

New species of *Cyclodontina* from Bahia, Brazil (Gastropoda, Pulmonata, Odontostomidae)

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ABSTRACT. A new species of pulmonate snail was recently collected in a small forest fragment in the city of Bom Jesus da Lapa, Bahia state, Brazil. Bahia is known for a high diversity of land snails and Bom Jesus da Lapa is an interesting locality, since it is close to the interface between two major Brazilian biomes: Cerrado and Caatinga. The new species is described as *Cyclodontina tapuia* sp. nov. and can be easily identified by its brown shell, conical spire, convex whorls, a sculpture comprised of strong ribs, and an aperture with four barriers: a median parietal tooth, a median palatal tooth, a median basal tooth and a strong columellar lamella. This discovery is also a reminder of how little the Brazilian continental molluscan fauna is known and of the urgency in studying and preserving the rich (though usually overlooked) fauna of the Caatinga.

KEYWORDS. Bom Jesus da Lapa, Caatinga, Cerrado, *Cyclodontina tapuia* sp. nov., Orthalicoidea.

RESUMO. Nova espécie de *Cyclodontina* da Bahia, Brasil (Gastropoda, Pulmonata, Odontostomidae). Uma nova espécie de gastrópode pulmonado foi coletada recentemente em um pequeno fragmento de mata em Bom Jesus da Lapa, Bahia, Brasil. O estado da Bahia é conhecido por sua alta diversidade de moluscos terrestres e Bom Jesus da Lapa é uma localidade particularmente interessante, pois localiza-se na interface entre os biomas Cerrado e Caatinga. A nova espécie é descrita como *Cyclodontina tapuia* sp. nov. e pode ser facilmente identificada por sua concha de cor marrom, espira cônica, voltas convexas, escultura composta por fortes costelas e uma abertura com quatro barreiras: um dente parietal, um dente palatal, um dente basal e uma forte lamela columelar. A presente descoberta atua como um lembrete de quão pouco é conhecida a malacofauna continental brasileira e também da urgência em estudar e preservar a rica (mas comumente negligenciada) fauna da Caatinga.

PALAVRAS-CHAVE. Bom Jesus da Lapa, Caatinga, Cerrado, *Cyclodontina tapuia* sp. nov., Orthalicoidea.

The semi-arid domains of the Caatinga were usually thought of as impoverished in terms of biodiversity, but they are simply understudied; recent works are revealing an astounding diversity of species across all main terrestrial and freshwater taxa, as well as many endemic species (TABARELLI & SILVA, 2002). SIMONE (2006) already showed a wide variety of land snails for the region. However, there are proportionally few works on these animals and knowledge remains utterly incomplete; they are not even cited in the most recent accounts of the Caatinga's proposed biodiversity conservation measures (e.g., SILVA *et al.*, 2003). The more arid regions are often considered an adverse place for land snails, but it seems that the Caatinga may still hide many discoveries.

The shell dealer José Coltro Jr. and his team recovered some fresh land snail shells from the leaf litter of a forest fragment in the city of Bom Jesus da Lapa, eastern Bahia state, Brazil (Fig. 1), and donated them to the malacological collection of the Museu de Zoologia da Universidade de São Paulo (MZSP; São Paulo, Brazil). The material is described herein in the genus *Cyclodontina* Albers, 1850. The following abbreviations are used throughout the text: Shell measurements: H, shell length; D, shell greatest width; S, spire (excluding aperture); S', spire (excluding body whorl); h, aperture height; d, aperture width. Institutional: ANSP (Academy of Natural Sciences of Philadelphia, Philadelphia, USA); MCZ (Museum of

Comparative Zoology, Cambridge, USA); MZSP (Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil); NMSW (National Museum Wales, Cardiff, U. K.); USNM (National Museum of Natural History, Smithsonian Institution, Washington D. C., USA).

SYSTEMATICS

Cyclodontina tapuia sp. nov.

(Figs 2–7)

Type material. Holotype: MZSP 109684 (A. Bianchi col., xii/2012; Figs. 2–5); paratypes: MZSP 109685 (2 juveniles, from type locality; A. Bianchi col., xii/2012; Figs. 6–7).

Type locality. BRAZIL, Bahia: Bom Jesus da Lapa, forest fragment on the vicinities of Bom Jesus da Lapa Hill (13°15'36"S, 43°25'20"W; Fig. 1).

Etymology. Reference to the Tapuias, the region's native inhabitants.

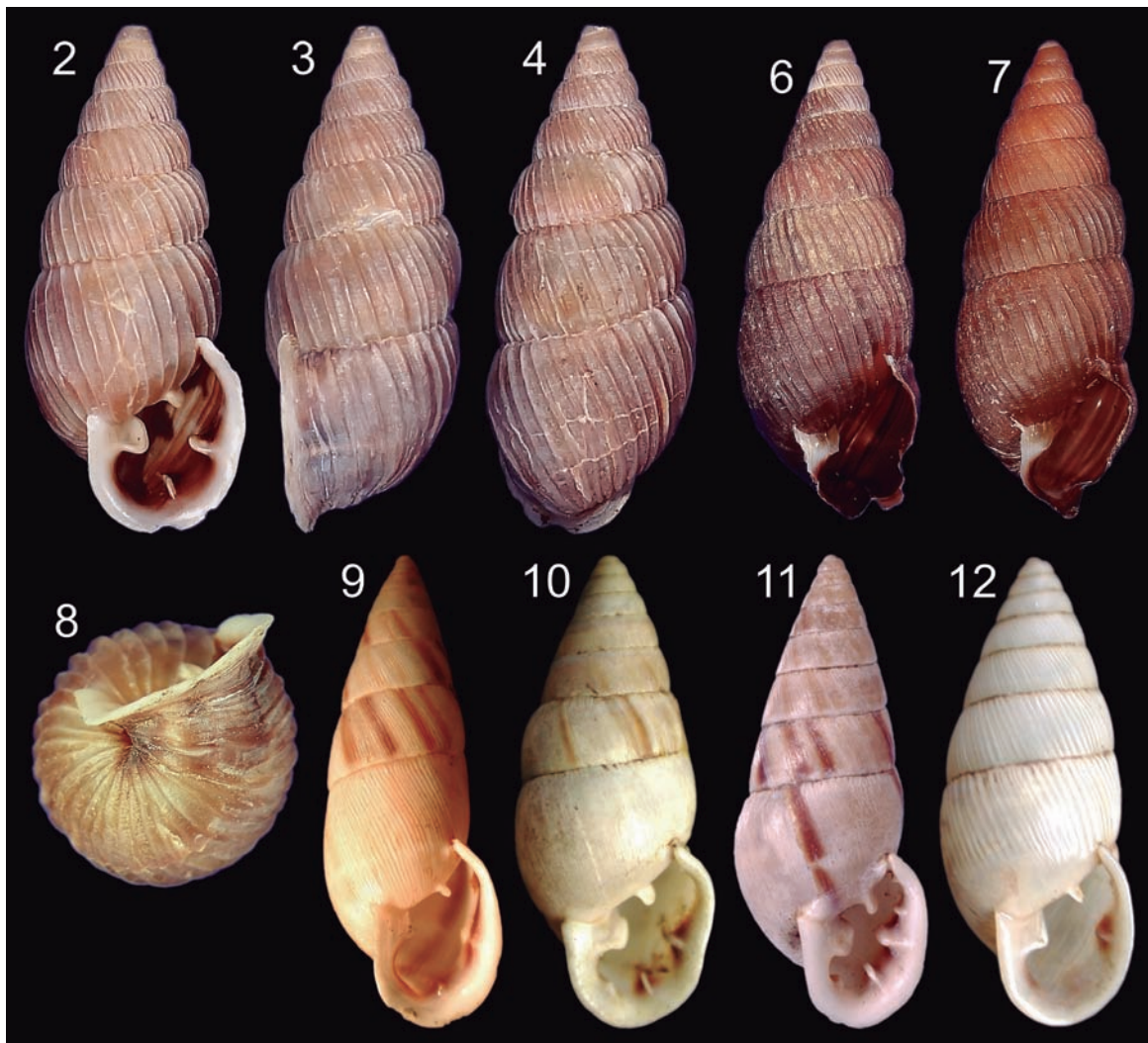
Distribution. Known only from the type locality.

Habitat. Caatinga forests.

Diagnosis. Shell brown, conical, sculptured by strong ribs. Greatest width on body whorl. Whorls profile convex. Aperture with four barriers: a median parietal tooth, a median palatal tooth, a median basal tooth and a strong columellar lamella.



Fig. 1. Map showing the type locality: the municipality of Bom Jesus da Lapa, in Bahia state. Abbreviations of neighboring states: MA, Maranhão; PI, Piauí; PE, Pernambuco; AL, Alagoas; SE, Sergipe; TO, Tocantins; GO, Goiás; MG, Minas Gerais; ES, Espírito Santo.



Figs 2-12. Species of *Cyclodontina* spp. *Cyclodontina tapuia* sp. nov.: Figs 2-5, holotype (MZSP 109684; H, 22.9 mm) in apertural, lateral, dorsal and umbilical views, respectively; Fig. 6, paratype #1, juvenile (MZSP 109685; H, 26.3 mm); Fig. 7, paratype #2, juvenile (MZSP 109685; H, 26.9 mm). Fig. 8, *C. chaseae* Marshall, 1926, holotype (USNM 3023; H, 27 mm). Fig. 9, *C. fasciata* (Potiez & Michaud, 1832) (ANSP 78018; H, 20 mm). Fig. 10, *C. inflata* (Wagner, 1827) (NMSW; H, 26 mm). Fig. 11, *C. maranguapensis* (Baker, 1913), holotype (ANSP 109323; H, 17 mm). Fig. 12, *C. scabrella* (Anthony in Dohrn, 1882), syntype (MZC 26233; H, 22 mm).

Description. Shell medium-sized (~25 mm), conical; greatest width on body whorl; penultimate whorl sometimes as wide as body whorl; width ~2/5 shell length. Shell color light to dark brown. Peristome and apertural barriers white. Spire angle 35–40°. Protoconch (~2 whorls) rounded, sculpture reticulated, with axial striae slightly stronger than spiral striae; transition to teleoconch unclear. Teleoconch sculptured by strong prosocline parallel ribs; distance between ribs 3 to 4 times rib width. Whorl profile convex. Suture well-marked, deep, almost perpendicular to columellar axis. Aperture oval, orthocone, with four distinctive apertural barriers: median parietal tooth, median palatal tooth, median basal tooth and strong columellar lamella. Parietal and basal teeth about same size, slightly smaller than palatal tooth. Aperture ~1/3 shell length, ~2/3 shell width. Peristome greatly reflexed. Body whorl with two shallow sulci preceding aperture, related to basal and palatal teeth. Body whorl almost 1/2 shell length. Umbilicus narrow.

Measurements (in mm). Holotype: 8 whorls; H, 22.9; D, 9.8; S, 13.9; S', 10.8; h, 8.4; d, 6.4. Paratype #1 (juvenile): 8½ whorls; H, 26.3; D, 9.8; S, 17.6; S', 14.0. Paratype #2 (juvenile): 8 whorls; H, 26.9; D, 9.9; S, 17.9; S', 13.7.

DISCUSSION

Cyclodontina is an endemic South American genus, occurring in Brazil, Paraguay, Uruguay and northern Argentina (SCHILEYKO, 1999; SIMONE, 2006), but being especially diverse in central and northeastern Brazil, in the semi-arid domains of the Cerrado and Caatinga biomes (SIMONE, 2006). None of the conchological features of *Cyclodontina tapuia* sp. nov. is exclusive when compared to its congeners, but the set of diagnostic features makes the species readily identifiable. The species which share with *C. tapuia* the conical shell profile are (occurrences according to SIMONE, 2006): *C. chaseae* Marshall, 1926, from Alagoas and Bahia states; *C. fasciata* (Potiez & Michaud, 1832), from Ceará, Rio Grande do Norte and Bahia states; *C. inflata* (Wagner, 1827), which occurs from northern Brazil to Uruguay; *C. maranguapensis* (Baker, 1913), from Ceará state; and *C. scabrella* (Anthony in Dohrn, 1882), from Paraíba and São Paulo states. *Cyclodontina tapuia* sp. nov. differs from *C. chaseae* (Fig. 8) by its smaller size, more convex whorls, and stronger ribs and apertural barriers. It differs from *C. fasciata* (Fig. 9) by the presence of ribs, more convex whorls, a more rounded aperture, the lack of a second basal tooth, and the positioning of the columellar lamella (closer to the parietal region). It differs from *C. inflata* (Fig. 10) by its more convex whorls, the presence of ribs, weaker and fewer apertural barriers and the lack of the channel-like structures on the borders of the aperture's parietal region. Finally, the remaining two species, *C. maranguapensis* and *C. scabrella*, are the ones that most closely resemble *C. tapuia*. Nevertheless, diagnosing *C. tapuia* sp. nov. remains rather simple: in comparison with *C.*

maranguapensis (Fig. 11), *C. tapuia* sp. nov. is larger, has more (basal tooth present) and stronger apertural barriers and more convex whorls, with a very distinct geographic distribution; *C. tapuia* sp. nov. differs from *C. scabrella* (Fig. 12) by being wider and very conical (*C. scabrella* is more fusiform), having fewer apertural barriers, a more dorsally positioned columellar lamella, thinner and more spaced ribs, a much wider aperture, and by lacking the channel-like structures on the borders of the aperture's parietal region.

Bom Jesus da Lapa, the city where *Cyclodontina tapuia* sp. nov. was discovered, is located in eastern Bahia state (Fig. 1), on the banks of the São Francisco River, and is very interesting by being part of the Caatinga biome, but very close to the interface with the Cerrado biome. Vegetation is predominantly hypoxerophytic, but marked by stretches of deciduous forests (SÁ *et al.*, 2003). The climate is hot and dry (mean temperature 23.7°C, max. 30.5°C, min. 19.8°C), rain is extremely seasonal and irregular and the region is considered having a medium to high risk of drought (IBGE, 2014). It is common for shells of more arid places to be sturdier, with strong ribs and large apertural barriers (GOODFRIEND, 1986). These features are found in *C. tapuia* and it should be noticed that the region of Bom Jesus da Lapa is rich in limestone, which is an attractive (or even requisite) for snails with sturdy shells. Moreover, strong apertural barriers, usually thought of as protection from predators, may serve as a protection against desiccation in more arid climates, by reducing the area of evaporation (GITTEBERGER, 1996; POKRYSZKO, 1997). Judging by family's richness in the Brazilian semi-arid regions (SIMONE, 2006), the odontostomids' typical apertural barriers could in fact be presently more related to the climate rather than to predation.

As previously stated, continental molluscs are not taken into account in environmental matters regarding the Caatinga, which is very troubling, since circa 20% of this environment is considered degraded (SÁ *et al.*, 2003). A proper knowledge of the species present in the Caatinga, their distributions and degree of endemism are of utmost importance for future conservation efforts, since type localities and areas with many endemic species have priority according to the Brazilian law.

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