

STENOPLAX IANSA SP. NOV. FROM BRAZIL (POLYPLACOPHORA, CHITONOIDEA)

JAIME A. JARDIM¹ & SERGIO M. ALMEIDA²

¹Museu de Zoologia da Universidade de São Paulo, CEP 04218–970, São Paulo, SP, Brazil.

²Curso de Ciências Biológicas, Centro de Ciências Biológicas e Saúde, Museu de Arqueologia e Ciências Naturais, Universidade Católica de Pernambuco, CEP 50050–900, Recife, PE, Brazil.

Abstract *Stenoplax iansa* sp. nov. is described from the coastal waters of Brazil based on morphology. The morphological distinctions along the species ontogeny are addressed and comparisons with other local congeners are provided.

Key words *Stenoplax iansa* nov. sp., *Ischnochitonidae*, Brazil, *Polyplacophora*

INTRODUCTION

The genus *Stenoplax* Dall, 1879 comprises 23 species (Marshall 2019) and is reported from the Eastern Pacific (Vancouver to Peru), Indo-Pacific (Japan to Sri-Lanka) and Western Atlantic (Florida, USA to Alagoas, Brazil; Kaas & Van Belle 1987). *Stenoplax* species are characterized by their elongate to oval body, slightly elevated lateral areas, a large and depressed valve viii, a subcentral mucro, and perinotum covered by minute to large scales (Kaas & Van Belle 1987). Only three species, *Stenoplax kempfi* (Righi, 1971), *S. purpurascens* (Adams 1845), and *S. marcusii* (Righi 1971), have been reported from Brazilian waters to date (Simone & Jardim 2009; Marshall 2015).

In the present paper, a new species of *Stenoplax* is introduced, based on four specimens from the northeastern coast (Ceará State) and two specimens from the southeastern coast (Rio de Janeiro State). We take the opportunity to provide a morphological description of juvenile and adult specimens.

MATERIAL & METHODS

Samples from Paracuru, Ceará State and Cabo de São Tomé, Rio de Janeiro State Brazil were deposited in the malacological collection of the Museu de Zoologia da Universidade de São Paulo (MZSP). Photographs were obtained using a Zeiss Discovery V8 stereomicroscope coupled with a Zeiss AxioCam MRc5 and processed with Zeiss AxioVision SE64 Rel 4.8 imaging software. Multifocal image slices were aligned and stacked

with CombineZP (Hadley 2010). All measurements were made with ImageJ (imagej.nih.gov/ij/download/). The taxonomy follows Sirenko (2006) and terminology of chiton structures follows Kaas & Van Belle (1981) and Schwabe (2010). Specimens examined under SEM were cleaned with sodium hypochlorite solution and covered with gold in the SEM Laboratory, MZSP. Distribution maps were drawn with Diva-Gis 7.5 (Hijimans *et al.* 2001). Both juvenile and “full-grown” specimens were analysed.

ABBREVIATIONS

tv	Tail valve
gr	Girdle (perinotum)
hv	Head valve
sp	Spicule

SYSTEMATICS

Family Ischnochitonidae Dall, 1889

Genus *Stenoplax* Dall, 1879

Stenoplax iansa sp. nov.
(Figs 2–26)

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Holotype (Figs 2–3) MZSP 131630, 3.42×1.13mm. Paratypes (Figs 4–9; 13–26) 3 specimens MZSP 131629, 3.95×1.5mm; 2.24×0.9mm; 3.0×1.03mm, Brazil, Ceará State, Paracuru, 3°23'46"S 39°00'21"W.

Type locality Intertidal zone, Brazil, Ceará State, Paracuru, 3°23'46"S 39°00'21"W.

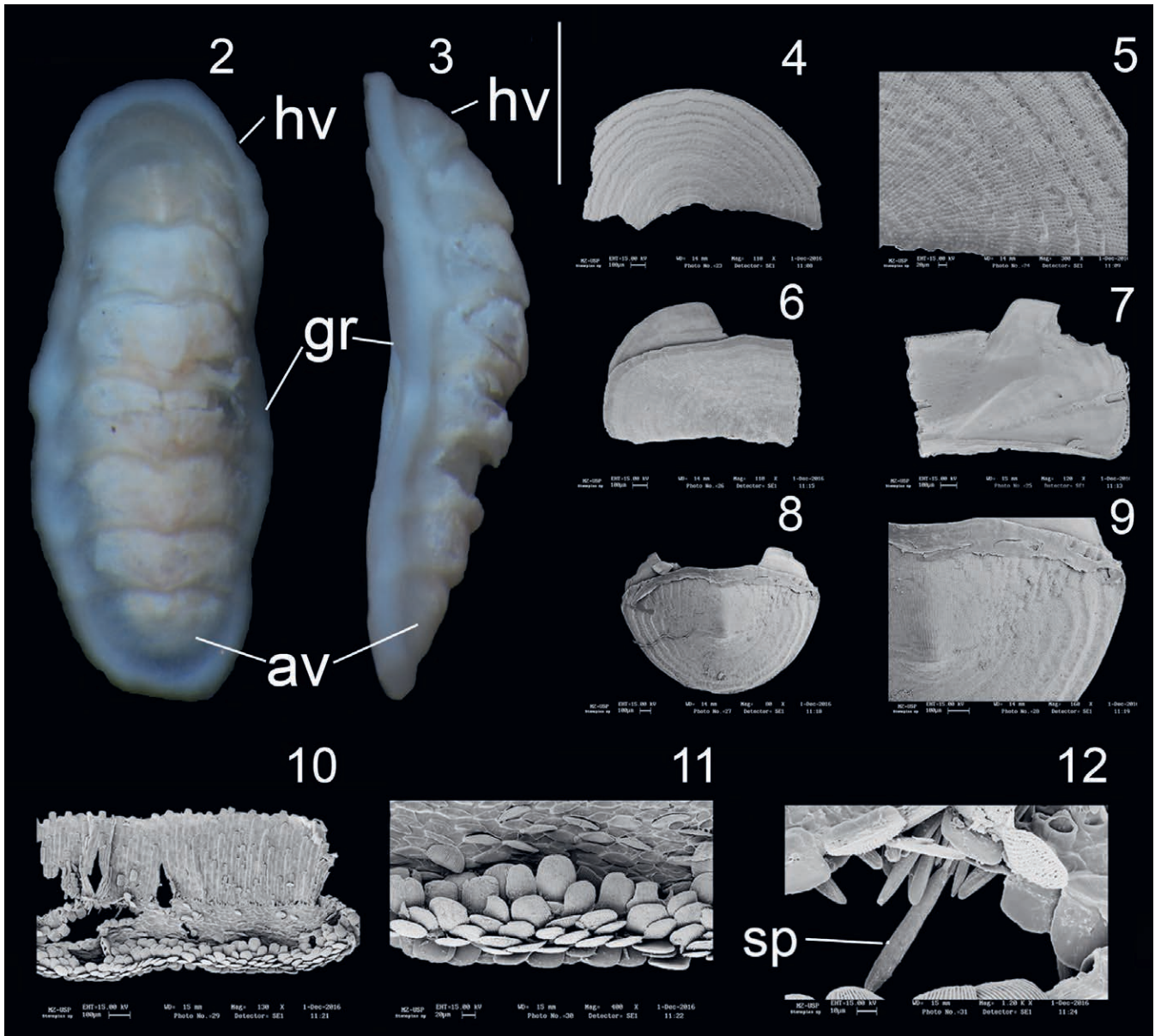


Figure 1 *Stenoplax iansa* sp. nov., distribution map: Triangle indicates the type locality; circle indicates another locality.

Additional material examined MZSP 134265, 2 specimens, (2.34×0.9mm; 3.95×1.5mm) (Figs 10–12), Brazil, Rio de Janeiro, Cabo de São Tomé, 21°59'S 40°58'W, intertidal zone.

Diagnosis Animal elongate-oval and small (to 3.95mm), high elevated ($h/w=0.88$), carinated. Tegmentum red to pink; sculptured with wavy lines on hv, lateral areas of intermediate valves and postmucronal area of tv; megal aesthetes arranged in radial lines on all valves (figs 4–5); mucro conspicuous. Mantle cream; dorsally covered by elongated scales; sculptured by longitudinal parallel ribs; margin covered by

elongated spicules that are sculptured by longitudinal ribs that diverge from base to apex and the base is half the width of the main body of the spicule; hyponotum covered by elongated spicules with rounded smooth apex. Ctenidia holobranchial, abanal, 15–18 gills per side. Radula has straight and narrow central tooth; first lateral teeth slightly concave; major lateral teeth narrow on central portion, presenting petaloid process below the tricuspidate cap; major uncinial teeth curved with concave portion at the inner side, forming a wing on upper side with truncated edge on outer side.

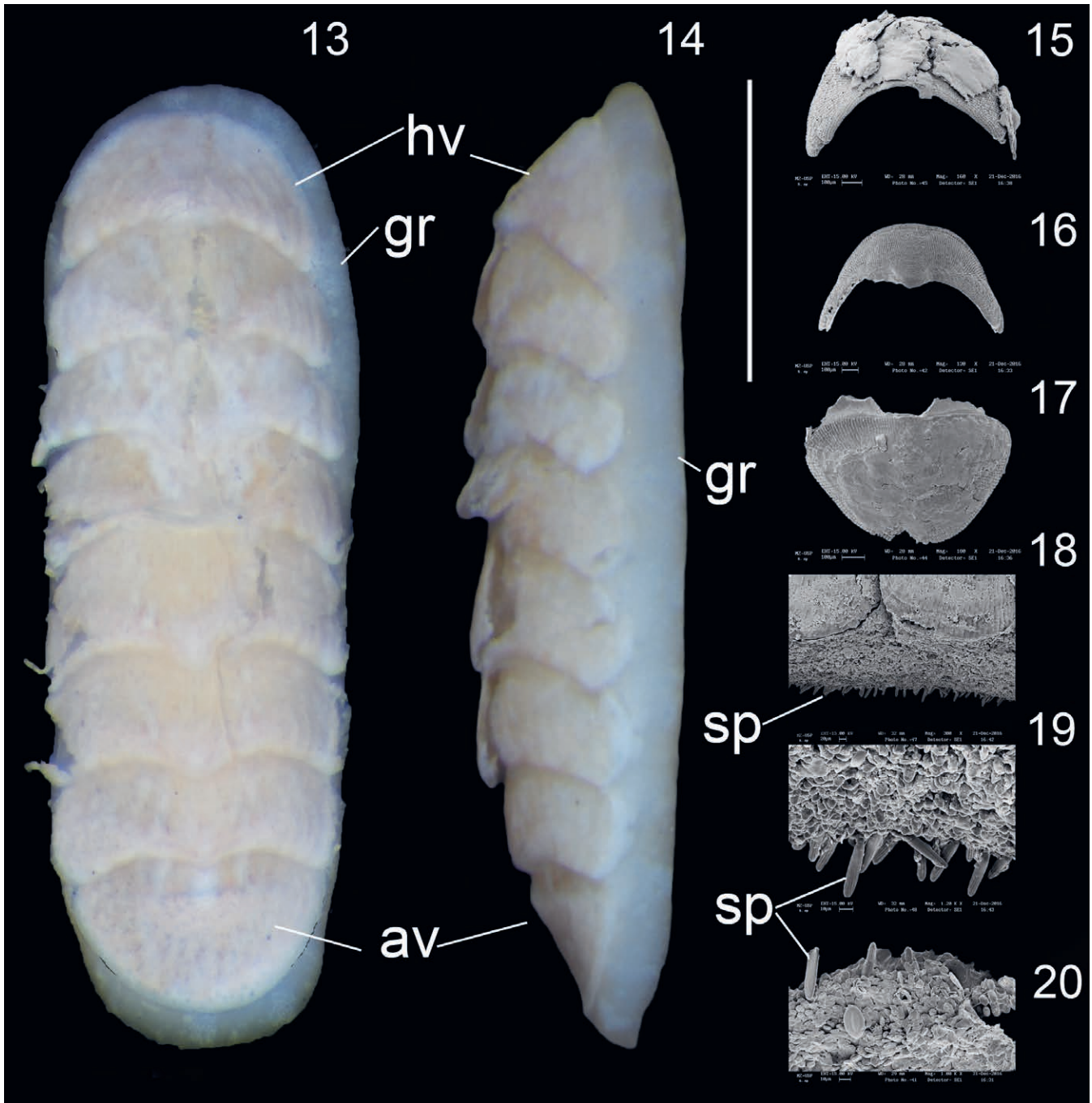


Figures 2–12 *Stenoplax iansa* sp. nov.: 2–3 Holotype (MZSP 131630 – 3.42×1.13mm), dorsal and lateral views, scale 5µm. Paratype (MZSP 131629), 4–5 hv, dorsal view, scale 100µm; 6–7 valve v, dorsal and ventral views, scale 100µm; 8–9 tv, dorsal view, 100µm. Additional material (MZSP 134265), 10 hyponotum, scale 100µm; 11 perinotum, scale 100µm; 12 marginal fringe of girdle, scale 100µm.

Description Animal elongate-oval, small (up to 3.95×1.50mm), dorsal elevation (in valve v) to 0.88; anus conspicuous.

Shell Bearing occasional random orange spots on intermediate valves, sculptured by wavy, commarginal lines; carinated, eaves spongy (Figs 4–9). Tegmentum presents conspicuous commarginal growth marks mainly on intermediate valves; hv posterior margin widely V-shaped, outline straight, not beaked; presenting numerous

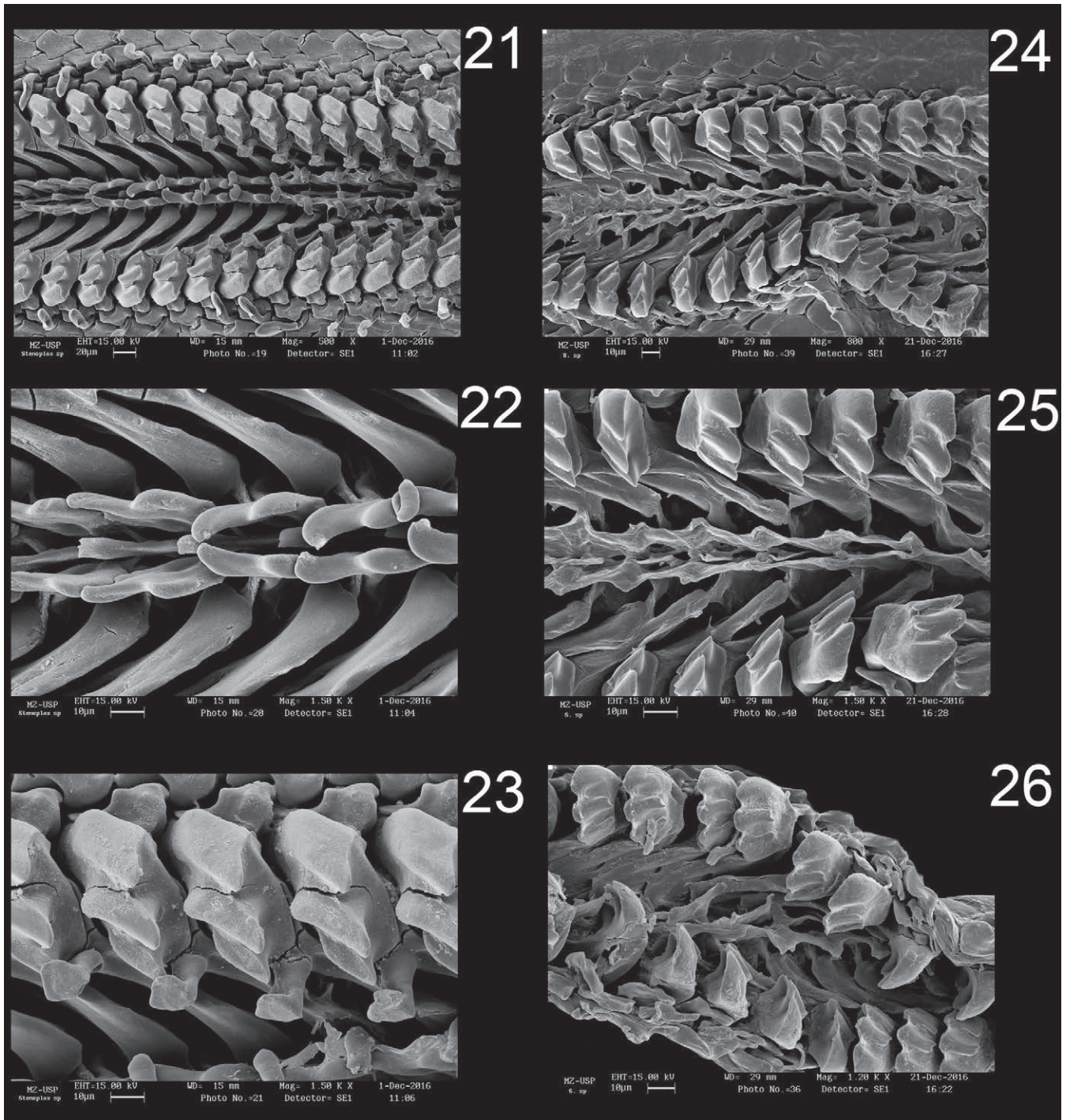
lines of megal aesthetes from apices to margin of all valves, forming radial pattern; intermediate valves rectangular, lateral areas slightly raised with slightly convex to straight side slopes; apices evident, diagonal ridge slightly visible, central area homogeneous with ornamentation similar to hv; tv rounded, antemucronal slope and postmucronal slope straight, angulated, micro conspicuous and subcentral, sculpture in postmucronal area similar to hv (Figs 2–3, 8, 13–14, 14 – tv). Articulamentum prominent, opaque white, slit



Figures 13–20 *Stenoplax iansa* sp. nov.: 13–14 Paratype (MZSP 131629 – 3.95 x1.5mm), dorsal and lateral views, scale 10 μ m; 15 hv, dorsal view, scale 100 μ m; 16 valve v, dorsal view, scale 100 μ m; 17 tv, dorsal view, scale 100 μ m; 18 perinotum, dorsal view, scale 100 μ m; 19 marginal fringe of girdle, scale 100 μ m; 20 hyponotum, scale 100 μ m.

ray present; valve ii–vii with triangular apophyses, square in tv; insertion teeth rectangular, slit formula 5/1/5 (Fig. 6). Perinotum covered by overlapping scales sculptured by 17–20 longitudinal ribs in “full-grown” shape, smooth in juvenile forms (25–45 \times 40–65 μ m); marginal fringe with obtusely pointed spicules, longitudinally fissured, lacking articulation (30–90 \times 10–15 μ m) and

ventrally covered by smooth, rectangular scales (80–120 μ m \times 30–45 μ m) (Figs 10–12, 18–20). Radula presenting 17 teeth per transverse row, central tooth straight and narrow; first lateral tooth slightly concave, bearing raised projection on dorsal surface; major lateral tooth showing contraction on median portion, tricuspid, bicuspid structure on distal portion of tooth (Fig. 21, 24).



Figures 21–26 *Stenoplax iansa* sp. nov. SEM of radulae: **21, 24** Paratype (MZSP 131629 – fig. 21–23 – 3.95 x1.5mm; fig. 24 – 2.24x0.9mm), panoramic view, scales 20µm and 10µm, respectively; **22, 25** central tooth, first lateral teeth, major lateral teeth, scales 10µm; **23, 26** major lateral teeth, scales 10µm.

Distribution Brazil, Paracuru, Ceará State, 3°23'46"S 38°21'13"W and Cabo de São Tomé, Rio de Janeiro State, 21°59'S, 40°58'W (Fig. 1).

Habitat On rocks, intertidal zone.

Derivation of name The specific name *iansa*, a noun in apposition, refers to the orixa Iansã, a deity from the Afro-Brazilian Candomblé and Umbanda religions known for wearing brightly coloured red or pink clothing.

DISCUSSION

The new species described herein clearly belongs in the genus *Stenoplax* Dall, 1879. It has an elongated body (two to three times longer than wide), slightly elevated lateral areas, a large and depressed valve viii, subcentral mucro, and perinotum covered by scales of a variable size, from minute to large, as reported by Kaas & Van Belle (1987).

Comparing *Stenoplax iansa* with *S. hernandezii* Dell' Angelo *et al.*, (2014), *S. iansa* differs by higher elevated valves, concave side slope, apices evident, postmucronal area angulated, valve viii rounded, and slit formula 5/1/5. In relation to *S. kempfi* (Righi 1971) *S. iansa* differs by higher elevated valves, lateral areas slightly elevated, diagonal ridge connecting to apex, concave side slopes, short antemucronal region, postmucronal slope angulated. Comparing with *Stenoplax marcusii*, *S. iansa* differs by intermediate valves carinated, deep grooves radially oriented, lateral areas with megal aesthetes. *Stenoplax iansa* differs to *S. purpurascens* (Adams, 1845) by its smaller size – length 3.42mm in holotype. Lastly, *S. iansa* differs from *S. floridana* (Pilsbry, 1892) by its smaller size, higher elevated valves, orange colouration, antemedian mucro.

The juvenile specimens (Figs 13–14) show fewer growth marks, especially on hv (Fig. 15), lateral areas of intermediate valves and tv (Fig. 17); sculpture of the tegmentum with com-marginal wavy lines crossed by radial deep grooves, formed by megal aesthete, from apex to margin. Adult forms show the same sculpture on the tegmentum.

Compared to large specimens, small ones shown smooth rounded to oval scales; com-marginal growth marks few visible and central teeth very narrow (Figs 24–26).

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