

An annotated type catalogue of seven genera of operculate land snails (Caenogastropoda, Cyclophoridae) in the Natural History Museum, London

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Abstract

The collection of the seven cyclophorid snail genera housed in the Natural History Museum, London (NHM), includes 95 available species-level names belonging to the genera *Pterocyclos* Benson, 1832, *Cycloctus* Swainson, 1840, *Myxostoma* Troschel, 1847, *Rhiostoma* Benson, 1860, *Scabrina* Blanford, 1863, *Crosopoma* Martens, 1891, and *Pearsonia* Kobelt, 1902. Lectotypes are here designated for twelve available species-level names to stabilise existing the nomenclature. A complete catalogue of these types, including colour photographs, is provided for the first time. After examining these type specimens, an unpublished manuscript name was found and is described herein as *Pterocyclos anamullayensis* Sutcharit & Panha, **sp. n.**

Keywords

systematics, type specimen, Southeast Asia, taxonomy, NHM, molluscs, conservation

Introduction

Cyclophoridae Gray, 1847 is a major group of terrestrial operculate snails found across southern Europe, Central America, Asia, Africa, and Australia (Kobelt 1902, Solem 1959, Stanisis 1998, Nantararat et al. 2014a). Many cyclophorid groups are common

and widespread, rich in species and are ecologically significant components of tropical habitats. They are both ground and arboreal dwelling, and exhibit a wide range of shell morphology from small (< 5 mm) to large (> 30 mm), turbate or globose to discoidal. Bouchet and Rocroi (2005) and Bouchet et al. (2017) have recognised four subfamilies, and the nominotypical subfamily consists of five tribes.

The cyclophorinid genera *Pterocyclos* Benson, 1832, *Cyclotus* Swainson, 1840, *Myxostoma* Troschel, 1847, *Rhiostoma* Benson, 1860, *Scabrina* Blanford, 1863, *Crossopoma* Martens, 1891, and *Pearsonia* Kobelt, 1902, represent approximately 180 nominal species, distributed across South and Southeast Asia, southern China and Japan (Kobelt 1902, Marzuki and Clements 2013). Two genera, *Myxostoma* and *Crossopoma*, which comprise only a few species, are considered to be endemic to southern Vietnam and the Sundaic Islands respectively (Henderson 1898, Kobelt 1902, Zilch 1955, Egorov 2009). The genus *Rhiostoma*, endemic to Indochina, consists of approximately fifteen species. In this genus, the last whorl is descending and curved detached-whorl (proboscis-like detached-whorl) and it possesses a calcareous cup-shaped operculum (Kobelt 1902, Egorov 2009). The genera *Pterocyclos*, *Cyclotus*, *Pearsonia*, and *Scabrina* have many similar features; they are discoidal in shape, have a circular aperture (sometimes with distinct accessory breathing device), and a calcareous to corneous operculum. Such similarities have made it difficult not only for species identification but also for generic assignment. The ambiguity in species boundary recognition has led to a limited number of taxonomic revisionary papers at the generic level, but generated numerous standalone species descriptions (i.e., Marzuki and Clements 2013, Sutcharit et al. 2014, Tumpeesuwan and Tumpeesuwan 2015, Foon 2016).

Since the complete morphological revision of these seven genera by Wilhelm Kobelt (1902, 1911–1914), no subsequent works have attempted a systematic rearrangement based on a molecular framework. The few papers dealing with the phylogenetics of Asian cyclophorids show that they are much more genetically diverse than their morphology suggests (Prasankok et al. 2011, Lee et al. 2012, Nantararat et al. 2014b, c, Oheimb et al. 2018). Unlike pulmonate molluscs, the reproductive organs of cyclophorids are more highly conserved and are consequentially less reliable as a taxonomically informative character. Thus, the correct identification of the species based on shell morphology presents a challenge for future phylogenetic approaches.

The traditional classification of *Crossopoma*, *Cyclotus*, *Myxostoma*, *Pearsonia*, *Pterocyclos*, *Rhiostoma* and *Scabrina* dates back to Kobelt (1902, 1911–1914), Gude (1921), Wenz (1938–1944) and Benthem Jutting (1948, 1959), all of which mainly relied on shell shape, accessory breathing device and shell colour pattern. Almost all of the known species have long been described, with only a brief type description, and mostly without illustration or explicitly designation of the name bearing type. Of these recognised species, 59 taxa (mostly described by O Boettger, F Haas, W Kobelt, O Möllendorff, H Rolle, B Rensch, and T-C Yen), whose type specimens are housed in the Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt, are well catalogued and illustrated (Zilch 1955, 1956). Later, Hwang (2014), Raheem et al. (2014), and Sutcharit et al. (2014) have re-investigated and illustrated the type specimens of eleven taxa within seven genera in their respective regional faunistic studies. However, the

majority of the remaining taxa have not been investigated or illustrated. The Natural History Museum, London (NHM) collections, is one of the largest museum mollusc collections, with specimens acquired from various sources and collectors (for more information see Dance 1986, Breure and Ablett 2011, Nantararat et al. 2014a, Hwang 2014, Sutcharit et al. 2015). The NHM collections hold the majority of the species described by WT Blanford, H Fulton, HH Godwin-Austen, G Nevill, L Pfeiffer, EA Smith, and GB Sowerby I, amongst others, and in many cases the type specimens have not been catalogued or illustrated since their original publication.

Type specimens provide key species data, as they represent the international standard and form the basis of nomenclatural stability when following the International Commission on Zoological Nomenclature (ICZN) guidelines. Therefore, the objective of this study was to evaluate the type status of *Crossopoma*, *Cyclotus*, *Myxostoma*, *Pearsonia*, *Pterocyclos*, *Rhiostoma*, and *Scabrina* type specimens in the NHM collections and to document and figure them in accordance with ICZN (1999) guidelines.

Materials and methods

Collections: The primary type specimens (i.e., holotype, lectotype, and syntype/s) along with secondary type specimens (paratype/s and paralectotype/s) of *Crossopoma*, *Cyclotus*, *Myxostoma*, *Pearsonia*, *Pterocyclos*, *Rhiostoma*, and *Scabrina* species described from the early of 19th century until the year 2018 are here examined. When considering the type specimens, in publications where a single primary type was not clearly designated, and the available specimens proved to form part of the type series, these are considered to be syntypes. In cases where a holotype was not designated, but it is clear from the original publication that the name was based on a single specimen, these are considered a holotype fixed by monotypy (ICZN 1999: Art. 73.1.2). Lectotypes mentioned in this catalogue are here designated, unless otherwise stated, to enhance the stability of the name.

All specimens considered as forming part of the type series are photographed in the standard positions (apertural, apical, and umbilical views). The original labels have been photographed and checked against the original description. The measurements of the holotype, lectotype, and syntypes were taken in mm with a digital caliper. We have also included specimen data in cases where the primary type is housed in another museum collection but paratype(s) or paralectotype(s) are kept in the NHM collections.

Presentation: This illustrated catalogue is listed by current genera with species in alphabetical order, regardless of termination, incorrect original spelling, and the association with the authorships and dates. The synonymy tabulation and the usage of each taxon name have been comprehensively provided in Kobelt (1902, 1911–1914), Gude (1921) and Benthem Jutting (1948, 1959). The original combination of the taxon name with reference to pages, plate, and/or figures that made the names available is mentioned. In addition, we also list references where type specimens have been subsequently mentioned or illustrated, especially publications like the “*Conchologia Iconica...*” by Reeve (1861, 1862, 1863), “*Systematisches Conchylien-Cabinet...*” by Pfeiffer (1849, 1853b, 1854a) and “*Conchologia Indica...*” by Hanley and Theobald

(1870–1876). The type locality is as stated in the original publication in the original wording and language. Additional locality data from original labels, with respect to current political boundaries or subsequently published localities is given in square brackets. Under the type materials, primary type specimens with the Natural History Museum registration number (hereafter NHMUK), number of specimen(s), and the figures as listed in this publication are given. In addition, if the paratype(s) of that taxa are present; the registration number, number of specimens, and figures of representative specimen are also given. The history and type evidence is summarised under each taxon. Full bibliographic references are provided at the end of this paper.

Institutional abbreviations: Abbreviation of the museum collection appeared below in the lists of taxa and species descriptions are listed as follows:

ANSP	Academy of Natural Sciences of Philadelphia, Drexel University, Philadelphia
CUMZ	Chulalongkorn University, Museum of Zoology, Bangkok
NHMUK	Natural History Museum, London
NMW	The National Museum of Wales, Cardiff
RBINS	Royal Belgian Institute of Natural Sciences, Brussels
RMNH	Rijksmuseum van Natuurlijke Historie, Leiden
SMF	Forschungsinstitut und Naturmuseum Senckenberg, Frankfurt am Main

Results

There are 95 available taxa that are classified into the seven genera of *Cyclotus*, *Crossopoma*, *Myxostoma*, *Scabrina*, *Personia*, *Pterocyclos* and *Rhiostoma*. Twelve species names “*atronitens*”, “*burrailensis*”, “*butleri*”, “*coorgensis*”, “*daflensis*”, “*hengdanensis*”, “*hirtus*”, “*lahupaensis*”, “*lemanii*”, “*lhotaensis*”, “*parrus*”, and “*syllhetensis*” are unpublished and found only on the labels of the specimens in Godwin-Austen collection, which are considered as unavailable nominal taxa (ICZN 1999: Art. 12). The un-published taxon name “*Pterocyclos anamullayensis*” in the Beddome collection is clearly distinct from all other known species, and is described here as a new species. Amongst these available taxa, the NHM retained 96 % of the name-bearing types exclusively as 12 holotypes, 15 lectotypes, and 64 lots of syntype material. In the case of the five holotype lots of “*bathyrhaphé*”, “*brounae*”, “*gwendolena*”, “*hungerfordi*”, and “*spiramentum*”, the type status has only recently been confirmed and is recognized as the holotype (fixed by monotypy). The five probable/possible syntype lots are “*cochinchinensis*”, “*inglisianus*”, “*politus*”, “*puriensis*”, and “*volvuloides*”. Among the 15 lectotype lots, eleven lots are here designated as the lectotypes to clarify their type status and promote the stability of the taxon name. The other four lots were previously designated from the original type series by Raheem et al. (2014) as “*comatus*”, “*cumingi*”, and “*fairbanksi*”, and by Hwang (2014) as “*taivanus*”. The remaining 4 % are solely paratypes, whose name-bearing types are housed elsewhere.

Catalogue of type material

1. *abletti* Thach, 2016

Fig. 1A

Rhiostoma abletti Thach, 2016: 37, 38, figs 53, 122–124.

Current generic position. *Rhiostoma* Benson, 1860

Type locality. Northwest of Lai Châu city, on the way going to Paso, Lai Châu Province (north Vietnam).

Type material. Holotype NHMUK 20160307 (Fig. 1A), paratype ANSP 467381 (1 shell).

2. *aborensis* Godwin-Austen, 1915

Fig. 1B, C

Pterocyclos aborensis Godwin-Austen, 1915: 498, pl. 39, figs 1, 1a. Gude 1921: 98.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Abor Hills; Pongping; Rami Lampang [region in Arunachal Pradesh State, India].

Type material. Syntype NHMUK 1903.7.1.3104 (3 shells; Fig. 1B, C) from Abor Hills; NHMUK 1903.7.1.3046 (2 shells) from Pongping, Abor; NHMUK 1903.7.1.3050 (3 shells) from Rami Lampang, Abor.

Remarks. Godwin-Austen's description was based on three lots of specimens. The original description includes an illustration and one set of measurements. The original description stated "Type no. 3104 Brit. Mus." There are three specimens from Godwin-Austen type collection that relate to this registration number. The specimen figured in the original description which corresponds to the measurements given is figured herein (Fig. 1B).

3. *amabilis* Fulton, 1905

Fig. 1D

Cyclotus (Eucyclotus) amabilis Fulton, 1905: 93.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. N. Borneo [North Borneo].

Type material. Syntype NHMUK 1905.4.14.4 (1 shell; Fig. 1D).

Remarks. The original description did not include an illustration and only one set of shell measurements was given. The author stated "sometime zigzag", which implied that this taxon was based on more than one specimen. The NHM collections contain a lot com-

prised of a single specimen purchased from Sowerby and Fulton with a label stating “Type” and with a collection locality written on the original label, this specimen is figured herein.

4. *amboinensis* (Pfeiffer, 1854)

Fig. 1E, F

Cyclostoma (*Cyclophorus*) *amboinense* Pfeiffer, 1854b [1852]: 144. Pfeiffer 1854a: 373, pl. 48, figs 20–22.

Cyclotus amboinensis — Kobelt 1902: 189.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Amboyna [Ambon Island, Maluku Province, Indonesia].

Type material. Lectotype (design. n.) NHMUK 20170352/1 (Fig. 1E), paralectotypes NHMUK 20170352/2–3 (2 shells; Fig. 1F).

Remarks. The original description lacked mention of an operculum and did not include an illustration, and only one set of shell measurements was given. Pfeiffer (1854a) re-published the description and figured the species which no operculum. There is a lot of four shells from the Cuming collection with two Pfeiffer handwritten labels. The larger label states “*C. Amboinensis* Pfr.”, “The operculum shows that...” and the collection locality from “Isle of Lobok”. We presume that this lot contains a subsequently introduced specimen that has an operculum. Therefore, the specimen with an operculum attached (NHMUK 20070352/4) is excluded from the type series. The remaining three shells have no operculum and the smaller label states “*Cycl. Amboinense* Pfr.” and gives the collection locality as “Amboyna”. The specimen that most closely matches with the measurements given in the original description and the illustration in Pfeiffer (1854a) is here designated as the lectotype to stabilise the name.

5. *andersoni* (Blanford, 1869)

Fig. 1G, H

Spiraculum andersoni Blanford, 1869b: 447.

Pterocyclos andersoni — Hanley and Theobald 1872: 23, pl. 49, figs 3, 4.

Pearsonia andersoni — Kobelt 1902: 172. Kobelt 1911: 766, 767, pl. 112, figs 10, 11.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. ad Bhamo cum praecedente [Bhamo District, Kachin State, Myanmar].

Type material. Syntype NHMUK 1906.5.5.77 (3 shells; Fig. 1G, H).

Remarks. The species description was clearly based on more than one specimen, but an illustration was not included in the original description. Later, the species was figured in Hanley and Theobald (1872). The figured specimen with red wool inside the aperture is illustrated in Figure 1G.



Figure 1. **A** Holotype of *Rhiostoma abletti* **B, C** syntype of *Pterocyclos aborensis* **D** syntype of *Cyclotus amabilis* **E, F** *Cyclotus amboinensis* **E** lectotype and **F** paralectotype **G, H** syntype of *Pearsonia andersoni* **I, J** syntype of *Pterocyclos anguliferus* **K, L** syntype of *Pterocyclos asperus*.

6. *anguliferus* (Souleyet, 1841)

Fig. 1I, J

Cyclostoma angulifera Souleyet, 1841: 347. Eydoux and Souleyet 1852: 530–532, pl. 30, figs 6–11.

Pterocyclos anguliferus — Reeve 1863: volume 14, *Pterocyclos*, pl. 2, species 10. Kobelt 1902: 161.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Les environs de Touranne (Cochinchine) [Da Nang City, Vietnam].

Type material. Syntype NHMUK 1854.7.24.365 (2 shells; Fig. 1I, J).

Remarks. The original description included one set of measurements. Later, Eydoux and Souleyet (1852) re-published the description and figured this species. Gray (1855: 19) made a list of type specimens of molluscs described by the late M Souleyet and housed in the NHM collections. There are two specimens with an original label stating the species name and collection locality. The specimen that closely matches the figure in Eydoux and Souleyet (1852) and is closest to the measurements given in the original description is illustrated in Figure 1I.

7. *aspersus* Bullen, 1906

Fig. 1K, L

Pterocyclos aspersus Bullen, 1906: 129, with text figure. Kobelt 1911: 752, 753, pl. 111, figs 11–13a.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Loeboek, Bangko [region in Bangko, Merangin Regency, Jambi Province, Indonesia].

Type material. Syntype NHMUK 1906.7.21.1 (5 adults + 1 juvenile; Fig. 1K, L).

Remarks. The original description is clearly based on more than one specimen, but only one set of measurements and illustrations were given. The NHM type collections contain a lot of six shells with the label stating the taxon name, collection locality, and “Type”. The specimen figured in the original description, which is closest to the shell dimensions given in the original description, is illustrated in Figure 1K.

8. *assamenseis* (Fulton, 1900)

Fig. 2A, B

Spiraculum assamense Fulton, 1900: 87, 88.

Pearsonia assamensis — Gude 1921: 113, 114, fig. 18.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Khasi Hills, Assam [Khasi Hills, Meghalaya State, India].

Type material. Syntype NHMUK 1901.4.25.45–46 (2 shells; Fig. 2A, B).

Remarks. The original description did not include an illustration, and only one set of shell measurements was given. There are two shells in the NHM collection with Fulton's handwritten label stating "TYPE (larger)". The larger specimen corresponds to the measurements given in the original description and is illustrated in Figure 2A.

9. *avana* (Blanford, 1863)

Fig. 2C

Spiraculum avanum Blanford, 1863: 319–321.

Pterocyclos avanus — Hanley and Theobald 1875: 54, pl. 134, figs 8, 9.

Pearsonia avana — Kobelt 1902: 172.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Shan Hills, east of the town of Ava [Shan Hills, Kyaukse District, Mandalay Region, Myanmar].

Type material. Syntype NHMUK 1903.7.1.4198 (1 shell; Fig. 2C).

Remarks. The species was clearly based on two specimens, one dead and one alive. The original description did not include an illustration and only one set of measurements was given. Subsequently, Hanley and Theobald (1875) figured a specimen of this species. The single specimen in the NHM from the Godwin-Austen collection, ex. WT Blanford collection and figured in Hanley and Theobald (1875) is figured herein.

10. *batchianensis* Pfeiffer, 1861

Fig. 2D

Cyclotus batchianensis Pfeiffer, 1861: 28, pl. 3, fig. 1. Kobelt 1902: 197.

Pterocyclos batchianensis — Reeve 1863: volume 14, *Pterocyclos*, pl. 2, species 6.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Ise of Batchian [Bacan Islands, north Maluku Province, Indonesia].

Type material. Syntype NHMUK 20170364 (1 adult + 1 juvenile; Fig. 2D).

Remarks. The original description by Pfeiffer includes an illustration and one set of shell measurements. The type lot in the NHM collections was collected by "Mr. Wallace" and is from the Cuming collection as stated in the original description. It has an original label in Pfeiffer's handwritings giving the species name and collection locality. The adult specimen that closely matches the measurements and the illustration shown in the original description is figured herein.

11. *bathyrhapse* (Smith, 1878)

Fig. 2E

Cyclophorus (Myxostoma) bathyrhapse Smith, 1878: 497–499, fig. 3.
Crossopoma bathyrhapse — Kobelt 1902: 85.

Current generic position. *Crossopoma* Martens, 1891

Type locality. Borneo.

Type material. Holotype NHMUK 1878.1.30.1 (Fig. 2E).

Remarks. Smith clearly stated that this taxon was described based on a single specimen from the GB Sowerby I collection. The species description included an illustration and a set of shell dimensions. The NHM collections contain a type lot that has an original label stating “Type”, subsequently re-written as “Holotype”. Therefore, we recognise this single shell as the holotype fixed by monotypy.

12. *beddomei* (Blanford, 1866)

Fig. 2F

Spiraculum beddomei Blanford, 1866: 31, 32.

Pterocyclos beddomei — Hanley and Theobald 1875: 54, pl. 134, figs 5, 6.

Pearsonia beddomei — Kobelt 1902: 172, 173, fig. 36. Kobelt 1911: 767, 768, pl. 112, figs 14–18.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Kimeky Hills near Waltair (Vizagapatam), northern division of the Madras Presidency [Visakhapatnam District, Andhra Pradesh State, India].

Type material. Syntype NHMUK 1906.1.1.942 (1 shell; Fig. 2F).

Remarks. The species description was based on more than one specimen. The original description did not include an illustration, and only one set of measurements was given. Hanley and Theobald (1875) subsequently figured this species. There is a specimen in the NHM from the Blanford collection figured in Hanley and Theobald (1875) that closely matches the dimensions given in the original description, it is figured herein.

13. *bhamoensis* (Theobald, 1876)

Fig. 2G

Spiraculum bhamoense Theobald, 1876: 186, 187.

Pearsonia bhamoensis — Kobelt 1902: 173.

Current generic position. *Pearsonia* Kobelt, 1902



Figure 2. **A, B** Syntype of *Pearsonia assamensis* **C** syntype of *Pearsonia avana* **D** syntype of *Cyclotus batchi-anensis* **E** holotype of *Crossopoma bathyrhaphe* **F** syntype of *Pearsonia beddomei* **G** syntype of *Pearsonia bhamoensis* **H, I** syntype of *Pterocyclos bifrons* **J, K** syntype of *Cyclotus birostris* **L** syntype of *Pearsonia bitubifera*.

Type locality. Bhamo valle Iravadi Regno Burmanico [Ayeyarwady Valley, Bhamo District, Kachin State, Myanmar].

Type material. Syntype NHMUK 1888.12.4.1964 (1 shell; Fig. 2G).

Remarks. The original description did not include an illustration, and only one set of measurements was given. Gude (1921: 116, 117, fig. 20) re-published the description and figured a type specimen from Theobald's collection. There is one shell in the NHM collection purchased from W Theobald, with an original label stating "type" and the collection locality "Bhamo". The specimen figured herein closely matches the measurements given in the original description.

14. *bifrons* Pfeiffer, 1855

Fig. 2H, I

Pterocyclos bifrons Pfeiffer, 1855b: 117. Reeve 1863: volume 14, *Pterocyclos*, pl. 1, species 1. Kobelt 1902: 162, 163.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Ceylon [Sri Lanka].

Type material. Syntype NHMUK 20170365 (3 shells; Fig. 2H, I).

Remarks. The species was described based on specimens from the Cuming collection. The original description did not include illustrations, and only one set of measurements was given. Reeve (1863) re-described and illustrated a single specimen from the Cuming collection. There are three specimens from the Cuming collection in the NHM type lot with an original label in Pfeiffer's handwriting stating the species name and collection locality. The specimen figured in Reeve (1863) closely matches the measurements given in the original description is illustrated here in Figure 2H.

15. *birostris* (Pfeiffer, 1855)

Fig. 2J, K

Cyclostoma birostre Pfeiffer, 1855a [1854]: 300.

Pterocyclos birostris — Reeve 1863: volume 14, *Pterocyclos*, pl. 4, species 18.

Cyclotus birostris — Kobelt 1902: 214.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Sarawak, Borneo [Sarawak, Malaysia].

Type material. Syntype NHMUK 20170353 (3 shells; Fig. 2J, K).

Remarks. This species was described based on material from the Cuming collection, and only one set of shell measurements was given. Later, Reeve (1863) re-described the species and illustrated a shell from the Cuming collection. There are three specimens in the NHM collections with an original label stating "Rev C. I. f. 18a–b".

The specimen figured herein (Fig. 2J) is closest to the illustration in Reeve (1863) and the shell dimensions given in the original description.

16. *bitubifera* (Theobald, 1876)

Fig. 2L

Spiraculum bitubiferum Theobald, 1876: 187.

Pearsonia bitubifera — Kobelt 1902: 173.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Bhamo [Bhamo District, Kachin State, Myanmar].

Type material. Syntype NHMUK 1888.12.4.1961 (1 shell; Fig. 2L).

Remarks. The original description did not include an illustration, and only one set of measurements was given. Gude (1921: 117, 118, fig. 21) re-published the description and figured a shell from Theobald's collection. There is one shell in the NHM collection purchased from W Theobald, with an original label stating "type" and the collection locality "Bhamo". This specimen closely matches the measurements given in the original description and is figured herein.

17. *boxalli* Godwin-Austen, 1889

Fig. 3A

Cyclotus boxalli Godwin-Austen, 1889: 343, 344, pl. 36, fig. 4, 4a. Kobelt 1902: 212.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Molu Hills [Gunung Mulu National Park, Miri Division, Sarawak, Malaysia].

Type material. Syntype NHMUK 1891.3.17.35 (1 shell; Fig. 3A).

Remarks. This species was described from the Hungerford collection. An illustration and a set of shell dimensions were given in the original description. Godwin-Austen (1889) does not explicitly indicate the number of specimens he has available to him in the original description. There is a single shell in the NHM collections from the R Hungerford collection with an original label stating "Type", the species name, and collection locality. This specimen closely matches with the illustration and the shell measurements given in the original description, and it is figured herein.

18. *boxalli* Godwin-Austen, 1893

Fig. 3B, C

Rhiostoma boxalli Godwin-Austen, 1893: 32, 33, fig. 1a–c. Kobelt 1902: 538, 539.

Current generic position. *Rhiostoma* Benson, 1860

Type locality. Near Kina Balu [Mount Kinabalu, Sabah, Malaysia]; Palawan [Palawan Islands, Province of Palawan, Mimaropa Region, Philippines].

Type material. Syntypes NHMUK 1894.5.23.1 from near Kina Balu (1 shell; Fig. 3B), NHMUK 1895.12.5.34 from Palawan (1 shell; Fig. 3C).

Remarks. The original description gives a set of shell measurements and figures of two specimens, so this species is clearly based on more than one specimen. There is a type lot (two shells) with differing registration numbers, one specimen NHMUK 1894.5.23.1 is from R Hungerford ex. Mr. Boxall from Kina Balu and the NHM registration book states “Type”. The other shell, NHMUK 1895.12.5.34, in the same box was collected by Mr. Whitehead from Palawan and agrees well with Godwin-Austen (1893: fig. 1b, c). These two shells form part of the type series and are considered as syntypes.

19. *brahmakundensis* Godwin-Austen, 1915

Fig. 3D, E

Pterocyclos brahmakundensis Godwin-Austen, 1915: 499, 500, with text figure 1. Gude 1921: 101.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Brahmakund, eastern Assam [Parshuram Kund, Lohit District, Arunachal Pradesh State, India].

Type material. Syntype NHMUK 1903.7.1.713 (3 shells; Fig. 3D, E).

Remarks. Godwin-Austen clearly stated that the original description was based on a lot of three shells “Type No. 713 B.M.”. The NHM type collections contain a lot of three shells from the Godwin-Austen collection and original label states “TYPE”. The specimen with red wool inside the aperture that corresponds to the illustrations and measurements given in the original description, and it is figured herein (Fig. 3D).

20. *brounae* (Sykes, 1898)

Fig. 3F

Cyclophorus (Scabrinus) brounae Sykes, 1898: 73, figs 2, 3.

Scabrina brounae — Kobelt 1902: 78.

Current generic position. *Scabrina* Blanford, 1863

Type locality. Nuwara–Eliya [Nuwara Eliya District, Central Province, Sri Lanka].

Type material. Holotype NHMUK 1903.7.17.3 (Fig. 3F).

Remarks. Sykes clearly stated that this taxon was described based on a single specimen collected by Mrs. Broun. The original description included an illustration and a



Figure 3. **A** Syntype of *Cyclotus boxalli* **B, C** syntype of *Rhiostoma boxalli* **D, E** syntype of *Pterocyclos brahmakundensis* **F** holotype of *Scabrina brounae* **G, H** syntype of *Scabrina calyx* **I** syntype of *Rhiostoma cambodjense* **J, K** syntype of *Pterocyclos celebensis* **L** holotype of *Rhiostoma christae*.

set of shell measurements. The NHM collections contain a Sykes type lot that has an original label stating “Type”, and so we recognise this single illustrated specimen as the holotype fixed by monotypy.

21. *calyx* (Benson, 1856)

Fig. 3G, H

Cyclophorus calyx Benson, 1856: 228, 229. Pfeiffer 1860b: 145, 146, pl. 37, figs 25–27. Reeve 1861: volume 13, *Cyclophorus*, pl. 20, species 104.

Scabrina calyx — Kobelt 1902: 87, 88.

Current generic position. *Scabrina* Blanford, 1863

Type locality. ad Akaouktong, prope ripas fluminis Irawadi [Akauk Taung (Hill), Padaung Township, Pyay District, Bago Region, Myanmar].

Type material. Syntype NHMUK 1954.6.2.1542–1544 (3 shells; Fig. 3G, H).

Remarks. The original description did not include an illustration or state the number of specimens examined and there is no information concerning the operculum, however one set of shell measurements were given. Later, Pfeiffer (1860b) and Reeve (1861) re-published the description and figured the species from specimens in the Benson collection. There is a type lot in the NHM ex. Hawkins collection containing three shells (1 with and 2 without periostracum). The specimen without periostracum that most closely matches with the measurements given in the original description and the illustrations in Pfeiffer (1860b: pl. 37, figs 25–27) and Reeve (1861: pl. 20, species 104) is figured herein (Fig. 3G).

22. *cambodjense* (Morelet, 1875)

Fig. 3I

Pterocyclos cambodjense Morelet, 1875: 286, 287, pl. 13, fig. 1. Breure et al. 2018: 232, figs 173, 174.

Rhiostoma cambodjense — Kobelt 1902: 177. Kobelt 1911: 763, 764, pl. 113, figs 14–16.

Current generic position. *Rhiostoma* Benson, 1860

Type locality. Battambang, Cambodje [Battambang Province, Cambodia].

Type material. Syntype NHMUK 1893.2.4.766 (1 shell; Fig. 3I).

Remarks. The original description includes an illustration and one set of shell measurements is given. However, the species description was not clearly based on a single specimen. Only one shell was found in the NHM collections with an original label stating “Type” and giving the reference of the original description and collection locality. This figured specimen exactly matches with the illustration and shell measurements given in the original description.

23. *celebensis* (Smith, 1896)

Fig. 3J, K

Cyclotus celebensis Smith, 1896b: 101, pl. 7, figs 4–6.*Pterocyclos celebensis* — Kobelt 1902: 163, 164.**Current generic position.** *Pterocyclos* Benson, 1832**Type locality.** South Celebes, 2000–4000 feet [South Sulawesi Province, Indonesia].**Type material.** Syntype NHMUK 1896.5.1.3 (2 shells; Fig. 3J, K).**Remarks.** There are two specimens in the type lot with original labels in Smith's handwriting stating "Type". The original description gives one set of measurements and illustrates one specimen. The specimen that corresponds to the illustrations in Smith (1896b: figs 4–6) and the given shell measurements in the original description and has a red spot on the last whorl is figured herein (Fig. 3J).**24. *chinensis* (Pfeiffer, 1855)**

Fig. 4A, B

Cyclostoma (*Cyclotus*) *chinense* Pfeiffer, 1855a [1854]: 299.*Leptopoma chinense* — Reeve 1862: volume 13, *Leptopoma*, pl. 7, species 43.*Cyclotus chinensis* — Kobelt 1902: 205.**Current generic position.** *Cyclotus* Swainson, 1840**Type locality.** Hong Kong, China.**Type material.** Syntype NHMUK 198040 (3 shells; Fig. 4A, B).**Remarks.** The original description did not include an illustration, and one set of shell measurements was given. Later, Reeve (1862) re-published the description and figured a shell from the Cuming collection. There is one lot from the Cuming collection containing three specimens collected by Mr. Fortune with an original label in Pfeiffer's handwriting stating the species name and collection locality. The specimen that most closely matches the measurements given in the original description and the illustration in Reeve (1862) is figured herein (Fig. 4A).**25. *christae* Thach, 2016**

Fig. 3L

Rhiostoma christae Thach, 2016: 38, figs 51, 130–133.**Current generic position.** *Rhiostoma* Benson, 1860**Type locality.** Near the road No. 6 to Chieng Ngan, Son La Province (north Vietnam).**Type material.** Holotype NHMUK 20160306 (Fig. 3L), paratype ANSP 467386 (1 shell).



Figure 4. **A, B** Syntype of *Cyclotus chinensis* **C** lectotype of *Rhiostoma chupingense* **D** probable syntype of *Cyclotus cochinchinensis* **E** lectotype of *Pterocyclos comatus* **F** syntype of *Cyclotus confluens* **G** syntype of *Pterocyclos cucullus* **H** lectotype of *Pterocyclos cumingi* **I, J** syntype of *Rhiostoma dalyi* **K, L** syntype of *Cyclotus daucinus*.

26. *chupingense* Tomlin, 1938

Fig. 4C

Rhiostoma chupingense Tomlin, 1938: 73, p1. 2, figs 1, 2.**Current generic position.** *Rhiostoma* Benson, 1860**Type locality.** Bukit Chuping, Perlis, Malaysia.**Type material.** Lectotype (design. n.) NHMUK 1938.10.25.1 (Fig. 4C), paralectotypes NMW 1955.158.01101 (3 shells) and NMW.Z 1981.118.02703 (1 shell).**Remarks.** The original description was clearly based on more than one specimen, and included an illustration and one set of shell measurements. There is only one specimen in the NHM type collections with Tomlin's hand written label stating "Type" and the collection locality. This specimen exactly matches with the illustration (not full adult stage) and the measurements given in the original description and is here designated as the lectotype to stabilise the name. The other two lots of Tomlin collections in the NMW with the label stating "paratype" are therefore considered as paralectotypes.**27. *cochinchinensis* (Pfeiffer, 1857)**

Fig. 4D

Cyclostoma (*Opisthophorus*) *cochinchinense* Pfeiffer, 1857a [1856]: 337.*Pterocyclos cochinchinensis* — Reeve 1863: volume 14, *Pterocyclos*, pl. 4, species 22.*Cyclotus cochinchinensis* — Kobelt 1902: 209.**Current generic position.** *Cyclotus* Swainson, 1840**Type locality.** Cochinchina [south of Vietnam].**Type material.** Probable syntype NHMUK 20170354 (1 shell; Fig. 4D).**Remarks.** This species was described from specimens in the Cuming collection and only one set of shell measurements was given in the original description. The NHM collections contains a lot of a single shell from the Cuming collection with an original label, probably in Pfeiffer's handwriting, stating the species name, however this has subsequently been overwritten. Reeve (1863) illustrated a single specimen from the Cuming collection. This single specimen closely matches the illustration in Reeve (1863) but is slightly larger than the shell dimensions given in the original description. Therefore, we consider this specimen to be a probable syntype.**28. *comatus* Beddome, 1881**

Fig. 4E

Pterocyclos comatus Beddome in Nevill, 1881: 146. Kobelt 1902: 164, 165.*Pterocyclos comatus* — Raheem et al. 2014: 42, fig. 23d, e.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Anaamullays.

Type specimen. Lectotype (designated by Raheem et al. 2014), NHMUK 1912.04.16.669/1 (Fig. 4E), paralectotypes NHMUK 1912.04.16.669/2 (2 shells), SMF 130504 (4 shells).

Remarks. One lot of four specimens SMF 130504/4 in Möllendorff ex. Beddome collection from “Anamullay–Berge” and labelled “Cotyphen” are considered as paralectotypes.

29. *confluens* (Pfeiffer, 1860)

Fig. 4F

Cyclophorus confluens Pfeiffer, 1860a: 140. Reeve 1861: volume 13, *Cyclophorus*, pl. 15, species 69.

Japonia (Lagochilus) confluens — Kobelt 1902: 40.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Borneo.

Type material. Syntype NHMUK 20170355 (1 shell; Fig. 4F).

Remarks. The species description by Pfeiffer did not indicate the number of available specimens and did not include an illustration. Only one set of shell measurements was given in the original description. Reeve (1861) re-published the description and figured one specimen from the Cuming collection. The NHM collections contain a lot containing one shell with Pfeiffer’s handwritten label giving the species name and collection locality. This figured shell matches well with the measurements given in the original description and the figure in Reeve (1861).

30. *cucullus* Godwin-Austen, 1889

Fig. 4G

Pterocyclos cucullus Godwin-Austen, 1889: 340, pl. 35, figs 2, 2a. Kobelt 1902: 165.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Niah Hills [Niah National Park, Miri Division, Srawak, Malaysia].

Type material. Syntype NHMUK 1889.12.7.17 (1 shell; Fig. 4G).

Remarks. The original description included an illustration and one set of shell measurements. Only one specimen is housed in the NHM type collections, with an original label stating “Type”. This shell closely matches the illustration and the measurements given in the original description.

31. *cumingi* Pfeiffer, 1851

Fig. 4H

Pterocyclos cumingi Pfeiffer, 1851: 5. Kobelt 1902: 165. Reeve 1863: volume 14, *Pterocyclos*, pl. 3, species 14. Raheem et al. 2014: 43, figs 23f, 24a.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. insula Ceylon [Sri Lanka].

Type material. Lectotype (designated by Raheem et al. 2014) NHMUK 20110220/1 (Fig. 4H).

32. *dalyi* Blanford, 1902

Fig. 4I, J

Rhiostoma dalyi Blanford, 1902: 34, 35, fig. 1.

Current generic position. *Rhiostoma* Benson, 1860

Type locality. Juxta Phitsanulok, in sylvis humidis et densis [Phitsanulok Province, Thailand].

Type material. Syntype NHMUK 1902.1.24.14–16 (3 shells; Fig. 4I, J).

Remarks. This species was described from specimens collected by Mr. WM. Daly from Thailand. The original description included an illustration and a set of shell dimensions. The NHM collections contain a lot of three specimens collected by Mr. Daly and have an original label stating the species name and collection locality. The specimen which is identical to the illustration, particularly in respect to the breathing device, and the shell measurements given in the original description is figured herein (Fig. 4I).

33. *daucinus* (Pfeiffer, 1857)

Fig. 4K, L

Cyclostoma (*Cyclotus*) *daucinum* Pfeiffer, 1857a [1856]: 337.

Cyclotus daucinus — Reeve 1863: volume 14, *Cyclotus*, pl. 8, species 49.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Salomon's Islands [Solomon Islands].

Type material. Syntype NHMUK 20170356 (2 shells; Fig. 4K, L).

Remarks. This species was described from material in the Cuming collection, and the original description included only one set of shell dimensions. Reeve (1863) re-described the species and illustrated a shell from the Cuming collection. The NHM collections contain a lot of two specimens from the Cuming collection with Pfeiffer's

hand written label giving the species name and collection locality. The specimen that corresponds to the shell measurements in the original description and the illustration in Reeve (1863) is figured herein (Fig. 4K).

34. *dautzenbergi* (Sykes, 1902)

Fig. 5A, B

Opisthophorus dautzenbergi Sykes, 1902a: 23. Sykes 1902b: 62, pl. 3, figs 5, 6.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Kelantan, Malay Peninsula [Kelantan, Malaysia].

Type material. Syntype NHMUK 20170357 (3 shells; Fig. 5A, B).

Remarks. The species description does not include an illustration, but later, Sykes (1902b) cited the species name and illustrated a shell of this taxon. The NHM collections contain a lot of three specimens from the Sykes collection. There is a specimen that exactly matches with the illustration in regard to the brownish zigzag streaks on the last whorl, and with the shell measurements given in the original description plus it has “Type” written on the shell. It is figured herein (Fig. 5A).

35. *diluvium* Sutcharit & Panha, 2014

Fig. 5C

Pterocyclos diluvium Sutcharit & Panha, 2014: 336, fig. 3l–p.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Tam Sumano, Patthalung, Thailand (7°35'183"N, 99°52'80"E).

Type material. Holotype CUMZ 4595. Paratypes CUMZ 4588 (11 specimens in ethanol), NHMUK 20150078 (2 shells, Fig. 5C).

36. *discoideus* (Sowerby I, 1843)

Fig. 5D, E

Cyclostoma discoideum Sowerby I, 1843a: 111, pl. 25, figs 87, 88. Pfeiffer 1849: 144, 145, pl. 20, figs 1–3.

Cyclotus discoideus — Reeve 1863: volume 14, *Cyclotus*, pl. 5, species 23. Kobelt 1902: 190, 191.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Demerara.

Type material. Syntype NHMUK 20170358 (2 shells; Fig. 5D, E).



Figure 5. **A, B** Syntype of *Cyclotus dautzenbergi* **C** paratype of *Pterocyclos diluvium* **D, E** syntype of *Cyclotus discoideus* **F, G** syntype of *Crossopoma enganoense* **H, I** syntype of *Cyclotus euryomphalus* **J** lectotype of *Pearsonia fairbanki* **K, L** syntype of *Cyclotus fortunei*.

Remarks. The original description and illustration in Sowerby I (1843a) as well as those in Pfeiffer (1849) and Reeve (1863) are particularly accurate, both showing the varices on the last whorl, which suggests that these figures are from the same specimen. The NHM collections contain a lot of two shells from the Cuming collection with original labels stating the taxon name and collection locality. The specimen that corresponds to the illustrations in Sowerby I (1843a), Pfeiffer (1849) and Reeve (1863) is figured herein (Fig. 5D).

37. *enganoense* Henderson, 1898

Fig. 5F, G

Crossopoma enganoense Henderson, 1898: 17, pl. 2, figs 1–3.

Current generic position. *Crossopoma* Martens, 1891

Type locality. Engano [Engano Island, north Bengkulu Regency, Bengkulu Province, Indonesia].

Type material. Syntype NHMUK 1898.12.5.40–41 (2 shells; Fig. 5F, G).

Remarks. The original description included an illustration and a set of shell measurements. The species description was based on more than one specimen. There are two shells in the NHM type collections with an original label stating “Type lot”, taxon name, and collection locality. The specimen that matches well with the illustration and the shell dimensions given in the original description is figured herein (Fig. 5F).

38. *euryomphalus* (Pfeiffer, 1857)

Fig. 5H, I

Cyclostoma (*Opisthophorus*) *euryomphalum* Pfeiffer, 1857a [1856]: 337.

Pterocyclos euryomphalus — Reeve 1863: volume 14, *Pterocyclos*, pl. 5, species 29.

Cyclotus euryomphalus — Kobelt 1902: 215.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Borneo.

Type material. Syntype NHMUK 20170351 (3 shells; Fig. 5H, I).

Remarks. This species was described based on specimens from the Cuming collection, and was not illustrated in the original description. Reeve (1863) re-published the description and figured a specimen from the Cuming collection. The NHM collections contain a lot of three shells from the Cuming collection with a label in Pfeiffer’s hand written label stating the taxon name and collection locality. The specimen which closely matches the illustration in Reeve (1863) and the shell measurements given in the original description is figured herein (Fig. 5H).

39. *fairbanki* (Blanford, 1869)

Fig. 5J

Spiraculum fairbanki Blanford, 1869a: 135–137.*Pterocyclos fairbanki* — Hanley and Theobald 1872: 23, pl. 49, figs 1, 2.*Pearsonia fairbanki* — Kobelt 1902: 175, 176, fig. 37. Kobelt 1911: 770, 771, pl. 112, figs 12, 13. Raheem et al. 2014: 45, fig. 24f.**Current generic position.** *Pearsonia* Kobelt, 1902**Type locality.** In montibus Pulney dictis, Indiae meridionalis [Pulney Mountains, south India].**Type material.** Lectotype (designated by Raheem et al. 2014) NHMUK 1906.05.05.79/1 (Fig. 5J).**40. *feddeni* Blanford, 1865**

Fig. 6A

Pterocyclos feddeni Blanford, 1865: 83. Hanley and Theobald 1870: 3, pl. 5, fig. 9.

Hanley and Theobald 1875: 3, 53, pl. 5, fig. 9, pl. 134, fig. 1. Kobelt 1902: 166.

Current generic position. *Pterocyclos* Benson, 1832**Type locality.** Thayet Myo, Pegu [Thayet District, Magway Division, Myanmar].**Type material.** Syntype NHMUK 1906.4.4.79 (1 shell; Fig. 6A).**Remarks.** The original description did not clearly state how many specimens were available to the author, although only one set of measurements was given. The NHM collections contain a lot comprising one specimen and an original label stating that the specimens were figured in the *Conchologia Indica*. This specimen matches well with the figures in Hanley and Theobald (1875: pl. 5, fig. 9, pl. 134, fig. 1), and the measurements given in the original description.**41. *fortunei* (Pfeiffer, 1854)**

Fig. 5K, L

Cyclostoma (Cyclotus) fortunei Pfeiffer, 1854b [1852]: 146.*Cyclostoma fortunei* — Pfeiffer 1854a: 375, 376, pl. 49, figs 3–5.*Cyclotus foutunei* — Reeve 1863: volume 14, *Cyclotus*, pl. 4, species 17. Kobelt 1902: 205, 206.**Current generic position.** *Cyclotus* Swainson, 1840**Type locality.** Shanghai, China [Shanghai Municipality, China].**Type material.** Syntype NHMUK 1980121 (1 adult + 1 juvenile; Fig. 5K, L).

Remarks. This species was described from specimens in the Cuming collection and only one set of shell measurements was given in the original description. Pfeiffer (1854a) re-published the description and figured a specimen from the Cuming collection. The NHM collections contain a lot of two specimens with a label stating “Type”. The adult specimen that matches well with the illustrations in Pfeiffer (1854a) and Reeve (1863), and the shell dimensions given in the original description, is figured herein (Fig. 5K).

42. *frednaggsi* Sutcharit & Panha, 2014

Fig. 6B

Pterocyclos frednaggsi Sutcharit & Panha, 2014: 336, 337, figs 2a–c, e, 3q–s.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Bukit Chintamanis, Pahang, Malaysia (03°26.798'N, 102°00.987'E).

Type material. Holotype CUMZ 4594. Paratypes CUMZ 4581 (18 specimens in ethanol), 4571 (29 shells), NHMUK 20150077 (2 shells, Fig. 6B).

43. *gwendolena* (Godwin-Austen, 1889)

Fig. 6C

Rhiostoma gwendolena Godwin-Austen, 1889: 342, pl. 36, fig. 2, 2a.

Cyclotus gwendolena — Kobelt 1902: 215.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Niah Hills [Niah, Srawak, Malaysia].

Type material. Holotype NHMUK 1889.12.7.9 (Fig. 6C).

Remarks. Godwin-Austen clearly stated this taxon was described based on only a single specimen collected by A Everett. The original description included an illustration and a set of measurements. The NHM collections contain a Godwin-Austen type lot with an original label stating “Type”, and so we recognise this illustrated shell as the holotype fixed by monotypy.

44. *hainanensis* (Adams, 1870)

Fig. 6D, E

Pterocyclos hainanensis Adams, 1870a: 8, pl. 1, fig. 16.

Cyclotus hainanensis — Kobelt 1902: 209, 210.

Current generic position. *Cyclotus* Swainson, 1840



Figure 6. **A** Syntype of *Pterocyclos feddeni* **B** paratype of *Pterocyclos frednaggsi* **C** holotype of *Cyclotus gwendolenaе* **D, E** syntype of *Cyclotus hainanensis* **F, G** syntype of *Rhiostoma hainesi* **H** holotype of *Cyclotus harryleei* **I, J** syntype of *Scabrina hispidula* **K** holotype of *Pearsonia huberi* **L** holotype of *Cyclotus hungerfordi*.

Type locality. Hainan [Hainan Province, China].

Type material. Syntype NHMUK 1878.1.28.19 (3 shells; Fig. 6D, E).

Remarks. Adams's description was based on specimens collected by Mr. Swinhoe from Hainan. The original description gives both a set of shell measurements and an illustration of a specimen. The NHM collections contain a lot of three specimens from the H Adams collection with an original label stating the taxon name and collection locality. The specimen marked with an "x" on the shell matches well with the shell dimensions and illustration given in the original description and it is figured herein (Fig. 6D).

45. *hainesi* Pfeiffer, 1862

Fig. 6F, G

Rhiostoma hainesi Pfeiffer, 1862: 115, pl. 12, fig. 8. Kobelt 1902: 177. Kobelt 1911: 762, pl. 113, fig. 1.

Pterocyclos hainesi — Reeve 1863: volume 14, *Pterocyclos*, pl. 4, species 19.

Current generic position. *Rhiostoma* Benson, 1860

Type locality. Camboja [Cambodia].

Type material. Syntype NHMUK 20170371 (2 shells; Fig. 6F, G).

Remarks. This species was described based on material in the Cuming collection, and Pfeiffer provided an illustration and a set of measurements. The NHM type lot contains two shells collected by H Mouhot and is from the Cuming collection. It has an original label in Pfeiffer's handwriting giving the taxon name, the collector as "Mr. Mouhot" and collection locality. The specimen that most closely matches the illustration and shell measurements given in Pfeiffer's (1862) description is figured herein (Fig. 6F).

46. *harryleei* (Thach & Huber, 2018)

Fig. 6H

Spiraculum harryleei Thach & Huber, 2018: 18, 19, figs 89–92.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Krabi, south Thailand [Krabi Province, Thailand].

Type material. Holotype NHMUK 20180248 (Fig. 6H).

Remarks. The shell characters of an expanded apertural lip and a small accessory breathing device (sutural tube) located in the suture closest to the aperture suggest that it is a member of the genus *Cyclotus*. It very closely resembles the widespread species *Cyclotus setosus* (Möllendorff, 1894) in the southern Thailand.

47. *hispidula* (Blanford, 1863)

Fig. 6I, J

Cyclophorus hispidulus Blanford, 1863: 321, 322. Hanley and Theobald 1872: 22, pl. 47, figs 5, 6.

Scabrina hispidula — Kobelt 1902: 88, fig. 22.

Current generic position. *Scabrina* Blanford, 1863

Type locality. Mya Leit Doung, near Ava [Myaleit Mountains, Pyinoolwin and Kyaukse Townships, Pyinoolwin and Kyaukse Districts, Mandalay Region, Myanmar].

Type material. Syntype NHMUK 1906.4.4.88 (5 adults + 2 juveniles; Fig. 6I, J).

Remarks. The original description did not include an illustration, and only one set of shell measurements was given. Subsequently, Hanley and Theobald (1872) figured a specimen of this species. There is a specimen in the NHM collections from the Blanford collection which was figured in Hanley and Theobald (1872) and matches well with the dimensions given in the original description, and it is figured herein (Fig. 6I).

48. *huberi* Thach, 2016

Fig. 6K

Pearsonia huberi Thach, 2016: 36, figs 48, 115–118.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Thanh area, Dien Khanh District, Khanh Hao Province, Vietnam.

Type material. Holotype NHMUK 20160302 (Fig. 6K).

49. *hungerfordi* (Godwin-Austen, 1889)

Fig. 6L

Rhiostoma hungerfordi Godwin-Austen, 1889: 342, 343.

Pearsonia hungerfordi — Kobelt 1902: 215.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Molu Hills, Borneo [Gunung Mulu, Sarawak, Malaysia].

Type material. Holotype NHMUK 1891.3.17.33 (Fig. 6L).

Remarks. Godwin-Austen clearly stated that this taxon was described based on only one specimen from the R Hungerford collection. There is one specimen in the NHM collections that has an original label stating “Type”. We recognise this specimen as the holotype fixed by monotypy.

50. *inglisianus* (Stoliczka, 1871)

Fig. 7A

Cyclophorus (Myxostoma) inglisianus Stoliczka, 1871: 148, 149, pl. 6, fig. 1.

Cyclophorus inglisianus — Hanley and Theobald 1876: 57, pl. 143, figs 8, 9.

Scabrina inglisianus — Kobelt and Möllendorff 1897: 88.

Current generic position. *Scabrina* Blanford, 1863

Type locality. Damotha, prope Moulmein [Dhammatat Cave, Mawlamyine Township, Mawlamyine District, Mon State, Myanmar].

Type material. Possible syntype NHMUK 20170363 (1 shell; Fig. 7A).

Remarks. The species description included an illustration and one set of shell measurements. There is a shell in the NHM collections from the Blanford collection, with an original label stating “figd. Conch. Ind. 143, f. 8, 9” and the collection locality “Damatha, Molmein”. This specimen matches with the shell dimensions given in the original description but lacks an operculum. Therefore, we consider this lot to be a possible syntype.

51. *insignis* Theobald, 1865

Fig. 7B

Pterocyclos insignis Theobald, 1865: 278. Hanley and Theobald 1870: 3, pl. 5, figs 6, 7. Kobelt 1902: 166.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Shan State [Myanmar].

Type material. Lectotype (design. n.) NHMUK 1888.12.4.1967 (Fig. 7B).

Remarks. The species description was very brief and only one set of measurements was given. The NHM collections contain a mixed-species lot consisting of two specimens with an original label stating “Type”. The specimen that matches with the figures in Hanley and Theobald (1870: pl. 5, figs 6, 7), the measurements (width 29.6 mm) given in the original description and marked with an “x” is here designated as the lectotype to stabilise the name.

The other shell, NHMUK 1888.12.4.1977, differs from the lectotype in having a smaller shell width (23.6 mm), shallow suture without a canal-like structure and an expanded apertural lip without a canal-like accessory respiratory structure. We considered this shell as a distinct species, and so it excludes it from the type series.

52. *iris* (Godwin-Austen, 1889)

Fig. 7C

Rhiostoma iris Godwin-Austen, 1889: 343.

Cyclotus iris — Kobelt 1902: 215.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Borneo.

Type material. Syntype NHMUK 1891.3.17.34 (1 shell; Fig. 7C).

Remarks. The original description gave the measurements for only one shell and did not include an illustration. The NHM collections contain a lot of one specimen from the R Hungerford collection with an original label stating “Type” and giving the collection locality as “Borneo”. This specimen matches well with the original description and shell dimensions given.

53. *kempi* (Godwin-Austen, 1915)

Fig. 7D, E

Spiraculum kempi Godwin-Austen, 1915: 496, 497, pl. 39, figs 4, 4a, 5, 5a.

Pearsonia kempi — Gude 1921: 119.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Abor Hills and Ponging [in the area of Arunachal Pradesh State, India].

Type material. Syntype NHMUK 1903.7.1.3105 from Abor Hill (2 shells; Fig. 7D), NHMUK 1903.7.1.3047 from Ponging (2 shells; Fig. 7E).

Remarks. Godwin-Austen’s description clearly indicated that the type series was from two collection localities “Abor Hills” and “Ponging”, and he provided illustrations of two shells from each different specimen lot. These two specimen lots were listed as being housed in the NHM collections. These two type lots have an original label in Godwin-Austen’s handwriting stating species name, collection locality and giving his own catalogue numbers. The figured specimen (Godwin-Austen 1915: figs 4, 4a) labelled as “Type”, is figured herein (Fig. 7D). Another figured shell (Godwin-Austen 1915: figs 5, 5a) labelled as “Typic.” is also figured herein (Fig. 7E). In addition, the original description states ‘Two specimens to Indian Museum’.

54. *labuanensis* (Pfeiffer, 1864)

Fig. 7F, G

Pterocyclos labuanensis Pfeiffer, 1864 [1863]: 525. Pfeiffer 1869: 443, pl. 98, figs 8–10.

Cyclotus labuanensis — Kobelt 1902: 212, 213, fig. 44.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. In insula Labuan [Federal Territory of Labuan, Malaysia].

Type material. Syntype NHMUK 20170369 (3 shells; Fig. 7F, G).

Remarks. The species was described based on material from the Cuming collection. The original description did not include an illustration and only one set of shell



Figure 7. **A** Possible syntype of *Scabrina inglisianus* **B** lectotype of *Pterocyclos insignis* **C** syntype of *Cyclotus iris* **D, E** syntype of *Pearsonia kempfi* **F, G** syntype of *Cyclotus labuanensis* **H, I** syntype of *Pterocyclos latilabrum* **J** paratype of *Cyclotus lepidotus* **K, L** syntype of *Cyclotus lindstedti*.

dimensions was given. Pfeiffer (1869) re-published the description and illustrated a specimen. The NHM collections contain a lot of three shells from the Cuming collection with a label stated “Type”. The specimen that closely matches with the shell measurements, the illustration in Pfeiffer (1869) and has an “X” written on the shell, is figured herein (Fig. 7F).

55. *latilabrum* Smith, 1895

Fig. 7H, I

Pterocyclos latilabrum Smith, 1895: 116, pl. 3, figs 23–25. Kobelt 1902: 166.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Gomanton Hill, N. Borneo [Gomantong Hill, Sandakan Division, Sabah, Malaysia].

Type material. Syntype NHMUK 1892.7.20.85–87 (3 shells; Fig. 7H, I).

Remarks. Smith based this taxon on more than one specimen since the author states “most of the specimens”. The original description includes an illustration but no shell measurements are given. The type lot in the NHM collections contain three specimens with an original label in Smith’s handwriting. The specimen that most closely matches the illustrations in the original description is figured herein (Fig. 7H).

56. *lepidotus* Vermeulen, 1996

Fig. 7J

Cyclotus lepidotus Vermeulen, 1996: 151, fig. 3. Vermeulen and Whitten 1998: 42, fig. 18a, b.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Nusa Penida [Nusa Penida Island, Klungkung Regency, Bali Province, Indonesia].

Type material. Holotype RMNH.MOL 57140, paratypes RMNH.MOL58921 (25 shells), NHMUK 20000249 (1 shell; Fig. 7J)

57. *lindstedti* (Pfeiffer, 1857)

Fig. 7K, L

Cyclostoma (*Cyclotus*) *lindstedti* Pfeiffer, 1857b [1856]: 391.

Cyclotus lindstedti — Reeve 1863: volume 14, *Cyclotus*, pl. 8, species 45. Kobelt 1902: 206.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Mount Ophir, Malacca [Gunung Ledang National Park, Tangkak District, Johor, Malaysia].

Type material. Syntype NHMUK 20170359 (1 adult + 2 juveniles; Fig. 7K, L).

Remarks. The species description did not include an illustration, and only one set of shell measurements were given. Reeve (1863) re-published the description and illustrated an adult specimen from the Cuming collection. The NHM collections contain a lot of three shells collected by FW Lindstedt from the Cuming collection with a label in Pfeiffer's handwritten stating the taxon name and collection locality. The adult specimen matches well with the shell dimensions given in the original description, the illustration in Reeve (1863), and is figured herein (Fig. 7K).

58. *lombockensis* (Smith, 1898)

Fig. 8A

Cyclotus (*Pseudocyclophorus*) *lombockensis* Smith, 1898a: 31, pl. 2, fig. 18. Kobelt 1902: 192.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Rinjani Peak, 2,500 ft [at 2500 ft., Gunung Rinjani, Lombok Island, west Nusa Tenggara Province, Indonesia].

Type material. Lectotype (design. n.) NHMUK 1897.3.13.59 (Fig. 8A).

Remarks. The species description was not explicitly based on one specimen, but only a single shell was illustrated and just one set of shell measurements was given in the original description. The NHM type lot contains one specimen with an original label in Smith's handwriting and a label stating "Type", subsequently changed to "Holotype". This is not a valid holotype designation (ICZN 1999: Art. 73.1 and Recommendation 73F). This specimen matches well with the illustration and the shell measurements given in the original description, and is designated here as the lectotype to stabilise the name.

59. *lowianus* (Pfeiffer, 1864)

Fig. 8B, C

Pterocyclos lowianus Pfeiffer, 1864 [1863]: 526. Pfeiffer 1869: 443, pl. 98, figs 11–13. *Cyclotus lowianus* — Kobelt 1902: 200.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. In insula Labuan [Federal Territory of Labuan, Malaysia].

Type material. Syntype NHMUK 20170350 (3 shells; Fig. 8B, C).

Remarks. This species was described based on specimens collected by H Low from the Cuming collection. In the original description, only one set of shell measurements was given. In 1869, Pfeiffer re-described and illustrated a single specimen from the



Figure 8. **A** Lectotype of *Cyclotus lombockensis* **B, C** syntype of *Cyclotus lowianus* **D** syntype of *Pearsonia luyorensis* **E, F** *Myxostoma lychnus* **E** lectotype and **F** paralectotype **G** lectotype of *Cyclotus macalpinewoodsii* **H** syntype of *Pterocyclos magnus* **I, J** syntype of *Pterocyclos marionae* **K, L** syntype of *Cyclotus mindaiensis*.

Cuming collection. The NHM collections contain a lot of three shells from the Cuming collection with Pfeiffer's handwritten label stating the taxon name, collector and collection locality. The specimen that matches well with the shell dimensions in the original description and the illustrations in Pfeiffer (1869) is figured herein (Fig. 8B).

60. *luyorensis* (Godwin-Austen, 1915)

Fig. 8D

Spiraculum luyorensis Godwin-Austen, 1915: 500, pl. 40, figs 5, 5a, b.

Pearsonia luyorensis — Gude 1921: 119, 120.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Luyor, Abor Hills [in the area of Arunachal Pradesh State, India].

Type material. Syntype NHMUK 1903.7.1.3530 (1 shell; Fig. 8D).

Remarks. Godwin-Austen's description was not clearly based on only one specimen. The original description included an illustration and one set of measurements were given. The author stated that one lot of the type series was housed in the NHM collections. The specimen NHMUK 1903.7.1.3530 has a label in Godwin-Austen's handwriting stating "Type" and exactly matches the measurements and illustrations given in the original description.

61. *lychnus* (Morelet, 1862)

Fig. 8E, F

Cyclostoma lychnus Morelet, 1862: 478. Breure et al. 2018: 334, figs 620, 621.

Myxostoma lychnus — Kobelt 1902: 86.

Current generic position. *Myxostoma* Troschel, 1847

Type locality. In insula Poulo-Condor [Con Son Island, Ba Ria–Vung Tau Province, Vietnam].

Type material. Lectotype NHMUK 1893.2.4.501 (Fig. 8E), paralectotype NHMUK 1893.2.4.502–503 (2 shells; Fig. 8F).

Remarks. The original description by Morelet (1862: 478) did not give an illustration of the species, although a set of shell dimensions was provided. The NHM register show that a lot of three specimens was purchased from Fulton from the A Morelet collection. The original label states the taxon name and gives the collection locality as "*C. breve* Martyn–*lychnus* Moret. I. Pulo Condor". The words "All too small for types" was added at a later date, however, our measurements of all specimens are close to those shell dimensions given in the original description (width 36 mm, height 25 mm). The specimen that matches well with the shell dimensions given in the original description is here designated as the lectotype to stabilise the name.

62. *macalpinewoodsi* Laidlaw, 1939

Fig. 8G

Rhiostoma macalpine-woodsii Laidlaw, 1939: 166, with text figure.**Current generic position.** *Rhiostoma* Benson, 1860**Type locality.** Sungai Siput, Perak [Sungai Siput, Kuala Kangsar District, Perak, Malaysia].**Type material.** Lectotype (design. n.) NHMUK 1939.4.13.23 (Fig. 8G).**Remarks.** The original description does not clearly state how many specimens were available to the author. Laidlaw's use of the term "Type specimen in my collection" does not constitute a valid holotype designation (ICZN 1999: Art. 73.1.1, 73.2 and Recommendation 73F). The NHM collections hold a lot containing one specimen, NHMUK 1939.4.13.23, with a label in Laidlaw's handwriting stating the taxon name, collection locality and "From type series". It has subsequently been incorrectly labeled as a "Paratype". To avoid the assumption of the existence of a holotype (ICZN 1999: Recommendation 73F), this specimen is here designated as the lectotype to stabilise the name.**63. *magnus* Godwin-Austen, 1876**

Fig. 8H

Pterocyclos magnus Godwin-Austen, 1876: 174, pl. 7, figs 3, 3a, 3b. Kobelt 1902: 166, 167.**Current generic position.** *Pterocyclos* Benson, 1832**Type locality.** Daffa Hills, Assam [India].**Type material.** Syntype NHMUK 1903.7.1.1491 (1 shell; Fig. 8H).**Remarks.** This species was clearly described based on more than one specimen since the author stated "largest example". The NHM collections contain a lot containing a single specimen with an original label in Godwin-Austen's handwriting stating "Type". This specimen matches well with the illustration and the measurements given in the original description.**64. *marionae* Preston, 1914**

Fig. 8I, J

Pterocyclos marionae Preston, 1914: 22, with text figure.**Current generic position.** *Pterocyclos* Benson, 1832**Type locality.** Naga Hills [Assam, Arunachal Pradesh and Nagaland states, India].

Typematerial. Syntype RBINS 524550 (1 shell; Fig. 8I), NHMUK 1911.10.12.20–21 (2 shells; Fig. 8J).

Remarks. A unique name bearing type was not explicitly designated and the species description was not clearly based on one specimen. The original description included a single illustration and one set of shell measurements. The RBINS collections contain a lot with one specimen from the collection of P Dautzenberg with an original label stating “Type” and “fig.”. This specimen matches well with the shell measurements given in the original description and is figured herein (Fig. 8I). The NHM collections also contain another lot of two specimens with an original label stated “co-types”, and are also considered to be syntypes.

65. *mastersi* (Blanford, 1877)

Fig. 9A

Pterocyclos (*Spiraculum*) *mastersi* Blanford, MSS. Hanley and Theobald 1870: 3, pl. 5, fig. 1 [nomen nudum].

Spiraculum mastersi Blanford, 1877: 313, 314.

Pearsonia mastersi — Kobelt 1902: 174. Kobelt 1913: 769, 770, pl. 113, fig. 9.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. in montibus Naga dictis, ad latus meridionale province Assam, haud procul a Golaghat [Naga Hills, Golaghat District, southern of Assam State, India].

Type material. Syntype NHMUK 1888.12.4.1957 (1 shell; Fig. 9A) from Gholaghta, Assam.

Remarks. This taxon was first published in Hanley and Theobald (1870), who attributed the name to WT Blanford as a manuscript name. However, Hanley and Theobald (1870: 3) did not provide any description or definition of the taxon, only a figure was provided, which does not meet the requirements of the ICZN (1999: Art. 12.2). Therefore, this taxon name was not made available. Pfeiffer (1876: 386) mentioned the taxon name without further description or definition, and so again the was not made available. Blanford (1877) published a complete description of this taxon under the same name and so making it available. Therefore, the type series is made up of the specimens sent by Blanford and cited and figured in Hanley and Theobald (1870: pl. 5, fig. 1), along with the specimens mentioned by Blanford (1870). Coan and Kabat (2012: 326) could not trace the specimen figured in Hanley and Theobald (1870: pl. 5, fig. 1). However, the NHM collections hold a lot containing a single shell from the WT Blanford collection with a handwritten label stating the taxon name, and the collection locality “Gholaghat, Assam”. This specimen matches well with the original description and the set of shell dimensions, and is considered as the syntype and figured herein.



Figure 9. **A** Syntype of *Pearsonia mastersi* **B, C** *Pearsonia minima* **B** lectotype and **C** paralectotype **D, E** syntype of *Cylotus mucronatus* **F, G** *Pearsonia nagaensis* **F** lectotype and **G** paralectotype **H, I** syntype of *Cyclotus natunensis* **J, K** *Pearsonia nevilli* **J** lectotype and **K** paralectotype **L** syntype of *Cyclotus niasensis*.

66. *mindaiensis* (Bock, 1881)

Fig. 8K, L

Pterocyclos mindaiensis Bock, 1881: 634, pl. 55, figs 8, 8a, b.*Cyclotus mindaiensis* — Kobelt 1902: 200.**Current generic position.** *Cyclotus* Swainson, 1840**Type locality.** Mindai (Amontai district) [Amuntai, Hulu Sungai Utara, South Kalimantan Province, Indonesia].**Type material.** Syntype NHMUK 1881.6.6.18–21 (3 adults + 1 juvenile; Fig. 8K, L).**Remarks.** In the original description, Bock illustrates two specimens (an adult and a juvenile), although only one set of shell measurements were given. There are four specimens in the NHM type lot from the Bock collection with an original label stating “Types”. The adult specimen, marked with an “x” matches well with the shell dimensions and illustration given in the original description (Bock 1881: fig. 8) and is figured herein (Fig. 8K).**67. *minima* (Godwin-Austen, 1915)**

Fig. 9B, C

Spiraculum minimum Godwin-Austen, 1915: 501, 502, pl. 40, figs 2, 2a–c.*Pearsonia minima* — Gude 1921: 121, 122.**Current generic position.** *Pearsonia* Kobelt, 1902**Type locality.** Jeku, Abor Hills and Sibbum, Abor Hills [Doje Jeku and Sibbum Villages, west Siang District, Arunachal Pradesh State, India].**Type material.** Lectotype (design. n.) NHMUK 1903.7.1.3145/1 (Fig. 9B) from Sibbum, Abor Hills, paralectotypes NHMUK 1903.7.1.3145/2–3 (2 shells; Fig. 9C), NHMUK 1903.7.1.3147 from Sibbum, Abor Hills (2 shells).**Remarks.** Godwin-Austen (1915) clearly states that this taxon was based on at least four lots of specimens from two different localities. The original description included illustrations and one set of measurements. In addition, Godwin-Austen (1915) stated that two lots were housed in the Indian Museum, and the other two lots were housed in the NHM. The specimen lot NHMUK 1903.7.1.3145 consisting of three shells has a label in Godwin-Austen’s handwriting stating “Typical”, and gives the collection locality “Sibbum”, and one of the specimens closely matches the original description. This specimen is here designated as the lectotype to stabilise the name.

The paralectotypes are the two remaining shells, NHMUK 1903.7.1.3145/2–3, from the same lot as the lectotype, the two specimens in lot NHMUK 1903.7.1.3147, and the remaining two specimen lots (nos. 6142 and 6143) housed in the Zoological Survey of India (formerly the Indian Museum) as indicated by the author. Following this lectotype designation, the type locality of this species is restricted to “Sibbum, Abor Hills” (ICZN 1999: Art. 76.2).

68. *mucronatus* (Sowerby I, 1843)

Fig. 9D, E

Cyclostoma mucronatum Sowerby I, 1843a (June): 113, pl. 25, fig. 91. Sowerby I 1843b (November): 63.

Platyrrhapha mucronata — Kobelt 1902: 185.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Under decayed leaves at Calauang in Luzon [Calauan, Laguna Province, Philippines].

Type material. Syntype NHMUK 1842.5.10.790–798 (6 adults + 3 juveniles; Fig. 9D, E).

Remarks. The species name was made available in volume 1 of the *Thesaurus Conchyliorum*, (Sowerby I 1843a; for date of publication see Petit (2009)). The original description includes an illustration, and the author clearly stated the taxon was described based on specimens collected by H Cuming. The NHM collections contain a lot of nine shells that have a label stating the type collection locality ‘Calauang, Luzon’. The NHM registration records show that this lot was purchased from the H Cuming collection. The specimen that closely matches with the original description and illustration in Sowerby I (1843a) is figured herein (Fig. 9D).

69. *nagaensis* (Godwin-Austen & Beddome, 1894)

Fig. 9F, G

Spiraculum nagaense Godwin-Austen & Beddome, 1894: 509.

Pearsonia nagaensis — Kobelt 1902: 174. Kobelt 1913: 771, 772, pl. 113, figs 12, 13.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Maokokchung, Naga Hills [Mokokchung District, Nagaland State, India].

Type material. Lectotype (design. n.) NHMUK 1903.7.1.2783 (Fig. 9F), paralectotypes NHMUK 1912.4.16.644 (3 shells; Fig. 9G).

Remarks. The original description did not contain any illustrations, and only one set of measurements was given. Godwin-Austen stated that the type series was from the Beddome collection. The NHM collections contain two lots that are considered to constitute the type series. Lot NHMUK 1903.7.1.2783 consists of a single specimen, collected by Muspratt, from the Godwin-Austen collection and has original labels giving the species name “*nagaensis*”, type collection locality and stating “TYPE”. This specimen is here designated as the lectotype to stabilise the name.

The paralectotypes consist of a lot of three shells, NHMUK 1912.4.16.644, from the Beddome collection, collected by Muspratt, with an original label stating the species name “*nagaense*”, type collection locality, the reference of the original description and is marked as “PARATYPES”.

70. *natunensis* Smith, 1894

Fig. 9H, I

Cyclotus natunensis Smith, 1894a: 461, 462, pl. 16, figs 14, 14a–c. Kobelt 1902: 193.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Banguran [Bunguran Islands, Riau Islands Province, Indonesia].

Type material. Syntype NHMUK 1894.2.1.43–44 (2 shells; Fig. 9H, I), NHMUK 1894.2.2.3–4 (2 juveniles).

Remarks. The original description included an illustration and one set of shell measurements. The NHM collections contain a lot of four shells collected by A Everett from Smith's collection with an original label stating taxon name, type collection locality, and "Type". The specimen that matches well with the illustration and shell dimensions given in the original description is figured herein (Fig. 9H).

71. *nevilli* (Godwin-Austen, 1876)

Fig. 9J, K

Spiraculum nevilli Godwin-Austen, 1876: 174, 175, pl. 7, figs 2, 2a.

Pearsonia nevilli — Kobelt 1902: 174, 175. Kobelt 1911: 765, 766, pl. 112, figs 1, 2.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. near Dihiri Parbat, on the outer sandstone range [Hari Parbat, Srinagar District, Jammu and Kashmir State, India].

Type material. Lectotype (design. n.) NHMUK 1903.7.1.2775/1 (Fig. 9J) and paralectotype NHMUK 1903.7.1.2775/2 (1 shell; Fig. 9K).

Remarks. The species description clearly stated that the taxon was based on two specimens from Dihiri Parbat. An illustration and one set of measurements were given in the original description. The NHM type collection contains one lot, consisting of two shells with Godwin-Austen's handwritten label stating "Type". The specimen figured in the original description that is closest to the given measurements is here designated as the lectotype to stabilise the name.

Godwin-Austen (1915: 497, 498) also recognised two varieties as "var." and "var. large". Nevertheless, these two varietal names have never been made available. There are two lots of specimens labeled as "var." and "var. large" housed in the NHM general collections, NHMUK 1903.7.1.3531 (3 shells) and NHMUK 1903.7.1.3089 (4 shells) respectively. They are excluded from the type series of this nominal species (ICZN 1999: Art. 72.4.1).

72. *niahensis* Godwin-Austen, 1889

Fig. 10B, C

Pterocyclos niahensis Godwin-Austen, 1889: 340, pl. 35, figs 3, 3a. Kobelt 1902: 167.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Niah Hills [Niah National Park, Miri Division, Sarawak, Malaysia].

Type material. Syntype NHMUK 1889.12.7.16 (1 shell; Fig. 10B), NHMUK 1890.7.15.2 (1 shell; Fig. 10C).

Remarks. Godwin-Austen described this species based on material from A Everett. The NHM collections contain a lot of two shells from the A Everett collection with an original label stating “Type”. The specimen which corresponds to the illustrations and shell dimensions given in the original description, and marked with an “X”, is figured herein (Fig. 10B).

Godwin-Austen also described a varietal form “var. *depressa*” from “Molu Hills” based on specimens collected by Mr. Boxall, ex. R Hungerford collection. The type series of the taxa could not be traced in the NHM collections.

73. *niasensis* Fulton, 1907

Figs 9L, 10A

Cyclotus niasensis Fulton, 1907: 156, pl. 10, fig. 9.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Nias Island, Sumatra [Nias Island, north Sumatra Province, Indonesia].

Type material. Syntype NHMUK 1907.5.3.131–133 (3 shells; Figs 9L, 10A).

Remarks. The original description included an illustration and gave one set of shell measurements. There are three specimens in the type lot with an original label in Fulton’s handwriting stating “Type”. The specimen that has a small label stating “Type.” glued on top of the shell matches well with the measurements and figures given in the original description, is figured herein (Fig. 9L).

74. *oakesi* (Godwin-Austen, 1915)

Fig. 10D, E

Spiraculum oakesi Godwin-Austen, 1915: 496, pl. 39, figs 3, 3a.

Pearsonia oakesi — Gude 1921: 124.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Abor Hills [region in Arunachal Pradesh State, India].

Type material. Syntype NHMUK 1903.7.1.3081 (3 adults + 2 juveniles; Fig. 10D, E).

Remarks. The author indicated that five specimens were examined, and the original description included an illustration and one set of measurements. The NHM type collections contain a lot of five specimens with a label in Godwin-Austen’s handwriting stating “Type”. The specimen with red wool inside the aperture, illustrated in the original description and very close to the given measurements, is figured herein (Fig. 10D). The other two specimens housed in the Zoological Survey of India (no. 3081) are also considered as syntypes.



Figure 10. **A** Syntype of *Cyclotus niasensis* **B, C** syntype of *Pterocyclos niahensis* **D, E** syntype of *Pearsonia oakesi* **F, G** possible syntypes of *Cyclotus politus* **H, I** *Cyclotus pterocycloides* **H** lectotype and **I** paralectotype **J, K** syntype of *Pearsonia putaoensis*.

75. *politus* (Sowerby I, 1843)

Fig. 10F, G

Cyclostoma politum Sowerby I, 1843a: 97, pl. 23, fig. 17. Pfeiffer 1849: 155, pl. 21, figs 13, 14. Reeve 1862: volume 13, *Cyclostoma*, pl. 19, species 125.

Cyclotus politus — Kobelt 1902: 194.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Unknown.

Type material. Possible syntype NHMUK 20170360 (4 shells; Fig. 10F, G).

Remarks. The original description was published by Sowerby I in 1843 and included an illustration. Later, Pfeiffer (1849) and Reeve (1862) re-published the description and figured this species based on material from the Cuming collection. The NHM collections contain a lot of four shells from the Cuming collection with original labels giving only the taxon name. However, the collection locality “Flores (Martens in litt.)” has been subsequently added. The specimens in the Cuming collection match well with the illustration in the original description, especially in regard to the dark brown reticulated pattern and dark spiral band on the periphery of last whorl. However, Sowerby I (1843a) did not explicitly state that the species description was based on specimens from the Cuming collection. Therefore, we consider this lot to be possible syntypes.

76. *pterocycloides* (Pfeiffer, 1855)

Fig. 10H, I

Cyclostoma (*Cyclotus*) *pterocycloides* Pfeiffer, 1855a [1854]: 300.

Pterocyclos anomalus Reeve, 1863: volume 14, *Pterocyclos*, pl. 5, species 27. Type locality: Borneo.

Cyclotus pterocycloides — Kobelt 1902: 216.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Unknown.

Type material. Lectotype (design. n.) NHMUK 20170361/1 (Fig. 10H), paralectotypes NHMUK 20170361/2–3 (2 shells; Fig. 10I).

Remarks. Reeve (1863) erroneously replaced the previously available name “*pterocycloides* Pfeiffer, 1855” with “*anomalus* Reeve, 1863”. This unnecessary substitution is therefore made available with its own authorship and date and is considered to be a junior objective synonym (ICZN 1999: Arts. 19.1, 33.2, 50.5 and 60.1).

Pfeiffer (1855a) stated that this species was described based on specimens from the Cuming collection. The original description did not include an illustration or collection locality, and only one set of shell measurements were given. The type lot contains four specimens of the same species, however an original label records that this is a

mixed lot containing three specimens from the Cuming collection and 1 specimen with an operculum presented by GB Sowerby I. Specimen NHMUK 20170361/1 has no operculum, is without collection locality but has an original label in Pfeiffer's handwriting stating "*Cyclost. pterocycloides* Pfr.". This specimen, that matches with the description and shell measurements given in the original description, and the illustration in Reeve (1863), is here designated as the lectotype to stabilise the name. The other two shells, NHMUK 20170361/2–3, from the Cuming collection lot therefore become the paralectotypes.

The remaining a single shell with an operculum, NHMUK 1886.9.10.1, which was presented by GB Sowerby I and has the collection locality "Borneo" is excluded from the type series.

77. *puriensis* Nevill, 1878

Fig. 11A

Pterocyclos rupestris var. *puriensis* Nevill, 1878: 260. Kobelt 1902: 169.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Pooree (=Puri) [Puri District, Odisha State, India] and Chandbally [region in Odisha State, India].

Type material. Possible syntype NHMUK 1912.4.16.658 (1 shell; Fig. 11A) from Puri, Orissa.

Remarks. The author clearly indicated that this taxon was described based on material from Pooree (=Puri) and Chandbally. The original description does not include any illustrations or shell measurements, and the species description is very brief, simply indicating that this taxon is a "dwarf form with raised spire...". The NHM collections contain a lot containing one shell from the Beddome collection with an original label stating collection locality as "Puri, Orissa". Since this lot was registered as "Nev. Hnd. List. p. 260", we consider this shell to be a possible syntype.

78. *putaoensis* (Godwin-Austen, 1915)

Fig. 10J, K

Spiraculum putaoensis Godwin-Austen, 1915: 500, 501, pl. 40, figs 3, 3a, b.

Pearsonia putaoensis — Gude 1921: 125.

Current generic position. *Pearsonia* Kobelt, 1902

Type locality. Putao, Upper Burma [Putao District, Kachin State, Myanmar].

Type material. Syntype NHMUK 1903.7.1.3598 (3 shells; Fig. 10J, K).

Remarks. The original description included an illustration, one set of measurements, and Godwin-Austen (1915) indicated that he examined three specimens. The

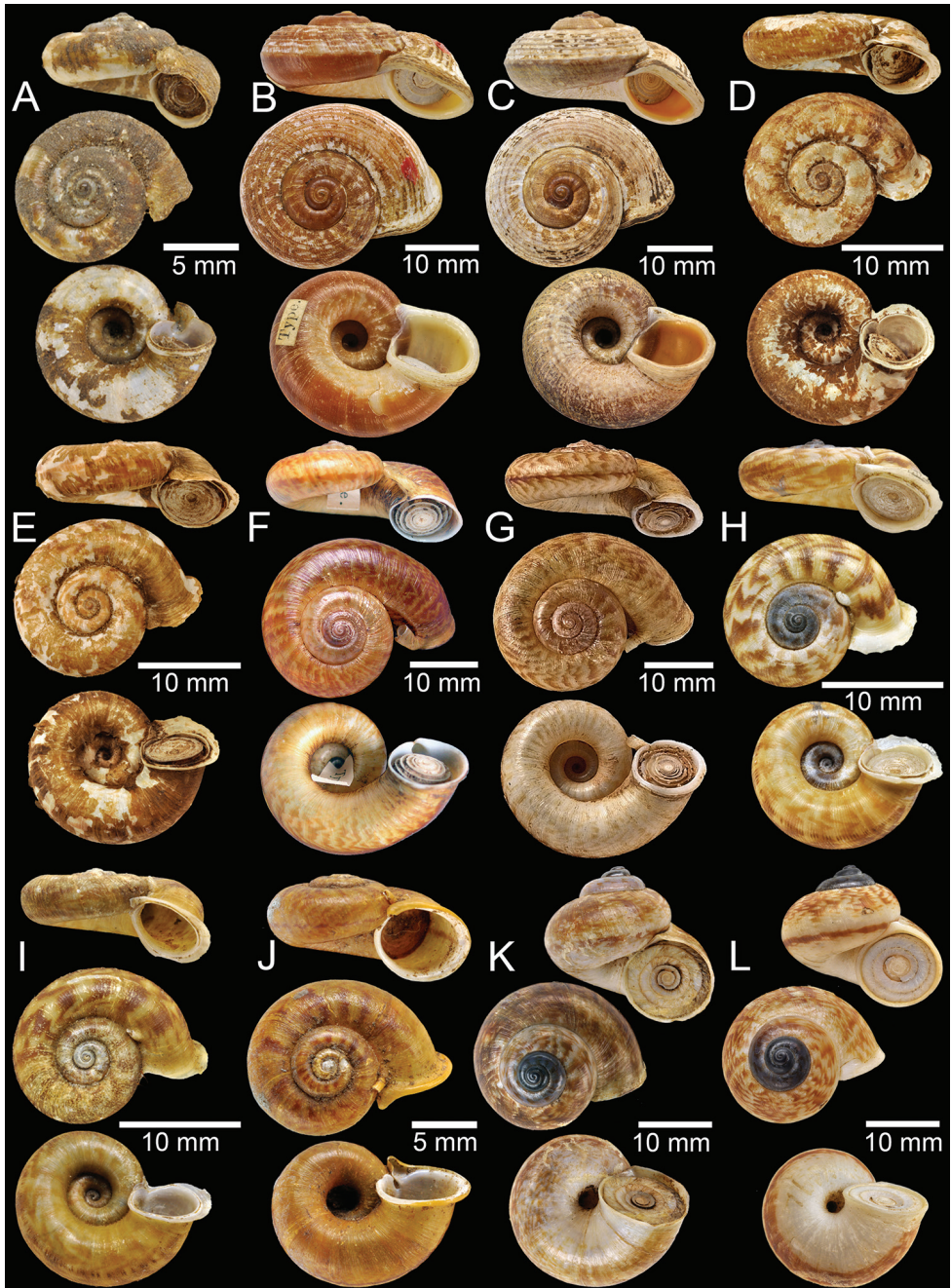


Figure 11. **A** Possible syntype *Pterocyclos rupestris puriensis* **B, C** syntype of *Cyclotus pyrostoma* **D, E** syntype of *Cyclotus siamensis* **F, G** syntype of *Rhiostoma simplicilabre* **H, I** syntype of *Cyclotus spiniferus* **J** holotype of *Pterocyclos spiramentum* **K, L** syntype of *Cyclotus suluanus*.

NHM type collections contain a lot of three specimens with a label in Godwin-Austen's handwriting stating "Type". The specimen closest to the given measurements and illustrations in the original description is figured herein (Fig. 10J).

79. *pyrostoma* Smith, 1896

Fig. 11B, C

Cyclotus pyrostoma Smith, 1896b: 100, 101, pl. 7, figs 1–3. Kobelt 1902: 202.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. South Celebes, at 2000 feet [south Sulawesi Province, Indonesia].

Type material. Syntype NHMUK 1896.4.30.1 (1 shell; Fig. 11B), NHMUK 1896.5.1.1–2 (2 shells; Fig. 11C).

Remarks. There are three specimens in the NHM type lot with a label in Smith's handwriting stating the species name and collection locality. One specimen has a small label "Type" attached under the shell. This specimen matches well to the illustration and shell dimensions given in the original description and is figured herein (Fig. 11B).

80. *siamensis* (Martens, 1860)

Fig. 11D, E

Opisthoporus siamensis Martens, 1860: 10.

Cyclotus siamensis — Kobelt 1902: 211.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Siam [Thailand].

Type material. Syntype NHMUK 1856.7.21.1 (5 adults + 3 juveniles; Fig. 11D, E).

Remarks. Martens (1860) states that this species was described based on material in the British Museum [= NHM] collected by JC Bowring from Siam. The original description did not include an illustration and only one set of shell measurements was given. The NHM collections contain a lot of eight specimens with an original label stating "typical specimens", and with the collection locality "Siam". The NHM registration book shows that this specimen lot was purchased from JC Bowring. The specimen that matches most closely with the shell measurements in the original description is figured herein (Fig. 11D).

81. *simplicilabre* Pfeiffer, 1862

Fig. 11F, G

Rhiostoma simplicilabre Pfeiffer, 1862: 115, pl. 12, fig. 7. Kobelt 1902: 178, 179. Kobelt 1911: 756, 757, pl. 110, figs 5–7, pl. 113, fig. 3.

Pterocyclos simplicilaris — Reeve 1863: volume 14, *Pterocyclos*, pl. 4, species 20.

Current generic position. *Rhiostoma* Benson, 1860

Type locality. Camboja [Cambodia].

Type material. Syntype NHMUK 20130214 (4 shells; Fig. 11F, G).

Remarks. This species was described based on specimens collected by H Mouhot from the Cuming collection. The original description included an illustration and one set of shell measurements. There are four specimens in the NHM collections from the Cuming collection with an original label in Pfeiffer's handwriting stating the taxon name, collector and collection locality. The specimen that closely matches the illustration has a small label stating "Type" glued inside the umbilicus is figured herein (Fig. 10F).

82. *spiniferus* (Morelet, 1861)

Fig. 11H, I

Cyclostoma spiniferum Morelet, 1861: 177. Breure et al. 2018: 439, 440, figs 1082, 1083.
Cyclotus spiniferus — Kobelt 1902: 217.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. probably in Borneo.

Type material. Syntype NHMUK 1893.2.4.1547–1549 (3 shells; Fig. 11H, I).

Remarks. The original description did not include an illustration and only one set of shell measurements was given. There are three specimens in the NHM collections purchased from A Morelet with the original label stating "type of spiniferum on left", and with the collection locality "Borneo". The specimen with an attached operculum, that most closely matched with the measurements given in the original description, and is marked with "X" under the shell, is figured herein (Fig. 10H).

83. *spiramentum* Godwin-Austen, 1915

Fig. 11J

Pterocyclos spiramentum Godwin-Austen, 1915: 498, 499, pl. 40, figs 4, 4a, 4b.

Current generic position. *Pterocyclos* Benson, 1832

Type locality. Abor Hills [region in Arunachal Pradesh State, India].

Type material. Holotype NHMUK 1903.7.1.3082 (Fig. 11J).

Remarks. The original description clearly stated that this taxon was described based on only one specimen. The NHM collections contain a lot consisting of a single specimen with a label in Godwin-Austen's handwriting stating "Type". This specimen matches well with the illustrations and measurements given in the original description, and so we consider this specimen as the holotype fixed by monotypy.

84. *subflammulatus* Pfeiffer, 1861

Fig. 12A

Cyclotus subflammulatus Pfeiffer, 1861: 28. Reeve 1863: volume 14, *Cyclotus*, pl. 8, species 43. Kobelt 1902: 194, 195.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Ise of Batchian [Bacan Islands, North Maluku Province, Indonesia].

Type material. Syntype NHMUK 20170362 (1 shell; Fig. 12A).

Remarks. The original description did not include an illustration and only one set of shell measurements was given. Pfeiffer (1861) stated that this taxon was described from a specimen collected by AR Wallace in the Cuming collection. Later Reeve (1863) re-published the description and figured a specimen from the Cuming collection. The NHM collections contain a lot consisting of only one specimen from the Cuming collection with a label in Pfeiffer's handwriting stating the species name and collection locality, however this has been subsequently overwritten. This shell matches well with the measurements given in the original description and the illustration in Reeve (1863).

85. *suluanus* Smith, 1894

Fig. 11K, L

Cyclotus suluanus Smith, 1894b: 56, pl. 4, fig. 7. Kobelt 1902: 195.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Sulu [Sulu Province, Philippines].

Type material. Syntype NHMUK 1891.3.17.966–967 (2 shells; Fig. 11K, L).

Remarks. The species description was clearly based on two specimens collected by R Hungerford and housed in the British Museum [= NHM]. The original description included an illustration and gave one set of shell measurements. The NHM collections contain a lot of two specimens with a label stating "Types". The specimen that matches well with the illustration and shell dimensions given in the original description is figured herein (Fig. 10K).

The manuscript name "*Cyclotus suluanus* m." was first mentioned in Möllendorff (1890: 270) and then cited as "*Cyclotus suluanus* Möllf., MS." in Cooke (1892). However, these two treatments do not make this name available since they lacked description or indication as is required by the ICZN (1999: Art. 12). Smith (1894) published a complete description and illustration of this taxon, where the name was made available and therefore Smith is given authorship.

86. *taivanus* Adams, 1870

Fig. 12B, C

Cyclotus taivanus Adams, 1870b: 378, 379, pl. 27, figs 11, 11a. Kobelt 1902: 207.
Hwang 2014: 4, fig. 1a.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Taiwan, Formosa.

Type material. Lectotype (designated by Hwang 2014: 4, fig. 1a) NHMUK 1871.1.20.9/1 from Formosa (Fig. 12B), paralectotypes NHMUK 1871.1.20.9/2–8 from Formosa (7 shells; Fig. 12C), NHMUK 1878.1.28.22 from Taiwan, Formosa (3 shells).

87. *tomlini* Salisbury, 1949

Fig. 12D

Rhiostoma tomlini Salisbury, 1949: 41–42, pl. 3b, figs 3, 4.

Current generic position. *Rhiostoma* Benson, 1860

Type locality. Khao Sabap, Siam [Pliue National Park, Khlung District, Chanthaburi Province, Thailand].

Type material. Holotype NMW 1955.158.24924, paratypes NHMUK 1949.6.7.1 (2 shells; Fig. 12D), NHMUK 20170372 JE Cooper coll. Acc. no. 2150 (1 juvenile).

Remarks. The original description included an illustration, one set of shell measurements, and was clearly based on more than one specimen. The author indicated that the ‘Type’ was kept in the JR le B Tomlin collection and ‘Paratypes’ were housed in the NHM collections. The holotype was clearly designated and is housed in the JR le B Tomlin collection (later transferred to the NMW in Cardiff). The NHM collections contain two lots, consisting of three shells in total, both containing an original label stating “Paratype”. The collection locality matches with the original description. Therefore, we consider these specimens as paratypes.

88. *trailli* Pfeiffer, 1862

Fig. 12E, F

Cyclotus trailli Pfeiffer, 1862: 116, fig. 4. Reeve 1863: volume 14, *Cyclotus*, pl. 9, species 56.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Russel-Canda, Madras [in the area of Chennai District, Tamil Nadu State, India].

Type material. Syntype NHMUK 20030588 (3 shells; Fig. 12E, F).



Figure 12. **A** Syntype of *Cyclotus subflammulatus* **B, C** *Cyclotus taivanus* **B** lectotype and **C** paralectotype **D** paratype of *Rhiostoma tomlini* **E, F** syntype of *Cyclotus trailii* **G** holotype of *Pearsonia travancornica* **H** syntype of *Cyclotus trusanensis* **I, J** syntype of *Cyclotus tubuliferus* **K, L** *Scabrina vanbuensis* **K** lectotype and **L** paralectotype.

Remarks. The original description by Pfeiffer includes the illustration of a shell and gives one set of shell measurements. The type lot in the NHM collections was collected by “Dr. Trail” and is from the Cuming collection as stated in the original description. It has an original label in Pfeiffer’s handwriting giving the species name and collection locality. The largest specimen, marked with an “x” which most closely matches the measurements and the illustration shown in the original description is figured herein (Fig. 12E).

89. *travancorica* (Blanford, 1880)

Fig. 12G

Spiraculum travancoricum Blanford, 1880: 212, 213, pl. 3, figs 6, 6a.

Pearsonia travancornica — Kobelt 1902: 175. Raheem et al. 2014: 45, 46, fig. 25a.

Type locality. In montibus Travancoricis haud procul a Tinnevely [Hills between Kerala State and Tinnevely District, Tamil Nadu State, India].

Type material. Holotype NHMUK 1912.04.16.646/1 (Fig. 12G) fixed by monotypy.

90. *trusanensis* Godwin-Austen, 1889

Fig. 12H

Cyclotus trusanensis Godwin-Austen, 1889: 344, pl. 36, figs 5, 5a. Kobelt 1902: 203.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Trusan Island [Terusan Island, Sabah, Malaysia].

Type material. Syntype NHMUK 1889.12.7.22 (1 shell; Fig. 12H).

Remarks. The species description was clearly based on more than one specimen. The original description included an illustration of a single specimen and gave two sets of shell measurements. The NHM collections contain a lot consisting of a single shell with an original label stating “type”. This shell matches with the illustration and the shell sizes correspond well with the measurements of the specimen cited as “Size of shell drawn”, in the original description.

91. *tubuliferus* (Pfeiffer, 1854)

Fig. 12I, J

Cyclostoma (*Cyclotus*) *tubuliferum* Pfeiffer, 1854c [1853]: 51.

Pterocyclos tubuliferus — Reeve 1863: volume 14, *Pterocyclos*, pl. 5, species 24.

Cyclotus tubuliferus — Kobelt 1902: 218.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. unknown.

Type material. Syntype NHMUK 20170370 (3 shells; Fig. 12I, J).

Remarks. The original description did not include an illustration or collection locality. Pfeiffer stated that this species was described based on material from the Cuming collection, and only one set of shell dimensions was given. Later, Reeve (1863) re-published the description and figured a specimen from the Cuming collection. A specimen lot containing three shells from the Cuming collection with an original label in Pfeiffer's handwriting giving the species name is housed in the NHM collections. The specimen that most closely matches the measurements given in the original description and the illustration in Reeve (1863) is figured herein (Fig. 12I).

92. *vanbuensis* (Smith, 1896)

Fig. 12K, L

Pterocyclus vanbuensis Smith, 1896a: 130.

Scabrina vanbuensis — Kobelt 1902: 90, 91.

Current generic position. *Scabrina* Blanford, 1863

Type locality. Vanbu, Tonkin [Van Ban District, Lao Cai Province, Vietnam].

Type material. Lectotype (design. n.) NHMUK 1896.1.25.7 (Fig. 12K), paralectotype NHMUK 1896.1.25.8 (1 shell; Fig. 12L).

Remarks. The original description included only one set of shell measurements; however, the species description was not explicitly based on one specimen. There are two shells in the NHM type lot with an original label stating “Types”, subsequently changed to read “holotype red spot”. The shell that matches the measurements given in the original description is here designated as the lectotype to stabilise the name.

93. *vicinus* Smith, 1896

Fig. 13A, B

Cyclotus vicinus Smith, 1896c: 150, fig. 13. Kobelt 1902: 195.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Jampea Island [Pulau Jampea, Selayar Islands Regency, south Sulawesi Province, Indonesia].

Type material. Syntype NHMUK 1896.5.16.46–51 (5 adults + 1 juvenile; Fig. 13A, B).

Remarks. Smith stated in the introduction to his paper that he had received specimens from A Everett. There are six specimens in the NHM type lot with original labels in Smith's handwriting. The original description gives one set of measurements and an

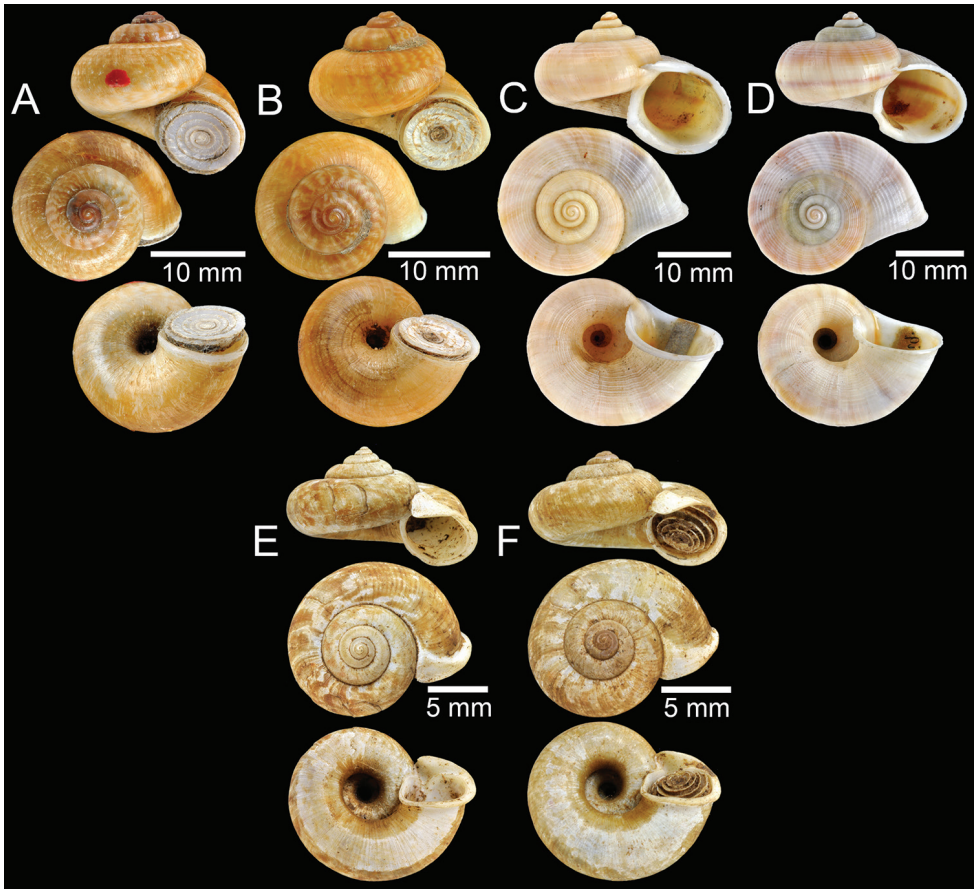


Figure 13. **A, B** Syntype of *Cyclotus vicinus* **C, D** possible syntypes of *Cyclotus volvuloides* **E, F** *Pterocyclos anamullayensis* Sutharit and Panha, new species **E** holotype and **F** paratype.

illustration of one specimen. The specimen that corresponds to the figure and measurements given in the original description, and with a red spot on the shell is figured herein (Fig. 13A).

94. *volvuloides* (Sowerby I, 1850)

Fig. 13C, D

Cyclostoma volvuloides Sowerby I, 1850: 162*, pl. 31b, figs 312, 313. Pfeiffer 1853b: 249, 250, pl. 33, figs 8, 9. Reeve 1863, volume 14, *Cyclotus*, pl. 4, species 19.

Cyclotus volvuloides — Kobelt 1902: 203, 204.

Current generic position. *Cyclotus* Swainson, 1840

Type locality. Unknown.

Type material. Possible syntype NHMUK 20160354 (3 shells; Fig. 13C, D).

Remarks. The original description of this species included an illustration. Later, Pfeiffer (1853b) and Reeve (1863) re-published the description and figured this species based on material in the Cuming collection. The NHM collections contain a lot of three shells from the Cuming collection with original labels giving the taxon name and citing the illustration “f. 312, 313”. The specimen in the Cuming collection matches well with the illustration in the original description, Pfeiffer (1853b) and Reeve (1863). However, Sowerby I did not clearly state that the species description was based on specimens from the Cuming collection. Therefore, we consider this lot to be possible syntypes.

Systematics

Family Cyclophoridae Gray, 1847

Subfamily Cyclophorinae Gray, 1847

Tribe Pterocyclini Kobelt & Möllendorff, 1897

Genus *Pterocyclos* Benson, 1832

95. *Pterocyclos anamullayensis* Sutcharit & Panha, sp. n.

<http://zoobank.org/F963ADA8-1F4C-437E-97DB-3D41C27BD64B>

Fig. 13E, F

Pterocyclos anamullayensis Beddome [unavailable name, only written on label of specimens].

Type material. Collection RH Beddome, Holotype NHMUK 1912.4.16.629/1 (Fig. 13E). Paratypes NHMUK 1912.4.16.629/2–4 (3 shells; Fig. 13F) from the type locality.

Type locality. Anamalais, India [Anamalai Hills (10°20'N, 76°55'E), Kerala and Tamil Nadu states, India].

Diagnosis. The differences between *Pterocyclos anamullayensis* new species, *P. comatus* Beddome 1881 and *P. cyclophoroideus* Nevill, 1881 are the elevated spire, expanded lip, stout last whorl, absence of a spiral band on periphery of the last whorl, the wing-shape of upper peripheral lip near the suture and a canal-like accessory respiratory structure. In comparison, *P. comatus* and *P. cyclophoroideus* both have a depressed spire, narrow dark brown peripheral band, wide umbilicus, and slight expansion of the upper peripheral lip. The accessory respiratory structure of *P. comatus* forms a nearly closed tubular structure (see Raheem et al. 2014: fig. 23d, e), while *P. cyclophoroideus* has a nearly closed tubular to canal shaped structure (see Raheem et al. 2014: fig. 24b, c).

Description. Shell small to medium, elevated conic, thickened, and widely umbilicated. Apex acute; spire elevated; suture wide and depressed; whorl 4 to 5 convex and becoming increasingly regular. Shell surface nearly smooth with thin growth lines; periostracum thin, corneous to brownish colour. Last whorl rounded and stout. Shell colour

monochrome with a white or brown zigzag pattern. Aperture rounded with white lip; upper peripheral-lip widely expanded with wing shaped near suture; lower part of apertural lip thickened and absent to little expanded. Accessory respiratory structure canal-like or notch shape. Operculum calcareous, concave inside and multi-lamellae outside.

Etymology. The specific epithet is derived from the type locality.

Distribution. This new species known only from the type locality.

Remarks. This new species was described based on the historical collections of RH Beddome from “Anamalis”. The NHMUK 1912.4.16.629 lot consists of four shells labelled as “*Pterocyclos anamullayensis* Bedd.” and “Type”, but this taxon name has previously never been published.

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