

# TAXONOMICAL STUDY ON A SAMPLE OF LAND SNAILS FROM SOUTHEASTERN TOCANTINS STATE, BRAZIL, WITH DESCRIPTION OF A NEW SPECIES

RODRIGO B. SALVADOR<sup>1,2</sup>, DANIEL C. CAVALLARI<sup>3</sup> & LUIZ R. L. SIMONE<sup>3</sup>

<sup>1</sup>Staatliches Museum für Naturkunde Stuttgart. Stuttgart, Germany

<sup>2</sup>Mathematisch-Naturwissenschaftliche Fakultät, Eberhard Karls Universität Tübingen. Tübingen, Germany

<sup>3</sup>Museu de Zoologia da Universidade de São Paulo. São Paulo, SP, Brazil

*Abstract* A sample of land snails, mainly pulmonates, was recently collected in southeastern Tocantins state, Brazil, close to the border with Bahia state. The following species were found in the material, all of them are reported for the first time from Tocantins: *Helicina schereri* (Helicinidae); *Solaropsis fairchildi* and *Solaropsis rosarium* (Camaenidae); *Anostoma rossi*, *Cyclodontina cf. gemellata* and *Cyclodontina sectilabris* (Odontostomidae); *Drymaeus poecilus* and *Naesiotus carlucioi* (Bulimulidae); *Streptaxis luetzelburgi* (Streptaxidae); *Megalobulimus conicus* (Strophocheilidae); *Beckianum cf. beckianum* (Subulinidae). Additionally, *Drymaeus dakryodes* sp. nov. is formally described herein. The new records and species addressed here constitute important findings, helping to fill distributional gaps and improving the knowledge of the local molluscan fauna. This is an essential step for future conservation efforts.

*Key words* Cerrado, *Drymaeus dakryodes* sp. nov., Gastropoda, Pulmonata, Taguatinga.

## INTRODUCTION

The Cerrado is the second largest biome in Brazil, harbouring an astounding diversity of species across almost all the main terrestrial and freshwater taxa, usually with a high degree of endemism (Ab'Saber, 1977; Klink & Machado, 2005). Despite being considered a biodiversity hotspot for conservation efforts, the Cerrado still attracts much less attention than, for instance, the Amazon Forest. As such, only a tiny fraction of the Cerrado's area is currently under protection (Klink & Machado, 2005). Land and freshwater snails, arguably the animals most threatened with extinction in almost all environments (Lydeard *et al.*, 2004; Régnier *et al.*, 2008), are never accounted for in Cerrado biodiversity conservation plans and policies (*e.g.*, Dias, 1992; Klink & Machado, 2005). The catalog of Simone (2006) shows a wide variety of land snails from Cerrado regions, but there are still proportionally few works on these animals and knowledge on them remains scarce. Judging by the complex nature of the Cerrado biome and the distributional pattern of its flora (Ratter *et al.*, 1997), it is reasonable to expect that it still hides many discoveries regarding land snails, possibly including a wealth of endemic species, as seen for other taxa such as insects and amphibians (Klink & Machado, 2005).

A recent expedition (June–August/2013) by shell dealer José Coltro Jr. and his team to the Cerrado domain of southeastern Tocantins state has brought to our attention interesting local land snail samples. Part of this material was donated to the collection of the Museu de Zoologia da Universidade de São Paulo (MZSP, São Paulo, Brazil) and is studied here. Tocantins was a part of Goiás state until 1988–89. Consequently, in most cases it is hard to know whether the previous known species records belong to the current Goiás or to the region that is now Tocantins. Even when this is known, Tocantins state still shows a startlingly low amount of records of land snail species (*e.g.*, Simone, 2006). The present work presents a formal description of a new species and reports the occurrence of other eleven, all of which are new records for Tocantins.

## MATERIAL AND METHODS

The collection locality for all except two species is found to the northeast of the city of Taguatinga (12°21'54"S 46°21'39"W, ~870m of elevation; along the road BR-242), in southeastern Tocantins state, close to the border with Bahia state. This locality is part of the Serra Geral region, which is considered insufficiently sampled even for "high-profile" animals such as birds (Rego *et al.*, 2011). The vegetation of the region is the deciduous

Cerrado (*stricto sensu*) forest and the climate is dry to semi-humid (Secretaria do Planejamento e Meio Ambiente, 2003). The area has scattered limestone outcrops, which could be attractive to land snails. The second collection locality is to the north of Taguatinga, along the state road TO-040; unfortunately, the collectors could not provide precise coordinates.

The specimens studied herein are all empty shells, almost exclusively of stylommatophoran pulmonates, with the exception of one neritimorph species. The list of examined material can be found under each species entry. Measurements were made with a digital caliper or with the aid of the Zeiss Axiovision SE64 Rel 4.8 imaging software. Shell dimensions abbreviations: H=shell length; D=shell greatest width; h=aperture height; d=aperture width. Identification was based on the work of Simone (2006), the original descriptions and additional material are housed in the collection of the MZSP.

#### SYSTEMATICS

Neritimorpha  
Family Helicinidae  
Genus *Helicina* Lamarck, 1799

*Helicina schereri* Baker, 1913  
(Figs 1–3)

*Helicina schereri* Baker, 1913: 625 (pl. 21, figs 1–2); Morretes, 1949: 64; Jaekel, 1952: 5; Salgado & Coelho, 2003: 152; Simone, 2006: 40 (fig. 28).

*Alcaldia (Alcaldia) schereri*: Haas, 1939: 264.

*Type locality* Ceará–Mirim, Rio Grande do Norte state, Brazil.

*Material analyzed* Brazil. Tocantins; Taguatinga, 12°21'54"S 46°21'39"W, MZSP 114879 (16 sh; Alex Bianchi col., viii/2013).

*Measurements* (in mm; n=10): H=3.5±0.2 (max 3.8, min 3.2); D=4.3±0.2 (max 4.6, min 4.1); h=1.8±0.1 (max 1.6, min 1.0); d=2.3±0.1 (max 2.5, min 2.2).

*Remarks* This species is known from the Brazilian states of Ceará, Rio Grande do Norte and Paraíba (Simone, 2006). The present record extends its range to the south and west.

Pulmonata  
Stylommatophora  
Family Camaenidae

Genus *Solaropsis* Beck, 1837

*Solaropsis fairchildi* Bequaert & Clench, 1938  
(Figs 4–6)

*Solaropsis gibboni fairchildi* Bequaert & Clench, 1938: 115 (pl. 9, figs 6–7); Morretes, 1949: 164; Tillier, 1980: 115 (in syn. of *Solaropsis undata* Lightfoot, 1786).

*Solaropsis gibboni fairchildi* [sic]: Oliveira *et al.*, 1981: 361.

*Solaropsis fairchildi*: Salgado & Coelho, 2003: 172; Simone, 2006: 240 (fig. 922).

*Type locality* Anápolis, Goiás state, Brazil.

*Material analyzed* Brazil. Tocantins; Taguatinga, 12°21'54"S 46°21'39"W, MZSP 114872 (6 sh; Alex Bianchi col., viii/2013).

*Measurements* (in mm; n=5) H=25.3±0.9 (max 26.1, min 23.9); D=43.4±1.6 (max 45.5, min 41.6); h=19.1±0.6 (max 19.8, min 18.4); d=24.4±0.9 (max 25.3, min 23.5).

*Remarks* This species is known from the Brazilian states of Goiás and Minas Gerais (Simone, 2006) and thus the present record slightly extends its range to the north. Some morphological variation was observed in the present specimens and are worthy of further notice: firstly, in some specimens the umbilical area is almost completely open (Fig. 6), while in others it can be up to 90% covered by the peristome; secondly, the overall color pattern is somewhat constant, but the basal dotted lines and stripes may be scarcer or even absent in some specimens.

*Solaropsis rosarium* (Pfeiffer, 1849)  
(Figs 7–9)

*Helix rosarium* Pfeiffer, 1849: 131; Pfeiffer, 1853: 247; Reeve, 1954: pl. 103, fig. 569.

*Helix (Solaropsis) rosarium*: Pilsbry, 1889: 188 (pl. 60, figs 13–15; pl. 61, figs 6–10).

*Solaropsis rosarium*: Ancey, 1897: 5; Vernhout, 1914: 8; Pilsbry, 1933: 68; Salgado & Coelho, 2003: 174.

*Psadara rosarium* [sic]: Ihering, 1900: 549; Morretes, 1949: 164.



**Figures 1–12** 1–3 *Helicina scherereri* (MZSP 114879; D=4.0mm). 4–6 *Solaropsis fairchildi* (MZSP 114872; H=23.8mm, D=42.5mm). 7–9 *Solaropsis rosarium* (MZSP 114871; H=14.1mm, D=23.8mm). 10–12 *Anostoma rossi* (MZSP 114870; H=14.7mm, D=28.7mm).

*Solaropsis (Solaropsis) rosarium*: Haas, 1952: 108.  
*Solaropsis (Psadara) rosarium*: Quintana, 1982: 105.  
*Psadara rosaria*: Simone, 2006: 245 (fig. 940).

*Type locality* Banks of the Amazon River (Pfeiffer, 1853; Pilsbry, 1935).

*Material analyzed* Brazil. Tocantins; Taguatinga, 12°21'54"S 46°21'39"W, MZSP 114871 (7 sh; Alex Bianchi col., viii/2013).

*Measurements* (in mm; n=7) H=12.7±1.2 (max 14.6, min 11.1); D=21.8±2.3 (max 25.2, min 19.2); h=9.8±0.9 (max 10.9, min 8.6); d=11.1±1.0 (max 12.2, min 9.8).

*Remarks* We follow here the works of Cuezzo (2002, 2003), which treats *Psadara* Miller, 1878 as a synonym of *Solaropsis* and place the latter in the Camaenidae. *Solaropsis rosarium* is known from Suriname and the Brazilian states of Amazonas, Pará, Goiás and Mato Grosso do Sul (Simone, 2006); as such, the present record "fills a gap" in its distribution. There are also records, unfortunately presently untraceable, from New Granada (Pilsbry, 1889), a republic from the mid-19<sup>th</sup> century that consisted primarily of present-day Colombia and Panama, but that also encompassed small portions of what today are other countries (Costa Rica, Nicaragua, Venezuela, Ecuador, Brazil and Peru). Pilsbry (1933) regarded the records from New Granada and Suriname spurious, arguing that the specimens that originated them were bought from dealers, and the collectors were unknown. Pilsbry (1889) reckoned the color pattern of this species as being very constant, which holds true for the present specimens. The number of spiral dotted lines is constant, but the lines show a slight variation in width.

Family Odontostomidae  
 Genus *Anostoma* Waldheim, 1807

*Anostoma rossi* Weber, 1925  
 (Figs 10–12)

*Anostoma rossi* Weber, 1925: 276 (pl. 5, fig. 6); Breure, 1974: 123; Breure & Schouten, 1985: 25 (fig. 15; pl. 4, fig. 2); Verdcourt, 1992: 184; Salgado & Coelho, 2003: 169; Simone, 2006: 175 (fig. 621).

*Anostoma (Anostoma) rossi*: Morretes, 1949: 159.

*Type locality* Inside a calcareous grotto (70m deep) in São Desidério, Bahia state, Brazil.

*Material analyzed* Brazil. Tocantins; Taguatinga, 12°21'54"S 46°21'39"W, MZSP 114870 (21 sh; Alex Bianchi col., viii/2013).

*Measurements* (in mm; n=21) H=14.4±0.5 (max 15.2, min 13.6); D=28.7±1.1 (max 30.4, min 26.4); h=11.2±0.7 (max 12.7, min 9.9); d=9.5±1.0 (max 11.5, min 7.7).

*Remarks* This species is known from the Brazilian states of Bahia and Goiás (Simone, 2006) and thus the present record would slightly extend its range to the northwest. Nevertheless, the record from Goiás is from the Serra Geral region (Breure, 1974), which ranges from Goiás to Tocantins. It is regarded that the geomorphology of the Serra Geral region, dividing the states of Tocantins and Goiás in one side and Bahia on the other, acts as a geographical barrier, being related to speciation events (Villela & Nogueira, 2011). The present species seem to occur on both sides of the mountainous chain without perceptible differences in shell morphology. Further anatomical and molecular studies should address this matter.

Genus *Cyclodontina* Beck, 1837

*Cyclodontina* cf. *gemellata* (Ancey in Pilsbry, 1901)  
 (Fig. 13)

*Type locality* Goiás state, Brazil.

*Material analyzed* Brazil. Tocantins; Taguatinga, 12°21'54"S 46°21'39"W, MZSP 114878 (8 sh; Alex Bianchi col., viii/2013).

*Measurements* (in mm; n=8) H=23.4±0.7 (max 24.6, min 22.0); D=7.2±0.3 (max 7.8, min 6.8); h=7.5±0.4 (max 8.1, min 6.9); d=5.0±0.3 (max 5.6, min 4.5).

*Remarks* This species is known only from Goiás state, Brazil (Simone, 2006), so the present record slightly extends its range to the north. The present specimens are only tentatively attributed to this species: despite having matching sizes and overall shell shape and features, they show a markedly different teleoconch sculpture pattern. All shells from Taguatinga show numerous delicate axial ribs, while typical *C. gemellata*

have fewer but stronger ribs. It is not presently possible to determine whether this feature simply represents normal morphological variation within *C. gemellata* or if it represents a distinct population or species.

*Cyclodontina sectilabris* (Pfeiffer, 1850)  
(Fig. 14)

*Bulimus (Odontostomus) sectilabris* Pfeiffer, 1850: 112.

*Bulimus sectilabris*: Pfeiffer, 1853: 369; Hupé, 1857: 60.

*Odontostomus inflatus* var. *sectilabris*: Pilsbry, 1901: 61 (pl. 11, figs 47–53).

*Odontostomus sectilabris*: Dall, 1910: 363 (pl. 37, fig. 1).

*Odontostomus (Cyclodontina) inflatus sectilabris*: Haas, 1939: 270; Morretes, 1949: 156.

*Odontostomus inflatus sectilabris*: Jaeckel, 1952: 7.

*Cyclodontina sectilabris*: Solem, 1956: 7; Breure, 1974: 123; Simone, 2006: 167 (fig. 580).

*Type locality* Bahia state, Brazil.

*Material analyzed* Brazil. Tocantins; Taguatinga, 12°21'54"S 46°21'39"W, MZSP 114877 (15 sh; Alex Bianchi col., viii/2013).

*Measurements* (in mm; n=15) H=35.9±1.1 (max 37.9, min 34.2); D=12.4±0.4 (max 13.3, min 11.5); h=12.8±0.7 (max 14.1, min 11.7); d=8.9±0.3 (max 9.3, min 8.3).

*Remarks* This species is known from the Brazilian states of Ceará, Rio Grande do Norte, Paraíba, Pernambuco and Bahia (Simone, 2006). Thus, the present record extends the species' range to the west. Despite being often considered a separate species, Pilsbry (1901) treats *C. sectilabris* as a larger variety of *C. inflata* (Wagner, 1827), with many intermediate forms linking the two species (and eventually some additional conchological differences). Moreover, Solem (1956) remarks that *C. inflata* might be a species complex with a large amount of conchological variation. Nevertheless, the present specimens compare well with typical *C. sectilabris* and we thus prefer this identification at least until further revisionary work is conducted.

Family Bulimulidae  
Genus *Drymaeus* Albers, 1850

*Drymaeus dakryodes* sp. nov.  
(Figs 15–21)

*Type material* Holotype: MZSP 114874 (Figs 15–17, 21); paratypes MZSP 114875, 4 sh, from type locality (Figs 18–20).

*Type locality* Brazil, Tocantins, Taguatinga, 12°21'54"S 46°21'39"W, ~870m of elevation (Alex Bianchi col., viii/2013).

*Distribution* Known only from type locality.

*Etymology* The specific epithet refers to the species' overall shell shape. From the Greek *dakryodes*, meaning "tear-like".

*Diagnosis* Acuminated spire; overall "water drop-like" shell shape. Color cream to solid brown or dark reddish brown, always homogenous.

*Description* Shell large, oval to fusiform, with acuminated spire; shell width ~1/2 its height. Color cream to solid brown or dark reddish brown, always homogenous. Spire angle ~45°. Protoconch (Fig. 21) of 1¼ to 1½ whorl with reticulated sculpture; transition to teleoconch unclear. First ~¾ whorl of teleoconch sculptured by sinuous spiral striae; remaining of teleoconch smooth, except for well-marked growth lines. Whorls profile weakly convex. Suture shallow but well-marked. Aperture (Fig. 15) large, oval; slightly prosocline; ~30° in relation to shell axis (Fig. 16); aperture height ~1/2 of shell height, width ~2/3 of shell width. Peristome reflected, especially on basal and columellar regions; parietal callus present. Columellar fold faint, slightly more conspicuous in some specimens (Fig. 19). Umbilicus narrow to rimate (Fig. 17).

*Measurements* (in mm; n=5) 7 to 7¾ whorls; H=40.0±1.8 (max 41.5, min 37.2); D=19.4±1.2 (max 21.2, min 18.2); h=19.2±1.4 (max 21.1, min 17.7); d=13.0±1.4 (max 14.7, min 11.2). Holotype 7 ¼ whorls; H=40.1; D=19.5; h=19.0; d=13.9.

*Remarks* The allocation of the present specimens in *Drymaeus* is justified by the overall shell and aperture shape (with a faint columellar fold) and typical protoconch sculpture (Breure, 1979). Nevertheless, the present specimens bear some



**Figure 13–23** 13 *Cyclodontina* cf. *gemellata* (MZSP 114878; H=22.9mm, D= 7.2mm). 14 *Cyclodontina* *sectilabris* (MZSP 114877; H=37.9mm, D=12.5mm). 15–21 *Drymaeus* *dakryodes* sp. nov. 15–17 (holotype, MZSP 114874; H=40.1mm, D= 19.5mm). 18–19 (paratype, MZSP 114875; H=41.4mm, D=20.3mm). 20 (paratype, MZSP 114875; H=37.4mm, D=18.6mm). 21 *Drymaeus* *dakryodes* sp. nov., protoconch detail (holotype, MZSP 114874; scale bar=0.5mm). 22–23 *Drymaeus* *poecilus*, apertural view. 22 (MZSP 114869; H=39.5mm, D=18.8mm). 23 (MZSP 114869; H=40mm, D=19.5mm).

overall resemblance to the recently described monospecific genus *Kora* Simone, 2012, but differ in their protoconch: the protoconch of *Kora* is sculptured only by scant axial striae (Simone, 2012). As commonly seen in *Drymaeus* species (Breure & Mogollón Avila, 2010), the present specimens show a good range of color variation, ranging from cream to dark reddish brown, but always presenting a homogenous coloration (*i.e.*, without any patterns of stripes or other markings).

*Drymaeus dakryodes* sp. nov. differs from its geographically close congeners mainly by its acuminate apex, which gives it a “water drop-like” outline, and a homogeneous shell coloration. It differs further from *D. acuminatus* Costa, 1906 and *D. alabastinus* (Scott, 1952) by having a less elongated outline, wider and rounder aperture and shallower suture. It differs from *D. branneri* Baker, 1913, *D. bucia* (Pfeiffer, 1859), *D. imperfectus* (Guppy, 1866), *D. magnus* (Wagner, 1827), *D. rufolineatus* (Droüetm 1859) and *D. souzalopesi* Weyrauch, 1965 by having a larger, more elongated shell and by lacking spiral stripes and/or spots. It can be distinguished from *D. edmulleri* (Albers, 1854), *D. erectus* (Reeve, 1849), *D. fidaensis* (Moricand, 1858), *D. roseatus* (Reeve, 1848) and *D. suprapunctatus* Baker, 1913 by its less elongated shell, with more inflated whorls, as well as its wider and rounder aperture. It differs from *D. expansus* (Pfeiffer, 1848), *D. hygrophylaeus* (d’Orbigny, 1835), *D. linostomus* (d’Orbigny, 1835), *D. nigrogularis* (Dohrn, 1882), *D. ribeiroi* Ihering, 1915 and *D. vanattai* Pilsbry, 1898 by its less inflated whorls, proportionally smaller aperture and less reflected outer lip; it can also be further distinguished from *D. expansus* and *D. vanattai* by its less developed axial sculpture. It differs from *D. flexilabris* (Pfeiffer, 1853) and *D. goianensis* Dutra–Clarke & Souza, 1991 by lacking a constriction on the outer lip, having a proportionally smaller protoconch and shallower suture. It can be distinguished from *D. limicolarioides* Haas, 1836 by having a larger, shorter shell, with more inflated whorls, less reflected outer lip, wider and rounder aperture and by lacking spiral sculpture. It differs from *D. saccatus* (Pfeiffer, 1855), *D. serratus* Pfeiffer, 1855, *D. similis* (Moricand, 1856) and *D. siolii* Haas, 1952 by having a larger shell, with proportionally smaller aperture and protoconch. Finally, it can be distinguished from *D. succineus* Pilsbry, 1901 by its

larger, more opaque shell, with a greater number of whorls. Of the more geographically distant species, the most similar in shape to *D. drakyodes* sp. nov. is *D. paucipunctus* (Pilsbry, 1898), known only from its type locality in northern São Paulo state (Simone, 2006). *Drymaeus drakyodes* sp. nov. can be distinguished from it by its larger and narrower shell, more homogenous coloration, more convex whorls and narrower spire top.

*Drymaeus poecilus* (d’Orbigny, 1835)  
(Figs 22–23)

Synonymy see Quintana (1982). In addition:  
*Bulimulus poecilus*: Pfeiffer, 1853: 420; Hupé, 1857: 51; Ancey, 1897: 12.

*Drymaeus poecilus*: Pilsbry, 1897–1898: 285 (pl. 49, figs 49–57); Breure, 1979: 113 (pl. 3, fig. 1); Oliveira *et al.*, 1981: 347; Salgado & Coelho, 2003: 163; Simone, 2006: 141 (fig. 468).

*Drymaeus (Leiostracus) poecilus*: Morretes, 1949: 151.

*Drymaeus poecilus poecilus*: Quintana, 1982: 95.

*Type locality* Chiquitos province, Bolivia.

*Material analyzed* Brazil. Tocantins; Taguatinga, along road TO–040, MZSP 114869 (14 sh; Roberto Santos col., vi/2013).

*Measurements* (in mm; n=14) H=40.5±1.8 (max 43.3, min 35.9); D=20.2±0.6 (max 21.0, min 19.1); h=20.3±1.1 (max 22.5, min 18.5); d=13.6±0.8 (max 15.1, min 12.3).

*Remarks* This species is known from Bolivia, Brazil (the states of Mato Grosso, Mato Grosso do Sul and São Paulo), Paraguay and Argentina (Simone, 2006) and therefore the present record slightly extends its range to the north and east. The present specimens, as common in the genus (Breure & Mogollón Avila, 2010), show a great variation in color pattern regarding the number and position of the dark brown markings (compare Figs 22 and 23).

Genus *Naesiotus* Albers, 1850

*Naesiotus carlucioi* (Rezende & Lanzieri, 1963)  
(Fig. 24)

*Protoglyptus carlucioi* Rezende & Lanzieri, 1963: 112 (figs 1–38).



**Figure 24–30** 24 *Naesiotus carluccioi*, (MZSP 114876; H=25.2mm). 25–27 *Streptaxis luetzelburgi* (MZSP 114873; D=14.9mm). 28–29 *Megalobulimus conicus* (MZSP 114868; H=76mm, D =42.8mm). 30 *Beckianum* cf. *beckianum*, apertural view (MZSP 114880; H=6.2mm).



*Naesiotus carlucioi*: Breure & Coppo, 1978: 170 (pl. 1, fig. 3; pl. 2, figs 3–4); Breure, 1979: 68; Salgado & Coelho, 2003: 160; Simone, 2006: 125 (fig. 296).

*Type locality* Planaltina, Goiás state, Brazil.

*Material analyzed* **Brazil. Tocantins**; Taguatinga, 12°21'54"S 46°21'39"W, MZSP 114876 (1 sh; Alex Bianchi col., viii/2013).

*Measurements* (in mm) H=25.2; D=12.4; h=10.7; d=8.3.

*Remarks* This species is known only from its type locality in Goiás state and from the Distrito Federal (Breure & Coppo, 1978; Simone, 2006). The present record extends its range to the north.

Family Streptaxidae  
Genus *Streptaxis* Gray, 1837

*Streptaxis luetzelburgi* Weber, 1925  
(Figs 25–27)

*Streptaxis luetzelburgi* Weber, 1925: 274 (pl. 5, fig. 5); Morretes, 1949: 168.

*Streptaxis luetzelburgi*: Simone, 2006: 192 (fig. 715).

*Type locality* São Desidério, Bahia, Brazil.

*Material analyzed* **Brazil. Tocantins**; Taguatinga, 12°21'54"S 46°21'39"W, MZSP 114873 (1 sh; Alex Bianchi col., viii/2013).

*Measurements* (in mm) H=10.4; D=14.9; h=5.5; d=6.4.

*Remarks* This species is known only from its type locality (Simone, 2006), a city circa 150km to the east of Taguatinga.

Family Strophocheilidae  
Genus *Megalobulimus* Miller, 1878

*Megalobulimus conicus* (Bequaert, 1948)  
(Figs 28–29)

*Strophocheilus oblongus conicus* Bequaert, 1948: 79 (pl. 6, fig. 1; pl. 19, fig. 2; pl. 23, figs 1–3).

*Psiloicus conicus*: Morretes, 1954: 69.

*Megalobulimus conicus*: Salgado & Coelho, 2003: 157; Simone, 2006: 208 (fig. 791).

*Type locality* Maranhão state, Brazil.

*Material analyzed* **Brazil. Tocantins**; Taguatinga, along road TO-040, MZSP 114868 (21 sh; Roberto Santos col., vi/2013).

*Measurements* (in mm; n=21) H=75.4±3.5 (max 82.2, min 70.4); D=41.0±1.9 (max 45.0, min 37.3); h=43.5±1.7 (max 45.6, min 39.2); d=30.9±1.3 (max 33.1, min 28.2).

*Remarks* This species is known from the Brazilian states of Amazonas, Maranhão and Bahia (Simone, 2006) and therefore the present record “fills a gap” in its known range.

Family Subulinidae  
Genus *Beckianum* Baker, 1961

*Beckianum cf. beckianum* (Pfeiffer, 1846)  
(Fig. 30)

*Type locality* Córdoba, Mexico (Baker, 1961).

*Material analyzed* **Brazil. Tocantins**; Taguatinga, MZSP 114880 (1 sh; Alex Bianchi col., viii/2013).

*Measurements* (in mm) H=6.2; D=3.0; h=2.0; d=1.5.

*Remarks* The single specimen of *Beckianum* found shows a remarkable sinistral coiling. Otherwise, its shell morphology is reminiscent of the species *B. beckianum*, which shows great morphological variation (Pilsbry, 1906) and occurs from Mexico to the southeastern Brazilian states of Rio de Janeiro and São Paulo, including the Caribbean Islands (Simone, 2006). Unfortunately, with a single specimen at hand, it is impossible to tell whether it represents a new species or if the sinistral coiling is a recurrent variation in *B. beckianum*. Nevertheless, we are more inclined to the latter. Sinistral forms of *Beckianum* are known from Central America and are treated as a distinct species, *B. sinistrum* Martens, 1898, known only from its shell and recorded in Nicaragua and Costa Rica (Pérez & Lopéz, 1995; Barrientos, 2003; Pérez *et al.*, 2008). Pérez & Lopéz (1995) comment that *B. sinistrum* is a “mirror image” of *B. beckianum*, consistent in all other characters other than its sinistral coiling. These authors suggest that *B. sinistrum* is possibly a synonym of *B. beckianum*, but such issue can only be solved with a thorough anatomical and/or molecular study.

## DISCUSSION

All the records reported in the present paper are the first from Tocantins state. These findings are especially important as they not only extend the geographical distribution of some species but also fill “distribution gaps” of some others. The latter is the case for *Solaropsis rosarium* (previously reported from Amazonas, Pará, Goiás and Mato Grosso do Sul) and *Megalobulimus conicus* (previously reported from Amazonas, Maranhão and Bahia). The remaining species had their distribution extended; one of them, *Streptaxis luetzelburgi*, was only known from its type locality.

Better known geographical distributions can further improve arguments for conservation. As previously stated, continental molluscs are not taken into account in environmental matters regarding the Cerrado. This is very troubling, since a large portion of the Cerrado biome is considered degraded and often only fragments of the original vegetation cover remain. Tocantins contains the largest Cerrado protection area in Brazil (the Jalapão State Park; Klink & Machado, 2005), but the situation is dire for the rest of the state, since it is one of the most deforested areas in Brazil (Machado *et al.*, 2004). Likely, many snail species in areas such as this are becoming extinct before being even known to science (*e.g.*, Richling & Bouchet, 2013). Descriptions of new species from the Cerrado are somewhat urgent to encourage legal protection, since according to the Brazilian legislation a type locality may more likely become a protected area. As such, it is our hope that the present work represents an important step towards this goal.

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