

# New records of *Helicina inaequistriata* (Gastropoda: Helicinidae) from Rio de Janeiro and São Paulo states, Brazil

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**ABSTRACT:** New records of *Helicina inaequistriata* Pilsbry, 1900 (Gastropoda: Helicinidae) are reported here from southeastern Brazil: Cabo Frio Island (“Ilha do Cabo Frio” in Portuguese), a continental island off Rio de Janeiro state, and three localities in São Paulo state (Mairiporã and Piracicaba municipalities and Alto Ribeira State and Tourist Park). The species was previously known only from Grande Island (“Ilha Grande”), off southern Rio de Janeiro, and two localities in São Paulo state (including the type locality). The occurrence of this species in well preserved areas such as Cabo Frio Island and Alto Ribeira Park is reassuring. The species is known from few localities and data on its abundance and conservation status are unknown.

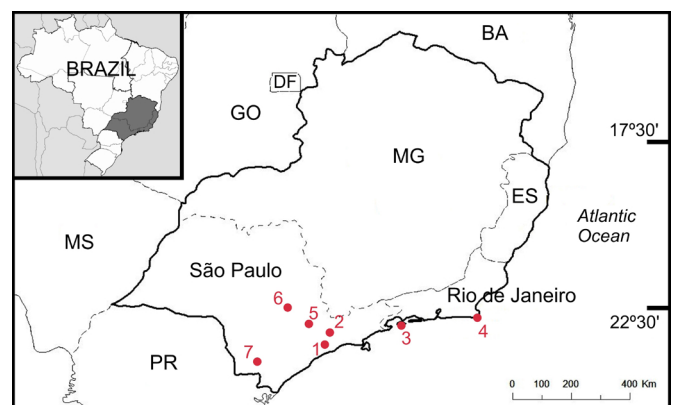
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The operculate land snail family Helicinidae, and in particular the genus *Helicina* Lamarck, 1799, is especially diverse in the southeastern region of Brazil (Simone 2006). *Helicina inaequistriata* Pilsbry, 1900 was first described from Raiz da Serra, Cubatão municipality, São Paulo state, Brazil (Pilsbry 1900; Wagner 1910), and later recorded from Grande Island (“Ilha Grande” in Portuguese) off southern Rio de Janeiro state, and from Piassaguera (formerly Piassagüera; Cubatão municipality) and Paranapiacaba (formerly Alto da Serra; Santo André municipality), both in São Paulo state (Morretes, 1949; Haas 1953; Simone 2006; Santos *et al.* 2010) (Figure 1). Herein, *H. inaequistriata* is reported for the first time from Cabo Frio Island (“Ilha do Cabo Frio” in Portuguese), a continental island off Rio de Janeiro, and three additional localities in São Paulo.

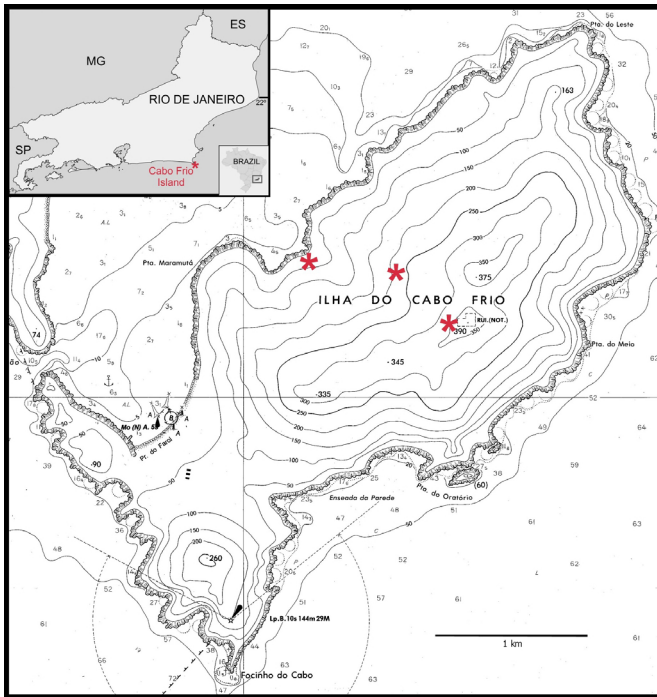
The material from Cabo Frio Island is housed in the malacological collection of the Museu de Zoologia da Universidade de São Paulo (MZSP; São Paulo, Brazil) and comprises three specimens from three separate sites. They were combined at the time of collection and thus were registered under a single catalog number: MZSP 115369 (N.G. Silva collector, 07 November 2013; Cabo Frio Island, off Arraial do Cabo municipality, Rio de Janeiro state, Brazil). The animals were found alive on a rainy day on leaf litter in three different forested areas (Figure 2): *ca.* 30 m a.s.l. (above sea level), 22°59'29.79" S, 41°59'44.84" W; *ca.* 200 m a.s.l., 22°59'33.18" S, 41°59'26.41" W; and *ca.* 350 m a.s.l., near the island's peak, 22°59'44.83" S, 41°59'11.29" W. Despite the elevation differences, the three localities are very close to each other, within 1.1 km total lineal distance (the middle one being *ca.* 570 m distant from each of the others).

The island is dominated by forests generally referred

to as Atlantic Forest, but comprises different but poorly characterized plant associations; a precise classification is still lacking due to the unique phytosociological structure and floristic composition. Although the collections were made relatively far from each other (especially regarding the altitude), the specimens were all found on the moist leaf litter under the woods; the forest vary in height from 2 m near sea level to about 12 m at *ca.* 200 m a.s.l. Moreover, numerous specimens of *Megalobulimus ovatus* (Müller, 1774) (Strophocheilidae), a coastal species distributed from Rio de Janeiro to Santa Catarina states (Simone 2006), were observed along the trails. The island is managed by the Brazilian Navy and thus the collection was made under an authorization of that institution.



**FIGURE 1.** Map of the southeast region of Brazil showing all the known localities with records of *Helicina inaequistriata*. Previously known localities: (1) Cubatão municipality (comprises both Raiz da Serra, the type locality, and Piassaguera); (2) Santo André municipality (Paranapiacaba/Alto da Serra locality); (3) Grande Island. New records: (4) Cabo Frio Island; (5) Mairiporã municipality; (6) Piracicaba municipality; (7) Alto Ribeira State and Tourist Park. Abbreviations of the neighboring states: BA, Bahia; GO, Goiás; DF, Distrito Federal (Federal District); MG, Minas Gerais; ES, Espírito Santo; MS, Mato Grosso do Sul; PR, Paraná.



**FIGURE 2.** Topographic map showing the precise collection localities on Cabo Frio Island (“Ilha do Cabo Frio” in Portuguese). Abbreviations of the neighboring states: MG, Minas Gerais; ES, Espírito Santo; SP, São Paulo.

The remaining material, from São Paulo state (Figure 1), belongs to the malacological collections of the MZSP and the Academy of Natural Sciences of Philadelphia (ANSP; Philadelphia, USA): MZSP 116325 (1 specimen; M.E. Bichuette *et al.* collectors, 02 October 2012; Alambari Baixo, in Alto Ribeira State and Tourist Park [“Parque Estadual Turístico do Alto Ribeira” in Portuguese, or “PETAR”], São Paulo state, Brazil); ANSP 47598 (2 shells; H. Ihering collector, 19 March 1920; Piracicaba municipality, São Paulo state, Brazil); ANSP 428491 (3 shells; ex Hemmen Collection, 16 April 1988; Cantareira mountain range [“Serra da Cantareira” in Portuguese], Mairiporã municipality, São Paulo state, Brazil). Unfortunately, these specimens do not have precise data on the collection localities, but all these places are dominated by the Atlantic Forest; the Alto Ribeira Park, especially, is an important conservation area of the original Atlantic Forest.

The catalogue by Simone (2006) was used for identification. *Helicina inaequistriata* can be easily identified by conchological characters alone (see below). The specimens were then further compared to the original description of the species (Pilsbry 1900) and its type material from Raiz da Serra, São Paulo state, Brazil: ANSP 78038 (lectotype), ANSP 358655 (paralectotypes, 5 shells) and MZSP 938 (paralectotypes, 17 shells).

*Helicina inaequistriata* can be diagnosed by its shell sculpture, consisting of numerous unequal low and flattened spiral ribs, with numerous prosocline spiral striae between and over them (Pilsbry 1900). All the specimens (Figures 3–7, 14) compare well with the type series (Figures 8–13). The shells are beige or yellowish brown to light brown; the operculum is of a darker shade of brown. The living animal’s soft body is uniformly chestnut brown on the dorsal surface and light brown on the ventral surface; the tentacles are proportionately long, but sturdy (Figure 14). Judging by all available specimens, the species shows some morphological variation: some specimens



**FIGURE 3-14.** *Helicina inaequistriata*. Shell measurements abbreviations: H, shell length; D, greatest shell width; h, aperture height; d, aperture width. Figures 3–6. Specimen #1 from Cabo Frio Island, Brazil (MZSP 115369; H = 6.6 mm, D = 9.4 mm, h = 4.1 mm, d = 4.0 mm). Figure 7. Specimen #2 from Cabo Frio Island, Brazil (MZSP 115369; H = 5.9 mm, D = 8.4 mm, h = 3.6 mm, d = 3.5 mm). Figures 8–10. Lectotype, Raiz da Serra, Cubatão, Brazil (ANSP 78038; H = 7.1 mm, D = 9.5 mm, h = 3.8 mm, d = 4.2 mm). Figure 11. Paralectotype #1, Raiz da Serra, Cubatão, Brazil (MZSP 938; H = 6.6 mm, D = 9.6 mm, h = 3.9 mm, d = 3.9 mm). Figure 12. Paralectotype #2, Raiz da Serra, Cubatão, Brazil (MZSP 938; H = 7.7 mm, D = 10.2 mm, h = 4.1 mm, d = 4.2 mm). Figure 13. Paralectotype #3, Raiz da Serra, Cubatão, Brazil (MZSP 938; H = 7.3 mm, D = 9.7 mm, h = 4.0 mm, d = 3.9 mm). Figure 14. Specimen #3 from Cabo Frio Island, Brazil, live animal (MZSP 115369; H = 5.9 mm, D = 8.4 mm, h = 3.6 mm, d = 3.5 mm).

have a stronger keel (and therefore a more angular palatal region of the aperture) and a more overall flattened shell shape (*e.g.*, Figures 3 and 11), while some have a weaker keel and a higher and more rounded shell (*e.g.*, Figures 8 and 12).

*Helicina inaequistriata* was previously known from coastal areas of São Paulo state and from Grande Island, off southern Rio de Janeiro state (Simone 2006) (Figure 1). As such, the present records extend the species’ distribution *ca.* 200 km to the east (Cabo Frio Island), *ca.* 200 km to the northwest (Piracicaba municipality) and *ca.* 250 km to the southwest (Alto Ribeira Park) (Figure 1).

With the current scarce knowledge of the species, it is impossible to infer if the island populations (both Grande and Cabo Frio Islands) are naturally occurring populations or the result of anthropic activity. Moreover, despite Cabo Frio Island not being a conservation unit, it is historically well managed by the Brazilian Navy and remains one of the best preserved natural areas in the region. As such, the occurrence of *H. inaequistriata* on Cabo Frio is reassuring, because the species is still not known from many localities and data on its abundance and conservation status are unknown. The same is valid for the Alto Ribeira Park, an equally well preserved area, where a live specimen of *H. inaequistriata* was collected in 2012. The other new records, from Piracicaba and Mairiporã municipalities, stem from historical collections and, thus, it is presently not possible to know whether the species is still extant at these localities.

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