

NOTES ON THE FAUNA OF THE CHIPOLA FORMATION — XXV:  
ON THE OCCURRENCE OF THE GENUS *ROTHPLETZIA* SIMONELLI  
(MOLLUSCA: GASTROPODA)

HAROLD E. VOKES  
TULANE UNIVERSITY

One of the unexpected discoveries in the fauna of the Burdigalian (late lower Miocene) Chipola Formation of Calhoun County, Florida, is the occurrence of a species of the hipponicid genus *Rothpletzia* Simonelli, 1890, originally described as *R. rudista* on the basis of specimens collected from Miocene (presumably Vindabonian) deposits on Gran Canaria Island. Specimens that seem certainly to be referable to the same genus, collected from the southern part of the island of Trinidad, were subsequently described by Hodson and Harris in 1931 as representing "an Oligocene Rudistid" for which they proposed the name *Neomonopleura weidenmayeri*. Rutsch (1934) later synonymized *Neomonopleura* with *Rothpletzia* and reported the presence of the Trinidad form in the Antigua Limestone on the island of Antigua.

The original specimens of "*Neomonopleura weidenmayeri*" were collected from the Morne Diablo Quarry, No. 1, in the southern part of Trinidad from strata reported as of middle Oligocene age (Hodson and Harris, 1931, p. 136). Kugler (1953, p. 42) said that the Morne Diablo 'Marac,' in which the quarry is located, consists of upper Oligocene limestone, but subsequently stated (p. 50) that these limestones are in the *fohsi* and *insueta* planktonic foraminiferal zones. These zones are now considered as being uppermost lower Miocene and early middle Miocene (Blow, 1969). The Chipola Formation is referred to the *Globigerinatella insueta* zone, N7 of Blow, although that deep-water species is not actually present (Akers, 1972, p. 8).

The similarity to the rudistid bivalves, expressed in the specific name given to the type species of *Rothpletzia* and in the taxonomic assignment of the Trinidad form appears to be the result of an unusual growth shape caused by the ecologic environment in which these forms developed. Many of the species of the hipponicid genera *Hipponix* and *Malluvium*, as well as *Rothpletzia* secrete a calcareous "Stützklappe" or supporting plate that, as Keen (1971, p. 451) states, is "in effect an attached operculum . . . on which the animal rests." In all known occurrences the specimens of

*Rothpletzia* are associated with algal limestones, mainly *Lithothamnion*. The excellent preservation of the initial coiled portion of the basal plate of the Chipola specimens as well as the ornamentation of its surface clearly indicates that it was not cemented to a substratum but rather was apparently nestled in the algal mat; the upward growth of the margins may well have been a function of the necessity of keeping the aperture above the level of the increasingly thick surrounding algae. A cross section of the "Stützklappe" of one of the specimens figured by Simonelli (1890, pl. 36, fig. 6d) shows transverse partitions, termed "septen" by the author, indicating that the animal found it necessary to move upward in the shell as the algal growth forced increase in height. The Chipola specimens are much less vertically extended than are those in which these structures occur; apparently the algal growth was not sufficient to require their development.

Family HIPPONICIDAE Troschel, 1861  
Genus ROTHPLETZIA Simonelli, 1890

*Rothpletzia* SIMONELLI in ROTHPLETZ and SIMONELLI, 1890, Zeitschr. Deutsch. Geol. Gesellsch., v. 42, p. 711. Type species (by monotypy): *Rothpletzia rudista* Simonelli (*sup. cit.*, p. 711, pl. 36, figs. 6, 6a-d); Miocene, Gran Canaria Island.

*Neomonopleura* HODSON and HARRIS, 1931, Bulls. Amer. Paleontology, v. 16, no. 61, p. 135. Type species (original designation): *Neomonopleura weidenmayeri* Hodson and Harris (*sup. cit.*, p. 135, pl. 1, figs. 1-3; pl. 2, figs. 1, 2) "Oligocene" (?lower Miocene), Trinidad.

ROTHPLETZIA FLORIDANA H. E. Vokes,  
n. sp.

Text figures 1 - 3

*Description.* The shell is relatively small and composed of two units. There is a "lower valve" or "attachment plate" that is cup-shaped with a flattened basal disc and upwardly arched sides leading to a broadly ovate "aperture;" sides of the shell in this area are of unequal length, the "posterior," which rises more or less directly above the apical end of the basal disc, is short and straight to slightly concave in profile; that on the opposite, or "anterior," side is broadly convex and in all specimens is at least twice the length of

the other. The "upper valve" is of typically hipponicid cup-shaped form. The apices of both the upper and lower units have a coiled protoconch of two smooth whorls succeeded by a teleoconch ornamented with submicroscopically fine, rounded radial ribbing; the number of ribs is increased by intercalation until they number approximately twenty-five to the millimeter on the upper edge of the anterior side of the holotype specimen; these ribs tend to be interrupted by irregularly spaced, moderately strong concentric growth lamellae. Interior of the "valves" with typically hipponicid horseshoe-shaped muscle scars adjacent to the aperture, that in the "lower valve" located around the shorter side, that on the upper one apparently above the apical end.

*Holotype*: USNM 340288; greatest length 13.2 mm; height of posterior side\* 4.1 mm; height of anterior side\* 10.6 mm; aperture length 11.7 mm; aperture width 10.55 mm. Locality TU 1048.

*Paratype A*: USNM 340289; greatest length 9.5 mm; height of posterior side\* 3.3 mm; height of anterior side\* 5.7 mm; aperture length 8.2 mm; aperture width 7.1 mm. Locality TU 1196.

*Paratype B*: USNM 340290; length, slightly incomplete, 7.6 mm; width 7.9 mm; height 2.0 mm. Locality TU 1048.

*Type locality*: TU 1048, Farley Creek, south bank, about 0.8 mile east of bridge of Florida Highway 275 (NE ¼ Sec. 21, T1N, R9W), Calhoun County, Florida.

*Remarks*: None of the specimens from the Chipola Formation attain the elongated rudistid shape of the "lower valves" such as is present in both the type of the genus and the Trinidad species, and none show the transverse "septen" shown in the original illustrations of *R. rudista* (Rothpletz and Simonelli, 1890, pl. 36, fig. 6d); the writer is inclined to attribute this difference to a less rapidly growing algal mat in the, presumably, slightly cooler waters present at the Chipola localities. The specimens of *R. floridana* are also considerably smaller than are those of the other two species. Simonelli did not cite the dimensions of his form, but it is to be noted that when illustrations of other species were enlarged they were accompanied by an adjacent line indicating their height or length; such indications are absent from those of *Rothpletzia rudista*, and when they were subsequently

reproduced by Wenz (1944, p. 887, fig. 2608) the dimensions were shown as "1/1." Measurement of the original figures reveals a total length of 36.2 mm for the largest specimen, a height of 24.2 and a width of 20.2 mm for a smaller one with an attached "upper valve" that, separately figured, shows a greatest length of 20.8 and a width of 17.1 mm. These dimensions indicate that species attained almost three times the size of the present form. The figured types of "*Neomonopleura*" *weidenmayeri* Hodson and Harris are somewhat larger than those of *R. rudista*, the holotype, an internal cast that includes both "valves," is stated to have a length "from beak to beak" of 34 mm, and the paratypes to have "lengths" of 48 to 50 mm, and "greatest diameters" of 26 to 30 mm.

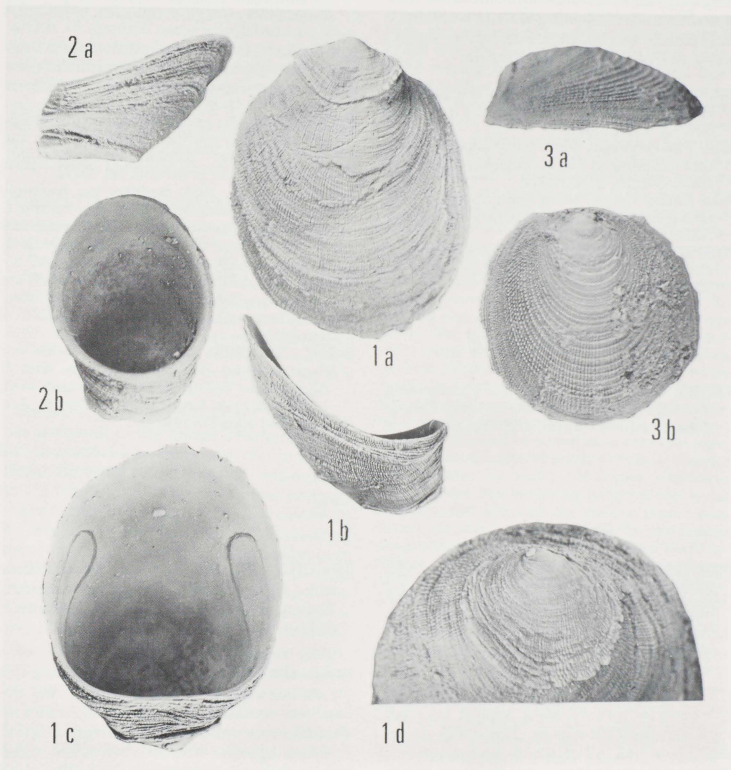
One striking difference between the Chipola and the type species appears to lie in the position of the muscle scars. Simonelli states (freely translated, italics mine): "Near the aperture and always on the convex side of the shell curvature lies a large horseshoe-shaped muscle imprint;" in all of the specimens of *R. floridana* the scar is situated adjacent to the shorter, straight to concave side with the broader convex side apparently being the apertural one. The ornamentation on the Chipola specimens appears to be very similar to that on the "upper valve" of *R. rudista*, described as consisting of "weak, densely crowded, erect radial ribs that are crossed near the lip by finer concentric striations." One of the paratypes of *R. weidenmayeri* (Hodson and Harris, 1931, pl. 2, fig. 2) has a portion of the outer surface preserved on the "lower valve," which is also very like that on *floridana* though somewhat coarser on the larger shell. Simonelli, however, described the exterior of the "lower valves" of *R. rudista* as being formed of "superimposed scaly lamellae," a feature that may reflect the erosion of the finer ornament by the *Lithothamnion* algal masses, rather than the original condition.

*Rothpletzia floridana* is represented in the Tulane University collections from the Chipola Formation by one "upper" and five "lower valves." All are from localities near the basal part of the formation on the upper reaches of Farley Creek, a tributary entering the Chipola River from the east. The

\*Assuming the basal disc as a flattened basal surface.

sediments here are primarily lime sands derived in part from the erosion of the underlying Chattahoochee Limestone; there are also occasional quartzite pebbles that apparently have been transported from much older sources to the north. The fauna at

these localities is exceedingly rich with many species of Mollusca, including abundant shells of true *Hipponix*, plus solitary and colonial corals, tube worms, and calcareous algae fragments. Similar conditions and faunas occur at many other Chipola



Text figure 1, *Rothpletzia floridana* n. sp. 1-Holotype, USNM 340288, lower "valve;" a) basal view,  $\times 4$ ; b) lateral view,  $\times 4$ ; c) dorsal view showing muscle scars,  $\times 4$ ; d) view of flattened "attachment" area showing ornamentation and nuclear whorls,  $\times 6$ . 2-Paratype, USNM 340289, lower "valve;" a) lateral view,  $\times 4$ ; b) dorsal view,  $\times 4$ . 3-Paratype, USNM 340290, upper "valve;" a) lateral view,  $\times 6$ ; b) dorsal view showing ornamentation and nuclear whorls,  $\times 6$ .

localities and it is difficult to determine those factors that seem to have resulted in the presence of *Rothpletzia* only at these sites.

#### LOCALITY DATA

The specimens of *Rothpletzia* were collected from the following Tulane University localities in the Chipola Formation, as exposed in Calhoun County, Florida:

823. Farley Creek, south bank about 2000 feet east of bridge on Florida Highway 275 (SE ¼ Sec. 21, T1N, R9W).  
 1048. Farley Creek, south bank about 0.6 mile east of bridge on Florida Highway 275 (SW ¼ NE ¼ Sec. 21, T1N, R9W).  
 1049. Farley Creek, south bank about 1.0 mile east of bridge on Florida Highway 275 (NE ¼ NE ¼ Sec. 21, T1N, R9W).  
 1196. Farley Creek, north bank about 0.65 mile east of bridge on Florida Highway 275 (SW ¼ NE ¼ Sec. 21, T1N, R9W).

#### LITERATURE CITED

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#### REVIEWS

THE GEOLOGICAL SCIENCES IN THE ANTEBELLUM SOUTH, edited by James X. Corgan. Published by The University of Alabama Press, University, Alabama, 1982, v + 195 pp., illustrated, indexed, \$17.50

This symposium contains nine papers by ten contributors offering insight into the southern geological work (1796-1860) of thirteen scientists, all of which had significant impact on intellectual and scientific development in the United States. Among these are Charles Lyell, already a celebrated scientist when he first visited the South in 1841; Gerard Troost and W. B. Rogers from early state-supported geological surveys; and Ebenezer Emmons, author of the ill-fated Taconic System. All did significant work in the southern states; this useful volume illustrates their impact on American science.

MARINE GEOLOGY, by James P. Kennett. Published by Prentice-Hall, Inc., Englewood Cliffs, New Jersey, 1982, xv + 813 pp., illustrated, index, \$35.00

This volume fulfills the need for a synthesis of marine geology, incorporating the enormous advances in this field during the last two decades. It is comprehensive and should prove most useful as a beginning text in this subject as well as a reference handbook for the working geologist and oceanographer.

Following the brief introduction and history of marine geology, the book comprises four sections: The Structural and Oceanographic Setting, The Ocean Margins, Oceanic Sediments and Microfossils, and Ocean History. Each section is well organized and clearly written; the book is highly recommended.

—H.C.S.