

HELIX ENTODONTA L. PFEIFFER, 1859, A TERRESTRIAL SNAIL FROM ECUADOR, IS A SPECIES OF *ZILCHISTROPHIA* WEYRAUCH, 1960 (GASTROPODA: SCOLODONTIDAE): IMPLICATIONS FOR THE DIAGNOSIS AND INTERPRETATION OF *SYSTROPHIA* PFEIFFER, 1855 AND *ENTODINA* ANCEY, 1887

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ABSTRACT: *Helix entodonta* L. Pfeiffer, 1859 is moved to *Zilchistrophia* Weyrauch, 1960 based on its small size and the presence of three palatal plicae. This has implications on the diagnosis of *Systrophia* L. Pfeiffer, 1855, as now none of the known species have palatal plicae inside the shell. That *Systrophia* does not have this type of plicae supports that *Entodina* Ancey, 1887 should be regarded as a separate, valid genus within the Scolodontidae.

KEY WORDS: Neotropics; nomenclature; re-diagnosis; taxonomy

INTRODUCTION

As frequently demonstrated in recent works, the taxonomy of the Neotropical snail family Scolodontidae can only be resolved by revisiting the original type material of genera and species prominently recorded in the literature (ROOSEN 2023, ROOSEN et al. 2023, ROOSEN & BREURE 2024). For instance, four different type designations were available for *Happia Bourguignat, 1890*, which caused four separate scolodontid genera to be continuously confused with each other. This could only be resolved by accepting *Helix ammonoceras* Reeve, 1854 as the type species of *Happia*, by typification of the replaced name *Ammonoceras* Pfeiffer, 1855 (not Lamarck, 1822). As the characters of *H. ammonoceras* were poorly known, the species had to be redescribed along with the closely related *Happia andia* (Pilsbry, 1932) to provide a solid definition of *Happia* (ROOSEN & BREURE

2024). In some other cases, wrongly identified species or specimens also undermined the diagnosis of several genera within the family (ROOSEN 2023), making the task of assigning scolodontid species to the correct genera all the more troublesome.

Helix entodonta L. Pfeiffer, 1859, described from Ecuador, is an example of a species causing major confusion in literature after several malacologists tried to interpret its characters with only limited information available. During its history, it has been assigned to three different scolodontid genera: *Polygyratia* Gray, 1847 (= *Ophiogyra* Albers, 1850), *Entodina* Ancey, 1887, and most often, *Systrophia* Pfeiffer, 1855 (MILLER 1878, PILSBRY 1894, KOBELT 1905, GUDE 1920, BREURE et al. 2022). Though it was often included in *Systrophia*, the diameter of *Helix entodonta* at 5.7 mm is less than half that of the



typical *Systrophia*, which often exceeds 12 mm in diameter (e.g. BREURE et al. 2022). This has troubled the separation of *Systrophia* from small genera with a similar shape, like *Zilchistrophia* Weyrauch, 1960 and *Entodina* Ancey, 1887. Moreover, several authors noted that *H. entodonta* has three palatal plicae in the shell (e.g. PFEIFFER 1859a, 1859b, GUDE 1920), which is a typical character for *Zilchistrophia* Weyrauch, 1960 (PÁLL-GERGELY & ASAMI 2014).

Zilchistrophia is a genus that currently only includes five species (PÁLL-GERGELY & ASAMI 2014). In

the past, it was tentatively assigned to Plectopylidae or Corillidae based on its palatal plicae (WEYRAUCH 1960), but RAMIREZ (1993) and PÁLL-GERGELY & ASAMI (2014) included it in Scolodontidae based on anatomical data. It is one of the few genera with known anatomy within Scolodontidae.

In this paper, we provide evidence that *Helix entodonta* is a member of *Zilchistrophia* based on a re-examination of the type material and discuss the nomenclatural implications of this decision.

MATERIAL AND METHODS

The syntypes of *Helix entodonta* L. Pfeiffer, 1855 were examined and photographed with a stereo microscope. The images were compared to the pictures and descriptions of *Zilchistrophia* in WEYRAUCH (1960) and PÁLL-GERGELY & ASAMI (2014), as well as to all known Ecuadorian Scolodontidae in BREURE et al. (2022). Detailed images of the type species of relevant taxa were also requested to be figured out in

the current paper. Specimens described or figured out in this paper are deposited in the collections of the Natural History Museum, London, United Kingdom (NHMUK), Muséum Bordeaux – Sciences et Nature (MHNbx) and The Museum of Comparative Zoology at Harvard University, Cambridge, Massachusetts, United States of America (MCZ).

SYSTEMATICS

Family Scolodontidae Baker, 1925

Genus *Zilchistrophia* Weyrauch, 1960

Zilchistrophia entodonta (L. Pfeiffer, 1859) comb. nov.

Figs 1–5

Helix entodonta PFEIFFER 1859a: 24, pl. 43, fig. 2; PFEIFFER 1859b: 31.

Helix (Ophiogyra) entodonta – MILLER 1878: 161.

Anchistoma entodonta – TRYON 1887: 126, pl. 26, fig. 9.

Polygyratia (Entodina) entodonta – PILSBRY 1894: 83.

Systrophia (Entodina) entodonta – KOBELT 1905: 89.

Polygyratia (Systrophia) entodonta – GUDE 1920: 59.

Systrophia entodonta (L. Pfeiffer, 1859) – BREURE et al. 2022: 109, fig. 137.

Studied material. NHMUK 20190603, syntype (two shells, dry), Ecuador, Cuenca.

Type locality. Cuenca, Ecuador.

Measurements. Diameter: 5.7 mm; Whorls: 7½.

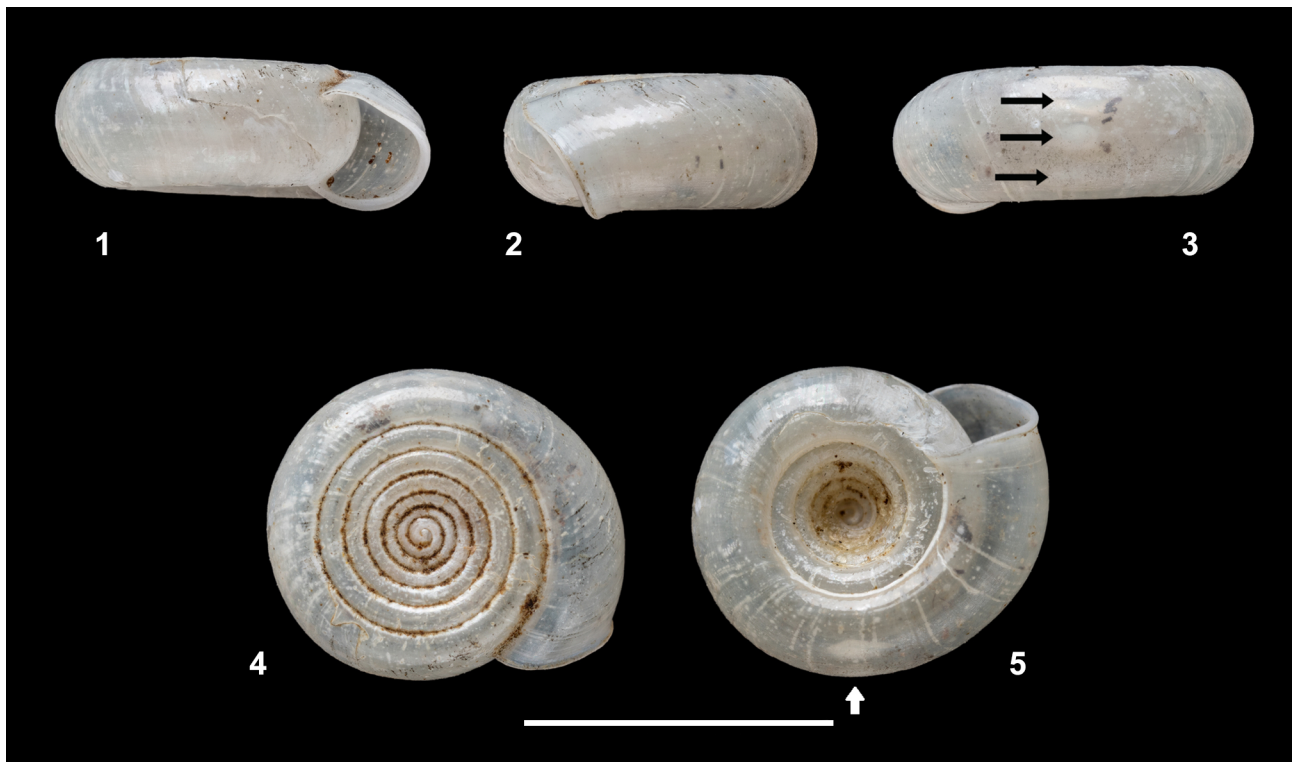
Redescription. Shell small, whitish transparent, sub-discoid, with a depressed spire. Protoconch smooth, protoconch-teleoconch transition unmarked.

Suture deeply excavated. Sculpture on the teleoconch consists of numerous slightly flexuous growth lines. Three small palatal plicae at ½ whorl from the aperture. Last part of the ultimate whorl slightly deflected. Aperture broadly lunulate, peristome reflected. Umbilicus 47% of total width.

Geographic range. Known only from type locality.

Comparisons. *Zilchistrophia hilaryae* Páll-Gergely, 2014 seems to be closely related to *Z. entodonta* comb. nov., but differs from the latter by its raised spire, position of the palatal plicae and slightly smaller umbilicus. The only other species known from Ecuador, *Zilchistrophia shiwiarorum* Páll-Gergely, 2014, is smaller (up to 3.9 mm), has a slightly raised spire, angulate whorl profile, only two palatal plicae and a comparatively small umbilicus. All Peruvian taxa are slightly larger and have an enlarged ultimate section of the body whorl (PÁLL-GERGELY & ASAMI 2014).

Remarks. GUDE (1920) seems to have recognised *Z. entodonta* comb. nov. as a representative of a supposedly new genus based on its palatal plicae. However, he did not name the genus and its palatal plicae have not been considered in later publications.



Figs 1–5. *Zilchistrophia entodonta* (L. Pfeiffer, 1859) comb. nov., syntype (NHMUK 20190603), Cuenca, Ecuador, photographs taken by JONATHAN ABLETT: frontal (1), lateral (2), dorsal (3), apical (4) and adapical (5) views. Scale bar 5 mm. The position of the palatal plicae is indicated by arrows

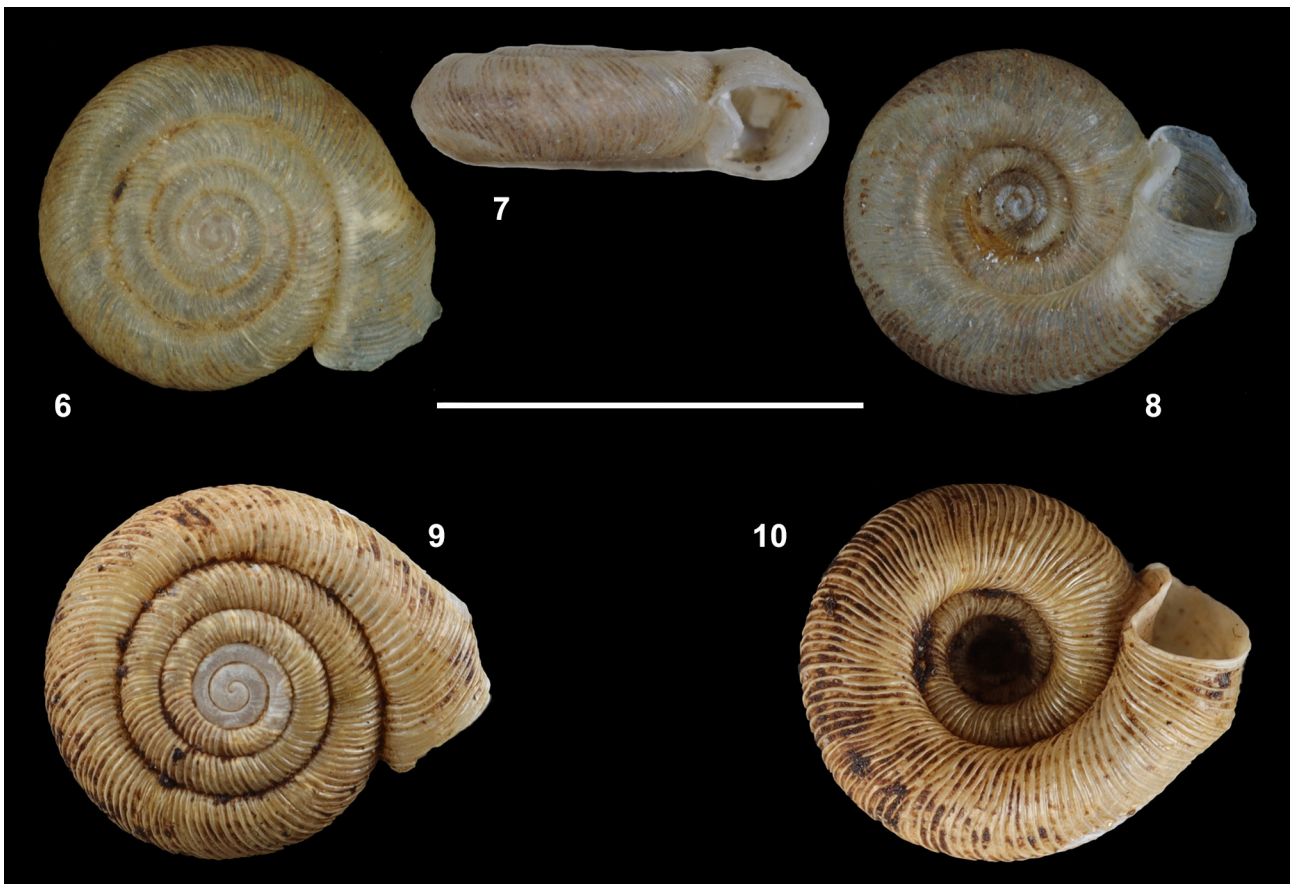
DISCUSSION AND CONCLUSION

In its nomenclatural history, *Helix entodonta* was often recognised as different from *Systrophia* L. Pfeiffer, 1855 by its small size and presence of plicae (e.g., PFEIFFER 1859a, 1959b, GUDE 1920). However, many decades passed before WEYRAUCH (1960) described *Zilchistrophia* and, several decades more before *Helix entodonta* was included in that genus (this study).

The decision to move *H. entodonta* to *Zilchistrophia* has little impact on the definition of *Zilchistrophia*. However, the conchological differences with *Systrophia* became more evident. *Helix entodonta* was to our knowledge the only member of *Systrophia* with internal plicae. RAMIREZ (1993) already used the absence or presence of internal plicae as a main difference between *Systrophia* and *Zilchistrophia* and this point of view is further solidified herein. Moreover, the small size also seems characteristic for *Zilchistrophia*, as most known true species of *Systrophia* (and all *Systrophia* species known from Ecuador) are two times as large (BREURE et al. 2022). An exception to this rule is *Systrophia argentina* (Strobel, 1874), a species from central Argentina, which is only 6 mm wide and has less whorls than typical adult *Systrophia* (5.5 whorls compared to >8). Based on this, it is possible that *S. argentina* is not a true species of *Systrophia* ei-

ther. However, MIQUEL (2020) does not report plicae in this species, so placement in *Zilchistrophia* is also unlikely. Research into its genetics will be needed to resolve the position of this species, which for now should be best kept in *Systrophia*.

The new combination of *Z. entodonta* comb. nov. also affects the interpretation of *Entodina* Ancey, 1887, as the size becomes an additional argument to separate *Entodina* from *Systrophia*. The DNA results presented by SALVADOR (2021) already indicated that *Entodina*, currently often regarded as a synonym or subgenus of *Systrophia*, is a separate genus more closely related to *Ridleyconcha* Christensen, 2020. SALVADOR (2021) hesitated to elevate *Entodina* back to the genus level, as he did not examine the type species. However, without including *Z. entodonta* in *Systrophia*, the shell characteristics and size also support separation at the genus level, since true *Entodina* are small (5.3 mm), have only ca. 5 whorls as adults and a sculpture generally consisting of numerous axial ribs and microscopic spiral grooves (Figs 6–10, based on the types of *Entodina reyrei* (Souverbie, 1858)). In addition, *Entodina reyrei* has at least one set of five plicae at 1/6 of a whorl from the aperture: two parietal plicae, two palatal plicae and one basal plica. These plicae will be imaged and discussed more



Figs 6–10. *Entodina reyrei* (Souverbie, 1858): 6–8 – syntype (MHNbX 2008.16975.3), Guayaquil, Ecuador, photographs taken by LAURENT CHARLES: apical (6), frontal (7) and adapical (8) views; 9–10 – syntype (MCZ 141466), Guayaquil, Ecuador, photographs taken by WILLIAM BRISTER and JENNIFER TRIMBLE: apical (9) and adapical (10) view. Scale bar 5 mm

properly in an upcoming paper. Considering these shell characteristics and the results of SALVADOR (2021), we propose to elevate *Entodina* back to the genus level like ANCEY (1887) intended.

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