

Description of *Hyalina cunhai*, a new species of Marginellidae (Mollusca: Gastropoda) from the eastern seaboard of Brazil

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ABSTRACT A new species of the marginellid genus *Hyalina* is described from Brazil. The new species *Hyalina cunhai* is compared to four other western Atlantic *Hyalina* species, including *H. avenacea* Deshayes, 1844, *H. moolenbeeki* Espinosa & Ortea, 2012, *H. pallida* Linnaeus, 1758, *H. tenuilabra* Tomlin, 1917, and five western Atlantic *Volvarina* species, including *V. adrianae* Cossignani, 2006, *V. affinis* Reeve, 1865, *V. brasiliensis* Boyer, 2000, *V. frazzinii* Cossignani, 2006 and *V. lactea* Kiener, 1841. When compared to these similar species, *H. cunhai* varies from them with distinct differences in body shape, spire, lip, and body ornamentation.

KEYWORDS Marginellidae, *Hyalina*, *Hyalina cunhai*, *Volvarina*, Brazil, new species.

INTRODUCTION

Our collective understanding of the Brazilian marginellids of genera *Hyalina* and *Volvarina* continues to evolve. Previously, Bavay had done the most work in the family in beginning of the 20th century (Boyer, 2000). E.C. Rios summarized the Brazilian marginellids in 1985 (Rios, 1985). In 1995, Coover and Coover reorganized the entire group creating a framework for modern organization of marginellids (Coover & Coover, 1995). In 2000, Boyer disputed some of Rios's conclusions, revised the family, and clarified Bavay's works (Boyer, 2000). In 2006, Cognissani created the most expansive work to date cataloging world marginellids, listing 13 species of *Volvarina* and 3 species of *Hyalina* in the waters off Brazil. In the past few years, the scientific knowledge for these families has grown with several new species being named, but it is expected that many more marginellid species are still to be discovered along the thousands of kilometers of Brazilian coastline (Boyer, 2000). Despite recent discovery and identification of several new species of

Southern Atlantic and Caribbean *Hyalina*, the genus *Hyalina* remains poorly documented.

Pacific and South African marginellid demonstrate broad diversity. Many new species have been discovered and named in the past 20 years. It is expected that marginellid of the Caribbean and Western Atlantic off the coast of tropical South America will demonstrate diversity as well. There are several reasons why diversity is expected in worldwide marginellid populations. Marginellid are small, have limited locomotive ability, and do not travel expansively. This creates isolated gene pools. In addition, many marginellid are thought to reproduce with a pediveliger stage instead of a planktonic larval stage (Lussi, 2013). Like other gastropods with pediveliger stages, distribution does not occur through ocean currents. Limited physical mobility and limited reproductive mobility likely lead to many small diverse populations. It has also been hypothesized that many species have evolved to have highly specific ecological requirements (Lussi, 2013). This may further limit their ability to survive in wide geographic ranges.

Collection and identification of new species of marginellids has been slow for several reasons. With the incredible diversity of the natural world, naming initially focused on larger shells. As time has gone on and more and more large species have been identified, smaller species come into focus. Several other factors impair collection and identification, like deep water locations, danger of diving at depths due to sharks, rough seas, and difficult weather conditions. Beyond diving range, collecting at depth remains difficult due to lack of infrastructure for dredging equipment, cost of dredging, dredge imprecision, and limited dredge size (Veldsman & Veldsman, 2017).

All specimens analyzed in this study were obtained from the collection of Dr. Carlo Magenta da Cunha who obtained them from a deep water petroleum research vessel in 2016.

ABBREVIATIONS

MZUSP – Zoological Museum of Sao Paulo University

SYSTEMATICS

Family MARGINELLIDAE Fleming, 1828
Subfamily MARGINELLINAE Fleming, 1828
Genus *Hyalina*, Schumacher, 1817
Type Species: *Hyalina pallida* (Linnaeus, 1758)

Hyalina cunhai Minior, new species
(Figures 1A-L)

Description. Shell size small for genus, average size 6.4 mm, ranging 6.3 to 6.5 mm; shell shape ovate, tapering at both ends, fragile build; surface porcellaneous with fine malleations; shell opacity translucent to partially translucent; shoulder rounded, uncallused, and terminates on last body whorl; spire low, convex, with faint radial blotches on some specimens, with convex sutural ramping; aperture wider at base than near shoulder; oblique columellar plications,

numbering 3-4; lip slightly flexuous, inflected, uniformly thin; no labial dentition; background color uniform cream, light orange, or white; faint translucent striations on dorsum when viewed under lower light intensities, otherwise no pattern.

Type Material. Holotype: 6.5 x 3.3 mm. Donated to Collection MZUSP – Zoological Museum of São Paulo University. Paratypes: Paratype 1 = 6.5 x 3.3 mm, Coll. D. Minior; Paratype 2 = 6.5 x 3.3 mm, Coll. D. Minior; Paratype 3 = 6.3 x 3.1 mm, Coll. D. Minior.

Type Locality. Brazil, off Santos, São Paulo State, dredged at 250-300 meters.

Distribution. Shells have been collected off Santos, São Paulo State, Brazil. This is so far the only known locality.

Etymology. This species is named for Dr. Carlo Magenta da Cunha from whom the original specimens were obtained.

Differential Diagnosis. This species is from the deep water mesopelagic zone between 250-300 meters, which has limited its collection. The soft parts of the animal have not been studied. Accessing its anatomy and radula would further clarify its status. It superficially resembles some other endemic Brazilian deep water marginellid previously described but distinct differences can be found on close examination. Below is a differential diagnosis of the new species *Hyalina cunhai* compared to morphologically similar looking species.

- *Hyalina avenacea* Deshayes, 1844 - *H. cunhai* is more ovate with a less pronounced spire. (Figure 2A)

- *Hyalina moolenbeeki* Espinosa & Ortea, 2012 - *H. cunhai* has a more pronounced spire, larger

sutural spacing, and does not have central body banding. (Figure 2B)

- *Hyalina pallida* Linnaeus, 1758 - *H. cunhai* is more ovate and less cylindrical in structure, has less flaring of the lip toward the base, and is more consistently opaque. (Figure 2C)

- *Hyalina tenuilabra* Tomlin, 1917 - *H. cunhai* is more ovate, has a less pronounced spire, and does not have the faint banding seen in *H. tenuilabra*. (Figure 2D)

- *Volvarina adrianadiae* Cossignani, 2006 - *H. cunhai* has a longer spire, a thinner, less flexuous lip, has faint body striations, and more variability in color. In *H. cunhai*, the last body whorl ends on the body instead of the spire. (Figure 2E)

- *Volvarina affinis* Reeve, 1865 - *H. cunhai* is smaller, narrower at mid body, has a uniformly thin lip, which is not thickened at its mid-point. It does not have faint, broad body stripes as seen in *V. affinis*. (Figure 2F)

- *Volvarina brasiliana* Boyer, 2000 - *H. cunhai* has a wider body structure, has a less pronounced spire, and does not have stripes. (Figure 2G)

- *Volvarina frazzinii* Cossignani, 2006 - *H. cunhai* is smaller, has a wider body at its anterior end, and does not have as pink a coloration. In *H. cunhai*, the last body whorl ends on the body instead of the spire. (Figure 2H)

- *Volvarina lactea* Kiener, 1841 - *H. cunhai* is more opaque, has a shorter, less conical spire, larger columellar plicae, body striations, and does not have body stripes. (Figure 2I)

DISCUSSION

The new species *Hyalina cunhai* can grossly be placed within the tribe Prunini based on shell morphology. Within Prunini, the classification becomes more difficult. The genus was originally assumed to be *Volvarina*, however upon further analysis it belongs in the genus *Hyalina*.

Hyalina are in general small, non-pattered, non-aesthetically pleasing, and have been largely ignored by main stream conchologists. They are sparsely covered in the literature with the most accessible work being done by Cooverts between 1970 and 2000. Creating confusion in the taxonomy of this new species, the classification of *Volvarina* and *Hyalina* over the past 200 years demonstrates the two different genera being applied to a large spectrum of overlapping morphologies. It seems that naming of Prunini in the 1800's and early 1900's occurred before in-depth malacological understanding of their differences, likely leading to misclassifications.

Based on shell morphology *Volvarina* are grossly more narrow and cylindrical, have a more pronounced spire, a thicker shell, 4 to 5 columellar plicae, thickening of the mid aspect of the lip and a slight inflection of the midpoint of the lip. In contrast, *Hyalina* have a thinner shell, are more ovate, have a reduced spire, and in general, fewer columellar plicae (usually 2-3). Further differentiation becomes more difficult without analysis of the animal. More accurate differentiation would require examination of the soft tissue parts. *Volvarina* often have a pustulose mantle and the type 6 radula common in Prunini. *Hyalina* have an esophageal caecum like *Volvarina*, but demonstrate loss of the radula, buccal mass, and buccal pouch.

With gross analysis of shell morphologies in the modern literature of the shells of both genera many *Volvarina* could be *Hyalina*, and some *Hyalina* could be *Volvarina*. Taxonomy in these genera need revision. It is likely that with further analysis upon revision, the more narrow, thicker, spired shells will be placed within the genus *Volvarina* and the thinner, more ovate, low spired shells will be placed in the genus *Hyalina*. Based on this analysis the new species *Hyalina cunhai* is placed within the genus *Hyalina*.

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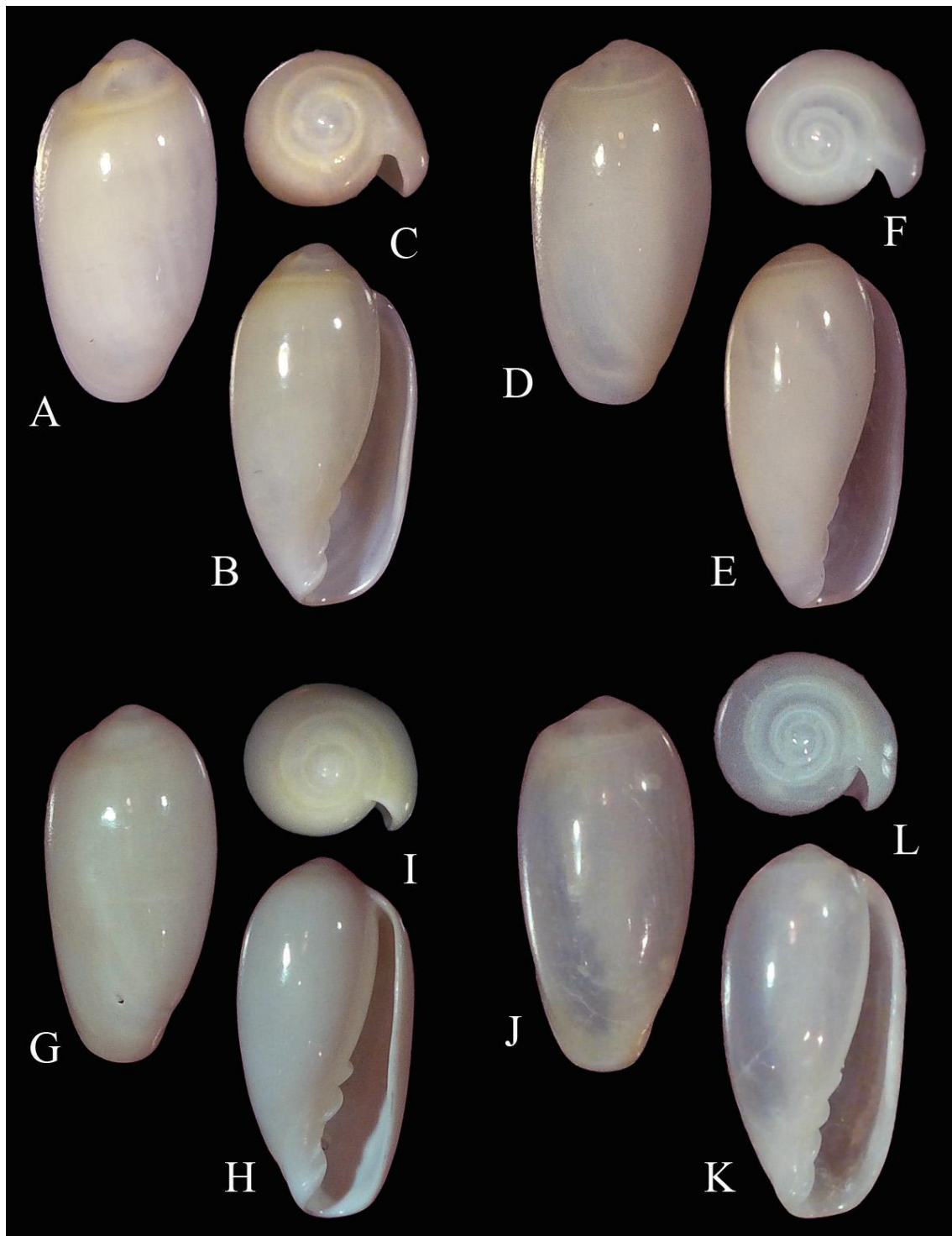


Figure 1. *Hyalina cunhai* new species. **A-C** = Holotype, 6.5 mm in length (MZUSP – Zoological Museum of São Paulo University); **D-F** = Paratype 1, 6.5 mm in length (Coll. D. Minior); **G-I** = Paratype 2, 6.3 mm in length (Coll. D. Minior); **J-L** = Paratype 3, 6.3 mm in length (Coll. D. Minior).



Figure 2. Comparison species in the genera *Hyalina* and *Volvarina*. **A**= *Hyalina avenacea* Deshayes, 1844, 8.3 mm in length (image from Femorale); **B**= *Hyalina moolenbeeki* Espinosa & Ortea, 2012, 13.7 mm in length (image from Femorale); **C**= *Hyalina pallida* Linnaeus, 1758, 9.0 mm in length (image from Femorale); **D**= *Hyalina tenuilabra* Tomlin, 1917, 12.8 mm in length (image from Femorale); **E**= *Volvarina adrianadiae* Cossignani, 2006, holotype 6.5 mm in length (image from *Malacologia Mostra Mondiale* 50:15-17, at p. 16); **F**= *Volvarina affinis* Reeve, 1865, 7.1mm in length (image from Femorale); **G**= *Volvarina brasiliana* Boyer, 2000, 7.7 mm in length (image from Femorale); **H**= *Volvarina frazzinii* Cossignani, 2006, 7.0 mm in length (image from Femorale); **I**= *Volvarina lactea* Kiener, 1841, 10.5 mm in length (image from Femorale).