

South American and Trinidadian terrestrial Gastropoda in the collection of the Museum of New Zealand Te Papa Tongarewa

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ABSTRACT: Despite its natural focus on the New Zealand region, the malacological collection of the Museum of New Zealand Te Papa Tongarewa (NMNZ), also includes a variety of specimens from elsewhere in the world, including a fair share of South American specimens. Examination of this material reveals valuable distributional data for several species, as well as previously unreported type material. This article examines and reidentifies all South American (and Trinidadian) gastropods from the NMNZ collection, excluding those from Brazil, Uruguay and Argentina, which were analysed in a separate publication. All the information gathered is compiled and presented here as an annotated species checklist, including photographs of the most important specimens. In total, 91 species are reported. Paralectotypes of *Neniops smithiae* (Pilsbry, 1902) (from the private collection of zoologist Henry Suter (1841–1918)) were found in the NMNZ collection and are illustrated here.

KEYWORDS: Caenogastropoda, South America, snails, natural history collections, Neritimorpha, Stylommatophora, Trinidad and Tobago, type material.

Introduction

The malacological collection of the Museum of New Zealand Te Papa Tongarewa (NMNZ, Wellington) harbours an estimated 80,000 lots of land snails. Unsurprisingly, most of these are from New Zealand and the Australasian region, but a good portion of material comes from all around the world, originating from exchanges and donations dating back to the late nineteenth century. The ongoing reorganisation of the

terrestrial gastropod collection has unveiled some hidden treasures, including type material (e.g. Salvador & Breure (2020); Salvador & Ablett (2020); Salvador (2021)) and specimens that add meaningful geographical data to our present knowledge (Salvador 2019). In this article, we examine the South American land snails in the NMNZ collection and present the compiled data below, excluding those from Brazil, Uruguay and Argentina, which were covered in Salvador (2019). We also include Trinidad in our work, which despite being officially part of Central

America has a fauna that bears close similarities with that of Venezuela. Most specimens are often well preserved and bear reasonable geographic provenance data. Given that many South American land snail species have scarcely been studied, we believe this article has produced important data for any future researcher working on that fauna.

Material and methods

Terrestrial snails from all South American countries (plus Trinidad but excluding Brazil, Uruguay and Argentina) in the NMNZ collection formed the basis of this study. No specimens from Tobago, Guyana, Suriname or French Guiana were found; the work of Salvador (2019) likewise did not find any material from Paraguay. The reidentification of all specimens (exclusively dry shells) was based on current specialised literature, including original descriptions and revisionary works, and available images of type material. The locality data of the specimens presented below was copied directly from the specimens' labels, with typos corrected and the names of the larger regions, departments and provinces added for reference. Photographs of selected specimens that are scarcely illustrated in the literature are provided here.

The classification scheme used here follows Bouchet *et al.* (2017), except for Epiphragmophoridae being considered a family, following Calcutt *et al.* (2020). Measurements were taken with a digital calliper.

A few specimens are juvenile or fragmentary shells, some of which lack more precise locality data, and thus could not be satisfactorily identified: Charopidae indet., NMNZ M.330542 (1 sh; Venezuela, Falcón state, inland from Coro, coastal side of scarp; J.R. Graham leg. viii/1988); *Drymaeus* sp., NMNZ M.205791 (2 sh; Peru; ex H. Suter colln. 3035), NMNZ M.317541 (1 sh; Ecuador, 'Tulumaje, Zacapa'; ex I.M. Worthy colln.); *Radiodiscus* sp., NMNZ M.330539 (1 sh; Venezuela, Falcón state, inland from Coro, coastal side of scarp; J.R. Graham leg. viii/1988); Scolodontidae indet., NMNZ M.329590 (2 sh; Chile, Navarino Island, Puerto Toro; A.N. Baker leg. 15/ii/1988), NMNZ M.329591 (2 sh; Chile, Seno Wide, Caleta Chacabucó; A.N. Baker leg. 04/iii/1988), NMNZ M.329592 (2 sh + 1 dry egg; Chile, Messier, Caleta Gray Canal; A.N. Baker leg. 05/iii/1988), NMNZ M.329593 (4 sh; Chile, Londonderry Island, Fortuna Harbour; A.N. Baker leg. 01/ii/1988), NMNZ M.330544 (2 sh; Venezuela, Falcón state, inland from Coro, coastal side of scarp; J.R. Graham leg. viii/1988).

Abbreviations

The following abbreviations are used: colln., collection; D, greatest shell width (perpendicular to H); H, shell length (parallel to columellar axis); leg., collector; sh, dry shell.

Systematics

Subclass NERITIMORPHA Superfamily Helicinoidea Family Helicinidae Genus *Helicina* Lamarck, 1799

Helicina dysoni L. Pfeiffer, 1849

MATERIAL: NMNZ M.206107 (7 sh; Trinidad; W.M. leg.; ex H. Suter colln. 2551); NMNZ M.206439 (3 sh; Trinidad).

DISTRIBUTION: Honduras, Bonaire, Curaçao, Trinidad and Venezuela (Pfeiffer 1849; Bland 1866; Hovestadt & van Leeuwen 2017).

Subclass CAENOGASTROPODA Superfamily Cyclophoroidea Family Neocyclotidae Genus *Aperostoma* Troschel, 1847

Aperostoma translucidum (G.B. Sowerby I, 1843)

MATERIAL: NMNZ M.206354 (2 sh; Trinidad; Mo. leg.; ex H. Suter colln. 2548).

DISTRIBUTION: Trinidad, Venezuela, Guyana and possibly Colombia (Bartsch & Morrison 1942).

REMARKS: The present specimens can be attributed to the subspecies *Aperostoma translucidum trinitense* (Guppy, 1864), which occurs in Trinidad and adjacent areas of Venezuela (Bartsch & Morrison 1942). The subspecies of *A. translucidum* are defined by minor conchological differences (Bartsch & Morrison 1942) and their validity needs to be confirmed.

Genus *Calaperostoma* Pilsbry, 1935

Calaperostoma nigrofasciatum (K. Miller, 1879)

MATERIAL: NMNZ M.329432 (1 sh; Ecuador, Pastaza province, Mera; ex I.M. Worthy colln.).

DISTRIBUTION: Central Ecuador, between Quito and Quevedo (Bartsch & Morrison 1942).

REMARKS: The locality given by Bartsch & Morrison (1942) is rather imprecise, but the present record locates the distribution of the species in the eastern Andean foothills.

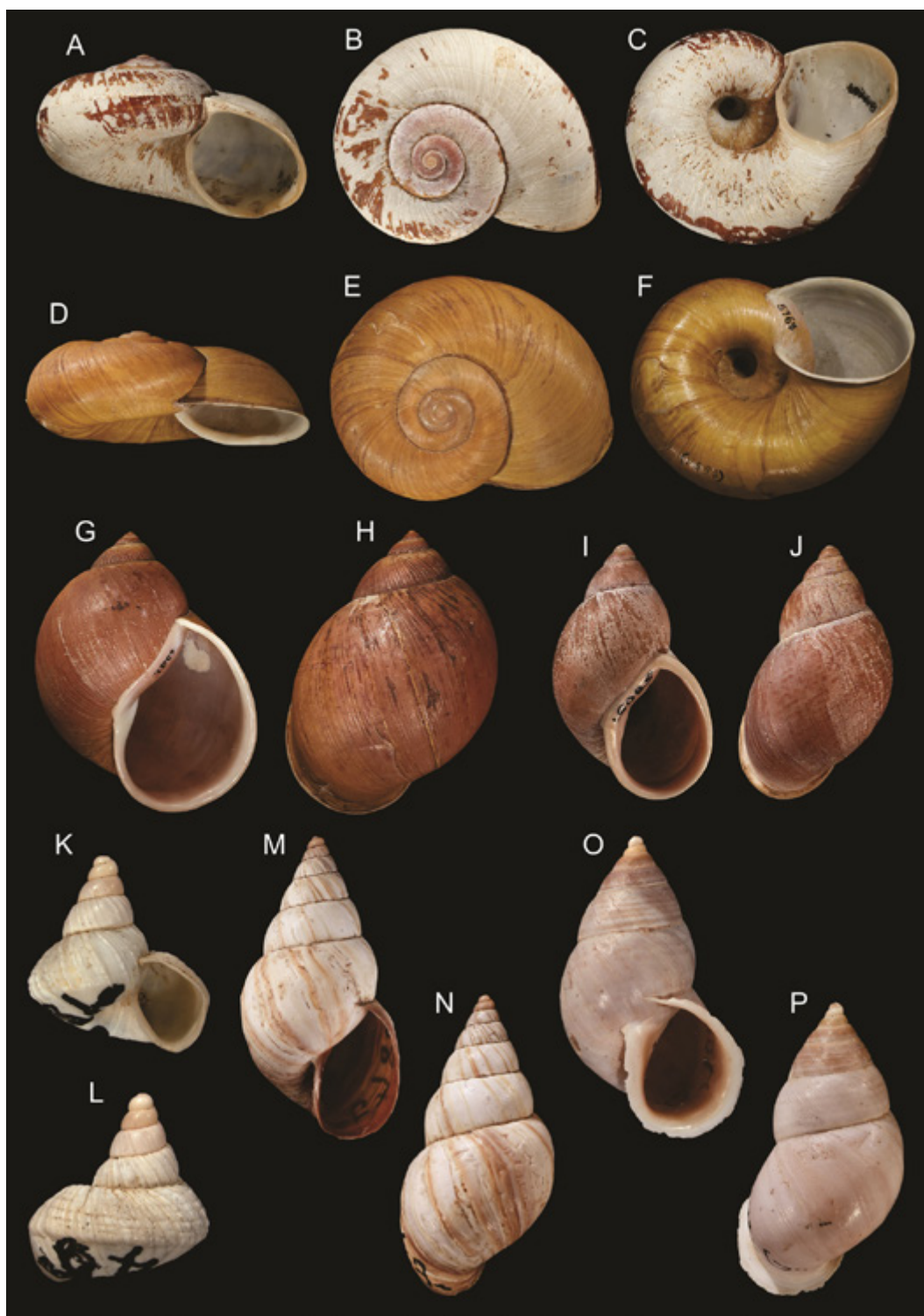


Fig. 1 A–C, *Incidostoma pichinchense* Bartsch & Morrison, 1942, NMNZ M.329647, H = 29.0 mm, W = 41.3 mm. D–F, *Macrocyclis peruvianus* (Lamarck, 1822), NMNZ M.205768, H = 22.5 mm, W = 55.0 mm. G–H, *Plekocheilus ampullaroides* (Mousson, 1873), NMNZ M.206321, H = 62.7 mm, W = 48.5 mm. I–J, *Plekocheilus* sp., NMNZ M.205805, H = 33.2 mm, W = 19.1 mm. K–L, *Bostryx metagyra* Pilsbry & Olsson, 1949, NMNZ M.317560, H = 7.9 mm, W = 7.5 mm. M–N, *Bostryx ignobilis* (Philippi, 1867), NMNZ M. 317563, H = 21.1 mm, W = 10.7 mm. O–P, *Bostryx rhodolarynx* (Reeve, 1849), NMNZ M.317562, H = 25.8 mm, W = 15.0 mm.

Genus *Incidostoma*
Bartsch & Morrison, 1942

Incidostoma pichinchense Bartsch & Morrison, 1942 (Fig. 1A–C)

MATERIAL: NMNZ M.329647 (1 sh; Ecuador, Pastaza province, Mera; ex I.M. Worthy colln.).

DISTRIBUTION: Reported only from Quito (Bartsch & Morrison 1942).

REMARKS: The material used by Bartsch & Morrison (1942) came from the Henderson collection (Smithsonian National Museum of Natural History, Washington, DC, USA). The specimens were likely collected during the nineteenth century and were given the imprecise locality 'Quito' (Breure & Borrero 2008: 3). The present record locates the species range c. 150 km to the south, on the eastern side of the Andes.

Genus *Neocyclotus*
Crosse & P. Fischer, 1886

Neocyclotus quitensis (L. Pfeiffer, 1854)

MATERIAL: NMNZ M.313307 (1 sh; Ecuador, Pastaza province, Mera; R.W. Jackson leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Northern and central Ecuador (Bartsch & Morrison 1942; Breure & Araujo 2017).

Subclass HETEROBRANCHIA
Order Stylommatophora
Superfamily Achatinoidea
Family Achatinidae
Genus *Leptinaria* Beck, 1837

Leptinaria lamellata (Potiez & Michaud, 1838)

MATERIAL: NMNZ M.206410 (2 sh; Trinidad; ex H. Suter colln. 2546).

DISTRIBUTION: From Nicaragua to southernmost Brazil (Silva *et al.* 2019); introduced to the West Indies and French Polynesia (Massemin *et al.* 2009).

Genus *Protobeliscus* Pilsbry, 1906

Protobeliscus cuneus (L. Pfeiffer, 1854)

MATERIAL: NMNZ M.313327 (1 sh; Ecuador, Pichincha province, Guarumos; ex I.M. Worthy colln.).

DISTRIBUTION: Northern Ecuador (Pilsbry 1906).

Genus *Subulina* Beck, 1837

Subulina octona (Bruguière, 1792)

MATERIAL: NMNZ M.206401 (5 sh; Trinidad; ex H. Suter colln. 2541).

DISTRIBUTION: Naturally occurring in continental Central and South America, but introduced to the Caribbean Islands, Asia, Africa and Pacific Islands (Massemin *et al.* 2009; Miquel & Herrera 2014).

Superfamily Punctoidea
Family Charopidae
Genus *Payenia*
Mabille & Rochebrune, 1889

Payenia saxatilis (A.A. Gould, 1846)

MATERIAL: NMNZ M.329594 (1 sh; Chile, Messier, Caleta Gray Canal; A.N. Baker leg. 05/iii/1988); NMNZ M.329595 (3 sh; Chile, Londonderry Island, Fortuna Harbour; A.N. Baker leg. 01/ii/1988).

DISTRIBUTION: Southernmost South America (Hylton Scott 1970; Stuardo & Vega 1985; Valdovinos 1999).

Genus *Radiodiscus* Pilsbry & Ferris, 1906

Radiodiscus magellanicus (E.A. Smith, 1881)

MATERIAL: NMNZ M.329599 (12 sh; Chile, Londonderry Island, Fortuna Harbour; A.N. Baker leg. 01/ii/1988); NMNZ M.329600 (2 sh; Chile, Seno Wide, Caleta Chacobucó; A.N. Baker leg. 04/iii/1988); NMNZ M.329601 (15 sh; Chile, Beagle Channel, Caleta Awaiakirrh; A.N. Baker leg. 02/ii/1988); NMNZ M.329602 (c. 30 sh; Chile, Navarino Island, Puerto Toro; A.N. Baker leg. 15/ii/1988); NMNZ M.329603 (8 sh; Chile, Gordon Island, Caleta Morning; A.N. Baker leg. 15/ii/1988); NMNZ M.330543 (2 sh; Chile, Seno Surmento, Caleta Wodehouse; A.N. Baker leg. 28/ii/1988).

DISTRIBUTION: Southern Argentina and southern Chile (Stuardo & Vega 1985; Valdovinos 1999).

Genus *Stephadiscus* Hylton Scott, 1981

Stephadiscus lyratus (A.A. Gould, 1846)

MATERIAL: NMNZ M.329596 (2 sh; Chile, Messier, Caleta Gray Canal; A.N. Baker leg. 05/iii/1988); NMNZ M.329597 (3 sh; Chile, Navarino Island, Puerto Toro; A.N. Baker leg. 15/ii/1988); NMNZ M.329598 (8 sh; Chile, Beagle Channel, Caleta Awaiakirrh; A.N. Baker leg. 02/ii/1988).

DISTRIBUTION: Southern Argentina and southern Chile (Hylton Scott 1970; Stuardo & Vega 1985; Valdovinos 1999; Miquel & Araya 2013).

Superfamily Urocoptoidea
Family Urocoptidae
Genus *Brachypodella* Beck, 1837

Brachypodella trinitaria (L. Pfeiffer, 1860)

MATERIAL: NMNZ M.206121 (7 sh; Trinidad; W.M. leg.; ex H. Suter colln. 2545).

DISTRIBUTION: Trinidad (Pilsbry 1904).

Superfamily Succineoidea
Family Succineidae
Genus *Omalonyx* d'Orbigny, 1837

Omalonyx matheroni (Potiez & Michaud, 1838)

MATERIAL: NMNZ M.206405 (4 sh; Trinidad; ex H. Suter colln. 3429).

DISTRIBUTION: From Guadeloupe and Trinidad to southern Brazil (Arruda *et al.* 2009; Birckolz *et al.* 2016).

Superfamily Rhytidoidea
Family Macrocyclidae
Genus *Macrocyclus* Beck, 1837

Macrocyclus peruvianus (Lamarck, 1822) (Fig. 1D–F)

MATERIAL: NMNZ M.205768 (1 sh; Chile, Chiloé province; ex H. Suter colln. 3658).

DISTRIBUTION: Central Chile (Maule to Chiloé) and Argentina (Neuquén to Bariloche) (Silva & Thomé 2009).

REMARKS: The species is usually referred to in the literature as *Macrocyclus laxata* (Férussac, 1820), a junior synonym. It is the only living member of the family.

Family Strophocheilidae
Genus *Chiliborus* Pilsbry, 1926

Chiliborus chilensis (G.B. Sowerby I, 1833)

MATERIAL: NMNZ M.213598 (1 sh; Chile).

DISTRIBUTION: Central Chile (Stuardo & Vega 1985; Valdovinos 1999; Breure & Araujo 2017).

Chiliborus rosaceus (King & Broderip, 1831)

MATERIAL: NMNZ M.211125 (1 sh; Chile, Coquimbo region, Pichidangui; exch. N. Weinstein 1957).

DISTRIBUTION: Northern and central Chile (Araya & Catalán 2014).

Genus *Megalobulimus* K. Miller, 1878

Megalobulimus intertextus (Pilsbry, 1895)

MATERIAL: NMNZ M.248359 (2 sh; Bolivia, La Paz department, Corocoro; ex E.S. Gourlay colln.); NMNZ M.248360 (2 sh; Bolivia, La Paz department, La Paz; ex E.S. Gourlay colln.).

DISTRIBUTION: Bolivia, western Brazil, Paraguay and northern Argentina (Salvador *et al.* 2018b).

Megalobulimus maximus (G.B. Sowerby I, 1825)

MATERIAL: NMNZ M.248361 (1 sh; Bolivia, Santa Cruz department, Santa Cruz de La Sierra; ex E.S. Gourlay colln.).

DISTRIBUTION: Peru, Bolivia and western Brazil (Simone 2006).

Megalobulimus oblongus (O.F. Müller, 1774)

MATERIAL: NMNZ M.203905 (1 sh; Trinidad); NMNZ M.206421 (2 sh; Trinidad; ex H. Suter colln. 155); NMNZ M.211977 (1 sh; Venezuela; ex H. Suter colln. 5053); NMNZ M.248358 (3 sh; Trinidad, San Fernando; ex E.S. Gourlay colln.); NMNZ M.255447 (4 sh; Trinidad; ex M. Holloway/A.G. Stevenson colln.).

DISTRIBUTION: Widespread in South America (Simone 2006); also occurs in Trinidad (Smith 1896). It might represent a species complex.

Megalobulimus thammianus (Martens, 1876)

MATERIAL: NMNZ M.206259 (1 sh; Peru, Loreto region, Iquitos; F.C. Kinsky leg. x/1955).

DISTRIBUTION: Colombia, Ecuador and Peru (Ramírez *et al.* 2012).

Superfamily Orthalicoidea
Family Amphibulimidae
Genus *Plekocheilus* Guilding, 1827

Plekocheilus ampullaroides (Mousson, 1873) (Fig. 1G–H)

MATERIAL: NMNZ M.206321 (1 sh; Colombia, Cundinamarca department, Bogotá).

DISTRIBUTION: Central Colombia (Borrero & Breure 2011).

REMARKS: This species is often considered a subspecies of *Plekocheilus coloratus* (Nyst, 1845), but Borrero & Breure (2011) considered it a separate taxon based on distinct shell morphology. Those authors, however, point out that the *P. coloratus* complex needs revision.

Plekocheilus aurissciuri Guppy, 1866

MATERIAL: NMNZ M.204309 (5 sh; Trinidad, Port of Spain, Belmont; ex H. Suter colln. [unnumbered]); NMNZ M.206031 (2 sh; Trinidad; W.M. leg.; ex H. Suter colln. 2547); NMNZ M.255457 (1 sh; Trinidad, Port of Spain; ex M. Holloway/A.G. Stevenson colln.).

DISTRIBUTION: Trinidad, Venezuela, Guyana, Suriname and French Guiana (Massemin *et al.* 2009).

Plekocheilus delicatus (Pilsbry, 1935)

MATERIAL: NMNZ M.313338 (2 sh; Colombia, near Bogotá; ex I.M. Worthy colln.).

DISTRIBUTION: Colombia, Bogotá and vicinity (Borrero & Breure 2011).

Plekocheilus distortus (Bruguière, 1789)

MATERIAL: NMNZ M.205757 (6 sh; Venezuela; ex H. Suter colln. 5500).

DISTRIBUTION: Panama, Colombia and Venezuela (Borrero & Breure 2011).

Plekocheilus floccosus (Spix *in* Wagner, 1827)

MATERIAL: NMNZ M.313346 (1 sh; Ecuador, Tungurahua province, Topo; ex I.M. Worthy colln.).

DISTRIBUTION: Central Ecuador (Breure & Araujo 2017).

Plekocheilus glabra (Gmelin, 1791)

MATERIAL: NMNZ M.205785 (1 sh; Venezuela; ex H. Suter colln. 5054).

DISTRIBUTION: Grenada, Trinidad and Venezuela, with further records from Colombia and Brazil being uncertain (Borrero & Breure 2011).

Plekocheilus nocturnus Pilsbry, 1939

MATERIAL: NMNZ M.313337 (1 sh; Ecuador, Tungurahua province, Topo; ex I.M. Worthy colln.).

DISTRIBUTION: Northern and central Ecuador (Borrero & Breure 2011).

Plekocheilus taylorianus (Reeve, 1849)

MATERIAL: NMNZ M.205759 (1 sh; Venezuela; ex H. Suter colln. 5051).

DISTRIBUTION: Ecuador (Breure & Ablett 2011).

REMARKS: The present specimen compares extremely well with the species' lectotype (NHMUK 1874.12.11.271, Natural History Museum, London, UK). This species is known only in Ecuador, however, so the locality noted on the label of the present specimen (Venezuela) is in all likelihood an error.

***Plekocheilus* sp.** (Fig. 1I–J)

MATERIAL: NMNZ M.205805 (1 sh; 'Chili'; ex H. Suter colln. 4814).

REMARKS: The specimen indeed belongs to *Plekocheilus*, but it was not possible to determine the species. The label reads 'Chili', but there are no *Plekocheilus* spp. reported from that country, so it is likely erroneous.

Family Bothriembryontidae

Genus *Plectostylus* H. Beck, 1837

Plectostylus broderipii (G.B. Sowerby I *in* Broderip & Sowerby I, 1832)

MATERIAL: NMNZ M.248286 (1 sh; Chile, Antofagasta (uncertain if region or municipality); ex E.S. Gourlay colln.).

DISTRIBUTION: North and central Chile (Stuardo & Vega 1985; Araya 2015; Breure & Araujo 2017).

Plectostylus coquimbensis (Broderip *in* Broderip & Sowerby I, 1832)

MATERIAL: NMNZ M.248287 (1 sh; Chile, Coquimbo (uncertain if region or municipality); ex E.S. Gourlay colln.).

DISTRIBUTION: Central Chile (Stuardo & Vega 1985).

Plectostylus peruvianus (Bruguière, 1789)

MATERIAL: NMNZ M.205786 (3 sh; Peru; ex H. Suter colln. 3033).

DISTRIBUTION: Northern and central Chile (Breure & Araujo 2017).

REMARKS: This species is only from Chile (Breure & Araujo 2017). Its type locality is Peru (Bruguière 1789–92), as is the provenance of the present specimens. The former southern portion of Peru is now the northern portion of Chile (transferred from one country to another during the late nineteenth and early twentieth centuries; Miranda (2006)), so the present specimen, as well as the type, likely came from that area.

Family Bulimulidae
Genus *Bocourtia* Rochebrune, 1882

Bocourtia achrous (F. Haas, 1952)

MATERIAL: NMNZ M.205606 (3 sh; Bolivia, Cochabamba department, near Chaguarani village; W.J. Eyerdam leg. 05/iv/1939).

DISTRIBUTION: Cochabamba region (Haas 1952).

REMARKS: Haas (1952) mentioned specimens (8 paratypes: FMNH 30607, Field Museum of Natural History, Chicago, USA) from Chaguarani (not found in modern gazetteers), collected by Eyerdam on the exact same date as the present specimens. As such, the present specimens were, in all likelihood, part of the same collection event.

Bocourtia culminea (d'Orbigny, 1835)

MATERIAL: NMNZ M.233518 (1 sh; Peru, Andes Mountains, Yauli province, mountaintops surrounding La Oroya, 15,000–16,000 ft [*c.* 4500–4900 m]; T.E. Savage leg. 31/xii/1950).

DISTRIBUTION: Central highlands of Peru (Breure 1978; Breure & Ablett 2014).

REMARKS: The material is most similar to the subspecies *Bocourtia culminea edwardsi* (Morelet, 1863), which is sometimes accepted as a distinct taxon in the literature (Weyrauch 1967; Breure & Ablett 2014).

Bocourtia revinctus altorum (F. Haas, 1951) (Fig. 2C–D)

MATERIAL: NMNZ M.317567 (1 sh; Peru, Junín department, near Huancayo, 3500 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Southern Peru (Weyrauch 1967).

Genus *Bostryx* Troschel, 1847

Bostryx andoicus (Morelet, 1863)

MATERIAL: NMNZ M.317583 (5 sh; Peru, Ayacucho department, Cangallo; i/1966; ex I.M. Worthy colln.).

DISTRIBUTION: Southern Peru (Breure & Ablett 2014).

Bostryx apodemetus (d'Orbigny, 1835)

MATERIAL: NMNZ M.255464 (4 sh; Bolivia, Tarija department, Yacuiba; ex M. Holloway/A.G. Stevenson colln.).

DISTRIBUTION: Bolivia, Paraguay, Uruguay and northern Argentina (Cuezzo *et al.* 2013).

Bostryx derelictus (Broderip *in* Broderip & Sowerby I, 1832)

MATERIAL: NMNZ M.204286 (1 sh; Chile; ex H. Suter colln. [unnumbered]); NMNZ M.213607 (1 sh; Chile).

DISTRIBUTION: Peru (possibly) and northern Chile (Breure & Ablett 2014).

Bostryx hennahi (J.E. Gray, 1830)

MATERIAL: NMNZ M.317582 (2 sh; Chile, Arica y Parinacota region, Arica; ex I.M. Worthy colln.).

DISTRIBUTION: Southern Peru and northern Chile (Breure & Ablett 2014).

Bostryx ignobilis (Philippi, 1867) (Fig. 1M–N)

MATERIAL: NMNZ M.317563 (1 sh; Peru, Junín department, Tarma, La Florida; ex I.M. Worthy colln.).

DISTRIBUTION: Central Peru (Breure 1978).

REMARKS: This is one of the similar-looking species that may be found in different parts of Peru. It may be confused with *Bostryx nigropileatus* (Reeve, 1849) (see Breure & Araujo 2017, and below).

Bostryx laurentii (G.B. Sowerby I, 1833)

MATERIAL: NMNZ M.205766 (1 sh; Peru; ex H. Suter colln. 3033).

DISTRIBUTION: Central coastal Peru (Breure 2013; Breure & Araujo 2017).

REMARKS: Possibly synonymous with *Bostryx modestus* (Broderip *in* Broderip & Sowerby I, 1832) (see Breure 2013).

Bostryx metagyra Pilsbry & Olsson, 1949 (Fig. 1K–L)

MATERIAL: NMNZ M.317560 (1 sh; Peru, Lima department, near Huacho; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Peru, from Huacho in Lima department and Chala in Arequipa department (Breure 2008).

REMARKS: This species was described without a precise locality (Pilsbry & Olsson 1949), and museum specimens stem from only two cities, Huacho and Chala, which are 600 km apart (Breure 2008). Given that other (and larger) congeners occurring in the region are very range-restricted, it is surprising that this small species has such a discontinuous range (Breure 2008).

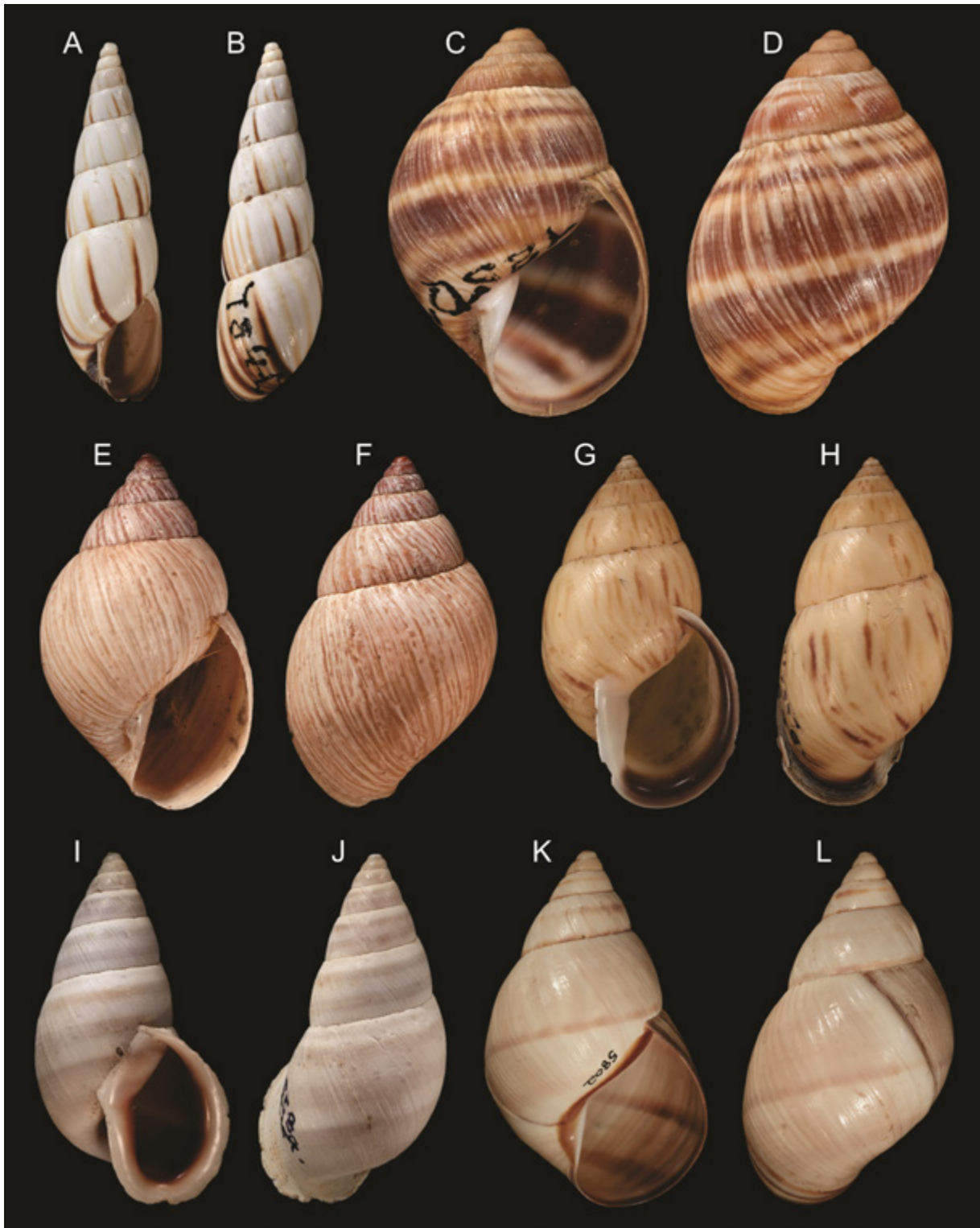


Fig. 2 A–B, *Bostryx williamsi* (L. Pfeiffer, 1858), NMNZ M.317564, H = 22.3 mm, W = 6.4 mm. C–D, *Bocourtia revinctus altorum* (F. Haas, 1951), NMNZ M.317567, H = 18.8 mm, W = 13.0 mm. E–F, *Naesiotus quitensis orinus* Rehder, 1940, NMNZ M. 317554, H = 18.0 mm, W = 10.8 mm. G–H, *Neopetraeus camachoi* (Weyrauch, 1967), NMNZ M.317557, H = 40.0 mm, W = 22.8 mm. I–J, *Scutalus cretaceus* (L. Pfeiffer, 1855), NMNZ M.317558, H = 41.3 mm, W = 20.3 mm. K–L, *Orthalicus maracaibensis imitator* (L. Pfeiffer, 1856), NMNZ M.205802, H = 57.3 mm, W = 35.2 mm.

Bostryx nigropileatus (Reeve, 1849)

MATERIAL: NMNZ M.317559 (1 sh; Peru, Cajamarca department, hills near Celendín, 265 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Northern Peru (Breure & Ablett 2014).

REMARKS: The species was described from Chachapoyas, in the Amazonas region of Peru.

Bostryx reentsi (Philippi, 1851)

MATERIAL: NMNZ M.317561 (1 sh; Peru, hill near Chalapa [likely Chala, in Arequipa department], 150 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Peru, vicinity of Chala (Breure 2008; Breure & Ablett 2014).

Bostryx rhodolarynx (Reeve, 1849) (Fig. 1O–P)

MATERIAL: NMNZ M.317562 (1 sh; Peru, Ninabamba River Pampas, 1950 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Reported from the banks of Apurímac River in southern Peru (Breure & Ablett 2014).

Bostryx tumidulus (L. Pfeiffer, 1842)

MATERIAL: NMNZ M.329649 (1 sh; Peru, Huánuco region, Ambo; Z. Zamora leg. i/1994; ex A. Grebneff colln.).

DISTRIBUTION: Peru, with Ambo being the likely type locality (Breure & Ablett 2014).

Bostryx virgultorum (Morelet, 1863)

MATERIAL: NMNZ M.317565 (1 sh; Peru, Quilabamba, Urubamba River; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Peru, eastern Cordillera in Cuzco department (Breure & Neubert 2008).

Bostryx williamsi (L. Pfeiffer, 1858) (Fig. 2A–B)

MATERIAL: NMNZ M.317564 (1 sh; Amazonas region, Marañón River above Balsas, 1200 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Peru, Cajamarca region (Pfeiffer 1858).

REMARKS: The locality of the present specimen, despite being in a distinct administrative region, is right at the border with Cajamarca department, so it does not represent a meaningful increase in geographic distribution.

Genus *Bulimulus* Leach, 1814

Bulimulus corumbaensis Pilsbry, 1897

MATERIAL: NMNZ M.205726 (2 sh; Bolivia, Santa Cruz province, Parapeti [River]; ex Museo Buenos Aires colln., ex H. Suter colln. 9340).

DISTRIBUTION: Santa Cruz province, Bolivia, Mato Grosso and Mato Grosso do Sul states, Brazil and Paraguay (Salvador *et al.* 2018b).

Genus *Drymaeus* Albers, 1850

Drymaeus ambustus (Reeve, 1849)

MATERIAL: NMNZ M.205790 (3 sh; Ecuador, Pichincha province, Quito; ex H. Suter colln. 3516).

DISTRIBUTION: Northern and central Ecuador (Breure & Ablett 2014; Breure & Araujo 2017).

Drymaeus expansus (L. Pfeiffer, 1848)

MATERIAL: NMNZ M.317544 (2 sh; Ecuador, Tungurahua province, Topo; ex I.M. Worthy colln.).

DISTRIBUTION: Ecuador and Peru (Breure & Ablett 2014; Breure & Araujo 2017).

Drymaeus farrisi (L. Pfeiffer, 1858)

MATERIAL: NMNZ M.330097 (1 sh; Peru; ex H. Suter colln. 3032).

DISTRIBUTION: Northern Peru (Breure & Eskens 1981).

Drymaeus scitulus (Reeve, 1849)

MATERIAL: NMNZ M.205595 (3 sh; Peru, Cajamarca region, Cochambul, near Cajamarca; E.L. Alarcon leg., W.J. Eyerdam leg.); NMNZ M. 255438 (7 sh; Peru, Cajamarca region, Cochambul, near Cajamarca; ex M. Holloway/A.G. Stevenson colln.).

DISTRIBUTION: Northwestern Peru (Breure & Ablett 2014).

Drymaeus serratus (L. Pfeiffer, 1855)

MATERIAL: NMNZ M.205755 (1 sh; Peru; ex H. Suter colln. 3034).

DISTRIBUTION: Central Peru (Breure & Eskens 1981; Breure & Ablett 2014).

Drymaeus stramineus (Guilding, 1824)

MATERIAL: NMNZ M.205973 (1 sh; Trinidad; ex H. Suter colln. 3573).

DISTRIBUTION: Dominica, Saint Vincent, Grenadines, Trinidad (Pilsbry 1899; Breure & Ablett 2014).

Drymaeus vincentinus (L. Pfeiffer, 1846)

MATERIAL: NMNZ M.210193 (2 sh; Trinidad; ex H. Suter colln. 3571).

DISTRIBUTION: Saint Vincent, Tobago and Trinidad (Pilsbry 1899; Breure & Ablett 2014).

Genus *Naesiotus* Albers, 1850

Naesiotus quitensis (L. Pfeiffer, 1848) (Fig. 2E–F)

MATERIAL: NMNZ M.317551 (12 sh; Ecuador, Pichincha province, slopes of Pichincha volcano northwest of Quito; ex I.M. Worthy colln.); NMNZ M.317552 (5 sh; Ecuador, Pichincha province, slopes of Antisana volcano southeast of Quito; ex I.M. Worthy colln.); NMNZ M.317553 (2 sh; Ecuador, Pichincha province, Quito, Guayllabamba; ex I.M. Worthy colln.); NMNZ M.317554 (5 sh; Ecuador, Chimborazo province, foothills of Chimborazo volcano near Riobamba; ex I.M. Worthy colln.).

DISTRIBUTION: Central Ecuador (Breure & Borrero 2008; Breure & Ablett 2014).

REMARKS: The specimens belonging to one lot (NMNZ M.317554) can be attributed to the subspecies *Naesiotus quitensis orinus* Rehder, 1940, due to the shorter spire and wider and more rounded body whorl.

Genus *Neopetraeus* E. von Martens, 1885

Neopetraeus camachoi (Weyrauch, 1967) (Fig. 2G–H)

MATERIAL: NMNZ M.317557 (1 sh; Peru, Chusgon River, 2000 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Andes of northern Peru (Breure & Ablett 2014).

Neopetraeus decussatus (Reeve, 1849)

MATERIAL: NMNZ M.317556 (2 sh; Peru, Cajamarca department, Chamis, 2700 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Peru, Andes of Cajamarca region (Breure & Ablett 2014).

Neopetraeus lobbii (Reeve, 1849)

MATERIAL: NMNZ M.317555 (1 sh; Peru, Amazonas region, Marañón River above Balsas, 1200 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Northern and central Peru (Breure & Ablett 2014; Breure & Araujo 2017).

Genus *Scutalus* Albers, 1850

Scutalus baroni (Fulton, 1896)

MATERIAL: NMNZ M.317572 (2 sh; Peru, 'Yonan River', 400 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Restricted to Tembladera region in Peru (Pilsbry & Olsson 1949).

REMARKS: The locality of the present specimen, Yonan River (also the type locality of the species), is the local name of the Jequetepeque River in the region of Tembladera in Cajamarca department (Breure & Ablett 2014). However, Pilsbry & Olsson (1949) pointed out that the name Yonan River could refer more specifically to a small stream that enters the Jequetepeque River near the city of Tembladera.

Scutalus chiletensis Weyrauch, 1967

MATERIAL: NMNZ M.317568 (1 sh; Peru, Cajamarca region, Choropampa, above Chilete, 1500 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Northern Peru (Breure & Ablett 2014).

Scutalus cretaceus (L. Pfeiffer, 1855) (Fig. 2I–J)

MATERIAL: NMNZ M.205599 (1 sh; Peru, 15 km southeast of Trujillo; W.J. Eyerdam leg. viii/1938); NMNZ M.206258 (6 sh; Peru, Andes, 2000 m; F.C. Kinsky leg. 17/iv/1956); NMNZ M.317558 (1 sh; Peru, Jequetepeque River; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Northwestern Peru (Breure & Ablett 2014).

REMARKS: Specimen NMNZ M.317558 has a taller and more slender shell compared to the typical morphology of this species.

Scutalus mutabilis (Broderip *in* Broderip & Sowerby I, 1832)

MATERIAL: NMNZ M.317566 (1 sh; Peru, Lima region, Quebrada Verde, near Lima; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Peru, Lima region (Breure & Ablett 2014).

REMARKS: *Scutalus mutabilis* has been generally considered synonymous with *S. versicolor* (Broderip, 1832), which is conchologically similar and also inhabits the Lima region (Hidalgo 1872). A recent work recognised *S. mutabilis* as a distinct species based on the larger size of the shell and the granulose body whorl of the type specimens (Breure & Ablett 2014). Those characters, however, are variable within *Scutalus* spp., and thus this potential synonymy would benefit from a further study involving a larger sample size.

Scutalus versicolor (Broderip *in* Broderip & Sowerby I, 1832)

MATERIAL: NMNZ M.205784 (3 sh; Peru, Lima; ex H. Suter colln. 1400); NMNZ M.317569 (1 sh; Peru, near Lima, 200 m; W. Weyrauch leg.; ex I.M. Worthy colln.); NMNZ M.317588 (2 sh; Peru, Lima, Atocongo; ex I.M. Worthy colln.).

DISTRIBUTION: Central Peru (Haas 1947; Breure & Ablett 2014).

Family Orthalicidae Genus *Corona* Albers, 1850

Corona pfeifferi (Hidalgo, 1869)

MATERIAL: NMNZ M.316475 (1 sh; Ecuador, Tungurahua province, Topo; ex I.M. Worthy colln.).

DISTRIBUTION: Ecuador and northeastern Peru (Breure & Mogollón Avila 2016).

Genus *Kara* Strebel, 1910

Kara thompsonii (L. Pfeiffer, 1845)

MATERIAL: NMNZ M.205758 (1 sh; Ecuador, Pichincha province, Andes of Quito; ex H. Suter colln. 5052).

DISTRIBUTION: Ecuador and Peru (Breure 2011; Breure & Mogollón Avila 2016).

Genus *Orthalicus* H. Beck, 1837

Orthalicus maracaibensis (L. Pfeiffer, 1856) (Fig. 2K–L)

MATERIAL: NMNZ M.205799 (4 sh; Colombia, Magdalena department, southeast of Santa Marta, 150 ft [c. 45 m]; ex H. Suter colln. 4368); NMNZ M.205802 (4 sh; Colombia, Magdalena department, southeast of Santa Marta, 150 ft [c. 45 m]; ex H. Suter colln. 4369).

DISTRIBUTION: Aruba, Colombia, Ecuador and Venezuela (Breure & Borrero 2008; Breure 2013; Hovestadt & van Leeuwen 2017).

REMARKS: The specimens from lot NMNZ M.205802 lack the flame-like pattern on the shell, instead having a plain creamy base colour and presenting a dark brown spiral band on the median portion of the whorl. In the literature such specimens are typically referred to as *Orthalicus maracaibensis imitator* (Pilsbry, 1899).

Orthalicus undatus (Bruguière, 1789)

MATERIAL: NMNZ M.204310 (3 sh; Trinidad, Belmont, near Port of Spain; ex H. Suter colln. 5070); NMNZ M.255414 (1 sh; Trinidad; ex M. Holloway/A.G. Stevenson colln.).

DISTRIBUTION: Trinidad, Venezuela and northern Brazil (Simone 2006; Breure 2013), but introduced to other localities in Central America (e.g. Deisler & Abbott (1984)).

Genus *Porphyrobaphe* Shuttleworth, 1856

Porphyrobaphe iostoma (Sowerby I, 1824)

MATERIAL: NMNZ M.212268 (1 sh; Peru); NMNZ M.308248 (2 sh; Ecuador, Pichincha province, Mindo; ex I.M. Worthy colln.).

DISTRIBUTION: From Ecuador to northernmost Peru (Breure & Mogollón Avila 2016; Salvador *et al.* 2018a).

REMARKS: The locality of specimens NMNZ M.308248, namely Mindo, is dubious, given that this well-known species is found only in the coastal area of Ecuador (Breure & Mogollón Avila 2016).

Porphyrobaphe irrorata (Reeve, 1849)

MATERIAL: NMNZ M.233629 (2 sh; Ecuador, Pichincha province, Mindo Valley, Gualea/Nanegal; ex Gatenby colln.); NMNZ M.308247 (1 sh; Ecuador, Tungurahua province, Topo; ex I.M. Worthy colln.).

DISTRIBUTION: Central Ecuador (Breure & Borrero 2008; Breure & Ablett 2015; Breure & Araujo 2017).

REMARKS: The label of specimen NMNZ M.233629 gives two distinct but nearby localities in Mindo Valley, the parishes Gualea and Nanegal. It is not possible to know whether: one specimen comes from Gualea and the other from Nanegal; the locality is uncertain, encompassing the area of both parishes or between them; or the collector (or whoever wrote the label) thought Gualea was part of Nanegal.

Genus *Scholviencia* Strebel, 1910

Scholviencia alutacea (Reeve, 1849)

MATERIAL: NMNZ M.317570 (1 sh; Peru, Junín department, Acobamba, 3000 m; ex I.M. Worthy colln.); NMNZ M.317571 (1 sh; Peru, Junín department, Tarmatambo, near Tarma, 3400 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Central Peru (Breure & Araujo 2017).

Genus *Sultana* Shuttleworth, 1856

Sultana deburghiae (Reeve, 1859)

MATERIAL: NMNZ M.308229 (1 sh; Ecuador, Tungurahua province, Topo; ex I.M. Worthy colln.).

DISTRIBUTION: Ecuadorian Amazon (Breure & Ablett 2015; Breure & Araujo 2017).

Sultana kellettii (Reeve, 1850)

MATERIAL: NMNZ M.205764 (1 sh; Ecuador; ex H. Suter colln. 5525); NMNZ M.248256 (1 sh; Ecuador, Azuay province, Cuenca; ex E.S. Gourlay colln.).

DISTRIBUTION: The species is known from Ecuador, including Cuenca (Breure & Araujo 2017).

Sultana sultana (Dillwyn, 1817)

MATERIAL: NMNZ M.248255 (1 sh; Bolivia, Santa Cruz department, Santa Cruz de la Sierra; ex E.S. Gourlay colln.).

DISTRIBUTION: Known from Guyana, Suriname, French Guiana, Peru, Bolivia and northern Brazil (Simone 2006; Massemín *et al.* 2009).

Superfamily Clausilioidea Family Clausiliidae Genus *Nenia* H. Adams & A. Adams, 1855

Nenia sztolcmani Polinski, 1922 (Fig. 3A–B)

MATERIAL: NMNZ M.327750 (2 sh; Peru, Junín region, Carpapata, 2300 m; ex I.M. Worthy colln.); NMNZ M.327754 (2 sh; Peru, Junín region, Acobamba province, 3000 m; ex I.M. Worthy colln.); NMNZ M.328861 (1 sh; Peru, Junín region, Tarma, river bridge, 2100 m; W. Weyrauch leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Known only from Acobamba. The name *Nenia acobambensis* Pilsbry, 1945 is a frequently used junior synonym (Pilsbry 1949; Loosjes & Loosjes-van Bemmelen 1984).

REMARKS: The specimens from Carpapata and Tarma represent new records for the species, albeit just, being 15 km northeast and 7.5 km southeast of Acobamba, respectively.

Genus *Neniops* Pilsbry, 1926

Neniops smithiae (Pilsbry, 1902) (Fig. 3C–D)

MATERIAL: NMNZ M.210194 (2 sh; Colombia, Sierra de Santa Marta, El Libano, 1830–2135 m; H.H. Smith leg. v/1898; ex H. Suter colln. 5002).

DISTRIBUTION: Known only from the Santa Marta area (Grego & Szekeres 2008).

REMARKS: The present specimens are paralectotypes of *Nenia smithiae* Pilsbry, 1902 (originally spelled *Nenia Smithiae*) and were very likely acquired by Henry Suter directly from Henry Pilsbry, who described the species. Other lots acquired from Pilsbry are known in the NMNZ collection (e.g. Salvador & Breure (2020)). The lectotype and five other paralectotypes of *N. smithiae* are housed in the collection of the Academy of Natural Sciences, Drexel University, Philadelphia, USA, under register numbers ANSP 81272 and ANSP 461410, respectively.

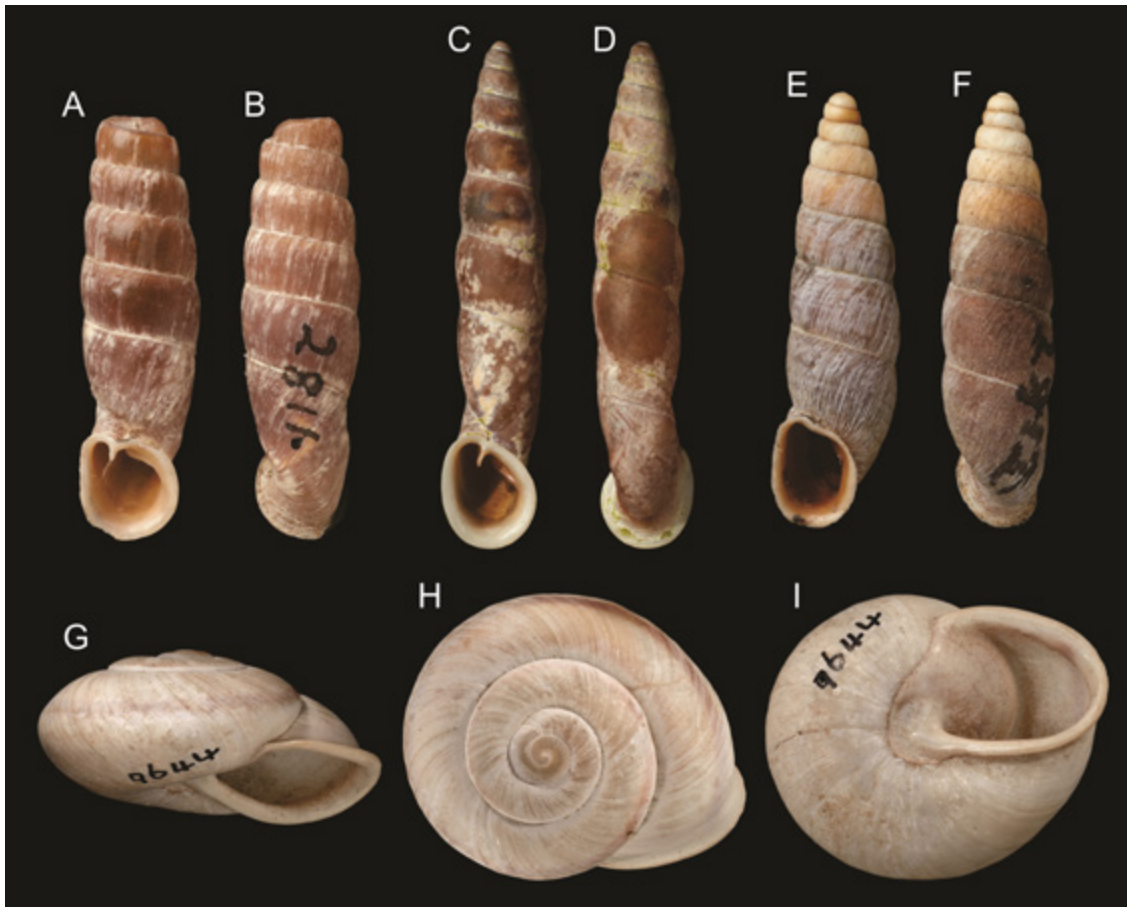


Fig. 3 A–B, *Nenia sztolcmani* Polinski, 1922, NMNZ M.327754, H = 16.0 mm. C–D, *Neniops smithiae* (Pilsbry, 1902), paralectotype of *Nenia Smithiae* Pilsbry, 1902, NMNZ M.210194, H = 24.4 mm. E–F, *Parabalea omissa* (Weyrauch, 1957), NMNZ M.327751, H = 14.5 mm. G–I, *Epiphragmophora oroyensis* Pilsbry, 1926, NMNZ M.209644, H = 13.9 mm, W = 27.3 mm.

Genus *Parabalea* Ancey, 1882

Parabalea omissa (Weyrauch, 1957) (Fig. 3E–F)

MATERIAL: NMNZ M.327751 (2 sh; Peru, Junín region, Tarmatambo, 3500 m; ex I.M. Worthy colln.).

DISTRIBUTION: Known typically from Junín region (Weyrauch 1957; Nordsieck 1999, 2010).

DISTRIBUTION: The species is only known from La Oroya. The original description reported an altitude of 12,000 ft (c. 3650 m; Pilsbry 1926: 3), but the present specimens are reportedly from higher up in the Andes (c. 4570–4870 m).

Superfamily Helicoidea Family Epiphragmophoridae Genus *Epiphragmophora* Doering, 1874

Epiphragmophora oroyensis Pilsbry, 1926 (Fig. 3G–I)

MATERIAL: NMNZ M.209644 (3 sh; Peru, Andes Mountains, Yauli province, mountain tops surrounding La Oroya, 15,000–16,000 ft [c. 4500–4900 m]; T.E. Savage leg. 31/xii/1950).

Family Helicidae Genus *Cornu* Born, 1778

Cornu aspersum (O.F. Müller, 1774)

MATERIAL: NMNZ M.206260 (1 sh; Peru, Lima; Feb/1956; ex F.C. Kinsky colln.); NMNZ M.327792 (2 sh; Peru, Lima, San Isidro; Feb/1966; ex I.M. Worthy colln.).

DISTRIBUTION: Originally from Europe, this species has been introduced to numerous countries worldwide.

Family Labyrinthidae
Genus *Isomeria* Albers, 1850

Isomeria bourcierii (L. Pfeiffer, 1853)

MATERIAL: NMNZ M.209898 (1 sh; Ecuador, Pichincha province, Quito; Pons. leg.; ex H. Suter colln. 3421); NMNZ M.307051 (2 sh; Ecuador, Pichincha province, Quito, Guayllabamba; ex I.M. Worthy colln.).

DISTRIBUTION: Central Ecuador (Solem 1966).

Isomeria cymatodes (L. Pfeiffer, 1852)

MATERIAL: NMNZ M.305801 (2 sh; Ecuador, Pastaza province, Mera; ex I.M. Worthy colln.).

DISTRIBUTION: Central and eastern Ecuador (Solem 1966).

Isomeria globosa (Broderip *in* Broderip & Sowerby I, 1832)

MATERIAL: NMNZ M.205742 (1 sh; Ecuador, Pichincha province, Quito; ex H. Suter colln. 5057); NMNZ M.305803 (1 sh; Ecuador, Pastaza province, Mera; R.W. Jackson leg.; ex I.M. Worthy colln.).

DISTRIBUTION: From southwestern Colombia to Ecuador (Solem 1966).

Isomeria jacksoni Solem, 1966

MATERIAL: NMNZ M.305802 (2 sh; Ecuador, Pastaza province, Mera; R.W. Jackson leg.; ex I.M. Worthy colln.); NMNZ M.305836 (1 sh; Ecuador, Pastaza province, Mera; R.W. Jackson leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Central Ecuador (Solem 1966).

Isomeria kolbergi (K. Miller, 1878)

MATERIAL: NMNZ M.205739 (1 sh; Ecuador, Pichincha province, Quito; ex H. Suter colln. 5058).

DISTRIBUTION: Northern and central Ecuador (Solem 1966).

Genus *Labyrinthus* H. Beck, 1837

Labyrinthus clappi Pilsbry, 1901

MATERIAL: NMNZ M.205800 (1 sh; Colombia, Sierra Nevada de Santa Marta, Los Nubes Estate, 4000 ft [c. 1200 m]; ex H. Suter colln. 5003).

DISTRIBUTION: Colombia, Sierra Nevada de Santa Marta (Solem 1966; Borrero 2012).

Labyrinthus manueli Higgins, 1872

MATERIAL: NMNZ M.307050 (2 sh; Ecuador, Pastaza province, Mera; R.W. Jackson leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Northern Ecuador (Solem 1966; Breure & Araujo 2017).

Labyrinthus otis (Lightfoot, 1786)

MATERIAL: NMNZ M.248138 (1 sh; Colombia, Chocó department, El Valle; ex E.S. Gourlay colln.).

DISTRIBUTION: Costa Rica, Panama, northern and central Colombia (Solem 1966).

Labyrinthus raimondii (Philippi, 1867)

MATERIAL: NMNZ M.205740 (1 sh; New Grenada; ex H. Suter colln. 5056); NMNZ M.305789 (2 sh; Ecuador, Pastaza province, Mera; R.W. Jackson leg.; ex I.M. Worthy colln.).

DISTRIBUTION: Colombia, Ecuador, Peru, and the Brazilian states of Amazonas and Pará (Solem 1966; Simone 2006; Breure & Araujo 2017).

Labyrinthus unciger (Petit de la Saussaye, 1838)

MATERIAL: NMNZ M.248139 (1 sh; Colombia, Chocó department, El Valle; ex E.S. Gourlay colln.).

DISTRIBUTION: From western Panama to northern Colombia; likely eastern Costa Rica (Solem 1966).

Conclusion

Some of the specimens from the NMNZ collection represent valuable additions to the geographic distribution of the species to which they belong. Furthermore, type specimens of one species, *Neniops smithiae* (Pilsbry, 1902), were discovered in the NMNZ collection. Figuring type specimens is a top priority for any museum, as further work on those taxa would greatly benefit from comparative analyses.

Natural history collections are irreplaceable biodiversity archives, and numerous discoveries can be made just by examining all that has been collected in the past (Allmon 1994; Salvador & Cunha 2020). A good portion of the records presented here date from the late nineteenth or early twentieth centuries, and in many cases it is unknown whether the species can still be found in those places. Nevertheless, data from historical collections can help us understand better how the present status of a species compares to its past, which hopefully can be used to inform threat assessment and conservation measures.

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