

A NEW SPECIES OF GOULDIA (MOLLUSCA: BIVALVIA)  
FROM THE PLEISTOCENE OF EASTERN NORTH CAROLINA

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The small venerid bivalve *Gouldia* is represented by many look-alike species from both modern and fossil Cenozoic marine environments. In the western Atlantic-Caribbean region the genus consists of species that feature either an exterior surface sculpture of fine radial costae crossing the concentric growth bands on the anterior and posterior edges of valves, or a more uniformly reticulate pattern over the whole of valve exteriors. All of these forms are assigned to the subgenus *Gouldia*, with the best known and most widely distributed species being *Gouldia (Gouldia) cerina* (C.B. Adams, 1845), the type of the genus.

Owing to the discovery of a rare new species described herein, in the middle Pleistocene Flanner Beach Formation, eastern North Carolina (Fig. 1), a second supraspecific subdivision of *Gouldia* is here recognized. The members of this subgenus have a surface ornamentation of coarse, flat costae that cross the concentric bands along the anterior and posterior ends of the valves, in contrast to the typical finely costate to reticulate surface design of most species of *Gouldia*.

The purpose of this note is to describe the new species from the Flanner Beach Formation, and to comment on its possible evolutionary and biostratigraphic significance. The general stratigraphy, geologic age and time-correlation, and paleoenvironmental contexts of the formation have been described by DuBar and Solliday (1963), Mixon and Pilkey (1976), McCartan *et al.* (1982), and Miller (this volume). All specimens have been deposited in the Academy of Natural Sciences of Philadelphia, Pennsylvania (ANSP).

Family VENERIDAE Rafinesque, 1815  
Subfamily CIRCINAE Dall, 1896  
Genus GOULDIA C.B. Adams, 1847  
Subgenus PARAGOULDIA, new subgenus

*Description:* Species of *Gouldia* with conspicuous broad, flat, radial costae adjacent to anterior and posterior margins of valve exteriors; interior morphology typical for the genus.

Type species: *Gouldia (Paragouldia) platycostata* n. sp.

GOULDIA (PARAGOULDIA) PLATYCOSTATA

W. Miller, III, new species

Fig. 2

*Description:* Shell small, largest valves measuring only 8 mm in length by 7 mm in height, subtrigonal to trigonal, becoming more inflated and equidimensional in adult stages; anterior and posterior ends rounded, with the posterior slightly more so than the anterior, the latter with a weakly developed shoulder beneath the umbones; beaks pronounced and rather high in juveniles, becoming much lower and less conspicuous in later growth stages; exterior ornamentation of more or less well-defined flat, concentric growth bands or ridges crossed by strongly developed broad, flattened costae on the anterior and posterior quarters of valves, occasionally with weaker radials located between stronger ones; the larger, wider radials (nearly plicae, involving the entire thickness of the valve) visible as weak corrugations along interior ventral margins, especially in juveniles; radial ornamentation lacking on mid-valve surfaces (except along ventral margins of mature individuals where it is weakly developed); costae equally strong on both ends, though covering slightly greater area on posterior surfaces; discontinuous microscopic striations radiating down the tops of larger costae in adults; hinge area, muscle scars, and pallial markings typical for the genus.

*Holotype:* ANSP 62892, Fig. 2b, c.

*Paratypes:* ANSP 62893, including broken valve shown in Fig. 2a.

*Type locality:* River bluff 0.3 km northwest of Smith Gut (a small, freshwater creek) and 3.4 km southeast of the center of the mouth of Beard Creek, north shore of Neuse River, southernmost Pamlico County, North Carolina (Fig. 1). This is the type section of the Smith Gut Member of the Flanner Beach Formation (Miller, this volume).

*Stratigraphic horizon:* Lowermost 0.5 m of bluff-face exposure, in bed of light olive-brown, shelly, muddy, fine to medium sand.

*Discussion:* *Gouldia platycostata* is distinguished from other western Atlantic-Caribbean species of *Gouldia* in having well-developed broad, flat, radial costae instead of the usual thin costae or reticulations seen in Late Cenozoic forms such as *G. cerina*, *G. burmudensis* (E.A. Smith, 1885), and *G. floridana* (Olsson and Harbison, 1953). This difference is so pronounced that a supraspecific category, to include only *G. platycostata*, seems justifiable. In terms of external morphology, *G. platycostata* is closest to the Indo-Pacific species described by E.A. Smith under the name *Circe amica* (1885, p. 145-146 and Plate II, Fig. 2-2e), which appears to be a *Gouldia* by virtue of lacking an escutcheon (see Cox *et al.*, 1969, p. N673). It is difficult to imagine how this species could be anything but a distant phylogenetic relative of *G. platycostata*, however, so I do not include the Indo-Pacific form in *Paragouldia*.

The new species is a rare component of the fossil association occurring in the Smith Gut Member. The sediments, fossils, and facies relationships suggest that this subunit of the Flanner Beach was deposited in a coastal bay setting, open to the Atlantic Ocean, during the early stages of coastal

inundation at the beginning of an interglacial high-stand of sea level, approximately 200,000 years ago (Miller, this volume).

To my knowledge, *G. platycostata* has not been collected from other Pleistocene fossil deposits in the area, and apparently did not survive to the present. If this is the case, and if the species only lived during the time span when Smith Gut sediments were being deposited in eastern North Carolina, it is tempting to view this rare, isolated venerid as a failed evolutionary experiment—an “aborted species” in the terminology of Stanley (1979). In current macroevolutionary parlance aborted species are newly derived, descendant forms that do not survive the initial isolation and divergence from an ancestral population to establish a successful daughter species. Or, to use Stanley’s aphorism, “many are called but few are chosen” (1979, p. 176). One of the possible explanations for the presence of rare fossils in collections of autochthonous faunal remains, in cases where stratigraphic occurrence is limited to a single level, is that these rarities are actually aborted species to be found nowhere else, no matter how much additional collecting be done. This specu-

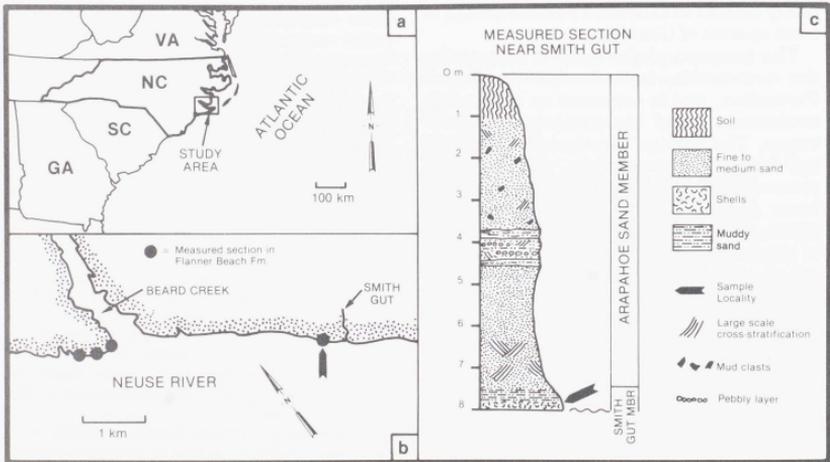


Figure 1. a, General location of collecting area; b, Detail of vicinity of type locality (indicated by arrow) on north shore of Neuse River; c, Measured section at the type locality.

lation about *G. platycostata* could be tested in part by searching for it in adjacent stratigraphic units (it does not occur elsewhere in the Flanner Beach). If found only in the coastwise temporal equivalents of the lower Flanner Beach Formation, *G. platycostata* will be proven a useful guide fossil, along with the very few other macrofossils so far recognized to have biostratigraphic potential in the Middle to Late Pleistocene of the Atlantic Coastal Plain (see Blackwelder, 1981).

The specific name is formed from the Greek term "plats," meaning broad and flat, and the Latin "costa," for rib.

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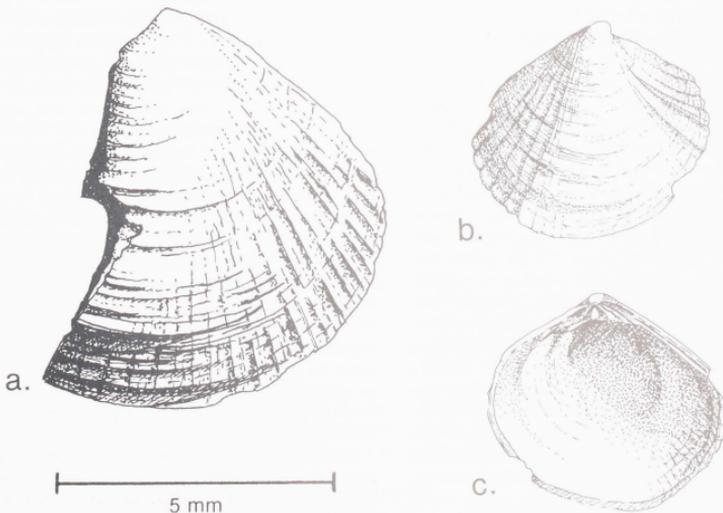


Figure 2. a, Exterior of adult valve of *Gouldia* (*Paragouldia*) *platycostata* n. sp. (ANSP 62893, a paratype); b, Exterior of the holotype of *G. (P.) platycostata* (ANSP 62892); c, Interior view of the holotype shown in b.