

Salvation and documentation: additional (probable) type material of South American land-snail species (Gastropoda, Stylommatophora) in the Museum für Naturkunde Berlin

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Abstract. Type material of some South American species in the Museum für Naturkunde Berlin, belonging to different families is documented. It includes 16 species: *Bulimus cuneus* L. Pfeiffer, 1854, *Bulimus proteus* Broderip, 1832, *Bulimus scarioides* L. Pfeiffer, 1867, *Bulimus similis* J. Moricand, 1856, *Andinia (Ehrmanniella) dedicata* Weyrauch & Zilch, 1954, *Helix hetneriana* E. von Martens, 1897, *Eurycampta hidalgonis* Döring, 1877, *Helix aequatoris* L. Pfeiffer, 1860, *Helix bituberculata* L. Pfeiffer, 1853, *Helix bourcierii* L. Pfeiffer, 1853, *Helix neogranadensis* L. Pfeiffer, 1845, *Cyclostoma (Cyclophorus) bourcierii* L. Pfeiffer, 1854, and *Helix platygyra* Albers, 1857. The concept of the “salvation” of type material is explained.

Key words. Achatinidae, Bulimulidae, Clausiliidae, Epiphragmophoridae, Labyrinthidae, Neocyclotidae, Scolodontidae

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INTRODUCTION

Type specimens are essential in taxonomy, especially in revisions and descriptions of new taxa. However, type material was usually not specified by the describing authors in the 18th and 19th centuries when the type concept was fluid. Authors sometimes renamed species if they thought its given name was not properly latinised (see for example several unjustified emendations introduced by Crosse; Breure et al. 2022b) or would better applied to another species. This practice continued until 1895 when the third International Congress of Zoology developed a system of rules to stabilise the use of scientific names and the International Commission of Zoological Nomenclature (ICZN) was established. Thus, working in historical collections, especially those formed before 1895, is sometimes challenging. Authors often kept in their personal collection the specimens on which they based their species' descriptions, and after their death these type specimens were in many cases sold or auctioned off. Despite lists that provide some guidance to the depositories where type material of authors currently may be expected (Sherborn 1940; Dance 1986; Ablett et al. 2019), types are

sometimes found in unexpected collections; these lists can be incomplete and uneven in their accuracy (Taylor 2016). Therefore, inventories or catalogues of types, as complete as possible, provide important guidance to current and future taxonomists.

This paper lists a small number of (possible) types of Neotropical species in the Museum für Naturkunde Berlin and is a supplement to, for example, Kilius (1961), Köhler (2007), Richling & Glaubrecht (2008), Glaubrecht & Zorn (2012), and Breure (2013). It also gives reference to type material of the same species in other museums.

MATERIAL AND METHODS

The material was examined during a visit to the Museum für Naturkunde Berlin (ZMB, with registration numbers prefixed with ZMB/Moll) to study land snails from South America, especially those from Ecuador and Peru. Specimens of a number of taxa were digitally photographed to allow for further study and documentation. Measurements were taken with digital vernier callipers. Other type material,



Figure 1. *Protobeliscus fairmaireanus* (Petit de la Saussaye, 1853). A–C, syntype of *Bulimus cuneus* L. Pfeiffer, 1854, ZMB/Moll 264723. D, labels, showing provenance. Scale bar: 10 mm.

when it exists, was located in other museums via personal access, the literature, or internet sources. The current names and systematics follow MolluscaBase (2023) unless stated otherwise. Scale bars are provided in the figures.

Additional abbreviations. Br.Mdg., diameter aperture; D, shell diameter; H, shell height; H.Mdg., height aperture. IFML, Instituto y Fundación Miguel Lillo, Tucumán, Argentina; MHNG, Muséum d'histoire naturelle, Geneva, Switzerland; MNHN, Muséum national d'Histoire naturelle, Paris, France; NHM/NHMUK, Natural History Museum London, U.K.; SMF, Senckenberg Natur-Museum, Frankfurt am Main, Germany.

SYSTEMATICS

Family Achatinidae Swainson, 1840

Genus *Protobeliscus* Pilsbry, 1906

Protobeliscus fairmaireanus (Petit de la Saussaye, 1853)

Figure 1A–D

Bulimus cuneus Pfeiffer 1854: 154.

Type locality. “in ripis fluvii Mira, reipublicae Aequatoris”.

Label. “Quito”, ex Albers ex Cuming.

Dimensions. “Long. 63, diam. 16 mill.”; figured specimen H 50 mm.

Type material. ZMB/Moll 264723, one probable syntype.

Remarks. Río Mira is in the department of Valle del Cauca, Colombia, but there is a second river with the old name of río Mira (now río San Juan) on the border of the provinces of Carchi and Esmeraldas in Ecuador. See Breure et al. (2022a: 93) for the distribution of *P. fairmaireanus* in Ecuador and Linares & Vera (2012: 212) for Colombian localities. Although the label shows “Quito”, this should be interpreted as a proxy for an unknown locality in Ecuador; in 19th century malacology, it was typical to indicate localities by the capital of a country or even only the name of a country. Pfeiffer did not state the number of specimens on which the description was based. There is no label with the handwriting of Pfeiffer. Three syntypes labelled with the precise type locality are in NHM (NHMUK 1985073).

Family Bulimulidae Tryon, 1867

Genus *Scutalus* Albers, 1850

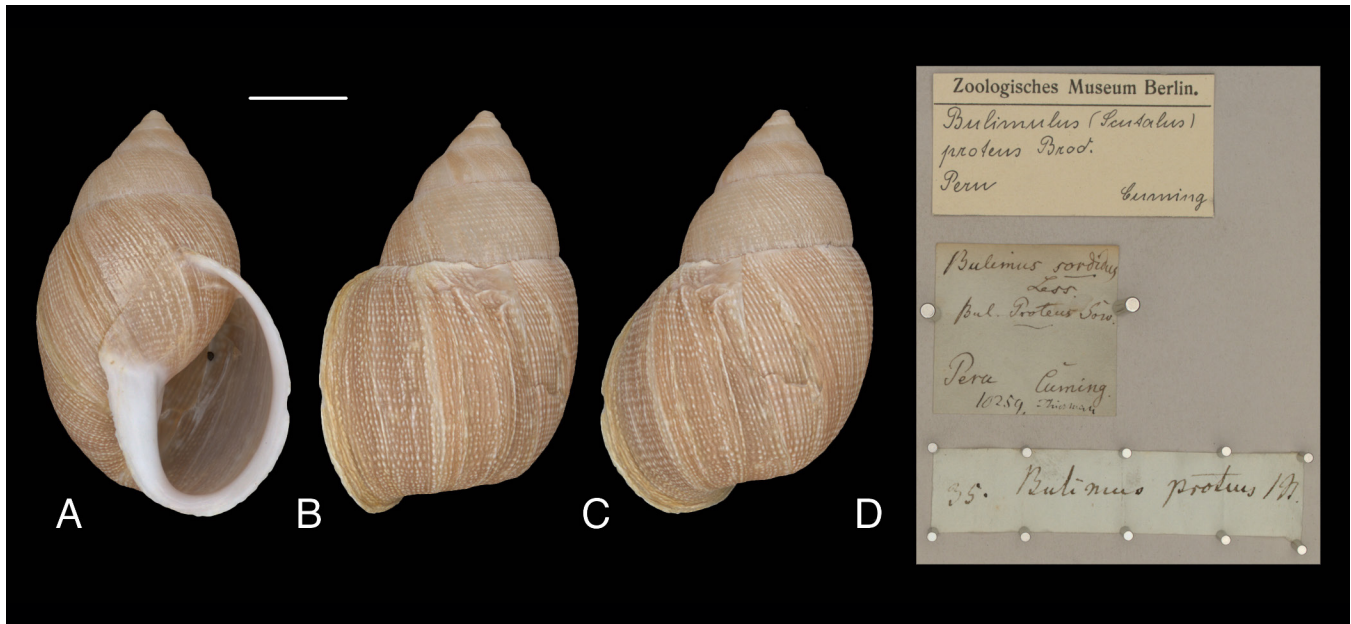


Figure 2. *Scutalus proteus* (Broderip, 1832). A–C, Paralectotype ZMB/Moll 10259. D, labels, showing provenance. Scale bar: 10 mm.

Scutalus proteus (Broderip, 1832)

Figure 2A–D

Bulimus proteus Broderip in Broderip & Sowerby I 1832: 107.

Type locality. “in Peruvia montibus (St. Jacina, near Samanca)”.

Label. “Peru”, ex Cuming.

Dimensions. “long. $1^{8/9}$, lat. $1^{2/10}$ poll” [H 47.8, D 30.4 mm]; figured specimen H 41 mm.

Type material. ZMB/Moll 10259, four paralectotypes.

Remarks. Broderip described this species using material received from the Cuming collection. The number of specimens on which the description was based is unknown. Köhler (2007: 141) found one lot (ZMB 112702) in the Albers collection with the same locality, and he considered this specimen to be a “probable syntype”. Breure & Ablett (2014: 157, figs 66A, B, L49i) found specimens in the Cuming collection with a similar label from which they selected a lectotype (NHMUK 20100638); there are three paralectotypes.

Genus *Bostryx* Troschel, 1847

Bostryx scalariodes (L. Pfeiffer, 1867)

Figure 3A–D

Bulimus scalariodes Pfeiffer 1867: 77.

Type locality. “in provincia Conchucos”.

Label. “Peru: Prov. Conchucos”, [ex Pfeiffer ex Philippi], Raimondi leg.

Dimensions. “Long. $12^{1/2}$, diam. 5 mill. Apert. 5 mill. longo, $2^{2/3}$ lata”; figured specimen H 11 mm.

Type material. ZMB/Moll 264727, one syntype.

Remarks. This was material collected by Antonio Raimondi (1826–1890) for Philippi, who apparently sent it to Pfeiffer. Pfeiffer did not state the number of specimens on which the description was based. Although it is likely that this syntype came from the Pfeiffer collection, we do not know the complete provenance of the specimen, and there is no label in Pfeiffer’s handwriting. As far as we know, there is no additional type material in other museums.

Genus *Drymaeus* Albers, 1850

Drymaeus similaris (J. Moricand, 1856)

Figure 4A–D

Bulimus similaris Moricand 1856: 177, pl. 6 fig. 8.

Type locality. “Moyobamba”.

Label. “Peru, Terapolo”, ex Albers ex J. Moricand.

Dimensions. “Haut. 23 à 25 mill. Larg. 10 mill.”; figured specimen H 23 mm.

Type material. ZMB/Moll 264729, two probable syntypes.

Remarks. Moricand did not state the number of specimens on which the description was based. The label has a misspelled locality, and “Terapolo” should be Tarapoto, which is near Moyobamba, Peru. In MHNG, Breure (2016: 82, fig. 51) found seven syntypes in the Moricand collection (MHNG-MOLL-63531).

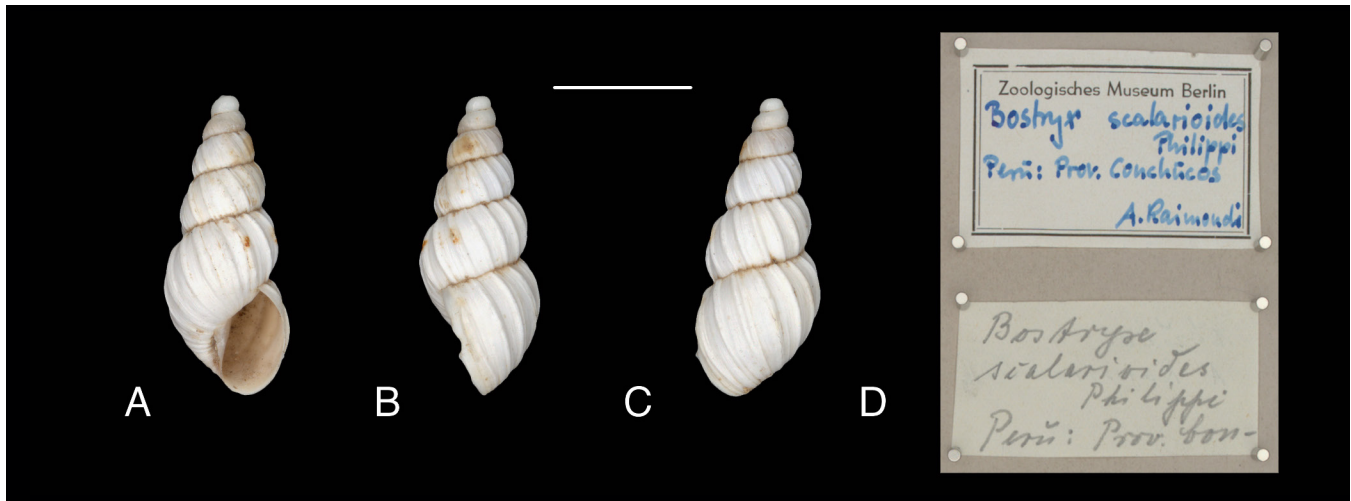


Figure 3. *Bostryx scalarioides* (L. Pfeiffer, 1867). A–C, syntype ZMB/Moll 264727. D, labels, showing provenance. Scale bar: 5 mm.

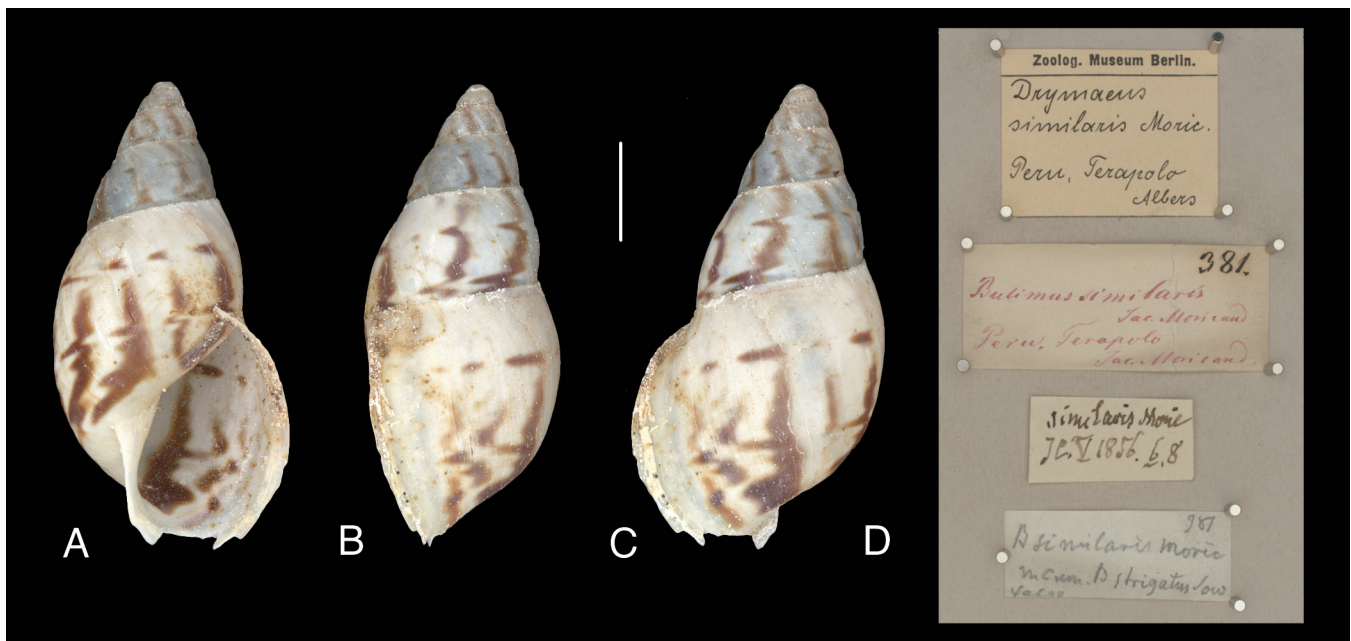


Figure 4. *Drymaeus similaris* (J. Moricand, 1856). A–C, syntype ZMB/Moll 264729. D, labels, showing provenance. Scale bar: line 5 mm.

Family Clausiliidae J.E. Gray, 1855

Genus *Brevinenia* Neubert & H. Nordsieck, 2005

Brevinenia dedicata (Weyrauch & Zilch, 1954)

Figure 5A–E

Nenia (*Andinia*) *zilchi* Weyrauch ms.

Andinia (*Ehrmanniella*) *dedicata* Weyrauch & Zilch in Zilch 1954: 68, fig. 5, pl. 5 fig. 5.

Type locality. “Peru, An der Landstrasse von Cerro de Pasco nach Huanuco, 3800 m Höhe, im Tale des Rio Payanchan, eine Zufluss des Rio Huallaga”.

Label. “An Landstrasse von Cerro de Pasco nach Huanuco, 3800 m (im Zuflusssystem des Huallaga), Peru”, ex Blume ex Weyrauch, Weyrauch leg.

Dimensions. The dimensions of eight specimens were listed in a table. H 11.9–14.0, D 4.0–4.5, H.Mdg. 3.5–3.8, Br.Mdg. 3.0–3.5 mm; figured specimen H 14 mm.

Type material. ZMB/Moll 97381, one paratype.

Remarks. This material was distributed under an earlier, manuscript name; the distribution of material under manuscript names was a common practice of Weyrauch (see Breure & Neubert 2008; Breure 2012). This paratype was



Figure 5. *Brevinenia dedicata* (Weyrauch & Zilch, 1954). A–C, paratype ZMB/Moll 97381. D, E, labels, showing provenance. Scale bar: 5 mm.

received by W. Blume, possibly as part of the paratype material that was in Weyrauch's personal collection (Zilch 1954: 70). Other type material consists of the holotype (SMF 135515), 10 paratypes in SMF (SMF 69816, nine paratypes; SMF 139781, one paratype), and 42 paratypes in Weyrauch's personal collection, which could not be located in the IFML collection.

Family Epiphragmophoridae Hoffmann, 1928

Genus *Epiphragmophora* Döring, 1875

Epiphragmophora claromphalos (Deville & Hupé, 1850)

Figure 6A–E

Helix hettneriana E. von Martens 1897: 40, pl. 7 figs 15–17.

Type locality. “Peru, zwischen Limatambo und Cucahuani und bei Abancay, 1500–2000 Meter hoch”.

Label. “Peru, Zw. Limatambo u. Curahuari u. bei Abancay 1500–2500m”, Hettner leg.

Dimensions. “Diam. maj. 19–21; min. 16–18; alt. 8–9, apert. Diam. $9^{1/2}$ lat. 7 Mill.”; figured specimen D 31 mm.

Type material. ZMB/Moll 44676, one syntype.

Remarks. The locality is partially misspelled; Curahuasi is the correct name of a place in Abancay Province, Apurimac Department, Peru. Some of the labels are in the handwriting of Martens. In MolluscaBase (2023) this taxon is listed as uncertain and unassessed, but, on account of a label written in an unknown hand, *H. hettneriana* is tentatively placed in the synonymy of *E. claromphalos*. The MNHN has one lot containing three syntypes of this species (MNHN-IM-2000-28799; MNHN 2023).

Epiphragmophora trenquelleonis (L. Pfeiffer, 1850)

Figure 7A–H

Eurycampta hidalgonis Döring 1877: 315—Döring 1878: 234.

Type locality. “la 3^a Sierra de Aconjigasta (Pocho)”.

Label. “Sierra de Aconjigasta”, ex Döring.

Dimensions. “Diam. may. 20–29^{mm}; min. 16–24^{mm}; alt. 10–16^{mm}”; figured specimen D 27 mm.

Type material. ZMB/Moll 28500, three paralectotypes.

Remarks. Figure 7 shows two of three specimens; E and F shows a second specimen which has a different shape in lateral view. The third specimen is broken. The date of publi-

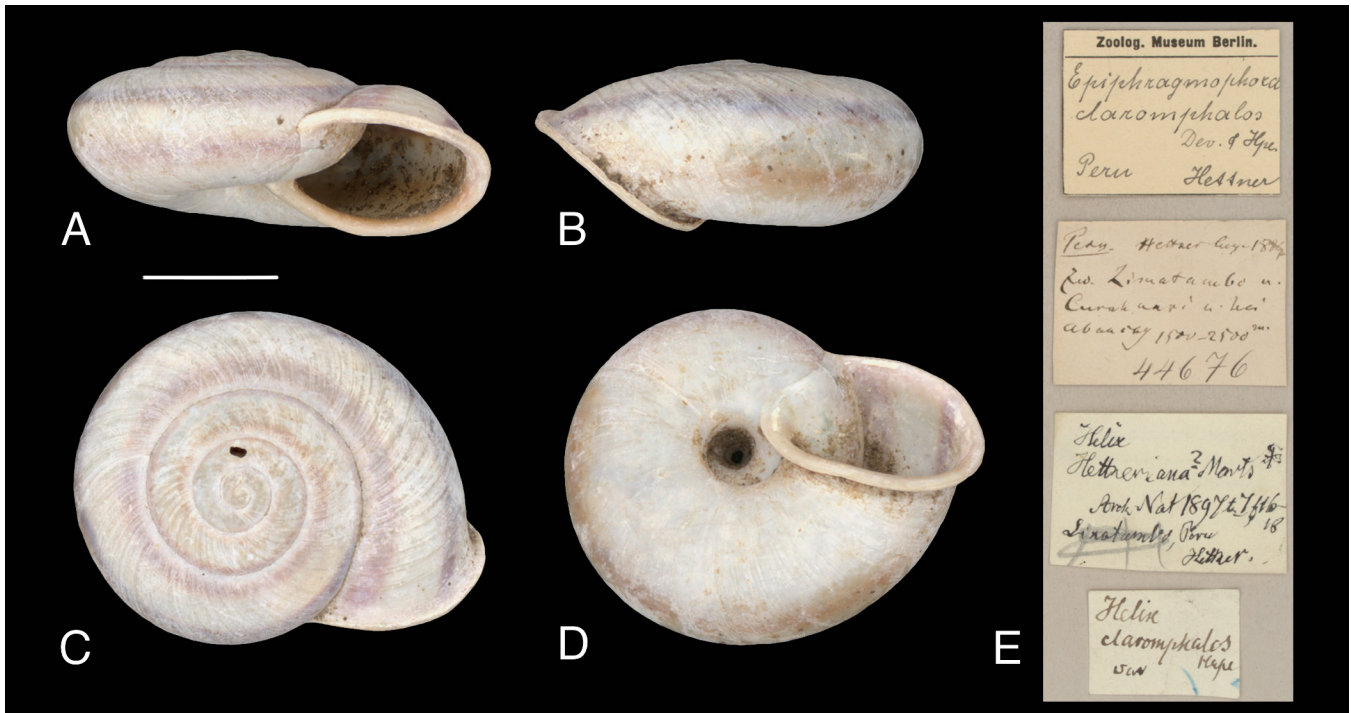


Figure 6. *Epiphragmophora claromphalos* (Deylle & Hupé, 1850). A–D, syntype of *Helix hettneriana* E. von Martens, 1897, ZMB/Moll 44676. E, labels, showing provenance. Scale bar: line 10 mm.

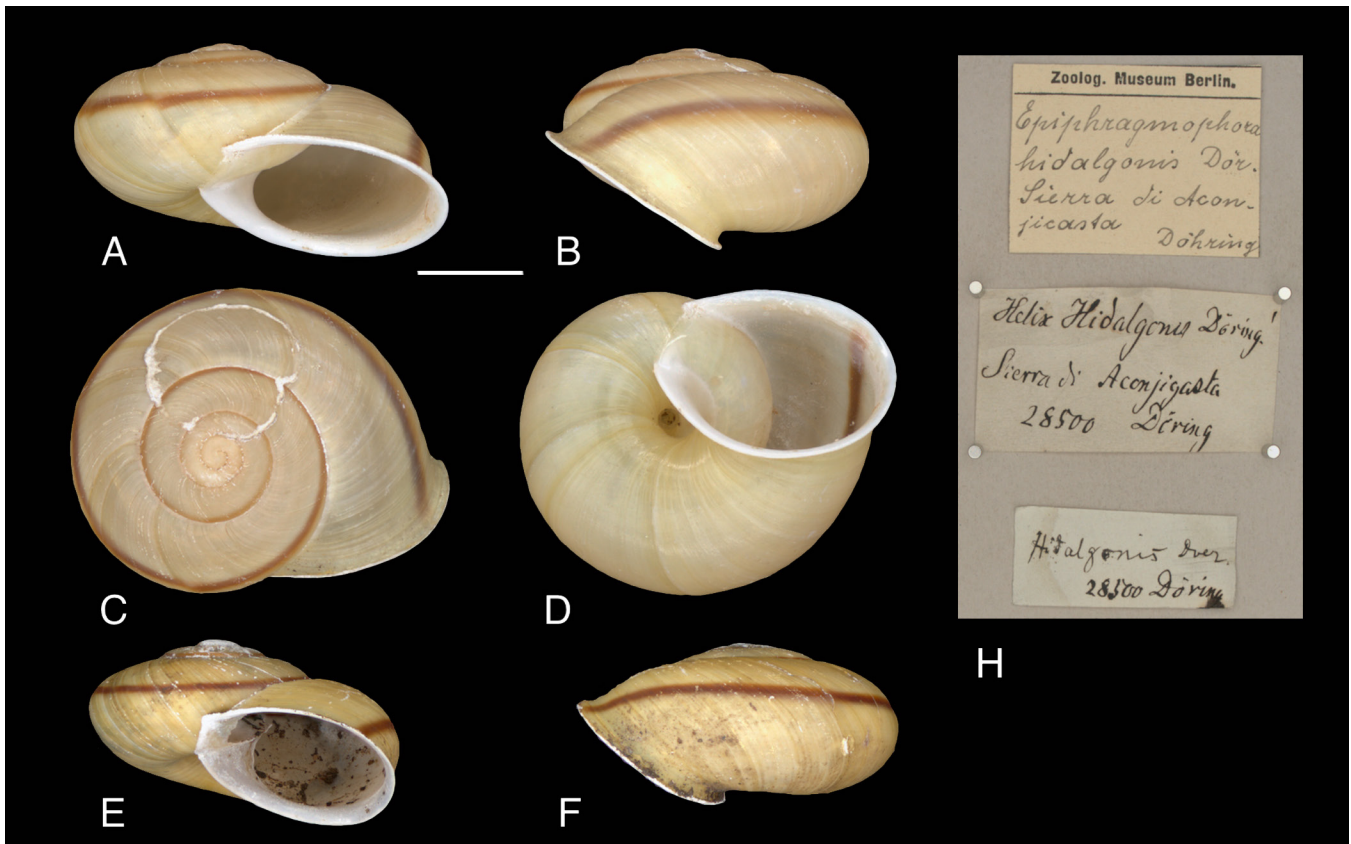


Figure 7. *Epiphragmophora tranquilleonis* (L. Pfeiffer, 1850). A–G, syntypes of *Eurycampta hidalgonis* Döring, 1877, ZMB/Moll 28500. H, labels, showing provenance. Scale bar: line 10 mm.



Figure 8. *Isomeria aequatoria* (L. Pfeiffer, 1860). A–D, probable syntype ZMB/Moll 264728. E, labels, showing provenance. Scale bar: line 10 mm.

cation of Döring's taxon has been frequently misinterpreted due to the complex and confusing history of the journal in which it was published. Breure & Miquel (2012) have provided an overview of relevant papers by Döring, with details on their dates of publication. Döring (1877: 316, 1878: 235) also described in the same publications the variety *minor*, so the dimensions of the nominotypical species are thus at the larger end of the ranges quoted above. The lectotype is in SMF (SMF 7708) and was figured by Cuzzo (2006: 153, fig 6B), who erroneously gave 1875 as the year of description.

Family Labyrinthidae Borrero, Sei, D.G. Robinson & Rosenberg, 2017

Genus *Isomeria* Albers, 1850

***Isomeria aequatoria* (L. Pfeiffer, 1860)**

Figure 8A–E

Helix aequatoris Pfeiffer 1860: 133, pl. 50 fig. 6.

Type locality. "Republic of Ecuador".

Label. "Quito", ex Dunker ex Cuming.

Dimensions. "Diam. maj. 38, min. 32, alt. 20 mill."; figured specimen 34 mm.

Type material. ZMB/Moll 264728, one syntype.

Remarks. See above for the explanation of the locality "Quito". Pfeiffer did not state the number of specimens on which the description was based. There is no label with the handwriting of Pfeiffer. Three syntypes labelled with the precise type locality are in NHM (NHMUK 20190602).

***Isomeria bituberculata* (L. Pfeiffer, 1853)**

Figure 9A–E

Helix bituberculata Pfeiffer 1853: 242.

Type locality. "prope Tunguragua reipublicae Aequatoris".

Label. "Quito", ex Albers ex Cuming respectively ex Dunker ex Cuming.

Dimensions. "Diam. maj. 22, min. 18^{1/2}, alt. 12 mill."; figured specimen D 25 mm.

Type material. ZMB/Moll 264712, 264775, one syntype each; 264799, one probable syntype.

Remarks. See above for the explanation of the locality "Quito". Pfeiffer did not state the number of specimens on which the description was based. There is no label with the handwriting of Pfeiffer. Three syntypes labelled with the precise type locality are in NHM (NHMUK 20160369).

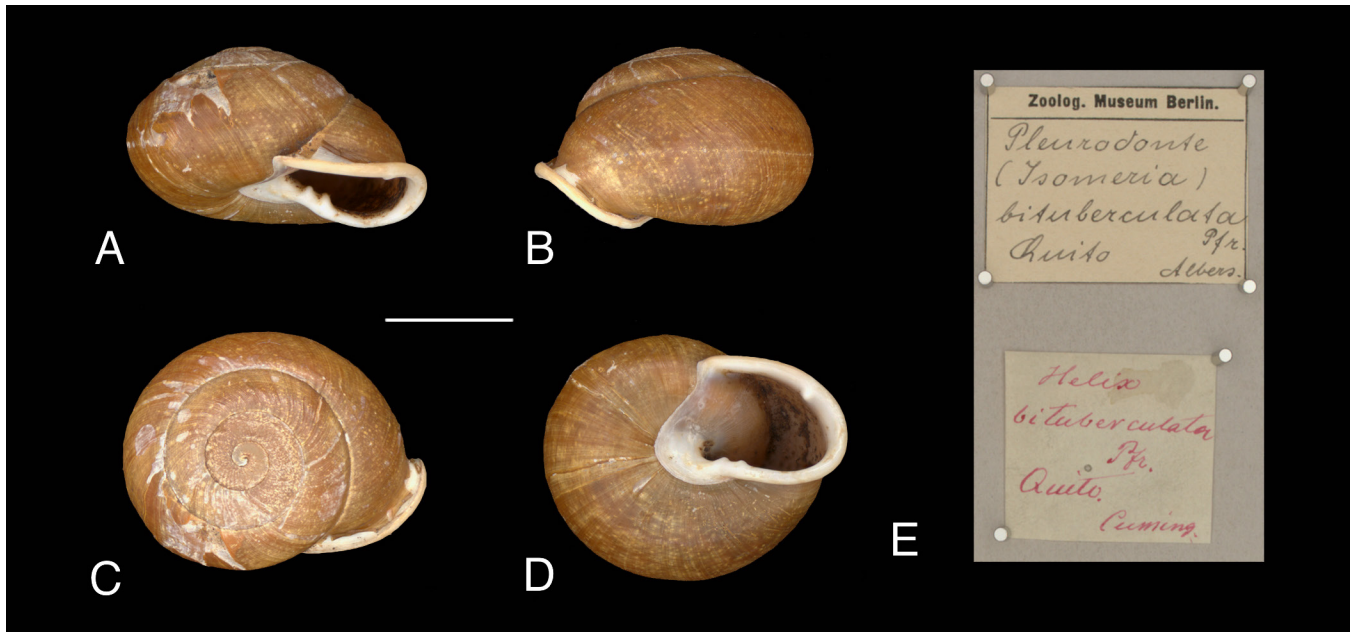


Figure 9. *Isomeria bituberculata* (L. Pfeiffer, 1853). A–D, probable syntype ZMB/Moll 264775. E, labels, showing provenance. Scale bar: line 10 mm.

***Isomeria bourcieri* (L. Pfeiffer, 1853)**

Figure 10A–E

Helix bourcieri Pfeiffer 1853: 209.

Type locality. “Otoralo reipublicae Aequatoris”.

Label. “Otorale”, ex Pfeiffer ex Cuming, Bourcier leg. respectively “Otoralo”, ex Albers ex Cuming.

Dimensions. “Diam. maj. 34, min. 27, alt. 18 mill.”; figured specimen D 22 mm.

Type material. ZMB/Moll 65897, 264736, respectively one, and two syntypes.

Remarks. Pfeiffer did not state the number of specimens on which the description was based. There is no label with the handwriting of Pfeiffer. The locality was mislabelled and refers to Otovalo in the province of Imbabura, Ecuador. Three syntypes labelled with the same mislabelled type locality are in NHM (NHMUK 20160370).

***Isomeria hartwegi* (L. Pfeiffer, 1846)**

Figure 11A–I

Helix hartwegi Pfeiffer 1846: 126.

Type locality. “El Catamajja, near Loxa, republic of the Equator”.

Label. “Loja, Ecuador”, ex Pfeiffer.

Dimensions. “Diam. 23, alt. 12 mill.”; figured specimen D 25 mm.

Type material. ZMB/Moll 65942, two syntypes.

Remarks. Pfeiffer did not state the number of specimens on which the description was based. There is no label with the handwriting of Pfeiffer. The locality refers to Catamayo, in the province of Loja, Ecuador. Three syntypes labelled with the precise type locality are in NHM (NHMUK 1966598).

***Isomeria jacksoni* Solem, 1966**

Figure 12A–E

Helix atrata Pfeiffer 1854: 153.

Type locality. “Puntophaya reipublicae Aequatoris”.

Label. “Puntaphaya”, ex Pfeiffer ex Cuming, Bourcier leg.

Dimensions. “Diam. maj. 44, min. 37, alt. 19 mill.”; figured specimen D 42 mm.

Type material. ZMB/Moll 65891, one syntype.

Remarks. Pfeiffer did not state the number of specimens on which the description was based. There is no label with the handwriting of Pfeiffer. The locality was mislabelled and refers to Puntoplaya in the province of Los Rios, Ecuador (see Breure et al. 2022a: 218). Three syntypes labelled with the same mislabelled type locality are in NHM (NHMUK 20160372).

***Isomeria neogranadensis* (L. Pfeiffer, 1845)**

Figure 13A–E

Helix neogranatensis Pfeiffer 1845: 64.

Helix neogranadensis Pfeiffer 1847 [1847–1848]: 296.

Type locality. “in the mountain Quendeu at New Granada”.

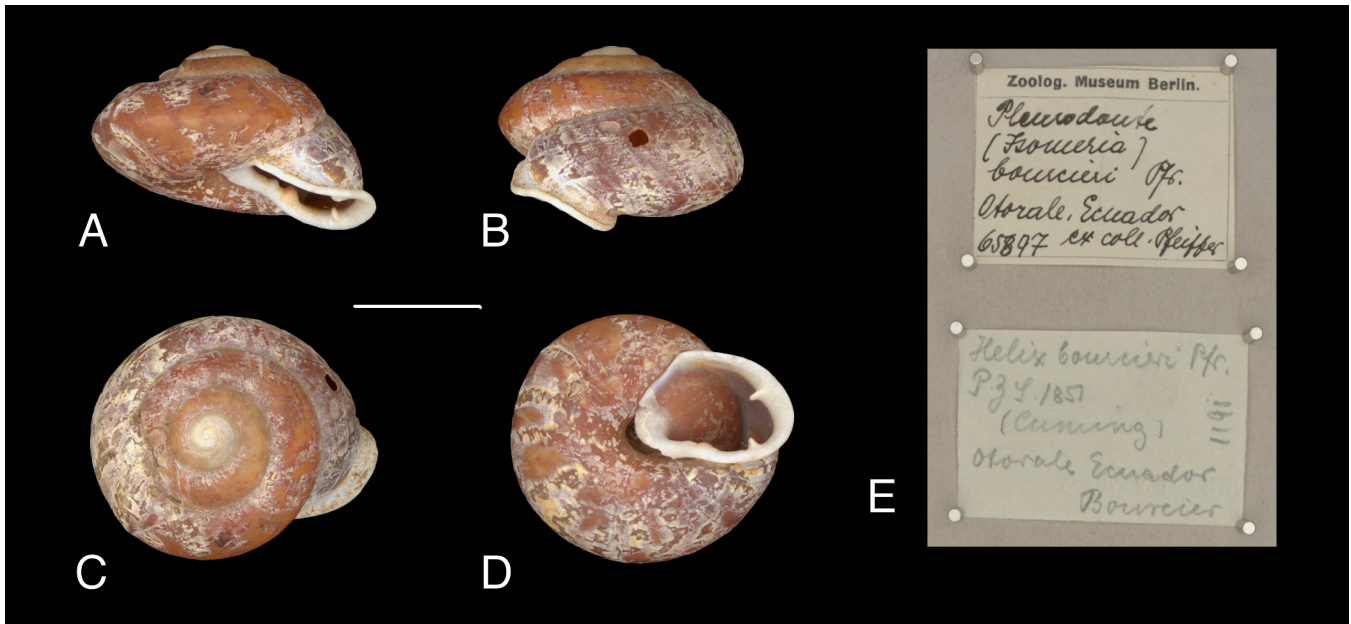


Figure 10. *Isomeria bourcierii* (L. Pfeiffer, 1853). A–D, syntype ZMB/Moll 65897. E, labels, showing provenance. Scale bar: line 10 mm.



Figure 11. *Isomeria hartwegi* (L. Pfeiffer, 1846). A–H, syntypes ZMB/Moll 65942. I, labels, showing provenance. Scale bar: line 10 mm.



Figure 12. *Isomeria jacksoni* Solem, 1966. A–D, syntype ZMB/Moll 65891. E, labels, showing provenance. Scale bar: line 10 mm.

Label. “Monte Quenden, Neu Granada”, ex Pfeiffer ex Cuming.

Dimensions. “Diam. 34, alt. 15 mill.”; figured specimen D 24 mm.

Type material. ZMB/Moll 65899, one syntype.

Remarks. The original name was an “inadvertent error for ‘neogranadensis’” (MolluscaBase 2023). The locality is misspelled and refers to the Quindio Mountains in the Department of Quindío, Colombia (see also the remark by Breure et al. 2022a: 220). Pfeiffer did not state the number of specimens on which the description was based. There is no label with the handwriting of Pfeiffer. Pfeiffer (1847: 296) mentioned “Mus. Cuming” as the source, but material in NHM has not been located.

Family Neocyclotidae Kobelt & Möllendorff, 1897

Genus *Calaperostoma* Pilsbry, 1935

***Calaperostoma bourcier* (L. Pfeiffer, 1854)**

Figure 14A–E

Cyclostoma (*Cyclophorus*) *bourcier* Pfeiffer 1854: 151.

Type locality. “prope Mindo, reipublicae Aequatoris”.

Label. “Mindó, Ecuador”, ex Pfeiffer [ex Cuming], Bourcier leg.

Dimensions. “Diam. maj. 19, min. 15, alt. 9 mill.”; figured specimen D 15 mm.

Type material. ZMB/Moll 65721, one syntype.

Remarks. Pfeiffer did not state the number of specimens on

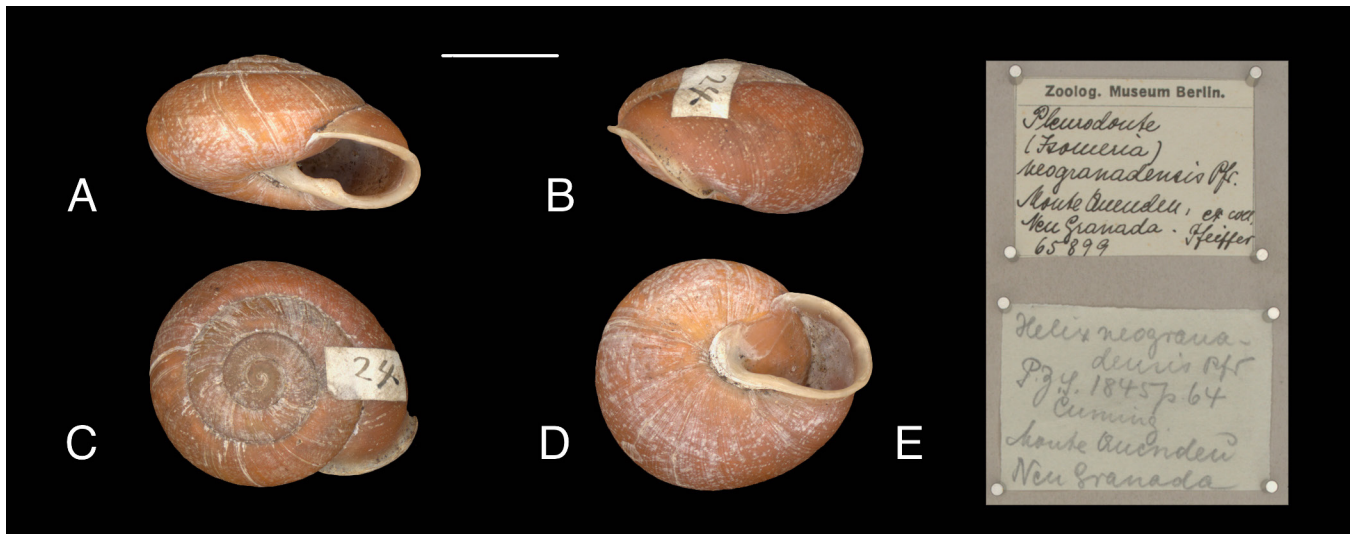


Figure 13. *Isomeria neogranadensis* (L. Pfeiffer, 1845). A–D, syntype ZMB/Moll 65899. E, labels, showing provenance. Scale bar: line 10 mm.

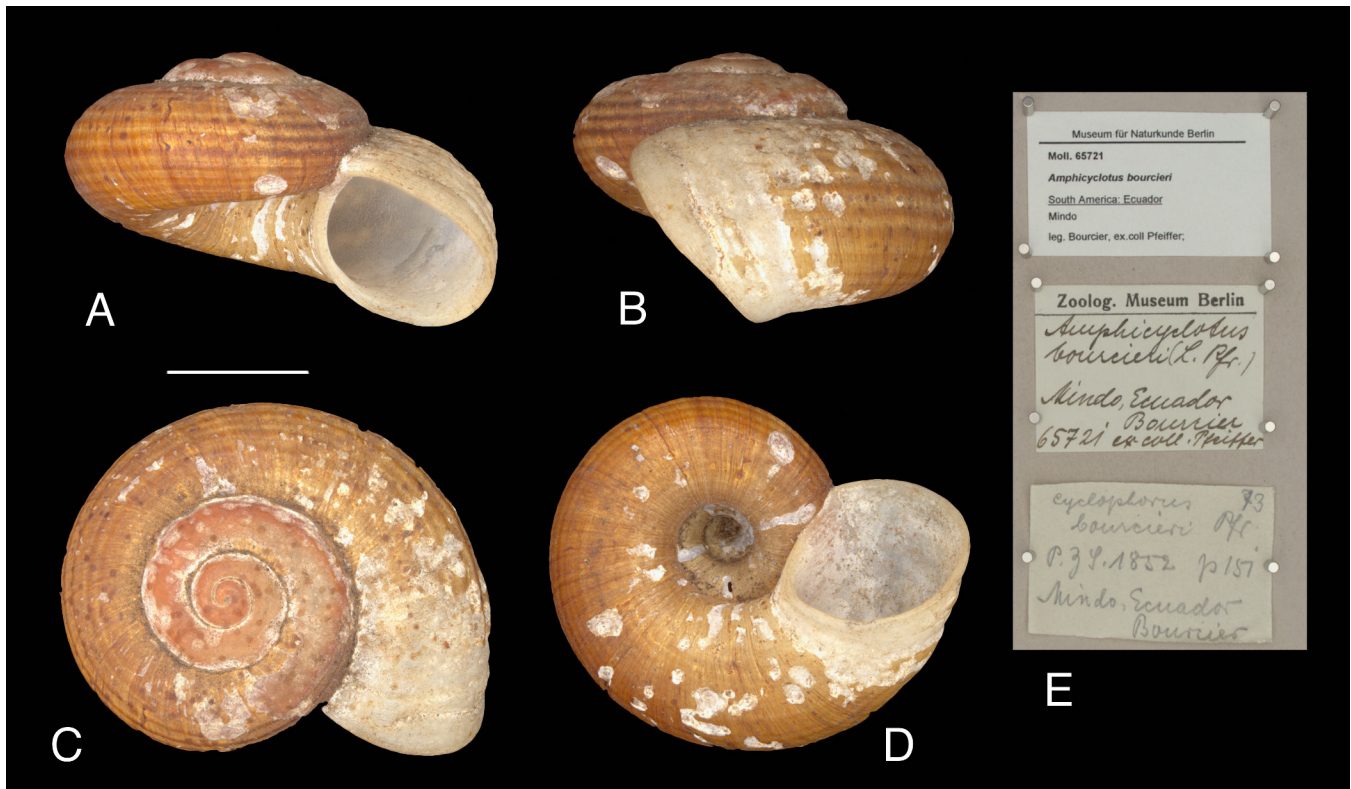


Figure 14. *Calaperostoma bourcierii* (L. Pfeiffer, 1854). A–D, syntype ZMB/Moll 65721. E, labels, showing provenance. Scale bar: line 5 mm.

which the description was based. There is no label with the handwriting of Pfeiffer. Two syntypes labelled with the precise type locality are in NHM (NHMUK 20190595).

Family Scolodontidae H.B. Baker, 1925

Genus *Systrophia* L. Pfeiffer, 1855

***Systrophia platygyra* (Albers, 1857)**

Figure 15A–I

Helix platygyra Albers 1857: 94.

Type locality. “Colombia, ad fluvium Maranhon”.

Label. “Columbien (Oberen Maranhon”, ex Albers, Warszawa leg.



Figure 15. *Systrophia platygyra* (Albers, 1857). A–H, syntypes ZMB/Moll 264702. I, labels, showing provenance. Scale bar: line 5 mm. The purple ink (“5465”) is characteristic of the Albers collection.

Dimensions. “Diam. maj. 12, min. 10, alt. 3 millim.”; figured specimen D 12 mm.

Type material. ZMB/Moll 264702, three specimens, including two syntypes.

Remarks. One of the three specimens is damaged at the aperture, and a second one at the central pillar. The material was collected by Józef Warszewicz (1812–1866), one of the most prolific nineteenth-century plant collectors and one of the top field experts on tropical American plants of his time who spent several years on expeditions to Central and South America (Köhler 2014). We tried in vain to get details of Warszewicz’s itinerary in Peru from Jagiellonian University in Kraków where, beginning in 1854, he was the main gardener at the university’s botanical garden. Albers did not state on how many specimens his description was based. Type material in other depositories is not known to us.

DISCUSSION

Under the International Code of Zoological Nomenclature, “The type series of a nominal species-group taxon consists of all the specimens included by the author in the new nominal taxon” (ICZN 1999, Article 72.4.1, partim). However, this is not always in accord with the practice of, for example, 19th century authors, who frequently did not list type material in their publications. Article 72.4.1.1 rules that “any evidence, published or unpublished, may be taken into account to determine what specimens constitute the type series”, but this may lead to differing interpretations of the type locality. Also the provenance may leave several options open, especially if it is incomplete and cannot be traced back to the original source. Those who favour a narrow interpretation will argue that the type locality of taxon must literally follow the wording in the original publication and a direct link

to the describing author must be present in the specimen data. On the other hand, there are those who recognise that the type locality need not follow the exact original wording, or that provenance and the association of specimens to the describing author can be assumed. This broader approach to interpretation may be called “salvation” (dixit Eike Neubert) and allows for the possibility to “rescue” material from historical collections that otherwise would not count as type material if a narrower interpretation is followed. In the material discussed in this paper there are two cases—*Bulimus cuneus* and *Helix bituberculata*—where the type locality is broader than that given in the original publications. Therefore, we consider the specimens as probable syntypes, and we prefer to salvage them as type material rather to leave them in oblivion. For several taxa, a link to the describing author cannot be directly demonstrated (e.g. when there is no taxon name in the handwriting of Pfeiffer), but documentation (i.e. that Cuming was the source) makes it defensible to consider the specimens as types. In these cases we find enough evidence to consider specimens as *probable* syntypes. In the past we have found slightly more problematic lots. For example, specimens of *Bulimus josephus* Angas, 1878 have a provenance ex Angas but are labelled “Talamanca Costa Rica”, while the original type locality was San José, Costa Rica (Angas 1878). Although Talamanca currently is a small district within San José, there is also a second-order division within Limón Province and a place of the same name near the border with Panama. Therefore, in this case, we have chosen to consider the specimens of this lot as *possible* syntypes (Breure & Ablett 2014: 100). Finally, there are circumstances when material is not considered as type material but there is evidence for a direct link to the describing author (e.g. a taxon label in his handwriting). This material may be called *ex auctore* and could be a source for a neotype selection if the original type series is lost.

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REFERENCES

- ABLETT JD, BROWN C, GALLICHAN J, GORDON D, HOLMES AM, HUNTER T, MACHIN R, MORGENROTH H, OLIVER PG, PETTS

- R, PYE S, REILLY M, ROWSON B, SALVADOR A, SUTCLIFFE R, TURNER JA, WOOD H. 2019. S.P. Dance Guide to collections. In: *Mollusca types in Great Britain*. Available at <https://gbmolluscatypes.ac.uk/media/Guide-to-Collections-20-Mar-2018.xlsx> (accessed 17 August 2023).
- ALBERS JC. 1857. Diagnosen neuer Heliceen mit gelegentlicher Berichtigung einiger älteren Arten. *Malakozoologische Blätter* 4: 89–100, pls 1, 2.
- ANGAS GF. 1878. Descriptions of seven new species of land-shells recently collected in Costa Rica by Mr. Adolphe Boucard. *Proceedings of the Zoological Society of London* 1878: 72–74. doi:10.1111/j.1469-7998.1878.tb07929.x
- BREURE ASH. 2012. Weyrauch's type localities: a clarification; with illustrations of types of Orthalicidae (Mollusca, Gastropoda, Stylommatophora) in the Tucumán museum. *Folia Conchyliologica* 17: 4–24.
- BREURE ASH. 2013. Annotated type catalogue of the Orthali-coidea (Mollusca, Gastropoda) in the Museum für Naturkunde, Berlin. *ZooKeys* 279: 1–101. doi:10.3897/zookeys.279.4701
- BREURE ASH. 2016. Annotated type catalogue of the Orthali-coidea (Mollusca, Gastropoda, Stylommatophora) in the Muséum d'histoire naturelle, Geneva. *Revue suisse de Zoologie* 123: 57–103. doi:10.5281/zenodo.46290
- BREURE ASH, ABLETT JD. 2014. Annotated type catalogue of the Bulimulidae (Mollusca, Gastropoda, Orthali-coidea) in the Natural History Museum, London. *ZooKeys* 392: 1–367. doi:10.3897/zookeys.392.6328
- BREURE ASH, MIQUEL SE. 2012. More than a number: clarifying the dates of publication of some papers of A. Doering on land and freshwater shells from Argentina and a note on his taxon *Clessinia* (Odontostomidae). *Zootaxa* 3572: 18–22. doi:10.11646/zootaxa.3572.1.3
- BREURE ASH, NEUBERT E. 2008. A preliminary revision of Weyrauch's unpublished names: taxa of the genus *Bostryx* Tro-schel, 1847 (Gastropoda, Pulmonata, Orthalicidae). *Basteria* 72: 319–330.
- BREURE ASH, ROOSEN MT, ABLETT JD. 2022a. Land and fresh-water molluscs of mainland Ecuador: an illustrated checklist. *Iberus* 40: 1–290. doi:10.5281/zenodo.6519855
- BREURE ASH, SALVADOR A, ABLETT JD. 2022b. New taxa introduced in Mollusca and Brachiopoda. Pp. 43–295 in: Breure ASH, Audibert C, Ablett JD (Eds) *Joseph Charles Hippolyte Crosse (1826–1898), 1: biography, bibliography and new taxa introduced*. Royal Belgian Institute of Natural Science, Brussels.
- BRODERIP W, SOWERBY GB I. 1832. [The collection of shells formed by Mr. H. Cuming on the western coast of South America and the South Pacific Ocean]. *Proceedings of the Zoological Society of London* 2: 104–108.
- CUEZZO MG. 2006. Systematic revision and cladistic analysis of *Epiphragmophora* Doering from Argentina and southern Bolivia (Gastropoda: Stylommatophora: Xanthonychidae). *Malacologia* 49: 121–188. doi:10.4002/1543-8120-49.1.121
- DANCE SP. 1986. *A history of shell collecting*. E.J. Brill – Dr. W. Backhuys, Leiden.

- DEVILLE E, HUPÉ H. 1850. Descriptions des quelques coquilles nouvelles provenant de l'expédition de M. de Castelnau. *Revue et Magazine de Zoologie (Série 2)* **2**: 638–644.
- DÖRING A. [1877] “1876”. Apuntes sobre la fauna de moluscos de la República Argentina (tercera parte). *Boletín de la Academia Nacional de Ciencias Exactas en Córdoba* **2**: 300–339.
- DÖRING A. [1878] “1875”. Apuntes sobre la fauna de moluscos de la República Argentina (Tercera parte). *Periódico Zoológico* **2**: 219–258.
- GLAUBRECHT M, ZORN C. 2012. More slug(gish) science: Another annotated catalogue on types of tropical pulmonate slugs (Mollusca, Gastropoda) in the collection of the Natural History Museum Berlin. *Zoosystema and Evolution* **88**: 33–51. doi:10.1002/zoos.201200005
- ICZN. 1999. *International Code of Zoological Nomenclature, Fourth edition*. International Trust for Zoological Nomenclature, London. Available at <https://www.iczn.org/the-code/the-international-code-of-zoological-nomenclature/the-code-online/> (accessed 17 August 2023).
- KILIAS R. 1961. Die Typen und Typoide der Mollusken-Sammlung des Zoologischen Museums in Berlin. *Mittheilungen aus dem Zoologischen Museum in Berlin* **37**: 159–167. doi:10.1002/mmzn.19710470117
- KÖHLER F. 2007. Annotated type catalogue of the Bulimulinae (Pulmonata, Orthalicoidae, Bulimulidae) in the Museum für Naturkunde, Berlin. *Mittheilungen Museum für Naturkunde Berlin, Zoologische Reihe* **83**: 125–159. doi:10.1002/mmzn.200700004
- KÖHLER P. 2014. The life of Józef Warszewicz (1812–1866): the Kraków period. *Acta Baltica Historiae et Philosophiae Scientiarum* **2**: 18–36.
- LINARES EL & VERA ML. 2012. *Catálogo de los moluscos continentales de Colombia*. Universidad Nacional de Colombia, Bogotá.
- MARTENS E VON. 1897. Conchologische Miscellen I. 1. Süd-Afrikanische Binnenmollusken. 2. Aus Südamerika. 3. Landschnecken aus Neu-Guinea und den unliegenden Inseln. *Archiv für Naturgeschichte* **63** (1): 35–46.
- MNHN. 2023. Consultation des collections. Available at <https://science.mnhn.fr/all/search> (accessed 17 August 2023).
- MORICAND J. 1856. Description de quelques nouvelles espèces de coquilles de Pérou. *Journal de Conchyliologie* **5**: 175–181.
- MOLLUSCABASE. 2023. MolluscaBase. Available at <https://www.molluscabase.org/index.php> (accessed 17 August 2023).
- PETIT DE LA SAUSSAYE SAA. 1853. Description de deux coquilles nouvelles appartenant aux genres *Fusus* et *Bulimus*. *Journal de Conchyliologie* **4**: 249–251.
- PFEIFFER L. 1845. Descriptions of twenty-two new species of land-shells, belonging to the collection of H. Cuming. *Proceedings of the Zoological Society of London* **13**: 63–68.
- PFEIFFER L. [1846] “1845”. Descriptions of thirty-six new species of *Helix*, belonging to the collection of H. Cuming Esq. *Proceedings of the Zoological Society of London* **13**: 126–133.
- PFEIFFER L. 1847–1848. *Monographia heliceorum viventium. Sistens descriptiones systematicas et criticas omnium huius familiae generum et specierum hodie cognitarum. Volumen primum*. F.A. Brockhaus, Lipsiae.
- PFEIFFER L. 1850. Neue Landschnecken. *Zeitschrift für Malakozoologie* **7**: 13–15.
- PFEIFFER L. 1853. *Monographia heliceorum viventium. Sistens descriptiones systematicas et criticas omnium huius familiae generum et specierum hodie cognitarum. Volumen tertium*. F.A. Brockhaus, Lipsiae.
- PFEIFFER L. [1854] “1852”. Descriptions of nineteen new species of land shells, collected by M. Bourcier, Consul-General, Quito. *Proceedings of the Zoological Society of London* **20**: 151–156.
- PFEIFFER L. 1860. Descriptions of thirty-six new species of land-shells from Mr. H. Cuming's collection. *Proceedings of the Zoological Society of London* **28**: 133–141.
- PFEIFFER L. 1867. Nachschrift von Dr. L. Pfeiffer. *Malakozoologische Blätter* **14**: 76–80. [Addition to: Philippi RA. 1867. Descriptio brevis molluscorum quorundam terrestrium, a clarissimo viro Antonio Raimondi in Peruvia lectorum]
- RICHLING I, GLAUBRECHT M. 2008. The types of Neotropical Helicinidae (Mollusca, Gastropoda, Neritopsina) in the malacological collection of the Museum für Naturkunde Berlin: an annotated catalogue, with emphasis on Cuban shells. *Zoosystema and Evolution* **84**: 265–310. doi:10.1002/zoos.200800011
- SHERBORN CD. 1940. *Where is the ——— collection? An account of the various natural history collections which have come under the notice of the compiler Charles Davies Sherborn D.Sc. Oxon. between 1880 and 1939*. Cambridge University Press, Cambridge.
- SOLEM A. 1966. The Neotropical land snail genera *Labyrinthus* and *Isomeria* (Pulmonata, Camaenidae). *Fieldiana, Zoology* **50**: 1–226. doi:10.5962/bhl.title.3083
- TAYLOR MA. 2016. ‘Where is the damned collection?’ Charles Davies Sherborn's listing of named natural science collections and its successors. *ZooKeys* **550**: 83–106. doi:10.3897/zookeys.550.10073
- ZILCH A. 1954. Landschnecken aus Peru, 2. *Archiv für Molluskenkunde* **83**: 65–78.