

Nanomelon vossi, a New Deep-Water Zidoninae from Off Southern Brazil (Gastropoda: Volutidae)

by

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Abstract. *Nanomelon vossi* sp. nov. is described from the upper bathyal zone on the slope off Rio Grande do Sul State, Brazil. The new species belongs to a recently described genus, originally thought to be monotypic. It is closely related to *N. viperinus*, differing by a larger spire angle, smaller protoconch, more convex whorls, less elongate profile, larger number of spiral cords with much narrower interspaces, and flatter axial ribs in the shell. Differences in morphology of the uniserial radula are restricted to changes in the relative positions of elements and proportions of the rachidian tooth.

INTRODUCTION

The volutid genus *Nanomelon* Leal & Bouchet, 1989, originally monotypic, was recently described from deep waters off southeastern Brazil. After the publication of the description of *Nanomelon*, we realized that a small, unknown volutid, collected in 1986 on the slope off Rio Grande do Sul State, Brazil, by the Brazilian research vessel *Atlântico Sul* of the "Fundação Universidade do Rio Grande," belongs in the same genus.

Deterioration of the soft parts due to poor preservation impeded proper anatomical comparisons with the previously described species. Notwithstanding, radular and conchological characters are distinctive enough to permit the generic allocation of the new species.

Abbreviations used in the description are as follows: MNHN, Muséum National d'Histoire Naturelle, Paris, France; MNRJ, Museu Nacional, Rio de Janeiro, Brazil; MORG, Museu Oceanográfico Prof. E. de C. Rios, Rio Grande, Brazil; USNM, National Museum of Natural History, Washington.

DESCRIPTION

Family VOLUTIDAE Rafinesque, 1815

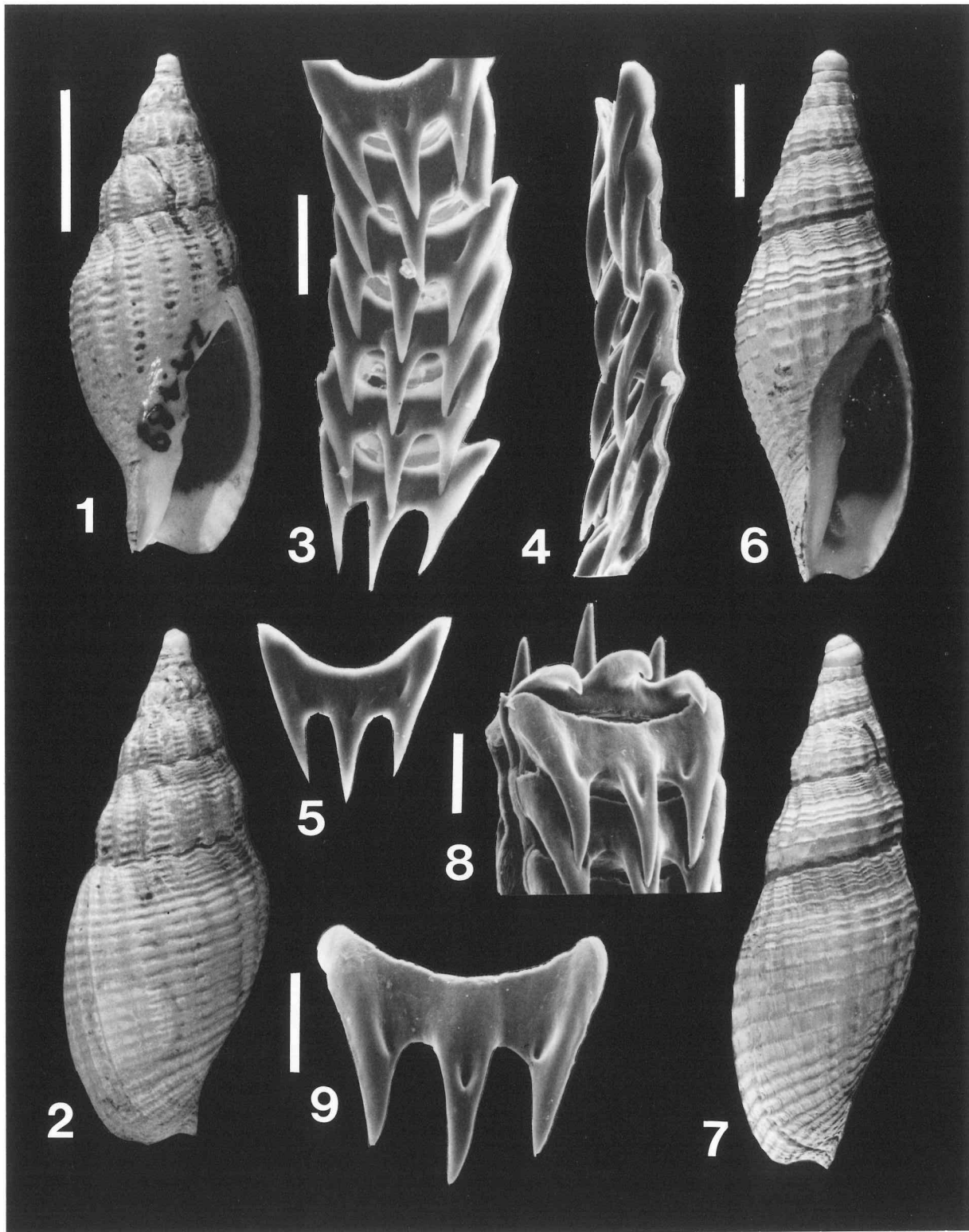
Subfamily ZIDONINAE H. & A. Adams, 1853

Genus *Nanomelon* Leal & Bouchet, 1989

Nanomelon vossi Leal & Rios, sp. nov.

(Figures 1-5, Table 1)

Shell (Figures 1, 2, Table 1): Fusiform (length/width about 2.5), reaching 35 mm length, 13 mm width. Spire angle about 40 degrees. Shell surface opaque, dirty-white to yellowish-white. Periostracum very thin, yellowish-brown. Protoconch white, cylindrical, about 2.25 whorls, about 1.8 mm in diameter. Spiral striation adapical to suture, barely discernible. Embryonic whorl about 0.8 mm, rapidly expanding into first protoconch whorl, but last protoconch whorl with same diameter as preceding one. Teleoconch with 4.5 shouldered whorls (holotype). Suture impressed, sutural ramp slightly concave. Combination of



Explanation of Figures 1 to 9

Figures 1-5. *Nanomelon vossi* sp. nov. Figures 1, 2. Holotype, off Rio Grande do Sul, Brazil, 32°25'S, 50°11'W, 460 m depth, ventral and dorsal views of the shell. Figures 3-5. SEM micro-

graphs of radula; anterior margin of teeth towards the top of illustration. Scale bar equals 10 mm in Figures 1 and 2. Figure 3. Radular ribbon. Figure 4. Lateral view of radular ribbon.

spiral and axial sculpture giving clathrate aspect to whole teleoconch. Spiral sculpture of 6 or 7 cordlets on sutural ramp (corresponding to adapical half of each whorl but last), and 18–23 larger spiral cords on remainder of whorl (values given for last whorl). Interspaces between cords at least twice the width of those between narrower, adapical cordlets. Spiral ribs on base not differing from those on remainder of last whorl, except for one weaker cordlet intercalated with each of 4 or 5 abapical cords. Axial ribs about 19 in last whorl. Aperture elongate (length/width about 3). Outer lip simple, thin. Interior of aperture opaque. Parietal region smooth. Columella strongly arched, with siphonal fold and 4 or 5 columellar plaits.

Radula (Figures 3–5): Radular ribbon uniserial. Rachidian 0.12 mm wide (holotype), tricuspid, basal plate strongly curved. Lateral and central cusps curved, defining planes that form respectively 10 and 20 degree angles with basal plate and radular ribbon (Figure 4). Cusps growing posteriorly from basal plate. Region of intersection of external edge of lateral cusp with anterior edge of basal plate pointed, forming well-defined angle. Central and lateral cusps with same length, but extremity of central cusp slightly more posterior than extremities of lateral cusps due to curvature of basal plate. External edges of lateral cusps forming 40 degree angle, slightly curved inwards in dorsal view. Dorsal surface of basal plate impressed by extremity of preceding teeth. Extremities of cusps interlock with these impressions in subsequent tooth, when radula not in protracted condition.

Holotype: MORG 24489, 35.1 mm length, 13.7 mm width, collected alive.

Type locality: Continental slope off the coast of Rio Grande do Sul State, Brazil, 32°25'S, 50°11'W, 460 m depth, muddy bottom, N. Oc. *Atlântico Sul*, May 1986, rectangular dredge.

Paratypes: Paratype 1, MNHN, 35.8 mm length, 14.3 mm width; paratype 2, USNM 860175, 30.3 mm length, 12.1 mm width; paratype 3, MNRJ 5767, 22.5 mm length, 9.7 mm width; all from type locality.

Etymology: The species is respectfully dedicated to the memory of the late Dr. Gilbert L. Voss and his many contributions in malacology and deep-water biology.

Remarks: Species in the genus *Nanomelon* are among the smaller ones in the subfamily Zidoninae (see WEAVER & DUPONT [1970] for dimensions of species in other genera). The small *Alcithoe grahami* (Powell, 1965) from New Zealand (about 32 mm length) was considered by DELL (1978)

Table 1

Nanomelon vossi sp. nov. Linear shell measurements and meristic counts for the holotype (Hol) and paratypes 1–3 (Pa1–Pa3). All are from the type locality, off Rio Grande do Sul State, Brazil, 32°25'S, 50°11'W, 460 m depth.

| Character | Hol | Pa1 | Pa2 | Pa3 |
|--------------------------------|------|------|------|------|
| Total length (mm) | 35.1 | 35.8 | 30.3 | 22.5 |
| Shell width (mm) | 13.7 | 14.3 | 12.1 | 9.7 |
| Length last whorl (mm) | 24.3 | 25.5 | 22.1 | 16.4 |
| Aperture length (mm) | 19.4 | 18.9 | 17.5 | 12.4 |
| Aperture width (mm) | 5.8 | 5.7 | 6.0 | 4.3 |
| Protoconch diameter (mm) | 1.8 | — | 1.8 | 2.0 |
| Protoconch whorls | 2.25 | — | 2.25 | 2.25 |
| Teleoconch whorls | 4.75 | 4.50 | 3.75 | 3.50 |
| Spire angle (degrees) | 34 | 39 | 41 | 40 |
| Spiral cords last whorl | 18 | 20 | 23 | 19 |
| Cordlets sutural ramp | 6 | 8 | 6 | 7 |
| Axial ribs last whorl | 19 | 20 | 13 | 13 |
| Length/width | 2.56 | 2.50 | 2.50 | 2.32 |
| Aperture length/length | 0.55 | 0.53 | 0.58 | 0.55 |
| Aperture length/aperture width | 3.34 | 3.32 | 2.92 | 2.88 |

to be a dwarf form of *A. wilsonae* (Powell, 1933). Poor preservation of the soft parts in *N. vossi* hampered the observation of anatomical structures used in the definition of the Zidoninae, and the present allocation is based solely on shell and radular characters.

Although only four individuals of the new species are known, adults of *Nanomelon vossi* seem on average even smaller than adults of *N. viperinus*. Both species show clathrate sculpture and a pattern of distinct, crowded spiral cordlets in the sutural ramp of whorls. *Nanomelon vossi* has a larger spire angle than *N. viperinus*, more convex whorls, and the protoconch diameter is about half of that in *N. viperinus*. As a consequence, the new species has a stubby, less elongate profile, with a more pointed apex. Cordlets and respective interspaces in the sutural ramp are not as distinctive and crowded as in *N. viperinus* and the remaining spiral cords are more numerous and interspaces much narrower in the new species. Interspaces are about three times wider than spiral cords in *N. viperinus*, but about the same width as cords in *N. vossi*. Values for the number of axial ribs in the last whorl overlap in the two species, but ribs in the new species are flatter, and the interspaces not as wide as in *N. viperinus*. Additionally, columellar and apertural regions are not as arched as in *N. viperinus*.

Differences in radular morphology are not remarkable, as expected between species of the same genus in the family

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Figure 5. Rachidian tooth. Scale bar equals 0.5 mm in Figures 3–5.

Figures 6–9. *Nanomelon viperinus* Leal & Bouchet, 1989. Holotype, off Rio de Janeiro, Brazil, 23°47'S, 42°10'W, 610 m depth. Figures 6, 7. Ventral and dorsal views of the shell. Scale bar

equals 10 mm in Figures 6 and 7. Figures 8, 9. SEM micrographs of radula; anterior margin of teeth towards the top of illustration. Figure 8. Radular ribbon. Figure 9. Rachidian tooth. Scale bar equals 0.5 mm in Figures 8 and 9. (Figures 3–5 and 9 have same magnification.)

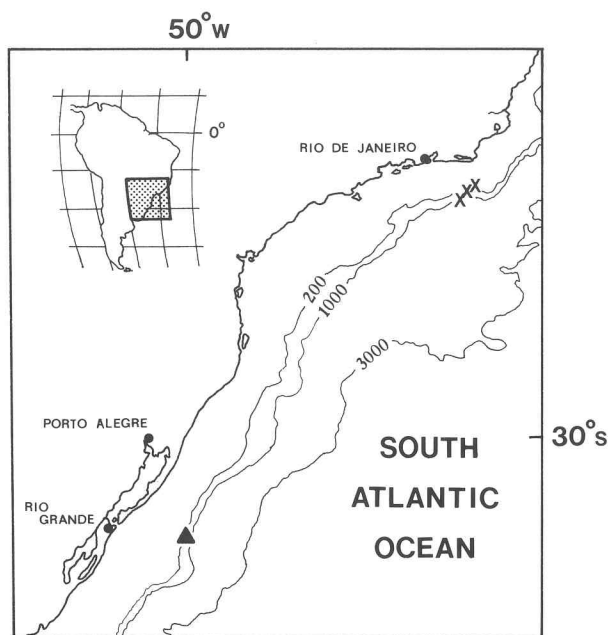


Figure 10

Records of the genus *Nanomelon*. x, *N. viperinus*; ▲, *N. vossi*. Inset shows area of South Atlantic that is detailed.

Volutidae. The angle formed by the external edges of the lateral cusps is 40 degrees in *Nanomelon vossi* and 30 degrees in *N. viperinus* and, as a result, the ratio of tooth width-distance between extremities of lateral cusps in a given tooth is larger in *N. vossi*. Also, the position of the impressions in the dorsal surface of teeth is more anterior in *N. vossi*, and the intersection of the external edge of the lateral cusps with the anterior margin of the tooth is well defined and pointed in *N. vossi*. It is rounded and ill defined in *N. viperinus*.

The large diameter of the embryonic whorl in both species of *Nanomelon* (about 1.0 mm in *N. viperinus* and 0.8 mm in *N. vossi*) and its large expansion rate indicates that, despite protoconchs with 2.5 whorls, both species exhibit non-planktotrophic, direct development. As indicated in HANSEN (1980), BOUCHET & POPPE (1988), and PENCHASZADEH (1988), this is the rule among volutids, and probably the reason for the restricted distributional range displayed by most species in the family. Records for *N. viperinus* and *N. vossi* on the slope off southeastern-southern Brazil are portrayed in Figure 10. Differences in shell morphology between the two taxa (especially the

difference in protoconch diameter and shape) and radula are here considered as sufficient to define them as distinctive species. Nonetheless, they seem to be closely related, and the geographic separation of their records on the slope suggests allopatric speciation and the recency of a common ancestor in the evolutionary history shared by the two taxa.

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