

## A new species of the genus *Lyocyclus* (Gastropoda: Caenogastropoda) from deep water of Cuba

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**Key words:** GASTROPODA, LYOCYCLIDAE, *Lyocyclus*, Cuba.

**Abstract:** A new species of the genus *Lyocyclus* Thiele, 1925 from deep waters of the north of Cuba is described and compared with *Lyocyclus africanuedae* Rubio & Rolán, 2018, *Lyocyclus guadeloupensis* Rubio & Rolán, 2018, *Lyocyclus lluviamonzoae* Rubio & Rolán, 2018 and *Lyocyclus mexicanus* Rubio & Rolán, 2018 which are the only previously known Caribbean species and with *Lyocyclus pernambucensis* (R.B. Watson, 1886), the only previously known species from the South Atlantic.

**Introduction:** R. B. Watson (1886: 137) described *Bifrontia? pernambucensis* from off Pernambuco, Brazil and although with doubts, he placed it in the genus *Bifrontia* Deshayes, 1832 (= *Omalaxis* Deshayes, 1830). He decided not to create a new genus until more was known about the shell and the animal. Thiele (1925: 82) shared Watson's doubts and situates *Bifrontia? pernambucensis* in the new family **Lyocyclidae**, being the only known species of *Lyocyclus* living in the South Atlantic. Rubio & Rolán (2018) described 4 new species of *Lyocyclus* (*L. africanuedae*, *L. guadeloupensis*, *L. lluviamonzoae* and *L. mexicanus*) from deep waters in the Caribbean. The occurrence of new species of *Lyocyclus* in the deep waters of the island of Guadalupe and the Gulf of Mexico expanded the geographical distribution of the genus. The occurrence of a new species of *Lyocyclus* in the deep waters of the island of Cuba confirms a wider and more homogeneous distribution of the genus in deep waters of the Caribbean.

Between 10 and 25 May 2017, an expedition to northern Cuban waters, between La Habana Bay and San Antonio Cap, was organised. This expedition, which used the ship *Weatherbird II*, resulted from a cooperation between the University of South Florida, University of Texas and

Eckerd College, the Centro de Investigaciones Marinas of La Habana University and the Centro de Estudios Ambientales de Cienfuegos of the Ministerio de Ciencia, Tecnología y Medio Ambiente. Part of the material collected during this expedition is currently being studied and some papers have already been published. In the present work, a new species of *Lyocyclus* is described.

### Abbreviations:

- ANC:** Acuario Nacional, La Habana, Cuba  
**CEAC:** Centro de Estudios Ambientales of Cienfuegos  
**CFG:** Collection Raúl Fernández Garcés, Cuba  
**CIM-UH:** Centro de Investigaciones Marinas, University of La Habana, Cuba  
**MHNS:** Museo de Historia Natural, Santiago de Compostela  
**MNCN:** Museo Nacional de Ciencias Naturales, Madrid  
**USF:** University of South Florida

### Systematic account:

Order unassigned **Caenogastropoda**

Family **Lyocyclidae** Thiele, 1925

Description in THIELE (1929: 240): “*Schale klein, farblos, in einer Ebene gewunden, die Embryonalschale bildet 1-1/2 Windungen, die folgenden, wenig zahl-reichen Windungen sind mehr oder weniger losgelöst, meistens mit Querfalten, in frischem Zustande vermutlich mit Börstchen besetzt. Mündung meistens oben und unten eckig, zuweilen rundlich. Tier unbekannt*”.

Genus ***Lyocyclus*** Thiele, 1925

Type species by original designation: *Lyocyclus solutus* Thiele, 1925. Recent. Zanzibar.

**Remarks:** Thiele (1925) described *Lyocyclus* to group five species from the Indian Ocean and he erected a new family, **Lyocyclidae**, and grouped it with **Solariidae** (**Architectonicidae**); later Thiele (1929) transferred it to **Trichotropidae**. Warén (1989) placed it in **Vanikoridae** after having examined soft parts and the radula from a species from New Caledonia. Bouchet & Rocroi (2005: 253), following the opinion of Ponder & Warén (1988), Warén (1989) and Ponder (1998), placed **Lyocyclidae** in Vanikoroidea Gray, 1840, as a synonym of **Vanikoridae**. Takano & Kano (2014), in their molecular phylogeny, concluded that *Lyocyclus*, a genus previously assigned to **Vanikoridae** or to its own family **Lyocyclidae**, was found to be distant from the type genus *Vanikoro* and formed a moderately supported clade with *Macrocypraea* Schilder, 1930 (**Cypraeidae**). Consequently, Bouchet et al. (2017: 346, 473) excluded **Lyocyclidae** from Vanikoroidea, because in the molecular phylogeny of Takano & Kano (2014) it is sister to the Cypraeoidea.

*Lyocyclus roselyae* sp. nov.

Fig. 1A-F

**Type material:** Holotype (Fig. 1A-B) in ANC (ANC.06.3.166)

**Material examined:** Only the type material. A second shell was lost.

**Type locality:** North of Cuba, Stn SL37-500, 22°11.094'N, 84°52.245'W, 1209 m.

**Description:** Shell very small (< 2.6 mm), fragile, discoidal, with an almost planispiral spire formed by 3.3 whorls, separated by a deep, wide suture. The protoconch has 1.5 whorls and a size of 630 µm in diameter and slightly protrudes over the next whorls. It begins with a rounded, mammillated nucleus, which measures 260 µm in diameter and has its surface finely rough; from the torsion zone, spirally aligned microtubercles are observed; mainly in the sutural zone. The protoconch has no raised cord and its margin is not opened to the outside. The teleoconch has 1.8 whorls and its development is planispiral, except for the last quarter of the whorl, where it inclines abapically. The coiling of the teleoconch is slightly disjunct, the whorls are mainly connected through the axial ribs, which continue all around the whorls; the last quarter of the whorl is disconnected from the previous whorl. Ornamentation formed by oblique axial lamellae, marked growth lines and spiral cords. The lamellae are erect, equidistant and obliquely surround the teleoconch; their margin is smooth; 10 lamellae are observed in the first whorl and 12 in the last. There are

marked growth lines between the axial lamellae. The spiral cords are not very prominent, they are only located in the periphery of the teleoconch and do not modify the margin of the outer lip. Aperture oval, peristome entire. The outer lip is thin, with a smooth outer margin. The umbilicus includes the whole shell and exposes all the whorls.

**Dimensions:** the holotype is 2.6 mm in diameter and 1.17 mm in height (it is the apertural height).

Animal, radula and operculum unknown.

**Distribution and bathymetric range:** Only known from the type locality, dredged at 1209 m.

**Remarks:** *Lyocyclus roselyae* sp. nov. is characterised by having spirally aligned microtubercles in the sutural zone of the protoconch and because it protrudes over the remaining whorls; and also by the presence of very soft spiral cords on the periphery of the teleoconch.

The Caribbean species *L. mexicanus*, *L. lluviamonsoae*, *L. guadeloupensis* and *L. africanuedae* all differ by having a raised cord, which forms an angle and disappears next to the margin of the protoconch.

The protoconch of *L. pernambucensis* also protrudes over remaining whorls, but this species differs because it has a higher number of axial lamellae and more prominent spiral cords.

**Etymology:** The species' name is after Rosely Peraza Escarrá, Master in marine biology, Researcher of the Centro de Investigaciones Marinas of the La Habana University (CIM-UH).

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**Plate:**

**A-G:** *Lyocyclus roselyae* sp. nov.

**A-B:** holotype, 2.6 mm in diameter, North of Cuba, Stn SL37-500, 22°11.094'N, 84°52.245'W, 1209 m (ANC).

**C-E:** optical photographs of a lost shell.

**F-G:** protoconch and detail of the nucleus of the holotype.

