

TWO NEW SPECIES OF MURICINAE FROM THE CRETACEOUS
AND PALEOCENE OF THE GULF COASTAL PLAIN,
WITH COMMENTS ON THE GENUS *ODONTOPOLYS* GABB, 1860

C.L. GARVIE
HOUSTON, TEXAS*

I. ABSTRACT

Two new species of muricid gastropods are described: *Poirieria (Paziella) cretacea*, from the Kemp Clay (Cretaceous: Maastrichtian) in Texas, and *Pterynotus (Pterynotus) aurorae*, from the Bells Landing Marl Member of the Tuscahoma Formation (Paleocene) of Alabama. The new species of *Poirieria* is the first reported occurrence of a muricine to be discovered in the Cretaceous of the New World and only the second worldwide. The previously known species from Saxony, eastern Germany, is a secondary homonym and is renamed *Poirieria* (?*Paziella*) *cenomae* herein. Examination of the type species of the genus *Odontopolys* Gabb, 1860, indicates its relationship to the genus *Vitularia*.

II. ACKNOWLEDGMENTS

The writer gratefully acknowledges the assistance and encouragement of Emily H. Vokes and David T. Dockery, III. In addition, Emily H. Vokes kindly supplied photographs of the *Poirieria* and *Odontopolys* specimens. Thanks also go to Klaus Bandel who kindly permitted me to state some conclusions from a paper he has in preparation on Cretaceous gastropods. Finally, I would like to thank my wife Shirley, who found the first specimen of the Cretaceous muricine.

III. SYSTEMATIC DESCRIPTIONS

Phylum MOLLUSCA

Class GASTROPODA Cuvier, 1797

Subclass PROSOBRANCHIA

Milne-Edwards, 1848

Order NEOGASTROPODA Wenz, 1938

Superfamily MURICACEA

Rafinesque, 1815

Family MURICIDAE da Costa, 1776

Subfamily MURICINAE da Costa, 1776

Genus POIRIERIA Jousseume, 1880

Poirieria JOUSSEAUME, 1880, Le Naturaliste, Année 2, no. 42, p. 335.

Type species: *Murex zelandicus* Quoy and Gaimard, 1833, by original designation.

Subgenus PAZIELLA Jousseume, 1880

Paziella JOUSSEAUME, 1880, Le Naturaliste, Année 2, no. 42, p. 335.

Type species: *Murex pazi* Crosse, 1869, by original designation.

POIRIERIA (PAZIELLA) CRETACEA

C.L. Garvie, n. sp.

Plate 1 figures 1, 2

Description: Protoconch initially of 1/2 whorl, enrolled, acute, followed by 3 1/2 smooth, rounded whorls, first varix appearing at the lower point of the whorl. The first teleoconch whorl with six lamellar curved varices, successive ones increasingly protruding from the bottom of the whorl. Six or seven varices on the spire whorls and five on the adult body whorl. Varices, thick, heavy, angular on the shoulder and swinging forward strongly above the shoulder, meeting the preceding whorls at an acute angle. Surface smooth, no visible spiral sculpture on spire; body whorl with five or six weak rounded cords in the intervarical area from the shoulder to the canal. Aperture triangular in outline, outer lip with two denticles under the shoulder area and seven on the remaining portion. Inner lip smooth with a moderate deposit of callus and an incipient denticle under the top of the whorl. Siphonal canal short, open and moderately recurved.

Dimensions of holotype: height 16.5 mm, diameter 10.1 mm.

Holotype: USNM 455526.

Type locality: Colorado river, bluff on left bank at Webberville, Travis County, Texas. U. S. Geological Survey locality 7601.

Occurrence: Kemp Clay, Upper Cretaceous (Maastrichtian).

Discussion: The Muricacea has been thought to be well-represented in the Late Cretaceous of the New World by the muricid subfamilies Rapaninae and Moreinae with genera *Ephora*, *Sargana*, *Morea*, *Paramorea*, and *Schizobasis* and the family Magilidae, with the genera *Latiarix* and *Lowenstamia*. See Sohl,

*Mailing address: P.O. Box 691091, Houston, TX 77269

(1964) for discussion of many species from the Ripley, Owl Creek and Prairie Bluff formations. However, examining the protoconchs of some of the well-preserved fauna of the Coffee Sand in Mississippi, Klaus Bandel (pers. comm.) has shown that *Sargana* is a close relative of the Trichotropid branch of the Mesogastropoda and *Lowenstamia* is probably a member of the Ficidae. The genus *Echphora*, or a close look-alike has been reported from the Cretaceous by Sohl, but according to both Klaus Bandel and Emily Vokes (pers. comm.) its systematic placement is incorrect. Petuch (1988, p. 12) considers it to be an "unnamed subgenus" of *Sargana*.

With regard to the subfamily Muricinae, even world-wide only one species has been reported, *Murex armatus* Geinitz, 1874, from the Late Cretaceous (Cenomanian) of Saxony, eastern Germany. As Vokes (1970, p. 5) noted, that name is preoccupied by *M. armatus* A. Adams, 1854. The Saxony species is herein renamed *Poirieria* (?*Paziella*) *cenomae*. An examination of Geinitz's two figures of *Murex armatus* shows a shell with seven or eight varices terminating in long open spines. On the apertural view the illustration also shows weak spiral sculpture on the shoulder area. The aperture is broken so one cannot know whether denticles were present; Vokes, (1970, p. 5) was confident it had a long, extended canal. Without a hand examination one cannot absolutely place the species but it appears to be a *Paziella*. Given the time interval of at least 26 million years between the deposits containing *Murex armatus* and those containing *P. cretacea*, it is surprising that the two species are so closely related. With such strong muricine characters already present in *P. cenomae* and the apparent slow evolution of the genus, indications are that the ancestral stock must have appeared much earlier, perhaps near the beginning of the Cretaceous.

The closest species to *P. cretacea* is *Poirieria* (*Paziella*) *harrisi* E. H. Vokes, 1970, to which it bears a close resemblance and which is in all probability its descendant. The Cretaceous species is more elon-

gated, has fewer and less foliated varices, even less spiral sculpture than *P. harrisi* and two more denticles on the outer lip. Five specimens were recovered from the Kemp Clay, two adult and three juveniles (one now lost). One juvenile has the lower part of the body whorl broken off and shows a columellar groove within the spire, a feature that is not visible in the aperture of the other unbroken specimens.

The Webberville location where the specimens were found was collected by Stephenson and Deussen in 1911 and does not seem to have been commented on since then. As with many other localities on the Colorado river, it has greatly deteriorated since the series of dams was constructed upstream from Austin and regular scouring by floodwaters no longer takes place. Both adult specimens show evidence of abrasion, a condition also seen in many of the other larger gastropods from this location. The bulk of the fauna is found in one thin layer that appears to be a channel deposit.

The Kemp Clay (Navarro Group) is the highest stratigraphic unit in the Upper Cretaceous series of Texas; Stephenson (1941) gives a description of the diverse fauna of 105 species of which 99 are Mollusca and their relationships to equivalent ones worldwide. Stephenson interpreted the environment as being marine, not exceeding 100 fathoms in depth.

At Webberville the middle part of the Kemp Clay is exposed and consists of black carbonaceous shales and sandy clay. The fossil fauna shows evidence of being transported in agitated conditions. Most of the fauna is found in thin sandy layers that often include fragments of fossil wood. The smaller specimens are most often found on the lee side of large mollusk fragments, which are commonly fragments of an ammonite. Approximately five miles north, at the Littig clay pit, Kocurek (1978) has interpreted the Kemp environment as deltaic, prodelta with shelf deposits; the proximity of the delta could explain the depositional environment. The Cretaceous fauna at the Littig clay pit itself is very meager, the only species the author has been able to find are a few poorly preserved specimens of *Tellina* spp. and *Nucula* spp.

Genus PTERYNOTUS Swainson, 1833

Pterynotus SWAINSON, 1833, Zool. Illust., (Ser. 2) vol. 3, expl. to pl. 100.

Type species: *Murex pinnatus* Swainson, 1822, by subsequent designation, Swainson, 1833.

Subgenus PTERYNOTUS s.s.

PTERYNOTUS (PTERYNOTUS) AURORAE

C.L. Garvie, n. sp.

Plate 1, figures 3, 4

Description: Whorls six (protoconch missing and first two extant whorls very worn), rounded and very slightly shouldered. Suture impressed and margined below with a slight subsutural swelling. Three foliated ruffled varices per whorl, the line of the varices making a slight adaperturnal spiral down from the apex. Inter-varicial axial sculpture consisting of about five weak, irregular ribs angling forward on the shoulder to meet the suture at an acute angle, dying out toward the base of the body whorl. Spiral sculpture consisting of five low rounded cords on the spire and about 12 on the body whorl. Aperture elliptical, outer lip with six denticles, parietal region smooth, excavated and with a small medial swelling. Siphonal canal moderate in size and slightly curved to the left.

Dimensions of holotype: height 25 mm, diameter 12 mm.

Holotype: USNM 455527.

Type locality: Greggs Landing on the Alabama river, locality AMo-1 of Toulmin, 1977.

Occurrence: Bells Landing Marl Member of the Tuscahoma Formation, Paleocene.

Discussion: This new species is represented by a single specimen. The three-winged shape with the foliated varices would seem to mandate an assignment to *Pterynotus* s.s., but other features are atypical. The siphonal canal is relatively short and straight and not bent to the right, the lower columella lip, although no longer complete, is quite thick and must have covered the canal substantially more than is now showing. A distinctive feature of most early Tertiary species of *Pterynotus* s.s. is an intervaricial node or ridge; the only Gulf coast Paleogene species lacking that feature is *Pterynotus* (*P.*) *matthewsensis* (Aldrich, 1886) from the Matthews Landing beds (Paleocene) of Alabama. All Claibornian and Jacksonian species of *Pterynotus* possess intervaricial nodes and *P. aurorae* can be separated from those by that feature alone, although its more elongate form is also distinctive. *Pterynotus*

matthewsensis lacks the intervaricial nodes but is more strongly shouldered and bears prominent spines.

The Tuscahoma Formation of the Sabine Stage has long been considered to be of Early Eocene age. Recent dating using nannoplankton has established an NP 9 zone age (see Siesser, 1983), which corresponds to a Thanetian (Paleocene) age.

Genus ODONTOPOLYS Gabb, 1860

Odontopolys GABB, 1860, Acad. Nat. Sci. Philadelphia, Jour., (Ser. 2) vol. 4, pt. 4, p. 377.

Type species: *Murex compsorhytes* Gabb, 1860, by original designation.

Discussion: The type species of *Odontopolys* Gabb, 1860, was described from the Wheelock Member of the Crockett Formation in Texas. In spite of efforts made by Stenzel (see Stenzel, Krause, and Twinning, 1957), the author, and others, the original type locality of the Wheelock Member where Gabb's species was presumably collected is now lost. About 19 miles from Wheelock are exposures of the Wheelock Member on the banks of the Little Brazos river, which have furnished numerous specimens of *O. compsorhytes*. Maintenance operations by the Texas Highway department in the vicinity of Wheelock some years ago did expose Wheelock marl and an examination established their similarity to the upper part of the formation exposed at the Little Brazos River locations.

Gabb described *Odontopolys* as having two columellar folds or plaits, a feature that would preclude an assignment within the Muricinae, although a few species within the subfamilies Muricipsinae and Ergalataxinae (E. H. Vokes, pers. comm.) do possess true columellar folds. However, an examination of several broken specimens from the Wheelock Member establishes that Gabb's columellar plaits are actually elongated denticles.

Gabb did not describe the protoconch: this is conical, set at a slight angle to the axis of the shell, similar to the protoconch of *Vitulularia salebrosa* (King and Broderip, 1832) and consists of three smooth whorls, the suture of which is minutely crenulated below. The first two whorls are smoothly rounded, the last one shouldered. The crenulated feature is diagnostic and can be used to separate juvenile specimens of *O.*

compsorhytes from the otherwise very similar appearing juveniles of *Pterynotus* (*P.*) *sabinola* Palmer, 1960, and all other Claibornian juveniles of *Pterynotus*.

The teleoconch has greater variability than Gabb described. The number of intervarical ribs may vary from two to six, with three being the most common number. The strength of the columellar denticles also varies widely from being inconspicuous to prominent.

In outline *O. compsorhytes* greatly resembles *Vitularia linguabison* (= *V. salebrosa*) Vokes, 1967, described from the "Miocene" (i.e., the Pliocene Fruitville Formation) of Florida. Instead of the pustulose surface seen in that species, as well as in other species of *Vitularia*, there is a peculiarly polished malleated surface upon which are low spiral lines whose strength varies somewhat irregularly as they cross over the rounded axial ribs. Points of similarity with *Vitularia* are the apertural shape, the denticulate labrum, the wide variability in shell characters, the inner lip separated from the lower portion of the siphonal canal and the low shouldered whorls. A completely closed canal is also seen in some specimens of *Vitularia miliaris* (Gmelin, 1791). Two well-preserved specimens of *O. compsorhytes* show the siphonal canal to be completely closed (although not fused along the edge). Were the smooth varices of *Odontopolys* lamellose the differences between it and *Vitularia* would be slight indeed.

IV. LITERATURE CITED

- ADAMS, A., 1854, Description of new shells from the collection of H. Cuming Esq.: Zool. Soc. London, Proc., pt. 21 (1853), p. 69-74.
- ALDRICH, T. H., 1886, Preliminary report on the Tertiary fossils of Alabama and Mississippi: Geol. Surv. Alabama, Bull. 1, p. 15-60, pls. 1-6, tables 1-10.
- CONRAD, T. A., 1860, Description of new species of Cretaceous and Eocene fossils of Mississippi and Alabama: Acad. Nat. Sci. Philadelphia, Jour., (Ser. 2) vol. 4, pt. 3, p. 275-298, pls. 46-47.
- COSTA, E. M. da, 1776, Elements of Conchology. 318 p., 7 pls., London.
- CROSSE, H., 1869, Diagnoses molluscorum novorum: Jour. Conchyliologie, vol. 17, p. 183-188.
- CUVIER, G., 1797, Tableau elementaire de l'histoire naturelle des animaux. xvi + 710 p, 14 pls., Paris.
- GABB, W.M., 1860, Descriptions of new species of American Tertiary and Cretaceous fossils: Acad. Nat. Sci. Philadelphia, Jour., (Ser. 2) vol. 4, pt. 4, p. 375-406, pls. 67-69.
- GEINITZ, H. B., 1874, Das Elbthalgebirge. I. Der untere Quader: Palaeontographica, vol. 20, p. 1-320, pls. 53-60.
- GMLIN, J. F., 1791, Caroli a Linne Systema Naturae, Ed. 13, vol. 1, pars VI, Vermes, p. 2 + 3021-3910.
- JOUSSEAUME, F., 1880, Division methodique de la famille des Purpuridés: Le Naturaliste, Année 2, no. 42, p. 335-336.
- KING, P. P., and W. J. BRODERIP, 1832, Description of Cirrhipeda, Conchifera and Mollusca . . . the southern coasts of South America: Zool. Jour., vol. 5, no. 19, p. 332-349.
- KOCUREK, G., 1978, Deltaic deposits in Kemp (Upper Cretaceous) and Kincaid (Paleocene) formations, south-central Texas: Geol. Soc. Amer., Abstracts with Programs, vol. 10, no. 1, p. 21.
- MILNE-EDWARDS, H., 1848, Note sur la classification naturelle des Mollusques Gastéropodes: Ann. Sci. Nat. Zool., (Ser. 3) vol. 9, p. 102-112.
- PALMER, K. V. W., in K. V. W. PALMER and D. C. BRANN, 1960, Catalogue of the Paleocene and Eocene Mollusca of the southern and eastern United States: Bulls. Amer.

PLATE 1

Figures

- 1, 2. *Poirieria (Paziella) cretacea* C.L. Garvie, n. sp.
USNM 455526 (holotype); height 16.5 mm, diameter 10.1 mm.
USGS locality 7601, Webberville, Colorado River; Kemp Clay.
- 3, 4. *Pterynotus (Pterynotus) aurorae* C.L. Garvie, n. sp.
USNM 455527; height 25.0 mm, diameter 12.0 mm.
Toulmin locality AMo-1, Greggs Landing, Alabama River; Bells Landing Marl Member of the Tuscahoma Formation.
5. *Odontopolys compsorhytes* (Gabb, 1860)
Texas BEG 113-T-9; height 18.7 mm, diameter 9 mm.
Alabama Ferry, Trinity River; Landrum Member of Cook Mountain Formation.



PLATE 1

- Paleontology, vol. 48, no. 218, p. 1-1057, pls. 1-5.
- PETUCH, E. J., 1988, Field guide to the Ectophoras. Coastal Education and Research Foundation [CERF], Charlottesville, Virginia, 140 p., pls. A1-A3, text figs. 1-52 + 10 unnumbered figures.
- QUOY, L. R. C., and J. P. GAIMARD, 1832-1835, Voyage de découverts de l'*Astrolabe* . . . pendant . . . 1826-29, sous le commandement de M. J. Dumont d'Urville. Zoologie, Mollusca II: p. 1-320, 1832; 321-686, 1833; III: p. 1-366, 1834, 367-954, 1835; Atlas, pls. 1-107.
- RAFINESQUE, C. S., 1815, Analyse de la nature ou tableaux de l'univers et des corps organisés. 224 p., Palermo.
- SIESSER, W., 1983, Paleogene calcareous nanoplankton biostratigraphy: Mississippi, Alabama and Tennessee: Mississippi Dept. Nat. Res., Bur. Geol., Bull. 125, p. 1-61, 37 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.
- STENZEL, H. B., E. K. KRAUSE and J. T. TWINING, 1957, Pelecypoda from the type locality of the Stone City Beds (Middle Eocene) of Texas: Univ. Texas Bur. Econ. Geol. Publ. 5704, p. 1-237, pls. 1-22.
- STEPHENSON, L. W., 1941, The larger invertebrate fossils of the Navarro Group of Texas: Univ. Texas Bur. Econ. Geol. Publ. 4101, p. 1-641, pls. 1-95.
- SWAINSON, W., 1820-1833, Zoological Illustrations, or original figures and descriptions of new, rare, or interesting animals. Series 1: pls. 1-18, 1820; 19-83, 1821; 84-134, 1822; 135-182, 1823. Series 2: pls. 1-30, 1829; 31-45, 1830; 46-85, 1831; 86-96, 1832; 97-136, 1833. London.
- SWAINSON, W., 1822, A Catalogue of the . . . shells, which formed the collection of Mrs Bligh, with an appendix, containing . . . descriptions of many new species. 58 p., 2 pls., London.
- TOULMIN, L. D., 1977, Stratigraphic distribution of Paleocene and Eocene fossils in the eastern Gulf Coastal Region: Geol. Surv. Alabama, Mon. 13, 602 p., 72 pls.
- WENZ, W., 1933-1944, Gastropoda. Teil 1: Allgemeiner Teil und Prosobranchia: Handbuch der Paläozoologie, vol. 6, , p. 1-1639, figs. 1-4211.
- VOKES, E. H., 1967, The genus *Vitularia* (Mollusca: Gastropoda) discovered in the Miocene of Florida: Tulane Stud. Geol. Paleont., vol. 5, no. 2, p. 90-92, 1 text-fig.
- VOKES, E. H., 1970, Cenozoic Muricidae of the western Atlantic Region. Part V - *Pteryotus* and *Poirieria*: Tulane Stud. Geol. Paleont., vol. 8, no. 1, p. 1-50, pls. 1-7, 1 text fig.