

A new species of *Arene* (Vetigastropoda, Areneidae) from Canopus Bank, off NE Brazil

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Abstract. *Arene lychee* sp. nov. is described from Canopus Bank, a seamount located ~190 km off Fortaleza, Ceará, NE Brazil (02°14'25"S, 38°22'50"W), based on shell morphology. The species is characterized by a large, trochiform shell; color ranging from intense reddish to white (darker on spiral cords, lighter at base) with a yellow apex; sculpture of 3-8 wide spiral cords with large scale-like spines; cords separated by deep interspaces with similar width, and interspaces sculptured by closely-packed, thin axial growth lines.

Key-Words. Angarioidea; Biodiversity; Gastropoda.

INTRODUCTION

The family Areneidae has been recently erected to remedy nomenclatural issues and to reflect recent molecular phylogenetic hypotheses of relationships within the Vetigastropoda (Williams *et al.*, 2008; McLean, 2012). As it is currently understood, the family exclusively accommodates species previously belonging to Liotiidae Gray, 1850. The Areneidae are characterized by colorful shells (as opposed to the whitish Liotiidae) with dominant spiral sculpture, a tangential aperture with denticles and a lip preceded by a short phase of whorl expansion (McLean, 2012). The group currently includes the African genus *Cinysca* Kilburn, 1970 and the Atlantic-Pacific *Arene* Adams & Adams, 1854, which is represented in Brazil by at least nine species (Rios, 2009).

Canopus Bank is a seamount located ~190 km off Ceará state, NE Brazil (02°14'25"S, 38°22'50"W, ca. 50-600 m depth), which harbors an impressive diversity of invertebrate species. The local substrate is mostly biogenic, presenting relatively large, calcareous particles consisting of mixed animal remains such as fragmentary hard corals, crustaceans, echinoderms, and mollusk shells. Studies on sediment samples from Canopus collected in 2005 have revealed a remarkable number of new taxa. This includes 17 new gastropod species belonging to 12 different families, most of which were described based on empty shells (e.g., Abbate & Cavallari, 2013; Simone & Cunha,

2014; Fernandes *et al.*, 2015). In the present study, we formally describe a new species of *Arene* from Canopus stemming from a broader review of the local vetigastropod fauna (Cavallari & Simone, unpublished data).

MATERIAL AND METHODS

The samples examined herein were collected in Canopus Bank in August 2005 by J. Coltro and P.M.S. Costa at 200-260 m depths. They comprise empty, dried out shells held at the malacological collection of the Museu de Zoologia da Universidade de São Paulo (MZSP, São Paulo, Brazil). Taxonomy and terminology follow Simone (2011). Specimens were photographed and measured under a Zeiss SteREO Discovery V12 stereomicroscope coupled with a Zeiss AxioCam MRc5 digital camera. Shells were coated with gold and examined with a scanning electron microscope at the MZSP.

SYSTEMATICS

Arene lychee sp. nov. (Figure 1A-H)

Type material: Holotype MZSP 70301. Paratypes: MZSP 93482, 2 shells (juveniles), MZSP 93501, 2 shells, MZSP 135314, 4 shells, same data as holotype, 200 m depth (viii/2005).

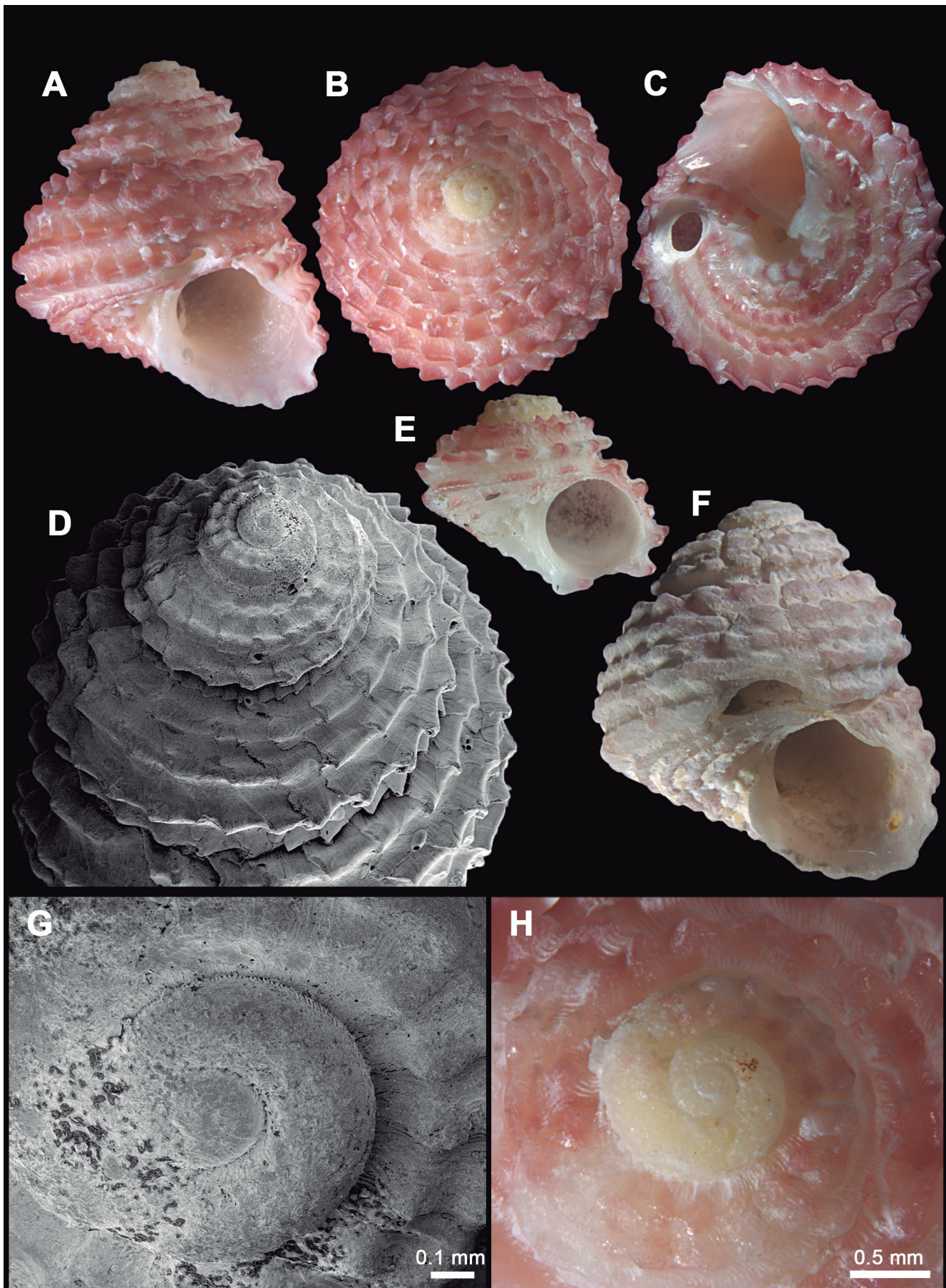


Figure 1. *Arene lychee* shell morphology. (A-D) Holotype MZSP 70301; (A) apertural view (H = 8.3 mm, D = 7.5 mm); (B) apical view; (C) umbilical view; (D) apical, slightly lateral view, SEM; (E) Paratype MZSP 135314, juvenile specimen (H = 3.6 mm, D = 4.7 mm); (F) Paratype MZSP 135314, apertural view (H = 7.2 mm, D = 6.5 mm); (G) Holotype protoconch, SEM, apical view (scale = 0.1 mm); (H) same, detail of the apex (scale = 0.5 mm).

Type locality: Brazil, Ceará, off Fortaleza, Canopus Bank, 02°14'25"S, 38°22'50"W, 260 m.

Diagnosis: Shell relatively large, trochiform. Teleoconch sculptured by 3 wide spiral cords (increasing in number, up to 8 on body whorl) bearing large, mostly hollow, scale-like spines and closely-packed, thin axial growth lines, more visible in interspaces; cords separated by equally wide, deep interspaces. Color from white to intense red, darker on spiral cords, and lighter at base; apex yellow.

Description: Shell relatively large (H 7-9 mm), trochoid, slightly taller than wide (H/D ~1.1), with 5 convex whorls; color strong red to white, darker on spiral cords and lighter at base (juveniles are often lighter colored overall; Fig. 1E); apex yellow (Fig. 1B, H). Spire medium-sized (height ~1/3 of shell height); apex rounded; spire angle ~85°. Protoconch (Fig. 1G-H) small (W 0.75 mm), protruding, of 1½ whorl; color yellow (Fig. 1H); transition to teleoconch visible as a radial groove (Fig. 1G). Teleoconch with ~3½ convex whorls, whorl profile rounded; sculpture of 3 evenly sized, spiny spiral cords (increasing in number, up to 8 on body whorl) separated by equally wide, deep interspaces; spines angular, large, spaced; on whorls 2 and beyond becoming partially hollow, scale-like (Fig. 1D); axial growth lines closely-packed, thin, more visible in interspaces between spiral cords. Suture barely visible. Aperture rounded, aperture height ~1/3 of shell height, white to light pinkish; inner lip thick, slightly flaring (Fig. 1A), producing short callus; outer lip slightly bending over aperture near whorl attachment (Fig. 1A, F). Shell base convex, sculptured by 4 spiral cords (with smaller spines than upper cords); periumbilical cord with larger, coarser nodules (Fig. 1C); umbilicus narrow, shallow. Operculum unknown.

Distribution: Known only from type locality.

Habitat: Coralline bottoms, 200-260 m.

Etymology: The specific name, a noun in apposition, is derived from the English common name of the Asian soapberry tree *Litchi chinensis* (Sapindaceae). The fruits of *L. chinensis* bear a strong resemblance to the shell of the described species, having similar coloration, globose outline, and an overall rough, "spiky" aspect.

Measurements (in mm): Holotype 5½ whorls, H = 8.3, D = 7.5.

Material examined: Types. *Additional material:* Syntype of *Arene briareus* var. *perforata* USNM 95025, Barbados, R/V Blake sta. 272, 139 m (05/iii/1879).

DISCUSSION

Compared to Western Atlantic congeners, *Arene lychee* sp. nov. is most similar to *Arene briareus* (Dall, 1881)

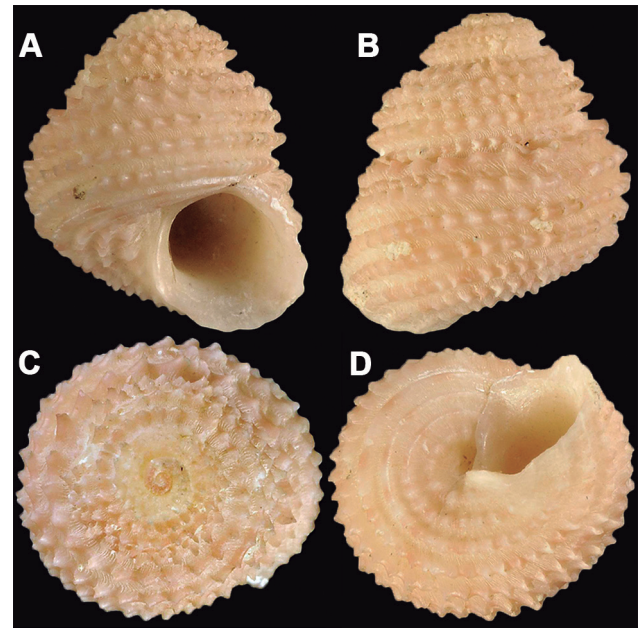


Figure 2. *Arene briareus* var. *perforata* Syntype USNM 95025; (A) apertural view (H = 8.0 mm, D = 7.3 mm); (B) dorsal view; (C) apical view; (D) umbilical view.

from the Caribbean, in both color range and size, and seems to be related to it. Though the syntype specimen of *Arene briareus* var. *perforata* (Dall, 1889) (= *Arene briareus*) depicted herein (Fig. 2A-D) apparently has its color altered or damaged in some way, as it seems to be only faintly reddish, it certainly has a slightly yellowish apex, thus presenting a color pattern that is quite similar to *A. lychee* sp. nov. Even so, the new species differs by having one less spiral cord per whorl, bearing much larger, coarser, and more pronounced nodules/spines, and a proportionally taller, trochoid shell with a straighter profile. Moreover, it can be distinguished from nearly every other congener in Brazilian waters by its size alone, being at least 25% larger than the remaining species. The sole exception is *Arene flexispina* Leal & Coelho, 1985, recently illustrated by Pimenta *et al.* (2014). It can be distinguished from the latter by having a predominantly red shell with a yellow apex, as opposed to an overall reddish-brown shell with lighter colored spiral cords and spines; more numerous nodules/spines; by being proportionally shorter and wider, and by having a less convex and more coarsely sculptured base.

The present discovery is based on relatively scarce samples but is nevertheless a testimony to the significance of studying seamount environments. Seamounts are known to harbor a diverse and often endemic biota (Stocks, 2004), which often suffers the effects of intense fishing pressure (Morato *et al.*, 2004, 2006). In our understanding, Canopus is no exception to this fact, which is made even worse when a large number of new species that have been revealed from that location is considered. Since the fauna of Canopus might be at risk due to intense human activities in that area (Melo-Filho & Melo, 2006), it is vital that the local biodiversity is thoroughly investigated so that proper legal protection can be provided.

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