# A New Species of Pleurotomariid Gastropod from the Western Atlantic

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## ABSTRACT

*Perotrochus charlestonensis*, a new species of pleurotomariid, is described from off the coast of South Carolina. This is the 12th Recent pleurotomariid taxon to be described from the western Atlantic. Its habitat is described, environmental data are provided, and comparisons made with closely related congeners.

*Key words:* Gastropoda; pleurotomariid; *Perotrochus*; slit shells; western Atlantic; JOHNSON-SEA-LINK.

## INTRODUCTION

Since the discovery of the first living species of the predominantly Mesozoic and Paleozoic family Pleurotomariidae in the western Atlantic over a century ago (Fischer & Bernardi, 1856), 24 Recent species and subspecies have been described, usually on the basis of one or a very few specimens. The habitat of these animals, generally steep-walled, hard substrates at depths in excess of 100 meters, accounts for their infrequent collection by such methods as trawling, dredging, and grab sampling, and, therefore, for the paucity of data on the biology and distribution of most species. Since the publication of a review of the Recent pleurotomariids that included six species from the West Indies (Bayer, 1966), three species (Bayer, 1967; Rios & Mathews, 1968; Leme & Penna, 1969) and two subspecies (Okutani & Goto, 1983, 1985) have been described from the western Atlantic.

Another new species of pleurotomariid, described herein, was collected while conducting fish population studies approximately 90 nautical miles east of Charleston, South Carolina, utilizing the submersible JOHNSON-SEA-LINK I (Harbor Branch Oceanographic Institution, Inc., Fort Pierce, Florida). Bottom topography at the study area was extremely rugged, making sampling by any other means difficult.

## SYSTEMATICS

Family **Pleurotomariidae** Swainson, 1840
Genus *Perotrochus* P. Fischer, 1885

*Perotrochus charlestonensis* new species
(figure 1)

**Description:** Shell (figure 1) moderately large (maximum diameter 87.4 mm, minimum diameter 80.1 mm, height 73.0 mm), broadly turbiniform, very thin, fragile; spire angle 89°, spire slightly convex in profile; protoconch of 1.0 whorls, translucent, glassy; transition to teleoconch marked by axial costae, with selenizone apparent by second postnuclear whorl; teleoconch of 8⅛ whorls; early whorls nearly flat-sided, becoming progressively more inflated; selenizone near suture in early whorls, shifting to slightly below mid-whorl by fifth postnuclear whorl; anal slit depth at upper margin 89°, at lower margin 57°; anal slit width 4 mm; suture adpressed; periphery rounded; base inflated, convex, non-umbilicate; nacreous umbilical callus extending ⅛ the distance from axis to periphery; spiral sculpture of 21 uniformly sized spiral cords between suture and anal slit, 20 cords of variable thickness between anal slit and periphery, 40 cords along base; selenizone with 0–5 broad cords, number increasing with shell size; axial sculpture of weak nodes on early whorls (88 on fourth postnuclear whorl), forming cancellate sculpture; axial sculpture decreasing, sculpture limited to spiral cords by sixth postnuclear whorl above selenizone, and seventh postnuclear whorl below selenizone; aperture broadly ovate; columellar lip slightly thickened, weakly recurved; color creamy white with diffuse brownish orange axial streaks and blotches; nacreous layer visible through porcellaneous layer, creating iridescent hue; color lighter on base than on dorsal surface; selenizone margins with cream colored lines most evident on penultimate and body whorls; aperture nacreous, iridescent; operculum multispiral (7 whorls), horny, brownish-yellow, translucent; soft parts unknown.

**Type locality:** 90 nautical miles east of Charleston, South Carolina (32°43′80″N, 78°05′60″W), in 213 m, R/S JOHNSON-SEA-LINK I, dive 1250, August 6, 1982.

**Holotype:** USNM 859961, maximum diameter 87.4 mm.

**Etymology:** Named after the type locality, commonly referred to as the Charleston Lumps.

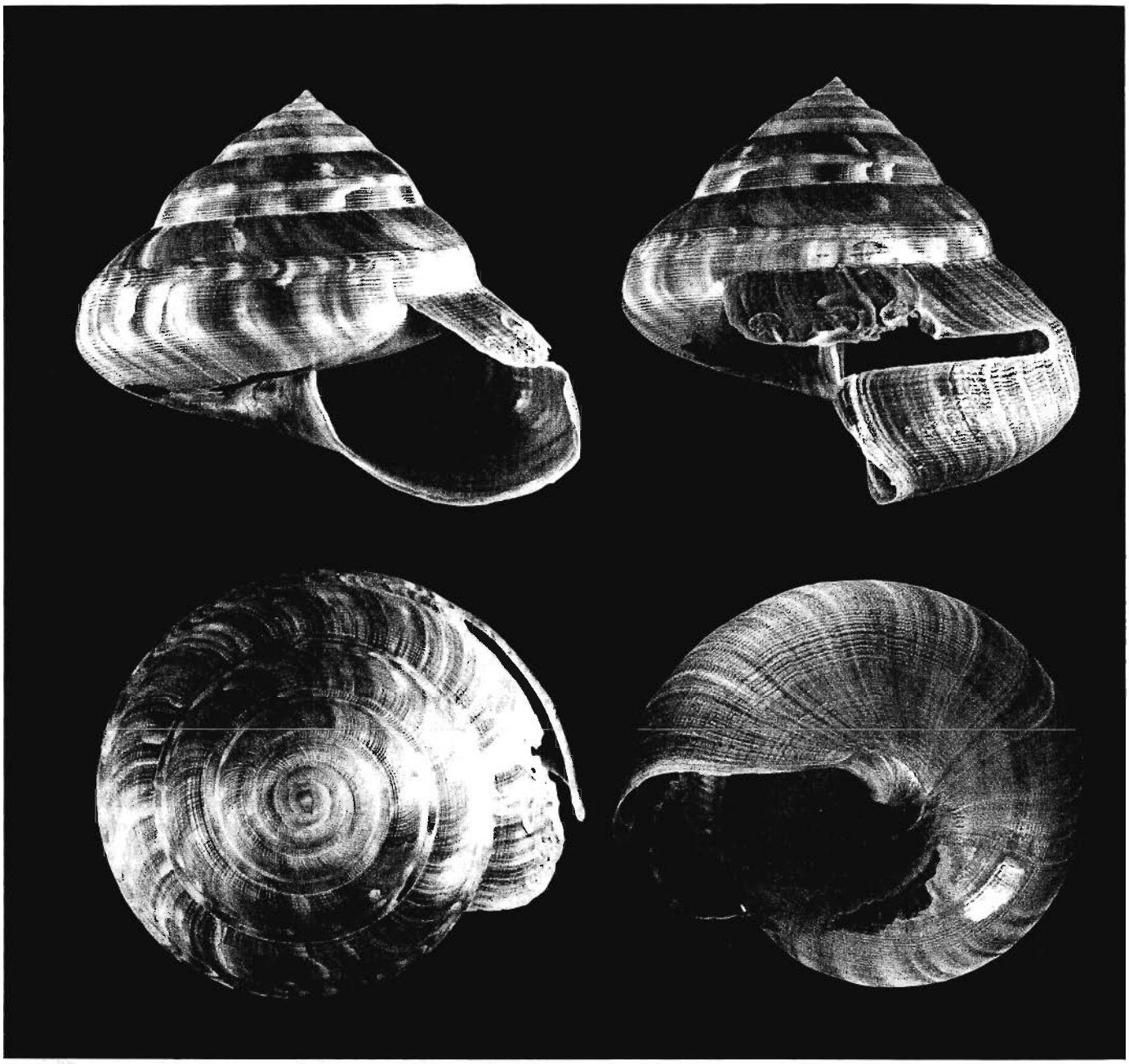

**Figure 1.** *Perotrochus charlestonensis* new species. Apertural, right lateral, apical, and basal views of the holotype (USNM 859961), off Charleston, South Carolina (32°43′80″N, 78°05′60″W), in 213 m, maximum shell diameter 87.4 mm.

**Ecology:** This species is known only from the type locality, an area of extremely rugged terrain where the bottom topography consists of steep, large hills and valleys. Topographical features (figure 2) consist of a pavement of relithified phosphorite and fibrous concretionary apatite composed of calcium phosphate and other minerals (Manheim *et al.*, 1980). This pavement, which ranges in thickness from 10 cm to almost a meter, has been undermined in some areas, causing large pieces to break off and fall down-slope forming rubble and boulder zones. Hills range in height from several meters to about 30 meters. Valleys contain sand composed primarily of brown to black phosphorite. This area was formed during the middle Tertiary and has remained stable since the Miocene (Baturin, 1982).

Marine life in the vicinity indicates an area of high productivity resulting from warmer Gulf Stream waters. Large snowy grouper [*Epinephelus niveatus* (Valenciennes, 1828)] and blue-lined tile fish [*Caulolatilus microps* (Goode & Bean, 1878)] are abundant in the area together with many species of small, deep-reef fish, which generally inhabit rocky terrain. Common invertebrates include basket and brittle stars, sea urchins, solitary and colonial anemones, solitary corals, arrow, spider, and gal-

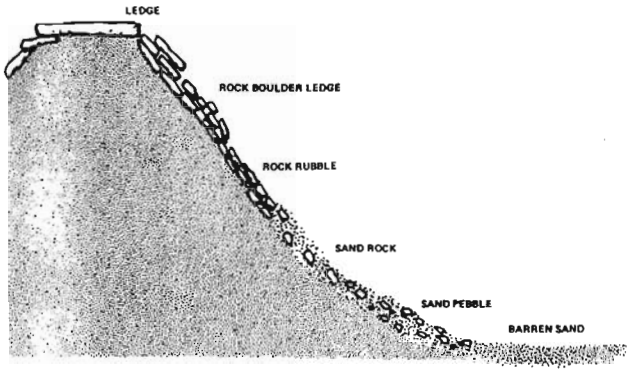


**Figure 2.** Cross-section of bottom topography at collection site. Hills range in height from 3 to 30 m.

atheid crabs, barrel and encrusting sponges, and hydroids. A pink featherlike hydroid covers many of the broken boulders along the ridge tops. Prevalent gastropods include *Perotrochus amabilis* (Bayer, 1963), *Calliostoma sayana* (Dall, 1889), *Stenorhytis pernobilis* (Fischer & Bernardi, 1857), *Aurinia gouldiana* (Dall, 1887), and *Pterynotus phaneus* (Dall, 1889).

**Remarks:** *Perotrochus charlestonensis* is a member of the species complex consisting of *P. midas* Bayer, 1966, *P. pyramus* Bayer, 1967, *P. africanus* (Tomlin, 1948), *P. teremachii* (Kuroda, 1955), *P. tangaroana* Bouchet & Metivier, 1982, and an undescribed species from off northwestern Australia (Group B, Bayer, 1966:745). All are characterized by having large, thin shells with inflated whorls and proportionally large, broadly ovate apertures. This new species most closely resembles *P. africana* and *Perotrochus* sp. (Bayer, 1966: fig. 29) from Japan, but differs from these taxa in having a thinner shell with more inflated whorls, and a more convex profile of the spire. *Perotrochus africanus* has a more stepped spire, a more strongly recurved and thicker columella, and a broader umbilical callus (¼ distance from axis to periphery). Of the western Atlantic species, *P. charlestonensis* is most similar to *P. pyramus*, but is more than twice the size, and is much higher-spired. *Perotrochus charlestonensis* also somewhat resembles *Perotrochus midas*, but lacks its characteristic flat, blunt spire and angular periphery. *Perotrochus charlestonensis* occurs in shallower water (213 m) than either *P. pyramus* (420–648 m) or *P. midas* (600–770 m).

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