



RESEARCH NOTE

***Helicodiscus theresa* from Brazil is the exotic species *Helicodiscus parallelus* (Gastropoda, Helicodiscidae)**

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Helicodiscus Morse, 1864 (family Helicodiscidae) is a genus of terrestrial snails with over 20 valid species (MolluscaBase 2020) and distributed almost exclusively over North America (Solem 1984). *Helicodiscus theresa* Thiele, 1927 has been described as native to Brazil, but herein we reassert the identity of this species as the North American *Helicodiscus parallelus* (Say, 1821), exotic to Brazil.

Thiele (1927) described the new species *Helicodiscus theresa* Thiele, 1927 (p. 323, fig. 28a-c) based on specimens from the city of Teresópolis, Rio de Janeiro state, southeast Brazil (Fig. 1A). Thiele described the shell as small (3.3 mm) with 4½ whorls, faint spiral striae, lacking axial sculpture except for final striae on the body whorl, a very wide umbilicus, and a crescent-shaped aperture. The radula possessed a long rachidian tooth and two lateral and nine marginal teeth. Thiele (1927) remarked that his new species was so similar to North American *Helicodiscus lineatus* (Say, 1817) (Fig. 1B), including the radula, that there was no doubt they belonged in the same group.

Helicodiscus lineatus was originally described as *Helix lineata* Say, 1817 (p. 18) from the vicinity of Philadelphia, Pennsylvania, USA. It is conchologically indistinguishable from *Helicodiscus parallelus* (Say, 1821) and was considered its synonym (Pilsbry & Ferris 1906) despite its apparent priority over *Helicodiscus parallelus*. *Helix lineata* Say, 1817 is junior homonym of *Helix lineata* Olivi, 1792, itself a synonym of *Cernuella virgata* (Mendes da Costa, 1778) (Geomitridae), and thus, the name was preoccupied. *Helicodiscus parallelus*, originally described from the Upper Missouri, USA, as *Planorbis parallelus* Say, 1821 (p. 164), was briefly described as having a shell between 3 and 4 mm wide, four whorls, regular and equidistant spiral striae crossed regularly by fine axial striae, a longer than wide aperture, and the umbilicus exhibiting all the whorls. Note that the original spelling of Say (1821) had two sets of double l's, while the prevailing usage ever since omit one l from the second set; the latter is thus considered a justified emendation under ICZN Article 33.2.3.1 (International Commission on Zoological Nomenclature 1999).

Baker (1928), based on Thiele's description, verified the great similarity of *H. theresa* with specimens of *H. parallelus* from Texas and New Mexico; he raised the possibility that *H. theresa* was a case of artificial introduction in Brazil. Pilsbry (1948) later presented a thorough description of *H. parallelus*, defining it by having a small pale yellow shell with 4-4½ whorls, a broad umbilicus showing all the whorls, the first whorls with faintly spiral striae, while the remaining whorls are more clearly sculptured with numerous spiral threads, two pairs of internal teeth in the shell, a narrow lunate aperture, radula with rachidian and five lateral and 10 marginal teeth. Pilsbry also studied Thiele's description of *H. theresa* and verified that it could not be distinguished from *H. parallelus* and, thus, included *H. theresa* as a synonym.

Even so, all later check lists of Brazilian mollusks have failed to acknowledge the synonymization of Pilsbry (1948) and have consistently listed *H. theresa* as a valid native species (Morretes 1949; Vaz 1987; Salgado & Coelho 2003; Simone 2006). Lists of introduced mollusks in Brazil failed to include *He-*

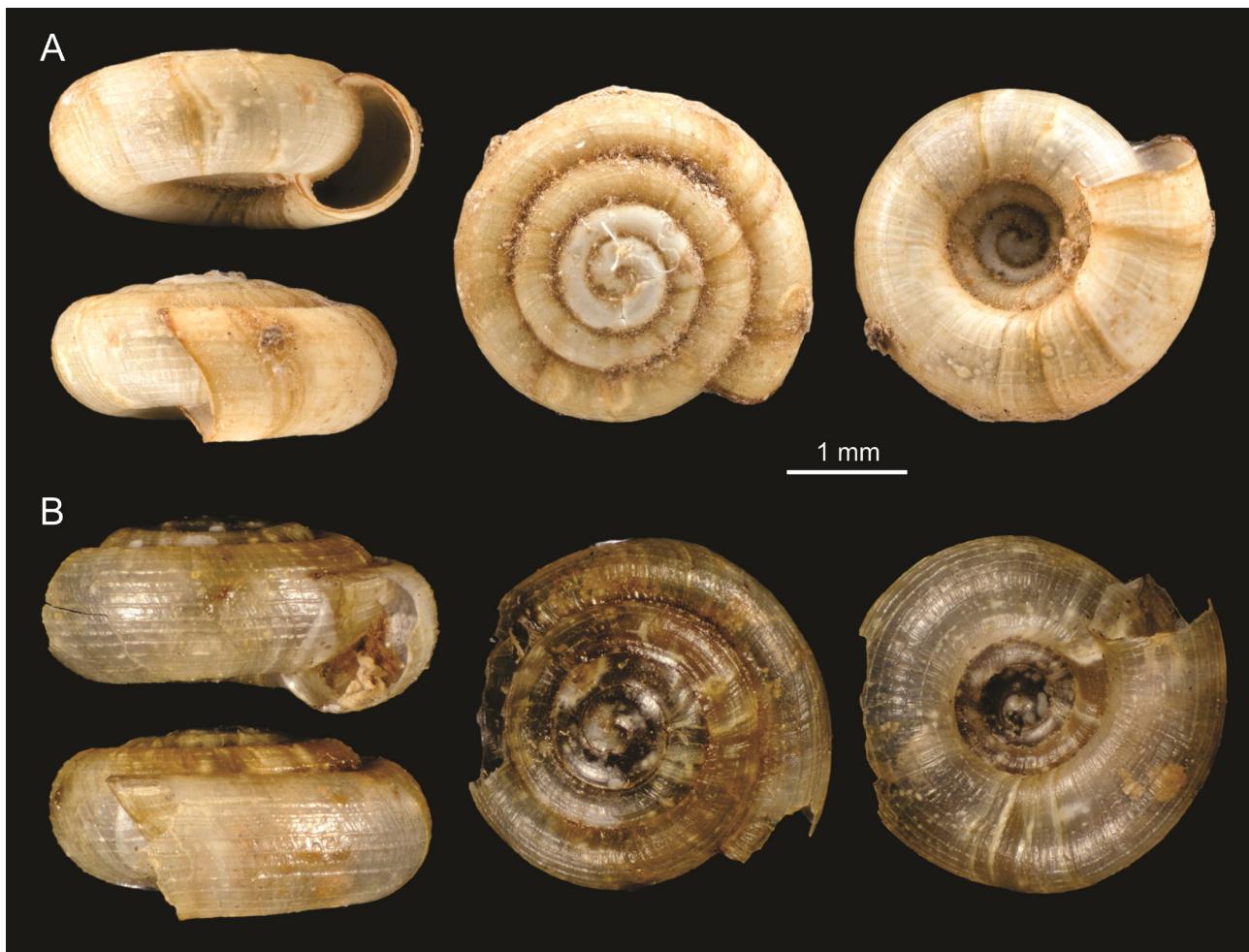


Figure 1. A. Syntype of *Helicodiscus theresa* Thiele, 1927 (ZMB 109132). B. Lectotype of *Helix lineata* Say, 1817 (ANSP 12327); image is a courtesy of the Academy of Natural Sciences of Drexel University (Philadelphia, USA).

licodiscus (e.g., Darrigan et al. 2020), although Salvador (2019) pointed out the likelihood that *H. theresa* was an introduced North American species. As it stands, *H. theresa* is the only helicodiscid outside the family's natural distribution in North and Central America (Zilch 1959). Another helicodiscid has been described from Malesia and Australia (Solem 1984; Stanisic et al. 2010), but that species is clearly misattributed to the family (Salvador et al. 2020).

As such, herein we rectify this matter, reasserting the synonymy of *H. theresa* with *H. parallelus* (as suggested by Pilsbry 1948) based on the comparison of conchological features of a syntype of *H. theresa* (Figure 1) with specimens of *H. parallelus* (see the Appendix for a full list of analyzed material). Thiele (1927) mentioned "a few specimens" ("Einige Tiere") in his description, so more than one syntype could be expected to exist; given that Thiele analyzed the radula, at least one had soft parts to be dissected. Nevertheless, only one specimen was found in the ZMB collection.

The report of Thiele (1927) from Teresópolis thus represents the first mention of this exotic species in Brazil. We could not trace additional records in the literature or in malacological collections in Brazil. As such, we cannot presently ascertain whether *H. parallelus* is still found in the country (*i.e.*, became established and naturalized). Likewise, we cannot pinpoint the origin of the introduced snails; Baker (1928) suggested New Mexico and Texas, USA, based on conchological similarities, but we cannot assume those as the source of the introduced forms found in Rio de Janeiro until new material becomes available for genetic studies.

Helicodiscus parallelus is naturally and widely distributed in North America, from central and eastern Canada to central and eastern USA, although some authors have likely wrongly identified other *Helicodiscus* species as *H. parallelus* (e.g., *H. shimeki* Hubricht, 1962). Pilsbry (1948) considered Council Bluff, Iowa, USA, as its type locality. He also remarked that it was such a common and widespread spe-

cies that it was likely to be exported with plants. The species has been recorded as an exotic in California (USA), Jamaica, Madeira, and the Azores (Pilsbry 1948; Bank et al. 2002; Rosenberg & Muratov 2006; Seddon, 2008; Frias Martins 2011). Furthermore, it has been found as a greenhouse exotic in the UK, Ireland, the Netherlands, and Germany (Meeuse & Hubert 1949; Stworzewicz 1993; Preece & White 2012).

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APPENDIX

Abbreviations: AMNH = American Museum of Natural History, New York, USA; ANSP = Academy of Natural Sciences of Drexel University, Philadelphia, USA; FMNH = Field Museum of Natural History, Chicago, USA; MZSP = Museu de Zoologia da Universidade de São Paulo, São Paulo, Brazil; ZMB = Museum für Naturkunde, Berlin, Germany.

Material analyzed: MNH 276571 (USA, Georgia, St. Catherines Island, Liberty county; J. Slapcinsky & W.E. Sage III col. 20/x/ 1994); AMNH 276566 (USA, Georgia, St. Catherines Island, Liberty county, 2.5 km NW of Back Creek; J. Slapcinsky et al. col. 22/x/1994); ANSP 12327 (lectotype of *Helix lineata* Say, 1817, designated by Baker, 1962; USA, Pennsylvania, near Philadelphia); FMNH 316554 (USA, Indiana, Porter; 2009); FMNH 324632 (USA, Illinois, Alexander; 2007); MZSP 151143 (USA, Alabama, Jackson county, Francisco; B. Winters col. i/2011); ZMB 109132 (syntype of *H. theresa* Thiele, 1927; Brazil, Rio de Janeiro, Teresópolis).