

DESCRIPTION OF A NEW WESTERN ATLANTIC SPECIES OF *EULIMETTA* (GASTROPODA: EULIMIDAE), PREVIOUSLY A MONOTYPIC GENUS FROM THE EASTERN PACIFIC

LEONARDO SANTOS DE SOUZA & ALEXANDRE DIAS PIMENTA

Malacologia, Departamento de Invertebrados, Museu Nacional / Universidade Federal do Rio de Janeiro. Quinta da Boa Vista s/n, São Cristóvão, Rio de Janeiro, RJ, Brasil.

Abstract The genus *Eulimetta* was previously known only from the eastern Pacific. Here we describe *E. atlantica* sp. nov., the second species of the genus, from the Brazilian coast based on shell morphology. This new species differs from its congener, *E. pagoda* Warén, 1992, mainly by the presence of an umbilical fissure and a pointed apex. Further, the expansion of the peripheral keel of *E. atlantica* is more regular than in *E. pagoda*. The microsculpture of *E. atlantica* follows the pattern of *E. pagoda*.

Key words Caenogastropoda, Eulimoidea, micromolluscs, Brazil, South America

INTRODUCTION

The family Eulimidae is cosmopolitan, with different species inhabiting the coastline to the deep sea (Warén, 1984). This family has a particular way of life, being parasites of echinoderms, and most species are ectoparasites (Warén, 1984). Eulimidae is traditionally classified in the superfamily Eulimoidea along with Aclididae (e.g. Warén, 1984; Bouchet & Rocroi, 2005), but more recently Takano & Kano (2014) based on molecular data presented a new classification of Eulimidae in the superfamily Vanikoroidea (see Takano & Kano, 2014 for further details). Eulimoidea comprises about a 1,000 accepted species (Rosenberg, 2014) and the huge amount of species in this superfamily are eulimids. Eulimidae is one of the richest families of marine gastropods (Albano *et al.* 2011). Bouchet *et al.* (2002) considered that around 80% of species collected in the Indo-Pacific region would be new to science.

Knowledge of the diversity of Eulimidae from Brazil is still incipient, in contrast to other more extensively studied regions, especially the North Atlantic, where extensive taxonomic surveys (e.g. Bouchet & Warén, 1986) have revealed a large numbers of species. In Brazil, the latest catalogue of Brazilian marine molluscs reports only 25 species of Eulimidae (Rios, 2009), and some records are dubious, lacking taxonomic confirmation or needing better descriptions and illustrations.

Attempts to describe the diversity of Eulimidae in the western Atlantic in the last decade have concentrated mainly in the Caribbean area (Espinosa *et al.* 2006; Espinosa *et al.* 2007), but more recently, contributions to the study of the eulimids have been made in Brazil (Simone & Birman, 2006; Queiroz *et al.*, 2013; Souza & Pimenta, 2014).

As part of a project to describe the diversity of Eulimidae from Brazil, we present the description of a new species of *Eulimetta*, up to now a monotypic genus restricted to the Pacific coast of North and Central America (Warén, 1992).

MATERIALS AND METHODS

The material examined was sorted from MNRJ and IBUFRJ malacological collections and consists only of empty shells. These shells were collected by three different expeditions: (1) A Multidisciplinary Amazon Shelf Sediment Study – AMASSEDS, collected by the RV *Columbus Iselin*; (2) Joint Oceanographic Projects -JOPS II, coll. RV *Victor Hensen*; (3) Environmental Characterization of the Campos Basin, Oceanprof (OP), coll. RV *Astro Garoupa*. This last expedition was sponsored by the Brazilian oil company Petrobras S.A.

The terminology is based on Warén (1984) and Bouchet & Warén (1986). Measurements of the shell presented in Table I, were done under camera lucida (Nikon SMZ800). They are total shell length (L), maximum width (W), height of the aperture (Ha) and width of the aperture (Wa).

Abbreviations used through the text: IBUFRJ: Instituto de Biologia, Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil; MNRJ: Museu Nacional / Universidade Federal do Rio de Janeiro, Rio de Janeiro, Brazil.

SYSTEMATICS

Family Eulimidae Philippi, 1853

Genus *Eulimetta* Warén, 1992

Type species *Eulimetta pagoda* Warén, 1992

Eulimetta atlantica sp. nov.

(Figs 1–2)

Holotype MNRJ 26277

Paratypes off Amapá state: IBUFRJ 19758, [1]; MNRJ 26241, type locality; IBUFRJ 19759, [1]; AMASSEDS sta 3205 (2°05.30'N, 48°51.30'W, 22m), 05/xi/1990; MNRJ 26270, [1], AMASSEDS sta 4134 (2°21.2'N, 48°29.9'W, 72m); South of Abrolhos Bank: IBUFRJ 10403, [2], JOPS sta 3231 (18°46.8'S, 38°31.4'W, 65m), 20/iv/1995.

Additional material examined MNRJ 33491, [1], OCEANPROF II sta 52 (22°04'45"S, 39°46'31"W, 1643m).

Type locality Brazil. Off Amapá state, AMASSEDS sta 3210 (1°52.45'N, 48°16.02'W, 47m), 05/xii/1990.

Measurements See Table 1.

Diagnosis Small (around 2.0mm) conical shell with sharp apex and pointed tip, a regular expanding peripheral spiral keel and well-developed umbilical chink.

Description Small conical shell, vitreous, yellowish, up to 2.2mm high, slender, with a sharp apex. Larval shell acuminate, about 2.7 whorls of slightly convex outline, diameter around 180µm; smooth, with short fine striations below suture, these striations most visible close to the strongly demarcated terminal scar at the transition to the teleoconch. Teleoconch with up to nine whorls with a straight outline, and a peripheral keel on the lower portion, just above the barely impressed suture; peripheral keel emerges as a slightly rounded elevation on the first/second whorl, becoming more pronounced on the third

teleoconch whorl, giving rise to a sharp keel, impressed by parallel spiral lines; sinuous incremental scars appearing at intervals of around 0.6 whorl; entire surface of teleoconch, except for the peripheral keel, covered with microscopic granules. Base truncated. Aperture ovoid, acute posteriorly and rounded anteriorly; outer lip thick, very slightly sinuous, with a lump in the lower region resulting from the peripheral keel; inner lip well demarcated; columella straight. Umbilicus varies from almost absent or as an umbilical chink varying in width in young specimens and adults.

Etymology The species is named after its occurrence in the Atlantic Ocean, in opposition to his congener from the Pacific Ocean.

Geographic range Brazil: Amapá state and Abrolhos Archipelago. From 22m to 72m depth.

DISCUSSION

When defining the genus *Eulimetta*, Warén (1992) noted some degree of variation in the expression of the peripheral keel, and raised the possibility that more than one species was involved. The peripheral keels of *Eulimetta atlantica*, show little variation, but one shell (Fig. 1B) has a wider peripheral keel on the last whorl. On the other hand, the umbilicus can be opened (Figs 1A–B), a narrower fissure (Fig. 2A, G), or almost entirely closed in younger shells (Fig. 1C). One paratype possess a slightly bent spire (Fig. 2A), but the rest of the shells studied here have a straight outline.

The presence of an umbilicus is the main difference from *Eulimetta pagoda*, which is always imperforate, even in shells with a larger number of whorls. Besides that, *E. pagoda* shows an irregular growth of the spiral keel, which becomes well raised after the incremental scars, giving the shell a flattened appearance in side view, according to Warén (1992). The spiral keel of *E. atlantica* has a more regular growth, in which the initial teleoconch whorls have a tiny elevation that gives rise to a well-demarcated spiral keel from the third whorl on. This developmental pattern does not change along the shell length in the shells studied here; even close to the incremental scars the keels do not become much lower as in *E. pagoda*. Additionally, the tip of the protoconch of *E. pagoda* with 3.5 whorls, indicating its transition to the teleoconch; in *E. atlantica*, we counted

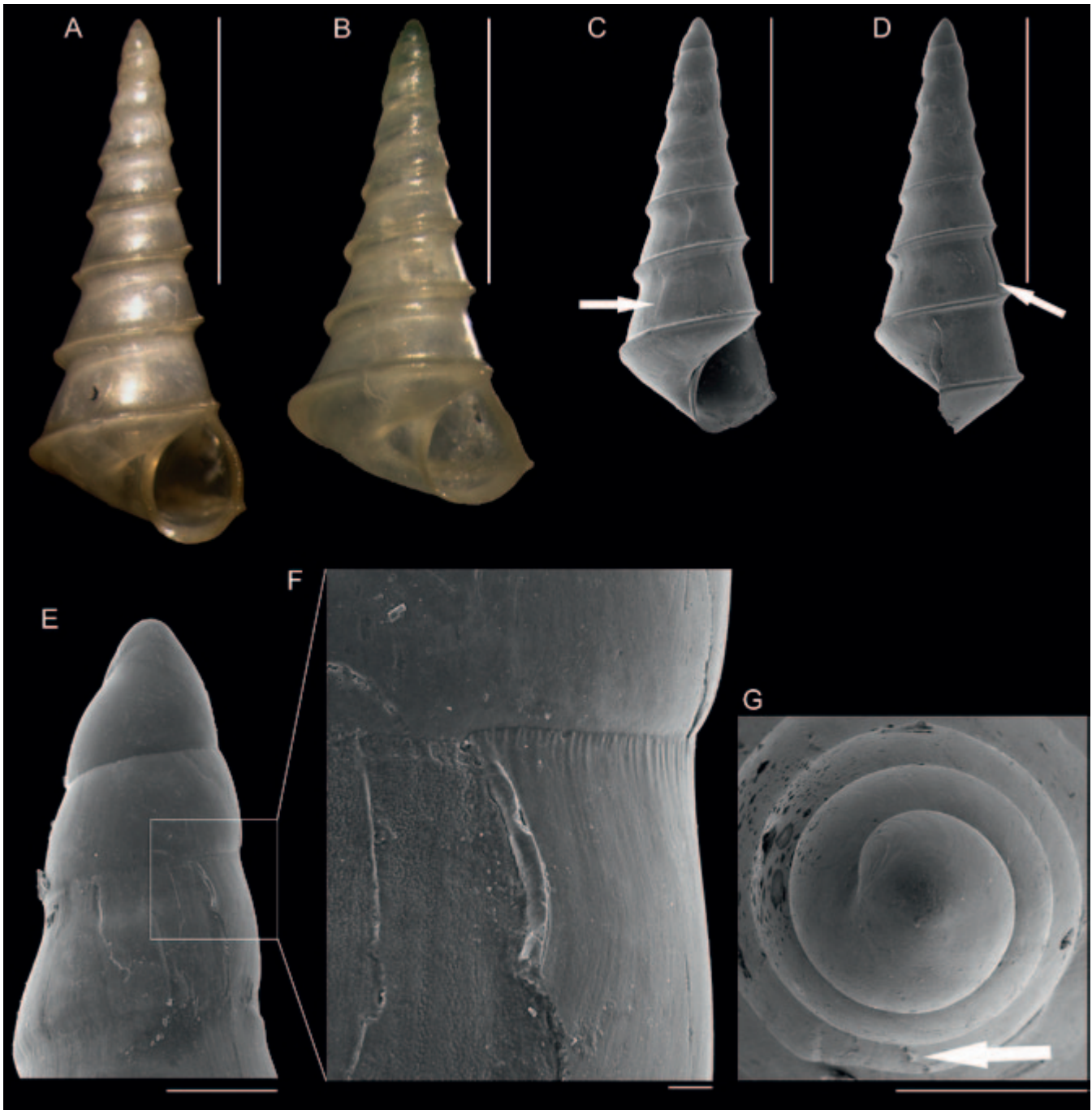


Figure 1 *Eulimetta atlantica* n. sp. **A** holotype; **B** paratype (IBUFRJ 19759); **C–G** paratype (MNRJ 26241). **A–D** whole shells; **E** protoconch; **F** detail of sculpture on transition protoconch-teleoconch; **G** protoconch in apical view. White arrows indicate: **C–D** incremental scars; **G** margin of protoconch in transition to teleoconch. Scale bars: **A–D** 1.0mm; **E, G** 100µm; **F** 10µm.

about 2.7 whorls with an almost smooth surface (Figs 1E–G).

Eulimetta atlantica has a remarkable teleoconch microsculpturing composed of widely spread microscopic granules that are especially visible above and below the peripheral keel (Figs 2B–D); the keel itself lacks this sculpturing, but

has spiral cords (Fig. 2E). The appearance of the microscopic granules indicates the protoconch-outer lip (partially broken in Fig. 1F); the protoconch surface (Figs 1E–F) does not bear the microscopic granules, but has small wrinkles below the suture, similar to those found in species of *Fusceulima* by Souza & Pimenta (2014).

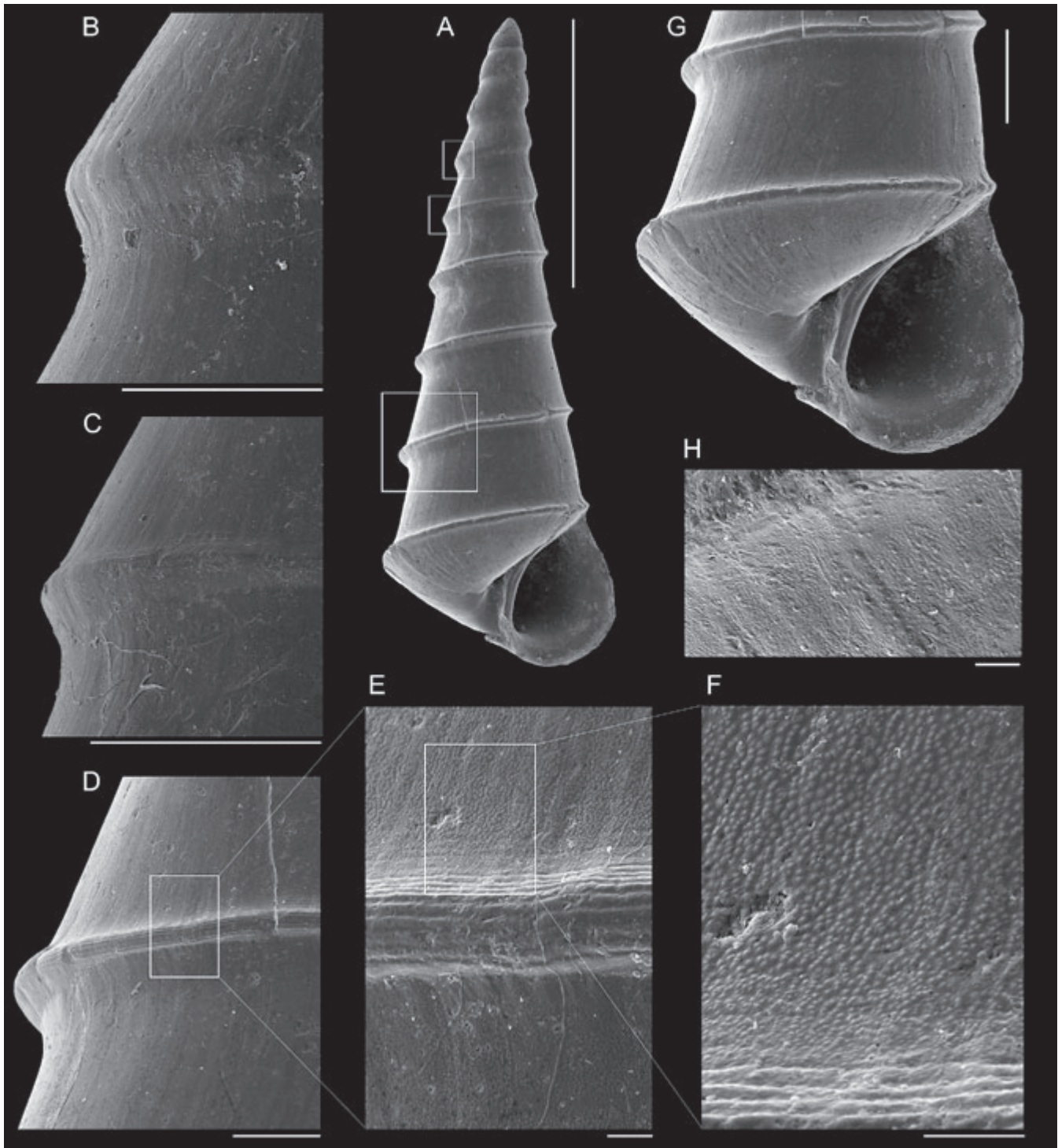


Figure 2 *Eulimetta atlantica* n. sp. (paratype MNRJ 26270). **A** whole shell; **B–D** successive details of spiral keel as indicated by rectangles in figure 2A; **E–F** successive enlargements of figure 2D, showing microscopic sculpture; **G** last whorl; **H** detail of base in similar scale of figure 2E. Scale bars: **A** 1mm; **B–D** 100µm; **E–F, H** 10µm; **G** 200µm.

Warén (1992) recognized this same sculpture of the teleoconch in *E. pagoda*, but he termed the microscopic granules “shallow pits”. Considering “pit” as a perforation in the shell surface, similar to those present in species of

the family Barleeidae (Ponder, 1983; Santos & Absalão, 2006), we consider that this sculpturing is best described as small granules, since resemble very small pustules or warts on the shell surface (Figs 2E–F). Fig. 41 in Warén (1992)

Table I Measurements (mm) of the material examined in this study. L- total shell length; W- maximum width of the shell; Ha- height of the aperture; Wa- width of the aperture; # whorls- number of whorls.

	L	W	Ha	Wa	# whorls
Holotype MNRJ 26277	1.97	0.88	0.48	0.37	8
Paratype MNRJ 26270	2.20	0.85	0.51	0.40	9
Paratype MNRJ 26241	1.57	0.63	0.43	0.29	7
Paratype IBUFRJ 10403	1.54	0.64	0.40	0.29	7
Paratype IBUFRJ 19758	2.14	0.82	0.51	0.40	9
Paratype IBUFRJ 19759	1.83	0.97	0.46	0.40	8
MNRJ 33941	2.05	0.91	0.51	0.40	8
Mean	1.84	0.78	0.47	0.36	–
Standard deviation (\pm)	0.30	0.15	0.04	0.05	–

shows identical sculpturing in *E. pagoda*, above and below the spiral keel.

No other eulimid in the western Atlantic has this unusual shape of *E. atlantica*. *Scalenostoma perrieriae* Barros, Padovan & Santos, 2001 is the species that most resembles *E. atlantica* on the Brazilian coast, with respect to the spiral keel. However, *E. atlantica* can be distinguished mainly by the more acuminate larval shell, the presence of an umbilicus, and the presence of the microsculpturing consisting of small granules. Barros *et al.* (2001) described *S. perrieriae* as having a smooth shell surface. The generic position of *S. perrieriae* requires a better understanding of the concept of *Scalenostoma* and examination of larger sample of *S. perrieriae*.

In comparison to *E. pagoda*, known from Baja California (~29°N) to Costa Rica (~10°N) (Pacific coast), at depths of 3–44m (Warén, 1992), *Eulimetta atlantica* occurs in a similar latitudinal range, with a tropical distribution, from the northern (~2°N) to the central (~18°S) coast of Brazil. The bathymetric range is also very similar; *E. atlantica* was recorded slightly deeper, in depths of 22–72. A single empty worn shell collected in the Campos Basin, southeast coast of Brazil at 1,643m, clearly resembles *E. atlantica*, with the same general shape, and characteristic peripheral keels, acuminate apex and the presence of an umbilicus. Examination of the microsculpturing was not possible because of the very eroded shell surface. We list this lot (MNRJ 33491) as additional material, because this record is probably a post-mortem occurrence.

The members of *Eulimetta* have a unique combination of shape and sculpturing quite

different from other genera. Eulimidae have a wide variety of general shapes, with almost all kinds of shell morphology except for sinistrality and planispiral shells (Warén, 1984; Ponder & Lindberg, 1997). The generic allocation of *E. atlantica* is confidently made. Some groups or species in Eulimidae also have a peripheral keel, e.g. *Bacula* H. Adams & A. Adams, 1863; *Nisorangia* (de Folin, 1867) and *Scalenostoma carinata* Deshayes, 1863 but differ in aspects of the larval shell, aperture shape and sculpturing.

ACKNOWLEDGEMENTS

We would like to thank R. Absalão and C. Oliveira (IBUFRJ) for loan of material. Also for A. Veiga and B. Cordeiro for SEM operation. J. Reid for revising the English text. Referees for comments regarding this manuscript. Petrobras S.A., for making the collection and study of material from the Environmental Characterization of Campos Basin project possible. FAPERJ (Fundação Carlos Chagas Filho de Amparo à Pesquisa do Estado do Rio de Janeiro), that provided financial support through project E- 26/110.325/2014 and project E-26/110.068/2014. CNPq (Conselho Nacional de Desenvolvimento Científico e Tecnológico) for a scholarship to L.S. Souza.

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