



## New records of *Pseudotorinia architae* (Gastropoda, Architectonicidae) from southeastern Brazil

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### ABSTRACT

Three new records of *Pseudotorinia architae* (O.G. Costa, 1841) are reported from southeastern Brazil, namely from the continental slope of Abrolhos (off Espírito Santo state) and from off Vitória Island and São Sebastião (São Paulo state). These new records greatly extend the known geographic range of the species; its previously southernmost record being from the Caribbean Sea.

**Keywords:** Amphi-Atlantic, Espírito Santo, São Paulo, Southwest Atlantic.

### INTRODUCTION

*Pseudotorinia architae* (O.G. Costa, 1841) is a widely distributed architectonicid snail species, originally described from the Gulf of Taranto, Italy, and a variety of forms is attributed to this taxon (BIELER 1993). The species distribution is Mediterranean and amphi-Atlantic, ranging from North Carolina, USA, to the Caribbean Sea (ROSENBERG 2009; BIELER & GOFAS 2012).

A recent review of the malacological collection of the Museu de Zoologia da Universidade de São Paulo (MZSP; São Paulo, Brazil) and the material collected by the R/V Marion-Dufresne MD55 expedition (for more information, see TAVARES 1999) revealed three specimens collected in Brazilian waters that compare well with the Western Atlantic forms of *P. architae*. The most well-preserved specimen was collected from off Vitória Island, São Paulo state, in April 1986; the other specimen from the MSZP collection is a fairly worn-out shell, collected off São Sebastião, São Paulo state, in May 1970; the specimen from the MD55 expedition is a well-preserved shell collected on the continental slope of Abrolhos, off Espírito Santo state, in May 1987. A brief description of these

specimens and remarks regarding their placement in the Western Atlantic form of *P. architectae* are provided herein.

## MATERIALS AND METHODS

The specimens studied herein are empty shells housed in the MZSP and the Muséum National d'Histoire Naturelle (MNHN; Paris, France); a list of the examined material follows the species description. Pictures and measurements were obtained using a Zeiss Axiocam MRc 5 and Zeiss Axiovision SE64 Rel 4.8 imaging software. The following abbreviations are used throughout the text for shell measurements (cf. BIELER 1993): SD, shell diameter; H, shell height; P, protoconch width; BF, basal field width; w, aperture width; h, aperture height; UD, umbilical diameter.

## SYSTEMATICS

Family Architectonicidae

Genus *Pseudotorinia* Sacco, 1892

**Type species:** *Solarium obtusum* Bronn, 1831, by original designation; Late Pliocene, Italy.

*Pseudotorinia architectae* (O.G. Costa, 1841)

(Figures 1–9)

Synonymy, see Bieler (1993: 277). Complement:

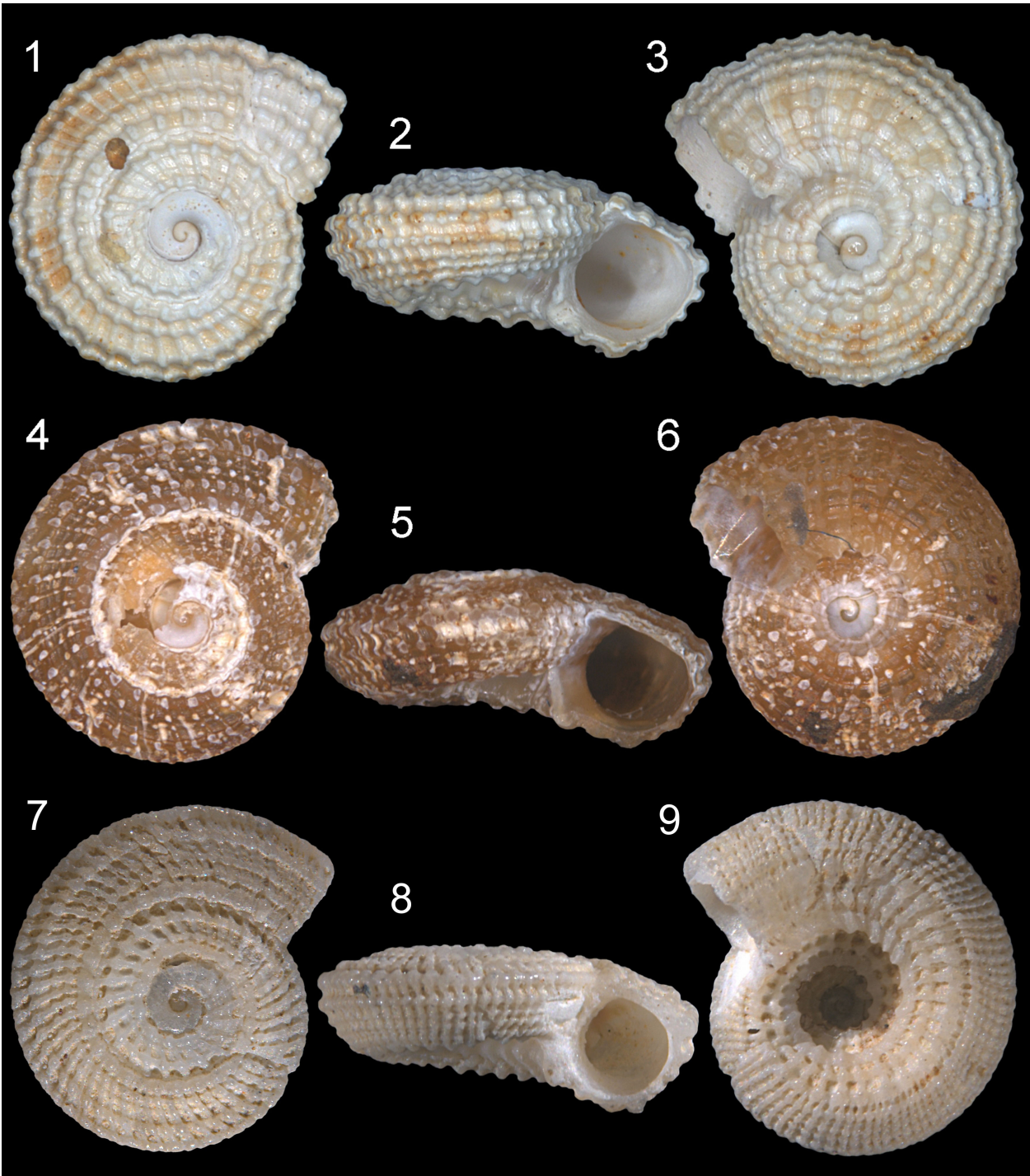
*Heliacus architectae*: Poppe & Goto, 1991: 46, pl. 36, figs. 26–27.

*Pseudotorinia cf. architectae*: Ávila, Azevedo & Gonçalves, 2000: 154.

*Pseudotorinia architectae*: Redfern, 2001: 139, pl. 63, fig. 575; Bogi *et al.*, 2002: 36, figs. 16–18; Mancini, 2003: 11; Micali *et al.*, 2004: 24; Antoniadou *et al.*, 2005: 122; Ruestes & Soriano, 2006: 12, fig. C; Capdevila & Folch, 2009: 40; La Porta *et al.*, 2009: 100; Rosenberg, Moretzsohn & García, 2009: 670; Concepción *et al.*, 2011: 154; Cortés, 2012: 153.

**Material examined:** BRAZIL. **Espírito Santo:** continental slope of Abrolhos, MD55 expedition, sta. CB77, 19°40'06"S 37°48'01"W, 790–940 m, MNHN unnumbered, 1 shell (Bouchet, Leal and Métivier col., 27/v/1987). **São Paulo:** off Vitória Island, Projeto Integrado sta. 19, 23°45'S 45°00'W, 46 m, MZSP 114498, 1 shell (20/iv/1986); off São Sebastião, MBT sta. 50, 23°39'S, 45°06'W, MZSP 77371, 1 shell (Plínio col., 8/v/1970).

**Description:** Shell very small (diameter ~2.75 mm), lenticular, relatively thick-walled; upper side and peripheral base convex (Figures 2, 5, 8). Protoconch very small (~0.5 mm; *sensu* Bieler 1993), weakly heterostrophic (Figures 1, 4, 7); protoconch-teleoconch limit indistinct (Figure 1). Teleoconch



**Figures 1–6.** *Pseudotorinia architae* from southeastern Brazil. **1.** MZSP 114498 (off Vitória Island, São Paulo state), apical view (SD = 2.4 mm). **2.** Same, apertural view (H = 1.3 mm). **3.** Same, umbilical view. **4.** MZSP 77371 (off São Sebastião, São Paulo state), apical view (SD = 2.9 mm). **5.** Same, apertural view (H = 1.3 mm). **6.** Same, umbilical view. **7.** MNHN unnumbered (continental slope of Abrolhos, Espírito Santo state), apical view (SD = 2.9). **8.** Same, apertural view (H = 1.0 mm). **9.** Same, umbilical view.

of 1<sup>3</sup>/<sub>4</sub>–2 whorls, whitish to yellowish or reddish brown, sculpture consisting of nodulose spiral ribs (dominant) and near orthocone axial ribs on both sides. Peripheral keel easily distinguishable, formed by strong lower peripheral rib; upper peripheral rib as strong as subsutural rib. Infraperipheral rib distinctly separated from lower peripheral rib, as strong as following basal ribs, but weaker than innermost proxumbilical ribs. Upper point of whorl attachment slightly above lower peripheral rib. Basal field sculpture (Figures 3, 6, 9) similar to upper side, but with strong basal keel dividing basal field into convex peripheral part (smaller, more numerous nodules) and concave inner part (coarser, bigger nodules). Aperture circular. Umbilicus wide (UD 27–33% of SD); umbilical crenae strong, with weakly demarcated, more angular nodules (Figures 3, 6, 9).

**Measurements (in mm):** MZSP 114498, SD = 2.46, H = 1.28, P = 0.55, U = 0.73, BF = 0.86, w = 0.87, h = 0.83. MZSP 77371, SD = 2.88, H = 1.3, P = 0.47, U = 0.8, BF = 1.0, w = 0.9, h = 0.83. MNHN unnumbered, SD = 2.93, H = 0.98, P = 0.46, U = 0.93, BF = 1.0, w = 0.73, h = 0.74.

**Previously known distribution:** Western Atlantic: North Carolina to Cuba, Caribbean Sea (ROSENBERG 2009; BIELER & GOFAS 2012). Eastern Atlantic: Spain to Azores, Mediterranean Sea (ROSENBERG 2009; BIELER & GOFAS 2012). **Type locality:** Gulf of Taranto, Italy.

**New occurrences:** Brazil. Espírito Santo state: continental slope of Abrolhos. São Paulo state: off Vitória Island (Ubatuba); and off São Sebastião.

## DISCUSSION

Bieler (1993) defined the *Pseudotorinia architae*-group as a complex of very similar Indo-Pacific and Atlantic forms, also offering a preliminary classification of the species and cautioning against the introduction of new names in the group without study of the fossil record. Bieler (1993) noted two forms of *P. architae*: a Mediterranean/Eastern Atlantic form and a Western Atlantic one. He described the latter as having a very small to small, weakly heterostrophic protoconch (P = 0.48–0.68 mm), convex upper side and peripheral base, widely open umbilicus (UD ca. 30% of SD), and sculpture consisting of granulose spiral ribs; 1–2 midribs between the basal keel and umbilical crenae. All these traits are verified in our specimens. However, there are some discrepancies to be noted, such as the homogeneous white or reddish brown color, and the absence of midribs on the upper side of the early whorls of one of the specimens (MZSP 114498, Figure 1). This specimen is juvenile, however, and a faint spiral rib can be observed on the upper side at 1<sup>1</sup>/<sub>2</sub> teleoconch whorl. Bieler's description of the Mediterranean/Eastern Atlantic form is quite similar, except for a larger protoconch (P = 0.62–0.72 mm) and a slightly larger, tan-colored, coin-shaped shell with more numerous whorls.

The relationship between the two Atlantic forms of *P. architae* remains obscure and Bieler (1993), citing the sympatric Pacific species in the genus, argues that they probably represent two distinct species. The present specimens could represent a third, Southern Atlantic form, more closely allied to the Western Atlantic form of Bieler (1993). Besides the above-mentioned discrepancies, it differs

from the Mediterranean/Eastern Atlantic form by having a smaller shell, with different coloration and stronger sculpture (large nodules rather than granules, and stronger axial ribs). The paucity of material of the South Atlantic precludes a more thorough analysis. In any case, the new records reported greatly extend the known range of *P. architae* to the Southwest Atlantic.

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