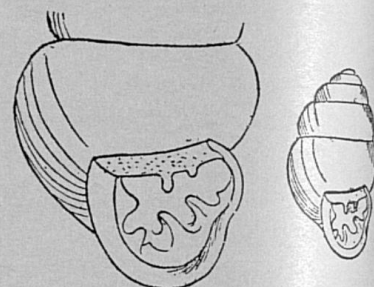


FIG. 219. *V. alabamensis conecuhensis* (Pilsbry).

Vertigo ovata Say

Vertigo ovata Say, Jour. A. N. S. P., II, 1822, p. 375; W. G. Binney, Manual, 1885, p. 33, figs. 362-3; Wheeler, Nautilus, XXV, 1912, p. 124; Pilsbry, Man. Conch., XXV, 1919, p. 82, pl. 6, figs. 1-4, 7.
Isthmia ovata Lewis, Ala. F. W. & L. Shells, 1876, p. 30.

FIG. 220. *V. ovata* (Binney).

Original Description: "Shell dextral, subovate, brown; apex obtuse; whorls five, glabrous; suture not very deeply impressed; body-whorl indented near and upon the labrum; aperture semioval; labium five-toothed, of which three are situated on the transverse portion of the lip, parallel to each other, equidistant, the superior and inferior ones being small, the latter sometimes obsolete, the intermediate one lamelliform, prominent, and the two others situate on the columella, approximate, extending at right angles to the three preceding ones, the superior one oblique and smaller; labrum reflected, but not flattened, bidentate, teeth lamelliform, prominent; umbilicus distinct.

"Length less than one-tenth of an inch. Breadth nearly one-twentieth of an inch." (Say.)

Type Locality: Philadelphia, Pennsylvania.

Alabama Records:

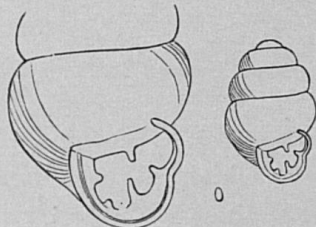
Baldwin Co.; Magnolia Springs; Fairhope.	Clarke Co.; Jackson.
Conecuh Co.; Evergreen.	DeKalb Co.; Valley Head; Big Wills Valley.
Elmore Co.; Wetumpka.	Lauderdale Co.; Florence.
Madison Co.; Gurley; Monte Sano.	Mobile Co.; Mobile; Toulminville; Saraland.
Randolph Co.; Wadley; Roanoke.	Sumter Co.; York.
Tuscaloosa Co.; Duncanville.	Washington Co.; Washington Co.
Wilcox Co.; Pine Hill.	

Generally distributed.

Vertigo ventricosa (Morse)

Isthmia ventricosa Morse, Ann. N. Y. Lyc. Nat. Hist., VIII, 1865, p. 1, fig. 1; Lewis, Ala. F. W. & L. Shells, 1876, p. 30.

Vertigo ventricosa W. G. Binney, Manual, 1885, p. 192, fig. 196; Pilsbry, Man. Conch., XXV, 1919, p. 94, pl. 7, figs. 1-3.

FIG. 221. *V. ventricosa* (Binney).

Original Description: "Shell umbilicate, ovate, conic, smooth, polished; apex obtuse; suture deep; whorls four, convex. Aperture semi-circular, with five teeth, one prominent on the parietal margin, two smaller on the columellar margin, and two prominent within, contracting the aperture at the base; peristome

widely reflected, the right margin flexuose, within thickened and colored.

"Length .07 inch; breadth .45 inch. (1.75×1.1 mm.)." (Morse.)

Type Locality: Not specified.

Alabama Records: "Alabama" (Lewis).

"*V. ventricosa* differs from *V. ovata* by the constantly smaller size, absence of an angular lamella, and smaller number of teeth. It is of an auburn color, somewhat transparent, glossy, with only a trace of striation. Under a high power it shows microscopic punctation or granulation. The basal fold is usually quite small, though sometimes it is well developed. In many Maine examples it is absent. The degree of prominence of the inwardly bent point of the lip-edge varies a good deal. The crest is quite low." (Pilsbry.)

Vertigo gouldii (Binney)

Pupa gouldii Binney, Proc. B. S. N. H., I, 1843, p. 105.

Isthmia gouldii Lewis, Ala. F. W. & L. Shells, 1876, p. 30.

Vertigo gouldii W. G. Binney, Manual, 1885, p. 190, fig. 191.

Vertigo gouldii Wheeler, Nautilus, XXVI, 1912, p. 15; Pilsbry, Man. Conch., XXV, 1919, p. 98, pl. 7, figs. 4, 5, 8.

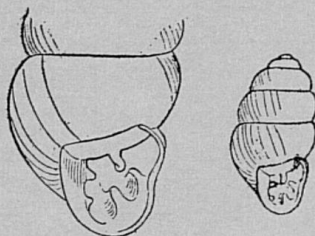


FIG. 222. *V. gouldii* (Binney).

Original Description: "Shell light chestnut, cylindrical-ovate; whorls between 4 and 5, ventricose, the last occupying nearly half the length of the axis; apex obtuse. Aperture lateral, composed of two unequal curves meeting in the centre of the outer lip; with 5 prominent white teeth: one upon the transverse margin, two upon the umbilical margin and two upon the labial margin; lip thickened, not reflected, umbilicus a little open.

"Length of axis one-sixteenth, diameter one-thirty-second of an inch." (Binney.)

Type Locality: Brookline, Massachusetts.

Alabama Records:

Franklin Co.; Russellville.
Madison Co.; Monte Sano.

Jackson Co.; Woodville.

"The surface is very distinctly striate, especially the penult whorl. The basal plica is subcolumellar in position. The parietal lamella is strong and rather long. There is never any trace of a palatal callus." (Pilsbry.)

A characteristic northern species, which has been found in only a few of the northern counties.

Vertigo bollesiana (Morse)

Isthmia bollesiana Morse, Ann. Lyc. Nat. Hist. N. Y., VIII, 1865, p. 209, figs. 4-6.

Vertigo bollesiana W. G. Binney, Manual, 1885, p. 191, fig. 193; Pilsbry, Man. Conch., XXV, 1919, p. 101, pl. 7, figs. 9-10.

Original Description: "Shell minutely perforate, cylindrical ovate, delicately striated, subtranslucent; apex obtuse; suture well defined; whorls four, sub-convex; aperture suborbicular, somewhat flattened on its outer edge; with five teeth, one prominent and somewhat curved on the parietal margin, two similar in form, the lower one the smaller, on the columellar margin, and two slightly elevated lamelliform teeth within and at the base, peristome subreflected and thickened.

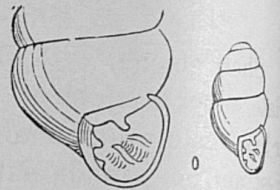


FIG. 223. *V. bollesiana* (Binney).

"Length .065 inch; breadth .035 inch." (Morse.)

Type Locality: Orono, Maine.

Alabama Record:

Franklin Co.; Russellville.

"There is an extremely small crest close behind the lip, and a rather large oblique impression over the palatal folds. The basal fold is sub-columellar in position and rarely it is absent. As Morse says, it is smaller, lighter-colored and more transparent and delicate than *V. gouldii* and is less distinctly striated. The teeth are smaller, especially the palatals. Length 1.5, diam. 0.9 mm.; 4.5 to 4.66 whorls." (H. A. P.)

Vertigo wheeleri Pilsbry, n. sp.

Vertigo concinnula Wheeler, Naut., XXV, 1912, p. 124; Pilsbry, Man. Con., XXV, 1919, p. 121.

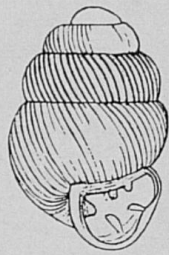


FIG. 224.
V. wheeleri
(Pilsbry).

"This species has the broad, ventricose figure of *V. hebardei* Van., but is a larger, less fragile and more strongly striate shell, the columellar lamella differing in form. It is decidedly more ventricose than *V. gouldii* which, with five teeth as in *wheeleri*, has generally a second columellar and but one tooth on the parietal wall; however these two teeth are variable in *V. gouldii*; the main distinction is in the shape of the shell. These two species appear to be the nearest relatives of the new form. *V. rugosula* and *oralis* have much more strongly developed teeth and an outer lip of different shape.

"Specimens presumably those now under consideration were shown me by Mr. H. E. Wheeler many years ago and were identified as *V. concinnula* Ckl., a Rocky Mountain species (Naut., XXV, 1912, p. 124). That is a larger shell, less inflated, with longer palatal folds, but very similar to the present form in sculpture." (Pilsbry.)

Type Locality: Monte Sano, Alabama.

Types in the collections of Bryant Walker and A. N. S. P.

I am indebted to Dr. Pilsbry for the preliminary diagnosis and figure given above.

SUBGENUS VERTILLARIA PILSBRY

Shell oblong, with the columellar lamella in form of a blunt vertical plate, other teeth short; outer lip biarcuate. There is no angular lamella or basal fold, and the upper palatal fold is minute or wanting. No external crest and no palatal callous.

Vertigo oscariana Sterki

Vertigo oscariana Sterki, Proc. A. N. S. P., 1890, p. 33; Clapp, Nautilus, XXVIII, 1915, p. 137, pl. VI, fig. 8; Pilsbry, Man. Conch., XXV, 1919, p. 144, pl. 8, figs. 8, 10, 11.

Original Description: "This is the most peculiar of our species. It is the size of *milium*, but oblong with either end nearly equally pointed, the last whorl being considerably narrowed and flattened towards the subtriangular small aperture. Shell thin, delicate, of pale horn color, as is the palatal wall and margin; the latter simple and straight, with a very slight, thin callus inside, lamellæ 3, whitish, rather small; one apertural (parietal), one columellar (longitudinal) and the inferior palatal; sometimes there is also a very small superior palatal. Length 1.5, diam. 0.8 mm." (Sterki.)



FIG. 225. *V. oscariana* (Pilsbry).

Type Locality: Mosquito Island, Volusia Co., Florida.

Alabama Records:

Baldwin Co.; Week's Bay.

Chambers Co.; Langdale.

Elmore Co.; Wetumpka.

Jefferson Co.; Squaw Shoals.

Conecuh Co.; Evergreen.

Jackson Co.; Stevenson.

"The surface is delicately, but rather sharply and regularly striate, most conspicuously so on the penult whorl. The columellar lamella is rather blunt and thick, the lower end vertical, the upper slanting slightly inward. The parietal lamella is short and rather high. It varies in the degree of inflation, as the figures show. Dr. Clapp has noted that the specimens from Evergreen, Alabama, are nearly smooth, showing only obsolete striation. One measures 1.45×0.8 mm. It is an isolated species, without near relatives in our fauna." (H. A. P.)

The scattering records indicate a general distribution over the state.

SUBGENUS ANGUSTULA STERKI

Angular, parietal and columellar lamellæ strongly developed, the parietal long, columellar crescentic, its inner end curving downward. Palatal folds strong, the lower entering to the dorsal side, its inner end curved downward.

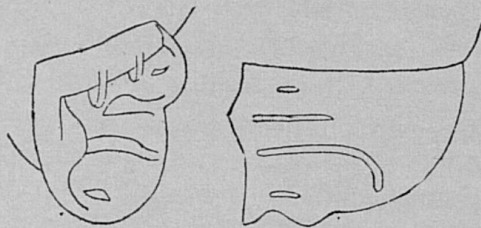


FIG. 226. Arrangement of apertural folds in *Angustula* (Sterki).

Vertigo milium (Gould)

Pupa milium Gould, Jour. B. S. N. H., III, 1840, p. 402, pl. III, fig. 23.

Isthmia milium Lewis, Ala. F. W. & L. Shells, 1876, p. 30.

Vertigo milium W. G. Binney, Manual, 1885, p. 332, fig. 361;

Wheeler, Nautilus, XXVI, 1912, p. 15; Pilsbry, Man.

Conch., XXV, 1919, p. 146, pl. 13, figs. 1-7.

Original Description: "T. minutissima, ovalis, castanea; anfractibus quatuor connexis, oblique striatus; apertura cordata, dentibus sex compressis armata, quorum duabus labio affixis; umbilico profundo.

"Axis $1/30$; diam. $1/40$ poll." (Gould.)

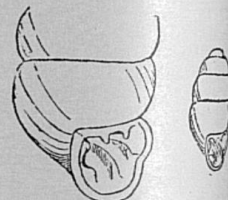


FIG. 227. *V. milium* (Binney).

Description (Inv. Mass., 1841, p. 187): "Shell minute, of a globosely oval form, color a light chestnut; whorls four or somewhat more, obviously wrinkled obliquely, rather convex; apex bluntly rounded, suture deep; aperture half the width of the last whorl, heart-shaped, the apex being at the right posterior angle; the transverse margin is nearly direct; the outer lip is scalloped by an indentation of the lip; the remainder of the margin is regularly arcuated; lip white, slightly everted; throat with six teeth, two of which are on the transverse lip, equidistant; one, with a tubercle at its base, is on the middle of the columella, and nearly at right angles with the preceding, and is the largest; a fourth is on the indenture of the outer lip, directed between the two on the transverse lip; and two smaller ones, more retired within the shell, are equidistant between the two last mentioned; umbilicus large and deep.

"Length less than $1/30$ of an inch; breadth $1/40$ of an inch." (Gould.)

Type Locality: Oak Island, Chelsea, Massachusetts.

Alabama Records:

Baldwin Co.; Magnolia Springs.
Clarke Co.; Jackson.

Elmore Co.; Wetumpka.
Madison Co.; Monte Sano.
Shelby Co.; Calera.

Choctaw Co.; Silas.
DeKalb Co.; Valley Head; Big Wills Valley.
Jackson Co.; Princeton; Stevenson.
Mobile Co.; Mobile.
Wilcox Co.; Gastonburg.

"Gould's description and figure are not quite correct in some points; evidently the columellar lamella and the lower palatal fold were not fully

seen. The color of the shell is cinnamon or paler. The last whorl has an external impression over the lower palatal fold; there is a swelling in front of the impression and below a deeper impression which runs to the lip over the upper palatal fold. The angular lamella is high, short, and situated inward from the insertion of the outer lip. The parietal is high and long, entering deeply. The high columellar lamella enters horizontally at first, then turns downward, being crescent-shaped. (Its downward continuation was mistaken by Gould for 'a tubercle at its base.') The upper palatal fold is long and high, slightly curved. Lower palatal is a little immersed, high, thin and enters to the dorsal side, where it curves downward. Both palatal folds are rather thick and tapering at their outer ends. The basal fold is somewhat immersed, short and high. There is sometimes a small, tubercular suprapalatal fold. The outer lip is somewhat expanded and strongly biarcuate. The parietal callus is generally rather thick.

"The size varies from 1.75×1 to 1.4×0.9 mm." (Pilsbry.)

Apparently of general distribution, but not, as yet, reported from the northwestern or southeastern counties.

GENUS PUPISOMA STOLICZKA

Shell ovate or globose-conic with obtuse apex, usually perforate, thin; whorls 3.5 to 5.5, strongly convex. Aperture truncate-rounded; peristome thin, slightly or not expanded, the columellar margin dilated and reflected.

Animal viviparous, having short eye-stalks and no inferior tentacles. Jaw composed of vertical plaits with narrow intervals. Radula with tricuspid central teeth; lateral teeth tricuspid or bicuspid; marginals with 4 or 5 unequal cusps.



FIG. 228. Radula of *P. dioscoricola* (Binney).

Pupisoma macneilli (Clapp)

Thysanophora macneilli Clapp, Nautilus, XXXI, 1918, p. 74, pl. VIII, fig. 1.
Pupisoma macneilli Pilsbry, Man. Conch., XXVI, 1920, p. 41, pl. 4, fig. 15.

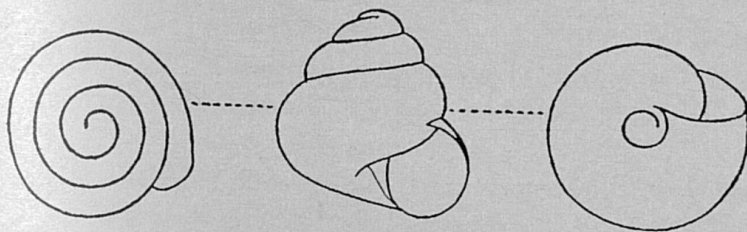


FIG. 229. *P. macneilli* (Clapp).

Original Description: "Shell small, globose, with about four well-rounded whorls, suture deep; color chestnut-brown, somewhat shining;

surface with faint growth lines and microscopically granulated; apex obtuse, large, more densely granulated than the body of the shell; widely umbilicate with the umbilicus extending to the apex and contained about 5 times in the diameter of the shell. Aperture well rounded slightly oblique, lip thin, partly reflected around the umbilicus.

"The type measures alt. 1.5, diam. 1.38, umbilicus 0.29 mm." (Clapp.)

Type Locality: Magazine Point, 8 miles north of Mobile, Alabama.

Alabama Records:

Conecuh Co.; Evergreen.

Mobile Co.; Magazine Point; Spring Hill; Fowl River, about three miles from the coast, in the southern part of Mobile County.

SUBFAMILY PUPILLINÆ

This group is characterized by the possession of inferior tentacles. Prior to the adult stage the shell has no apertural armature. Adults have 0 to 5 teeth in the typical positions; angular lamella, when present, is tuberculiform (not entering and lamelliform, as in Gastrocoptinæ), and remote from the parietal lamella. Basal lamella is wanting. The peristome is usually reflected or expanded. The size of the shell is usually greater than in the Vertigininæ, and the small teeth, when present, obstruct the aperture very little.

GENUS PUPOIDES PFEIFFER

Shell small (about 3 to 6 mm. long), rimate, long-ovate, turrit or rarely cylindric, with obtuse apex and a few (generally 5-6) rather long whorls. Aperture ovate, toothless except for a small, tuberculiform, angular lamella close to the insertion of the outer lip, or united with it, rarely wanting; peristome expanded, reflected and usually thickened within. Internal axis slender, thickened within.

Animal (*P. marginatus*): Head, neck and eye-peduncles black, posterior and lower parts lighter; eye-peduncles long and slender, tentacles very short.

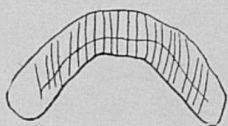


FIG. 230. Jaw of *P. marginatus* (Binney).

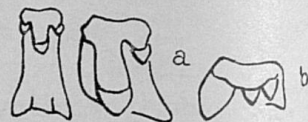


FIG. 231. Radula of *P. marginatus* (Binney).

Jaw wide, low, slightly arcuate; ends blunt, but little attenuated.

Radula: Centrals quite narrow, the reflected portion very small, tricuspid. Laterals quite broad, bicuspid. Marginals quadrate, low, wide, with one inner, long, oblique, blunt denticle, and several outer, small, irregular, blunt denticles. The outer lower edges of the centrals and laterals have the projecting or short re-enforcements shown in the figure.

Pupoides marginatus (Say)

- Cyclostoma marginata* Say, Jour. A. N. S. P., II, 1821, p. 172.
Leucochila fallax Lewis, Ala. F. W. & L. Shells, 1876, p. 30.
Pupa fallax W. G. Binney, Manual, 1885, p. 324, fig. 351.
Pupoides fallax Hinkley, Nautilus, XX, 1906, p. 35.
Pupoides marginatus Wheeler, Nautilus, XXV, 1912, p. 124; Pilsbry, Man. Conch., XXVI, 1921, p. 111, pl. 12, figs. 1-7.



FIG. 232.
P. marginatus
 (Binney).

Original Description: "Shell turreted, pale horn color, or dusky, obsoletely wrinkled across; suture rather deeply impressed; volutions six; aperture mutic, suboval, truncated transversely above by the penultimate whorl, nearly one-third the length of the shell; labium nearly transverse, color of the exterior part of the shell; labium equally and widely reflected, thick, white, umbilicus distinct. Length one-fifth of an inch." (Say.)

Type Locality: Upper Missouri.

Alabama Records:

- | | |
|---|---|
| Blount Co.; Blount Springs. | Choctaw Co.; Black Bluff. |
| Colbert Co.; Tuscumbia. | Conecuh Co.; Evergreen. |
| DeKalb Co.; Fort Payne; Valley Head. | Elmore Co.; Wetumpka. |
| Franklin Co.; Russellville. | Greene Co.; Boligee. |
| Jackson Co.; Stevenson. | Lauderdale Co.; Florence. |
| Madison Co.; Huntsville; Gurley; Monte Sano. | |
| Marengo Co.; Demopolis. | Mobile Co.; Mobile; Oak Grove; Calvert. |
| Montgomery Co.; Barachias; McGee's Station; Montgomery. | |
| Perry Co.; Hamburg; Uniontown. | Shelby Co.; Calera. |
| St. Clair Co.; Whitney. | Sumter Co.; York; Livingston. |
| Tuscaloosa Co.; Tuscaloosa. | Walker Co.; Forks of Warrior. |
| Wilcox Co.; Camden; Gastonburg. | |

This common and well known species is generally distributed through the state.

Pupoides modicus (Gould)

- Pupa modica* Gould, Proc. B. S. N. H., II, 1848, p. 40; W. G. Binney, Manual, 1885, p. 417, fig. 460; Gratacap, Bull. Am. Mus. Nat. Hist. XIV, 1901, p. 364.
Leucochila modica Lewis, Ala. F. W. & L. Shells, 1876, p. 30.
Pupoides modica Pilsbry, Man. Conch., XXVI, 1921, p. 115, pl. 12, figs. 13-15.



FIG. 233.
P. modicus
 (Binney).

Original Description: "T. minuta, fragili, ovato-conica, elongata, alba vel cornea, edentata, anfr. 5 convexis, *P. fallaci* similima sed minore dimidio, anfractibus duobus carente; apertura campanulata, labro expanso, haud planulato.

Long. 1/10; lat. 1/15 poll." (Gould.)

Pilsbry's description is as follows: "Shell perforate, rimate, tapering from the last whorl to the obtuse summit, thin, dull brown, somewhat glossy, irregularly striate. The whorls are strongly convex, the last ascending in front. The aperture is oval. Peristome thin, broadly expanded, very little or not thickened within, white, the outer margin regularly curved,

columellar margin straightened, margins converging and joined by a transparent callous. No callous pad or tubercle in the angle. Length 3.45-4.2, diam. 1.8-2.15 mm."

Type Locality: Florida.

Alabama Record: Cited from Alabama, but without definite locality by Lewis, Binney and Gratacap.

"Differs from *P. fallax* only in being one half its size, in having two whorls less, and in having a bell-shaped aperture with a thin revolute lip instead of a thick flattened one." (Gould.)

"Smaller and thinner than *P. marginatus*, somewhat more striate, the lip very little or not thickened." (Pilsbry.)

GENUS COLUMELLA WESTERLUND

Shell cylindric or cylindric-tapering with obtusely conic summit and distinctly perforate axis, brown and nearly smooth, composed of 5 to 9

convex whorls. Aperture sub-basal, semi-circular, oblique; peristome thin and sharp, the outer lip not expanded, regularly arcuate; columellar margin dilated.

Foot short, oval, without pedal grooves, above with a coarse-meshed network of impressed lines. No lower tentacles.

Genitalia about as in *Vertigo*, but the penis is smaller and without glandular tissue. Atrium very short. The penis is small, slender anteriorly, bearing the vas deferens and retractor muscle at the apex. There is no appendix. The ovo-testis is composed of a single mass of grape-like follicles, as in *Vertigo*. The spermatheca has a rather long slender duct.

Jaw wide, arcuate, composed of about 16 rhomboidal, overlapping plates, not closely united, but not wholly unconnected as in *Punctum*.

Radula: Centrals tricuspid, side teeth bicuspid, the cusps subequal, short; basal plates of all but the outermost teeth are long as in *Punctum*. There is no distinct differentiation into lateral and marginal teeth.

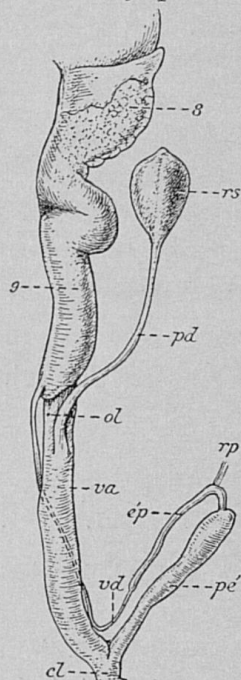


FIG. 235. Genitalia of *C. edentula* (Steenberg). *cl*, cloaca; *ep*, epiphallus; *ol*, free oviduct; *pd*, spermatheca duct; *pe*, penis; *rp*, retractor penis; *rs*, spermatheca; *va*, vagina; *vd*, vas deferens; *s*, upper part of the free oviduct.



FIG. 234. Animal of *C. edentula* (Hanna).

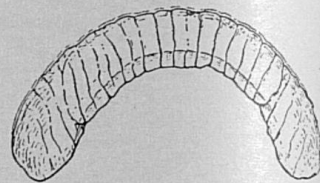


FIG. 236. Jaw of *C. edentula* (Steenberg).

FIG. 237. Radula of *C. edentula* (Gwatkin).*Columella edentula* (Draparnaud)*Pupa edentula* Draparnaud, Hist. Moll., 1805, p. 59, pl. III, figs. 28-29.*Sphyradium edentulum* Hanna, Proc. U. S. N. M., 41, 1911, p. 374.*Vertigo simplex* W. G. Binney, Manual, 1885, p. 191, fig. 195.

Original Description: "Coquille extrêmement petite, de forme ovale et un peu conique, obtuse au sommet, d'un brun plus ou moins pale, mince, luisante et transparente, finement strie. Spire composee de cinq tours, dont les deux premiers sont plus petits a proportion. Ouverture demi-circulaire et sans dents: peristome simple. Omphalic peu evase." (Draparnaud.)

FIG. 238.
C. edentula
(Binney).

Hanna's description is as follows: "Shell smaller than either of the two preceding species (*hastata* and *alticolum*), not more than 2 mm. in height; translucent brown in color, the apex not lighter than the body of the shell in live specimens. Outline conical rather than cylindrical; apex obtuse. Whorls four to five, well rounded on the face and with the sutures well impressed. Lines of growth very faint and oblique. Shell not spoiled in symmetry by the last whorl increasing in size unproportionately. Aperture well rounded and proportionately not so large as in *S. alticolum*; entirely without teeth or lamellæ. Peristome thin and acute, without callous thickenings or indentations. Umbilicus minutely perforate.

"Height, 1.60 mm.; diameter, 0.80 mm."

Type Locality: Not specified.

Alabama Records: Chambers Co.; Langdale. Conecuh Co.; Evergreen.

A characteristic circumpolar species that has wandered far south of its usual range into Chambers and Conecuh counties.

It is easily distinguished by its small size, obtusely conical shape and edentulous aperture.

FAMILY STROBILOPSIDÆ

Characters as in the genus *Strotilops*.

GENUS STROBILOPS PILSBRY

Shell small, perforate or umbilicate, trochiform to subdiscoidal, with rounded, angular, or carinate periphery, of $4\frac{1}{2}$ to 6 closely-coiled whorls. Cavity of the last whorl obstructed by two or three long parietal lamellæ, the upper one emerging to the edge of the parietal callus, the lower one weaker, emerging or immersed, the intermediate one, when present, smallest and remote from the aperture; a series of two or more short folds

on the basal wall of the cavity deep within the last whorl. Peristome expanded, usually thickened, the insertions of the lip remote, connected by a parietal callus.

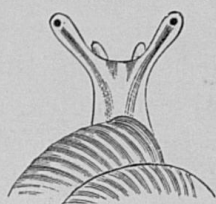


FIG. 239. Animal of *S. labyrinthica* (Binney).

Animal (*S. labyrinthica*)

without pedal grooves or caudal mucus pore, but hav-

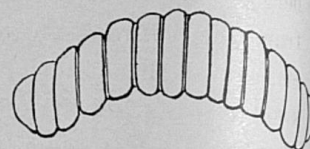


FIG. 240. Jaw of *S. labyrinthica* (Binney).

ing a network of incised lines on the surface of the skin, the meshes of which are quite large. Tentacles and eye-peduncles normal, the latter thick and bulbous. Genital opening just back of the right eye-peduncle. Fore part of the body, black; tail region light gray and sole of foot white.

Jaw low, wide, slightly arcuate, ends scarcely attenuated, blunt; cutting margin without a median projection; anterior surface with crowded ribs, denticulating either margin and more developed on the centre of the jaw.

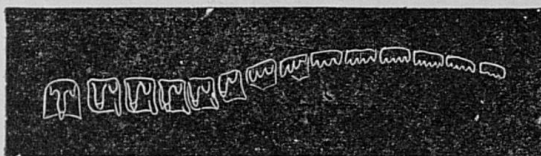


FIG. 241. Radula of *S. labyrinthica* (Binney).

Radula: Centrals with basal plate about square, slightly larger than that of the first lateral, tricuspid; lateral teeth bicuspid; marginals low, wide, with numerous subequal, short cusps.

Genitalia: Penis with an excessively long flagellum. One branch of the bifurcated retractor muscle is attached at the junction of the penis and flagellum; the other is attached to a bend of the vas deferens a short distance above its union with the penis. The vas deferens is considerably swollen in the section nearest to the penis, where it is almost as large as the latter organ. It gradually becomes smaller, however, and discharges high up on the oviduct. The appendix is swollen in its distal end to the diameter of the penis and it has there an abrupt flexure. The penis and vagina unite at the point of exit. There is no appreciable atrium. The vagina is a thin-walled, slightly pouched organ, smaller in diameter at its junction with the penis than elsewhere. The upper end corresponds to what is usually called the oviduct in land snails, but there is no point of demarkation between the two in this species. The upper end is folded into a series of lamellar pouches,

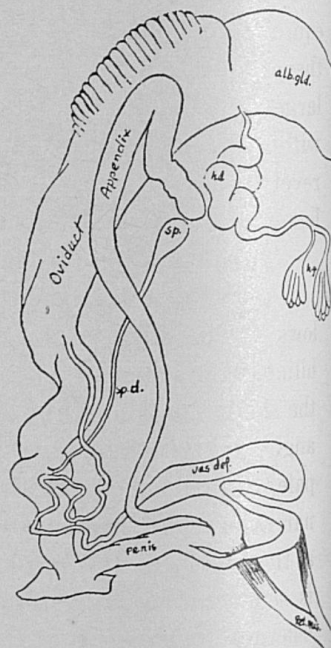


FIG. 242. Anatomy of *S. labyrinthica* (Hanna).

all of which fit close together like plates ("Possibly the prostate" Steenberg). The albumen gland is large and finely granulose. Its separation from the vagina-oviduct is not well marked. The hermaphrodite duct empties at the junction of the two. This duct is greatly convoluted and swollen in its lower portion. Upwards it is thin and slender. The hermaphroditic gland is composed of two portions, grape-like granules embedded in the coarsely granular liver. The spermatheca is pear-shaped and empties into the vagina a considerable distance below the termination of the vas deferens. (Hanna.)

SECTION STROBILOPS s. s.

Shell conoidal; umbilicus narrow; parietal lamellæ generally with prickly or rugose nodes.

SECTION STROBILOPS s. s.

Upper surface costulate; an interparietal lamella present.

Strobilops labyrinthica (Say)

Helix labyrinthica Say, Jour. A. N. S. P., I, 1817, p. 124.

Strobila labyrinthica Lewis, Ala. F. W. & L. Shells, 1876, p. 29; W. G. Binney, Manual, 1885, p. 264, fig. 281; Sargent, Nautilus, 1892, p. 77.

Strobilopsis labyrinthica Hinkley, Nautilus, XX, 1906, p. 35.

Strobilops labyrinthica Wheeler, Nautilus, XXV, 1912, p. 124; Pilsbry, Man. Con., XXVIII, 1927, p. 20, pl. I, figs. 1-11.

Original Description: "Shell conic, dark reddish brown, body lighter; whorls five or six, with conspicuous, elevated, equidistant, obtuse lines across, forming grooves between them; apex obtuse, lip reflected, rounded; pillar-lip with a large, lamelliform, elongated tooth, which appears to revolve within the shell, parallel to the suture; a smaller raised line revolves nearer to the base within the shell, but becomes obsolete before it arrives at the pillar-lip; umbilicus rather large. "Breadth one-tenth of an inch." (Say.)

Pilsbry's description (Man., XXVIII, p. 20) is as follows: "The shell is narrowly umbilicate, the width of umbilicus contained about 11 (9-12) times in the diameter of the shell; very convexly conic or dome-shaped, the periphery obtusely sub-angular. Whorls $5\frac{1}{2}$, convex, very slowly widening, the first $1\frac{1}{2}$ smooth, pale, the rest chestnut-brown, sculptured with narrow obliquely radial ribs narrower than their intervals, passing over the periphery but weakening at the base, the first half of which is typically nearly smooth. The aperture is semi-lunar. Peristome brown, expanded, thick. The parietal lamella emerges to the edge of the parietal callus and penetrates inward a little more than half a whorl. The infraparietal lamella is much smaller, only

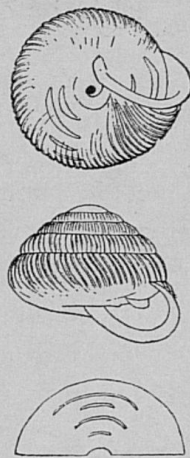


FIG. 247. *S. labyrinthica*.

shortly emerging, the end visible in a basal view; inside it penetrates as far as the parietal lamella. There is a low and slender interparietal lamella between these lamellæ deep within; all three are strongly nodose at the edge, the nodes armed with minute prickles directed towards the aperture. Within the basal and outer walls, at the last third of the base, there is a low, rather blunt columellar lamella and a forwardly curving series of five (or six) unequal basopalatal folds; first and second folds are large and high, the second longer; two or three following folds are low and thin, the one immediately above the periphery usually longer, and there is sometimes another fold above it."

Height 1.7-1.8; diam. 2.3 mm.

Type Locality: Not specified.

Alabama Records:

Baldwin Co.; Foley.	Barbour Co.; Pea River, Elamville.
Bibb Co.; Eoline; Woodstock.	Chambers Co.; Langdale.
Choctaw Co.; Silas.	Clarke Co.; Jackson; Thomasville.
Elmore Co.; Wetumpka.	Escambia Co.; Foshee.
Jackson Co.; Princeton; Stevenson.	Jefferson Co.; Valley Creek, Adger.
Macon Co.; Tuskegee.	Madison Co.; Huntsville.
Marengo Co.; Rembert.	Mobile Co.; Mobile; Oak Grove.
Perry Co.; Marion; Hamburg; Uniontown.	
Randolph Co.; Wadley.	Shelby Co.; Calera.
Sumter Co.; Epes; Livingston; York.	
Talladega Co.; Horseblock Mountain.	
Tuscaloosa Co.; Tuscaloosa; Hagler; Duncanville; Holt.	
Walker Co.; Junction of Lost and Wolf Creeks; Forks of Warrior.	
Washington Co.; Chatom.	Wilcox Co.; Gastonburg; Pine Hill; Alberta.

This common and widespread northern species has a general distribution over the state. It is characterized by the 2 or 3 short, internal lamellæ on the floor of the body whorl, while in *virgo* and *affinis* the internal lamellæ on the floor and the adjacent side wall of the body whorl number 6 or more. See Pilsbry, *Nautilus*, VII, p. 57.

Strobilops labyrinthica virgo (Pilsbry)

Strobila labyrinthica virgo Pilsbry, *Nautilus*, VI, 1892, p. 94, pl. 4.
Strobilops labyrinthica virgo Pilsbry, *Man. Con.*, XXVIII, 1927, p. 23, pl. 4, figs. 3-4.
Strobilops virgo Pilsbry, *Naut.*, VII, 1893, p. 57; Johnson & Pilsbry, *ibid.*, XI, 1898, p. 117; Cat., 1898, p. 19; Walker, *Rep. Geol. Surv. Mich.*, 1895, p. 506, fig. 120; Wheeler, *Nautilus*, XXVI, 1912, p. 15.

Original Description: "We have received from Rev. H. W. Winkley of Saco, Me., specimens of a *Strobila* differing from *labyrinthica* in being somewhat larger and more depressed, and translucent-white in color, the lip and lamellæ opaque-white." (Pilsbry.)

A more detailed description is as follows: Shell umbili-

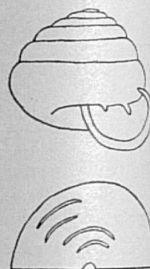


FIG. 248.
S. virgo.

eated, globosely elevated, white or pale brownish color; finely and closely ribbed above, ribs subobsolete on the base; spire high, dome-shaped; whorls 5.5, narrow, about as high as wide, body whorl somewhat angled at the periphery, rounded below, impressed around the umbilicus, which is a mere perforation; aperture lunately rounded; peristome narrow, thickened, reflected; two parietal folds conspicuously emerging; six long lamellae on the base and outer wall of the body whorl.

Type Locality: Sebec Lake, Piscataquis Co., Maine.

Alabama Records:

Baldwin Co.; Baldwin Co.	Blount Co.; Blount Springs.
Chambers Co.; Langdale.	Fayette Co.; Fayette.
Cullman Co.; Cullman.	DeKalb Co.; Valley Head.
Franklin Co.; Russellville.	Jackson Co.; Woodville; Stevenson.
Jefferson Co.; Squaw Shoals.	
Madison Co.; Huntsville; Gurley.	Marion Co.; Bear Creek.
Randolph Co.; Roanoke.	Shelby Co.; Calera.
St. Clair Co.; Whitney.	
Talladega Co.; Horseblock Mountain.	
Tuscaloosa Co.; Duncanville; Hagler.	

A common northern form, which is quite generally distributed in the northern part of the state.

It differs from the associated species in the number and character of the internal lamellae.

Strobilops labyrinthica parietalis Pilsbry

Strobilops labyrinthica form *parietalis* Pilsbry, Man. Con., XXVIII, 1927, p. 24, pl. 9, figs. 10-11.

Original Description: "Similar to the *S. labyrinthica* in the convexly conic, ribbed shell and weakly emerging infraparietal lamella, but the lamellae penetrate more deeply, being between two-thirds and three-fourths of a whorl long. There is a blunt columellar lamella and four basal folds, four within the side wall. The whole base is ribbed in some examples, or smoothish, merely finely striate in others. Height 1.75, diam. 2.35 mm." (Pilsbry.)

Type Locality: Ardsley, Montgomery Co., Pennsylvania.

Alabama Records:

Baldwin Co.; Week's Bay.	Blount Co.; Blount Springs.
Conecuh Co.; Evergreen.	DeKalb Co.; Valley Head.
Madison Co.; Gurley.	Wilcox Co.; Gastonbury and Alberta.

Strobilops aenea Pilsbry

Strobilops labyrinthica strebeli Pilsbry, Naut., VII, 1893, p. 57; Johnson & Pilsbry, 1898, p. 108; Cat., 1898, p. 18.
Strobilops aenea Pilsbry, Naut., XL, 1926, p. 69; Man. Con., XXVIII, 1927, p. 29, pl. 3, figs. 6-12.

Original Description: "Is the form known in some United States collections as *S. labyrinthica strebeli*. It is much more

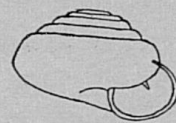


FIG. 243.
S. aenea.

depressed than *S. labyrinthica*, the periphery decidedly angular, ribs finer and more closely set, color dark brown with a golden gleam. The umbilicus is contained about 7 times in the diameter. Basal folds 3 or 4. Height 1.8, diam. 2.7 mm." (Pilsbry.)

Pilsbry's recent description in the Manual (*l. c.*) is as follows: "The shell is narrowly umbilicate, the width of the umbilicus contained about $6\frac{1}{2}$ times in the diameter of the shell, low-conic, with obtuse, rounded summit, the periphery distinctly but bluntly angular. The base is somewhat flattened below the periphery, elsewhere moderately convex. Whorls $5\frac{1}{2}$, convex, slowly increasing, the first $1\frac{1}{2}$ smooth, corneous, the rest dark brown with a red-gold gleam; sculptured with narrow riblets which are somewhat oblique, retractive, rather fine and close. The base is smoothish, marked with growth-striae only, except on its last third, where the riblets of the upper surface continue over the base. The aperture is semilunar, low but wide. Outer and basal lips brown, well expanded, somewhat thickened, the columellar margin dilated. The parietal lamella emerges to the edge of the parietal callus, penetrating inward a half whorl. Infraparietal lamella weakly emerging. Midway between the lamellae there is a very weak, low, deeply-placed interparietal lamella. These lamellae are nodose far within, the nodes roughened, shortly prickly. The internal barrier, situated one-third of a whorl from the aperture, is radial, but slightly oblique; it consists of a short, weak columellar fold and four basal folds, visible through the shell; the second and fourth folds from the axis are long, the first short, the third fold weak or sometimes wanting. Height 1.5-2, diam. 2.4-2.75 mm." (Pilsbry.)

Type Locality: Cazenovia, N. Y.

Alabama Records:

Baldwin Co.; Magnolia Springs; Week's Bay.

Blount Co.; Blount Springs.

Conecuh Co.; Evergreen.

Jefferson Co.; Henry Ellen.

Marion Co.; Winfield.

Randolph Co.; Wadley.

Tuscaloosa Co.; Tuscaloosa; Duncanville.

Generally distributed.

Clarke Co.; Thomasville.

Jackson Co.; Woodville, Stevenson; Princeton.

Madison Co.; Gurley; Huntsville; Matthews' Hill, Huntsville.

Mobile Co.; Mobile.

St. Clair Co.; Whitney.

Strobilops aenea micromphala Pilsbry

Strobilops aenea form *micromphala* Pilsbry, Man. Con., XXVIII, 1927, p. 30, pl. 9, figs. 8-9.

Original Description: "Lighter colored than *S. aenea*, between cinnamon and cinnamon-brown; outlines of spire more convex; umbilicus narrower, contained about 8 times in the diameter; last third of base ribbed.

The infraparietal lamella does not emerge. Three folds visible through the base. Height 1.7, diam. 2.5 mm.; $5\frac{1}{2}$ whorls." (Pilsbry.)

Type Locality: Boeuf River, above Charlieville, Richland Parish, Louisiana.

Alabama Records:

Baldwin Co.; Simpson Island, Mobile River.
Clarke Co.; Jackson.
Elmore Co.; Wetumpka.
Mobile Co.; Mobile.
Perry Co.; Hamburg; Marion.
Shelby Co.; Calera.
Wilcox Co.; Gastonbury and Alberta.

Apparently restricted to the southern part of the state.

Strobilops aenea spiralis Pilsbry

Strobilops aenea spiralis Pilsbry, Man. Con., XXVIII, 1927, p. 31, pl. 9, figs. 5-7.

Original Description: "The shell is somewhat less depressed than *S. aenea*, light brown; ribs rather distinct on the base. The parietal lamella is much longer, forming a full whorl in the type (but slightly shorter, over three-fourths of a whorl in specimens from Wyandotte, Indiana). The basal barrier is situated more deeply than in *aenea* and consists, as in that species, of four basal folds and a small, short one on the columella. Height 1.9, diam. 2.6 mm." (Pilsbry.)

Type Locality: Magazine Mountain, Logan Co., Arkansas.

Alabama Records:

DeKalb Co.; Valley Head.
Randolph Co.; Roanoke.
Wilcox Co.; Pinehill.

Strobilops affinis Pilsbry

Strobilops labyrinthica affinis Pilsbry, Proc. A. N. S. P., 1892, p. 404.
Strobilops affinis Pilsbry, Nautilus, VII, 1893, p. 57.

Original Description: "About 8 short lamellæ arranged in a curved radial series; color dark brown; form elevated." (Pilsbry.)

Type Locality: Not specified; "New York, Ohio, etc."

Alabama Records:

Jackson Co.; Stevenson.

Perry Co.; Hamburg.

"Its prominent feature is the armature of numerous short lamellæ, extending in a forwardly curved series from the axis across the base and up the side wall." (H. A. P.)

The abbreviated original description may be supplemented as follows: Shell umbilicated; obtusely elevated; dark brown; finely and closely ribbed

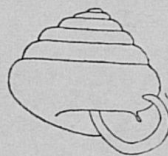


FIG. 244.
S. affinis.

above, ribs lighter below; spire obtusely elevated; whorls 5.5, rather narrow, higher than wide, body whorl obtusely angled at the periphery, somewhat flattened, but rounded below, impressed around the umbilicus, which is round and deep; aperture lunately rounded; peristome thickened, narrowly reflected; about 8 short lamellæ arranged in a forwardly curved radial series from the axis across the base and up the outer wall of the body whorl. Alt. 2.5, greater diam 2.875 mm.

Strobilops texasiana floridana Pilsbry

Strobilops floridanus Pilsbry, Nautilus, XXIII, 1909, p. 90.

Strobilops texasiana floridana Pilsbry, Man. Con., XXVIII, 1927, p. 26, pl. 2, figs. 1-4.



FIG. 245.
S. floridanus.

Original Description: "The shell is conic with convex outlines, almost dome-shaped; the periphery only weakly angular, the base convex; rather solid; brown, the summit whitish-corneous. Whorls 5.5, the first two smooth, the rest sculptured with narrow, rather widely separated ribs (about 30 on the last whorl). These ribs continue on the base, which is radially ribbed. Aperture semilunar, the peristome thick, narrowly reflexed, brown or whitish; parietal callus rather thick at the edge. Parietal lamella emerging to the edge of the callus, fully a whorl long. Infraparietal lamella scarcely emerging, penetrating as far inward as the parietal lamella. The inner half of this lamella and the parietal is nodose, the nodes minutely asperate. Interparietal lamella very low, about half a whorl long, nodose, penetrating as deeply as the parietal lamella. There is one axial lamella and four basal plicæ, the outer one peripheral in position; a single palatal plica is generally developed. These plicæ form a curved, very obliquely radial series, the inner end near the aperture. The two inner basal lamellæ are much stouter and higher than the others, the second from the axis (or third, counting the axial) being the longest and highest of the plicæ." (Pilsbry.)

Type Locality: Miami, Florida.

Alabama Records:

Baldwin Co.; Point Clear; Magnolia Springs.

Conecuh Co.; Evergreen.

Lee Co.; Auburn.

Mobile Co.; Mobile; Magazine Point.

Montgomery Co.; McGee's Station.

Tuscaloosa Co.; Duncanville; Vance; Hagler.

Wilcox Co.; Gastonbury.

Lauderdale Co.; Florence.

Shelby Co.; Calera.

Sumter Co.; Livingston.

"This species resembles *S. virgo* (Pils.) in shape and peristome, but it differs in the more widely spaced ribs, continued over the base. It differs from all known North American species by the *much more deeply entering parietal lamellæ*, the inner ends of which pass under the parietal callus of

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FIG. 246.
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the aperture. In other species these lamellæ are only about a half whorl long. The inner basal plicæ, are placed more deeply within than in other species." (H. A. P.)

Generally distributed.

SUBGENUS DISCOSTROBILOPS PILSBRY

The shell is thin, strongly depressed, the height less than half the diameter, subdiscoidal with well-opened umbilicus; finely costulate or rib-striate above, smoother beneath. Parietal lamella emerging; infraparietal lamella either wholly immersed or weak and emerging; deep within, the edges of the lamellæ are either smoothish or sparsely prickly, without knots or nodes; interparietal lamella either present or absent. There is no columellar lamella. Basal folds three or four. Type, *S. hubbardi*.

Strobilops hubbardi (A. D. Brown)

Helix hubbardi A. D. Brown, Proc. A. N. S. P., 1861, p. 333, text figure.

Strobila hubbardi W. G. Binney, Manual, 1885, p. 359, fig. 389.

Strobilops hubbardi Pilsbry, Man. Con., XXVIII, 1927, p. 47, pl. 7, figs. 1-3.

Original Description: "Shell umbilicated, depressed, thin, obliquely striated, striæ upon the base obsolete, brownish horn color; laminae 4, 2 upon the parietal wall, the upper one prominent, the lower very faint, 2 deep within the last whorl; spire slightly elevated; whorls 4.5-5, convex, the last slightly descending; umbilicus wide; aperture very oblique, subcircular; peristome slightly reflected, simple. Diam. maj. 2.25, alt. 1.25 mm." (Brown.)

"The parietal lamella is somewhat elevated and triangular, reaching the edge of the parietal callus. Infraparietal lamella very low, inconspicuous, weakly emerging, but not to the edge. Both enter slightly further than one-third of a whorl; between them near their inner ends there is a thread-like interlamellar lamella. At about one-third of a whorl within there is a series of four basal folds; the first situated where the basal curves into the columellar floor; the second, stout and erect, in the middle of the basal wall; the third one small; the fourth near the periphery and longer than the others." (Pilsbry, *l. c.*)

Type Locality: Indianola, Calhoun Co., Texas.

Alabama Records:

Baldwin Co.; Week's Bay.

Mobile Co.; Mobile; Saraland.

A southern species, which has been found only in the extreme southwestern counties of the state.

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Fig. 246.
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FAMILY VALLONIIDÆ

Characters as in the genus *Vallonia*.

GENUS VALLONIA RISSO

Shell minute, openly and widely umbilicate, depressed, the spire low-convex; whorls 3-4.5; color light and uniform; surface smooth or ribbed; periphery rounded; last whorl usually descending in front. Aperture oblique, circular or short oval; peristome continuous or nearly so, everted or straight, with or without a whitish lip.

Foot small, short, with no pedal grooves; edges of sole somewhat crenulated; sole undivided; eye-peduncles cylindrical, not enlarged distally; tentacles short; labial lobes well developed.

Jaw rather stout and short, arcuate, with a slight median projection or none, with irregular, sharp, rib-like striae, denticulating the cutting edge, with a faint, ill-defined, backward extension.

Radula: Centrals narrow and smaller than the adjacent laterals, tricuspid, the mesocone not half as long as the basal plate, ectocones very small; laterals with large, square basal plates, bicuspid, the mesocone extending to the edge of the basal plate, ectocone small; marginals low and wide, multicuspid.

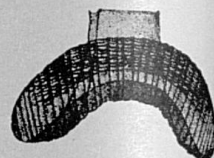


FIG. 249. Jaw of *V. pulchella* (Sterki).

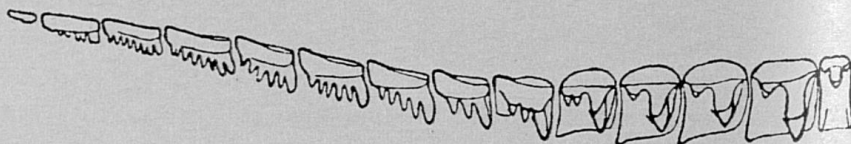


FIG. 250. Radula of *V. pulchella* (Watson).

Genitalia: Apparently in most individuals of this genus the male genital ducts are entirely lacking. Boycott (Proc. Mal. Soc. Lond., XII, 1917, p. 224) has suggested that in such cases the "vagina could function as a intromittent organ." When the male system is present the penis has a long lateral appendix, swollen distally and also near its origin, where it receives one of the branches of the forked penial retractor. In the specimen figured there was a second appendix practically as long as the other, but without basal enlargement, and arising from the anterior end of the penis. The receptacular duct is long and unbranched. The oviduct and vagina are without other appendages. The older authors have stated that there is a dart sac and dart, but this has not been found by more recent investigators and its existence remains to be definitely determined.

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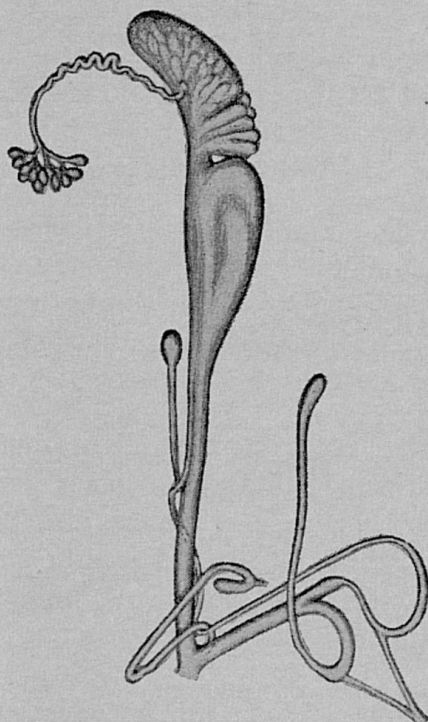


FIG. 251. Genitalia of *V. costata* (Watson).

Vallonia perspectiva Sterki

Vallonia perspectiva Sterki, Man. Conch., VIII, 1892, p. 257, pl. 33, figs. 39-45; Proc. A. N. S. P., 1893, p. 271, pl. VIII, fig. F; Sargent, Nautilus, VI, 1892, p. 77; Johnson & Pilsbry, *ibid.*, XI, 1897, p. 71; Cat., 1898, p. 7.

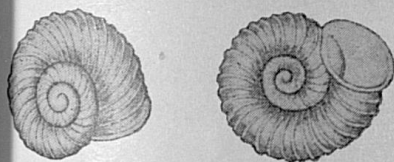


FIG. 252. *V. perspectiva* (Sterki).

Original Description: "Shell very widely, perspectively umbilicated, flat or a little elevated above; pale horn color or colorless, thin, translucent, with rather dense, rather regular, moderately strong membranous ribs, and finer striae

between them; nucleus without revolving lines (?). Whorls 3.33, gradually increasing, a little flattened below the periphery, with a deep suture; the last comparatively narrow, little expanding toward the aperture, descending in front. Aperture very oblique and inclined, transversely short ovoid or oblong; peristome solute, continuous, shortly everted, except near the suture, without a lip.

"Alt. 0.7, greater diam. 2.0, lesser 1.7 mm." (Sterki.)

Type Locality: Not specified. "Knoxville, Tenn.; Jackson Co., Ala.; Iowa."

Alabama Record: Woodville, Jackson Co.

"The free, continuous peristome is a character distinguishing our species from all others known to me. In general the aperture is not as conspicuously elongated transversely as in other related forms, and the inner part

in some examples is at least as well rounded as the outer, or even more. There are about 35 ribs on the last whorl, as there are also in *V. parvula*, which the present species resembles in size and general appearance; but the wide umbilicus, the transversely elongated aperture, continuous peristome, the absence of a strong lip, and the last whorl descending in front, are sufficient to distinguish the form under consideration." (Sterki.)

Vallonia pulchella (Müller)

Helix pulchella Müller, Verm. Hist., II, 1774, p. 30.

Vallonia pulchella Lewis, Ala. F. W. & L. Shells, 1876, p. 30; W. G. Binney, Manual, 1885, p. 77, fig. 39; Sterki, Man. Conch., VIII, 1892, p. 248, pl. 32, figs. 1-5.

Original Description: "Testa tota alba, glabra, subpellucida, supra planiuscula, subtus aliquantum convexa. Vertex testae, dum limax eam inhabitat, luteolus. Anfractus vix quatuor, subtus unicus. Apertura fere circularis, limbo elevato, tereti, reflexo. Testa quidem striata est, at striae microscopio tantum visibiles." (Müller.)

Sterki's description is as follows: "Shell moderately umbilicated, more widely for the last half whorl; convex or depressed conic above; straw colored, transparent, with fine and dense striae which are more regular at the suture and umbilicus; smooth at the nucleus; whorls 3.33-4, rather rapidly increasing, with a moderately deep suture, the last comparatively large, well rounded, little expanded toward the aperture, not descending in front, or slightly so at the suture. Aperture moderately oblique and inclined, forming five-sixths of a circle; peristome abruptly everted, with a strong white lip, thinner at either end.

"Alt. 1.2, greater diam. 2.4, lesser 2.0 mm."

Type Locality: Not specified.

Alabama Records: Northern Alabama? (Smith.) Alabama. (Lewis.)

FAMILY COCHLICOPIDÆ

Shell oblong, cylindric-oblong or narrowly tapering, smooth and glossy, with imperforate axis; aperture ovate or acuminate, the columella notched below or continuous with the basal lip. Foot without pedal grooves. Kidney with a direct ureter, of the Basommatophorous type. Genitalia with a long appendix on the penis, as in *Achatinella* and the *Pupillidæ*. Jaw and radula about as in *Pupillidæ*.

GENUS COCHLICOPA "FER." RISSO

Shell oblong-conic or oblong-cylindric, imperforate, smooth and glossy, composed of 5 to 7 slightly convex whorls. Aperture small, ovate, nearly

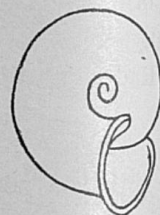


FIG. 253. *V. pulchella* (Sterki).

vertical, toothless. Outer and basal lips arcuate, obtuse, thickened within by a callous rim which is continuous to the upper insertion; columella short, concave or straightened, very slightly sinuate at the base; parietal callous very thin throughout.

Animal heliciform, obtuse before, pointed behind; mantle subcentral, thin, simple, protected by a shell; anal and respiratory orifices on the right side of the mantle under the peristome; generative orifice behind the right eye-peduncle; no locomotive disk; no caudal mucus pore.

Jaw arcuate, delicately and closely plaited vertically.

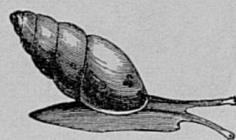


FIG. 254. Animal of *C. lubrica* (Binney).

Radula: Centrals narrow, with a short middle cusp, no side cusps; laterals wide, with square basal plates and a large inner cusp (mesocone); outer cusp small, with a small cutting point only. There are 8 perfect laterals, the 9th or 10th tooth having the ectocone split. The marginals are low and wide, and have both cusps split, forming a pectinate edge of 4 to 6 denticles, decreasing towards the outer teeth.

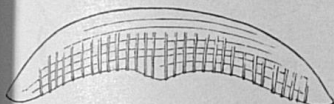


FIG. 255. Jaw of *C. lubrica* (Binney).

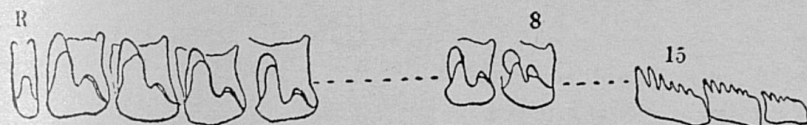


FIG. 256. Radula of *C. lubrica* (Pilsbry).

Genitalia with a long appendix inserted on the penis. This appendix

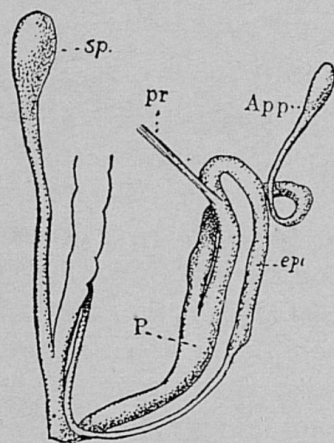


FIG. 257. Genitalia of *C. lubrica* (Pilsbry).

is contracted near the middle, swollen again at the distal end. The spermatheca is oval on a rather long duct.

Cochlicopa lubrica appalachicola Pilsbry

Ferussacia subcylindrica Sargent, Naut., VIII, 1895, p. 105.

Cochlicopa lubrica appalachicola Pilsbry, Man. Conch., XIX, 1908, p. 317, pl. 49, fig. 43.



FIG. 258. *C. lubrica appalachicola* (Pilsbry).

Original Description: "Shell more cylindric than *C. lubrica*, less conic, much thinner, transparent, showing the pillar through; pale greenish corneous. Aperture much narrower than in *C. lubrica*, the lip but very lightly and narrowly thickened within. It differs from *C. l. morseana* in color and by having the aperture somewhat larger. Length 6.4, diam. 2.25, length aperture 2.3 mm.; whorls 5.5." (Pilsbry.)

Type Locality: Woodville, Jackson Co., Alabama.

Alabama Records:

Jackson Co.; Stevenson; Woodville.
Lauderdale Co.; Florence.
Madison Co.; Gurley.

Randolph Co.; Roanoke.

Restricted to the northern part of the state.

Sargent's citation of *F. subcylindrica* from Woodville is, no doubt, this variety, as the typical form does not extend into Alabama.

II. HETERURETHRA

SUPERFAMILY ELASMOGNATHA

FAMILY SUCCINEIDÆ

Tentacles but little developed or wanting. Jaw surmounted by an accessory plate. Central tooth of the radula tricuspid, of the same size as the laterals, which are tricuspid or bicuspid, of the type of the *Helicidae*. Marginal teeth quadrate, with narrow base, multicuspid reflection, serrate by the splitting of the inner cusp into numerous denticles. Shell external or internal, very thin, transparent, spiral.

GENUS SUCCINEA DRAPARNAUD

Shell imperforate, thin, ovate or oblong; aperture large, obliquely oval, columella simple, acute; peristome simple, straight.

Animal heliciform, thick and blunt before, short and pointed behind; mantle central, simple, protected by a shell, which does not conceal the whole retracted animal; respiratory and anal orifices on the right of the mantle edge under the peristome; generative orifice behind the right eye-peduncle; no caudal mucus pore.

Jaw with an upper, quadrangular, accessory plate; strongly arched, the ends acuminate or blunt, with a median projection to the cutting margin, ribbed or smooth.

Radula: Centrals tricuspid; laterals bicuspid or tricuspid; marginals short, serriform; the centre of the lower edge of the basal plates of the centrals and the inner lower lateral angle of the basal plates of the laterals

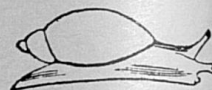


FIG. 259. Animal of *Succinea* (Binney).



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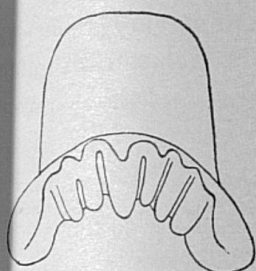


FIG. 260. Jaw of *S. ovalis* (Binney).

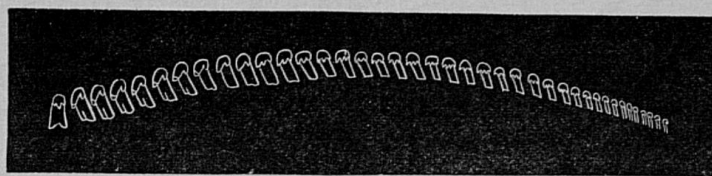


FIG. 261. Radula of *S. retusa* (Binney).

Succinea ovalis Say

Succinea ovalis Say, Jour. A. N. S. P., I, 1817, p. 15.

Succinea obliqua Lewis, Ala. F. W. & L. Shells, 1876, p. 30; W. G. Binney, Manual, 1885, p. 341, fig. 371.

Original Description: "Shell suboval, pale yellowish, diaphanous, very thin and fragile, with nearly three oblique volutions. Body very large, spire small, but little prominent, somewhat obtuse. Aperture longitudinally subovate, large. Columella much narrowed, so as almost to permit the view of the interior apex, from the base of the shell. Scarcely any calcareous deposit on the pillar-lip. Length nine-twentieths of an inch, aperture seven-twentieths." (Say.)

Type Locality: Not specified.

Alabama Records:

Baldwin Co.; Point Clear; Magnolia Springs.
Perry Co.; Uniontown.

Mobile Co.; Mobile.
Sumter Co.; 7 m. N. E. of Livingston.
Tuscaloosa Co.; Tuscaloosa.

This common northern species appears to have a scattering distribution in the western part of the state.



FIG. 262. *S. ovalis* (Binney).

Succinea campestris Say

Succinea campestris Say, Jour. A. N. S. P., I, 1817, p. 281; W. G. Binney, Manual, 1885, p. 443, fig. 489; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 402.



FIG. 263. *S. campestris* (Binney).

Original Description: "Shell oval, very fragile; whorls three, not remarkably oblique, pale yellowish, with opaque, white, and vitreous lines, irregularly alternating. Length not quite three-fifths, breadth seven-twentieths of an inch." (Say.)

Type Locality: Not specified.

Alabama Records:

Mobile Co.; Nanna Hubbard Bluff, Mobile.
Alabama (Gratacap).

"The resemblance between this species and the *ovalis* is very great; it differs, however, in being less elongated, and of a more robust form; the revolution of the spire is much less oblique, the shell itself is thicker and less fragile." (Say.)

Succinea campestris unicolor Tryon

Succinea unicolor Tryon, Amer. Jour. Conch., II, 1866, p. 230, pl. II, fig. 3.

Original Description: "Oval, inflated, very thin, translucent, finely striate; spire very short, apex acute, suture moderately impressed; whorls 3, the last very large; aperture short-ovate, outer lip somewhat expanded. Light corneous.

"Length 8, diam. 6 mill." (Tryon.)

Type Locality: New Orleans, Louisiana.

Alabama Records: Mobile Co.; Kelly's Pond; Choctaw Point; Toulminville.



FIG. 264.
S. campestris unicolor.

Succinea floridana Pilsbry

Succinea luteola Lewis, Ala. F. W. & L. Shells, 1876, p. 30.

Succinea floridana Pilsbry, Nautilus, XIX, 1905, p. 40.



FIG. 265.
S. floridana.

Original Description: "Shell obesely ovate, thin but strong for the genus, *opaque*, flesh-tinted or pinkish-white, marked with corneous-fleshy streaks, and usually a few scattered clear dots, readily seen by holding the shell up towards the light; apical whorls usually reddish-brown. Interior more or less deeply *tinted with ochre-yellow*. Whorls 3.5 to 3.75, very convex, the last whorl evenly convex. Sculpture of fine, unequal growth-lines and coarse but low wrinkles, with some indistinct malleations on the last whorl. Aperture ovate, short; outer lip well arched; columella oblique and nearly straight.

"Length 12.3, diam. 7.2, length of aperture 8 mm.

"Length 12.2, diam. 7, length of aperture 7.8 mm.

"Length 12.8, diam. 7, length of aperture 8 mm." (Pilsbry.)

Type Locality: Big Pine Key, Florida.

Alabama Records:

Baldwin Co., Pt. Clear.

Dallas Co.; Dallas Co.

Perry Co.; Hamburg.

Wilcox Co.; Camden; Alberta; Gastonburg.

Montgomery Co.; Barachias; McGee's Station.

Sumter Co.; Epes; Livingston.

"This species has hitherto been considered a form of *S. luteola*, from which it differs in the much shorter contour and more convex last whorl. I have seen no specimens from Florida referable to *luteola*. *S. floridana* is also closely related to *S. campestris*, which is still more obese, and more strongly corrugated, with the spire less slender. *S. floridana* varies a good deal in size. The largest seen is from Key West, 14 mm. long, and the

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FIG. 267.
S. grosvernori
(Binney)

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smallest adults are from Boca Chica Key, 8.5 mm. long, with 3.5 whorls." (H. A. P.)

Apparently restricted to the southern part of the state.

Succinea concordialis Gould

Succinea concordialis Gould, Proc. B. S. N. H., III, 1848, p. 37; W. G. Binney, Manual, 1885, p. 441, fig. 485; Pilsbry & Ferriss, Proc. A. N. S. P., 1906, p. 159, text-figs. 11-12.

Original Description: "T. tenui, lucida, oblique ovata, acuminata, reflexa, cerea et ad apicem rubicunda, leviter striata et lineis obseuris volventibus insculpta; anfr. 3 perobliquis, supernis parvulis, tumidis, sutura profunda; apertura ovata, trientesduae longitudinis testae aequante, basi rotundata; columella arcuata, absque plica, leviter arrecta; intus micante. Long. $\frac{1}{2}$; lat. $\frac{1}{2}$ poll." (Gould.)

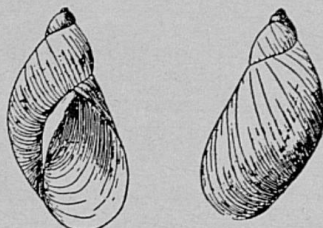


FIG. 266. *S. concordialis* (P. & F.).

Pilsbry and Ferriss give the following description: "It is a thin shell, rather deeply amber-colored, with the apical whorls darker, reddish-orange. Whorls 3.5, the last deeply descending, somewhat flattened above, very convex basally, having thus a more sack-like contour than *S. retusa*; this being its chief peculiarity. The sculpture consists of rather coarse wrinkles and often some indistinct spiral impressions on the last whorl. The aperture is symmetrically ovate, the columella concave throughout, with a delicate fold. Large specimens from San Marcos (Texas) measure:

"Length 16.8, diam. 9, length of aperture 11.5, width 6 mm.

"Length 16, diam. 8, length of aperture 10.5, width 6 mm."

Type Locality: Lake Concordia, Louisiana.

Alabama Records:

Lauderdale Co.; Florence.
Mobile Co.; Mobile.

Montgomery Co.; Montgomery.

Apparently a rare species in Alabama.

Succinea grosvernori Lea

Succinea grosvernori Lea, Proc. A. N. S. P., 1864, p. 109; W. G. Binney, Manual, 1885, p. 344, fig. 372b; Pilsbry & Ferriss, Proc. A. N. S. P., 1906, p. 161.



FIG. 267.
S. gros-
vernori
(Binney).

Original Description: "Shell obliquely ovate, striate, somewhat transparent, straw-yellow and thin; spire exerted; sutures very much impressed; whorls four, convex; aperture nearly round and rather large; outer lip expanded; columella bent in and twisted. Diam. .32, length .51 inch." (Lea.)

Type Locality: Not specified. Santa Rita Valley, Kansas? and Alexandria, Louisiana.

Alabama Record: Dallas Co.; Dallas Co.

A western species, which has only been reported from Dallas County.

"This species is characterized by its very full, rounded whorls and irregular sculpture, often with traces of spiral lines, though as frequently without them." (Pilsbry & Ferriss.)

Succinea avara Say

Succinea avara Say, Long's Exped., II, 1822, p. 260, pl. XV, fig. 6; Lewis, Ala. F. W. & L. Shells, 1876, p. 30; W. G. Binney, Manual, 1885, p. 339, fig. 369; Gratacap, Bull. Am. Mus. Nat. Hist., XIV, 1901, p. 401; Sargent, Nautilus, VI, 1892, p. 77; Wheeler, *ibid.*, XXVI, 1912, p. 15.

Original Description: "Shell suboval, pale reddish-yellow, subdiaphanous, fragile, covered with an earthy crust; whorls three, minutely wrinkled; body whorl very large; spire small; aperture large, subovate, about two-thirds of the whole length of the shell. "Length three-twentieths of an inch." (Say.)

Type Locality: Northwest Territory.

Alabama Records:

Conecuh Co.; Evergreen.	Dallas Co.; Selma.
Elmore Co.; Wetumpka.	Etowah Co.; Big Wills Creek, Attalla.
Franklin Co.; Russellville.	Jackson Co.; Woodville; Stevenson.
Jefferson Co.; Squaw Shoals.	Lauderdale Co.; Florence.
Madison Co.; Huntsville; Gurley; Monte Sano.	
Marshall Co.; Columbus.	Mobile Co.; Mobile.
Montgomery Co.; McGee's Station.	Perry Co.; Marion; Uniontown.
St. Clair Co.; Gallant.	Sumter Co.; Epes.
Tuscaloosa Co.; Duncanville; Hagler; Tuscaloosa; Vance.	
Wilcox Co.; Alberta.	

This widespread species has a scattering, but apparently general distribution over the state.

"This shell at first sight appears to be the young of some of the larger species, but it has as many whorls as any of them, though not attaining more than one-fourth part their size. It differs from all others in having a long and pointed spire, and in its shorter aperture, which is only half as long as the shell. The whorls do not expand so fast from the apex towards the aperture, and the last whorl consequently forms a much smaller part of the whole volume of the shell. One of its characters, but not entirely peculiar to it, is the loose manner in which the whorls are united, the suture being in some instances so deep as nearly to separate them." (Binney.)

Succinea aurea Lea

Succinea aurea Lea, Proc. Am. Phil. Soc., II, 1841, p. 32; W. G. Binney, Manual, 1885, p. 340, fig. 370.



FIG. 268.
S. avara
(Binney).



FIG. 269.

S. aurea
(Binney).

Binney's description is as follows: "Shell very symmetrical in form, elongated-oval, the texture very thin and lucid and of a clear amber color; whorls three, the suture deeply impressed and the whorls a little tabulated posteriorly; aperture narrow-ovate, acute posteriorly; the columella has an indistinct fold. Length, 7.5; breadth, 3 mm."

Type Locality: Springfield, Ohio.

Alabama Records: Baldwin Co.; Point Clear. Mobile Co.; Mobile.

A species of the Interior Region, which has been reported only from Baldwin and Mobile Counties.

"This small species is about the size of *S. avara*, but is less ventricose in form and of a more vitreous structure and a more yellow cast of color. The aperture, especially, is far less rounded; indeed, it is more narrow than in any other American species." (Binney.)

SUBORDER BASOMMATOPHORA

FAMILY ELLOBIIDÆ

Shell spiral; aperture elongate or oval, with strong folds on the columella and parietal wall; outer lip often dentate. Internal septa usually absorbed.

Head ending in a snout; mouth with a heavy lunate jaw, and with two dilated buccal lobes, united above, separated below; tentacles cylindrical, contractile; eyes sessile at the inner sides of the bases. Mantle closed, with a thickened margin; foot long, posteriorly blunt; respiratory orifice posterior on the right side, excretory orifice near it. Sexes united, orifices of the generative organs distant, on the right side.

GENUS CARYCHIUM MÜLLER

Shell minute, pupæform, very thin, transparent, with but few whorls; aperture suboval, with one dentiform columellar fold, sometimes obsolete; parietal wall with one or two teeth; peristome expanded; extremities united by a parietal callous.

Tentacles relatively large, cylindrical, obtuse; eyes situated below and behind the tentacles near their base; foot thick, obtuse behind and transversely divided anteriorly.

Jaw slightly arched, without ribs or marginal denticulations, broadly striated towards the margin.

Radula: Teeth in slightly bent cross series; centrals equilateral, narrow; laterals broad, short, denticulated.

FIG. 270. Animal of *C. exiguum* (Binney).



FIG. 271.
Jaw of
Carychium
(Moquin-
Tandon).

"The lamellæ of *Carychium* are two in number, the lower one arising as a tubercle on the columellar margin of the aperture, the upper appearing as a more conspicuous projection upon the parietal wall. The lower fold is the smaller and revolves about the columella beneath the upper lamella, which attains its greatest development within the body whorl of the shell. The edge of each lamella is thickened, cord-like." (Winslow.)



FIG. 272. Radula of *C. exiguum* (Binney).

The shape of these lamellæ is quite constant in the different species and affords good specific characters.

Carychium exiguum (Say)

Pupa exigua Say, Jour. A. N. S. P., II, 1822, p. 375.
Carychium exiguum W. G. Binney, L. & F. W. Shells, II, 1865, p. 6, figs. 5-9; Lewis, Ala. F. W. & L. Shells, 1876, p. 26; Pilsbry, Nautilus, VIII, 1893, p. 63, figs. 1-3; Wheeler, *ibid.*, XXVI, 1912, p. 16; Winslow, Occ. Pap., Mus. Zool., U. of Mich., No. 128, 1922, p. 3, pl. II, figs. 8-11; pl. III, figs. 12-15.

Original Description: "Shell dextral, tapering, oblong, with minute grooved lines; apex obtuse; whorls five; suture deeply impressed; labium bidentate, superior tooth situate rather beneath the middle of the lip, inferior tooth small, placed on the columella; labrum mutic, reflected, but not flattened; umbilicus distinct. Length more than one-twentieth of an inch." (Say.)

Type Locality: Vicinity of Philadelphia.

Alabama Records:

Clarke Co.; Thomasville.
Conecuh Co.; Evergreen.
DeKalb Co.; Valley Head.
Elmore Co.; Wetumpka.
Madison Co.; Monte Sano.
Randolph Co.; Roanoke.

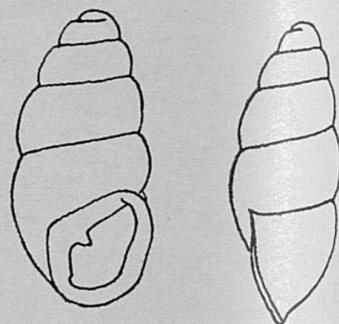


FIG. 273. *C. exiguum* (Clapp).

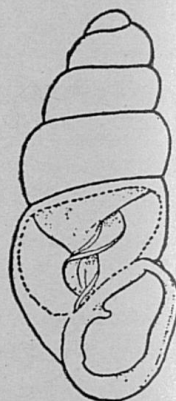


FIG. 274. *C. exiguum* (Winslow).

The reported records for this minute species indicate a general distribution through the state from the northeast to the southwest counties, but it

has not, as yet, been reported from the northwestern and southeastern portions of the state.

"Shell cylindrical, the last two whorls of about equal diameter. Whorls 4.5. Aperture decidedly over one-third the total altitude. Outer lip sinuous, moderately thickened, very strongly arcuate at the upper outer portion." (Pilsbry.)

"The lamellæ may be described as follows: Upper fold small in proportion to the diameter of the last whorl, somewhat sinuate, but never deflected sharply downward. Lower fold evenly sinuate, in well developed specimens shelf-like for a short distance beneath the upper fold in the last whorl of the shell." (Winslow.)

Carychium exile H. C. Lea

Carychium exile H. C. Lea, Am. Jour. Sci. (I), XLII, 1841, p. 109, pl. I, fig. 5; Pilsbry, Nautilus, VIII, 1894, p. 63, figs. 10-14; Wheeler, *ibid.*, XXV, 1912, p. 126; Winslow, Occ. Pap., Mus. of Zool., Univ. of Mich., No. 128, 1922, p. 3, pl. I, figs. 1-5.

Carychium exiguum exile Sargent, Nautilus, VI, 1892, p. 78.

Original Description: "Shell ovately conical, much elevated, subperforate, diaphanous, longitudinally striate; spire obtuse; whorls six, convex; sutures impressed; mouth elliptical, entire, with three teeth; lip much reflexed. Length .075. Breadth .025 of an inch." (H. C. Lea.)

Type Locality: Wissahickon Creek, Philadelphia, Pennsylvania.

Alabama Records:

Cherokee Co.; Dugger Mt., Piedmont.
Choctaw Co.; Silas.
Conecuh Co.; Evergreen.
DeKalb Co.; Fort Payne; Valley Head.
Franklin Co.; Burleson; Russellville; Forks of Sipsey.
Jackson Co.; Paint Rock; Princeton; Woodville.
Jefferson Co.; Squaw Shoals.
Lauderdale Co.; Florence.
Madison Co.; Monte Sano; Huntsville; Gurley.
Mobile Co.; Mobile.
Montgomery Co.; McGee's Station.
Randolph Co.; Roanoke; Wadley.
Talladega Co.; Horseblock Mountain.
Tuscaloosa Co.; Holt; Duncanville; Hagler; Tuscaloosa.
Walker Co.; Forks of Warrior.

This is the most common species of *Carychium* in Alabama and has a general distribution through the state.

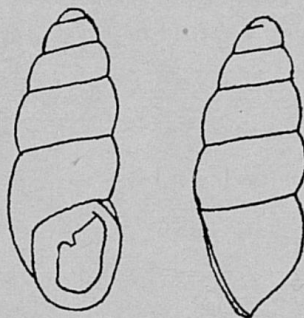


FIG. 275. *C. exile* (Clapp).

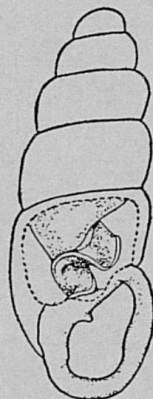


FIG. 276. *C. exile* (Winslow).

"Shell elongated. Whorls 5-5.5. Aperture small, very oblique, about one-third the length of the shell. Outer lip more or less thickened. Surface closely, regularly and very distinctly striated." (Pilsbry.)

"The upper columellar fold is very large in proportion to the diameter of the last whorl, almost touching the wall of the whorl at the upper angle of the aperture. Typically it is bent sharply downward at its widest part, the edge turning toward the columella. The lower fold is leaf-like, curling at its edge, wider than in *exiguum* and conspicuously projecting from the columella beneath the upper fold. Both lamellæ are more persistent in the penultimate whorl than is the case in *exiguum*, becoming wider in that whorl before disappearing in the upper whorls." (Winslow.)

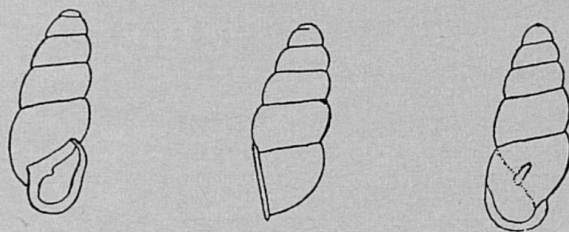


FIG. 277. *C. nannodes* (Clapp).

Carychium nannodes Clapp

Carychium nannodes Clapp, Nautilus, XIX, 1905, p. 91, pl. III, figs. 7-9; Wheeler, Nautilus, XXV, 1912, p. 126.

Original Description: "In shape this species resembles *C. exile*, being long and slender, but differs in being absolutely smooth, *without any trace of growth lines* even when magnified 60 diameters; under high magnification the surface shows a faint granulation; color waxy-white, transparent, the columellar fold showing distinctly through the shell; whorls about 4.5, regularly tapering from the body-whorl to the apex; sutures deep, whorls slightly shouldered; lip wide and well reflected, especially at the columella, where it forms a distinct umbilical chink, outer curve of lip decidedly flattened, hardly thickened within; viewed from the back the lip is more squared below than in *exile* and *exiguum*; upper columellar fold of good size, lower one almost obsolete.

"Length 1.4, diameter 0.5 mm." (Clapp.)

Type Locality: Monte Sano, about five miles east of Huntsville, Alabama.

Alabama Records:

Jefferson Co.; Squaw Shoals; Cohorts; Princeton.

Lauderdale Co.; Florence.

Madison Co.; Monte Sano; Gurley.

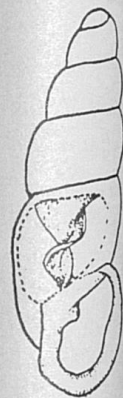


FIG. 278. *C. nannodes* (Winslow).

"Abundant among leaves in a shady ditch in damp forest near the top."
(H. H. S.) Altitude about 1,600 feet.

"This is a most distinct species, as its size alone at once separates it from all of the other American representatives of the genus." (G. H. C.)

"Upper fold small in proportion to the size of the last whorl, evenly sinuate. Lower fold scarcely more than a cord, becoming somewhat flattened and slightly projecting during the course of the first turn."
(Winslow.)

Apparently restricted to the northern part of the state.

9; Wheeler,



. 278. *C.*
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