

An Annotated List of Snails from Texas and Northern Mexico Collected by C. D. Orchard¹

E. P. Cheatum

A collection of land and fresh-water shells, principally from central, southern and southwestern Texas counties, with a few lots from Mexico, has been sent to me by Mr. C. D. Orchard, of San Antonio. Each lot was accompanied by ecological data; and since there were many intergrading forms, the following annotated list may be interesting and useful to field zoölogists and systematists.

Family BULIMULIDAE

Singley² in 1892 listed five species and one subspecies of the Genus *Bulimulus* for Texas. Pilsbry and Ferriss³ reduced this list to two recognized species, namely, *Bulimulus dealbatus* and *Bulimulus alternatus*. These distinct species can be distinguished both by shell characters and by morphology of the reproductive organs.

The shell of *B. alternatus* is solid, oblong, with interior ranging from light brown to purplish; it may be marked with longitudinal jagged or smooth stripes of bluish-gray to brown. Shells of *B. dealbatus* are relatively thin with a light interior, and are frequently marked on the outside with streaks showing a color range of white, gray, tan and brown. Since Pilsbry and Ferriss believe that typical *B. dealbatus* does not range into Texas, only subspecies are recognized. This distribution follows³:

"*B. dealbatus mooreanus* W.G.B., Pfr. Arid region of central and south Texas."

"*B. dealbatus liquabilis* Rve. Eastern and Southeastern Texas."

"*B. dealbatus ragsdalei* Pils. Bluffs of Red River and southwestern Texas."

"*B. dealbatus pecosensis* Pand. Southwestern Texas."

¹My best thanks are due to Dr. Henry Pilsbry, of the Philadelphia Academy of Natural Sciences, for the identifications of the snails collected in Mexico; and to Prof. S. W. Geiser, for critical reading of the manuscript.

²Singley, J. A. "A Preliminary List of the Land, Fresh Water, and Marine Mollusca of Texas," *Fourth Annual Report. Geol. Survey Texas. Pt. II*, 1892.

³Pilsbry, H. A. and Ferriss, J. H.; "Mollusca of the Southwestern States, Part II." *Proc. Acad. Nat. Sci. Phila.*, Vol. 58, 1906.

"*B. dealbatus pasonis* Pils. El Paso, western Texas."

"*B. alternatus marie* (Albers). Ranges through southern Texas."

In the shells of the Orchard and the Southern Methodist University collections so much intergrading between the subspecies *B. dealbatus liquabilis* and *B. dealbatus mooreanus* exists that naming these subspecies is practically impossible from the shell characters.

According to Pilsbry and Ferriss, the shell aperture of *B. d. liquabilis* is half the total length of the shell or more. Shells of *B. d. liquabilis* from the same habitat show, however, an aperture-length ratio conforming to *B. dealbatus mooreanus* (see Tables below); the shell color and texture however, fit the description of *B. d. liquabilis*. There are shells of *B. d. liquabilis* in the collection which have predominantly the corneous-brown coloring typical of *B. d. liquabilis*; but these individuals lived on dry Cretaceous soil, not at all characteristic of the alluvial lowlands in the San Marcos region, where this species is known to occur.

Bulimulus dealbatus mooreanus W.G.B., Pfr.

Jim Wells County.—Two miles northeast of Alice, Texas, in weed-covered fields.

Alt. ⁴	22	21	20	19	23	17	16	22
Diam.	13	11	10	11	12	10	9	12
Aper.	11	10	10	10	11	9	8	12
Whorls	6	5½	5¾	5½	6	5½	5¾	5¾

In measurements, the above shells included both subspecies; in color, they were typical of *B. d. mooreanus*.

Wharton County.—Near Boling, Texas, in well-drained weedy fields.

Alt.	24	21	22	24	22	25	23	22	23	22	23
Diam.	12	11	13	13	14	15	14	13	14	13	14
Aper.	12	11	12	11	11	13	11	11	11	11	10
Whorls	6	5½	5¾	5¾	6	5¾	6	5½	5¾	5¾	5¾

Nueces County.—Near Corpus Christi in chaparral thickets.

Alt.	24	23	22	24	25	23	22	18	19
Diam.	13	12	12	12	13	14	13	11	11
Aper.	11	10	10	11	11	12	11	9	9
Whorls	5¾	5¾	5¾	5¾	5¾	5¾	5¾	5	5

Most of the shells displayed pearl-gray lines alternating with white jagged lines.

Bexar County.—Olmos Park, embedded in subsoil.

Alt.	27	22	24	24	25	22	21	20	18	18	19
Diam.	16	14	13	14	15	13	13	12	12	11	12
Aper.	13	12	11	11	13	11	12	11	10	10	10
Whorls	6	6	6	6	6	5¾	5¾	5¾	5¾	5	5

⁴All measurements are in millimeters.

Bandera County.—In eastern part of the county, along Pipe Creek, the majority from high knolls. The shells were bleached, heavy, and one shell was finely ribbed on all but the basal whorl.

Nueces County.—Callo del Oso, ten miles west and south of Corpus Christi, in a field of brushy land cut with deep arroyos. Vegetation principally *Opuntia* and cutinized and suberized shrubs. One shell was exceptionally heavy, and possessed a regenerated peristome and whorls marked with a longitudinal series of white and tan lines.

Webb County.—Seven miles east of Laredo, on *Yucca* and *Opuntia*, in sandy soil. Guadalupe County.—West bank of Lake McQueeney, along the Guadalupe, five miles west of Seguin.

Brazoria County.—Quintana Cut, along Gulf Coast, east of Freeport, Texas.

Kendall County.—Specimens immature.

Bulimulus alternatus mariae (Albers)

Jim Wells County.—Near Alice, Texas, in well drained weedy fields. The columellar callus of one shell was unusually thick, and a conspicuous rib margined the peristome.

Guadalupe County.—Along west bank of Lake McQueeney. Most shells from this habitat displayed a columellar callus heavily striped with brown; all the whorls were marked with irregular longitudinal lines varying from bluish-white to brown.

Alt.	29	34	30	31	26	22
Diam.	16	18	17	18	16	14
Aper.	15	11	9	11	15	13
Whorls	6	6½	6½	6¼	6	6

Webb County.—Seven miles east of Laredo in sandy habitat; *Opuntia* and *Yucca* abundant.

Bexar County.—From well-drained areas, especially along weedy fence-rows. Those from Olmos Park had unusually globose whorls.

Mexico.—Near Don Martine Lake at Coahuila, among chaparral and other desert shrubs. The shells were smooth, tapering, with tan interiors and an absence of dark lines externally.

Family HELICIDAE

Polygyra texasiana (Moricand)

Brazoria County.—Quintana Cut, east of Freeport, Texas.

Dia.	11	11½	11	10	9½	10	9½	11½	9	9	9
Alt.	4½	5	5	4½	4½	4	5	4½	4½	4½	4

One shell of this lot was typical of *P. texasiana hyperolia* as described by Pilsbry and Ferriss, but the remaining shells intergraded between *hyperolia* and typical *texasiana*.

Guadalupe County.—West band of Lake McQueeney.

Diam.	10	11	9	9½	9	9	9
Alt.	4½	4½	4½	4½	4	5	4

All the shells displayed intergradations between *hyperolia* and typical *texasiana*.

Bexar County.—Olmos Park.

Nueces County.—Chaparral thickets near Corpus Christi.

Diam.	9	9	8¼	9½	10	10	7½	10	9½	8½	10	9	9½
Alt.	3¼	4	4½	4	5	5	4½	4	5	4½	5	4	5

The shells from this group show a sculpture typical of *texasiana* in that the last two whorls are strongly rib-striate above, the riblets rapidly diminishing to the smooth glossy embryonic whorl. As indicated by the above measure-

ments a few shells are more depressed than others. The altitude-diameter ratio shows forms intergrading between *texasiana* and *hyperolia*, yet the fine striations and relative smoothness of *hyperolia* are lacking.

Jim Wells County.—Alice, Texas.

Alt.	10½	4½	10	9	9	11	10	10	10½	9½
Diam.	5	4	4½	4½	4	5	4½	5	5	5

The basal whorl from shells of this locality is strongly rib-striate above, smooth below and the remaining whorls are almost smooth; a condition of sculpturing intermediate between *texasiana* and *hyperolia*. In two of the largest shells the peristomial teeth were absent and the columellar teeth were represented by faint ridges.

Comal County.—Collected on the Wetmore-Smithson Valley road at an elevation of 1124 feet. The area is rocky, with cedar, buckeye, Mexican persimmon and live oak trees constituting the dominant vegetation. All shells conformed to the specifications of typical *texasiana*. Also occurs at Landa Park, New Braunfels, Texas.

Wharton County.—Near Boling, Texas.

Kendall County.—Dierck's Ford, along Guadalupe river.

Bandera County.—Along Pipe Creek, in the eastern portion of the county.

Bexar County.—Classen ranch. Sculpturing of shells from the habitat was typical of *hyperolia*.

Mexico.—Two and one-half miles south of Valles, San Luis Potosi.

Polygyra mooreana (W. G. Binn.)

Comal County.—Collected on the Wetmore-Smithson Valley road at an elevation of 1129 feet; and at Landa Park, New Braunfels, Texas.

Bexar County.—Helotes, Texas.

Kendall County.—Dierck's Ford, along Guadalupe river.

Polygyra dorfeuilliana (Lea)

Brazoria County.—Quintana Cut east of Freeport, Texas.

Diam.	9½	9	8	7½
Alt.	4	3½	3½	3½

These shells are on the average of greater diameter than indicated by Binney⁵ who gives 8 mm. as maximum. In Dallas County the shell-diameter seldom exceeds 8 mm. Shell sculpture is similar to that of *P. texasiana*.

Mexico.—Collected 2.5 miles south of Valles, San Luis Potosi. The vegetation was chiefly *Mimosa* and cacti. This report extends the range of this species into Mexico.

Polygyra fraterna (Say)

Brazoria County.—Quintana Cut, east of Freeport, Texas. In one specimen the rather deep and wide umbilicus suggested *P. monodon*; but in the others the reflected peristome practically closed the umbilicus.

Bexar County.—Classen ranch.

Guadalupe County.—West bank of Lake McQueeney.

⁵Binney, W. G. *A Manual of American Land Shells*. (Bull. U. S. Natl. Mus. No. 28, 1885.)

Polygyra thyroides (Say) var. *bucculenta* (Gould)

Wharton County.—Boling, Texas.

a. Measurements of shells with reflected peristome and parietal tooth:

Diam.	19	17	15	15	16	16
Alt.	12	11	10	10	10	9

b. Measurements of shells with reflected peristome and parietal tooth either present or absent:

Diam.	19	21	21	20	17	17	19	22	21	19
Alt.	14	12	13	13	12	12	13	13	13	12

Shells from this locality show a perfect intergradation from typical *P. thyroides* to the variety *bucculenta*. In the lot lacking a reflected peristome and parietal tooth, the shells are thin, translucent, pale grayish-green and delicately furrowed with growth striae. Shells with a reflected lip show the parietal tooth either well-developed, vestigial or absent. It is also of interest to note that the diameter-altitude measurements average higher than maxima given by Binney.

Harris County.—Hermann Park, Houston, Texas.

Polygyra hippocrepis (Pfr.)

Comal County.—Landa Park, New Braunfels.

Praticolella berlandieriana Moricand.

This species is represented in the collection from Comal, Bexar, Jim Wells, Kendall, Nueces and Wharton counties. It was also collected 2.5 miles south of Valles, San Luis Potosi, Mexico.

Praticolella berlandieriana pachyloma (Mke., Pfr.)

Nueces County.—Collected from chaparral thicket near Corpus Christi, Texas.

Family HELICINIDAE

Helicina orbiculata tropica Jan. Pfr.

Shells from the following counties are in the collection: Nueces, Brazoria, Kendall, Bexar, Comal, Wharton, Bandera, Uvalde and Guadalupe. This species was also collected 2.5 miles south of Valles, San Luis Potosi, Mexico. Mr. Orchard states that at Boling, Texas, it is found abundantly in the interstices of boxelder bark.

Helicina chrysocheila Binn.

Collected in Mexico 2.5 miles south of Valles.

Family ENDODONTIDAE

Anguispira alternata (Say)

From Wharton, Brazoria and Guadalupe counties.

Helicodiscus parallelus (Say)

Kendall County.—Several shells of the lot had the weak spirals characteristic of my own Davis Mountains (Trans-Pecos Texas) material.

Family OLEACINIDAE

Euglandina singleyana (W. G. Binn.)

Bexar County.—Near Olmos Creek, Olmos Park. The largest shell measured 45 mm. in length, 17 mm. in diameter; the aperture length was 23 mm. Mr. Orchard found this species frequently in the cedar-brake country, on cedar trees.

Hidalgo County.—An individual was collected at Donna, and brought to the laboratory in damp moss. The shell measured 32 mm. in length, 12 mm. in width, with an aperture-length of 16 mm. Within a few days eight eggs resembling white miniature chicken eggs were deposited. These eggs hatched within 12 days into snails conforming in shape and size to the external appearance of the egg. Eggs averaged 6 mm. in length and $4\frac{1}{2}$ mm. in width. The shell of the egg was brittle and well developed.

Family ZONITIDAE

Mesomphix friabilis (W. G. Binn.).—Wharton and Brazoria counties.

Eucomulus chersinus trochulus (Reinhardt).—Kendall County.

Zonitoides arboreus (Say).—Kendall County.

Retinella indentata umbilicata (Singl. and Kkll.).—Bexar, Kendall and Comal counties.

Hawaiiia minuscula (W.G. Binn.).—Kendall County.

Family SUCCINEIDAE

Succinea luteola Gould

Collected from Brazoria, Guadalupe, Kendall, Bexar, Wharton and Jim Wells counties. The shells from Brazoria displayed wrinkles so pronounced as to impart a striped effect to the shell. All shells were pale yellowish-green with darker apical whorls.

Succinea concordialis Gould

From Travis and Nueces counties. Mr. Orchard also found this species 2.5 miles south of Huichihuayan, San Luis Potosi, Mexico, living at base of corn stalks in lowlands along the Axtla river.

Succinea avara Say

Wilson County; attached to bark of *Quercus*.

Family ACHATINIDAE

Rumina decollata Linne

Nueces and Guadalupe counties. Near Corpus Christi, this species was found in chaparral thickets.

Synopeas beckianum Pfr.

Collected 2.5 miles south of Huichihuayan, San Luis Potosi, Mexico, associated with *Succinea concordialis*.

Leptinaria tamaulipasensis Pils.

Collected from the same habitat as *S. beckianum*.

Family PUPIDAE

Pupoides marginatus (Say)—Kendall and Brazoria counties.

Gastrocopta armifera (Say)—Kendall County.

Gastrocopta contracta (Say)—Kendall and Brazoria counties.

Strobilops labyrinthica texasiana Pils. and Ferr.—Kendall and Brazoria counties.

Gastrocopta procerca duplicata (Sterki)—Kendall County.

Family UROCOPTIDAE

Stenogyra sp. ?—Collected 2.5 miles south of Huichihuayan, San Luis Potosi, Mexico.

Microceramus texanus Pils.—Comal and Bexar counties.

Holospira roemeri Pfr.—Kendall and Bexar counties.

Family PHYSIDAE

Physa anatina Lea.—Nueces, Wharton and Kendall counties.

Physa humerosa Gould.—Bexar County.

Physa forsbeyi Lea.—Brazoria, Wharton, Kendall and Nueces counties.

Family PLANORBIDAE

Helisoma trivolvis lentum (Say).—Wharton and Harris counties.

Helisoma tenue (Phil.).—Bexar and Nueces counties.

Tropicorbis liebmanni Dunker.—Bexar and Kendall counties.

Tropicorbis obstructus (Morelet).—Kendall County.

Family LYMNAEIDAE

Lymnaea bulimoides tebbella Pils. and Ferr.—Kendall County.

Family PLEUROCERIDAE

Goniobasis comalensis Pils.—Comal County.

Pachycheilus suturalis Pils. and Hinkl.

Collected about 500-600 feet above sea level 2.5 miles west of Huichihuayan, San Luis Potosi, Mexico; also found about 7 miles south of Huichihuayan.

Family AMNICOLIDAE

Ammicola peracuta Pils. and Walker—Comal County.

Within the collection are forty-five species of snails representing fifteen families. The taxonomic difficulties in the genera *Polygyra* and *Bulimulus* as presented in the tables and discussion emphasizes the point that the southwest is a great "mixing bowl" for many of our land snails. The solution of some of our problems concerning shell variation requires careful study of a large series of shells, with detailed ecological notes, from Texas, Arizona, New Mexico and ranging well into Mexico. Such notes are not only necessary for the ecologist, but would also furnish the key to many of the causes of variation in shell characters of our southwestern gastropods.