

**ARENE FLEXISPINA, A NEW SPECIES (GASTROPODA: LIOTIIDAE)  
FROM OFF EASTERN BRAZIL**

**José Henrique N. Leal<sup>1</sup> and Arnaldo C. dos Santos Coelho**

Setor de Malacologia<sup>2</sup> - Museu Nacional  
20.942 - Rio de Janeiro, RJ - Brasil

Seven species of the genus *Arene* H. & A. Adams, 1854 are already known from the Brazilian coast: *Arene tricarinata* (Stearns, 1872), *A. briareus* (Dall, 1881), *A. variabilis* (Dall, 1889), *A. bairdii* (Dall, 1889), *A. brasiliiana* (Dall, 1927), *A. riisei* Rehder, 1943 (Abbott, 1974; Rios, 1975) and *A. notialis* Marini, 1975 (Marini, 1975). The present description is based on specimens obtained through bottom sampling (van Veen and Petersen grabs) between 54 and 82 meter depth during the GEOMAR X cruise undertaken by the Brazilian Navy research vessel "N.Oc. Almirante Câmara" along the eastern coast of Brazil, in the period of 01-11 June 1978. Sampled substrate in the three stations where the species was found consisted of fragments of calcareous algae and calcareous gravel. Although soft parts are not preserved, thus making difficult a more accurate taxonomic characterization, shell features are markedly distinct.

***Arene flexispina* new species**

(Figs. 1-3)

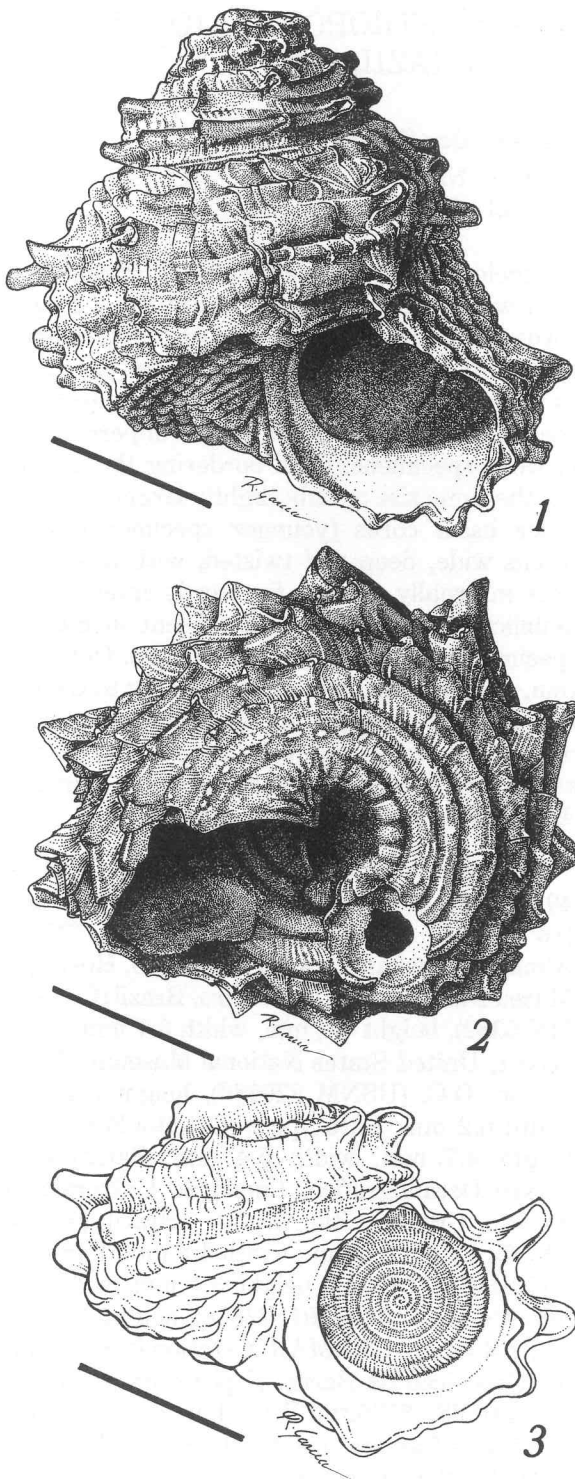
**Description:** Shell small, solid, trochoid in shape, reddish brown, with spiral rows and spines of lighter color. Ratio height/width of the shell higher in adults than in younger specimens. Whorls 5½, the first 1½ comprising the protoconch; white and smooth, lower than the subsequent whorl. Teleoconch whorls with 2 larger peripheral spiral rows of 10 or 11 large, fluted spines spirally raised and imbricated. Narrower row 1-2 subsutural, one intermediate (between the 2 larger) and one immediately above the subsequent whorl, with numerous imbricated scale-like spines, smaller than those in the 2 larger rows. Finely incised axial lines on entire shell microscopic and crowded. Suture

channeled, clearly defined. Body whorl rounded, with wider spiral cords; spines in the 2 larger cords triangular, bent outwards and sharply pointed in apical view; spines number the same as in the spire. Base with 4 or 5 well-separated beaded spiral cords; beads almost imperceptible in worn specimens. Cord bordering the umbilicus the same size or only slightly larger than the other basal cords (younger specimens). Umbilicus wide, deep and twisted, with fine axial lines internally. One or two cords entering the umbilicus in younger shells, absent in mature specimens. Aperture whitish, oblique. Outer lip thin, with crenulations corresponding to the external spiral ornamentation. Operculum round, multispiral, with small radial lines giving beaded aspect to its calcareous external surface. Attachment side horny and convex.

**Material examined:** GEOMAR X station 048, 40 km off Ponta de Corumbaú, Bahia, Brazil (16°56'30"S, 38°39'30"W), 80 m depth, "N.Oc. Almirante Câmara" col. 09 June 1978, Holotype, Museu Nacional, Rio de Janeiro, Brazil (Col.Mol. MN 5352), height 6.4 mm, width 6.7 mm; Paratype 1, United States National Museum, Washington, D.C. (USNM 820786), height 5.4 mm, width 6.2 mm; Paratype 2 (Col.Mol.MN 5353), height 4.7 mm, width 5.4 mm; Paratype 3, Museu Oceanográfico, Fundação Universidade do Rio Grande, Rio Grande, Brazil (MORG 22807), height 3.5 mm, width 4.5 mm; Paratype 4 (USNM 820786A), height 3.4 mm, width 4.3 mm; Paratype 5 (MORG 22808), height 3.2 mm, width 4.3 mm; GEOMAR X station 038, 170 km off Conceição da Barra, Espírito Santo, Brazil (18°49'00"S, 37°52'00"W), 54 m depth, "N.Oc. Almirante Câmara" col. 07 June 1978, Paratype 6 (MORG 22619), height 2.0 mm, width 3.0 mm; GEOMAR X station 047, 120 km off Abrolhos Reef, Bahia, Brazil (17°44'00"S, 37°21'00"W), 54 m depth, "N.Oc. Almirante Câmara" col. 08 June 1978, Paratype 7 (Col.Mol.MN 5354), height 1.4 mm, width 2.4 mm.

<sup>1</sup>Present address: B.L.R., Rosenstiel School of Marine and Atmospheric Science, 4600 Rickenbacker Causeway, Miami, FL 33149

<sup>2</sup>Contribution no. 46



FIGS. 1-3. *Arene flexispina* n. sp. 1 and 2, Apertural and ventral views of the holotype, Col.Mol.MN 5352, 40 km off Ponta de Corumbaú, Bahia State, Brazil. Scale bar=2 mm. 3, Apertural view with operculum of the paratype 6, MORG 22619, 170 km off Conceição da Barra, Espírito Santo State, Brazil. Scale bar=1 mm.

*Type locality:* Brazil, Bahia State, 40 km off Ponta do Corumbaú, (16°56'30"S, 38°39'30"W), 80 m depth, calcareous algae bottom (Fig. 4).

*Etymology:* The specific name stands for the large outwardly bent spines in the spiral cords of the spire and body whorl.

*Remarks:* The species seems to belong in the subgenus *Arene* s.s. which is, as stated by Keen (1971:345), characterized by a sculpture of coarsely beaded spiral cording on the body whorl and base, the periphery rounded or stellate. Although *A. flexispina* n. sp. possesses some of the characters of the subgenus *Marevalvata* Olsson & Harbison, 1953, such as general outline, spiral cords in the umbilicus wanting in mature specimens and outer lip not thickened, it doesn't exhibit the diagnostic flattened base with radial lines extended from the umbilicus and a nacreous inner layer (Olsson & Harbison, 1953:348; Keen, 1971:346). Further investigations or a revision work on the western Atlantic species of *Arene* seems to be necessary to confirm the positioning of *A. flexispina* at subgeneric level.

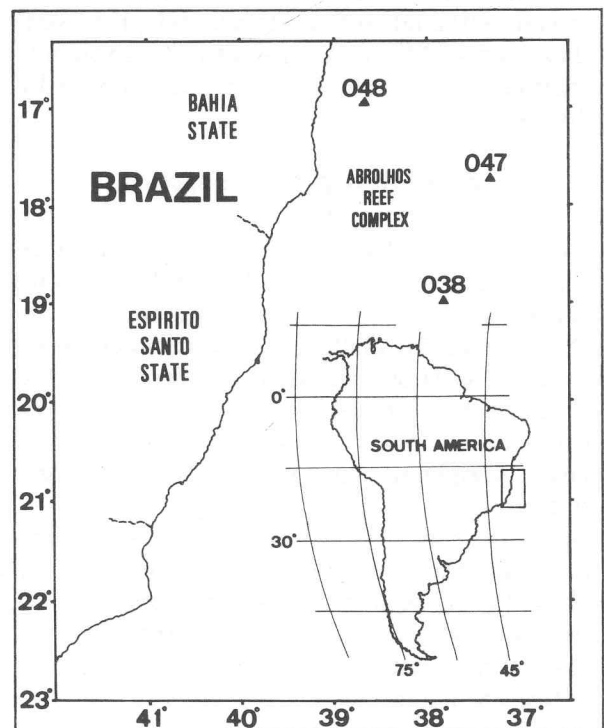


FIG. 4. Location of the three GEOMAR X stations in which *Arene flexispina* n. sp. was found (solid triangles). The type locality is represented by station 048. Inset shows position of the area in southern Atlantic Ocean.

It was observed from the shell measures of the 8 examined specimens of *A. flexispina* that the ratio height/width increases as the shell grows, suggesting a pattern of allometric growth (Fig. 5), probably a consequence of a gradual alteration in the angle of coiling in the species.

*Arene flexispina* appears to be related to *A. briareus* from the Caribbean and tropical western Atlantic, according to the original description (Dall, 1881:52), and later illustration by the same author (Dall, 1889: pl. 24, figs. 5, 5a), and by comparison of specimens (Col.Mol.MN 5390; Morg 14.969), mainly by its elevated spire and spinose ornamentation. *A. flexispina* differs, however, by its darker color, two obviously larger cords on body whorl, which are all about the same size or only a little larger than the remaining in *briareus*; ornamentation of the spiral cords consisting in about 11 large fluted spines, instead of about 40 small spines in *briareus*; a well differentiated ridge or cord around the umbilicus and a nodulose spiral ridge inside it in *briareus*, not present in *flexispina*; outer lip thicker in *briareus*.

*Arene notialis* from off southeastern Brazil differs by its whitish color, lower spire, about 21

nodules (not spines) on spiral cords in the body whorl, 8 joined strongly beaded basal spiral cords instead of 5 separated cords in *flexispina*; umbilicus smaller and straight, bordered by a larger basal cord and outer lip thicker in *notialis*, according to Marini (1975) and material examined of *A. notialis* from off Guarapari, Espírito Santo, Brazil, "N.Oc. Almirante Saldanha" col. September 1968, 80 m depth, Col.Mol.MN 4862, two specimens.

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#### LITERATURE CITED

- Abbott, R. T. 1974. *American Seashells* (2nd Edition). Van Nostrand-Reinhold, New York, 663 pp.
- Dall, W. H. 1881. Reports on the Results of Dredging, under the Supervision of Alexander Agassiz, in the Gulf of Mexico, and in the Caribbean Sea, 1877-79, by the United States Coast Survey Steamer "Blake", . . . XV. Preliminary Report on the Mollusca. *Bull. Mus. Comp. Zool.*, Harvard Univ., Cambridge 12(6):171-318, pls. 1-9.
- \_\_\_\_\_ 1889. Reports on the Results of Dredging, under the Supervision of Alexander Agassiz, in the Gulf of Mexico (1877-78) and in the Caribbean Sea (1879-80), by the U.S. Coast Survey Steamer "Blake", . . . XXIX. - Report on the Mollusca. Part II. - Gastropoda and Scaphopoda. *Bull. Mus. Comp. Zool.* Harvard Univ., Cambridge 18:1-492, 31 pls.
- Keen, A. M. 1971. *Sea Shells of Tropical West America*. Stanford University Press, Stanford, 1064 pp.
- Marini, A. C. 1975. Sobre duas espécies novas de moluscos (Trochacea: Turbinidae; Liotiidae) da costa brasileira. *Pap. Avul. Zool. St. Paulo* 29(5):31-34, 2 pls.
- Olsson, A. A. and A. Harbison. 1953. *Pliocene Mollusca of Southern Florida*, with special reference to those from North Saint Petersburg with special chapters on Turridae by Williams G. Fargo and Vitrinellidae and Fresh-water Mollusks by Henry A. Pilsbry. *Acad. Nat. Sci. Philad.*, Monog. 8:1-457, 65 pls.
- Rios, E. C. 1975. *Brazilian Marine Mollusks Iconography*: Fundação Universidade do Rio Grande, Rio Grande, 331 pp., 91 pls.

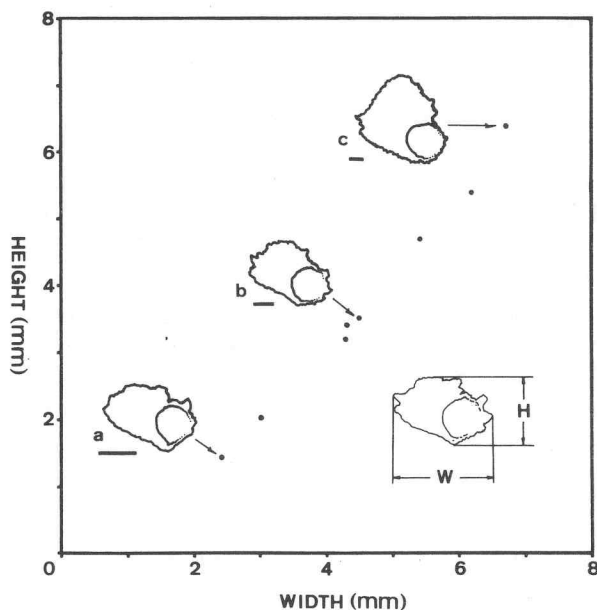


FIG. 5. Allometric shell growth in *Arene flexispina* n. sp.; sketches illustrate the shape of shells at three points on the curve: a) Paratype 7, Col.Mol.MN 5354, height 1.4 mm, width 2.4mm; b) Paratype 3, MORG 22807, height 3.5 mm, width 4.5 mm; c) Holotype, Col.Mol.MN 5352, height 6.4 mm, width 6.7 mm. Scale bars=1 mm.