

NOTES ON THE FAUNA OF THE CHIPOLA FORMATION - X
ON THE OCCURRENCE OF THE VOLUTID SUBGENUS *ENAETA*JEAN M. CATE
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During the course of recent work on the Chipola Mitridae, I came across a group of shells in the Tulane University Geology Department collection that seemed out of place in this family. Upon further study, I determined that the species had first been described by Maury as a *Caricella* (Family Volutidae). Dall later described the same species as a *Strigatella* (Family Mitridae), and Gardner, although correctly synonymizing the Dall species with that of Maury, failed to note the discrepancies between the shell's characters and the characters of the named genus, thus erroneously retaining the species in the mitrid genus *Strigatella*.

The type species of *Strigatella* is the Indo-Pacific (Recent) *Strigatella paupercula* (Linné, 1758); a typical specimen is illustrated at Plate 1, figure 6. Modern workers (Cernohorsky, 1970; Coan, *et al.*, in press.) treat *Strigatella* as a subgenus of *Mitra*, no longer as a distinct genus.

There are several important characteristics in the species *isabellae* which would seem to preclude its placement in *Strigatella*; first of these is the presence of axial ribbing. The species in *Strigatella* are either smooth or spirally grooved, but never longitudinally ribbed; axial ribbing is present, however, in the volutid genus *Lyria* Gray, 1847. Secondly, the arrangement of the columellar folds is not consistent with *Strigatella*; columellar folds are typically stronger anteriorly in the volutids, but posteriorly in the mitrids; *isabellae* has definitely volutid columellar plaits, as the anterior folds are visibly stronger than the posterior ones. Furthermore, the plaits are more or less transverse, another typical character of the genus *Lyria*, the columellar folds being typically oblique in the Mitridae.

Finally, the presence of a blunt tooth on the labrum is an important characteristic of *Lyria* subgenus *Enaeta* Adams & Adams, 1853; in fact, it is the single character by which this subgenus is differentiated. Also, while the labrum is thickened in both *Lyria* and *Strigatella*, there is a difference in the manner in which it is thickened in the two genera; in *Lyria* s.s. the lip is simply heavy but smooth, whereas in *Strigatella* there is a large callus area present, and frequently a notch as well—but never a tooth. The blunt tooth, or nodule, so prominent in this species is typical only of species of *Enaeta*. The type species of *Enaeta* is the Panamic (Recent) *Lyria* (*Enaeta*) *harpa* (Barnes, 1824) = *L. (E.) barnesii* (Gray, 1825); typical specimens are illustrated on Plate 1, figures 4, 5.

The subgenus *Enaeta* shares certain morphological characteristics with another taxon, the closely related volutid genus *Mitreola* Swainson, 1833, type: *Mitreola monodonta* (Lamarck, 1803), from the Paris Basin, France. One of the most conspicuous differences between *Mitreola* and *Enaeta* is the nature of the color pattern. Although *Mitreola* is known only from the Eocene, fossil specimens from the Paris Basin display, under ultraviolet light, a color pattern similar to that seen in the modern *Strigatella*, while the Chipola specimens of *Enaeta isabellae* show a pattern almost identical with that of the Recent *Enaeta barnesii*. (Compare Plate 1, figs. 3 and 5, with figs. 6a and 7b.) Moreover, in *Mitreola* the callosity on the outer lip is a simple thickening and bears no resemblance to the labral nodule present in *Enaeta*; there is also a prominent parietal wall, which is lacking in *Enaeta*; the shell in *Mitreola* is more slender, and most importantly, the nucleus in *Mitreola* is more prominent and more mammillate. Pilsbry and Olsson (1954) removed the genus *Mitreola*

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from its former placement in Mitridae, placing it in the Volutidae, subfamily Lyriinae. It seems evident that additional work should be done in the relationships among these closely allied forms.

The differences among the various taxa discussed herein, and the need for re-assigning Maury's species to a different family, genus and subgenus, will be readily seen by a comparison of the figures on Plate 1. For all

the reasons given, I am here assigning *Caricella isabellae* Maury, 1910, to a more appropriate place in the Volutidae as *Lyria (Enaeta) isabellae* (Maury, 1910).

The presence of the subgenus *Enaeta* in the Chipola Formation is of more than usual interest, for according to Woodring (1964, p. 289) the only other known fossil species of *Enaeta* occur in younger Miocene deposits of Panamá and the Dominican Republic, making

PLATE 1

Figures

- 1-3. *Lyria (Enaeta) isabellae* (Maury, 1910) (X 2)
1. Holotype — *Caricella isabellae* Maury, 1910.
PRI 3446; height 27.4 mm, width 14.0 mm, length of aperture 19.0 mm.
Locality: "Bailey's Ferry, Florida." Chipola Formation, late lower Miocene.
 2. Holotype — *Strigatella americana* Dall, 1915.
USNM 114343; height 28.2 mm, width 14.0 mm, length of aperture 19.0 mm.
Locality: USGS 2212 (= TU 457). Chipola Formation, late lower Miocene.
 3. Color pattern as revealed by ultraviolet light.*
USNM 646935; height 24.2 mm, width 13.0 mm., length of aperture 17.4 mm.
Locality: TU 951. Chipola Formation, late lower Miocene.
- 4-5. *Lyria (Enaeta) barnesii* (Gray, 1825) (X 2) [Type of *Enaeta* Adams & Adams, 1853]
4. Cate coll. no. 59-2230; height 31.9 mm, width 16.1 mm, length of aperture 22.6 mm.
(Shell whitened to show ornamentation.)
Locality: Tenacatita Bay, Jalisco, Mexico, 20-40 fms; leg. G. Willett. Recent.
 5. USNM 707683; height 31.3 mm, width 17.5 mm, length of aperture 22.4 mm.
Locality: TU R-166, Barra de Navidad, Jalisco, Mexico. Recent.
6. *Strigatella paupercula* (Linné, 1758) (X 2) [Type species of *Strigatella* Swainson, 1840]
- Cate coll. no. 68-4539; height 27.5 mm, width 12.0 mm, length of aperture 15.2 mm.
Locality: Coron, Philippine Islands. Recent.
(Fig. 6a, color pattern; fig. 6b, whitened to show ornamentation.)
7. *Mitreola monodonta* (Lamarck, 1803) (X 2½) [Type species of *Mitreola* Swainson, 1833]
- USNM 646936; height 20.0 mm, width 9.4 mm, length of aperture 8.0 mm.
Locality: Grignon, France. Middle Eocene.
(Fig. 7a, white light; fig. 7b, color pattern as revealed by ultraviolet light.*)
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*The photographs taken with ultraviolet light are actually double negatives, reproducing the original color pattern present on the shell. The ultraviolet light gives a negative image unless thus converted. For further discussion of the technique involved see Vokes and Vokes, 1968, Tulane Stud. Geol., v. 6, no. 2, p. 76. The specimen of *Mitreola* had a brilliant fluorescence even without treatment in bleach, suggesting that the original color pattern was very intense in life, much like *Strigatella*.

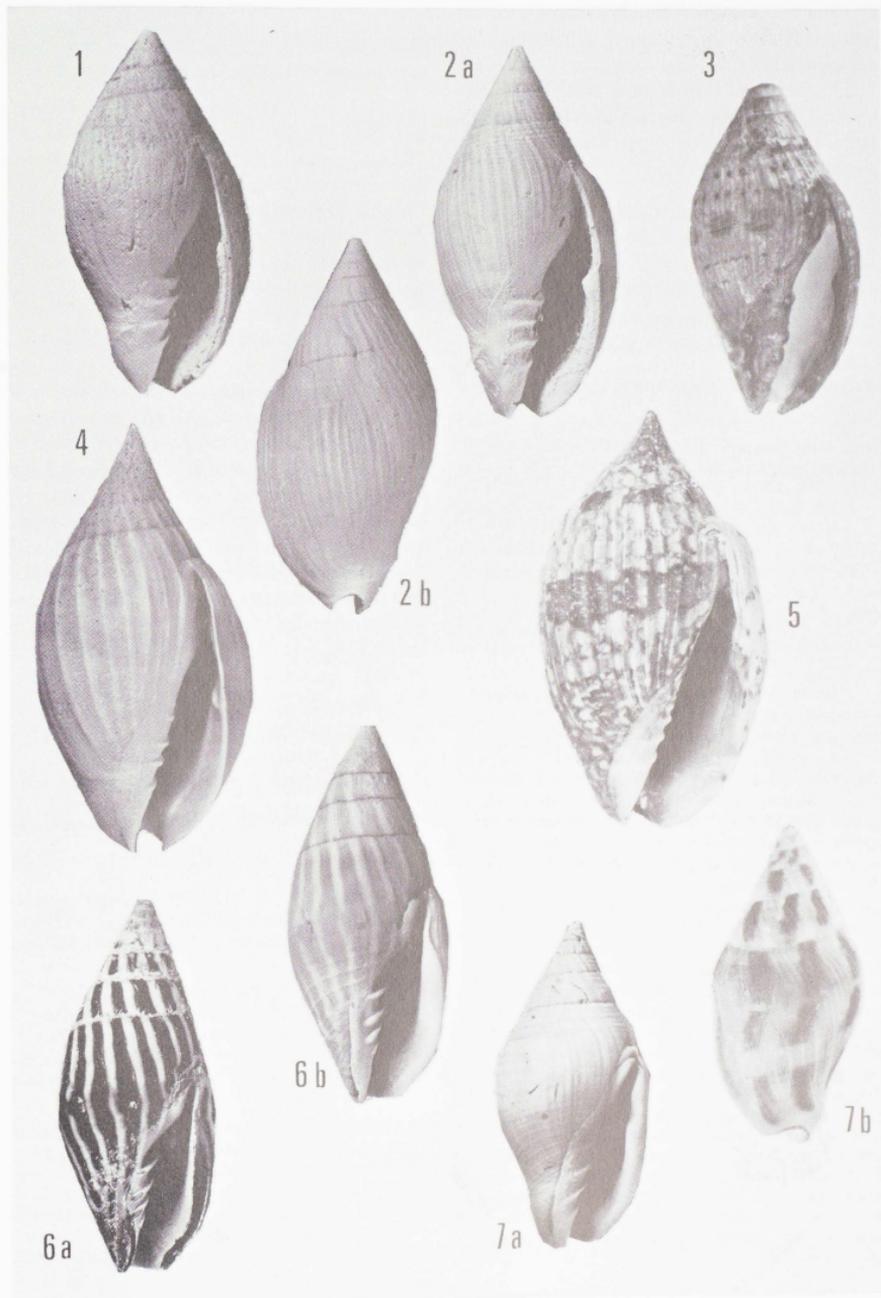


PLATE 1

this the oldest known fossil occurrence of the group. Pilsbry and Olsson (1954, p. 24) anticipated me in observing that "*Strigilla*" [*sic*] *americana* Dall is an *Enaeta*, but in the hopes of focusing attention upon its identity and significance this more detailed note is presented.

LYRIA (ENAETA) ISABELLAE
(Maury, 1910)

Plate 1, figs. 1-3

- Caricella isabellae* MAURY, 1910, *Bull. Amer. Paleontology*, v. 4, no. 21, p. 17, pl. 4, fig. 7. (See Plate 1, fig. 1)
- Strigatella americana* DALL, 1915, *U.S. Natl. Mus., Bull.* 90, p. 61, pl. 9, fig. 2. (See Plate 1, figs. 2a, 2b)
- Strigatella isabellae* (Maury). GARDNER, 1937, *U.S. Geol. Surv. Prof. Paper* 142-F, p. 419.
- Enaeta americana* (Dall). PILSBRY and OLSSON, 1954, *Bull. Amer. Paleontology*, v. 35, no. 152, p. 24, pl. 3, fig. 3 (holotype).
- [*Enaeta*] *isabellae* Maury. WOODRING, 1964, *U.S. Geol. Surv. Prof. Paper* 306-C, p. 289 (with "*Strigatella*" *americana* Dall in synonymy).
- Mitreola americana* (Dall). CERNOHORSKY, 1970, *Auckland Inst. Mus., Bull.*, No. 8, p. 88, pl. 12, fig. 5 (after Olsson and Pilsbry, 1954, pl. 3, fig. 3).

The protoconch is very small, obtuse, smooth, and highly polished and performs between two and two and one-half revolutions. The initial turn is broadly rounded posteriorly and almost entirely immersed. The succeeding one and one-half turns are feebly convex, flattening laterally toward the close of the protoconch. The dividing line between the conch and protoconch is indicated by a slight change in the texture of the shell, the increased lateral flattening of the whorl, and the introduction of faint spiral and incremental striae. The spirals are low and obscure, finely waved, and more or less irregular. They usually run from 9 to 13 to the whorl. The axial sculpture is incremental in character and irregular in development. Both the axial and the spiral sculpture have been somewhat exaggerated in Dall's figure. Miss Maury's type was doubtless slightly weathered, and the ornamentation is so obscure that it is easily obliterated by only a slight degree of erosion. The suture line is deeply impressed and is dragged backward near the aperture. The aperture is obliquely lenticular in outline and acutely angulated posteriorly. The anterior of the four labial plications is less elevated and less produced than any of those behind it. The siphonal notch is deep but not conspicuously wide; its margins are parallel and obliquely directed." (Gardner, 1937)

Figured specimens: Fig. 1, PRI 3446 (holotype-*Caricella isabellae* Maury); height 27.4 mm; width 14.0 mm; exact locality unknown. Fig. 2, USNM 114343 (holotype-*Strigatella americana* Dall);

height 28.2 mm; width 14.0 mm; locality USGS 2212 = TU 457. Fig. 3, USNM 646935; height 24.2 mm; width 13.0 mm; locality TU 951. Other occurrences: TU locality nos. 458, 546, 830, 998.

Discussion: The type locality of Maury's specimen is not known, as she cited only "Chipola marls, Bailey's Ferry, Fla." As has been noted previously in this series, the Chipola Formation does not occur at Bailey's Ferry and thus her specimen was probably from somewhere farther downstream. The type locality for Dall's species is USGS 2212 (= TU 457) and it is this which must be employed as the type locality for "*Caricella*" *isabellae* Maury. In the Tulane Geological Collections the species has not been collected at TU 457, and it is rare throughout the entire Chipola Formation with only 42 specimens known at the present time from all localities. The majority of these specimens were found in the lower beds along Ten Mile Creek but this is probably facies limited and not time limited, as a few specimens have also been taken at stratigraphically higher localities.

ACKNOWLEDGMENT

My thanks go to Dr. Emily H. Vokes, who first brought this interesting problem to my attention and offered helpful guidance in the further preparation of this paper. She has also kindly provided the illustrations.

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