

1210. Gurabo Fm., Rio Gurabo, east bank, first bluff below the bridge on the road from Los Quemados to Sabaneta, Dominican Republic (= USGS 8544; Maury's Zone B).

LITERATURE CITED

- AKERS, W.H., 1972, Planktonic foraminifera and biostratigraphy of some Neogene formations, northern Florida and Atlantic Coastal Plain: Tulane Stud. Geol. Paleont., v. 9, p. 1-139, pls. 1-60, 4 figures, 1 map.
- AKERS, W. H., 1974, Age of Pinecrest Beds, south Florida: Tulane Stud. Geol. Paleont., v. 11, no. 2, p. 119-120, 1 figure.
- ARAKAWA, K. Y., 1965, A study of the radulae of the Japanese Muricidae (3): Venus, v. 24, no. 2, p. 113-126, pls. 13, 14.
- MAURY, C. J., 1917, Santo Domingo type sections and fossils, Pt. 1: Mollusca: Bulls. Amer. Paleontology, v. 5, no. 29, p. 165-415, pls. 27-65, map; Pt. 2: Stratigraphy: *ibid.*, v. 5, no. 30, p. 416-460, pls. 66-68, correlation chart.
- OLSSON, A. A., 1942, Tertiary and Quaternary fossils from the Burica Peninsula of Panama and Costa Rica: Bulls. Amer. Paleontology, v. 27, no. 106, p. 153-258, pls. 14-25.
- RADWIN, G. E., and ANTHONY D'ATTILIO, 1976, *Murex* shells of the world, An illustrated guide to the Muricidae. Stanford, California. 284 p., 32 color plates, 192 text figs.
- SOWERBY, G. B., 1850, Descriptions of some new species of fossil shells found by J. S. Heniker, Esq. in J. C. MOORE, On some Tertiary beds in the Island of San Domingo; from notes by J. S. Heniker, Esq., with remarks on the fossils: Geol. Soc. London, Quart. Jour., v. 6, p. 39-53, pls. 9, 10.
- SEIGLIE, G. A., and OSCAR CUCURULLO, JR., 1971, Foraminiferos planctónicos de las localidades tipo de la "Caliza Mao Adentro" y de la "Arcilla Mao", Mioceno y Plioceno, Santo Domingo: Caribbean Jour. Sci., v. 11, nos. 3-4, p. 101-122, pls. 1-6, 4 text figs.
- VOKES, E. H., 1967, The genus *Vitularia* (Mollusca: Gastropoda) discovered in the Miocene of southern Florida: Tulane Stud. Geol., v. 5, no. 2, p. 90-93, 1 text fig.

November 16, 1977

NOTES ON THE FAUNA OF THE CHIPOLA FORMATION—XXII
ON THE OCCURRENCE OF *DOLICHOLATIRUS* (MOLLUSCA:GASTROPODA)

EMILY H. VOKES
TULANE UNIVERSITY

The small genus-group for which the name *Dolicholatirus* is now employed has a lengthy geologic history, dating back to the late Cretaceous Owl Creek Formation of Mississippi. Here we see a curious species, named *Dolicholatirus torquatus* by Sohl (1964, p. 209, pl. 26, figs. 9, 10, 16, 17), that is to all indications a good case of ontogeny *anticipating* phylogeny. The juvenile paratype (*ibid.*, figs. 9, 10) is apparently a good *Dolicholatirus*, with two faint columellar plications. The columellar lip, if it was ever present, has been broken away, leaving behind a *Fasciolaria*-like aperture, but the overall shell shape is identical to the modern members of *Dolicholatirus*. However, the adult holotype (*ibid.*, figs. 16, 17) has no visible plications as far into the aperture as it

is possible to see without breaking away the shell and has an expanded body whorl that externally looks exactly like *Fasciolaria* (*Triplofusus*). This subgenus (type species: *Fasciolaria gigantea* Kiener) has three small plications at the anterior end of the columella, which is bent. The adult *D. torquatus* has a straight columella more like *Dolicholatirus*. Perhaps it is the ancestor to both lines.

Certainly by the Eocene the modern genus-group is well established. In the United States we see from the middle Eocene: "*Latirus*" *singleyi* Harris, 1895, and "*L.*" *obtusus* Johnson, 1899; from the upper Eocene, "*L.*" *leaensis* Harris, 1897; and from the Oligocene, "*Turbinella*" *perexilis* Conrad, 1847. In the Paleogene of Europe there are numerous species, including "*Fusus*"

funiculosus Lamarck, 1803, from the Eocene of the Paris Basin, and "*Fusus*" *cognatus* Beyrich, 1856, from the Oligocene of northern Germany.

After the Oligocene the line becomes much rarer, although world-wide in distribution. In the New World it is represented by a single species, "*Latirus*" *exilis* Gabb, 1873, from the Miocene beds of Santo Domingo. In the Old World we also see a single species from the middle Miocene of Italy, "*Fusus*" *bronni* Michelotti, 1847, type of the genus, and "*Fusus*" *aciformis* Tate, 1888, described from Australian beds originally thought to be Eocene but now known to be middle Miocene in age also.

In the United States the group has not been reported from the Oligocene up to the Recent where we see, among others, "*Fusilaturus*" *pauli* McGinty, 1955, a form very closely related to the Dominican Miocene form. Therefore, it was with some pleasure the genus was recognized in the fauna of the lower Miocene Chipola Formation of northwestern Florida. The line is extremely conservative, there being little change from the Eocene to the Recent species, but it was rather unexpected to find that the Chipola form is the same as that described by Gabb from Santo Domingo.

The shell of this genus is easily recognized by its long, perfectly straight, non-umbilicate anterior canal, resembling that of *Fusinus* s.s., and its two columellar plications, reminiscent of *Latirus*. However, as shown by McGinty (1955, p. 79, text fig. A), the radula is unlike either of those genera. Although *Dolicholaturus* has frequently been assigned as a subgenus of *Latirus*, the differences seem such that the resemblances are probably coincidental.

Bellardi (1884, p. 38) was the first person to realize that the group of extremely elongated (*dolichos* – Greek, an elongated bean; the kidney bean) shells, bearing only two labial plications, represented a genus or subgenus separate from the similar appearing *Latirus* (*lathyros* – Greek, a bean; *Lathyrus* is the modern name of the sweet-pea). He included two species: *Latirus* (*Dolicholati-*

rus) *apenninicus* Bellardi and one which he cited as "*Turbinella*" *bronni* Michelotti. Of the latter he stated that Michelotti had published a "buonissima" figure (1847, pl. 10, fig. 15), however, there was no accompanying description. This is correct, Michelotti only listed the name in a table (1847, p. 398) with a footnote to the effect that this new species had been discovered too late to be included in the text. What is not correct is that Michelotti did not call it *Turbinella* but *Fusus*. This error was repeated by Cossmann (1901, p. 23) when he selected this species as type of the genus, which he considered as closer to "*Fusus*" (i.e., *Fusinus*), placing it in the "Fusinae," than to "*Lathyrus*," which he placed in the Fasciolarinae. In terms of radular type the group is apparently not related to either of these, the radula being totally different. On radular bases alone it would seem closer to the Vasidae than anything in the Fasciolaridae. The geologic history of the line, wherein the morphotype has existed virtually without change since the Eocene, suggests that it is a completely distinct group and probably should have its own family.

Genus DOLICHOLATIRUS Bellardi, 1884

Dolicholaturus Bellardi, 1884, Moll. Terr. Terz. Piemonte e Liguria, pt. 4, p. 38 (as a "sezione," i.e., subgenus of *Latirus* Montfort).

Type species, by subsequent designation, Cossmann, 1901: "*Turbinella*" *bronni* Michelotti [= *Fusus bronni* Michelotti, 1847].

Latirofusus COSSMANN, 1889, Cat. Illus. Coquilles Fossiles Eocene Paris, pt. 4, p. 179.

Type species, by original designation: *Fusus funiculosus* Lamarck.

Dolicholathyrus (emendation) COSSMANN, 1901, Essais Paléoconch. Comp., pt. 4, p. 22.

Fusilaturus MCGINTY, 1955, Acad. Nat. Sci. Phila., Proc., v. 107, p. 79.

Type species, by original designation: *Fusilaturus pauli* McGinty.

DOLICHOLATIRUS EXILIS (Gabb)

Text figures 1, 2

Latirus exilis GABB, 1873, Amer. Phil. Soc., Trans., (N.S.) v. 15, p. 217.

Latirus exilis Gabb. MAURY, 1917, *Bulls. Amer. Paleont.* v. 5, no. 29, p. 83(247), pl. 14(40), fig. 4.

Latirofuscus exilis (Gabb.) PILSBRY, 1921, *Acad. Nat. Sci. Phila., Proc.*, v. 73, p. 346, pl. 25, fig. 1.

Diagnosis: "Small, elongate, slender, spire longer than the aperture and canal; whorls numerous, suture bordered by a rib; surface marked by a very few large longitudinal ribs, five or six to a volution. These are crossed by strong revolving lines, of which about three appear on the upper whorls. Mouth small, oval, extended into a long slender, slightly curved canal; inner lip encrusted, the plate extending so as to make a raised sharp border to the mouth; internally marked by two strong transverse folds. Length 1.5 inch." (Gabb, 1873)

Dimensions of holotype: height 31.6 mm, diameter 9.5 mm.

Holotype: ANSP 2948.

Type locality: Dominican Republic; Rio Gurabo near Los Quemados (= TU 1210), here designated.

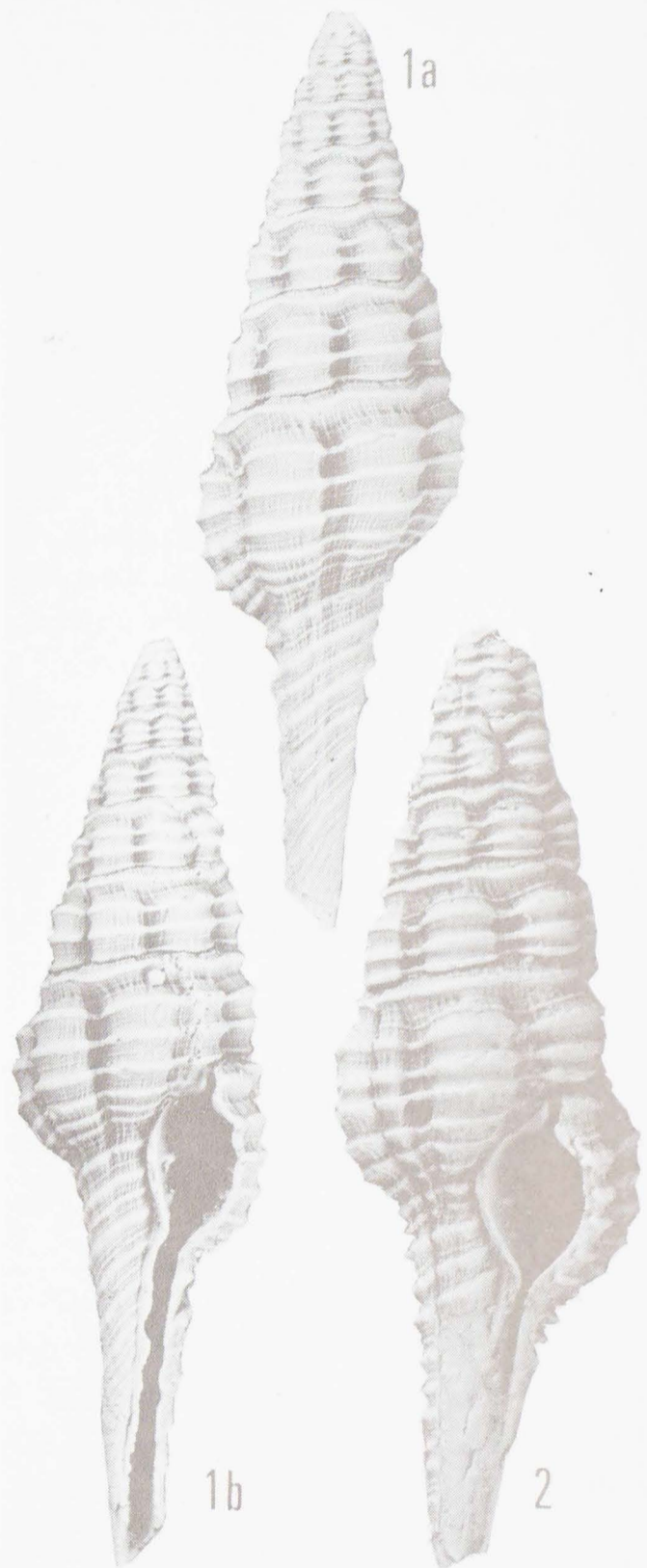
Occurrence: Chipola Formation, lower Miocene; Florida. Cercado and Gurabo formations, (?) upper Miocene; Dominican Republic.

Figured specimens: Text figure 1, USNM 647712; height 20.3 mm, diameter 5.5 mm; TU 830. Text figure 2, USNM 248193; height 22.0 mm, diameter 7.3 mm; TU 1210. Other occurrences: TU locality numbers 1048, 1230.

Discussion: This small species is never common; in the Tulane Collections it is represented by four specimens, one from each of the four localities cited above. As was his usual practice, Gabb gave no data for his species, but both the Maury Collection (1917, p. 83) and ours made at the same spot, downstream from where the road crosses the Rio Gurabo west of Los Quemados (now a bridge, but a ford for Maury and Gabb), contain specimens and it is probable that this is also where Gabb made his collection. Therefore, TU 1210 is here designated as the type locality. This outcrop is in the Gurabo Formation, but the species also occurs in the Cercado Formation (TU 1230), which may be only a shallow-water facies of the deeper Gurabo Formation.

The Cercado and Gurabo formations were originally described as being of Aquitanian and Burdigalian ages, respectively. Subsequent work (of which there has been very little) suggests that the beds are younger. Seiglie and Cucurullo (1971) have dated the Mao Adentro Limestone and the Mao Clay

as Zones N 18 and N 19 (lower Pliocene) and, as the Gurabo grades into the Mao Adentro, it seems probable that the latter is approximately N 17, or uppermost Miocene. Neither the Gurabo nor the Cercado have



Text figure 1, *Dolicholatirus exilis* (Gabb), USNM 647712; locality TU 830, Chipola Formation. Text figure 2, *D. exilis* (Gabb), USNM 248193; locality TU 1210, Dominican Republic. (X 4)

yielded any definitive guide fossils, but according to W. H. Akers (personal communication) the beds at TU 1210 are between Zones N 17 and 19. The presence of a Dominican species in the Chipola Formation offers little assistance in an age determination, for, as noted above, the *Dolicholatirus* shell form is so conservative that there is little change from the Eocene to the Recent forms, and individual species would be expected to be long-lived. The Recent *D. pauli*, is also very much like *D. exilis* and may prove to be the same species. While it is unusual to find a lower Miocene species still living, it is not unheard of — in the Chipola there are approximately a dozen mollusks that still are found in the Recent fauna.

ACKNOWLEDGEMENTS

The writer would like to express her appreciation to Robert C. Hoerle, West Palm Beach, Florida, who collected the specimen figured from the Chipola Formation; to Thomas R. Waller, U.S. National Museum, and Earl A. Shapiro, Philadelphia Academy of Natural Sciences, for the loan of type specimens; and, especially, Robert C. Bullock, Dept. of Zoology, University of Rhode Island, for his assistance with the genus *Dolicholatirus*.

LOCALITY DATA

The following are Tulane University fossil locality numbers.

830. Chipola Fm., Ten Mile Creek, at power line crossing about one mile west of Chipola River (SE ¼ Sec. 12, T1N, R10W), Calhoun Co., Florida.
1048. Chipola Fm., Farley Creek, south bank, about 0.6 mile east of bridge on Florida High-

way 275 (NE ¼ Sec. 21, T1N, R9W), Calhoun Co., Florida.

1210. Gurabo Fm., Rio Gurabo, east bank, first bluff below the bridge on the road from Los Quemados to Sabaneta, Dominican Republic (= USGS 8544; Maury's Zone B).
1230. Cercado Fm., east bank of the Rio Caña at Caimito, just above bridge on road from Los Quemados to Sabaneta, Dominican Republic (Maury's Zone H).

LITERATURE CITED

- BELLARDI, LUIGI, 1884, I Molluschi dei terreni Terziarii del Piemonte e della Liguria; Parte 4: R. Accad. Sci. Torino, Mem., (Ser 2) v. 37, p. 1-62, pls. 1, 2.
- COSSMANN, A. E. M., 1901, Essais de paléoconchologie comparée, v. 4. Paris. 293 p., 10 pls.
- GABB, W. M., 1873, On the topography and geology of Santo Domingo: Amer. Phil. Soc., Trans., (N.S.) v. 15, p. 49-259, 2 maps.
- MAURY, C. J., 1917, Santo Domingo type sections and fossils, Pt. 1: Mollusca: Bulls. Amer. Paleontology, v. 5, no. 29, p. 165-415, pls. 27-65 map; Pt. 2: Stratigraphy: *ibid.*, v. 5, no. 30, p. 416-460, pls. 66-68, correlation chart.
- MCGINTY, T. L., 1955, New Marine mollusks from Florida: Acad. Nat. Sci. Phila., Proc., v. 107, p. 75-85, pls. 1, 2, text figure A.
- MICHELOTTI, GIOVANNI, 1847, Descriptions des fossiles des terrains Miocènes de l'Italie Septentrionale: Nat. Verhand. Holland. Maat. Wetens. Haarlem, (Ser. 2) v. 3, no. 2, p. 1-409, pls. 1-17.
- SEIGLIE, G. A., and OSCAR CUCURULLO, JR., 1971, Foraminiferos planctónicos de las localidades tipo de la "Caliza Mao Adentro" y de la "Arcilla Mao," Miocene y Plioceno, Santo Domingo: Caribbean Jour. Sci., v. 11, nos. 3-4, p. 101-122, pls. 1-6, 4 text figs.
- SOHL, N. F., 1964, Neogastropoda, Opisthobranchia and Basommatophora from the Ripley, Owl Creek, and Prairie Bluff Formations: U.S. Geol. Surv. Prof. Paper 331-B, p. 153-344; pls. 19-52.

November 16, 1977