A NEW SPECIES OF THE BIVALVE GENUS *NUCINELLA* FROM THE EOCENE OF LOUISIANA

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Mr. James E. Allen of Alexandria, Louisiana, a dedicated collector and student of the Eocene faunas of this State, recently brought to Tulane University a minute bivalve that he had not been able to identify from the literature at his disposal. He found the specimen in material collected from a slump block of Cook Mountain Formation, (Claibornian), Middle Eocene, on the east bank of the Sabine River, near Columbus, Sabine Parish, Louisiana. The specimen was a left valve of a species of *Nucinella,* a genus that the writer had studied in some detail on an earlier occasion (see Vokes, 1956) and which has not previously been reported from the lower Tertiary deposits of the Gulf Coastal Plain. Subsequently Mr. Allen located two additional, but unfortunately fragmentary, specimens including part of a right and of a second left valve, and sent all three for description.

Family NUCINELLIDAE Vokes, 1956

Genus NUCINELLA Wood, 1851

Pleurodon WOOD, 1840, Mag. Nat. Hist., ser. 2, v. 4, p. 250. [Not *Pleurodon* Harlan, 1831, Jour. Acad. Nat. Sci., Philadelphia, v. 6, p. 284 (Mammalia).]
Type species, *Pleurodon ovalis* Wood, by monotypy.

Nuculina D'ORBIGNY, 1844, Pal. France, Cret. Lamell., p. 161. [Not *Nuculina* "Filippi" Poro, 1837, Bibl. Ital., v. 82, p. 55 (Crustacea ?).]
Type species, *Nucula miliaris* Deshayes, by monotypy.

Nucinella WOOD, "1850" [1851], Monogr. Crag Moll., (Palaeontogr. Soc. Monogr.) pt. 2, Bivalves, p. 72.
Type species, *Nucula miliaris* "Deshayes" Wood, [1851], (non Deshayes, 1829),= *Pleurodon ovalis* Wood, 1840, by monotypy. [for discussion of the nomenclatorial problem involved in the determination of the type species, see Vokes, 1956, pp. 653-655.]

Cyrillona IREDALE, 1929, Records Australian Museum, v. 17, p. 160.
Type species, *Cyrilla dalli* Hedley, by original designation.

Neopleurodon HERTLEIN and STRONG, 1940, Zoologica, v. 25, p. 419.
Type species, *Pleurodon subdolus* Strong & Hertlein, by original designation.

The genus *Nucinella* has a geologic range extending from the Lower Jurassic (Hettangian Stage) of Europe to the Recent. It has been reported from the upper Miocene to the Recent of Florida but to date has not been recognized in older Tertiary deposits of the Atlantic and Gulf Coastal Plain area. Despite the long geologic range and wide geographic distribution of the genus, specimens are very rare in collections; apparently their small size leads to their being overlooked by students. Indeed, so far as can be determined from the original descriptions, 11 of the 33 named species were originally based upon a single valve and two others mention but two specimens.

Recent species have been described from the Atlantic, Pacific, and Indian Oceans. Available bathymetric data indicate a depth range from 5 fathoms [*maorianus* (Hedley), (1904, p. 87, text fig. 14)] to 254 fathoms [*maxima* (Thiele & Jaeckel), (1931, p. 188, pl. 1, fig. 28, a, b)], with ten of the 13 available records being in the 5 to 104 fathom range, with an average in the 50 to 60 fathom interval. These data may, however, be suspect in view of the fact that most of the records are based upon dead shells or separated valves, which because of their small size may be subject to posthumous transportation by wave and current action.

NUCINELLA ALLENI Vokes, n. sp.

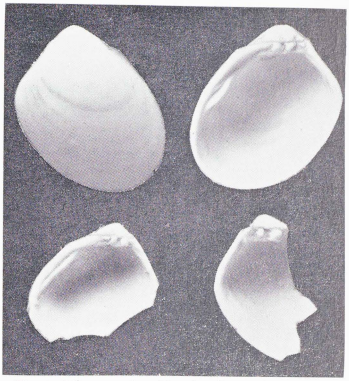
Text figure 1

Holotype: Pal. Res. Inst. 27537, length 1.0 mm; height 1.2 mm; diameter (a left valve) ca. 0.4 mm.

Paratype: Pal. Res. Inst. 27538, (a left valve with ventral margin broken away).

Paratype: Pal. Res. Inst. 27539, (anterior half of a right valve).

Description: The shell is minute, small even for the genus *Nucinella,* being comparable in this extent only to the European Oligocene species *N. dobergensis* (Lienenklaus) (1890, p. 121, pl. 2, figs. 4a-c) and *N. zinndorfi* (Zilch) (1937, p. 250, text figs. 1a, b). The valve is tumid, being most strongly inflated in the subumbonal area at approximately the upper fourth of the



Text Figure 1. *Nucinella alleni* Vokes, n. sp., (above) interior and exterior of holotype left valve, P.R.I. 27537, X 28. (below) paratypes, left valve, P.R.I. 27538, and right valve P.R.I. 27539; X 28.

total shell height. The umbo is small, slightly prosogyrate, and in the holotype can be observed to be tipped with a small, glassy protoconch. The anterior margin of the valve is strongly rounded approximately at its mid-height, with the dorsal half being straight to slightly concave with a strong antero-ventral slope; the posterior half of the margin is gently convex, almost straight and trends posteriorly at an angle almost equal to the anterior trend of the dorsal segment. The ventral margin is broadly and regularly rounded, passing gradually into the gently convex posterior end. The margin, dorsal to the hinge plate, is straight and slightly auriculate at its anterior and posterior ends where it is sharply angulate to the adjacent margins. There is no lunule or escutcheon.

The exterior of the valves is smooth and polished, marked by fine incremental lines, and, on the ventral portion of the holotype valve, by two or three broad, shallow and inconspicuous concentric undulations.

The hinge is typical of the genus and consists, in the two left valves available for study, of a sub-umbonal series of "cardinal" teeth more or less taxodont in character, and of a long, slightly curved posterior lateral tooth that is separated from the valve margin by a broad socket for the reception of the right posterior lateral. In the holotype specimen there is a small, somewhat diagonally trending secondary ridge margining the external side of this socket and itself also separated from the raised valve margin. No similar secondary ridge can be observed in the paratype left valve. The fragmentary right valve lacks the posterior dentition.

The sub-umbonal "cardinal" series in the two left valves consists of two relatively strong transverse teeth with a broad deep socket between, and with less well-defined socket-like areas located anteriorly and posteriorly. In the holotype valve there is, in addition, a small cardinal-like protuberance margining the dorsal side of the anterior "socket" and separated from the anterior "cardinal" by a very narrow interruption. The paratype left valve lacks the anterior protuberance, but shows, instead, a somewhat similar, though less well defined structure on the dorsal side of posterior "socket." The "cardinal" area of the fragmentary right valve is incomplete posteriorly. That portion which remains agrees in almost all details with the holotype left valve. There are two strong "cardinal" teeth with a well-developed socket between, and an anterior socket-like structure with a minute tooth-like protuberance on its dorsal edge. In view of the great degree of variation in the nature and number of the teeth in the "cardinal" series of other known species of the genus it is not possible to ascertain whether the observed socket between the two "cardinal" teeth in the right valve was for the reception of the anterior or of the posterior cardinal in the left valve. It may well be that a second strong socket margined with an additional "cardinal" tooth were present posterior to the preserved area of the hinge structure, but this would seem to require a somewhat longer hinge plate than is to be seen on either of the left valves examined. The determination as to whether there were two or three "cardinal" teeth in the right hinge will have to await the discovery of additional material.

The ligamental area is minute, wholly anterior to the umbo and apparently the ligament was very slightly impressed into the anterior dorsal margin of the hinge plate.

The anterior adductor scar and the pallial line cannot be observed on any of the specimens available. The posterior adductor scar is relatively large, a little impressed, and is situated immediately below the posterior lateral tooth. The inner margin of the valves is smooth.

Discussion: The small size of *Nucinella alleni* will at once distinguish it from other known North American Tertiary species. *N. gunteri* (Mansfield) (1932, p. 37, pl. 2, figs. 4, 6) from the "*Arca* zone" of the Miocene Choctawhatchee Formation of Florida has a length of 1.8 mm, and a height of 2.6 mm; *N. woodii* (Dall) (1898, p. 600, pl. 24, fig. 10) from the Pliocene Caloosahatchee Formation of Florida has a length of 1.75 mm, and a height of 2.75 mm. A specimen from the Choctawhatchee

Formation at Jackson's Bluff, Leon County, Florida referred by Mansfield (1932, p. 37, pl. 2, figs. 1, 3) to *N. woodii* is 2.0 mm long and 2.6 mm high. In addition, Dall described (1898, p. 601, pl. 24, fig. 9) *N. adamsi* [as *Pleurodon adamsi*] a Recent species, from the area of the Florida Straits with dimensions being given as "longest diameter" 3.25 mm, and "antero-posterior diameter" 2.87 mm. The holotype of the only other known North American Eocene species, *N. oregona* Vokes (1945, p. 657, text figs. 2a-c) from the Upper Eocene Nestucca Formation of Oregon has a length of 3.1 mm, and a height of 3.4 mm; this is the largest described North American species. All of these forms also differ from *N. alleni* in the details of the "cardinal" area of the hinge structure, and, in agreement with the larger size of the valves, all tend to have more numerous "cardinal" teeth on the hinge plate.

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