

# New Species of *Solariella* (Gastropoda: Trochidae) from the Western Atlantic Ocean

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## ABSTRACT

Three new species of the genus *Solariella* Wood, 1842, are described. *Solariella quadricincta* is known only from the continental shelf off northeastern Venezuela in depths of 26–86 m, and *S. staminea* is known only from the Davis Seamount off southeastern Brazil in 60 m; shells of both species are very similar to those of *S. carvalhoi* Lopes and Sá Cardoso, 1958. *Solariella cristata* is known from the upper continental slope of Isla Cancun, Yucatán, Mexico, and off Key Largo, Florida Keys, in depths of 155–256 m, and off St. Vincent, Lesser Antilles in 165–201 m.

**Key words:** Trochidae; Solariellinae; *Solariella*; systematics; new species.

## INTRODUCTION

Two recent monographs of western Atlantic Trochidae present accounts of the faunas of restricted geographical areas: the Straits of Florida (Quinn, 1979) and the Gulf of Mexico (Quinn, in press). In the process of examining specimens for those reports, several new species from other areas of the western Atlantic Ocean were discovered. This paper presents descriptions of three new species of *Solariella* Wood, 1842. These species are included in *Solariella* because of the similarities of their shells to those of species such as *S. lacunella* (Dall, 1881); however, because radular characters are important (Herbert, 1987) and animals of the three species were unavailable for study, such assignment of these species is tentative at present.

Institutional abbreviations used in this paper are as follows: MNHN (Museum National d'Histoire Naturelle, Paris, France); MORG (Museu Oceanográfico da Fundação Universidade do Rio Grande, Rio Grande, RS, Brazil); UMML (Rosenstiel School of Marine and Atmospheric Science, University of Miami, Miami, Florida); USNM (National Museum of Natural History, Smithsonian Institution, Washington, DC).

## SYSTEMATICS

Genus *Solariella* Wood, 1842

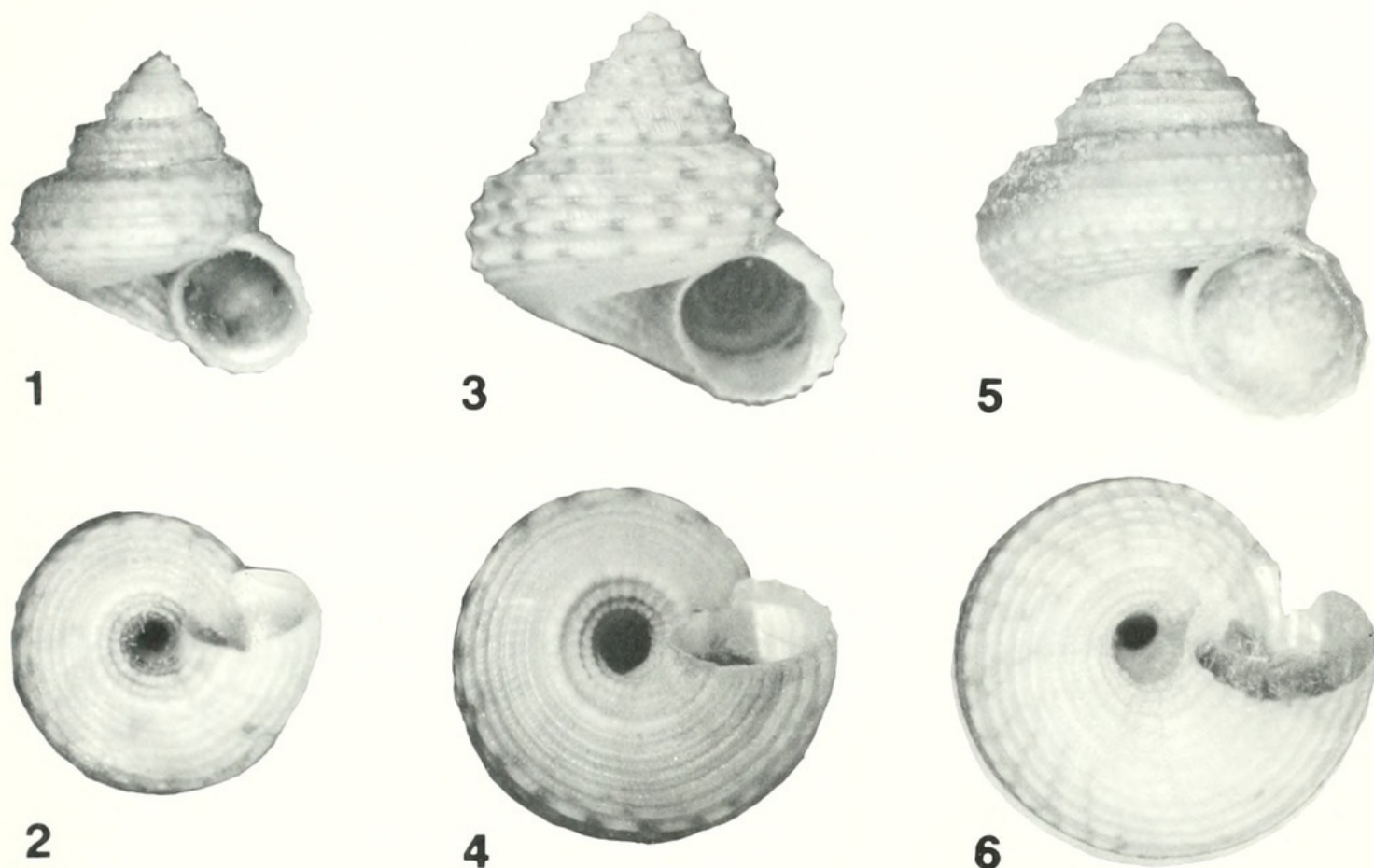
**Type species** (monotypy): *Solariella maculata* Wood, 1842.

*Solariella quadricincta* new species  
(figures 1–4)

**Material examined:** 1 fragment, UMML 30.6695 (paratype); JOHN ELLIOTT PILLSBURY Station P-727, 10°20'N, 65°02'W, 64 m; 10-ft otter trawl; 21 July 1968.—1 specimen, UMML uncatalogued [examined and photographed in 1975 (figs. 3, 4), but a recent attempt to relocate this specimen was unsuccessful, and it is presumed lost]; JOHN ELLIOTT PILLSBURY Station P-721, 11°06.5'N, 64°22.5'W, 26–27 m; 10-ft otter trawl; 21 July 1968.—1 specimen, USNM 859437 (holotype); 1 specimen, UMML 30.6528 (paratype); JOHN ELLIOTT PILLSBURY Station P-718, 11°22.5'N, 64°08.6'W, 60 m; 10-ft otter trawl; 20 July 1968.—1 specimen, UMML 30.6376 (paratype); JOHN ELLIOTT PILLSBURY Station P-705, 10°45'N, 62°00'W, 77–86 m; 10-ft otter trawl; 18 July 1968.

**Description:** Shell of moderate size for genus, attaining 6.55 mm height, 7.15 mm width, umbilicate, ivory with light orange-brown spots and flammules, nacreous under thin outer porcelaneous layer. Protoconch 300–325  $\mu$ m maximum diameter, of about 1 whorl. Teleoconch whorls 5.5, tubular, shouldered; first 3 whorls with 3 strong, subequal spiral cords forming whorl periphery, adapical cord forming whorl shoulder; subsequent whorls with subsutural spiral cord forming narrow channel with suture; last whorl with fourth primary spiral cord, subequal to other peripheral spiral cords and coincident with suture on previous whorls; 1–2 weak spiral cords sometimes occurring between primary spiral cords; fine spiral threads overlying interspaces and primary spiral cords on last 3 whorls. Axial sculpture consisting of rather strong riblets on whorls 2 and 3, fading in strength to numerous col-labral threads in interspaces of spiral cords on subsequent





**Figures 1–4.** *Solariella quadricincta* new species. **1, 2.** Apertural and basal views of holotype, USNM 859437, height 6.40 mm, width 6.40 mm, from off Isla de Margarita, Venezuela, 11°22.5'N, 64°08.6'W, 60 m. **3, 4.** Apertural and basal views of specimen (lost; measurements unknown), UMML 30.6639, from off Isla de Margarita, Venezuela, 11°06.5'N, 64°22.5'W, 26–27 m. **Figures 5, 6.** *Solariella carvalhoi* Lopes and Sá Cardoso, 1958. FSBC I 39514, height 7.9 mm, width 8.2 mm, from Cagaras Island, Rio de Janeiro, Brazil, 32 m.

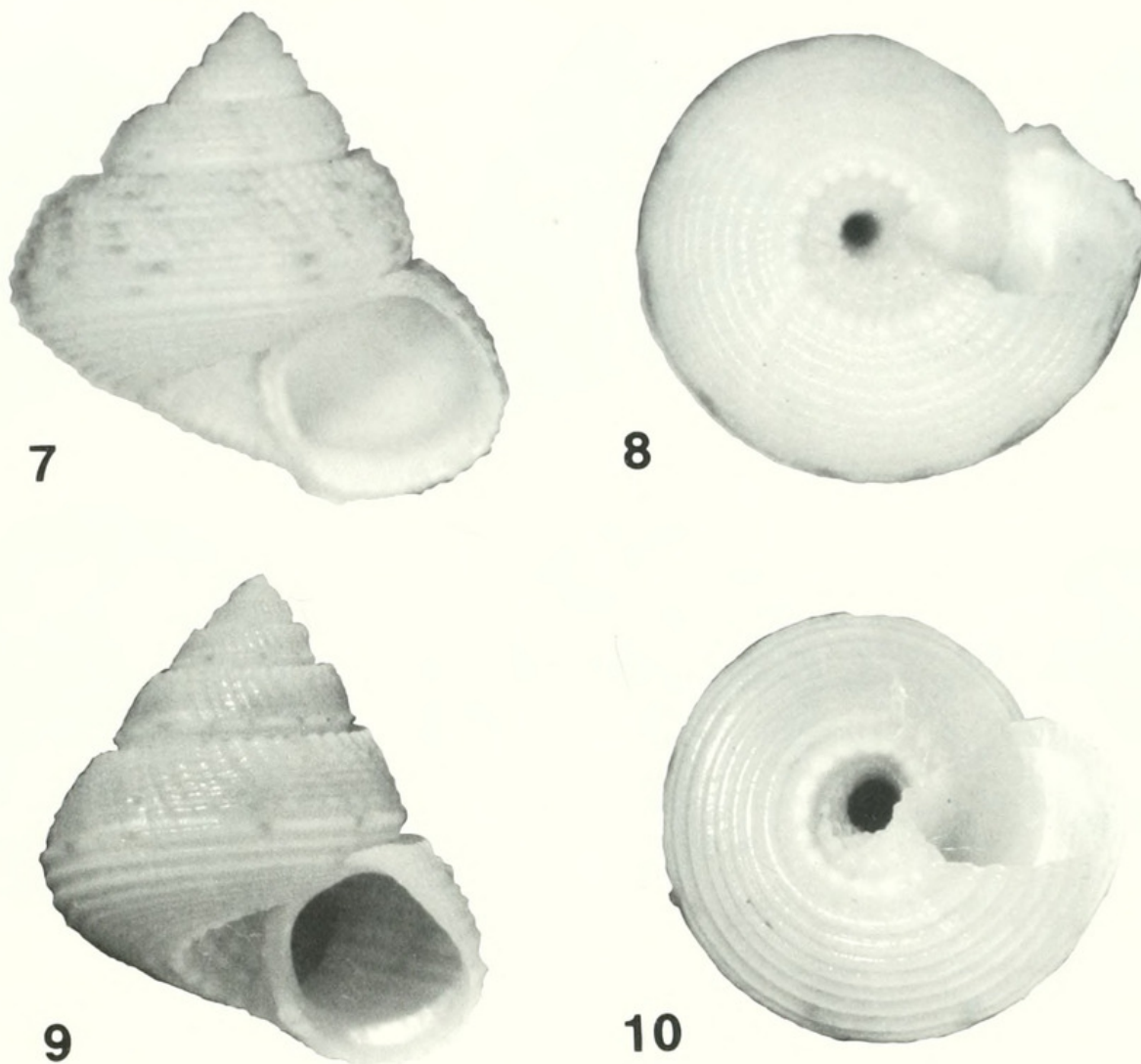
whorls; axial threads form lamelliform beads on subsutural spiral cord, weakly beading shoulder spiral cord on whorls 3–5. Subsutural shelf rather wide, flat, sloping abapically from subsutural spiral cord to shoulder spiral cord; fine spiral threads appearing on third whorl near shoulder, progressively covering shelf surface on subsequent whorls; 1–2 stronger spiral threads appearing on last whorl. Base convex, with 6–7 strong spiral cords; cords and interspaces with fine spiral threads; interspaces with fine collabral threads. Umbilicus wide, about 40–45% maximum shell width, funnel-shaped; walls convex, with 6 strongly beaded spiral cords. Shell ground color ivory, with regularly spaced, spirally elongate light orange-brown spots on major spiral cords, with occasional flammules of same color on subsutural shelf. Operculum thin, corneous, multispiral.

**Type locality:** Off Isla de Margarita, Venezuela, 11°22.5'N, 64°08.6'W, 60 m.

**Remarks:** Shells of *Solariella quadricincta* closely resemble those of *S. staminea*, new species, and *S. carvalhoi* Lopes and Sá Cardoso, 1958, from Brazil (figs. 5, 6). Shells of all three species have four strong, subequal

primary spiral cords on the last whorl, of which the shoulder spiral cord is the most distinctly beaded; have fine spiral threads on suprabasal whorl surface; and have flat subsutural shelves. Shells of *S. quadricincta* differ from those of *S. staminea* by being slightly narrower (height:width ratios = 0.92–1.01 and 0.79–0.90, respectively); by having a channeled suture; by having crisp rather than flattened axial threads; by having fewer, narrower, rounded basal spiral cords; by having a narrow and more strongly beaded circumumbilical cord; by having more numerous, more strongly beaded intra-umbilical spiral cords; and by having a strong, distinct color pattern. Shells of *S. quadricincta* differ from those of *S. carvalhoi* by being smaller at similar whorl number; by having canaliculate sutures; by having more steeply sloping subsutural shelves; by having finer, crisper, more closely spaced axial threads that are present in the interspaces of all spiral cords; by having a more finely beaded shoulder cord; by having wider interspaces between the basal spiral cords; and by having more strongly beaded intraumbilical spiral cords. *Solariella quadricincta* is only known from the continental shelf off north-eastern Venezuela in depths of 26–86 m.





**Figures 7–10.** *Solariella cristata* new species. **7, 8.** Holotype, USNM 859421, height 9.1 mm, width 9.45 mm, from SE of St. Vincent, Lesser Antilles, 13°11.2'N, 61°05.1'W, 165–201 m. **9, 10.** Paratype, UMML 30.5669, height 8.1 mm, width 8.0 mm, from off Isla Mujeres, Yucatán, Mexico, 21°07'N, 86°21'W, 155–205 m.

*Solariella cristata* new species  
(figures 7–10)

**Material examined:** 1 specimen, UMML 30.5669 (paratype); JOHN ELLIOTT PILLSBURY Station P-598, 21°07'N, 86°21.0'W, 155–205 m; 10-ft otter trawl; 15 March 1968.—1 specimen, UMML 30.7433 (paratype); GERDA Station G-61, 25°14'N, 80°02'W, 256 m; 6-ft otter trawl; 29 August 1962.—1 specimen, USNM 859421 (holotype); JOHN ELLIOTT PILLSBURY Station P-874, 13°11.2'N, 61°05.1'W, 165–201 m; 5-ft Blake trawl; 6 July 1969.

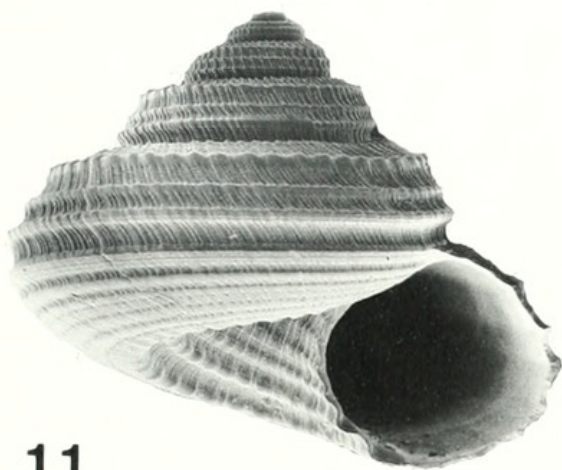
**Description:** Shell rather large for genus, attaining 9.1 mm height, 9.45 mm width, umbilicate, ivory with light brown spots and flammules, nacreous under thin outer porcelainous layer. Protoconch 300–320  $\mu$ m maximum diameter, of about 1 whorl. Teleoconch whorls 6.1, tubular, shouldered; first 3 whorls with 4–5 spiral cords, increasing to 14 on body whorl; abapical cord on whorls 3–5 strongest, forming peripheral carina; cords on last whorl becoming subequal to peripheral cord, giving whorl

more evenly rounded appearance. Axial sculpture appearing on whorl 2, consisting of rather strong, low, flattened folds on adapical half to two-thirds of whorls 2–4, becoming narrower, rounded, more crowded, and extending to level of suture on subsequent whorls; axial folds forming strong, rounded beads on spiral cords, beads strongest on adapical part of whorl. Subsutural shelf narrow, sloping adapically from suture to shoulder spiral cord; single strong spiral cord bisecting shelf. Base weakly convex, with 7–10 strong, smooth spiral cords. Umbilicus wide, about 30% maximum shell width, funnel-shaped; walls convex, with 4–6 strong, strongly beaded spiral cords. Shell ground color ivory, with scattered light brown spots appearing on fourth whorl, becoming more numerous and forming irregular axial flammules on last whorl.

**Type locality:** SE of St. Vincent, Lesser Antilles, 13°11.2'N, 61°05.1'W, 165–201 m.

**Remarks:** The peripherally carinate, rather strongly axially sculpted shells of *Solariella cristata* most closely





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**Figure 11–12.** *Solariella staminea* new species. Apertural and basal views of holotype, MORG 26530, height 3.8 mm, width 4.8 mm, from Davis Seamount, Brazil, 20°40'S, 34°41'W, 60 m.

resemble shells of *S. cincta* (Philippi, 1836) (see Fretter & Graham, 1977:46–48, figs. 31, 32) from the north-eastern Atlantic Ocean. However, shells of *S. cristata* are larger, have a narrower subsutural shelf, and have a distinct color pattern, whereas those of *S. cincta* are uniformly ivory. The only other western Atlantic species having shells with a strongly carinate periphery is *S. patriae* Carcelles, 1953, but shells of that species lack other spiral cords except the shoulder and circumbasal spiral cords, and have only three basal cords (see Rios, 1985:23, pl. 10, fig. 97). The three widely separated localities from which *S. cristata* has been collected (the Florida Keys, Yucatán, and the Lesser Antilles) suggest that the species is widespread, but rare, in the Caribbean Sea.

*Solariella staminea* new species  
(figures 11, 12)

**Material examined:** 1 specimen, MORG 26530 (holotype); 3 specimens, MNHN uncatalogued (paratypes); MARION-DUFRESNE Cruise MD-55, Station DC-40, 20°40'S, 34°41'W, 60 m; dredge; May 1987; P. Bouchet, J. H. Leal, and B. Metivier collectors.

**Description:** Shell of moderate size for genus, attaining 6.7 mm height, 7.45 mm width, umbilicate, white with few light yellow to orange-brown spots and streaks, nacreous under thin outer porcelaneous layer. Protoconch about 300  $\mu$ m maximum diameter, of about one whorl. Teleoconch whorls 5.6, tubular, shouldered; spire whorls with 3 strong spiral cords, adapical one forming whorl shoulder; last whorl with fourth strong spiral cord, subequal to other spiral cords and coincident with suture on previous whorls; 1–2 additional, weaker, intercalary spiral threads sometimes present; fine spiral threads overlying interspaces and lower 2–3 spiral cords on last 3 whorls. Axial sculpture of rather strong riblets on whorl 2, fading in strength to numerous, crowded, rather flattened collabral threads in interspaces of spiral cords on subsequent whorls; axial threads forming weak, rounded

beads on shoulder spiral cord, finely beading other spiral cords. Subsutural shelf moderately wide, flat, sloping abapically from suture to shoulder spiral cord; fine spiral threads appearing on third whorl; one spiral cord appearing near beginning of first whorl, but fading to obscure angulation or disappearing on second whorl; 1–2 spiral cords appearing on third whorl, one near middle of shelf strongest. Base weakly convex, with 9–11 strong, flattened spiral cords; innermost cord strap-like and weakly beaded; interspaces with fine collabral threads, forming weak rugae on spiral cords on adaxial half of base. Umbilicus wide, about 35–45% maximum shell width, funnel-shaped; walls convex, with 4–5 beaded spiral cords. Shell ground color white, with few, widely spaced light yellow to orange-brown spots, principally on shoulder cord, but occasionally extending abaxially as short streaks or flammules.

**Type locality:** Davis Seamount, off southeastern Brazil, 20°40'S, 34°41'W, 60 m.

**Remarks:** Shells of *Solariella staminea* are very similar to those of *S. quadricincta* and *S. carvalhoi*. Differences that distinguish shells of *S. staminea* from those of *S. quadricincta* are discussed in the Remarks section of the latter species. Shells of *S. staminea* differ from those of *S. carvalhoi* by being broader (height:width ratios = 0.79–0.90 and 0.93–0.98, respectively); by having a broader subsutural shelf with stronger spiral cords and axial threads; by having a shoulder spiral cord bearing rounded rather than spirally elongate beads; by having more numerous, flatter basal spiral cords; by having a circumumbilical spiral cord that is broad, flat, and weakly beaded rather than narrow, sharp, and strongly beaded; by having stronger, more weakly beaded intraumbilical cords; and by having a very weak color pattern.

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