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A new species of *Acteon* (Opisthobranchia: Acteonidae) from Northeast Brazil

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ABSTRACT. A new species of *Acteon* Montfort 1810, *Acteon mirim* **sp. nov.**, from Canopus Bank, state of Ceará, Brazil is described based on shell morphology. The new species is compared with other species of the genus reported from Brazil. It differs from other Brazilian species in having a whitish color with dark orange-brown spiral bands and a shell surface covered with small spiral grooves, regularly rectangular.

KEY WORDS. Gastropoda, Cephalaspidea, deep water, conchology, taxonomy.

The acteonids are small gastropods typical of infralittoral environments. The opisthobranch organization of their bodies contrasts with the heavy and well-developed structure of their shells. Acteonidae is the largest family of the superfamily Acteonoidea (Bouchet & Rocroi 2005). Recently, Valdés (2008) described a large number of new species under the genus *Acteon* Montfort 1810 from tropical southwest Pacific waters showing the diversity of this group in deep water environments.

Rios (2009) reported four *Acteon* species for the Brazilian coast: *A. pelecais* Marcus, 1972 previously reported as *A. punctostriatus* (C.B. Adams, 1840) (Marcus 1958: 32, 1970: 924); *A. candens* Rehder, 1939 originally described from Florida and first reported by Marcus (1974: 305); *A. danaida* Dall, 1881 of Caribbean waters and *A. vagabundus* (Mabille & Rochebrune, 1885) of Cape Horn, Chile. Both *A. danaida* and *A. vagabundus* were collected off Alagoas State, Northeast of Brazil as empty shells (Marcus, 1970). Also, Marcus (1970: 923) reported *A. cumingii* A. Adams, 1854; which was later moved to the genus *Mysouffa* introduced by Marcus (1974: 308).

Recent dredging at Canopus Bank, located off Ceará State, Brazil, has revealed several new species (Costa & Simone 2005, Cunha 2005, Simone 2005, 2006a, Simone & Abbate 2005) and new occurrences of known species (Simone 2007) in an uncommon gravel ecosystem. The goal of the present study is to describe a new Acteonidae from the same locality.

MATERIAL AND METHODS

Samples were obtained with a dredge (1 x 1.2 x 0.3 m) in the Canopus Bank area (state of Ceará, Brazil) at a depth of 240 m (Fig. 1). Each sample was washed through a 0.5 mm mesh and preserved in 70% ethanol. The residue was examined under magnification and molluscs were sorted out of the mixture.

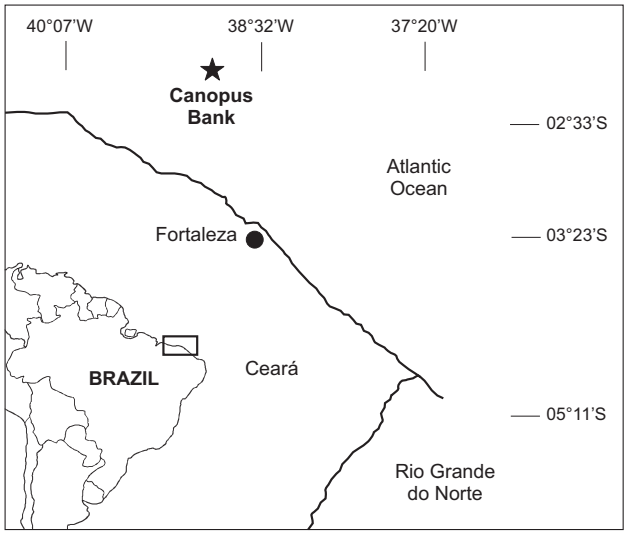


Figure 1. Geographic distribution of *Acteon mirim*.

Only empty shells were found, but most were in good state of preservation.

For detailed examination, samples were mounted on stubs and coated with a gold-palladium alloy and observed under a Zeiss DSM 940 scanning electron microscope. Measurements were made by light microscopy using Zeiss SV-6 dissecting microscope.

Abbreviations of Institutions. (ANSP) Academy of Natural Sciences of Philadelphia, USA; (MNRJ) Museu Nacional da Universidade Federal do Rio de Janeiro, Rio de Janeiro, RJ, Brazil; (MZSP) Museu de Zoologia da Universidade de São Paulo, São Paulo, SP, Brazil; (ZSM) Zoologische Staatssammlung, München, Germany.

TAXONOMY

Acteon Montfort, 1810

[Type species: *Voluta tornatilis* Linnaeus, 1758, original designation]

Acteon mirim **sp. nov.**

Figs 2-8

Type material. Holotype, MZSP 70344; Paratypes: ANSP 413313, 1 shell; MNRJ 10529, 3 shells; MZSP 57091, 1 shell; MZSP 57092 1 shell; MZSP 94212, 1 shell; MZSP 96881, 1 shell; ZSM 20060172, 1 shell.

Type locality. Brazil, *Ceará*: off Fortaleza, Canopus Bank, 2º 14′ 25″S and 38º 22′ 50″W, 240 m depth (dredged, viii-ix/2005. J. Coltro and P.M. Costa *leg*.

Diagnosis. Shell spire shorter than aperture; color whitish with dark orange-brown spiral bands; shell surface with small and spiral grooves, regularly rectangular

Description. Shell (Figs 2-8). Oval, maximum length 3.5 mm; approximately 1.5 x longer than wide (Figs 2 and 5). Walls relatively thin. Color whitish with dark orange-brown spiral bands (Figs 2-4); one spiral band present in each spiral whorl, two on last whorl; each spiral band covering about two or three spiral sculpture (Fig. 4). Spire short, about 1/5 of total length (Fig. 3). Protoconch rounded, glossy, with about 1.5 whorls; separation from teleoconch as a narrow orthocline furrow (Fig. 7). Teleoconch with up to 3.5 whorls, each whorl strongly convex, profile rounded, mainly because of the last whorl (Fig. 6). Suture marked by a shallow, narrow and smooth furrow (Fig. 7). Surface distinctive, sculptured with narrow spiral lines distributed rather regularly on the teleoconch, formed by small regularly rectangular grooves. The grooves are separated by thin gaps, smooth and glossy, that are several times narrower than the grooves. (Fig. 8); last whorl with about 22 spiral lines gradually becoming slightly deeper and closer to each other towards the umbilical area (Fig. 6); about six on inferior half (Fig. 5). Umbilicus absent. Aperture about 2/3 of total length, anteroposteriorly elongated; superior end pointed, inferior (siphonal) end rounded. Inner lip concave; superior half convex, strongly rounded, lacking callus; inferior half slightly concave, with narrow edge; between both regions of inner lip with columellar fold (Figs 2 and 5). Outer lip thin.

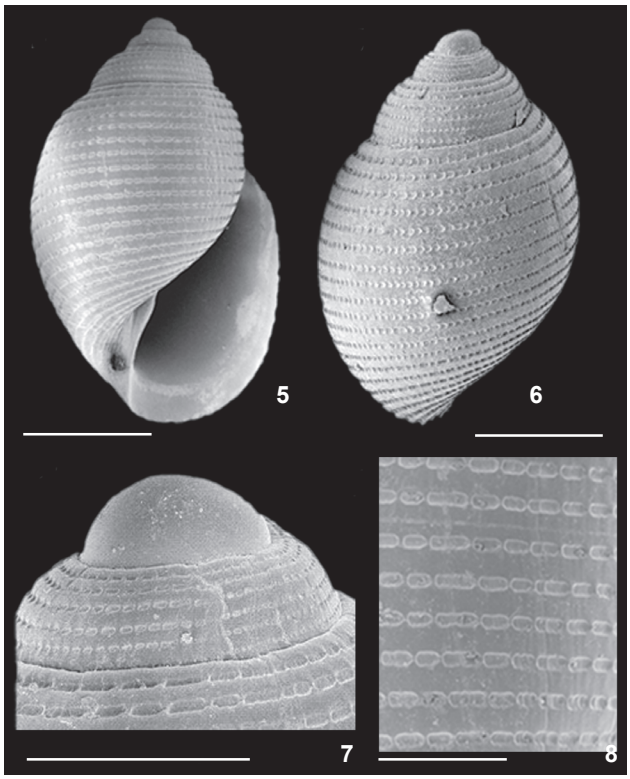
Habitat. Gravel bottoms with dead corals, 240 m depth.

Measurements of shells (length and width in mm): ANSP 413313, 1 shell: 2.9 by 1.9; MNRJ 10529, 3 shells: 3.0 by 2.0, 2.8 by 1.8 and 3.0 by 2.0; MZSP 57091, 1 shell: 3.4 by 2.0; MZSP 57092, 1 shell: 3.0 by 1.9; MZSP 70344, 1 shells: 3,5 by 2.0; MZSP 96881, 1 shell: 3.4 by 1.9; MZSP 94212, 1 shell: 3.3 by 2.1; ZSM 20060172, 1 shell: 2.8 by 1.9.

Etymology. The specific epithet refers to the small size of the species, from the Tupy language *mirim*, which means "small".

Remarks. Generic definitions within the Acteonidae [*Acteon* (*Acteon*) Montfort, 1810] are still unclear. Rudman (1971) proposed that *Acteon* should be used only for species with a columellar fold and numerous minute hook-shaped radular teeth. In fact radular teeth are diagnostic among Acteonidae

Figures 2-4. *Acteon mirim* **sp. nov.**, shell of holotype MZSP 70344: (2) View of the aperture; (3) Lateral (outer lip) view; (4) Dorsal view. (= 3,5 mm of length).



Figures 5-8. *Acteon mirim* **sp. nov.**, paratype, MZSP 57091 in SEM: (5) view of the aperture, scale bar = 1 mm; (6) dorsal view, scale bar = 1 mm; (7) detail of apex, profile, scale bar = 0,5 mm; (8) detail of shell sculpture, scale bar = 0,1mm.

genera, but they have usually unavailable for analysis, as is the case in the present study. Thus, the generic assignment of *Acteon mirim* should be considered tentative until the soft parts become known.

A review of the literature shows that six acteonid species, distributed among *Acteon* Montfort, 1810, *Crenilabium* Cossmann, 1889 and *Mysouffa* Marcus, 1974, have been reported from Brazil (Marcus 1958, 1970, 1972a, b, Simone 2006b, Rios 2009). *Acteon mirim* **sp. nov.** is distinguished from all due to the orange-brown spiral band (Figs 2-4), small size (as indicated by its name) and conspicuous surface sculptured by small grooves, regularly rectangular and separated by thin gaps (Fig. 8).

The four other species of the genus known from Brazil (Rios 1994: 192, 2009: 390), *A.candens* Rehder, 1939, *A. danaida* Dall 1881, *A. pelecais* Marcus 1972 and *A. vagabundus* (Rochebrune & Mabile, 1885), can all be distinguished clearly from *A. mirim* described herein.

Despite the fact that the columellar fold is considered a character for generic assignment (Rudman 1971), this character appears to be absent in some Brazilian species. In fact, we can even divide the Brazilian species into two groups, with and without a columellar fold. Within this context, *A. mirim* differs from *A. candens* (Rehder 1939: 21, fig. 7) and *A. danaida* (Dall 1881: 96, fig. 12, Pl. XVII; Rios 2009: 390, species number 1053 of that catalogue [same illustration of original description]) in having a columellar fold, a more solid shell, and a spire with more whorls. Additionally, *A. mirim* has dark orange-brown spiral bands (Figs 2-4), instead of caramel colored bands that may be present on the early whorl in *A. candens* and the grayish color of *A. danaida*.

On other hand, *A. pelecais* (Marcus 1972a: 170, figs 1 and 6-10) and *A. vagabundus*, (type figured by Valdés & Héros, 1998: 698, fig. 1C) have a columellar fold similar to that of *A. mirim*. However they differ in the morphology of the sculpture, both composed by small grooves, but separated by thin gaps in *A. mirim*, and partially fused together within each groove in *A. vagabundus*, whereas *A. pelecais* has a smooth last whorl. Also *A. vagabundus* has a more elongate aperture and a deeper suture than *A. mirim. Acteon pelecais* is a shallow water species that has a deeper suture than *A. mirim* **sp. nov.**, which is a deep water species. Furthermore, *A. mirim* **sp. nov.** has a dark orange-brown spiral band (Figs 2-4), that differs from the grayish color of *A. vagabundus* and the white color of *A. pelecais*.

Although *A. mirim* **sp. nov.** is not co-generic with, it is most similar to other acteonids such as *Japonacteon pusillus* (MacGillivray, 1843) (figured by Beck *et al.* 2006: 91) which occurs in a much wider range (North Atlantic and Mediterranean), but still more than 5000 km away from the type locality of *A. mirim*. Despite the similar color pattern between the two species, *A. mirim* has narrower, more well-defined spiral bands than *J. pusillus,* which also has a more elongate shell than *A. mirim* **sp. nov.**

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