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Annotated type catalogue of the Bothriembryontidae and Odontostomidae (Mollusca, Gastropoda, Orthalicoidea) in the Natural History Museum, London

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Abstract

The type status is described for specimens of 84 taxa classified within the families Bothriembryontidae and Odontostomidae (superfamily Orthalicoidea) and kept in the Natural History Museum, London. Lectotypes are designated for *Bulimus* (*Liparus*) *brazieri* Angas, 1871; *Bulimus broderipii* Sowerby I, 1832; *Bulimus fuligineus* Pfeiffer, 1853; *Helix guarani* d'Orbigny, 1835; *Bulimus* (*Tomigerus*) *ramagei* E.A. Smith, 1890; *Helix rhodinostoma* d'Orbigny, 1835; *Bulimus* (*Bulimulus*) *ridleyi* E.A. Smith, 1890. The type status of the following taxa is changed to lectotype in accordance with Art. 74.6 ICZN: *Placostylus* (*Euplacostylus*) *cylindricus* Fulton, 1907; *Bulimus pyrostomus* Pfeiffer, 1860; *Bulimus turneri* Pfeiffer, 1860. The following taxon is synonymised: *Bulimus oblitus* Reeve, 1848 = *Bahiensis neglectus* (Pfeiffer, 1847).

Keywords

Bothriembryontidae, Odontostomidae, types

Introduction and methods

This is the second paper on the types of Orthalicoidea in the Natural History Museum, London. An earlier paper (Breure and Ablett 2011) has presented the context of the collection, the criteria used for the selection of lectotypes, some biohistorical notes, and a list of type specimens belonging to the Amphibulimidae. The aim of this publication

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is to supplement the earlier paper with data on the type specimens classified with the Bothriembryontidae and Odontostomidae (sensu Breure and Romero in press).

Abbreviations used for depositories of material are: ANSP, Academy of Natural Sciences, Philadelphia, U.S.A.; MHNG, Muséum d'Histoire Naturelle, Geneve, Switserland; MNHN, Muséum National d'Histoire Naturelle, Paris, France; MNHNM, Museo Nacional de Historia Natural, Montevideo, Uruguay; NHMUK, Natural History Museum, London, U.K.; RBINS, Royal Belgian Institute of Natural Sciences, Brussels, Belgium; RMNH, Netherlands Centre for Biodiversity Naturalis, Leiden, the Netherlands; SMF, Senckenberg Natur-Museum, Frankfurt am Main, Germany; UF, Florida Museum of Natural History, Gainesville, U.S.A.; ZMB, Museum für Naturkunde, Berlin, Germany. Other abbreviations used are: **/** end of line in cited text; coll., collection; D, diameter; H, shell height; leg., *legit*, collected; W, number of whorls. See Fig. 1 for the way measurements of the shell have been taken. Label styles in the Cuming collection (M.C.) are explained in Breure and Ablett (2011: 7–8, fig. 6).

Systematics

Systematic list of taxa arranged in generic order

This systematic list follows Breure (1979); the family classification amended as proposed by Breure and Romero (in press). The generic classification has been adapted from Simone (2006) for the Odontostomidae (but see Remarks below); the classification of Bothriembryontidae is based on unpublished data from the senior author. Within each family, genus and at species level, taxa are presented in alphabetical order.

Family Bothriembryontidae Iredale, 1937

Remarks. The Gondwanan group within the Orthalicoidea (Placostylidae sensu Neubert et al. 2009, *Bothriembryon*, *Prestonella*, *Plectostylus*, and *Discoleus*) appears to be monophyletic (Breure and Romero in press). Thus the oldest family name, i.e. Bothriembryontidae, is used herein for this group.

Aspastus Albers, 1850
miltocheilus (Reeve, 1848); ***sellersi*** (Cox, 1871).

Bothriembryon Pilsbry, 1894
angasianus (Pfeiffer, 1864); ***brazieri*** (Angas, 1871); ***dux*** (Pfeiffer, 1861); ***kingii*** (J.E. Gray, 1825); ***leeuwinensis*** (E.A. Smith, 1894); ***physoides*** (Reeve, 1849); ***rhodostomus*** (J.E. Gray, 1834); ***spenceri*** (Tate, 1894); ***tasmanicus*** (Pfeiffer, 1853).

Callistocharis Pilsbry, 1900
crassilabrum (Garrett, 1872); ***ochrostoma*** (Garrett, 1872); *subroseus* Fulton, 1915.

Eumecostylus Martens in Albers, 1860
backhuysi Delsaerdt, 2010; ***calus*** (E.A. Smith, 1891); ***cylindricus*** Fulton, 1907; ***foxi*** Clench, 1941; ***hargravesi*** (Cox, 1871); ***sanchristovalensis*** (Cox, 1870).

Euplacostylus Crosse, 1875
koroensis (Garrett, 1872).

Placocharis Pilsbry, 1900
guppyi E.A. Smith, 1891; ***kreftii*** (Cox, 1872); ***macgillivrayi*** (Pfeiffer, 1855); ***strangei*** (Pfeiffer, 1853).

Placostylus Beck, 1837
alba (Crosse, 1874); ***asopeus*** (Gassies, 1871); ***bairdii*** (Reeve, 1848); ***bulbulus*** (Gassies, 1871); ***corpulentus*** (Gassies, 1871); ***cuninculinsulae*** (Cox, 1872); ***eddystonensis*** (Pfeiffer, 1855); ***edwardsianus*** (Gassies, 1863); ***falcicula*** (Gassies, 1871); ***gatopensis*** (Crosse, 1870); ***grammica*** (Crosse, 1870); ***infundibulum*** (Gassies, 1871); ***necouensis*** (Gassies, 1871); ***ouensis*** (Gassies, 1870); ***pinicola*** (Gassies, 1870); ***priscus*** Powell, 1938; ***pyrostomus*** (Pfeiffer, 1860); ***salomonis*** (Pfeiffer, 1853); ***savesi*** (Crosse, 1886); ***singularis*** (Morelet, 1857); ***sinistrorsa*** (Crosse, 1884); ***souvillei*** (Morelet, 1857); ***superfasciatus*** (Gassies, 1871).

Plectostylus Beck, 1837
broderipii (Sowerby I, 1832); ***coturnix*** (Sowerby I, 1832); ***elegans*** (Pfeiffer, 1842); ***elongata*** (d'Orbigny, 1837); ***punctulifer*** (Sowerby I, 1833); ***reflexus*** (Pfeiffer, 1842); ***variegata*** (Pfeiffer, 1842).

Poecilocharis Kobelt, 1891
turneri (Pfeiffer, 1860).

Prestonella Connolly, 1929
bowkeri (Sowerby III, 1890); ***nuptialis*** (Melvill and Ponsonby, 1894); ***quadingensis*** Connolly, 1929.

Santacharis Iredale, 1927
fuligineus (Pfeiffer, 1853).

Family Odontostomidae Pilsbry and Vanatta, 1894

Remarks. We follow here the classification of Simone (2006), with exceptions mentioned below. However, it must be emphasized that a revision of this family, combining morphological and molecular data, is much overdue.

Anostoma Fischer von Waldheim, 1807
brunneum Verdcourt, 1990; ***carinatum*** Pfeiffer, 1853.

Bahiensis Jousseaume, 1877
fuscagula d'Orbigny, 1837; ***guarani*** (d'Orbigny, 1835); ***longulus*** (Pfeiffer, 1859); ***neglecta*** (Pfeiffer, 1847); ***oblita*** (Reeve, 1848); ***occultus*** (Reeve, 1849); ***paralellus*** (Pfeiffer, 1857); ***rhodinostoma*** (d'Orbigny, 1835).

Biotocus Salgado and Leme, 1990
cumingii (Pfeiffer, 1849); ***turbinatus*** (Pfeiffer, 1845).

Bonnanius Jousseaume, 1900
ramagei (E.A. Smith, 1890).

Clessinia Döring, 1874
costatus (Pfeiffer, 1849).
Remarks. Molecular evidence appear to suggest that taxa hitherto placed in ***Spixia*** and ***Clessinia*** belong to the same group (Breure and Romero in press); in case further studies should confirm the synonymy of these taxa, ***Clessinia*** has priority over ***Spixia*** Pilsbry and Vanatta, 1894.

Cyclodontina Beck, 1837
catharinae (Pfeiffer, 1857); ***charpentieri*** (Pfeiffer, 1850); ***corderoi*** Klappenbach, 1958; ***minor*** (d'Orbigny, 1837).

Hyperaulax Pilsbry, 1897
ridleyi (E.A. Smith, 1890).

Moricandia Pilsbry and Vanatta, 1898
tolerata (Fulton, 1903).

Odontostomus Beck, 1837
grayanus Pfeiffer, 1845; ***odontostomus*** (Sowerby I, 1824).
Remarks. Simone (2006) seems to have misinterpreted this genus, by considering ***Plagiodontes daedaleus*** (Deshayes, 1851) as a member of ***Odontostomus***, whilst placing the type species of this genus in ***Macrodontes*** Swainson, 1840 without further discussion.

Plagiodontes Döring, 1876
dentata (Wood, 1828); ***patagonica*** (d'Orbigny, 1835).

Spixia Pilsbry and Vanatta, 1894
major (d'Orbigny, 1837).

Alphabetic list of taxa by species name

***Bulimus ouveanus alba* Crosse, 1874**
http://species-id.net/wiki/Bulimus_ouveanus_alba
Figs 8G–H

Bulimus ouveanus var. *γ alba* Crosse 1874: 109; Breure & Schouten 1985: 66.
Placostylus fibratus ouveanus (Dotzauser in Mousson); Neubert et al. 2009: 74, fig. 96

Type locality. "in loco Siandé dicto, Novae Caledoniae (*E. Marie*)".

Label. "Siandé"; label in Crosse's handwriting glued to the shell.

Dimensions. "Long. 48, diam. maj. 23 1/2 mill."; holotype H 48.1, D 23.8, W 6.1.

Type material. NHMUK 1929.9.14.6, holotype (Marie coll.).

Remarks. The shell is accompanied by another label in Crosse's handwriting, stating that on 30 July 1884 he received a message from E. Marie that this shell had to be considered a monstrosity. Neubert et al. (2009) ascribe this taxon to Pfeiffer, but it is unclear if Pfeiffer ever saw this specimen.

Current systematic position. Bothriembryontidae, *Placostylus fibratus ouveanus* (Dotzauer in Mousson, 1869).

***Bulimus angasianus* Pfeiffer, 1864**
http://species-id.net/wiki/Bulimus_angasianus
Figs 2A–B, iii

Bulimus angasianus Pfeiffer 1864: 528; B.J. Smith 1992: 101.
Bothriembryon (*Bothriembryon*) *angasianus* (Pfeiffer); Breure 1979: 93.

Type locality. "Port Lincoln, South Australia".

Label. "Port Lincoln / South Australia"; presumably in Angas' handwriting.

Dimensions. "Long. 25 1/2, diam. 14 mill."; syntype H 20.6 D 14.6, W 4.5.

Type material. NHMUK 1870.10.26.176, one syntype (Angas coll.).

Remarks. The label bears "type" in the original handwriting, but the specimen does not match the dimensions given by Pfeiffer. There are three additional syntypes in the Angas collection in the Hancock Museun [now part of the Great North Museum in Newcastle-upon-Tyne] (D. Gordon, pers. comm.)

Current systematic position. Bothriembryontidae, *Bothriembryon angasianus* (Pfeiffer, 1864).

Bulimus asopeus **Gassies, 1871**
http://species-id.net/wiki/Bulimus_asopeus
Figs 7E, 7v

Bulimus asopeus Gassies 1871: 87; Breure and Schouten 1985: 66; Neubert et al. 2009: 51, 54, fig. 18.

Type locality. [New Caledonia] "Ile des Pins, sud de la Nouvelle-Calédonie".

Label. No information given. The specimen is marked by Gassies with "T" on the ventral side of the last whorl.

Dimensions. "Long. 50 mill.; diam. maj. 34"; holotype H 49.7, D 35.1, W 6.5.

Type material. NHMUK 1883.11.10.1173, holotype, R.P. Lambert leg. (ex Gassies).

Remarks. The specimen is a monstrosity and was classified as *Placostylus fibratus fibratus* (Martyn, 1784) in a recent revision by Neubert et al. (2009).

Current systematic position. Bothriembryontidae, *Placostylus fibratus fibratus* (Martyn, 1784).

Eumecostylus vicinus backhuysi **Delsaerdt, 2010**
http://species-id.net/wiki/Eumecostylus_vicinus_backhuysi

Eumecostylus vicinus backhuysi Delsaerdt 2010: 43, pl. 6 figs 10–13.

Type locality. "Marau area, SE Guadalcanal, Solomon Islands".

Label. "Marau area, SE Guadalcanal, Solomon Islands".

Dimensions. "68.4 x 29.3 mm"; holotype H 68.4, D 29.3, W 4+.

Type material. NHM 20100568, holotype, R. Moylan leg. (ex Delsaerdt ex Backhuys).

Remarks. The apex of the specimen is missing.

Current systematic position. Bothriembryontidae, *Eumecostylus vicinus backhuysi* Delsaerdt, 2010.

Bulimus bairdii **Reeve, 1848**
http://species-id.net/wiki/Bulimus_bairdii
Figs 7A, 7i

Bulimus bairdii Reeve 1848 [1848–1850]: pl. 43 fig. 272; Breure and Schouten 1985: 67 (lectotype designation); Neubert et al. 2009: 51, 53, fig. 8.

Type locality. "—?".

Label. No locality given. "Type specimen" added in a later handwriting (E.A. Smith?)

Dimensions. Not given. Specimen figured herein H 78.1, D 36.2, W 7.3.

Type material. NHMUK 1975223, lectotype.

Remarks. Reeve indicated that his specimen was in "Mus. Brit.". His description leaves room for the possibility that Reeve passed additional specimens to other collectors/institutions; therefore, we concur with Breure and Schouten (1985) to designate this specimen as lectotype. Neubert et al. (2009), who consider this specimen a syntype, treat this taxon as a synonym of *Placostylus fibratus fibratus* (Martyn, 1784).

Current systematic position. Bothriembryontidae, *Placostylus fibratus fibratus* (Martyn, 1784).

***Bulimus* (*Mesembrinus?*) *bowkeri* Sowerby III, 1890**

http://species-id.net/wiki/Bulimus_bowkeri
Figs 6A–C, 6i

Bulimus (*Mesembrinus?*) *bowkeri* Sowerby III 1890: 581, pl. 56 fig. 5.
Prestonella bowkeri (Sowerby); Herbert 2007: 6, figs 2–7, 9–11, 19, 25 (lectotype designation).

Type locality. [South Africa] "Somerset (East), Cape Colony. Forest about 3,000 ft above sea level (*Col. Bowker*)".

Label. "Somerset (East), Cape / Colony. Forest about / 3,000 ft above sea level / Col. Bowker".

Dimensions. "Long. 20, maj. diam. 11 mill."; lectotype H 19.6, D 10.3, W 4.7.

Type material. NHM 1889.11.4.9, lectotype.

Current systematic position. Bothriembryontidae, *Prestonella bowkeri* (Sowerby III, 1890).

***Bulimus* (*Liparus*) *brazieri* Angas, 1871**

http://species-id.net/wiki/Bulimus_brazieri
Figs 2C–E, 2ii

Bulimus (*Liparus*) *brazieri* Angas 1871: 19, pl. 1 fig. 28; B.J. Smith 1992: 102.
Bothriembryon (*Bothriembryon*) *brazieri* (Angas); Breure 1979: 93.

Type locality. [Western Australia] "Sinclair's Range, King George's Sound"; see Remarks.

Label. " Stirling Range, King George's Sound".

Dimensions. "Length 8 lines, breadth 4 lines"; lectotype H 14.3, D 8.7, W 4.9.

Type material. NHMUK 1870.11.5.8, lectotype, and one paralectotype (Angas coll.).

Remarks. According to Iredale (1939) the published locality was in error and should read "Stirling Range". The taxon forms part of an ill-defined species complex.

The material corresponds to the original figures of Angas. The shell pictured in the right-hand view is here selected lectotype (design. n.). The specimens are not full-grown.

Current systematic position. Bothriembryontidae, *Bothriembryon brazieri* (Angas, 1871).

***Bulinus broderipii* Sowerby I, 1832**
http://species-id.net/wiki/Bulinus_broderipii
Figs 4A–B, 4i

Bulinus broderipii Sowerby I in Broderip & Sowerby 1832a: 30; Sowerby 1833 [1833–1838]: figs 1–1*.

Type locality. "prope Copiapo Chilensium".

Label. "Chili" (in a later handwriting on board). M.C. label style I.

Dimensions. "long. 1 6/8, lat. 1 1/8 poll. [44.3, 28.5 mm]"; lectotype H 44.3, D 26.1, W 5.9.

Type material. NHMUK 20100655, lectotype, and three paralectotypes (Cuming coll.).

Remarks. This taxon may be confused with several other *Plectostylus* species; a revision of this group is pending (F. Cádiz, pers. commun.). One of the specimens matches the original shell height and corresponds to the figures in Sowerby 1833–1838; this shell is here selected as lectotype (design. n.).

Current systematic position. Bothriembryontidae, *Plectostylus broderipii* (Sowerby I, 1832).

***Anostoma octodentatum brunneum* Verdcourt, 1991**
http://species-id.net/wiki/Anostoma_octodentatum_brunneum
Figs 16D–F

Anostoma octodentatum brunneum Verdcourt 1991: 81, fig. 1.
Anostoma brunneum Verdcourt; Simone 2006: 174, fig. 617.

Type locality. "Brazil, Goias State, about 20 km SE. Dianapolis, near Jardim".

Label. "Brazil, Goiás, near Jardim, c. 20 km SE Dianapolis".

Dimensions. "Alt. 16 mm, greater diam. 33–34 mm"; holotype H 16.3, D 32.6, W 4.3.

Type material. NHMUK 1990125, holotype and NHMUK 1990126, (juvenile) paratype (R.M. Hartley leg., 12.ii.1987); in ethanol.

Remarks. A paratype in the MZSP collection was figured by Simone (2006).

Current systematic position. Odontostomidae, *Anostoma octodentatum brunneum* Verdcourt, 1991.

***Bulimus bulbulus* Gassies, 1871**
http://species-id.net/wiki/Bulimus_bulbulus
Figs 7F, 7vi

Bulimus bulbulus Gassies 1871: 193.

Type locality. [New Caledonia] "les environs de Nouméa, de Concepcion, Baie du Sud, etc., fossile à l'île des Pins".

Label. No type locality. Taxon label in Gassies' handwriting.

Dimensions. "Diam. maj. 4 mill., alt. 5 mill."; specimen figured herein H 4.13, D 3.56, W 2.1.

Type material. NHMUK 1883.11.10.223-229, seven syntypes (Gassies coll.).

Remarks. Three specimens are still glued on board, four others separate in capsule. These specimens are juveniles, probably of *Placostylus fibratus* (Martyn, 1784).

Current systematic position. Bothriembryontidae, *Placostylus* cf. *fibratus* (Martyn, 1784).

***Placostylus calus* E.A. Smith, 1891**
http://species-id.net/wiki/Placostylus_calus
Figs 11A, 11i

Placostylus calus E.A. Smith 1891: 489, pl. 40 fig. 7.
Placostylus (*Placocharis*) *calus* (E.A. Smith) [sic, no parenthesis required]; Breure & Schouten 1985: 63 (lectotype designation).
Eumecostylus calus (E.A. Smith); Delsaerdt 2010: 44, pl. 7 figs 1–4.

Type locality. "Solomon Islands".

Label. "Solomon Is.", in Smith's handwriting.

Dimensions. "Longit. 78 millim., diam. maj. 33"; lectotype H 78, D 33.7, W 5+.

Type material. NHMUK 1891.11.3.4, lectotype; NHMUK1891.11.3.5-6, two paralectotypes (ex Brazier).

Remarks. The apex of the lectotype is damaged.

Current systematic position. Bothriembryontidae, *Eumecostylus calus* (E.A. Smith, 1891).

***Anostoma carinatum* Pfeiffer, 1853**
http://species-id.net/wiki/Anostoma_carinatum
Figs 16A–C, 16i

Anostoma carinatum Pfeiffer 1853a: 57.
Ringicella carinata (Pfeiffer); Simone 2006: 175, fig. 622.

Type locality. "Brasilia (*Mus. Dennison.*)".

Label. "Brazils".

Dimensions. "Diam. maj. 24 1/2, (..) alt. 13 mill."; specimen figured herein H 13.3, D 24.3, W 4.9.

Type material. NHMUK 20100509, three syntypes (Cuming coll.).

Remarks. Although the taxon label is not in Pfeiffer's handwriting, the specimens fit the original measurements and are considered probable syntypes.

Current systematic position. Odontostomidae, *Anostoma carinatum* Pfeiffer, 1853.

***Bulimus catharinae* Pfeiffer, 1857**
http://species-id.net/wiki/Bulimus_catharinae
Figs 23A–B, 23i

Bulimus catharinae Pfeiffer 1857: 389; Breure 1974: 113.
Cyclodontina (*C.*) *fusiformis* (Menke); Breure & Schouten 1985: 6, pl. 1 figs 1–2 (lectotype designation).
Cyclodontina catharinae (Pfeiffer); Simone 2006: 165, fig. 567.

Type locality. "St. Catherine's, Brazil".

Label. "St Catherines Brazil"; taxon label in Pfeiffer's handwriting.

Dimensions. "23–25, 7 1/2–8 mill."; specimen figured herein H 24.4, D 7.5, W 8.1.

Type material. NHMUK 1975261, lectotype and two paralectotypes (Cuming coll.).

Remarks. Simone revalidated this taxon without providing further discussion; however, we follow here the synonymization of Breure and Schouten (1985).

Current systematic position. Odontostomidae, *Cyclodontina fusiformis* (Menke, 1828).

***Bulimus charpentieri* Pfeiffer, 1850**
http://species-id.net/wiki/Bulimus_charpentieri
Figs 21G–I, 21ii

Bulimus charpentieri "Grateloup" Pfeiffer 1850: 14; Pfeiffer in Küster and Pfeiffer 1854 [1840–1865]: 143, pl. 45 figs 14–15; Breure 1974: 113.

Type locality. "Cardova [sic, Córdoba] reipubl. Argentinae".

Label. "Brazils". M.C. label style III.

Dimensions. "Long. 20, diam. 5 2/3 mill."; specimen figured herein H 17.9, D 5.15, W 9.2.

Type material. NHMUK 20110386, syntype (Cuming coll.).

Current systematic position. Odontostomidae, *Cyclodontina charpentieri* (Pfeiffer, 1850).

***Cyclodontina* (*Spixia*) *corderoi* Klappenbach, 1958**
http://species-id.net/wiki/Cyclodontina_corderoi
Figs 21J–K, 21iii

Cyclodontina (*Spixia*) *corderoi* Klappenbach 1958: 2, pls 1–2; Breure 1974: 114.

Type locality. [Uruguay] "Pozo Hondo, próxima a la población Tambores en el departemento de Tacuarembó".

Label. "Pozo Hondo, Tambores, Depto Tacuarembó, Rep. del Uruguay".

Dimensions. "Largo total 17.5, Ancho 5 (en millimetros)"; specimen figured herein H 16.1, D 5.44, W 7+.

Type material. NHMUK 1961679, three paratypes, M.A. Klappenbach & P. San Martin leg., 12.x.1957, ex MNHNM 0716.

Remarks. The apex of the shell is slightly damaged.

Current systematic position. Odontostomidae, *Cyclodontina corderoi* Klappenbach, 1958.

***Bulimus corpulentus* Gassies, 1871**
http://species-id.net/wiki/Bulimus_corpulentus
Figs 10A, 10i

Bulimus corpulentus Gassies 1871: 183; Breure & Schouten 1985: 67.
Placostylus corpulentus (Gassies); Neubert et al. 2009: 112, fig. 184.

Type locality. "Fossile à l'île des Pins et à l'îlot Koutoumo".

Label. "New Caledonia".

Dimensions. "Long. 100 mill.; diam. maj. 55 mill."; specimen figured herein H 94.0, D 64.0, W 6.7.

Type material. NHMUK 1883.11.10.1178, syntype, R.P. Lambert leg. (ex Gassies).

Remarks. The surface of the specimen is covered by various encrustations.

Current systematic position. Bothriembryontidae, *Placostylus corpulentus* (Gassies, 1871).

***Bulimus costatus* Pfeiffer, 1848**
http://species-id.net/wiki/Bulimus_costatus
Figs 22F–G, 22ii

Bulimus costatus Pfeiffer 1848: 114; Pfeiffer 1849a: 111; Reeve 1849 [1848–1850]: pl. 65 fig. 450.
Clessinia costata (Pfeiffer); Breure & Schouten 1985: 10, pl. 1 fig. 4 (lectotype designation); Simone 2006: 164, fig. 563.

Type locality. "Brasilia" [Brazil].

Label. "Brazil". M.C. label style III. Another label indicates that this specimen was also figured in Reeve's Conchologica Iconica.

Dimensions. "Long. 18, diam. 5 1/2 mill."; lectotype H 17.8, D 5.6, W 8.8.

Type material. NHMUK 1975250, lectotype and two paralectotypes (Cuming coll.).

Remarks. Although the first publication was in Pfeiffer (1848), he refers to Pfeiffer (1849) as the original description; this paper was describing new species from the Cuming collection.

Current systematic position. Odontostomidae, *Clessinia costata* (Pfeiffer, 1848).

***Bulinus coturnix* Sowerby I, 1832**
http://species-id.net/wiki/Bulinus_coturnix
Figs 4C–D, 4ii

Bulinus coturnix Sowerby I in Broderip & Sowerby 1832a: 30.

Type locality. [Chile] "Huasco".

Label. "Huasco". M.C. label style I.

Dimensions. "Long 1 1/4, lat. 7/8 poll. [H 31.7, D 22.2 mm]"; specimen figured herein H 32.4, D 21.0, W 5.0.

Type material. NHMUK 20100620, five possible syntypes (Cuming coll.).

Remarks. Of the five specimens, only one is adult; although it does not correspond to the original measurements, it originates from the type locality. The material is considered as possible syntypes.

Current systematic position. Bothriembryontidae, *Plectostylus coturnix* (Sowerby I, 1832).

***Bulimus crassilabrum* Garrett, 1872**
http://species-id.net/wiki/Bulimus_crassilabrum
Figs 13A, 13i

Bulimus crassilabrum Garrett 1872: 233, pl. 18 fig. 5.

Type locality. [Fiji] "Vanna Levu Id., Viti Isles".

Label. "Vanua Levu".

Dimensions. "Length 41 mill., diam. 21 mill."; specimen figured herein H 44.0, D 22.1, W 5.1.

Type material. NHMUK 20030801, one syntype, ex Kennard ex Garrett coll. ("cotype ex auct.").

Remarks. Richardson (1995: 286) placed this taxon in the synonymy of *Aspastus rugatus* (Garrett, 1872), without further comments. Judging by the descriptions and figures of both species, there is every reason to consider these two taxa identical. Based on Garrett's 1872 paper, *Bulimus crassilabrum* has page priority.

Current systematic position. Bothriembryontidae, *Callistocharis crassilabrum* (Garrett, 1872).

***Tomigerus cumingii* 'Newcomb' Pfeiffer, 1849**
http://species-id.net/wiki/Tomigerus_cumingii
Figs 19A–C, 19i

Tomigerus cumingii 'Newcomb' Pfeiffer 1849b: 67.
Biotocus cumingii (Pfeiffer); Simone 2006: 177, fig. 633.

Type locality. "Para[,] Brasiliae".

Label. "Para". M.C. label style III.

Dimensions. "Diam. maj. 7 1/2, min. 5, alt. 6 mill."; specimen figured herein H 6.45, D 6.72, W 4.8.

Type material. NHMUK 1975587, three syntypes, ex Newcomb (Cuming coll.).

Current systematic position. Odontostomidae, *Biotocus cumingii* ('Newcomb' Pfeiffer, 1849).

***Bulimus cuninculinsulae* Cox, 1872**
http://species-id.net/wiki/Bulimus_cuninculinsulae
Figs 12C, 12iii

Bulimus cuninculinsulae Cox 1872b: 19, 233, pl. 18 fig. 5; Breure & Schouten 1985: 68 (lectotype designation).

Type locality. [Australia] "Rabbit Island, near Lord Howe's Island, Pacific Ocean".

Label. "Rabbit Is. / near Lord / Howe's Is. / Pacific ocean".

Dimensions. "Length 1.65, breadth 0.75 of an inch [H 41.9, D 19.1 mm]"; lectotype H 41.6, D 20.5, W 5.6.

Type material. NHMUK 1880.12.11.47-48, lectotype and one paralectotype (ex Cox).

Remarks. The specimen figured by Cox (1872) has been chosen by Breure & Schouten (1985) as the lectotype; the paralectotype matches the original measurements (H 41.9).

Current systematic position. Bothriembryontidae, *Placostylus cuninculinsulae* (Cox, 1872).

***Placostylus* (*Euplacostylus*) *cylindricus* Fulton, 1907**

http://species-id.net/wiki/Placostylus_cylindricus
Figs 11C, 11iii

Placostylus (*Euplacostylus*) *cylindricus* Fulton 1907: 154, pl. 10 fig. 3.
Placostylus (*?Proaspastus*) *cylindricus* (Fulton); Breure & Schouten 1985: 64.
Eumecostylus cylindricus (Fulton); Delsaerdt 2010: 39, pl. 5 figs 1–5.

Type locality. "Isabel Island, Solomons" (see remarks).

Label. "Isabel Id. / Solomon Ids.", in Fulton's handwriting.

Dimensions. "Maj. diam. 23, alt. 71 mm."; lectotype H 71.3, D 27.4, W 6.7.

Type material. NHMUK 1907.5.3.160, lectotype (ex Fulton).

Remarks. Fulton (1907) mentioned that he had three specimens, of which the NHMUK specimen corresponds to his figure. Contrary to Breure & Schouten (1985), it should not be considered as holotype, but is here designated as the lectotype (Art. 74.6 ICZN). The specimen has the apex damaged. Clench (1941) questioned the type locality and suggested it was erroneous. Also Delsaerdt (2010) has been unable to locate this species on Santa Isabel; it is only known from Guadalcanal.

Current systematic position. Bothriembryontidae, *Eumecostylus cylindricus* (Fulton, 1907).

***Pupa dentata* Wood, 1828**

http://species-id.net/wiki/Pupa_dentata
Figs 25A–D, 25i

Pupa dentata Wood 1828: 24, 50, pl. 8 fig. 71.

Type locality. Not given.

Label. "Montevideo".

Dimensions. Not given. Specimen figured herein H 14.16, D 7.17, W 7.9.

Type material. NHMUK 1840.9.12.50, two syntypes, ex Mrs. Mawe.

Remarks. Wood (1828: 24) referred to material from "Br.M. [British Museum]". This supports the claim expressed on the label that this material may be

considered as probable syntypes. It is not clear, however, on what evidence the locality "Montevideo" is based, as Wood did not state it in his publication. One specimen is damaged.

Current systematic position. Odontostomidae, *Plagiodontes dentata* (Wood, 1828).

***Bulimus dux* Pfeiffer, 1861**
http://species-id.net/wiki/Bulimus_dux
Figs 3A–B, 3i

Bulimus dux Pfeiffer 1861: 24; B.J. Smith 1992: 103.
Bothriembryon (*Bothriembryon*) *dux* (Pfeiffer); Breure 1978: 203 (lectotype designation); Breure 1979: 94.

Type locality. "King George's Sound, [Western] Australia".

Label. "King Georges Sound / W. Australia"; taxon label damaged, possibly in Pfeiffer's handwriting. M.C. label style IV.

Dimensions. "Long. 51, diam. 26 mill."; lectotype H 48.5, D 28, W 6.0.

Type material. NHMUK 19598, lectotype; 19599, two paralectotypes (Cuming coll.).

Remarks. These specimens were identified by E.A. Smith as type material.

Current systematic position. Bothriembryontidae, *Bothriembryon dux* (Pfeiffer, 1861).

***Bulimus eddystonensis* Pfeiffer, 1855**
http://species-id.net/wiki/Bulimus_eddystonensis
Figs 9D, 9iv

Bulimus eddystonensis Pfeiffer 1855a: 8.
Placostylus (*Placostylus*) *eddystonensis* (Pfeiffer); Breure & Schouten 1985: 59 (lectotype designation); Neubert et al. 2009: 94, fig. 149.

Type locality. "Eddystone Island, Australian Seas" [Solomon Islands; see remarks].

Label. "Eddystone Isld / Australian sea", taxon label in Pfeiffer's handwriting. M.C. label style IV.

Dimensions. "Long. 74, diam. 34 mill."; lectotype H 73.3, D 36.3, W 6.2.

Type material. NHMUK 1975230, lectotype and two paralectotypes (Cuming coll.).

Remarks. The type locality was in error and was subsequently corrected to New Caledonia, Hienghène (Gassies 1863: 260); see Neubert et al. 2009: fig. 156 for distributional data.

Current systematic position. Bothriembryontidae, *Placostylus eddystonensis* (Pfeiffer, 1855).

***Bulimus edwardsianus* Gassies, 1863**
http://species-id.net/wiki/Bulimus_edwardsianus
Figs 9F, 9vi

Bulimus edwardsianus Gassies 1863: 40, pl. 4 fig. 2; Breure & Schouten 1985: 60.
Placostylus caledonicus (Petit); Neubert et al. 2009: 104, fig. 171.

Type locality. [New Caledonia] "Nékété, Kanala, l'île Nu, l'île Pôt".

Label. "Nékété", taxon label in Gassies' handwriting, marked "T".

Dimensions. "Long. 80 mill.—Diam. maj. 34 mill."; specimen figured herein H 72.0, D 36.5, W 6.7.

Type material. NHMUK 1883.11.10.1172, one possible syntype (ex Gassies ex Marie).

Remarks. Neubert et al. (2009) consider this specimen a possible syntype; it is not the originally figured specimen.

Current systematic position. Bothriembryontidae, *Placostylus caledonicus* (Petit de la Saussaye, 1845).

***Succinea elegans* Pfeiffer, 1842**
http://species-id.net/wiki/Succinea_elegans
Figs 4G–H, 4iv

Succinea elegans Pfeiffer 1842: 56; Pfeiffer 1843: 187; Pfeiffer 1855, in Küster & Pfeiffer 1840–1865: pl. 60 fig. 7. Not *Succinea elegans* Risso, 1826.
Plectostylus coquimbensis perelegans (Pilsbry); Breure 1978: 201, pl. 9 fig. 14 (lectotype designation).

Type locality. "Huasco, Chile (*Bridges*)".

Label. "Questa de Arenas / Huasco, Chili", taxon label in Pfeiffer's handwriting. M.C. label style IV.

Dimensions. "Long. 36, diam. 17 mill."; lectotype H 30.0, D 16.2, W 5.1.

Type material. NHMUK 1975360, lectotype; 1975361, three paralectotypes (Cuming coll.).

Remarks. The lectotype corresponds to the specimen figured by Pfeiffer (1855 [1840–1865]). The original shell height may have been in error. This taxon is now considered a junior subjective synonym of *Bulinus broderipii* Sowerby I, 1832 (F. Cádiz, unpublished data).

Current systematic position. Bothriembryontidae, *Plectostylus broderipii* (Sowerby I, 1832) (synon. n.).

***Bulimus broderipi elongata* d'Orbigny, 1837**
http://species-id.net/wiki/Bulimus_broderipi_elongata
Figs 4E–F, 4iii

Bulimus broderipi var. *elongata* d'Orbigny 1837 [1834–1847]: 266.

Type locality. "Cobija, Bolivia" [Chile].

Label. "Cobija"; in d'Orbigny's handwriting.

Dimensions. "Long. 30 millim.; lat. 17 millim."; lectotype H 30.5, D 16.4, W 5.2.

Type material. NHMUK 1854.12.4.102, lectotype and six paralectotypes (d'Orbigny coll.).

Remarks. No material of this taxon has been found in the MNHN. As the species was not figured by d'Orbigny, the specimen that most closely matches the given dimensions has been chosen as the lectotype. This taxon is now considered a junior subjective synonym of *Bulinus broderipii* Sowerby I, 1832 (F. Cádiz, unpublished data).

Current systematic position. Bothriembryontidae, *Plectostylus broderipii* (Sowerby I, 1832) (synon. n.).

***Bulimus falcicula* Gassies, 1871**
http://species-id.net/wiki/Bulimus_falcicula
Figs 7B, 7ii

Bulimus falcicula Gassies 1871: 190.
Placostylus (*Placostylus*) *falcicula* (Gassies); Breure & Schouten 1985: 59.
Placostylus (*Placostylus*) *fibratus fibratus* (Martyn); Neubert et al. 2009: 50, fig. 15.

Type locality. [New Caledonia] "Baie du Sud (Nouvelle-Calédonie)".

Label. No locality label; taxon label in Gassies' handwriting.

Dimensions. "Long. 80 mill.; diam. maj. 40 mill."; specimen figured herein H 74.5, D 35.9, W 6.5.

Type material. NHMUK 1883.11.10.1174, syntype, R.P. Lambert leg. (ex Gassies).

Remarks. The taxon label is marked "T", and the shell is marked with "245" on the last whorl.

Current systematic position. Bothriembryontidae, *Placostylus fibratus fibratus* (Martyn, 1784).

***Placostylus* (*Eumecostylus*) *foxi* Clench, 1950**
http://species-id.net/wiki/Placostylus_foxi
Figs 11B, 11ii

Placostylus (*Eumecostylus*) *foxi* Clench 1950: 3, figs 1–2; Breure & Schouten 1985: 68.
Eumecostylus foxi Clench; Delsaerdt 2010: 34, pl. 3 figs 9–15.

Type locality. "Heuru western end of San Cristobal Island, Solomon Islands".

Label. "Brit. Solomon Isl. / Heuru, western Cristobal Isl.".

Dimensions. "Length 86.8, Gt. width 32 [mm]"; specimen figured herein H 82.3, D 31.5, W 5.9.

Type material. NHMUK 1953.2.4.1, paratype (ex Schlesch).

Remarks. Delsaerdt (2010) corrected the coordinates of the type locality as given by Clench. The specimen in NHMUK was obtained "Through Dr Quick" from the Schlesch collection and has a label "paratype" glued within the aperture. It may be noted that Clench (1950) stated "Paratypes (...) in the Museum of Comparative Zoology, the B.P. Bishop Museum and the collections of A.G. Stevenson, Reverend Fox and Walter J. Eyerdam". It is not clear how the specimen reached the Schlesch collection or if it was genuinely part of the original series.

Current systematic position. Bothriembryontidae, *Eumecostylus foxi* (Clench, 1950).

***Bulimus fuligineus* Pfeiffer, 1853**
http://species-id.net/wiki/Bulimus_fuligineus
Figs 15A, 15i

Bulimus fuligineus Pfeiffer 1853b: 301; Pfeiffer 1854, in Küster & Pfeiffer 1840–1865: 157, pl. 48 figs 5–6.
Bulimus fuligineus var. β Pfeiffer 1859: 363.
Placostylus (*Santacharis*) *fuligineus* (Pfeiffer); Solem 1959: 134, pl. 8 figs 3, 6.

Type locality. [Vanuatu] "Novis Hebridis".

Label. "New Hebrides". "Isle of Aneiteum"; taxon labels in Pfeiffer's handwriting. M.C. label style IV.

Dimensions. "Long. 38, diam. 16 mill."; lectotype H 39.4, D 19.2, W 4.6.

Type material. NHMUK 1975226, lectotype and two paralectotypes; 20100650, three paralectotypes of the varietal form, all Macgillivray leg. (Cuming coll.).

Remarks. Two lots, each consisting of three specimens proved to be present, one corresponding to the variety recognized by Pfeiffer (1859). All material was taken at Vanuatu, Prov. Tafea, Anatom (of which Anaiteum and Aneityum are a few of the variant names), according to the label glued inside the aperture of one of the specimens and the label of the variety lot. The specimen figured by Pfeiffer (1854: pl. 48 figs 5–6) is now seclected lectotype (design. n.).

Current systematic position. Bothriembryontidae, *Santacharis fuligineus* (Pfeiffer, 1853).

***Bulimus fuscagula* d'Orbigny, 1837**
http://species-id.net/wiki/Bulimus_fuscagula
Figs 23E–F, 23iii

Bulimus fuscagula d'Orbigny 1837 [1834–1847]: 318, pl. 39 figs 1–2; Gray 1854: 22.
Bahiensis miliola (d'Orbigny); Simone 2006: 169, fig. 591b.

Type locality. [Brazil] "Rio de Janeiro".

Label. "In Bresil"

Dimensions. "Long. 30 millim.; lat. 8 millim."; lectotype H 28.6, D 7.6, W 9.4.

Type material. NHMUK 1854.12.4.141, lectotype (d'Orbigny coll.).

Remarks. This specimen was thought by d'Orbigny to represent *Auricula fuscagula* Lea, 1837 [= *Cyclodontina punctatissima* (Lesson, 1830)], which is, however, a distinct species. The type lot consisted of a second specimen (NHMUK 1854.12.4.142) which indeed belongs to this species described by Lesson. Therefore, to solve the potential confusion, specimen NHMUK 1854.12.4.141 is here designated as lectotype (design. n.) of *Bulimus fuscagula* d'Orbigny.

Current systematic position. Odontostomidae, *Bahiensis fuscagula* (d'Orbigny, 1837).

***Bulimus souvillei gatopensis* Crosse, 1870**
http://species-id.net/wiki/Bulimus_souvillei_gatopensis
Figs 8B–C, 8iii

Bulimus souvillei var. δ *gatopensis* Crosse 1870: 242; Breure & Schouten 1985: 69; Neubert et al. 2009: 61.

Type locality. "Gatope et in loco 'Ferme modèle' dicto, Novae Caledoniae. (E. Marie)".

Label. No locality given. Taxon label in Crosse's handwriting (?).

Dimensions. "Long. 88–95, diam. maj. 47–56 mill."; specimen figured herein H 94.5, D 55.5, W 6.5.

Type material. NHMUK 1929.9.14.4, syntype, ex Marie coll.

Remarks. A label (from Crosse?) with the note "type" is glued on the dorsal side of the last whorl. Neubert et al. (2009) have commented on the type locality of this material, noting it to be erroneous or based on introduced material. A further syntype is in the MNHN collection.

Current systematic position. Bothriembryontidae, *Placostylus fibratus guestieri* (Gassies, 1869).

***Bulimus fibratus grammica* Crosse, 1870**
http://species-id.net/wiki/Bulimus_fibratus_grammica
Figs 9A, 9i

Bulimus fibratus grammica Crosse 1870: 242; Neubert et al. 2009: 62, fig. 54.

Type locality. "Nouvelle-Calédonie".

Label. "New Caledonia" added in a later handwriting. "type de l'auteur" glued on shell.

Dimensions. "Long. 111, diam. maj. 47 mill."; specimen figured herein H 111.3, D 52.5, W 7.4.

Type material. NHMUK 1929.9.14.5, syntype, ex Marie coll.

Remarks. In the recent revision of New Caledonian *Placostylus* (Neubert et al. 2009) an argument is made for the current systematic position of this taxon.

Current systematic position. Bothriembryontidae, *Placostylus fibratus goroensis* (Souverbie, 1870).

***Bulimus grayanus* Pfeiffer, 1845**
http://species-id.net/wiki/Bulimus_grayanus
Figs 24E–H, 24ii

Bulimus grayanus Pfeiffer 1845b: 73.
Macrodontes grayanus (Pfeiffer); Simone 2006: 162, fig. 556.

Type locality. "Brazils".

Label. "Brazil". M.C. label style III.

Dimensions. "Long. 35, diam. 11 mill."; specimen figured herein H 34.1, D 12.8, W 6.0.

Type material. NHMUK 20110387, syntype (Cuming coll.).

Current systematic position. Odontostomidae, *Odontostomus grayanus* (Pfeiffer, 1845).

***Helix guarani* d'Orbigny, 1835**
http://species-id.net/wiki/Helix_guarani
Figs 18A–B, 18iii

Helix guarani d'Orbigny 1835: 21.
Bulimus guarani d'Orbigny 1837 [1834–1847]: 518, pl. 41bis fig. 1.

Type locality. "provincia Corrientesensi (republica Argentina)".

Label. "corrientes. rep. Argentina", label in d'Orbigny's handwriting.

Dimensions. "Longit. 23 millim., latit. 8 1/2"; lectotype H 20.5, D 7.4, H 8.1.

Type material. NHMUK 1854.12.4.140, lectotype and one paralectotype (d'Orbigny coll.).

Remarks. The specimen corresponding to d'Orbigny 1837 [1834–1847]: pl. 41 bis fig. 1 has been selected lectotype (design. n.); the apex of the specimen is slightly damaged and its current shell height is somewhat smaller than in the original measurements. This species is tentatively classified with *Bahiensis*, awaiting a generic level revision of this group.

Current systematic position. Odontostomidae, *Bahiensis guarani* (d'Orbigny, 1835).

***Placostylus guppyi* E.A. Smith, 1891**
http://species-id.net/wiki/Placostylus_guppyi
Figs 14C, 14iii

Placostylus guppyi E.A. Smith 1891: 489, pl. 40 fig. 6; Breure & Schouten 1985: 69 (lectotype designation).
Placocharis guppyi (Smith); Delsaerdt 2010: 60, pl. 11 figs 12–13.

Type locality. "Solomon Islands"; restricted to West Guadalcanal by Delsaerdt (2010).

Label. "Solomon Is.", taxon label in Smith's handwriting.

Dimensions. "Longit. 80 millim., diam. maj. 37"; lectotype H 80.1, D 40.1, W 5.5.

Type material. NHMUK 1891.11.6.110, lectotype; 1891.11.6.111, paralectotype, Brazier leg.

Current systematic position. Bothriembryontidae, *Placocharis guppyi* (E.A. Smith, 1891).

***Bulimus hargravesi* Cox, 1871**
http://species-id.net/wiki/Bulimus_hargravesi
Figs 12A, 12i

Bulimus hargravesi Cox 1871: 323, pl. 34 fig. 3; Breure & Schouten 1985: 69.
Eumecostylus hargravesi (Cox); Delsaerdt 2010: 47, pl. 8 figs 1–6.

Type locality. "Treasury Island, Solomon Islands", corrected to Malaita, Solomon Islands (Delsaerdt 2010).

Label. "Solomon Isls".

Dimensions. "Diam. 1.05, long. 2.60 unc. [H 64.3, D 25.9 mm]"; lectotype H 65.0, D 30.9, W 5.3.

Type material. NHMUK 1880.12.11.43, lectotype (ex Cox).

Remarks. The holotype designation (Breure & Schouten 1985) has to be interpreted as lectotype designation (Art. 74.6 ICZN); the claim of Delsaerdt (2010:

unnumbered page opposite contents [not repeated in main text]) of a lectotype designation is thus erroneous. Delsaerdt interpreted Cox' abbreviation "unc." equalling 25.4 mm given his dimensions of the type specimens as 26.67 x 66.04 mm. Cox' abbreviation can also be read as the Roman uncia, equal to 2.473 cm (Rowlett 2004), but according to Woodward (1851 [1851–1856]: 61) the uncia equals the inch (= 25.4 mm).

Current systematic position. Bothriembryontidae, *Eumecostylus hargravesi* (Cox, 1871).

***Bulimus infundibulum* Gassies, 1871**
http://species-id.net/wiki/Bulimus_infundibulum
Figs 8A, 8i

Bulimus infundibulum Gassies 1871: 86; Breure & Schouten 1985: 69; Neubert et al. 2009: 55, fig. 23.

Type locality. [New Caledonia] "Ilôt Koutoumo, sud de la Nouvelle-Calédonie".

Label. No locality label. Taxon label in Gassies' handwriting and marked "T".

Dimensions. "Long. 75 mill.; diam. maj. 40"; holotype H 75.6, D 46, W 6.5.

Type material. NHMUK 1883.11.10.1163, holotype, ex Gassies.

Remarks. Gassies (1871) remarked that he had seen only one specimen. The single specimen known is a monstrosity; it is marked "241" on the last whorl.

Current systematic position. Bothriembryontidae, *Placostylus fibratus guestieri* (Gassies, 1869)

***Bulimus kingii* J.E. Gray, 1825**
http://species-id.net/wiki/Bulimus_kingii
Figs 2F–G, 2i

Bulimus kingii J.E. Gray 1825: 414; B.J. Smith 1992: 104.
Bothriembryon (*Bothriembryon*) *kingii* (Gray); Breure 1978: 205 (lectotype designation); Breure 1979: 94.

Type locality. [Australia] "New Holland, *Capt. King*".

Label. "Australia".

Dimensions. "Long. 1, diam. 1/2 unc."; lectotype H 24.5, D 10.6, W 5.5.

Type material. NHMUK 195910, lectotype; 195911, one paralectotype, ex P.P. King R.N.

Remarks. According to Pilsbry (1900) and Iredale (1939) the type locality is Western Australia, King George Sound, near Bald Head. Captain King visited this locality

on 20 Juanuary 1818 and stated "An abundance of shells of the *helix* tribe (*Helix bulimus*) was found on the top and sides of the hill" (King 1827: 12).

Current systematic position. Bothriembryontidae, *Bothriembryon kingii* (J.E. Gray, 1825).

***Bulimus koroensis* Garrett, 1872**
http://species-id.net/wiki/Bulimus_koroensis
Figs 13E, 13iv

Bulimus koroensis Garrett 1872: 236, pl. 18 fig. 9.

Type locality. "Koro Isl., Viti Isles".

Label. "Koro, Viti".

Dimensions. "Length 53 mill.; diam. 18 mill."; specimen figured herein H 51.2, D 18.0, W 5.1.

Type material. NHMUK 20030802, two probable syntypes, ex Taylor, ex Garrett.

Current systematic position. Bothriembryontidae, *Euplacostylus koroensis* (Garrett, 1872).

***Bulimus* (*Charis*) *kreftii* Cox, 1872**
http://species-id.net/wiki/Bulimus_kreftii
Figs 14A, 14i–ii

Bulimus (*Charis*) *kreftii* Cox 1872b: 19, pl. 4 fig. 4.
Placocharis kreftii (Cox); Delsaerdt 2010: 67, pl. 11 figs 14–17 (lectotype designation).

Type locality. "Solomon Islands", restricted to Florida Islands by Delsaerdt (2010).

Label. "Solomon Isles", in Cox' handwriting (see remarks).

Dimensions. "Length 2.10, breadth 0.92 of an inch [H 53.3, D 23.3]"; specimen figured herein H 54.9, D 24.3, W 5.2.

Type material. NHMUK 20070068, lectotype and three paralectotypes, ex Kennard ex Cox; 1880.12.11.46, paralectotype, ex Cox.

Remarks. Both series are accompanied by a label in Cox' handwriting. The specimen registered 1880.12.11.46 was presented by J.C. Cox, has a taxon label "Bulimus kreftii" and corresponds to pl.4 fig. 4 of Cox (1872). The other lot (ex A.S. Kennard collection) has a taxon label "Placostylus krefftii" [sic, misspelled] and is "(Ex Auct.)"; the locality on Kennard's label "New Caledonia" is clearly in error. It is therefore more likely that the specimen presented by Cox was truly part of the type series; those from the Kennard collection may have been collected at a later

stage, for which the genus name *Placostylus* on the taxon label written by Cox (Fig. 14ii) is an indication.

Current systematic position. Bothriembryontidae, *Placocharis kreftii* (Cox, 1872).

***Bulimus leeuwinensis* E.A. Smith, 1894**
http://species-id.net/wiki/Bulimus_leeuwinensis
Figs 3C–E, 3ii

Bulimus leeuwinensis E.A. Smith 1894: 94, pl. 7 fig. 27; B.J. Smith 1992: 105.
Bothriembryon (*Bothriembryon*) *leeuwinensis* (Smith); Breure 1978: 206 (lectotype designation); Breure 1979: 94.

Type locality. "Cape Leeuwin, S.W. Australia".

Label. "Cape Leeuwin, S.W. Australia".

Dimensions. "Longit. 27 mm.; diam. 12.5 mm."; lectotype H 27, D 13.7, W 5.4.

Type material. NHMUK 1891.11.21.128, lectotype; 1891.11.21.129–132, four paralectotypes, J.J. Walker leg.

Current systematic position. Bothriembryontidae, *Bothriembryon leeuwinensis* (E.A. Smith, 1894).

***Bulimus longulus* 'Behn' Pfeiffer, 1859**
http://species-id.net/wiki/Bulimus_longulus
Figs 17A–B, 17i

Bulimus longulus 'Behn' Pfeiffer 1859a: 44.
Bahiensis longulus (Pfeiffer); Simone 2006: 169, fig. 590.

Type locality. [Brazil] "Chicatas Brasiliae".

Label. "Brazils". M.C. label style III.

Dimensions. "Long. 30, diam. 7 1/2 mill."; specimen figured herein H 29.8, D 7.23, W 11.2.

Type material. NHMUK 20110388, syntype (Cuming coll.).

Remarks. Pfeiffer (1859) stated that the material was in "Mus. Cuming". The specimens found are not accompanied by a taxon label in Pfeiffer's handwriting, but their type status is not disputed. Simone (2006) listed the specimen as lectotype, but we are unaware of a previous lectotype designation for this taxon. His listing does not fulfill the requirements of ICZN Art. 74.7, and therefore the specimen is regarded as a syntype. The registration number quoted by him was incorrect. The type locality has not been found using modern gazetteers.

Current systematic position. Odontostomidae, *Bahiensis longulus* (Pfeiffer, 1859).

***Bulimus macgillivrayi* Pfeiffer, 1855**
http://species-id.net/wiki/Bulimus_macgillivrayi
Figs 14B, 14v

Bulimus macgillivrayi Pfeiffer 1855b: 108, pl. 32 fig. 2.
Placostylus (*Placocharis*) *macgillivrayi* (Pfeiffer); Breure & Schouten 1985: 63 (lectotype designation).
Placocharis macgillivrayi (Pfeiffer); Delsaerdt 2010: 61, pl. 10 figs 9–11.

Type locality. "Wanderer Bay, Guadalcanar, Salomon's Islands (*Macgillivray*)".

Label. "Wanderer Bay, Guadal- / canar, Solomon's Islds (Macgillivray)". M.C. label style III.

Dimensions. "Long. 59, diam. 22 mill."; lectotype H 58.5, D 24.2, W 5.4.

Type material. NHMUK 1975232, lectotype, and two paralectotypes, Macgillivray leg. (Cuming coll.).

Current systematic position. Bothriembryontidae, *Placocharis macgillivrayi* (Pfeiffer, 1855).

***Pupa spixii major* d'Orbigny, 1837**
http://species-id.net/wiki/Pupa_spixii_major
Figs 22A–E, 22i

Helix spixii var. *major* d'Orbigny 1835: 21 [nomen nudum].
Pupa spixii var. α *major* d'Orbigny 1837 [1834–1847]: 320.
Pupa spixii (d'Orbigny); Gray 1854: 23 [partim].
Spixia striata (Spix); Breure 1976: 1158 [partim].

Type locality. "...pays habité par les Guarayos, au sein des forêts humides des frontiers nord de la province de Chiquitos (république de Bolivia), et dans la province de Corrientes (république Argentine), en un bois voisin de la rivière de Santa-Lucia, au lieu dit "Pasto reito""; see Breure 1973: 122.

Label. Two labels, "guarayos" and "corrientes, Rep. Argentina", both in d'Orbigny's handwriting.

Dimensions. "Long. var. A, 35 millim., (...) Lat. var. A, 12 millim."; lectotype H 34.8, D 11, W 10.6.

Type material. NHMUK 1854.12.4.232, lectotype, matching best the original shell height; NHMUK 1854.12.4.232, six paralectotypes (d'Orbigny coll.).

Remarks. In d'Orbigny (1835) only the name of this taxon is mentioned, together with a locality, thus it was invalidly published. The first valid publication is in d'Orbigny 1837 [1834–1847], where only a brief description was given but no figures of the ventral view of the shell (only a side view of a living snail). There is no explicit mentioning of "var. *major*" on the label, as d'Orbigny has done with

varieties of other taxa; the only link are the localities quoted in his original paper. This taxon is here figured for the first time. As the lots referring to *Pupa spixii* refer to two taxa, a lectotype is here designated for each (design. n.); see also *minor* d'Orbigny.

Current systematic position. Odontotomidae, *Spixia striata* (Spix, 1827).

***Bulimus miltocheilus* Reeve, 1848**
http://species-id.net/wiki/Bulimus_miltocheilus
Figs 10C, 10iii

Bulimus miltocheilus Reeve 1848 [1848–1850]: pl. 49 fig. 322; Breure & Schouten 1985: 70.
Aspastus miltocheilus (Reeve); Delsaerdt 2010: 21 (lectotype designation).

Type locality. [Solomon Islands] "San Christoval, southeastern island of Solomon's Group, northeast coast of New Holland". Restricted to [Makira] "Kirakira (Wainoni-Bay)" by Rensch and Rensch (1935: 72).

Label. "San Cristoval, Solomon Is.". M.C. label style IV.

Dimensions. Not given. Specimen figured herein H 68.3, D 25.0, W 6.0.

Type material. NHMUK 20070072, two paralectotypes (Cuming coll.).

Remarks. Delsaerdt (2010) has selected Reeve's original figure as the lectotype.

Current systematic position. Bothriembryontidae, *Aspastus miltocheilus* (Reeve, 1848).

***Pupa spixii minor* d'Orbigny, 1837**
http://species-id.net/wiki/Pupa_spixii_minor
Figs 21A–F, 21i

Helix spixii var. *minor* d'Orbigny 1835: 21 [nomen nudum].
Pupa spixii var. β *minor* d'Orbigny 1837 [1834–1847]: 320.
Pupa spixii (d'Orbigny); Gray 1854: 23 [partim].
Spixia striata (Spix); Breure 1976: 1158 [partim].

Type locality. [Bolivia] "province de Chiquitos, entre Santo-Corazon et San-Juan"; see Breure 1973: 123.

Label. "chiquitos, Bolivia"; in d'Orbigny's handwriting.

Dimensions. "Long. (...) var. B, 30 millim. Lat. (...) var. B, 7 millim."; lectotype H 29.2, D 7.46, W 11.1.

Type material. NHMUK 1854.12.4.231, lectotype and seven paralectotypes.

Remarks. In d'Orbigny (1835) only the name of this taxon is mentioned, together with a locality, thus it was invalidly published. One specimen, which most closely matches the original shell height, is here designated as the lectotype. As the lots refer-

ring to *Pupa spixii* refer to two taxa, a lectotype is here designated for each (design. n.); see also *major* d'Orbigny. This taxon is here figured for the first time.

Current systematic position. Odontostomidae, *Cyclodontina minor* (d'Orbigny, 1837).

***Bulimus necouensis* Gassies, 1871**
http://species-id.net/wiki/Bulimus_necouensis
Figs 8I, 8iv

Bulimus necouensis Gassies 1871: 191; Neubert et al. 2009: 68, fig. 75.

Type locality. [New Caledonia] "Nécoué, Baie Lebris (Nouvelle-Calédonie)".

Label. No locality information on the label, which gives the taxon name as "*Bulimus Nekouensis*". A second label states "New Caledonia" but this is likely to have been added after the receipt of the material.

Dimensions. "Long. 77 mill.; diam. maj. 33 mill."; holotype H 73.9, D 33.6, W 6.5.

Type material. NHMUK 1883.11.10.1175, holotype, E. Marie leg. (ex Gassies).

Remarks. The specimen is marked "T" above the aperture on the last whorl. Neubert et al. (2009) have clarified the type status of this specimen and the taxonomic status of the taxon.

Current systematic position. Bothriembryontidae, *Placostylus fibratus alexander* (Crosse, 1855).

***Bulimus neglectus* Pfeiffer, 1847**
http://species-id.net/wiki/Bulimus_neglectus
Figs 18H–I, 18i

Bulimus neglectus Pfeiffer 1847: 67.
Clessinia neglecta (Pfeiffer); Breure & Schouten 1985: 10 (lectotype designation); Simone 2006: 164, fig. 564.

Type locality. [Brazil] "Brasilia".

Label. "Brazils", taxon label in Pfeiffer's handwriting. M.C. label style I.

Dimensions. "Long 19, diam. 6 mill."; lectotype H 16.8, D 5.18, W 8.2.

Type material. NHMUK 1975263, lectotype and one paralectotype (Cuming coll.).

Remarks. A note accompanies the material stating "types / var. designation not Pfeiffer's". However, the label on the back of the cardbox has Pfeiffer's handwriting, and the type status of these specimens is not disputed here. Simone (2006) incorrectly gave the size of the lectotype as 21 mm height. This species is tentatively classified with *Bahiensis*, a group awaiting a generic level revision.

Current systematic position. Odontostomidae, *Bahiensis neglecta* (Pfeiffer, 1847).

Buliminus nuptialis **Melvill and Ponsonby, 1894**
http://species-id.net/wiki/Buliminus_nuptialis
Figs 6D–F, 6iii

Buliminus nuptialis Melvill and Ponsonby 1894: 92, pl. 1 fig. 5.
Prestonella nuptialis (Melvill and Ponsonby); Herbert 2007: 11, fig. 12–13.

Type locality. [South Africa, Eastern Cape] "Craigie Burn, Somerset East (*Mrs. Mary Layard Barber*)".

Label. "Craigie Burn, Somerset / East, S. Africa".

Dimensions. "Long. 15, lat. 8.50 mill."; holotype H 14.6, D 9.82, W 4.4.

Type material. NHMUK 1905.1.26.29, holotype, Mrs. Mary Layard Barber (née Bowker) (ex E.L. Layard ex Ponsonby).

Remarks. The data on the collector and the way this specimen has found its way to the NHMUK collection have been taken from Herbert (2007). The size of the specimen was erroneously given as "length 11.5 mm".

Current systematic position. Bothriembryontidae, *Prestonella nuptialis* (Melvill and Ponsonby, 1894).

Bulimus oblitus **Reeve, 1848**
http://species-id.net/wiki/Bulimus_oblitus
Figs 18F–G, 18ii

Bulimus oblitus Reeve 1848 [1848–1850]: pl. 56 fig. 376.
Clessinia oblita (Reeve); Breure & Schouten 1985: 10 (lectotype designation); Simone 2006: 164, fig. 565.

Type locality. "Brazil".

Label. "Brazil". M.C. label style III.

Dimensions. Not given. Lectotype H 20.9, D 6.27, W 9.2+.

Type material. NHMUK 1975254, lectotype and two paralectotypes (Cuming coll.).

Remarks. This species is tentatively classified with *Bahiensis*, awaiting a revision at generic level of this group. *Bulimus oblitus* is now considered a junior subjective synonym of *Bahiensis neglecta* (Pfeiffer, 1847) (synon.n.).

Current systematic position. Odontostomidae, *Bahiensis neglecta* (Pfeiffer, 1847).

Bulimus occultus **Reeve, 1849**
http://species-id.net/wiki/Bulimus_occultus
Figs 17C–D, 17ii

Bulimus occultus Reeve 1849 [1848–1850]: pl. 83 fig. 617.

Cyclodontina (*Bahiensis*) *occultus* (Reeve); Breure & Schouten 1985: 7, pl. 1 fig. 3 (lectotype designation).
Bahiensis occultus (Reeve); Simone 2006: 169, fig. 592.

Type locality. "Brazil".
Label. "Brazil". M.C. label style III.
Dimensions. Not given. Lectotype H 23.6, D 5.8, W 9.0.
Type material. NHMUK 1975258, lectotype (Cuming coll.).
Remarks. See also the discussion under *Bulimus parallelus* Pfeiffer, 1857.
Current systematic position. Odontostomidae, *Bahiensis occultus* (Reeve, 1849).

***Bulimus ochrostoma* Garrett, 1872**
http://species-id.net/wiki/Bulimus_ochrostoma
Figs 13B, 13iii

Bulimus ochrostoma Garrett 1872: 232, pl. 18 fig. 3.

Type locality. [Fiji, Taviuni Island] "Tavinni [sic] Island, Viti Islands".
Label. "Taviuni, Viti".
Dimensions. "Length 29 mill., diam. 16 mill."; specimen figured herein H 35.8, D 18.3, W 4.7.
Type material. NHMUK 20030803, two probable syntypes (ex Taylor ex Garrett).
Remarks. Garrett's original description mentioned that types were in the author's collection and in the ANSP. The specimens originate from Garrett and were probably part of the original series.
Current systematic position. Bothriembryontidae, *Callistocharis ochrostoma* (Garrett, 1872).

***Bulimus odontostoma* Sowerby I, 1824**
http://species-id.net/wiki/Bulimus_odontostoma
Figs 24A–D, 24i

Bulimus odontostoma Sowerby I 1824: 59, pl. 5 fig. 3.

Type locality. [Brazil] "Rio de Janeiro".
Label. "Brazil", in a later hand. M.C. label style IV.
Dimensions. "Axis 1 4/10, diam. 4/10 unc. [H 35.6, D 10.16 mm]"; specimen figured herein H 37.1, D 12.8, W 6.2.
Type material. NHMUK 20100632, two possible syntypes (Cuming coll.).

Remarks. According to Sowerby, he had seen "A few specimens...". Since it is not unlikely that Sowerby made use of the Cuming collection to describe species (Petit 2009), the specimens are considered possible syntpes.

Current systematic position. Odontostomidae, *Odontostomus gargantua* (Férussac, 1821).

***Bulimus ouensis* Gassies, 1870**
http://species-id.net/wiki/Bulimus_ouensis
Figs 7D, 7iv

Bulimus ouensis Gassies 1870: 142.
Placostylus (*Placostylus*) *fibratus* (Martyn); Breure & Schouten 1985: 60.
Placostylus fibratus fibratus (Martyn); Neubert et al. 2009: 50, fig. 10.

Type locality. "Insula Ouen, Novae Caledoniae".

Label. Only a taxon label is present, with the name written in Gassies' handwriting and marked "T".

Dimensions. "Long. 86, diam. maj. 41 mill."; holotype H 83.7, D 40.7, W 7.3.

Type material. NHMUK 1883.11.10.1176, holotype (ex Gassies).

Remarks. The specimen is marked "T" on the last whorl beside the aperture. Gassies (1870) mentioned that he had seen only one specimen.

Current systematic position. Bothriembryontidae, *Placostylus fibratus fibratus* (Martyn, 1784).

***Bulimus parallelus* Pfeiffer, 1857**
http://species-id.net/wiki/Bulimus_parallelus
Figs 17E–F, 17iii

Bulimus parallelus Pfeiffer 1857: 389; Breure & Schouten 1985: 7 (lectotype designation).
Moricandia parallela (Pfeiffer); Simone 2006: 172, fig. 606.

Type locality. "St. Catherine's, Brazil".

Label. "St. Catherines Brazil", taxon label in Pfeiffer's handwriting. M.C. label style III.

Dimensions. "Long. 22, diam. 7 mill."; lectotype H 22.5, D 7.17, W 7.3.

Type material. NHMUK 1975256, lectotype and one paralectotype (Cuming coll.).

Remarks. Simone (2006) has revalidated this taxon as a separate species, removing it from the synonymy of *Bahiensis occultus* (Reeve, 1849) (See also Pisbry 1901 [1901–1902]: 48), and placing it in the genus *Moricandia* Pilsbry and Vanatta, 1898. Pfeiffer's type is somewhat stouter, but has the same characteristic brown

blotch behind the lip. Tentatively, the synonymy with *Bulimus occultus* Reeve, 1849 is here retained.

Current systematic position. Odontostomidae, *Bahiensis occultus* (Reeve, 1849).

Helix patagonica **d'Orbigny, 1835**

http://species-id.net/wiki/Helix_patagonica
Figs 25E–G, 25ii

Helix patagonica d'Orbigny 1835: 22.
Bulimus patagonicus d'Orbigny 1837 [1834–1847]: 321, pl. 41 figs 17–18.
Plagiodontes patagonicus (d'Orbigny); Breure 1976: 1159, pl. 5 fig. 4, pl. 10 fig. 4 (lectotype designation).

Type locality. [Argentina] "Patagonia".

Label. "baie blanche [Bahia Blanca], Patagonia", in d'Orbigny's handwriting.

Dimensions. "Longit. 22 1/2 millim., latit. 11 millim."; specimen figured herein H 22.3, D 11.2, W 7.5.

Type material. NHMUK 1854.12.4.235, five paralectotypes (d'Orbigny coll.).

Remarks. The lectotype is in the MNHN collection (Breure 1976).

Current systematic position. Odontostomidae, *Plagiodontes patagonica* (d'Orbigny, 1835).

Bulimus physoides **Reeve, 1849**

http://species-id.net/wiki/Bulimus_physoides
Figs 2H–I, 2iv

Bulimus physoides Reeve 1849 [1848–1850]: pl. 70 fig. 507.
Bulimus (*Liparus*) *physoides* Reeve; E.A. Smith 1894: 95, pl. 7 fig. 30.

Type locality. "—?".

Label. "W. Australia", taxon label in Pfeiffer's handwriting. M.C. label style III.

Dimensions. Not given. Specimen figured herein H 19.2, D 11.22, W 5.0.

Type material. NHMUK 1975224–1975225, three possible syntypes (Cuming coll.).

Remarks. Reeve (legend to pl. 70: "Mus. Pfeiffer") evidently based his description on material from Pfeiffer, who referred to "*physodes* (Menke mss.)"; this species was published as such by Menke (1843: 7), and Reeve's name is therefore probably an emendation of Menke's name. However, as Menke's material is presumably lost (B.J. Smith 1992: 105), these specimens are interesting, since they may have originated via Pfeiffer from Menke's collection.

Current systematic position. Bothriembryontidae, *Bothriembryon melo* (Quoy and Gaimard, 1832).

***Bulimus pinicola* Gassies, 1870**
http://species-id.net/wiki/Bulimus_pinicola
Figs 8D, 8ii

Bulimus pinicola Gassies 1870: 142.
Placostylus (*Placostylus*) *fibratus* (Martyn); Breure & Schouten 1985: 60.
Placostylus fibratus guestieri (Gassies); Neubert et al. 2009: 55, fig. 21.

Type locality. "Insula Pinorum, Novae Caledoniae".

Label. Only a taxon label "Bulimus pinicula" in Gassies handwriting, marked "T".

Dimensions. "Long. 90, diam. maj. 44 mill."; specimen figured herein H 92.8, D 44.3, W 6.7.

Type material. NHMUK 1883.11.10.1164, one syntype (ex Gassies).

Remarks. Marked "T" on last whorl besides aperture. Gassies (1870) stated that he had seen three specimens.

Current systematic position. Bothriembryontidae, *Placostylus fibratus guestieri* (Gassies, 1869).

***Placostylus ambagiosus priscus* Powell, 1938**
http://species-id.net/wiki/Placostylus_ambagiosus_priscus
Fig. 12D

Placostylus ambagiosus priscus Powell 1938: 149, pl. 34 figs 9–10.

Type locality. [New Zealand, North Island] "about three quarters of a mile east of the extreme north-western headland [Cape Maria van Diemen]".

Label. "Cape Maria van Diemen (mainland)"

Dimensions. "Height, 77 mm.; breadth, 31 mm."; specimen figured herein H 70.3, D 28.5, W 6.5.

Type material. NHMUK 1939.3.17.18, one paratype (ex Powell).

Remarks. The holotype of this subspecies, which is supposedly of Pleistocene age, is in the Auckland Museum. Buckley et al. (2011) have revised the New Zealand *Placostylus* and showed that this taxon falls within the overall variation of *P. ambagiosus* Suter, 1906.

Current systematic position. Bothriembryontidae, *Placostylus ambagiosus* Suter, 1906.

***Bulinus punctulifer* Sowerby I, 1833**
http://species-id.net/wiki/Bulinus_punctulifer
Figs 5A–B, 5i

Bulinus punctulifer Sowerby I 1833 [1833–1838]: 36.
Plectostylus punctulifer (Sowerby); Breure 1979: 90.

Type locality. "Chili, Questa Prado [Cuesta Lo Prado]".

Label. "Chili". M.C. label style IV.

Dimensions. "long. 1.5, lat. 0.75 poll. [H 38.0, D 19.0 mm]"; specimen figured herein H 46.5, D 21.7, W 5.3.

Type material. NHMUK 1975171, eight syntypes (Cuming coll.).

Remarks. The dimensions of the specimen figured herein have been taken from the largest specimen found in the lot.

Current systematic position. Bothriembryontidae, *Plectostylus punctulifer* (Sowerby I, 1833).

***Bulimus pyrostomus* Pfeiffer, 1860**
http://species-id.net/wiki/Bulimus_pyrostomus
Figs 15C, 15iii

Bulimus pyrostomus Pfeiffer 1860: 137; Breure & Schouten 1985: 59, 72.
Placostylus (*Santacharis*) *salomonis* (Pfeiffer); Solem 1959: 132, pl. 8 fig. 5 (lectotype designation).
Santacharis salomonis (Pfeiffer); Delsaerdt 2010: 76, pl. 12 figs 13–14.

Type locality. [Vanuatu, Erromanga] "Erumanga, New Hebrides".

Label. "Isle of Eurymanga, New Hebrides", taxon label in Pfeiffer's handwriting. M.C. label style III.

Dimensions. "Long. 42, diam. 19 mill."; lectotype H 41.5, D 22.0, W 5.3.

Type material. NHMUK 1975235, lectotype and two paralectotypes (Cuming coll.).

Remarks. According to Solem (1959) the "holotype of *pyrostomus* is more slender than most of the specimens seen, but it is not too atypical. The holotype of *salomonis* could not be located in the British Museum". Solem based his comments on a photograph of the type and was possibly unaware of the existence of two additional specimens. His "holotype of *pyrostomus*" is here interpreted as a lectotype designation (Art. 74.6 ICZN), overruling the subsequent designation by Breure and Schouten (1985: 59). See also under *Bulimus salomonis*.

Current systematic position. Bothriembryontidae, *Santacharis salomonis* (Pfeiffer, 1853).

***Prestonella quadingensis* Connolly, 1929**
http://species-id.net/wiki/Prestonella_quadingensis
Figs 6G–I, 6ii

Prestonella quadingensis Connolly 1929: 233, pl. 14 fig. 25; Herbert 2007: 13 figs 14–16.

Type locality. [Lesotho, Quthing] "Basutoland, Quading".

Label. "Quading".

Dimensions. "Long. 12.3, lat. 7.3 mm"; specimen figured herein H 11.42, D 7.85, W 4.2.

Type material. NHMUK 1937.12.30.7079–7080, two paratypes, E. Ford leg.

Remarks. See Herbert (2007) for a discussion on the taxonomic status of this species.

Current systematic position. Bothriembryontidae, *Prestonella quadingensis* Connolly, 1929.

***Bulimus* (*Tomigerus*) *ramagei* E.A. Smith, 1890**
http://species-id.net/wiki/Bulimus_ramagei
Figs 20A–B, 20i

Bulimus (*Tomigerus*) *ramagei* E.A. Smith 1890: 500, pl. 30 fig. 8.
Bonnanius ramagei (Smith); Simone 2006: 178, fig. 638.

Type locality. [Brazil, Fernando Noronha] "Tobacco Point".

Label. "Fernando Noronha".

Dimensions. "Longit. 23 1/2 millim., diam. 16. / longit. 17 1/2 millim, diam. 12 1/2"; lectotype H 17.5, D 12.9, W 4.5.

Type material. NHMUK 1888.6.27.163, lectotype; 1888.6.27.164–170, seven paralectotypes.

Remarks. The specimen figured by E.A. Smith corresponds to the smallest specimen measured by him; this specimen is here selected lectotype (design.n.).

Current systematic position. Odontostomidae, *Bonnanius ramagei* (E.A. Smith, 1890).

***Succinea reflexa* Pfeiffer, 1842**
http://species-id.net/wiki/Succinea_reflexa
Figs 5E–F, 5ii

Succinea reflexa Pfeiffer 1842: 56.
Plectostylus reflexus (Pfeiffer); Breure 1978: 202 (lectotype designation).

Type locality. "Pichidanque prope Coquimbo, Chile".

Label. "Pichidanque near / Coquimbo, Chili". M.C. label style IV.

Dimensions. "Long. 39, diam. 17 mill."; lectotype H 36.9, D 15.5, W 5.3.

Type material. NHMUK 1975358, lectotype; 1975359, three paralectotypes (Cuming coll.).

Remarks. The original label states "found on the leaves / of Pourretia Coarctata" [= *Puya chilensis* (Molina, 1782)]. This taxon is now considered a junior subjective synonym of *Bulinus broderipii* Sowerby I, 1832 (F. Cádiz, unpublished data).

Current systematic position. Bothriembryontidae, *Plectostylus broderipii* (Sowerby I, 1832) (synon. n.).

***Helix rhodinostoma* d'Orbigny, 1835**
http://species-id.net/wiki/Helix_rhodinostoma
Figs 18C–E, 18iv

Helix rhodinostama [sic] d'Orbigny 1835: 20.
Bulimus rhodinostoma d'Orbigny 1837 [1834–1847]: 317, pl. 41 figs 6–8.
Bahiensis rhodinostomus (d'Orbigny); Simone 2006: 170, fig. 595.

Type locality. [Brazil] "in imperio Brasiliano".

Label. "Brésil", in d"Orbigny"s handwriting.

Dimensions. "Longit. 21 millim., diam. 7 millim."; lectotype H 21.7, D 7.25, W 8.1.

Type material. NHMUK 1854.12.4.139, lectotype (d'Orbigny coll.).

Remarks. The material consists of one specimen, corresponding to the figure in d'Orbigny 1837 [1834–1847]; it is here desingated lectotype (design.n.) as d'Orbigny did not state on how many specimens his description was based. Although d'Orbigny (1835) published this taxon as *Helix rhodinostama*, and this was not corrected by him in the same work, the prevailing usage of *rhodinostoma* makes this a justified emendation (Art. 33.2.3.1 ICZN).

Current systematic position. Odontostomidae, *Bahiensis rhodinostoma* (d'Orbigny, 1835).

***Bulimus rhodostomus* J.E. Gray, 1834**
http://species-id.net/wiki/Bulimus_rhodostomus
Figs 3F–G, 3iv

Bulimus rhodostomus J.E. Gray 1834: 65; B.J. Smith 1992: 106.
Bothriembryon (*Bothriembryon*) *rhodostomus* (J.E. Gray); Breure 1978: 207 (lectotype designation); Breure 1979: 95.

Type locality. [Australia] "Novâ Hollandiâ?"; see Remarks.

Label. "Australia", probably written by a later hand.

Dimensions. "Axis 1 1/4, diam. 3/4 unc. [H 31.75, D 19.05 mm]"; lectotype H 31.1, D 18.0, W 5.4.

Type material. NHMUK 1874.10.28.1, lectotype; 1975222, one paralectotype (ex Gray).

Remarks. Iredale (1939: 19) has restricted the type locality to Western Australia, Goose Island.

Current systematic position. Bothriembryontidae, *Bothriembryon rhodostomus* (J.E. Gray, 1834).

***Bulimus* (*Bulimulus*) *ridleyi* E.A. Smith, 1890**
http://species-id.net/wiki/Bulimus_ridleyi
Figs 20A–B, 20i

Bulimus (*Bulimulus*) *ridleyi* E.A. Smith 1890: 501, pl. 30 fig. 9.
Hyperaulax ridleyi (E.A. Smith); Simone 2006: 178, fig. 637.

Type locality. [Brazil, Fernando Noronha] "on the north side of the island; also found at the base of the Peak, north side, (...) and on Rat Island".

Label. "Fernando Noronha".

Dimensions. "Longit. 12 millim., diam. 6"; lectotype H 11.46, D 5.9, W 5.3.

Type material. NHMUK 1888.6.27.106, lectotype; 1888.6.27.107-110, four paralectotypes.

Remarks. The specimen figured by E.A. Smith is here desingated lectotype (**design.n.**). The four paralectotypes are glued onto paper.

Current systematic position. Odontostomidae, *Hyperaulax ridleyi* (E.A. Smith, 1890).

***Partula salomonis* Pfeiffer, 1853**
http://species-id.net/wiki/Partula_salomonis
Figs 15B, 15ii

Partula salomonis Pfeiffer 1853b: 446; Pfeiffer 1856, in Küster & Pfeiffer 1840–1865: 276, pl. 66 figs 10-11.
Placostylus (*Santacharis*) *salomonis* (Pfeiffer); Breure & Schouten 1985: 59 (lectotype designation).
Santacharis salomonis (Pfeiffer); Delsaerdt 2010: 76, pl. 12 figs 13-14.

Type locality. "in insulis Salomonis" (see remarks).

Label. "Solomon Ils" (badly faded). M.C. label style III.

Dimensions. "Long. 34, diam. 15 mill."; lectotype H 33.6, D 19.6, W 6.0.

Type material. NHMUK 1975234, lectotype (Cuming coll.).

Remarks. The specimen, which corresponds to the original measurements and which has been figured by Pfeiffer (1856), was designated lectotype by Breure and Schouten 1985. Dohrn (1862: 213) was the first to recognize the synonymy between *Partula salomonis* Pfeiffer, 1853 and *Bulimus pyrostomus* Pfeiffer, 1860, despite the erroneous locality given for the former taxon. The species only occurs on the New Hebrides (Solem 1959, Delsaerdt 2010).

Current systematic position. Bothriembryontidae, *Santacharis salomonis* (Pfeiffer, 1853).

***Bulimus sanchristovalensis* Cox, 1870**
http://species-id.net/wiki/Bulimus_sanchristovalensis
Figs 12B, 12ii

Bulimus sanchristovalensis Cox 1870: 172, pl. 16 fig. 7.
Eumecostylus sanchristovalensis (Cox); Delsaerdt 2010: 37, pl. 4 figs 7–10 (lectotype designation).

Type locality. "San Christoval, Solomon Islands".

Label. "Solomon Isls", taxon label in Cox' handwriting.

Dimensions. "Diameter 1.20, length 1.60 (...) inch [H 40.6 D 30.5 mm; erroneous, see Delsaerdt 2010]"; lectotype H 67.7, D 27.6, W 5.4.

Type material. NHMUK 1880.12.11.44, lectotype; 1880.12.11.45, one paralectotype, 20070069, five paralectotypes.

Remarks. In addition, two further specimens are present; of which one is a probable paralectotype (1880.12.11.2) and the other (1877.7.23.23) is non-type material; however, as these specimens were previously mounted on the same board (possibly for display), but subsequently removed from the board, there is now no way of telling which specimen is which.

Current systematic position. Bothriembryontidae, *Eumecostylus sanchristovalensis* (Cox, 1870).

***Placostylus savesi* Crosse, 1886**
http://species-id.net/wiki/Placostylus_savesi
Figs 9E, 9v

Placostylus savesi Crosse 1886: 163, pl. 7 figs 3–3a.
Placostylus (*Placostylus*) *savesi* Crosse; Breure & Schouten 1985: 63.
Placostylus eddystonensis savesi Crosse; Neubert et al. 2009: 96, fig. 152.

Type locality. [New Caledonia] "in loco "Pouembou" dicto, Novae Caledoniae".

Label. "Pouembou (N. Cie)", label in Crosse's handwriting glued on dorsal side of shell.

Dimensions. "Longit. 56 millim., diam. maj. 28."; holotype H 57.5, D 30.0, W 6.0.

Type material. NHMUK 1929.9.14.7, holotype (ex Crosse ex Marie).

Remarks. The type status of this specimen has been discussed by Neubert et al. (2009); they concluded that it should be considered the holotype.

Current systematic position. Bothriembryontidae, *Placostylus eddystonensis savesi* Crosse, 1886.

***Bulimus sellersi* Cox, 1872**
http://species-id.net/wiki/Bulimus_sellersi
Figs 10B, 10ii

Bulimus sellersi Cox 1872a: 644, pl. 52 fig. 3.
Aspastus sellersi (Cox); Delsaerdt 2010: 27, pl. 2 figs 15–19 (lectotype designation).

Type locality. "Guadalcanar Island, Solomon Islands".

Label. "Solomon Isls", taxon label "Placostylus / sellersi / Cox" (see remarks).

Dimensions. "Length 1.90, breadth 0.66 of an inch [H 46.3, D 16.8 mm]"; lectotype H 44.4, D 18.9, W 5.5.

Type material. NHMUK 20070067, lectotype; seven paralectotypes (ex Kennard ex Cox).

Remarks. The specimens are accompanied by a second label "B. sellersi / Cox / Austr:", which is possibly the original label of Cox. Furthermore, a third label. presumably made by Kennard, reads "Guadalcanar Cotypes Cox coll.". The measurements of the lectotype as given by Delsaerdt (2010) appear to be erroneous ("The length of the lectotype is 50 mm").

Current systematic position. Bothriembryontidae, *Aspastus sellersi* (Cox, 1872).

***Bulimus singularis* Morelet, 1857**
http://species-id.net/wiki/Bulimus_singularis
Figs 9C, 9iii

Bulimus singularis Morelet 1857: 27; Breure & Schouten 1985: 72.
Placostylus porphyrostomus porphyrostomus (Pfeiffer); Neubert et al. 2009: 79, fig. 101.

Type locality. [New Caledonia] "Portum Galliae, littore occidentali Nova-Caledoniae" [Nouméa].

Label. "Nlle Calédonie" in Morelet`s handwriting.

Dimensions. "Longit. 69, diam. 31 mill."; holotype H 70.0 D 35.2, W 6.5.

Type material. NHMUK 1893.2.4.1530, holotype (Morelet coll.).

Current systematic position. Bothriembryontidae, *Placostylus porphyrostomus porphyrostomus* (Pfeiffer, 1851).

***Bulimus ouveanus sinistrorsa* Crosse, 1884**
http://species-id.net/wiki/Bulimus_ouveanus_sinistrorsa
Figs 8E–F

Bulimus ouveanus sinistrorsa Crosse 1884: 328, pl. 7 figs 3–3a.
Placostylus fibratus ouveanus (Dotzauer in Mousson); Neubert et al. 2009: 74, fig. 97.

Type locality. [New Caledonia] "Lifou, une des îles Loyalty".

Label. No locality; taxon label in Crosse's handwriting.

Dimensions. "Longueur totale de la coquille 47 millimètres, plus grand diamètre 23"; specimen figured herein H 49.2, D 26.0, W 6.2.

Type material. NHMUK 1929.9.14.8, one specimen, E. Marie leg. (Crosse coll.).

Remarks. Crosse described this specimen as monstruosity. Neubert et al. (2009) correctly stated that this taxon name was proposed for a teratological specimen and is thus unavailable under ICZN Art. 1.3.2.

Current systematic position. Bothriembryontidae, *Placostylus fibratus ouveanus* (Dotzauer in Mousson, 1869).

***Bulimus souvillei* Morelet, 1857**
http://species-id.net/wiki/Bulimus_souvillei
Figs 9B, 9ii

Bulimus souvillei Morelet 1857: 26.
Placostylus (*Placostylus*) *souvillei* (Morelet); Breure & Schouten 1985: 63 (lectotype designation).
Placostylus fibratus souvillei (Morelet); Neubert et al. 2009: 63, figs 55–68.

Type locality. [New Caledonia] "ad Sanctam-Mariam de Balade, Novae-Caledoniae ore occidentale" [see remarks].

Label. "Ste Marie de Balade. Nlle Calédonie", in Morelet`s handwriting.

Dimensions. "Longit. 118; diam. maj. 62 mill."; lectotype H 116.5, D 66.5, W 6.8.

Type material. NHMUK 1893.2.4.1529, lectotype (ex Morelet).

Remarks. The type locality is erroneous according to Neubert et al. (2009), "as *f. souvillei* does not live north of the Mt. Humboldt area".

Current systematic position. Bothriembryontidae, *Placostylus fibratus souvillei* (Morelet, 1857).

***Liparus spenceri* Tate, 1894**
http://species-id.net/wiki/Liparus_spenceri
Figs 2J–K, 2v

Liparus spenceri Tate 1894: 192; Tate 1896: 202, pl. 17 fig. 3; B.J. Smith 1992: 107.

Type locality. [Northern Territory, near Alice Springs] "Glen of Palms by the junction with Palm Creek" (Tate 1896: 202).

Label. "Glen of Palms", presumably in Tate's handwriting.

Dimensions. "Length, 20; width 12.5 (...) mm"; specimen figured herein H 17.5, D 12.2, W 4.4.

Type material. NHMUK 1895.10.1.202–207, six paratypes (ex W.A. Horn).

Remarks. This material was collected during the Horn Scientific Expedition to Central Australia (1894). Three of the specimens are subadult or juvenile. Further type material is present in the South Australia Museum in Adelaide (Breure and Whisson in press).

Current systematic position. Bothriembryontidae, *Bothriembryon spenceri* (Tate, 1894).

***Bulimus strangei* Pfeiffer, 1855**
http://species-id.net/wiki/Bulimus_strangei
Figs 14D, 14iv

Bulimus strangei Pfeiffer 1855a: 8.
Placocharis strangei (Pfeiffer); Delsaerdt 2010: 73, pl. 12 figs 5–9 (lectotype designation).

Type locality. [Solomon Islands, Simbo] "Eddystone Island, Australian Seas".

Label. "Eddystone Isld / Australian Seas". M.C. label style III.

Dimensions. "Long. 46, diam. 17 mill."; lectotype H 45.9, D 20.7, W 5.4.

Type material. NHMUK 20100652, lectotype and two paralectotypes (Cuming coll.).

Remarks. Delsaerdt (2010) selected Pfeiffer's figure (1856 in Küster & Pfeiffer 1840–1865: pl. 16 figs 11–12) as lectotype. He remarked that the whereabouts of the type are unknown. Three specimens were found in the NHM Mollusca General Collection, which originate from Cuming's collection and have the label in agreement with Pfeiffer's type locality. One of the specimens corresponds to the figure in Delsaerdt representing the lectotype; its measurements fit with Pfeiffer's and it is now considered the lectotype despite the fact that the taxon label is not in Pfeiffer's handwriting.

Current systematic position. Bothriembryontidae, *Placocharis strangei* (Pfeiffer, 1855).

***Placostylus* (*Callistocharis*) *subroseus* Fulton, 1915**
http://species-id.net/wiki/Placostylus_subroseus
Figs 13C, 13ii

Placostylus (*Callistocharis*) *subroseus* Fulton 1915: 242, fig; Breure & Schouten 1985: 73.

Type locality. [Fiji] "Viti Islands".
Label. "Viti Ids".
Dimensions. "Alt. 44, diam. maj. 20 mm."; holotype H 43.8, D 20.9, W 5.2.
Type material. NHMUK 1919.12.31.50, holotype (ex Fulton).
Current systematic position. Bothriembryontidae, *Callistocharis subroseus* (Fulton, 1915).

***Bulimus superfasciatus* Gassies, 1871**
http://species-id.net/wiki/Bulimus_superfasciatus
Figs 7C, 7iii

Bulimus superfasciatus Gassies 1871: 190; Breure & Schouten 1985: 60.
Placostylus fibratus fibratus (Martyn); Neubert et al. 2009: 50, fig. 16

Type locality. [New Caledonia] "Boulari".
Label. No locality given. Taxon label in Gassies' hand, and marked with "T".
Dimensions. "Long. 80 mill.; diam. maj. 37 mill."; specimen figured herein H 77.1, D 39.8, W 5.8.
Type material. NHMUK 1883.11.10.1165, syntype (ex Gassies).
Remarks. The characteristic "T" mark confirms the type status of this specimen.
Current systematic position. Bothriembryontidae, *Placostylus fibratus fibratus* (Martyn, 1784).

***Bulimus tasmanicus* Pfeiffer, 1853**
http://species-id.net/wiki/Bulimus_tasmanicus
Figs 3H–I, 3iii

Bulimus tasmanicus Pfeiffer 1853c: 260; B.J. Smith 1992: 108.

Type locality. [Australia, Tasmania] "Van Diemen's Land" (see remarks).
Label. "Van Diemens / isl.", taxon label in Pfeiffer's handwriting. M.C. label style III.
Dimensions. "Long. 25, diam. 11 mill."; specimen figured herein H 29.3, D 15.1, W 5.4.
Type material. NHMUK 1981204, one syntype (Cuming coll.).

Remarks. The material (two specimens) is accompanied by two labels in Pfeiffer's handwriting. One states "B. Tasmanicus / Pfr. Van Diemens / isl."; this is considered the original label as it is entirely written in Pfeiffer's hand and the specimen is considered to be a syntype. The second label reads "B. Tasmanicus Pfr. var. / Isle of Ianna / New Caledonia"; only the taxon name ("Tasmanicus Pfr. var.") is in Pfeiffer's handwriting and this material is not considered to be a syntype as the locality seems to be erroneous.

Kershaw (1987) has restricted the type locality to Maria Island.

Current systematic position. Bothriembryontidae, *Bothriembryon tasmanicus* (Pfeiffer, 1853).

***Odontostomus* (*Moricandia*) *toleratus* Fulton, 1903**
http://species-id.net/wiki/Odontostomus_toleratus
Figs 23C–D, 23ii

Odontostomus (*Moricandia*) *toleratus* Fulton 1903: 100, pl. 9 fig. 2.
Moricandia tolerata (Fulton); Simone 2006: 172, fig. 607.

Type locality. "Brazil".

Label. "Brazil", in Fulton's handwrting.

Dimensions. "Maj. diam. 9; alt. 32 millim."; holotype H 31.9, D 9.54, W 8.8.

Type material. NHMUK 1903.11.20.34, holotype (ex Fulton).

Remarks. The label indicates "Type".

Current systematic position. Odontostomidae, *Moricandia tolerata* (Fulton, 1903).

***Tomogeres turbinatus* Pfeiffer, 1845**
http://species-id.net/wiki/Tomogeres_turbinatus
Figs 19F, 19ii

Tomogeres turbinatus Pfeiffer 1845a: 45; Pfeiffer in Philippi 1846 [1845–1847]: 131, pl. 8 fig. 13.
Tomigerus (*Tomigerus*) *turbinatus* (Pfeiffer); Breure & Schouten 1985: 24, pl. 1 figs 8–10 (lectotype designation).
Biotocus turbinatus (Pfeiffer); Simone 2006: 178, fig. 634.

Type locality. "In Brasiliâ".

Label. "Brazils". M.C. label style IV.

Dimensions. "Diam. maj. 11 (...) alt. 10 mill."; lectotype H 9.68, D 12.56, W 5.0.

Type material. NHMUK 1973107, lectotype and two paralectotypes (Cuming coll.).

Remarks. The material is not accompanied by a label in Pfeiffer's handwriting. The lectotype corresponds to the figure given by Pfeiffer in Philippi 1846 [1845–1847].

Current systematic position. Odontostomidae, *Biotocus turbinatus* (Pfeiffer, 1845).

***Bulimus turneri* Pfeiffer, 1860**
http://species-id.net/wiki/Bulimus_turneri
Figs 13D, 13v

Bulimus turneri Pfeiffer 1860: 138, pl. 51 fig. 10; Breure & Schouten 1985: 73.
Placostylus (*Poecilocharis*) *turneri* (Pfeiffer); Solem 1959: 137, pl. 8 figs 1–2.

Type locality. [Vanuatu, Erromanga] "Erumanga, New Hebrides".

Label. "Euramanga, New Hebr". M.C. label style III.

Dimensions. "Long. 32, diam. 17 mill."; lectotype H 32.9, D 19.2, W 3.9.

Type material. NHMUK 1975237, lectotype and two paralectotypes, Turner leg. (Cuming coll.).

Remarks. The holotype designation (Solem 1959) has to be interpreted as lectotype designation (Art. 74.6 ICZN). Of the paralectotypes, one is subadult, the other juvenile.

Current systematic position. Bothriembryontidae, *Poecilocharis turneri* (Pfeiffer, 1860).

***Succinea variegata* Pfeiffer, 1842**
http://species-id.net/wiki/Succinea_variegata
Figs 5C–D, 5iii

Succinea variegata Pfeiffer 1842: 56; Pfeiffer 1843: 187.
Plectostylus variegatus (Pfeiffer); Breure 1978: 202, pl. 9 figs 17–18 (lectotype designation).

Type locality. "Chile prov. septembr. (*Bridges*)".

Label. "the valleys north of Coquimbo / found in the crevices of roc[ks]". M.C. label style IV.

Dimensions. "Long. 48, diam. 23 mill."; lectotype H 46.0, D 24.8, W 5.3.

Type material. NHMUK 1975362, lectotype; 1975363, three paralectotypes (Cuming coll.).

Remarks. Pfeiffer's description was read before the Zoological Society of London on 13 December 1842, but appeared in print in 1843. In this paper he gives the exact text as shown on the label. The locality label does not seem to have the taxon name in Pfeiffer's hand; however, there is a second label in his handwriting "B. variegatus / Pfr.". Therefore we do not question the type status of these specimens. This taxon is now considered a junior subjective synonym of *Bulinus broderipii* Sowerby I, 1832 (F. Cádiz, unpublished data).

Current systematic position. Bothriembryontidae, *Plectostylus broderipii* (Sowerby I, 1832) (synon. n.).

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Plates

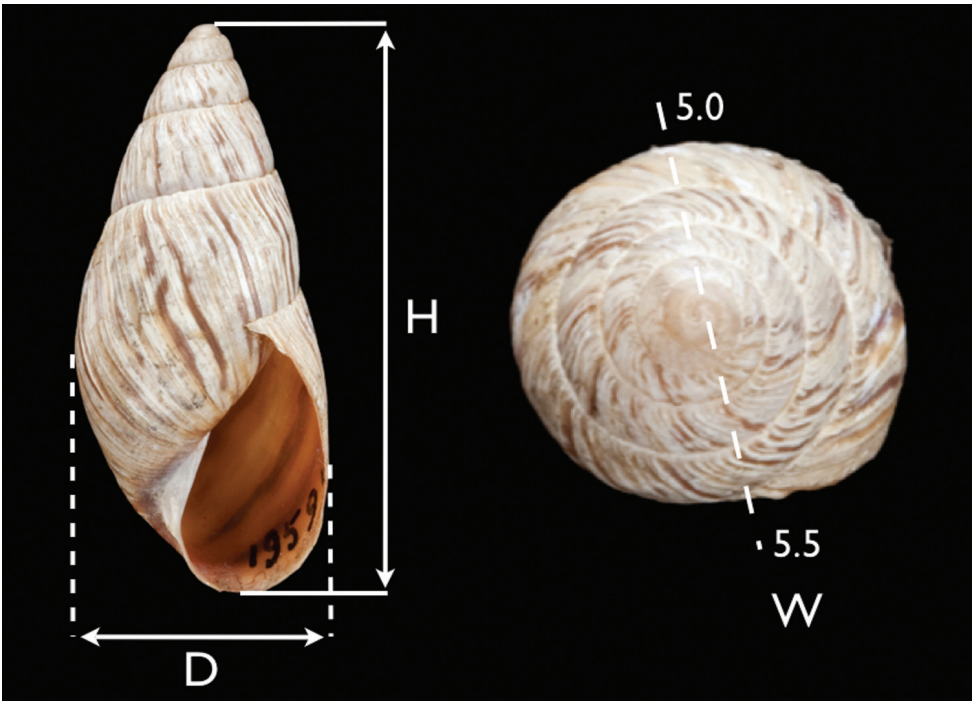

Figure 1. Way the measurements of shell height (H) and diameter (D) have been taken and whorls (W) have been counted.

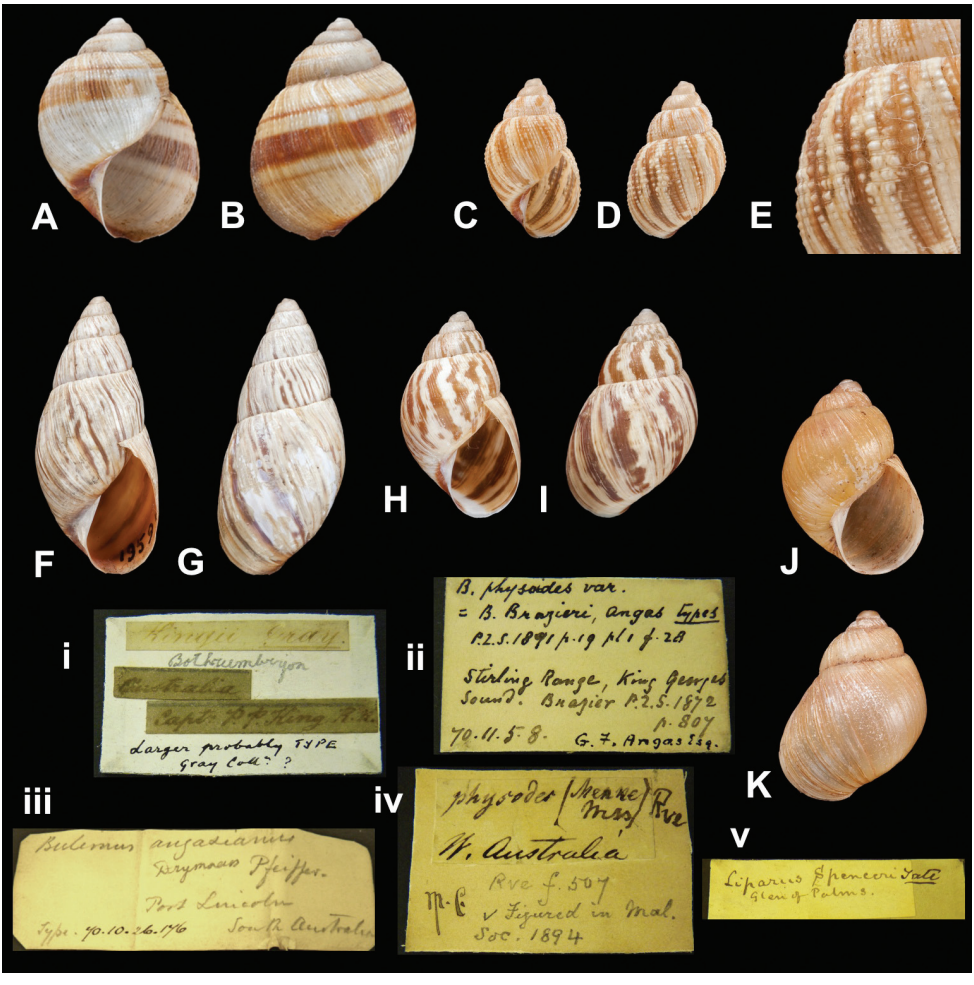

Figure 2. *Bothriembryon* species. **A–B, iii** *B. angasianus* (Pfeiffer, 1864), syntype NHM 1870.10.26.276 (H = 20.6) **C–E, ii** *B. brazieri* (Angas, 1871, lectotype NHM 1870.11.5.8 (H = 14.3) **E** detail of sculpture (× 3.5) **F–G, i** *B. kingii* (J.E. Gray, 1825), lectotype NHM 1975910 (H = 19.1) **H–I, iv** *B. melo* (Quoy and Gaimard, 1832), lectotype of *Bulimus physoides* Reeve, 1848 NHM 1975224 (H = 19.2) **J–K, v** *B. spenceri* (Tate, 1894), syntype NHM 1895.10.2.202 (H = 17.5).

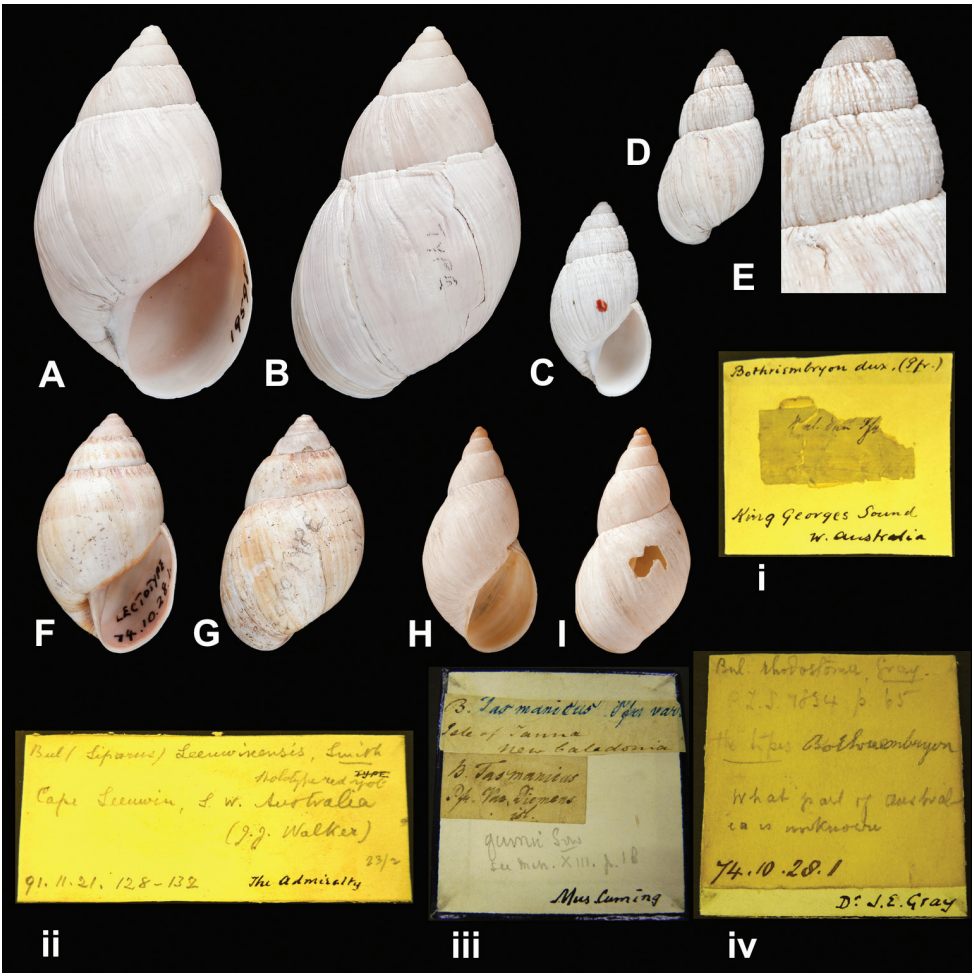

Figure 3. *Bothriembryon* species. **A–B, i** *B. dux* (Pfeiffer, 1861), lectotype NHM 1975598 (H = 48.5) **C–E, ii** *B. leeuwinensis* (E.A. Smith, 1894), lectotype NHM 1881.11.21.128 (H = 27.0); **E** detail of sculpture (× 6) **F–G, iv** *B. rhodostomus* (J.E. Gray, 1834), lectotype NHM 1874.10.28.1 (H = 31.1) **H–I, iii** *B. tasmanicus* (Pfeiffer, 1853), syntype NHM 1981204 (H = 30.1).

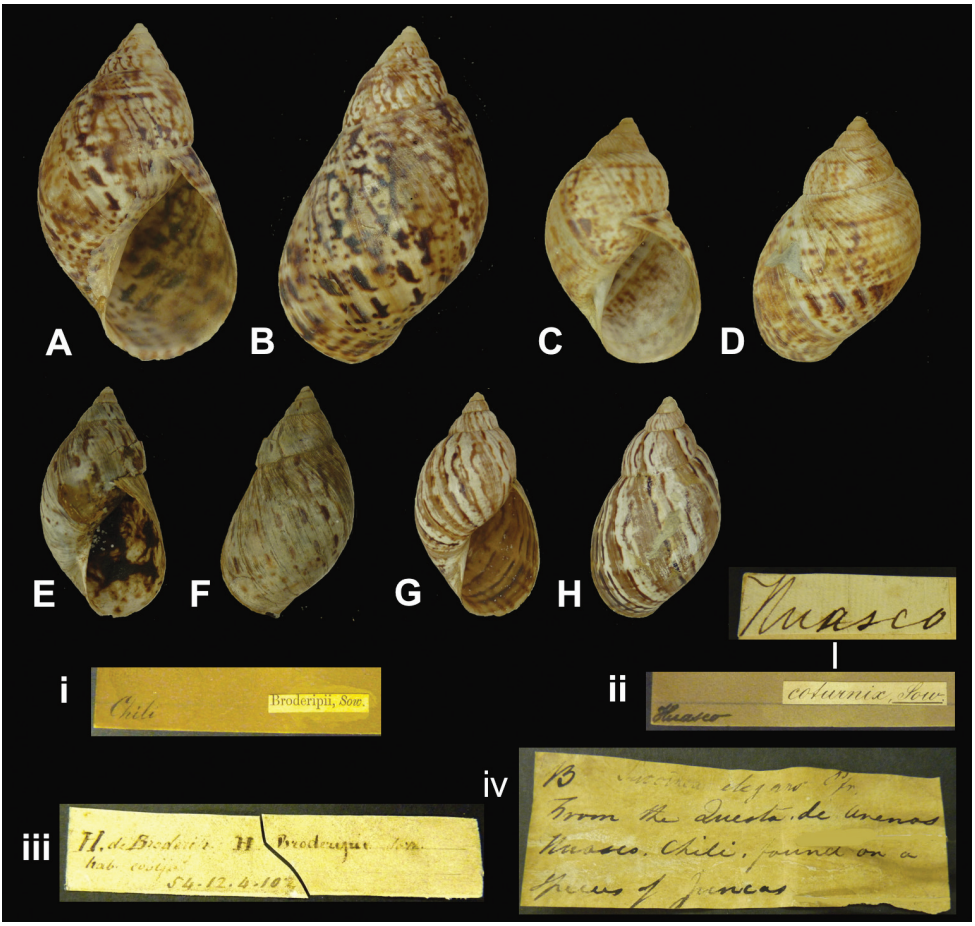

Figure 4. *Plectostylus* species. **A–B, i** *P. broderipii* (Sowerby I, 1832), lectotype NHM 20100655 (H = 44.5) **C–D, ii** *P. coturnix* (Sowerby, 1832), possible syntype NHM 20100620 (H = 32.4) **E–H** *P. broderipii* (Sowerby I, 1832) **E–F, iii** Lectotype of *Bulimus broderipi* var. *elongata* d'Orbigny, 1837 NHM 1854.12.4.102 (H = 30.5) **G–H, iv** Lectotype of *Succinea elegans* Pfeiffer, 1842 NHM 1975360 (H = 30.0).

Figure 5. *Plectostylus* species. **A–B, i** *P. punctulifer* (Sowerby I, 1833), syntype NHM 1975171 (H = 46.5) **C–F** *P. broderipii* (Sowerby I, 1832) **C–D, iii** Lectotype of *Bulimus variegatus* Pfeiffer, 1842 NHM 1975362 (H = 46.0) **E–F, ii** Lectotype of *Bulimus reflexus* Pfeiffer, 1842 NHM 12975358 (H = 36.9).

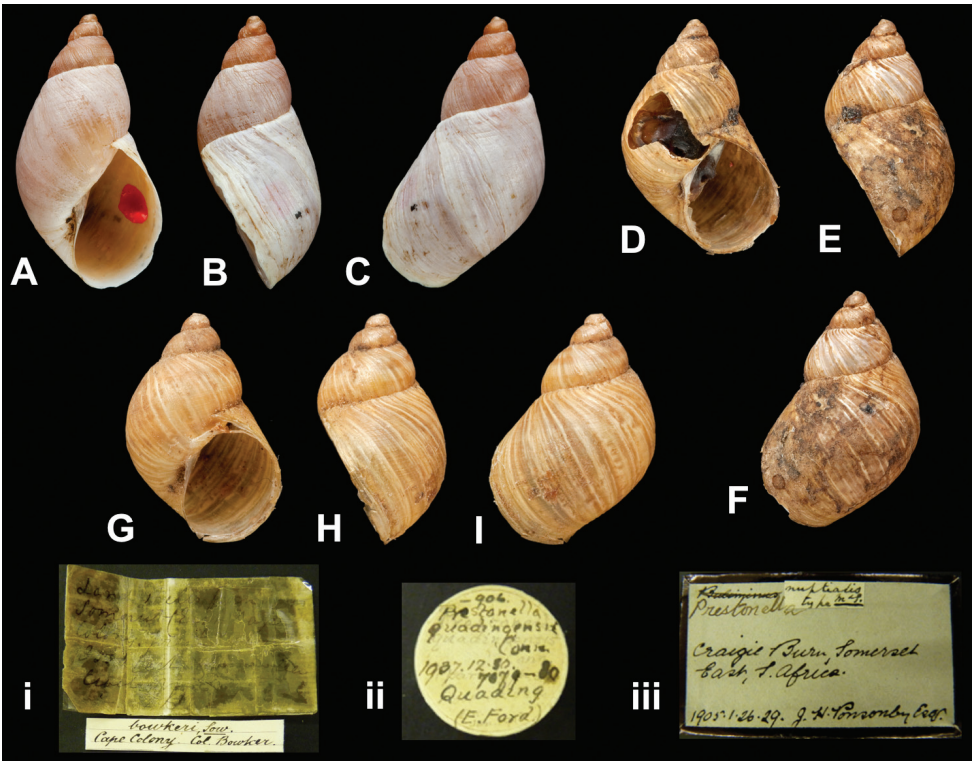

Figure 6. *Prestonella* species. **A–C, i** *P. bowkeri* (Sowerby, 1890), lectotype NHM 1889.11.4.9 (H = 19.6) **D–F, iii** *P. nuptialis* (Melvill and Ponsonby, 1894), holotype NHM 1905.1.26.29 (H = 14.6) **G–I, ii** *P. quadingensis* Connolly, 1929, paratype NHM 1937.12.30.7079 (H = 11.4).

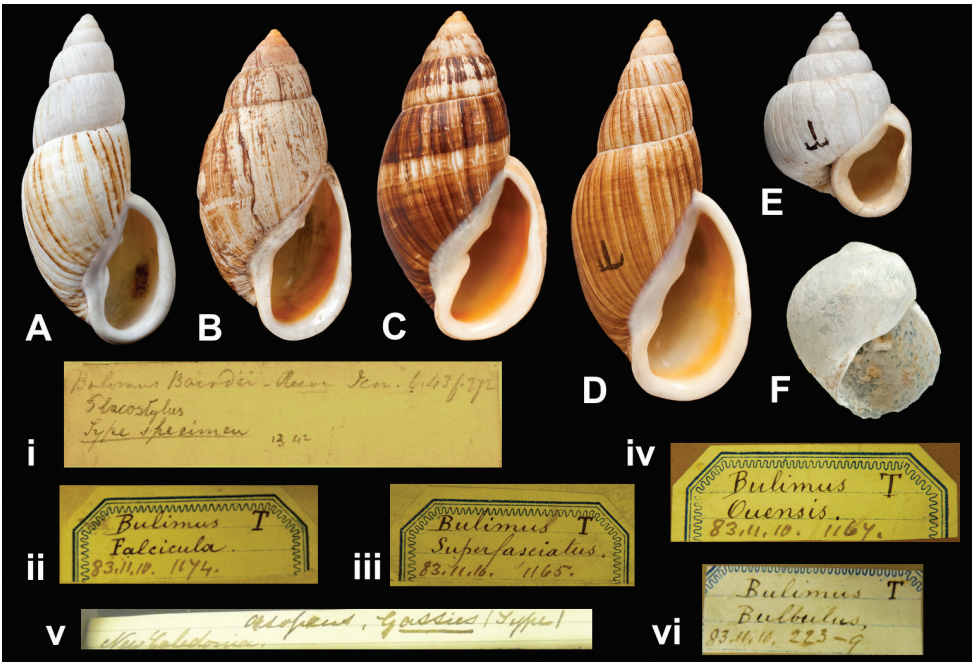

Figure 7. *Placostylus f. fibratus* (Martyn, 1784). **A, i** *Bulimus bairdii* Reeve, 1848, lectotype NHM 1975223 (H = 78.1) **B, ii** *B. falcicula* Gassies, 1871, syntype NHM 1883.11.10. (H = 74.5) **C, iii** *B. superfasciatus* Gassies, 1871, syntype NHM 1883.11.10.1167 (H = 77.1) **D, iv** *B. ouensis* Gassies, 1870, holotype NHM 1883.11.10.1176 (H = 83.7) **E, v** *B. asopeus* Gassies, 1871, holotype NHM 1883.11.10.1173 (H = 49.7) **F, vi** *B. bulbulus* Gassies, 1871, syntype NHM 1883.11.10.223 (H = 4.13). All reduced in size.

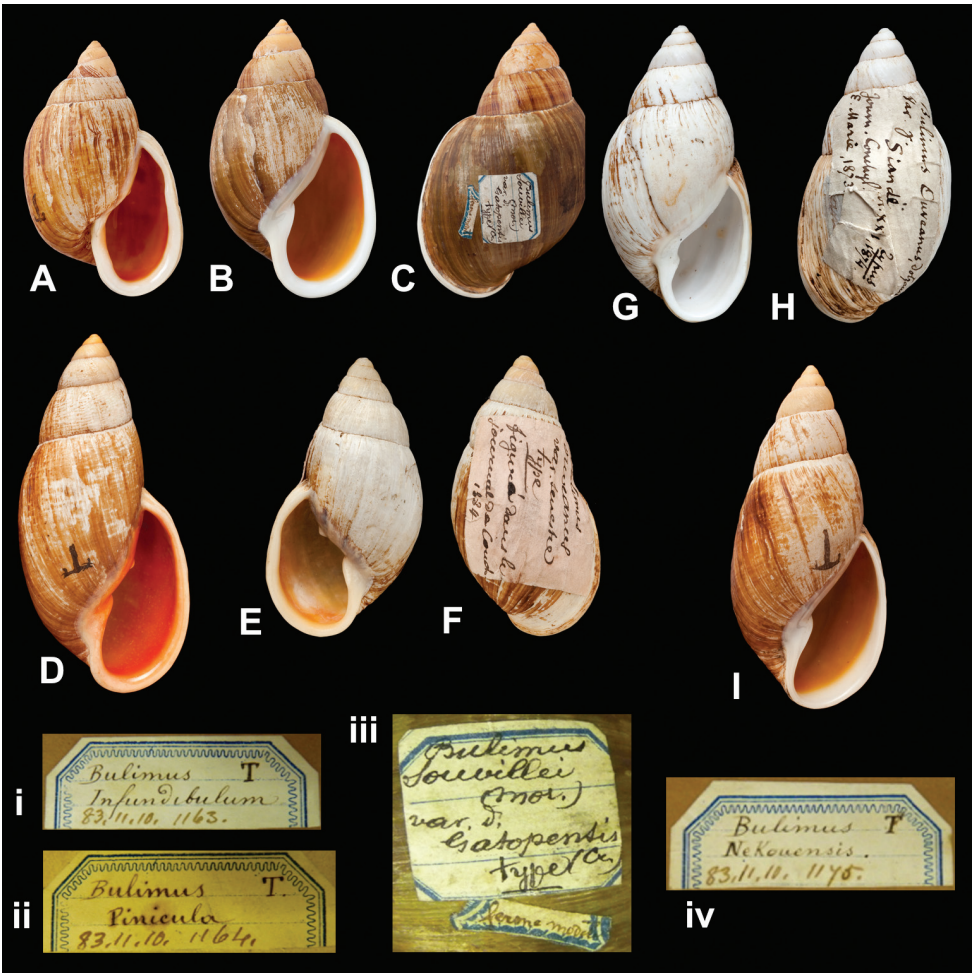

Figure 8. *Placostylus fibratus* subspecies. **A–D** *P. f. guestieri* (Gassies, 1869) **A, i** *Bulimus infundibulum* Gassies, 1871, holotype NHM 1883.11.10.1163 (H = 75.6) **B–C, iii** *B. souvillei gatopensis* Crosse, 1870, syntype NHM 1929.9.14.4 (H = 94.5) **D, ii** *B. pinicola* Gassies, 1870, syntype NHM 1883.11.10.1164 (H = 92.8) **E–H** *P. f. ouveanus* (Dotzauer in Mousson, 1869) **E–F** *B. ouveanus sinistorsa* Crosse, 1884, NHM 1929.9.14.8 (H = 49.2) **G–H** *B. ouveanus alba* Crosse, 1874, holotype NHM 1929.9.14.6 (H = 48.1) **I, iv** *P. f. alexander* (Crosse, 1855), holotype of *B. necouensis* Gassies, 1871 NHM 1883.11.10.1175 (H = 73.9). All reduced in size.

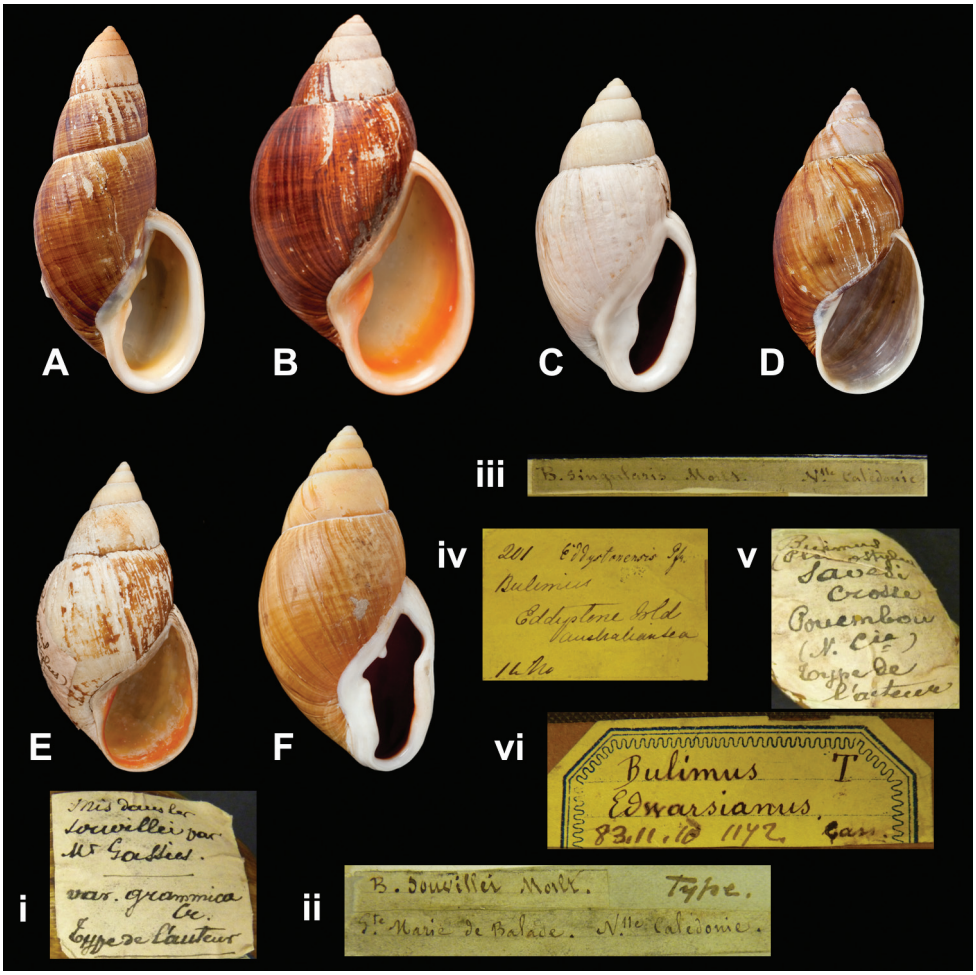

Figure 9. *Placostylus* species. **A, i** *P. fibratus goroensis* (Souverbie in Souverbie and Montrouzier, 1870), syntype of *Bulimus fibratus grammica* Crosse, 1870 NHM 1929.9.14.15 (H = 111.3) **B, ii** *P. f. souvillei* (Morelet, 1857), lectotype NHM 1893.2.4.1529 (H = 116.5) **C, iii** *P. p. porphyrostomus* (Pfeiffer, 1851), holotype of *B. singularis* Morelet, 1857 NHM 1893.2.4.1530 (H = 70.0) **D, iv** *P. e. eddystonensis* (Pfeiffer, 1855), lectotype NHM 1975230 (H = 73.3) **E, v** *P. e. savesi* (Crosse, 1886), holotype NHM 1929.9.14.7 (H = 57.5) **F, vi** *P. caledonicus* (Petit de la Saussaye, 1845), possible syntype of *B. edwardsianus* Gassies, 1863 NHM 1883.11.10.1172 (H = 72.0). All reduced in size.

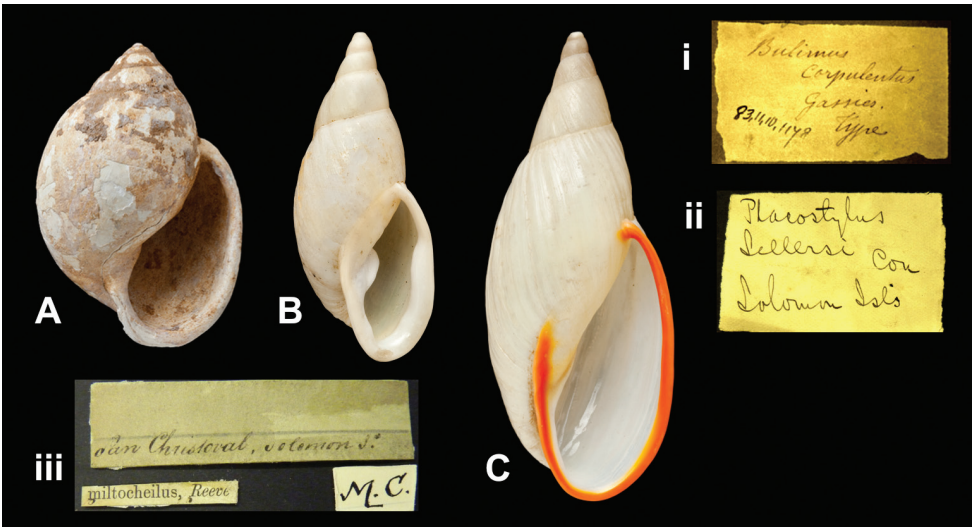

Figure 10. *Placostylus* and *Aspastus* species. **A, i** *Placostylus corpulentus* (Gassies, 1871), syntype NHM 1883.11.10.1173 (H = 94.0). Reduced in size **B, ii** *A. sellersi* (Cox, 1871), lectotype NHM 2007069 (H = 44.4) **C, iii** *A. miltocheilus* (Reeve, 1848), lectotype NHM 2007072 (H = 68.3).

Figure 11. *Eumecostylus* species. **A, i** *E. calus* (E.A. Smith, 1891), lectotype NHM 1891.11.3.4 (H = 78.0) **B, ii** *E. foxi* (Clench, 1941), paratype NHM 1953.2.4.1 (H = 82.3) **C, iii** *E. cylindricus* (Fulton, 1907), lectotype NHM 1907.5.3.160 (H = 71.3).

Figure 12. *Eumecostylus* and *Placostylus* species. **A, i** *E. hargravesi* (Cox, 1871), lectotype NHM 1880.12.11.43 (H = 65.0) **B, ii** *E. sanchristovalensis* (Cox, 1870), lectotype NHM 1880.12.11.44 (H = 67.7) **C, iii** *P. cuninculinsulae* (Cox, 1872), lectotype NHM 1880.12.11.47 (H = 41.6) **D** *P. ambagiosus* Suter, 1906, paratype of *P. a. priscus* Powell, 1938, NHM 1939.3.17.18 (H = 70.3).

Figure 13. A–C *Callistocharis* species **A, i** *C. crassilabrum* (Garrett, 1872), syntype NHM 20030801 (H = 44.0) **B, iii** *C. ochrostoma* (Garrett, 1872), probable syntype NHM 20030803 (H = 35.8) **C, ii** *C. subroseus* (Fulton, 1915), holotype NHM 1919.12.31.50 (H = 43.8) **D, v** *Poecilocharis turneri* (Pfeiffer, 1860), lectotype NHM 1975237 (H = 32.9) **E, iv** *Euplacostylus koroensis* (Garrett, 1872), probable syntype NHM 20030802 (H = 51.2).

Figure 14. *Placocharis* species. **A, i–ii** *P. kreftii* (Cox, 1872), lectotype NHM 20070068 (H = 54.9) **i** Label of the specimen presented by J.C. Cox **ii** Labels of the specimens originating from the Kennard collection **B, v** *P. macgillivrayi* (Pfeiffer, 1855), lectotype NHM 1975232 (H = 58.5) **C, iii** *P. guppyi* (E.A. Smith, 1891), lectotype NHM 1891.11.6.110 (H = 80.1) **D, iv** *P. strangei* (Pfeiffer, 1853), lectotype NHM 20100652 (H = 45.9).

Figure 15. *Santacharis* species. **A, i** *S. fuligineus* (Pfeiffer, 1853), lectotype NHM 1975226 (H = 39.4) **B–C** *S. salomonis* (Pfeiffer, 1853) **B, ii** Lectotype NHM 1975234 (H = 33.6) **C, iii** Lectotype of *Bulimus pyrostomus* Pfeiffer, 1860 NHM 1975235 (H = 41.5).

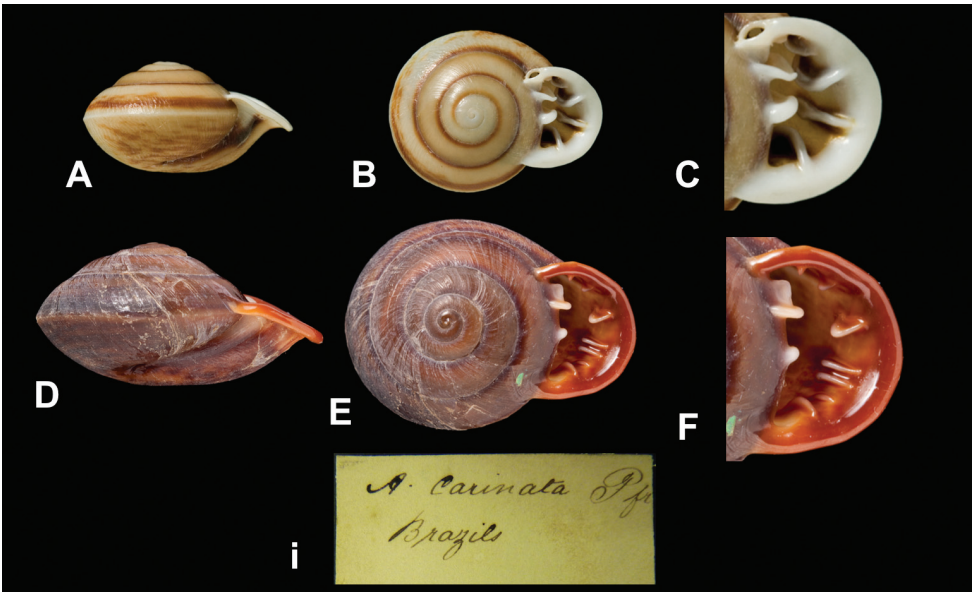

Figure 16. *Anostoma* species. **A–C, i** *A. carinatum* (Pfeiffer, 1853), probable syntype NHM 20100509 (D = 24.3) **D–F** *A. octodentatum brunneum* Verdcourt, 1991, holotype NHM 1990126 (D = 32.6).

Figure 17. *Bahiensis* species. **A–B, i** *B. longulus* (Pfeiffer, 1859), syntype NHM 1975252 (H = 29.8) **C–F** *B. occultus* (Reeve, 1849) **C–D, ii** Lectotype of *Bulimus occultus* Reeve, 1849 NHM 1975258 (H = 23.6) **E–F, iii** Lectotype of *Bulimus parallelus* Pfeiffer, 1857 (H = 22.5).

Figure 18. *Bahiensis* species. **A–B, iii** *B. guarani* (d'Orbigny, 1835), lectotype NHM 1854.12.4.140 (H = 20.5) **C–E, iv** *B. rhodinostoma* (d'Orbigny, 1835), lectotype NHM 1854.12.4.140 (H = 21.7) **F–I** *B. neglectus* (Pfeiffer, 1847) **F–G, ii** Lectotype of *Bulimus oblitus* Reeve, 1849 NHM 1975254 (H = 20.9) **H–I, i** Lectotype of *Bulimus neglectus* Pfeiffer, 1847 NHM 1975263 (H = 16.8).

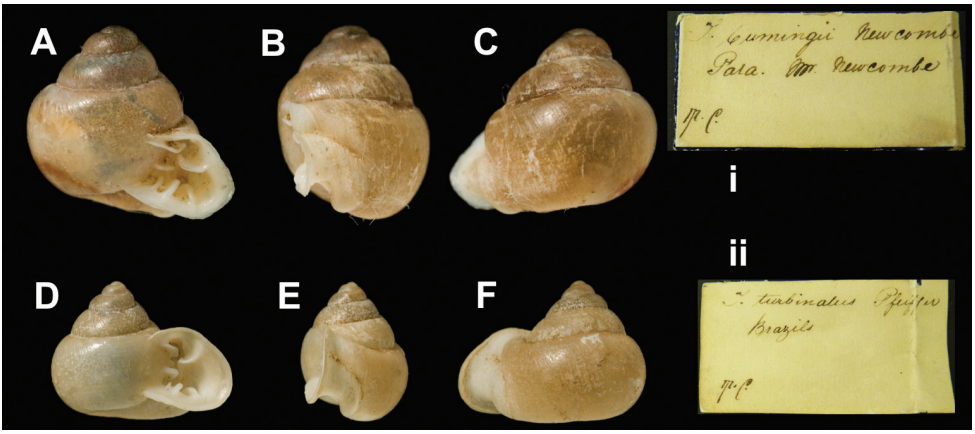

Figure 19. *Biotocus* species. **A–C, i** *B. cumingii* (Pfeiffer, 1849), syntype NHM 1975787 (H =). **D–F, ii** *B. turbinatus* (Pfeiffer, 1845), lectotype NHM 1975253 (H = 9.68).

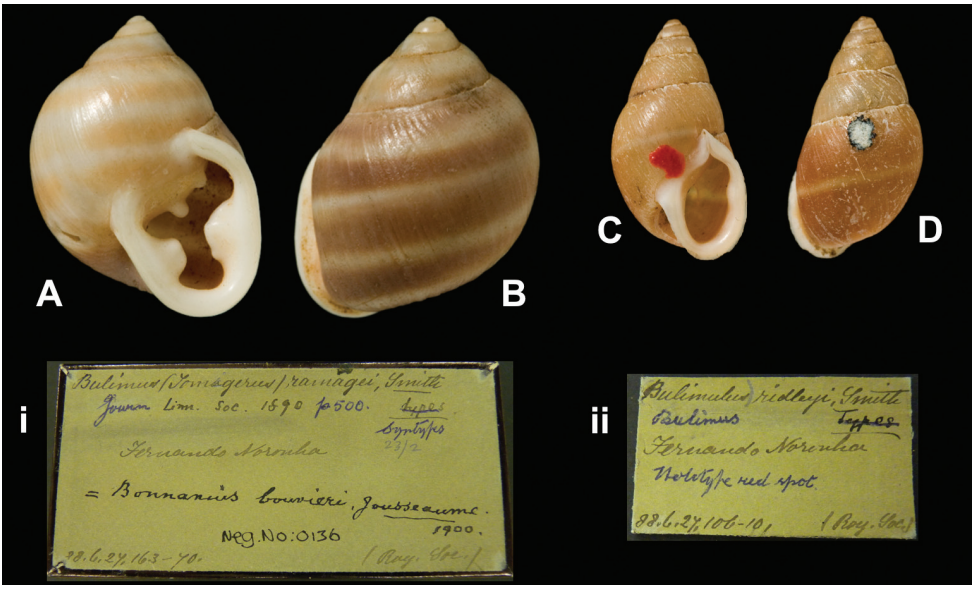

Figure 20. A–B, i *Bonnanius ramagei* (E.A. Smith, 1890), lectotype NHM 1888.6.27.163 (H = 17.5) **C–D, ii** *Hyperaulax ridleyi* (E.A. Smith, 1890, lectotype NHM 1888.6.27.106 (H = 11.46).

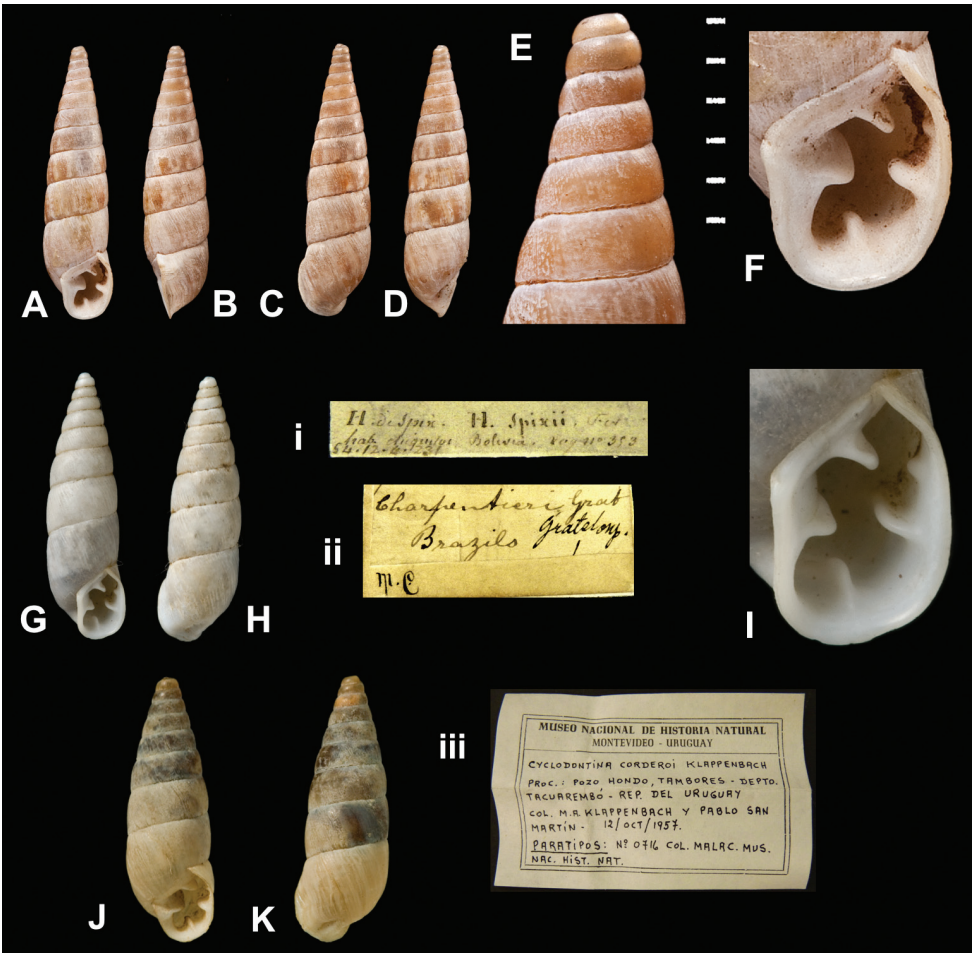

Figure 21. *Cyclodontina* species. **A–F, i** *C. minor* (d'Orbigny, 1837), lectotype NHM 1854.12.4.231 (H = 29.2) **E** apical whorls (scale equals 5 mm) **F** detail of aperture **G–I, ii** *C. charpentieri* (Pfeiffer, 1850), possible syntype NHM 1975585 (H = 17.9) **I** detail of aperture **J–K, iii** *C. corderoi* Klappenbach, 1958, paratype NHM 1961679 (H = 16.1).

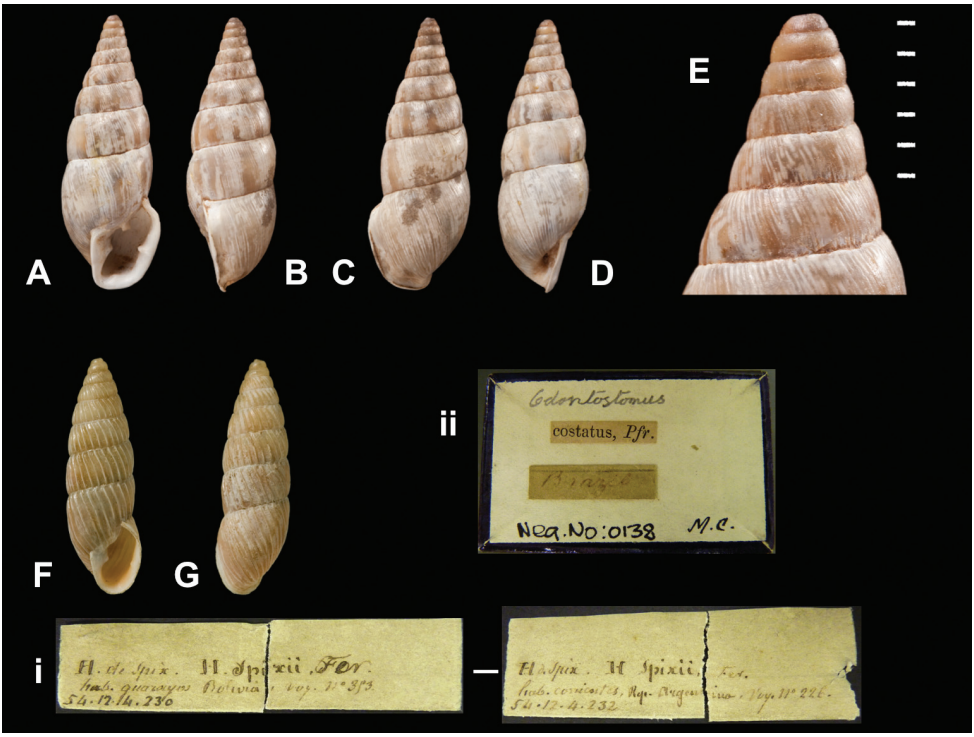

Figure 22. A–E, i *Spixia striata* (Spix, 1827), lectotype of *Pupa spixii major* (d'Orbigny, 1837) NHM 1854.12.4.232 (H = 34.8) **E** apical whorls (scale equals 5 mm) **F–G, ii** *Clessinia costata* (Pfeiffer, 1848), lectotype NHM 1975250 (H = 17.8).

Figure 23. A–B, i *Cyclodontina fusiformis* (Menke, 1828), lectotype of *Bulimus catharinae* Pfeiffer, 1857 NHM 1975261 (H = 24.4) **C–D, ii** *Moricandia tolerata* (Fulton, 1903), holotype NHM 1903.11.20.34 (H = 31.9) **E–F, iii** *Bahiensis fuscagula* (d'Orbigny, 1837), lectotype NHM 1854.12.4.141 (H = 30).

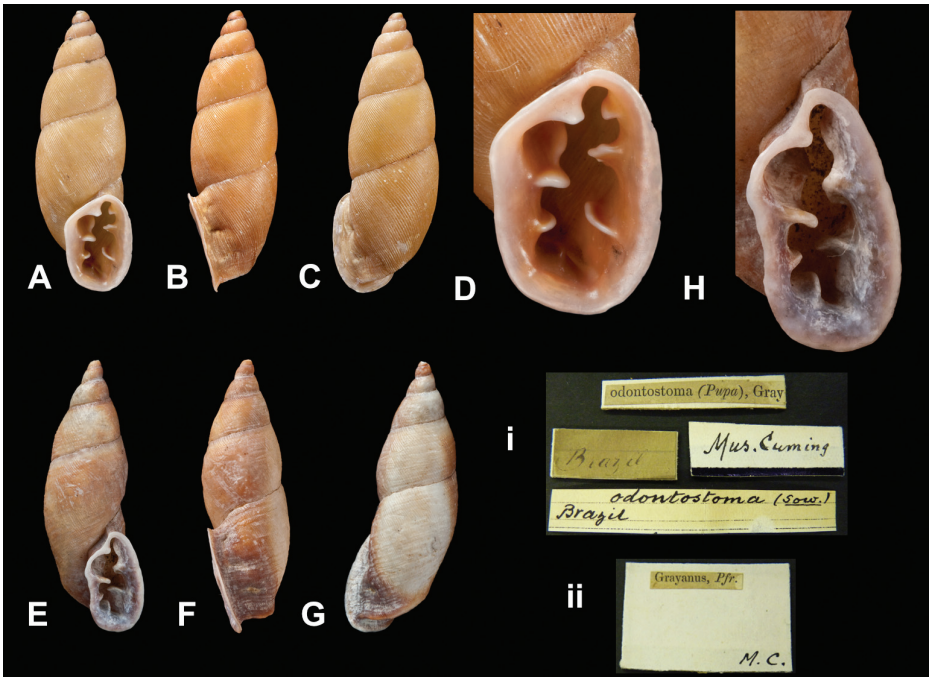

Figure 24. *Odontostomus* species. **A–D, i** *O. gargantua* (Férussac, 1821), possible syntype of *Bulimus odontostomus* Sowerby I, 1824 NHM 20100632 (H = 37.1) **D** detail of aperture **E–H, ii** *O. grayanus* (Pfeiffer, 1845), syntype NHM 20110387 (H = 34.1) **H** detail of aperture.

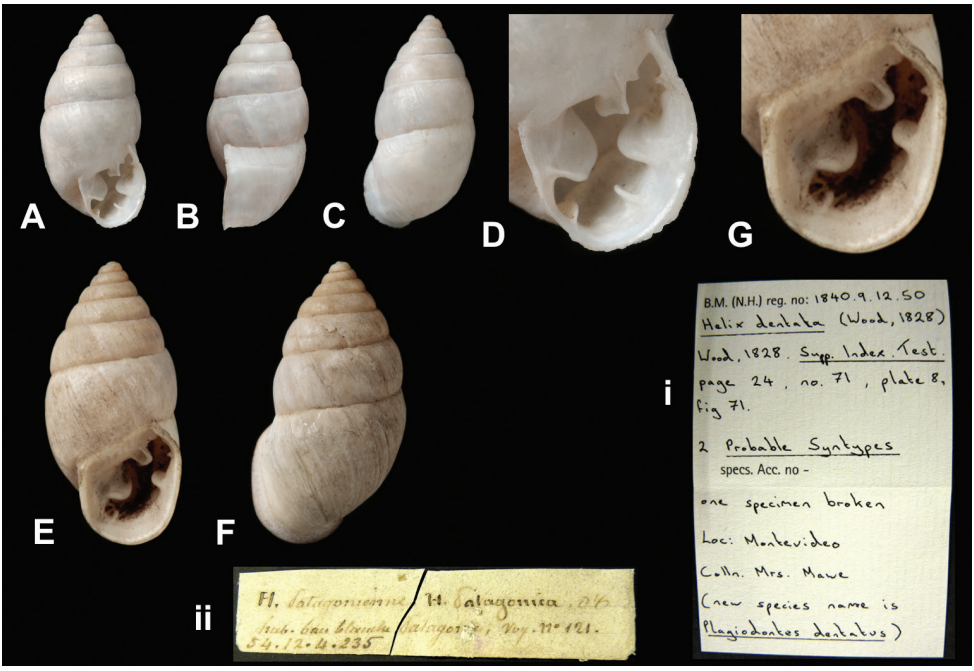

Figure 25. *Plagiodontes* species. **A–D, i** *P. dentata* (Wood, 1828), syntype NHM 1840.9.12.50 (H = 17.5) **D** detail of aperture **E–G, ii** *P. patagonica* (d'Orbigny, 1835), paralectotype NHM 1854.12.4.235 (H = 22.3) **G** detail of aperture.

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The caddisfly fauna (Insecta, Trichoptera) of the rivers of the Black Sea basin in Kosovo with distributional data for some rare species

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Abstract

Adult caddisflies were collected from 12 stations in the Black Sea basin in Kosovo using UV light traps. Sixty-five of the seventy-six species reported in this paper are first records for the Kosovo caddisfly fauna. The unexpected discovery of several species during this investigation: *Agapetus delicatulus* McLachlan, 1884, *Psychomyia klapaleki* Malicky, 1995, *Tinodes janssensi* Jacquemart, 1957, *Hydropsyche emarginata* Navas, 1923, *Drusus botosaneanui* Kumanski, 1968, *Potamophylax rotundipennis* (Brauer, 1857), *Potamophylax schmidi* Marinković-Gospodnetić, 1970, *Ceraclea albimacula* (Rambur, 1842), *Helicopsyche bacescui* Orghidan & Botosaneanu, 1953, *Adicella filicornis* (Pictet, 1834), *Beraea maurus* (Curtis, 1834) and *Beraeamyia hrabei* Mayer, 1937 illustrates that collections from poorly investigated areas in Europe will almost certainly revise the existing knowledge on the distribution of these and other species.

Keywords

Trichoptera, aquatic insects, Kosovo, Balkan Peninsula, Europe

Introduction

To our knowledge, Europe (in the zoogeographical sense) currently holds more than 1100 caddisfly species (e.g. Malicky 2004; Oláh 2010; Wiberg-Larsen 2008). Within Europe, the Balkan Peninsula is a unique region that is known for its plant and animal

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species richness, due in part to its biogeographical and ecological features such as the presence of different regions with a variety of condition, complex geological history and interaction between populations, species and ecosystems (Savić 2008) . Historic faunistic data for several groups of aquatic insects, including caddisflies, in the Balkan Peninsula date back over a century (e.g. Klapálek 1899, 1902; Radovanović 1931, 1935, 1953). Only recently, however, have distributions and zoogeographic characteristics, descriptions of new taxa, and larval-adult associations been examined more thoroughly in the Balkans (e.g. Chvojka 1997; Ćuk and Vučković 2009; Graf et al. 2008; Kučinić et al. 2011a, 2011b; Kučinić and Malicky 2002; Malicky 2009; Oláh 2010; Previšić et al. 2007; Vučković et al. 2011; Waringer et al. 2009; Živić et al. 2009).

Poorly investigated areas in Europe still remain: until recently Albania and Kosovo were among the least studied areas in the Balkan Peninsula and Europe in general. Recent caddisfly investigations in Albania have documented many rare or unexpected species (e.g. Oláh 2010; Oláh et al. 2011). This suggests that caddisfly zoogeographic studies in poorly investigated areas of the Balkan Peninsula will continuously revise the present knowledge of the distributions of many European species. Kosovo still remains a poorly investigated area in Europe in regard to caddisfly fauna. Until recently, only 37 Trichoptera species were known from Kosovo (Ibrahimi et al. in press; Malicky 1986, 1999; Marinković-Gospodnetić 1975, 1980; Oláh 2010; Pongrácz 1923). This study is part of the first large-scale investigation of caddisfly fauna distribution in this part of the Balkan Peninsula based on adult specimen collections.

All rivers in Kosovo belong to the drainage basins of three seas: the Black Sea, the Adriatic Sea and the Aegean Sea. This study examined the caddisfly fauna of the Black Sea drainage basin, which is the largest in the area and covers about 50% of the Kosovo's territory of 10,908 km^2. Rivers that belong to the Black Sea drainage basin are the Ibri, Sitnica, Llapi, Drenica, and Morava e Binçës, as well as other smaller streams and tributaries.

Material and methods

Adult caddisflies were collected using UV light traps at 12 stations in the Black Sea drainage basin of Kosovo (Figure 1 and Table 1). The sampling was carried out between March 2009 and November 2010. Light traps were placed on stream banks and operated for approximately one hour and fifteen minutes after dusk. All samples were preserved in 80 % ethanol. The specimens were identified under a stereomicroscope with determination keys from Malicky (2004) and Kumanski (1985, 1988). Specimens were collected by Halil Ibrahimi and were determined by Halil Ibrahimi and Mladen Kučinić unless otherwise noted. The collection is deposited at the Laboratory of Zoology of the Faculty of Natural and Mathematical Sciences, University of Prishtina, Kosovo.

Systematics and nomenclature follows Malicky (2004) and Marinković – Gospodnetić (1970). Within the families the genera and taxa are given in alphabetical order. Biogeographic analysis and distributional data follow Botosaneanu and Malicky (1978),

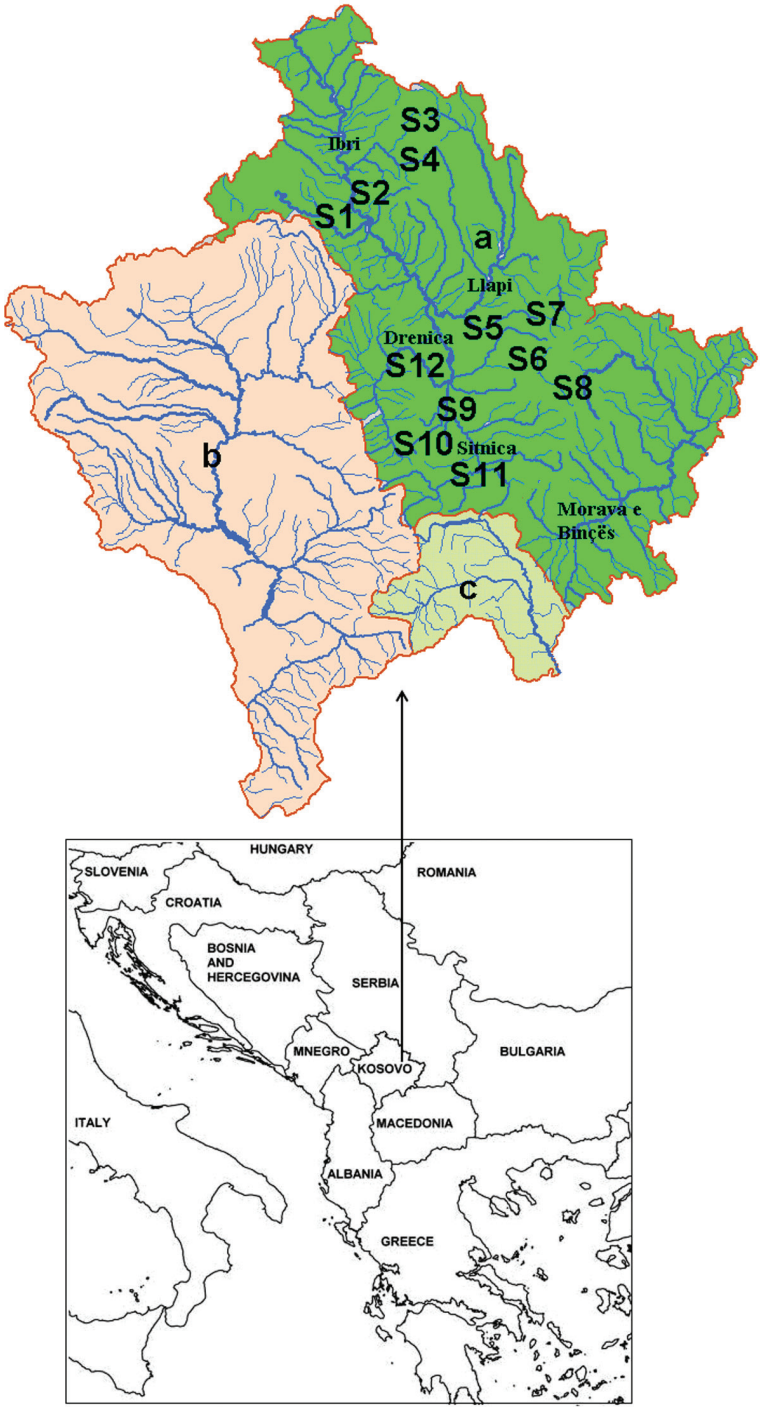

Figure 1. Sampling sites: S1 Koshtovë, S2 Mazhiq, S3 Murgull, S4 Kaqandoll, S5 Siqevë, S6 Orllan, S7 Llukar, S8 Marefc, S9 Blinajë, S10 Mollopolc, S11 Caralevë and S12 Grabofc. Drainage basins: a) Black Sea basin, b) Adriatic Sea basin and c) Aegean Sea basin.

Cianficoni (2002), Graf et al. (2008), Krušnik (1987), Kumanski (1985, 1988), Kučinić (2002), Kučinić et al. (2008, 2011a), Malicky (2011), Marinković-Gospodnetić (1979), Oláh (2010), Previšić et al. (2007), Stanić-Koštroman (2009), Waringer et al. (2009) and Živić et al. (2006, 2009). Female specimens belonging to the genera where identification until species level is impossible according to Malicky (2004) were not counted in taxa list except the female specimen of *Potamophylax* sp., which is morphologically different from *Potamophylax luctuosus* (Piller & Mitterpacher, 1783), *P. pallidus* (Klapalek, 1899), *P. rotundipennis* (Brauer, 1857) and *P. schmidi* Marinković – Gospodetić, 1970, and consequently was counted as a twelfth taxa of Limnephilidae family.

Table 1. Locality data for the 12 sampling stations.

Code	Sampling Stations	River/Stream	Latitude °N	Longitude °E	Altitude m
S1	Koshtovë	Ibër River	42.8688	20.8271	859
S2	Mazhiq	Mazhiq Stream	42.9401	20.9331	853
S3	Murgull	Murgull River	43.0743	21.066	882
S4	Kaqandoll	Kaqandoll River	42.9666	21.0702	1069
S5	Siqevë	Siqevë Stream	42.7369	21.2343	798
S6	Orllan	Stream	42.7709	21.3262	844
S7	Llukar	Prishtina River	42.6987	21.2367	728
S8	Marefc	Marefc Stream	42.6321	21.4257	691
S9	Blinajë	The first lake	42.5185	20.9788	721
S10	Mollopolc	Mollopolc Stream	42.4056	21.0408	655
S11	Caralevë	Caralevë Stream	42.4477	20.9482	756
S12	Grabofc	Drenica River	42.6749	20.9664	600

Results

A total of 8,869 specimens belonging to seventy-six species are reported. The distribution of species per family is as follows: Rhyacophilidae (8) Glossosomatidae (5), Hydroptilidae (1), Philopotamidae (5), Hydropsychidae (11), Polycentropodidae (4), Psychomyiidae (6), Phryganeidae (1), Brachycentridae (2), Limnephilidae (12), Goeridae (5), Lepidostomatidae (1), Leptoceridae (9), Sericostomatidae (2), Helicopsychidae (1) and Beraeidae (3) (Table 2).

Sixty-five out of the seventy-six total species reported here are new records for the Kosovo caddisfly fauna (Table 2). A singe female specimen of *Potamophylax* sp. (Limnephilidae) that does not match the descriptions for any described females in this genus was found in station S9. The female specimen is similar to *P. rotundipennis* in appearance, but the genital morphology clearly distinct (Malicky, per. com.). This specimen could potentially be new to science, but we refrain from a description until associated males are available. Eight species in the genus *Rhyacophila* presented in this paper were previously reported and discussed (Ibrahimi et al., in press; Marinković-Gospodnetić, 1975), but we provided detailed collection data together with data for specimens collected at new localities in 2009 and 2010.

Table 2. Systematic list of described caddisflies collected in the Black Sea Basin from 2009–2010. Species new to the fauna of Kosovo are indicated by an asterisk *.

Family Rhyacophilidae

Rhyacophila armeniaca Guerin - Meneville, 1834

S3 Murgull: 20.VII.2009. 1 ♀, 4 ♂♂; S4 Kaqandoll: 20.VII.2009. 2 ♂♂; S5 Siqevë: 21.VI.2009. 1 ♂.

Rhyacophila fasciata Hagen, 1859

S1 Koshtovë: 15.III.2010. 10 ♂♂, 16.IV.2010. 5 ♀♀, 13 ♂♂, 13.V.2010. 6 ♀♀, 15 ♂♂, 18.VI.2010. 7 ♀♀, 11 ♂♂, 20.VII.2010. 1 ♀, 7 ♂♂, 16.VIII.2010. 3 ♀♀, 7 ♂♂, 17.IX.2010. 4 ♀♀, 16 ♂♂, 18.X.2010. 4 ♀♀, 4 ♂♂; S2 Mazhiq: 18.VI.2009. 6 ♀♀, 7 ♂♂, 20.VII.2009. 8 ♀♀, 3 ♂♂, 16.VIII.2009. 13 ♀♀, 21 ♂♂, 17.IX.2009. 14 ♀♀, 32 ♂♂; S3 Murgull: 20.VII.2009. 4 ♀♀, 8 ♂♂, 17.VIII.2009. 3 ♀♀, 9 ♂♂, 18.IX.2009. 2 ♀♀, 6 ♂♂, 19.X.2009. 8 ♀♀, 10 ♂♂, 19.XI.2009. 2 ♂♂; S4 Kaqandoll: 19.VI.2009. 1 ♀, 5 ♂♂, 20.VII.2009. 6 ♀♀, 9 ♂♂, 18.IX.2009. 21 ♀♀, 33 ♂♂; S5 Siqevë: 15.VIII.2009. 11 ♀♀, 23 ♂♂, 16.IX.2009. 13 ♀♀, 7 ♂♂, 17.X.2009. 5 ♀♀, 7 ♂♂; S6 Orllan: 21.VI.2009. 3 ♀♀, 6 ♂♂, 17.VII.2009. 2 ♀♀, 7 ♂♂, 15.VIII.2009. 13 ♀♀, 24 ♂♂, 16.IX.2009. 12 ♀♀, 23 ♂♂; S7 Llukar: 15.VIII.2009. 5 ♀♀, 9 ♂♂, 16.IX.2009. 11 ♀♀, 4 ♂♂; S8 Marefc: 09.IV.2010. 3 ♂♂, 09.V.2010. 6 ♂♂, 12.VI.2010. 3 ♂♂, 11.VII.2010. 1 ♀ ,9 ♂♂, 10.VIII.2010. 12 ♂♂, 09.IX.2010. 29 ♀♀, 28 ♂♂; S10 Mollopolc: 13.IV.2010. 5 ♂♂, 16.V.2010. 4 ♀♀, 31 ♂♂, 11.VI.2010. 7 ♂♂, 14.VII.2010. 4 ♂♂, 15.VIII.2010. 3 ♂♂, 14.IX.2010. 4 ♀♀, 5 ♂♂; S11 Caralevë: 16.V.2010. 7 ♀♀, 9 ♂♂, 11.VI.2010. 5 ♀♀, 9 ♂♂, 14.VII.2010. 13 ♀♀, 8 ♂♂, 15.VIII.2010. 4 ♂♂, 14.IX.2010. 8 ♀♀, 4 ♂♂; S12 Grabofc: 06.VI.2009. 3 ♀♀, 6 ♂♂, 03.VIII.2009. 13 ♀♀, 9 ♂♂.

Rhyacophila fischeri Botosaneanu, 1957

S2 Mazhiq: 13.V.2009. 2 ♀♀, 16 ♂♂; S3 Murgull: 14.V.2009. 3 ♀♀, 20 ♂♂, 19.V.2009. 2 ♀♀, 34 ♂♂; S4 Kaqandoll: 14.V.2009. 4 ♀♀, 9 ♂♂; S5 Siqevë: 13.V.2009. 2 ♀♀, 7 ♂♂; S7 Llukar: 17.07.2009. 14 ♀♀, 26 ♂♂.

Rhyacophila laevis Pictet, 1834

S5 Siqevë: 13.V.2009. 4 ♀♀, 6 ♂♂; S8 Marefc: 09.V.2010. 8 ♀♀, 9 ♂♂.

Rhyacophila loxias Schmid, 1970

S2 Mazhiq: 18.VI.2009. 4 ♂♂; S3 Murgull: 19.VI.2009. 1 ♂.

Rhyacophila nubila Zetterstedt, 1840

S1 Koshtovë: 16.IV.2010. 2 ♀♀, 6 ♂♂, 13.V.2010. 11 ♀♀, 32 ♂♂, 18.VI.2010. 8 ♀♀, 16 ♂♂, 20.VII.2010. 6 ♀♀, 21 ♂♂; S3 Murgull: 18.IX.2009. 5 ♀♀, 12 ♂♂.

Rhyacophila polonica McLachlan 1879

S2 Mazhiq: 18.VI.2009. 5 ♀♀, 14 ♂♂, 20.VII.2009. 4 ♀♀, 22 ♂♂, 16.VIII.2009. 13 ♀♀, 4 ♂♂; S6 Orllan: 21.VI.2009. 12 ♀♀, 23 ♂♂, 17.VII.2009. 11 ♀♀, 30 ♂♂, 15.VIII.2009. 14 ♀♀, 2 ♂♂; S8 Marefc: 12.VI.2010. 4 ♂♂; S10 Mollopolc: 21.VI.2010. 1 ♀, 5 ♂♂.

Rhyacophila tristis Pictet, 1834

S2 Mazhiq: 15.V.2009. 3 ♀♀, 9 ♂♂; S3 Murgull: 14.V.2009. 12 ♀♀, 22 ♂♂, 19.VI.2009. 3 ♂♂, 20.VII.2009. 2 ♂♂; S4 Kaqandoll: 14.V.2009. 14 ♀♀, 23 ♂♂, 19.VI.2009. 5 ♀♀, 19 ♂♂; S5 Siqevë: 13.VI.2009. 9 ♀♀, 21 ♂♂, 21.VI.2009. 21 ♀♀, 42 ♂♂, 17.VII.2009. 3 ♀♀, 7 ♂♂; S7 Llukar: 13.V.2009. 5 ♀♀, 24 ♂♂; S10 Mollopolc: 18 ♀♀, 39 ♂♂, 11.VI.2009. 48 ♀♀, 53 ♂♂, 14.VII.2009. 15 ♀♀, 6 ♂♂, 15.VIII.2009. 2 ♂♂; S11 Caralevë: 14.V.2010. 5 ♀♀, 42 ♂♂.

Family Glossosomatidae

Agapetus delicatulus McLachlan, 1884 *

S5 Siqevë: 21.VI.2009. 5 ♀♀ (2 ♀♀ det. H. Malicky), 12.VII.2009. 1 ♂.

Agapetus ochripes Curtis, 1834 *

S4 Kaqandoll: 19.VI.2009. 2 ♂♂.

Glossosoma conformis Neboiss, 1963 *

S4 Kaqandoll: 19.VI.2009. 2 ♂♂.

Synagapetus iridipennis McLachlan, 1879 *

S2 Mazhiq: 18.VI.2009. 5 ♀♀, 13 ♂♂; S5 Siqevë: 21.VI.2009. 3 ♀♀, 18 ♂♂, 17.VII.2009. 2 ♀♀, 18 ♂♂; S6 Orllan: 21.VI.2009. 4 ♀♀, 14 ♂♂, 17.VII.2009. 5 ♂♂; S7 Llukar: 21.VI.2009. 32 ♀♀, 28 ♂♂; S10 Mollopolc: 11.VI.2010. 5 ♂♂ (2 ♂♂ det. H. Malicky); S12 Grabofc: 05.IV.2009. 7 ♀♀, 3 ♂♂, 06.V.2009. 4 ♀♀, 7 ♂♂, 06.VI.2009. 6 ♀♀, 13 ♂♂, 08.VII.2009. 5 ♀♀, 7 ♂♂.

Synagapetus slavorum Botosaneanu, 1960 *

S10 Mollopolc: 11.VI.2010. 2 ♂♂, 15.VIII.2010. 4 ♂♂.

Family Hydroptilidae

Hydroptila forcipata (Eaton, 1873) *

S1 Koshtovë: 18.VI.2010. 55 ♀♀, 20.VII.2010. 49 ♀♀, 2 ♂♂, 16.VIII.2010. 76 ♀♀, 1 ♂, 17.IX.2010. 87 ♀♀, 2 ♂♂.

Family Philopotamidae

Philopotamus montanus (Donovan, 1813) *

S2 Mazhiq: 15.III.2009. 6 ♂♂, 16.IV.2009. 6 ♂♂, 13.V.2009. 16 ♀♀, 11 ♂♂, 18.VI.2009. 13 ♀♀, 12 ♂♂, 20.VII.2009. 5 ♀♀, 4 ♂♂, 16.VIII.2009. 21 ♀♀, 22 ♂♂; S3 Murgull: 16.III.2009. 3 ♂♂, 17.IV.2009. 1 ♀, 9 ♂♂, 14.V.2009. 8 ♀♀, 31 ♂♂, 19.VI.2009. 1 ♀, 14 ♂♂, 20.VII.2009. 7 ♀♀, 3 ♂♂; S4 Kaqandoll: 16.III.2009. 5 ♂♂, 17.IV.2009. 20 ♂♂, 14.V.2009. 6 ♀♀, 18 ♂♂, 19.VI.2009. 11 ♀♀, 13 ♂♂; S5 Siqevë: 14.III.2009. 4 ♂♂, 16.IV.2009. 2 ♀♀, 18 ♂♂, 13.V.2009. 21 ♀♀, 13 ♂♂, 21.VI.2009. 13 ♀♀, 7 ♂♂, 17.VII.2009. 8 ♀♀, 11 ♂♂; S6 Orllan: 13.V.2009. 12 ♂♂, 21.VI.2009. 13 ♀♀, 6 ♂♂, 17.VII.2009. 2 ♀♀, 5 ♂♂; S7 Llukar: 16.IV.2009. 21 ♂♂, 13.V.2009. 32 ♀♀, 14 ♂♂; S10 Mollopolc: 12.III.2010. 6 ♂♂, 13.IV.2010. 5 ♂♂, 16.V.2010. 24 ♀♀, 19 ♂♂, 11.VI.2010. 9 ♀♀, 8 ♂♂, 14.VII.2010. 3 ♂♂, 15.VIII.2010. 2 ♀♀, 8 ♂♂, 14.IX.2010. 4 ♂♂; S12 Grabofc: 06.06.2009. 4 ♀♀, 3 ♂♂, 08.VII.2009. 6 ♀♀, 4 ♂♂.

Philopotamus variegatus (Scopoli, 1763) *

S8 Marefc: 09.V.2010. 2 ♂♂.

Wormaldia occipitalis (Pictet, 1834) *

S3 Murgull: 19.VI.2009. 11 ♂♂, 20.VII.2009. 15 ♀♀, 3 ♂♂; S5 Siqevë: 17.VII.2009. 5 ♂♂, 17.X.2009. 6 ♀♀, 7 ♂♂; S6 Orllan: 16.IX.2009. 5 ♀♀, 16 ♂♂; S7 Llukar: 17.VII.2009. 15 ♀♀, 21 ♂♂, 15.VIII.2009. 6 ♀♀, 9 ♂♂; S8 Marefc: 11.VII.2010. 4 ♂♂, S9 Blinajë: 10.V.2010. 12 ♀♀, 18 ♂♂, 13.VI.2010. 21 ♀♀, 34 ♂♂, 11.VIII.2010. 4 ♀♀ , 14 ♂♂,10.IX.2010. 21 ♀♀, 34 ♂♂, S10 Mollopolc: 14.VII.2010. 7 ♂♂, 15.VIII.2010. 21 ♀♀, 14 ♂♂, 14.IX.2010. 32 ♀♀, 6 ♂♂; S11 Caralevë: 11.VI.2010. 7 ♂♂; S12 Grabofc; 08.VII.2009. 4 ♀♀, 2 ♂♂.

Wormaldia pulla (McLachlan, 1878) *

S4 Kaqandoll: 19.VI.2009. 1 ♂.

Wormaldia subnigra McLachlan, 1865 *
S6 Orllan: 17.VII.2009. 5 ♂♂.

Family Hydropsychidae

Cheumatopsyche lepida (Pictet, 1834) *
S6 Orllan: 21.VI.2009. 12 ♀♀, 5 ♂♂, 17.VII.2009. 5 ♀♀, 13 ♂♂, 15.VIII.2009. 9 ♀♀; S7 Llukar: 13.V.2009. 4 ♀♀, 7 ♂♂, 21.VI.2009. 21 ♀♀, 32 ♂♂; S8 Marefc: 09.V.2010. 170 ♀♀, 38 ♂♂, 12.VI.2010. 98 ♀♀, 23 ♂♂, 11.VII.2010. 43 ♀♀, 21 ♂♂, 10.VIII.2010. 56 ♀♀, 12 ♂♂, 09.IX.2010. 32 ♀♀, 6 ♂♂.

Diplectrona atra McLachlan, 1878 *
S3 Murgull: 19.VI.2009. 14 ♀♀, 11 ♂♂, 20.VII.2009. 1 ♀, 4 ♂♂, 17.VIII.2009. 14 ♀♀; S8 Marefc: 09.V.2010. 23 ♀♀, 8 ♂♂, 12.VI.2010. 12 ♀♀, 2 ♂♂, 11.VII.2010. 16 ♀♀, 2 ♂♂.

Hydropsyche angustipennis (Curtis, 1834) *
S9 Blinajë: 13.VII.2010. 18 ♂♂ (1 ♂ det. H. Malicky), 11.VIII.2010. 12 ♂♂.

Hydropsyche bulbifera McLachlan, 1878 *
S5 Siqevë: 16.IX.2009. 6 ♂♂; S6 Orllan: 21.VI.2009. 1 ♂, 15.VIII.2009. 5 ♂♂; S12 Grabofc: 05.IV.2009. 6 ♂♂, 03.VIII.2009. 4 ♂♂.

Hydropsyche emarginata Navas, 1923 *
S7 Llukar: 21.VI.2009. 3 ♂♂; S8 Marefc: 09.V.2010. 11 ♂♂, 12.VI.2010. 23 ♂♂, 11.VII.2010. 12 ♂♂, 10.VIII.2010. 5 ♂♂, 09.IX.2010. 5 ♂♂; S12 Grabofc: 06.VI.2009. 9 ♂♂.

Hydropsyche fulvipes Curtis, 1834 *
S7 Llukar: 21.VI.2009. 1 ♂ (det. H. Malicky).

Hydropsyche incognita Pitsch, 1993 *
S8 Marefc: 12.VI.2010. 4 ♂♂.

Hydropsyche instabilis (Curtis, 1834)
S4 Kaqandoll: 17.VIII.2009. 5 ♂♂.

Hydropsyche peristerica Botosaneanu & Marinković-Gospodnetić, 1968 *
S3 Murgull: 14.V.2009. 1 ♂, 20.VII.2009. 3 ♂♂; S5 Siqevë: 13.V.2009. 1 ♂ (det. H. Malicky).

Hydropsyche saxonica McLachlan, 1884 *
S4 Kaqandoll: 17.VIII.2009. 3 ♂♂, S6 Orllan: 21.VI.2009. 5 ♂♂, 15.VIII.2009. 5 ♂♂; S9 Blinajë: 13.VII.2010. 14 ♂♂ (1 ♂ det. H. Malicky).

Hydropsyche tabacarui Botosaneanu, 1960 *
S3 Murgull: 14.V.2009. 6 ♂♂; S10 Mollopolc: 11.VI.2010. 7 ♂♂.

Hydropsyche sp. ♀
S1 Koshtovë: 13.V.2010. 3 ♀♀; S2 Mazhiq: 18.VI.2009. 10 ♀♀, 20.VII.2009. 21 ♀♀, 16.VIII.2009. 12 ♀♀; S3 Murgull: 19.VI.2009. 8 ♀♀, 20.VII.2009. 8 ♀♀, 17.VIII.2009. 12 ♀♀; S4 Kaqandoll: 19.VI.2009. 17 ♀♀, 17.VIII.2009. 32 ♀♀; S5 Siqevë: 16.IX.2009. 13 ♀♀; S6 Orllan: 17.VII.2009. 13 ♀♀, 15.08.2009. 24 ♀♀; S7 Llukar: 21.VI.2009.32 ♀♀, 17.VII.2009. 14 ♀♀; S8 Marefc: 09.V.2010. 12 ♀♀, 12.VI.2010. 5 ♀♀, 11.VII.2010. 22 ♀♀, 10.VIII.2010. 5 ♀♀, 09.IX.2010. 8 ♀♀; S9 Blinajë: 13.VI.2010. 11 ♀♀, 12.VII.2010. 14 ♀♀, 11.VIII.2010. 21 ♀♀; S10 Mollopolc: 16.V.2010. 3 ♀♀, 11.VI.2010. 5 ♀♀, 14.VII.2010. 8 ♀♀; S11 Caralevë: 16.V.2010. 12 ♀♀, 11.VI.2010. 23 ♀♀, 14.VII.2010. 43 ♀♀, S12 Grabofc: 06.V.2009. 21 ♀♀, 06.VI.2009, 23 ♀♀, 08.VII.2009. 32 ♀♀, 03.VIII.3009. 13 ♀♀.

Family Polycentropodidae

Cyrnus trimaculatus (Curtis, 1834) *

S9 Blinajë: 10.V.2010. 12 ♀♀, 19 ♂♂, 13.VI.2010. 21 ♀♀, 13 ♂♂. 12.VII.2010. 14 ♀♀, 18 ♂♂, 11.VIII.2010. 12 ♀♀, 5 ♂♂, 10.IX.2010. 7 ♀♀, 21 ♂♂; S12 Grabofc: 05.IV.2009. 3 ♀♀, 5 ♂♂, 06.V.2009. 4 ♀♀, 7 ♂♂, 06.VI.2009. 2 ♀♀, 4 ♂♂, 08.VII.2009. 21 ♀♀, 26 ♂♂, 03.VIII.3009. 5 ♀♀, 9 ♂♂.

Polycentropus excisus Klapalek, 1894 *

S10 Mollopolc: 13.X.2010. 1 ♂ (det. H. Malicky).

Polycentropus flavomaculatus (Pictet, 1834) *

S9 Blinajë: 12.VII.2010. 7 ♀♀, 10 ♂♂.

Plectrocnemia conspersa (Curtis, 1834) *

S2 Mazhiq: 20.VII.2009. 8 ♂♂, S8 Marefc: 11.VII.2010. 3 ♂♂.

Family Psychomyiidae

Lype reducta (Hagen, 1868) *

S2 Mazhiq: 18.VI.2009. 12 ♀♀, 17 ♂♂, 20.VII.2009. 5 ♀♀, 11 ♂♂; S3 Murgull: 19.VI.2009. 1 ♂; S7 Llukar: 17.VII.2009 5 ♂♂ (1 ♂ det. H. Malicky); S9 Blinajë: 11.VIII.2010. 18 ♀♀, 13 ♂♂; S12 Grabofc: 08.VII.2009. 4 ♀♀, 7 ♂♂.

Psychomyia klapaleki Malicky, 1995 *

S1 Koshtovë: 20.VI.2010. 21 ♀♀, 2 ♂♂ (2 ♂♂ + 4 ♀♀ det. H. Malicky), 16.VIII.2010. 44 ♀♀, 2 ♂♂, 17.IX.2010. 54 ♀♀, 2 ♂♂.

Psychomyia pusilla (Fabricius, 1781) *

S6 Orllan: 21.VI.2009. 31 ♀♀, 5 ♂♂, 15.VIII.2009. 24 ♀♀, 2 ♂♂, 16.IX.2009. 44 ♀♀; 17.X.2009. 23 ♀♀; S7 Llukar: 21.VI.2009. 12 ♀♀, 17.VII.2009. 21 ♀♀, 1 ♂, 15.VIII.2009. 23 ♀♀, 1 ♂; S8 Marefc: 09.V.2010. 154 ♀♀, 3 ♂♂, 12.VI.2010. 342 ♀♀, 6 ♂♂, 11.VII.2010. 238 ♀♀, 8 ♂♂, 10.VIII.2010. 213 ♀♀, 5 ♂♂, 09.IX.2010. 459 ♀♀, 6 ♂♂; S12 Grabofc: 08.VII.2009. 32 ♀♀, 5 ♂♂, 03.VIII.3009. 76 ♀♀, 4 ♂♂.

Tinodes janssensi Jacquemart, 1957 *

S9 Blinajë: 10.V.2010. 5 ♀♀, 2 ♂♂, 13.VI.2010. 2 ♀♀.

Tinodes rostocki McLachlan, 1878 *

S2 Mazhiq: 13.V.2009. 3 ♀♀, 13 ♂♂; S3 Murgull: 14.V.2009. 9 ♀♀, 6 ♂♂, 20.VII.2009. 5 ♀♀, 3 ♂♂; S4 Kaqandoll: 14.V.2009. 14 ♀♀, 7 ♂♂; S5 Siqevë: 13.V.2009. 3 ♀♀, 8 ♂♂, 21.VI.2009. 12 ♀♀, 31 ♂♂, 17.VII.2009. 3 ♀♀, 4 ♂♂; S6 Orllan: 21.VI.2009. 2 ♂♂, 17.VII.2009. 4 ♂♂; S10 Mollopolc: 4 ♂♂, 14.IX.2009. 5 ♀♀.

Tinodes unicolor (Pictet, 1834) *

S10 Mollopolc: 13.X.2010. 6 ♀♀, 7 ♂♂.

Tinodes sp.♀

P11 Caralevë: 12.VI.2010. 8 ♀♀, 12.VII.2010. 7 ♀♀, 14.VIII.2010. 8 ♀♀.

Family Phryganeidae

Agrypnia varia (Fabricius, 1793) *

S1 Koshtovë: 16.VIII.2010. 8 ♀♀, 12 ♂♂.

Family Brachycentridae

Micrasema minimum McLachlan, 1876 *

S7 Llukar: 21.VI.2009. 13 ♀♀, 27 ♂♂, 17.VII.2009. 4 ♀♀, 7 ♂♂.

Micrasema sericeum Klapalek, 1902 *
S1 Koshtovë: 18.VI.2009. 13 ♀♀, 33 ♂♂, 20.VII.2010. 12 ♀♀, 23 ♂♂, 13 ♀♀, 33 ♂♂, 20.VII.2010. 12 ♀♀, 23 ♂♂.

Family Limnephilidae

Anabolia furcata Brauer, 1857 *
S12 Grabofc: 06.VI.2010. 6 ♀♀, 03.VIII.2009. 5 ♀♀, 9 ♂♂, 06.IX.2009. 13 ♀♀, 18 ♂♂.

Chaetopteryx bosniaca Marinković, 1955 *
S3 Murgull: 19.X.2009. 1 ♀, 11.X.2010. 11 ♀♀, 12 ♂♂; S9 Blinajë: 11.X.2010. 11 ♀♀, 12 ♂♂.

Drusus botosaneanui Kumanski, 1968 *
S2 Mazhiq: 16.VIII.2009. 12 ♀♀, 4 ♂♂, 17.IX.2009. 23 ♀♀, 18 ♂♂; S3 Murgull: 17.VIII.2009. 5 ♂♂, 18.IX.2009. 2 ♀♀, 9 ♂♂, 19.IX.2009. 14 ♀♀, 7 ♂♂; S4 Kaqandoll: 18.IX.2009. 14 ♀♀, 8 ♂♂, 19.X.2009. 2 ♂♂, 20.XI.2009. 4 ♀♀; S5 Siqevë: 15.VIII.2009. 13 ♀♀, 7 ♂♂, 16.IX.2009. 20 ♀♀, 15 ♂♂, 18.XI.2009. 1 ♀; S6 Orllan: 15.VIII.2009. 12 ♀♀, 5 ♂♂, 16.IX.2009. 23 ♀♀, 18 ♂♂; S7 Llukar: 15.VIII.2009. 16 ♀♀, 3 ♂♂, 16.IX.2009. 12 ♀♀, 7 ♂♂; S10 Mollopolc: 14.IX.2010. 13 ♀♀, 7 ♂.

Glyphotaelius pellucidus (Retzius, 1783) *
S12 Grabofc: 06.VI.2009. 4 ♀♀, 3 ♂♂.

Grammotaulius nigropuncatus (Retzius, 1873) *
S10 Mollopolc: 13.X.2010. 1 ♀; 06.V.2009. 3 ♂♂.

Halesus digitatus (Schrank, 1781) *
S2 Mazhiq: 17.IX.2009. 1 ♀; S5 Siqevë: 17.X.2009. 1 ♀; S7 Llukar: 17.X.2009. 4 ♀♀, 18.XI.2009. 4 ♀♀.

Limnephilus vittatus (Fabricius, 1798) *
S9 Blinajë: 10.V.2010. 3 ♂♂.

Potamophylax luctuosus (Piller & Mitterpacher, 1783) *
S10 Mollopolc: 13.VI.2010. 1 ♂ (det. H. Malicky).

Potamophylax pallidus (Klapalek, 1899)
S11 Caralevë: 14.XI.2010. 1 ♀.

Potamophylax rotundipennis (Brauer, 1857) *
S5 Siqevë: 15.IX.2009. 2 ♀♀ (det. H. Malicky); S8 Marefc: 08.X.2010. 1 ♂.

Potamophylax schmidi Marinković-Gospodnetić, 1970 *
S5 Siqevë: 13.VI.2009. 1 ♀ (det. H. Malicky).

Potamophylax sp. *
S9 Blinajë: 12.XI.2010. 1 ♀ (det. H. Malicky).

Family Goeridae

Goera pilosa (Fabricius, 1775) *
S6 Orllan: 21.VI.2009. 5 ♀♀, 7 ♂♂; S7 Llukar: 21.VI.2009. 2 ♀♀, 7 ♂♂; S12 Grabofc: 08.VII.2009. 12 ♀♀, 21 ♂♂, 03.VIII.2009. 13 ♀♀, 7 ♂♂.

Lithax obscurus (Hagen, 1859) *
S6 Orllan: 21.VI.2009. 3 ♂♂; S7 Llukar: 13.V.2009. 37 ♀♀, 36 ♂♂.

Silo graellsi Pictet, 1865 *
S2 Mazhiq: 18.VI.2009. 8 ♀♀, 14 ♂♂; S4 Kaqandoll: 14.V.2009. 1 ♂; S5 Siqevë: 21.VI.2009. 6 ♀♀, 7 ♂♂.

Silo pallipes (Fabricius, 1781) *
S3 Murgull: 14.V.2009. 2 ♀♀, 6 ♂♂.

Silo piceus (Brauer, 1857) *

S1 Koshtovë: 16.IV.2010. 6 ♀♀, 2 ♂♂, 13.V.2010. 18 ♀♀, 11 ♂♂, 18.VI.2010. 4 ♀♀, 1 ♂; S4 Kaqandoll: 19.VI.2009. 44 ♀♀, 21 ♂♂; S6 Orllan: 19.VI.2009: 4 ♀♀, 23 ♂♂; S7 Llukar: 1 ♀, 14 ♂♂, 21.VI.2009. 4 ♀♀, 7 ♂♂, 17.VII.2009. 12 ♀♀, 24 ♂♂, 15.VIII.2009. 3 ♀♀, 5 ♂♂; S12 Grabofc: 03.VIII.2009. 31 ♀♀, 19 ♂♂.

Family Lepidostomatidae

Lepidostoma basale (Kolenati, 1848)

S3 Murgull: 20.VII.2009. 8 ♀♀, 18.IX.2009. 1 ♂; S4 Kaqandoll: 14.V.2009. 24 ♀♀, 29 ♂♂, 19.VI.2009. 6 ♀♀, 1 ♂, 17.VIII.2009. 3 ♀♀, 4 ♂♂.

Family Leptoceridae

Adicella filicornis (Pictet, 1834) *

S10 Mollopolc: 13.X.2010. 2 ♂♂ (det. H. Malicky).

Adicella syriaca Ulmer, 1907 *

S12 Grabofc: 06.VI.2009. 6 ♀♀, 4 ♂♂.

Athripsodes bilineatus (Linnaeus, 1758) *

S6 Orllan: 21.VI.2009. 9 ♀♀, 26 ♂♂ (6 ♂♂, 1 ♀ det. H. Malicky); 17.07.2009. 13 ♀♀, 19 ♂♂; S7 Llukar: 21.VI.2009. 5 ♀♀, 2 ♂♂, 17.VII.2009. 14 ♀♀, 8 ♂♂; S9 Blinajë: 13.VI.2010. 3 ♀♀, 13 ♂♂; S10 Mollopolc: 14.VII.2010. 8 ♀♀, 21 ♂♂, 15.VIII.2010. 6 ♀♀, 9 ♂♂, 13.X.2010. 3 ♀♀, 1 ♂, 13.XI.2010. 4 ♂♂; S12 Grabofc: 06.VI.2009. 13 ♀♀, 17 ♂♂; 08.VII.2009. 6 ♂♂.

Athripsodes cinereus (Curtis, 1834) *

S8 Marefc: 09.V.2010. 5 ♂♂, 12.VI.2010. 4 ♀♀, 8 ♂♂, 11.VII.2010. 2 ♀♀, 8 ♂♂, 10.VIII.2010. 12 ♀♀, 24 ♂♂.

Ceraclea albimacula (Rambur, 1842) *

S12 Grabofc: 06.VI.2009. 2 ♀♀, 7 ♂♂, 08.VII.2009. 4 ♀♀, 3 ♂♂, 03.VIII.2009. 1 ♂.

Ceraclea dissimilis (Stephens, 1836) *

S12 Grabofc: 03.VIII.3009. 1 ♂.

Leptocerus interruptus (Fabricius, 1775) *

S3 Murgull: 20.VII.2009. 2 ♂♂; S8 Marefc: 11.VII.2010. 7 ♂♂; S12 Grabofc: 06.VI.2009. 13 ♀♀, 21 ♂♂, 08.VII.2009. 13 ♀, 27 ♂♂.

Mystacides azurea (Linnaeus, 1761) *

S6 Orllan: 17.VII.2009. 6 ♀♀, 29 ♂♂; S8 Marefc: 09.V.2010. 2 ♀♀, 5 ♂♂, 12.VI.2010. 5 ♀♀, 3 ♂♂, 11.VII.2010. 7 ♀♀, 3 ♂♂, 10.VIII.2010. 4 ♀♀, 9 ♂♂; S9 Blinajë: 10.V.2010. 21 ♀♀, 43 ♂♂, 13.VI.2010. 13 ♀♀, 29 ♂♂, 12.VII.2010. 6 ♀♀, 8 ♂♂, 11.VIII.2010. 12 ♀♀, 23 ♂♂, 10.IX.2010. 4 ♀♀, 9 ♂♂; S12 Grabofc: 03.VIII.2009. 5 ♀♀, 8 ♂♂, 06.IX.2009. 5 ♀♀, 8 ♂♂.

Mystacides nigra (Linnaeus, 1758) *

S9 Blinajë: 10.V.2010. 11 ♀♀, 32 ♂♂, 12.VII.2010. 3 ♀♀, 9 ♂♂; S12 Grabofc: 06.V.2009. 6 ♀♀, 06.VI.2009. 4 ♀♀, 3 ♂♂, 08.VII.2009. 5 ♀♀, 9 ♂♂.

Family Sericostomatidae

Oecismus monedula (Hagen, 1859) *

S2 Mazhiq: 18.VI.2009. 3 ♂♂; S8 Marefc: 6 ♀♀, 9 ♂♂; S12 Grabofc: 05.IV.2009. 3 ♀♀, 6 ♂♂.

Sericostoma flavicorne Schneider, 1845 *

S1 Koshtovë: 13.V.2010. 3 ♀♀, 1 ♂, 18.VI.2010. 5 ♀♀, 6 ♂♂; S3 Murgull: 20.VII.2009. 3 ♀♀, 7 ♂♂; S4 Kaqandoll: 14.V.2009. 2 ♂♂, 19.VI.2009. 7 ♀♀, 12 ♂♂.

Family Helicopsychidae

Helicopsyche bacescui Orghidan & Botosaneanu, 1953 *

S9 Blinajë: 10.V.2010. 4 ♂♂.

Family Beraeidae

Beraea maurus (Curtis, 1834) *

S6 Orllan: 17.VII.2009. 2 ♂♂.

Beraeamyia hrabei Mayer, 1937 *

S7 Llukar: 17.VII.2009. 2 ♂♂ (1 ♂ det. H. Malicky); S10 Mollopolc: 11.VI.2010. 2 ♂♂, 14.VII.2010. 9 ♀♀, 6 ♂♂.

Ernodes articularis (Pictet, 1834) *

S5 Siqevë: 21.VI.2009. 2 ♂♂, 17.VII.2009. 1 ♂; S10 Mollopolc: 11.VI.2010. 5 ♂♂.

Discussion

Most of the species collected during this investigation belong to the European fauna (27) followed by the Euro-Asian group with 23 species, the Balkanic group with 9 species, the Western-Palearctic group with 8 species, the Carpathian-Balkanic group with 5 species and the Palearctic group with 4 species.

Besides the common and widespread species that are also known from the surrounding countries in the region, we found several species that were previously considered endemics for certain regions on the Balkan Peninsula and/or South-Eastern Europe: *Tinodes janssensi*, *Psychomyia klapaleki*, *Potamophylax schmidi*, *Hydropsyche emarginata* and *Drusus botosaneanui*. We also found species whose occurrences were unexpected in this part of Europe: *Agapetus delicatulus*, *Potamophylax rotundipennis*, *Ceraclea albimacula*, *Helicopsyche bacescui*, *Adicella filicornis*, *Beraea maurus* and *Beraeamyia hrabei*.

For example, *Agapetus delicatulus* is a widespread species in Europe and its range extends to the Western Asia Minor. According to present knowledge it is, however, absent from most part of the Balkan Peninsula. The closest areas to Kosovo from which it is reported are Albania and Bulgaria (Chvojka 1997; Kumanski 1985). The limited number of localities and our finding this species in Kosovo suggests that its distribution is greater than previously thought and extends farther south on the Balkan Peninsula. The species *Psychomyia klapaleki* was described from Slovenia (Malicky 1995) but is also known from Croatia, Bosnia and Hercegovina and Serbia (Stanić-Koštroman 2009; Vučković 2011; Živić et al. 2006). The finding in Kosovo suggests that the distribution area of this species is wider than previously thought. Currently, Kosovo presents the southernmost point of its known distribution. *Tinodes janssensi* is a very rare Balkanic endemic species present in several localities in Greece (Malicky 2005), from where it was originally described, and is also reported from single localities in Albania (Chvojka 1997) and Bulgaria (Kumanski 1985). The finding in Kosovo represents the northernmost point of its known distribution. The species *Potamophylax schmidi* was described from Bosnia and Hercegovina (Marinković-Gospodnetić 1970). Besides this, *P. schmidi* is only

known from a single locality in Croatia (Malicky, per. com.) not far away from the type locality. There are several local endemic species of the genus *Potamophylax* in the Balkan Peninsula that were thought to be strictly limited to the mountains or other areas where they were found previously (Kumanski and Malicky 1999). Because of this and because of the large intervening distance, this species was not expected in Kosovo. As a result of our finding, the distributional area of *P. schmidi is* considerably enlarged. This suggests that other endemic species of the genus *Potamophylax* in the Balkan Peninsula may have wider area of distribution than currently known. The species *Potamophylax rotundipennis* was also not expected in Kosovo. This species is widespread in North-Western Europe stretching towards the East as well. Despite very detailed studies in many parts of South-Eastern Europe, the species was previously not found beyond Croatia or Romania. The finding of *P. rotundipennis* in Kosovo is a first record for ecoregion 6 and represents the southernmost locality of its distribution, remarkably enlarging its distribution range. A single specimen of this species collected in Serbia also was found in a museum collection (Živić et al. 2006), suggesting that the distribution of *P. rotundipennis* is wider than previously thought.

The species *Drusus botosaneanui* was known previously from Greece, Bulgaria, Serbia and the Sultan Mountains in Turkey (Kumanski 1988; Malicky 2005; Sipahiler 2003), and seems to be widely distributed in the Balkan Peninsula. During this investigation it was found at seven stations, making it one of the most widely distributed species in Kosovo. Recently this species was found in Albania (Oláh 2010) and Macedonia (Halil Ibrahimi unpublished results). *Ceraclea albimacula* in Europe is present only in the north-western part of the continent. The only record for this species in South-Eastern Europe is from Bosnia and Hercegovina (Stanić-Koštroman 2009). The find in Kosovo suggests that there are isolated populations of this species towards the south-eastern part of the continent, well beyond its previously known distribution area. Two species of Beraeaidae: *Beraea maurus* and *Beraeamyia hrabei* according to present knowledge are almost completely lacking from most of the Balkan Peninsula, and finding these species in Kosovo enlarges remarkably their distribution. The species *Helicopsyche bacescui* in Europe has a disjunct distribution, and recent investigations in neighboring Serbia documented its wide distribution (Živić et al. 2009). Discovering this species in Kosovo considerably enlarges its distribution towards the south-west. The presence of *Hydropsyche emarginata* and *Adicella filicornis* in Kosovo also enlarges their known distributions in South-Eastern Europe.

This study, along with other investigations (e.g. Krušnik 1987; Krušnik and Urbanič 2002; Kumanski 1985, 1988; Kumanski and Malicky 1999; Malicky 2005; Marinković-Gospodnetić 1966, 1975, 1980; Obr 1969; Oláh 2010; Oláh et al. 2011; Stanić-Koštroman 2009; Živić et al. 2002, 2006, 2009) have greatly expanded the biogeographical knowledge of Trichoptera in the Balkan Peninsula. The collection data of caddisflies presented in this paper enhance our knowledge of distributional patterns for several species in South-Eastern Europe and Europe as a whole. Further investigations in Kosovo and other parts of Europe where caddisfly distributional data are scarce or lacking will enable better practical approaches in conservation plans and protection efforts for this group of aquatic insects.

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The genus *Shirozuella* Sasaji (Coleoptera, Coccinellidae, Shirozuellini) from the Chinese mainland

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Abstract

The genus *Shirozuella* Sasaji, 1967 from the Chinese mainland is reviewed. Eight species are recognized, including four new species: *S. motuoensis* **sp. n.**, *S. tibetina* **sp. n.**, *S. unciforma* **sp. n.**, and *S. guoyuei* **sp. n.** Male genitalia of *S. parenthesis* Yu and *S. quadrimacularis* are described for the first time. All species are described and illustrated. A key and distribution map to the known species from the Chinese mainland are given.

Keywords

Coleoptera, Coccinellidae, Shirozuellini, *Shirozuella*, new species, China

Introduction

The genus *Shirozuella* was established by Sasaji (1967) with *Shirozuella mirabilis* from Taiwan, China, as type species. It is a peculiar genus as follows: Clypeus distinctly expanded laterally, but antennal insertions not entirely hidden under the clypeus and distinctly visible in the lateral aspect, and labrum relatively long and exposed in front of the clypeus; antennae moderate in length with a distinct club; terminal maxillary palpomere

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very elongate, not distinctly broadening apically; underside of head capsule with deep furrows beside the mouth parts, for the reception of the retracted antennae. Based on these characteristics, Sasaji (1967) established the tribe Shirozuellini for reception of the genus *Shirozuella* and *Promecopharus* Sicard, 1910. Presently, Shirozuellini includes five genera (Miyatake 1994), *Shirozuella* Sasaji, *Promecopharus* Sicard, *Medamatento* Sasaji, 1989, *Ghanius* Ahmad, 1973, and *Sasajiella* Miyatake, 1994. Seago et al. (2011) listed *Guillermo* Ślipiński, 2007 and *Poorani* Ślipiński, 2007 as Shirozuellini (Coccinellinae) in a table. Although this was purported to be the original placement, Ślipiński (2007) had actually placed these genera in Coccidulini. Regardless, nothing in these recent analyses provided a justification for the inclusion of *Guillermo* and *Poorani* in Shirozuellini.

The genus *Shirozuella* is something of a taxonomic enigma. It is similar to Telsimiini of the Chilocorinae in having the *Chilocorus*-like clypeus, but the features of the antennae and maxillae, and the number of abdominal ventrites, as well as the structure of the head capsule are different than in the latter. A relatively close affinity with Sticholotidini is suggested by the very elongate maxillary palpi, the femora not strongly flattened, the relatively long antennae with a distinctly spindle shaped club, and the ventrally articulated labial palpi. Similarly, an affinity with Serangiini is supported by the possession of longitudinal furrows on the underside of the head, and by the nearly triangular median area of the prosternum. Based on this body of evidence, Sasaji (1967, 1968) placed *Shirozuella* in the tribe Shirozuellini of the subfamily Sticholotidinae (Sasaji 1967; 1968). Seago et al's (2011) molecular analysis didn't support Sasaji's result, although it also failed to place Shirozuellini in any reasonable group. Instead, it adopted a two subfamily system for the family Coccinellidae as suggested by Ślipiński (2007), Microweiseinae and Coccinellinae, and placed Shirozuellini in Coccinellinae.

At present, the genus *Shirozuella* includes eight species distributed in Southeast and East Asia. Yu and Pang (1992) described the male genitalia of *S. mirabilis* and added two new species from Taiwan, *S. appendiculata* and *S. alishanensis*. Canepari and Milanese (1997) described a new species, *Ghanius schawalleri,* from Nepal Himalayas which was subsequently transferred to *Shirozuella* by Yu (2000[1999]). Four species were added from the Chinese mainland, *S. parenthesis*, *S. bimaculata*, *S. quadrimacularis*, *S. nibagou* (Yu 2000[1999]; Yu et al. 2000). The male genitalia of *S. bimaculata* were described by Ren et al. (2009).

Specimens of *Shirozuella* are rarely collected, and both sexes are known only for two of the eight previously described species. Most species were described based on only one or two specimens. In this paper, species of *Shirozuella* from the Chinese mainland are reviewed, and four species new to science are described, bringing the total to eight mainland species, and twelve species in all. Male genitalia of *S. parenthesis* and *S. quadrimacularis* are illustrated and described for the first time.

Materials and methods

The specimens examined were collected from China. All of them were preserved in 85% ethanol. External morphology was observed with a dissecting stereo microscope

(SteREO Discovery V20, Zeiss). The following measurements were made with an ocular micrometer: total length, from apical margin of clypeus to apex of elytra (TL); total width, across both elytra at widest part (TW=EW); height, through the highest point of elytra to metaventrite (TH); head width, including eyes (HW); pronotal length, from the middle of anterior margin to the base of pronotum (PL); pronotal width at widest part (PW); elytral length, along the suture, from the apex to the base including the scutellum (EL). Male and female genitalia were dissected, cleared in a 10% solution of NaOH by boiling for several minutes, and examined with an Olympus BX51 compound microscope.

Images were photographed with digital cameras (AxioCam HRc and Coolsnap–Pro*cf* & CRI Micro*Color), connected to the dissecting microscope. The software AxioVision Rel. 4.8 and Image–Pro Plus 5.1 were used to capture images from both cameras, and photos were cleaned up and laid out in plates with Adobe Photoshop CS 8.0.

Terminology follows Ślipiński (2007) and Ślipiński and Tomaszewska (2010).

The specimens are deposited in: South China Agriculture University, Guangzhou (SCAU), Institute of Plant & Environmental Protection, Beijing Academy of Agricultural & Forestry Science, Beijing (BAAF) and in the Institute of Zoology, Chinese Academy of Sciences, Beijing (IOZ).

Taxonomy

Genus *Shirozuella* Sasaji, 1967
http://species-id.net/wiki/Shirozuella

Shirozuella Sasaji, 1967: 24. Type species: *Shirozuella mirabilis* Sasaji, 1967
Shirozuella: Yu and Pang 1992: 37; Miyatake 1994: 274; Yu et al. 2000: 187.

Diagnosis. The tribe Shirozuellini includes five genera sharing many similar morphological characters: laterally expanded clypeus, very elongate terminal maxillary palpomere. *Shirozuella,* however can be distinguished from others by having: prosternum with distinct grooves anteriorly to receive antennae (Fig. 2) and maxillary palpi when the head is retracted; underside of head capsule with distinct grooves for reception of the retracted antennae; and antennae composed of nine antennomeres (Fig. 3).

Description. Body small, oval, relatively elongate; dorsum weakly convex and pubescent (Figs 12–29). Head moderate in size, frontal surface of capsule flattened, slightly convex; clypeus long and distinctly expanded laterally; antennae inserted laterally near the apical end of head capsule; eyes large (Fig. 1). Antennae relatively long, composed of nine antennomeres with a distinct club composed of three antennomeres, eighth antennomere longest and widest, terminal antennomere rather small and conical (Fig. 3). Labrum relatively long. Mandible, bidentate at apex (Fig. 4). Maxillary palp much longer than antenna, composed of four palpomeres; terminal palpomere very elongate, and spatulate, more than twice as long as wide, with apex obliquely

truncate (Fig. 5). Labial palp composed of 3 palpomeres and distal two palpomeres elongate and nearly cylindrical. Ventral surface of head capsule with distinct grooves for reception of retracted antennae.

Pronotum transverse, about twice as wide as long, strongly convex, lateral margins narrowly marginated and distinctly emarginated anteriorly. Scutellum medium-sized, triangular. Elytra elongate and weakly convex, with conspicuous swelling near humeral edge. Elytral base hardly wider than base of pronotum; elytral margins with very narrow rim, but distinctly visible from above. Hind wing well developed, with veins rather well-developed.

Prosternum short in front of coxae, distinctly grooved to receive antennae and palpi; prosternal process broad without longitudinal carinae. Mesoventrite broadly and nearly quadrate, slightly wider than long, anterior margin emarginate. Metaventrite broad, discrimen complete. Elytral epipleuron relatively narrow, nearly horizontal, not foveate, obsolete in apical third. Abdomen with six ventrites, ventrite 1 with complete postcoxal lines (Fig. 6). Legs relatively long; femora distinctly swollen and grooved to receive tibiae when retracted; tibiae slender and simple, tarsi composed of 3 tarsomeres (Fig. 7).

Distribution. China (Gansu, Hunan, Henan, Shanxi, Shaanxi, Sichuan, Taiwan, Tibet, Yunnan), Japan, Nepal.

Key to species of *Shirozuella* Sasaji from the Chinese mainland

1 Elytron with a yellow or yellowish brown spot or stripe **2**
– Elytron with two yellow or yellowish brown spots or stripes **6**
2 Elytron with a nearly rounded spot **3**
– Elytron with a long and diagonal stripe **4**
3 Penis short and stout, penis guide in ventral view nearly triangular, apex pointed (Fig. 10). TL: 1.71–1.86mm, TW: 1.19–1.32mm ... ***S. bimaculata***
– Penis long and slender, penis guide in ventral view almost parallel at basal 2/3, apex truncate with a pair of small triangular projections on each side (Fig. 39). TL: 1.58–1.81mm, TW: 1.06–1.22 mm ..... ***S. motuoensis***
4 Elytral macula emarginate antero-laterally (Figs 18–19). Abdominal postcoxal line complete, reaching ½ length of ventrite 1 (Fig. 41). TL: 1.88mm, TW: 1.19 mm ..... ***S. nibagou***
– Elytral macula without antero-lateral emargination Abdominal postcoxal line complete, reaching more than ½ length of ventrite 1 ..... ***5***
5 Elytra black, apex very narrowly brown (Figs 21–22). Anterior angles of pronotum black (Fig. 23). Apex of penis guide pointed, slightly curved outwardly (Fig. 46). TL: 1.68–1.75mm, TW: 1.02–1.12mm ..... ***S. tibetina***
– Elytra reddish brown, apical 1/10 yellow (Figs 24–25). Anterior angles of pronotum yellow (Fig. 26). Apex of penis guide unciform (Fig. 51). TL: 1.65–1.75mm, TW: 1.12–1.29mm ..... ***S. unciforma***
6 Each elytron with two longitudinal yellow spots (Fig. 27). Pronotum black (Fig. 27). TL: 1.86mm, TW: 1.2mm ..... ***S. quadrimacularis***

– Each elytron with two transverse bands. Pronotum yellow, or bicolored.....**7**
7 Pronotum with disk black and lateral margins yellow (Fig. 30). TL: 1.81–2.31mm, TW: 1.24–1.58mm.....***S. parenthesis***
– Pronotum yellow (Fig. 33). TL: 1.94mm, TW: 1.32mm..... ***S. guoyuei***

***Shirozuella bimaculata* Yu, 2000**
http://species-id.net/wiki/Shirozuella_bimaculata
Figs 1–14, 68

Shirozuella bimaculata Yu, 2000[1999]: 63; Ren et al. 2009: 42.

Diagnosis. This species can be identified as follows: pronotum uniformly yellow (Fig. 12), elytron black with a large yellow spot (Fig. 12), penis short and stout (Fig. 8), and penis guide short and subtriangular (Figs 9–10).

Description. TL: 1.71–1.86mm, TW: 1.19–1.32mm, TH: 0.63–0.69mm, TL/TW: 1.41–1.44; PL/PW: 0.44–0.47; EL/EW: 1.08–1.14.

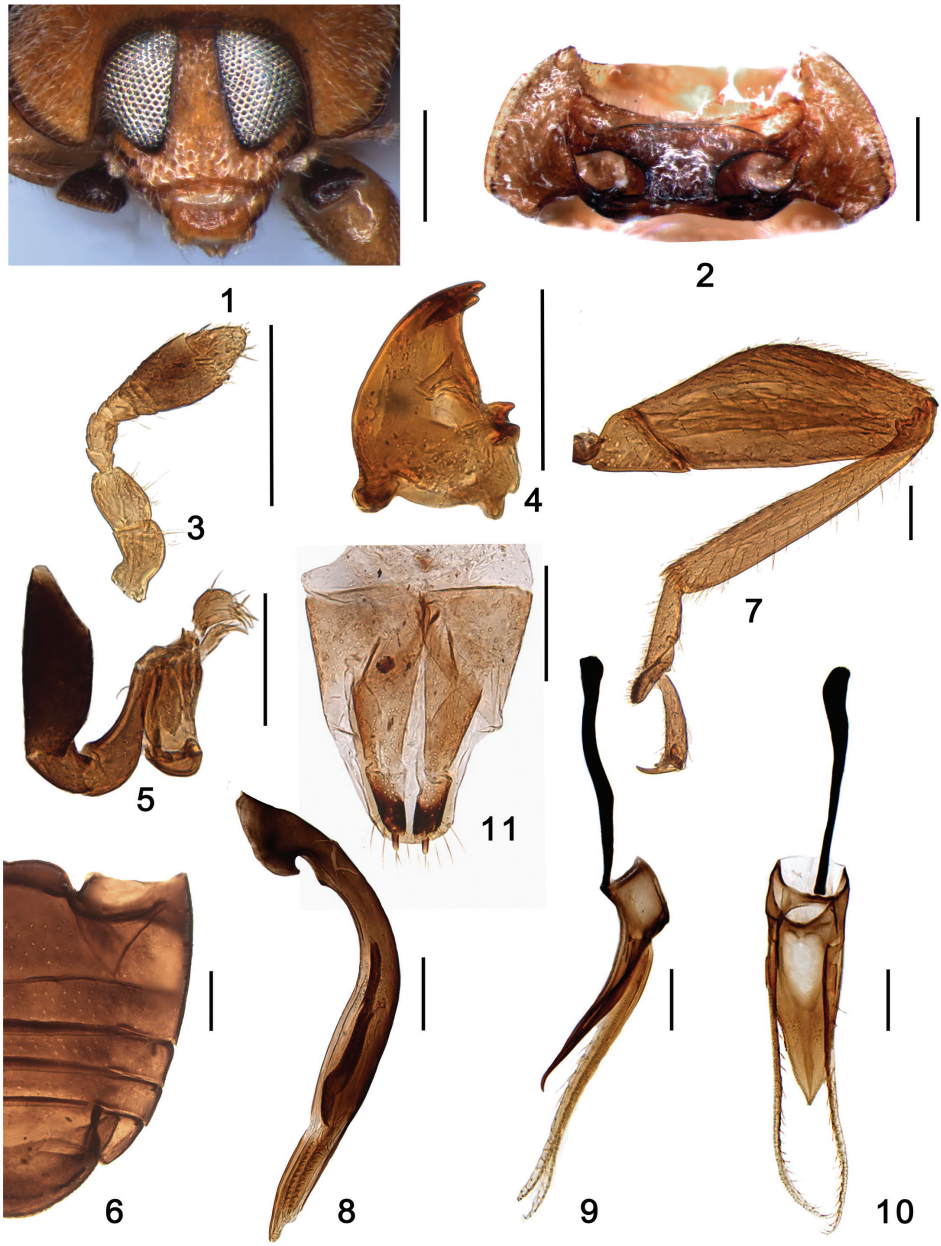
Body small, elongate oval, weakly convex, dorsum covered with relatively sparse pubescence (Figs 12–14). Head yellow with maxillary palpus dark brown. Pronotum yellow, scutellum dark brown. Elytra blackish, with two large yellow spots placed on apical half, apex narrowly yellow. Ventral surfaces uniformly dark brown, legs yellow.

Head moderately large (Fig. 1), 0.35× elytral width (HW/EW=2.86); frontal surface of head capsule slightly convex; punctures on frons fine and sparse, separated by about 2.0–3.0× a diameter, with sparse long setae in punctures; eyes large, narrowly separated; widest interocular distance 2× narrowest width. Pronotum relatively small, 0.74× elytral width (PW/EW=1:1.36), pronotal punctures fine, inconspicuous, smaller than those on head, separated by 3.0–4.0× a diameter. Scutellum moderately large, triangular, visible from above. Punctures on elytra moderately large, irregular, obviously larger than those on pronotum, separated by 1.0–2.0× a diameter.

Surface of prosternum slightly shagreened, punctures inconspicuous, with sparse short setae. Mesoventrite shiny and glabrous, punctures inconspicuous, with several short setae. Metaventrite broad and glabrous, median part concave, with complete median discrimen; punctures sparse and large, with short sparse setae. Abdominal postcoxal line complete, v-shaped, reaching to 2/3 length of ventrite 1, or almost touching posterior margin (Fig. 6).

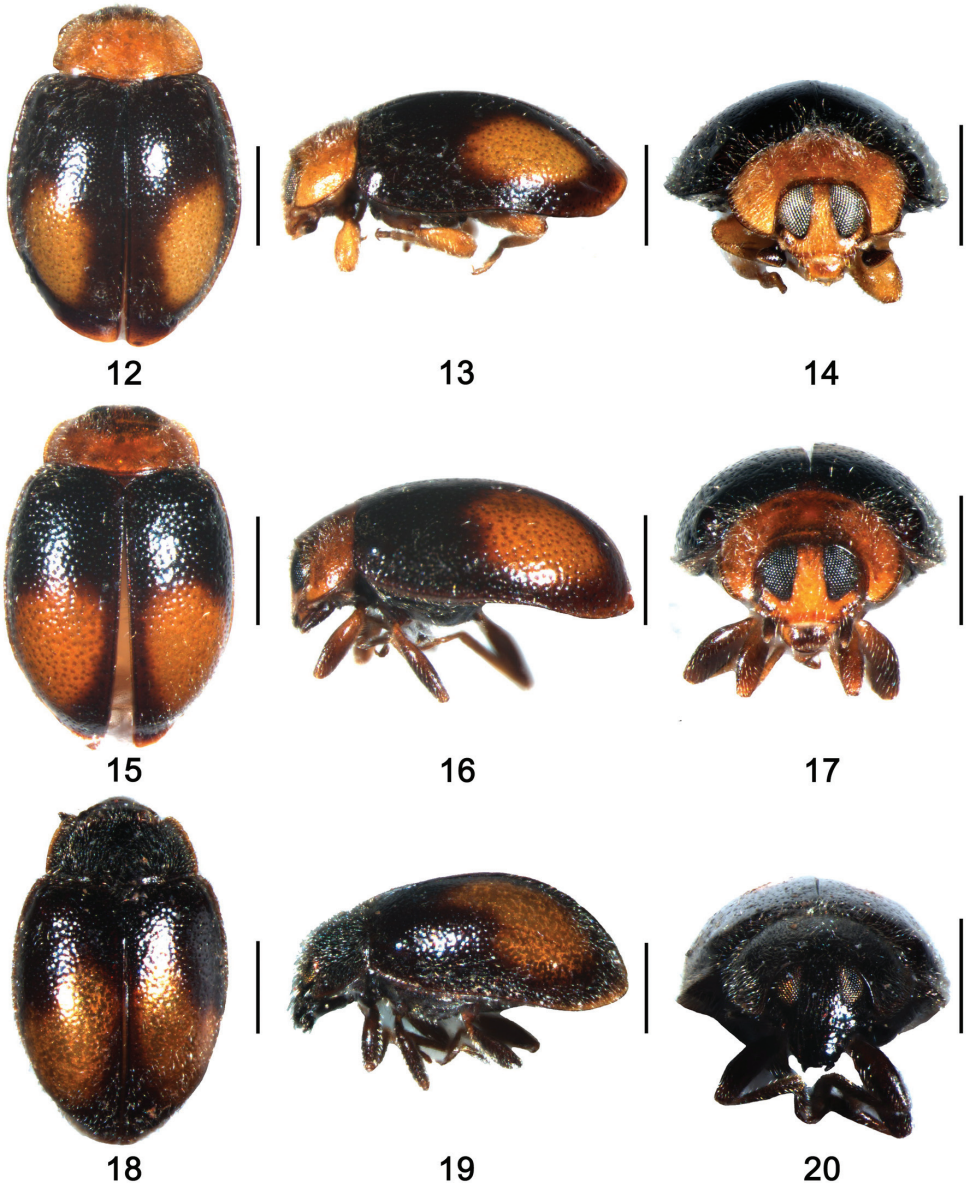
Male genitalia: Penis short and stout, penis capsule with indistinct outer arm and short inner one (Fig. 8); penis guide in lateral view slender, widest at base, tapering to apex, apex pointed and slightly curved (Fig. 9); parameres slender, sparsely setose on apical half, about 1.65× as long as penis guide (Fig. 9); penis guide in ventral view short and stout, subtriangular, widest at base, tapering to apex, apex pointed (Fig. 10).

Female genitalia: Coxites elongate, about 3.0 times as long as wide, tapering to blunt, darker apices, styli distinct, with short terminal setae (Fig. 11); spermatheca not sclerotized.



Figures 1–11. *S. bimaculata* Yu. **1** head, frontal view **2** prothorax, ventral **3** antenna **4** mandible **5** maxilla **6** abdomen **7** hind leg **8–10** male genitalia **8** penis **9** tegmen, lateral view **10** tegmen, ventral view **11** female genitalia: ovipositor. Scale bars: **1–2**: 0.2mm; **3–10**: 0.1mm.

Types examined. Holotype: 1♀, **China, Henan:** Huangshian, Laojieling, Taiping Town, Xixia County, [33°37.53'N, 111°46.17'E], ca 1500m, 19.vii.1998, Yu Guoyue leg. (BAAF).



Figures 12–20. 12–14 *S. bimaculata* Yu. **12** dorsal view; **13** lateral view **14** frontal view **15–17** *S. motuoensis* sp. n. **15** dorsal view **16** lateral view **17** frontal view **18–20** *S. nibagou* Yu. **18** dorsal view **19** lateral view **20** frontal view. Scale bars: 0.5mm.

Other specimens examined. 1♂1♀, **China, Gansu:** Maijishan Forest Park, Tianshui, [34°20.81'N, 106°0.71'E], ca 1500m, 10.viii.2008, Wang XM leg. (SCAU); 4♂♂, Maijishan Forest Park, Tianshui, [34°20.81'N, 106°0.71'E], ca 1650m, 6.viii.2009, Wang XM et al. leg. (3♂♂ SCAU; 1♂ IOZ); **Henan:** 2♂♂2♀♀, Longy-

uwan Forest Park, Luanchuan, [33°41.16'N, 111°50.72'E], ca 1400m, 11.vii.2009, Wang XM et al. Leg. (1♂1♀ SCAU, 1♂1♀ IOZ); **Shaanxi:** 2♂♂2♀♀, Xunyangba, Ningshan, [33°32.87'N, 108°33.13'E], ca 1600m, 23.vii.2009, Wang XM et al. Leg. (SCAU).

Distribution. China (Gansu, Henan, Shaanxi).

***Shirozuella motuoensis* sp. n.**
urn:lsid:zoobank.org:act:8705EDF0-F6A7-4298-94A6-8A9F2AB90F4F
http://species-id.net/wiki/Shirozuella_motuoensis
Figs 15–17, 36–40, 68

Diagnosis. This species is close to *S. bimaculata* in general appearance, but it is easily distinguished from the latter by the long and slender penis and the special shape of penis guide (Figs 37–39).

Description. TL: 1.58–1.81mm, TW: 1.06–1.22mm, TH: 0.63–0.82mm, TL/TW: 1.49–1.50; PL/PW: 0.48–0.50; EL/EW: 1.14–1.31.

Body small, elongate oval, weakly convex, dorsum covered with relatively sparse pubescence (Figs 15–17). Head yellow to yellowish brown, with labrum and maxillary palpus brown. Pronotum yellowish brown, scutellum dark brown. Elytra blackish, with two large yellow spots placed on apical half, apex narrowly yellow. Prosternum dark brown, meso- and metaventrite black, elytral epipleura and legs brown.

Head moderately large, 0.41× elytral width (HW/EW=2.46); frontal surface of head capsule slightly convex and rather weakly anteriorly inclined below; punctures on frons fine and sparse, inconspicuous, separated by 2.0–4.0× a diameter, with sparse long setae in punctures; eyes relatively large, narrowly separated; widest interocular distance 1.3× narrowest width. Pronotum relatively small, 0.69× elytral width (PW/EW=1: 1.45), pronotal punctures very fine and inconspicuous, smaller than those on head, separated by 3.0–4.0× a diameter. Scutellum moderately large, triangular, visible from above. Punctures on elytra moderately large, irregular, obviously larger than those on pronotum, separated by 1.0–2.5× a diameter.

Surface of prosternum mat and slightly shagreened, punctures inconspicuous, with sparse short setae. Mesoventrite slightly shagreened, punctures inconspicuous, with several short setae. Metaventrite broad and glabrous, median part concave, with complete median discrimen; punctures sparse and fine, separated by 2.0–6.0× a diameter, with short sparse setae. Abdominal postcoxal line complete, v-shaped, touching posterior margin of ventrite 1 (Fig. 36).

Male genitalia: Penis long and slender, strongly curved at 2/5 length, distinctly swollen at middle, penis capsule small (Fig. 37); penis guide in lateral view slender, widest at base, tapering to apex, apex pointed and slightly curved (Fig. 38); parameres slender, sparsely setose on apical half, about 2× as long as penis guide, always strongly curved at apical 2/5 length (Fig. 38); penis guide in ventral view short and stout, al-

most parallel at basal 2/3, then tapering to apex, apex truncated with a pair of small triangular projections on each side (Fig. 39).

Female genitalia: Coxities elongate, about 3.5× as long as wide, tapering to blunt, darker apices, styli small and distinct, with short terminal setae, apical area distinctly darkened (Fig. 40); spermatheca not sclerotized.

Types. Holotype: 1♂, **China, Tibet:** Hanmi, Motuo County, [29°°21.87'N, 95°7.75'E], ca 2100m, 13.x.2009, Wang XM leg. (SCAU). **Paratypes: China, Tibet:** 2♀♀, same data as holotype; 1♂, Yarang village, Motuo, [29°17.70'N, 95°16.87'E], ca 1000m, 24.x.2007, Wang XM leg. (SCAU).

Distribution. China (Tibet).

Etymology. The specific epithet refers to Motuo, the type locality of this ladybird.

***Shirozuella nibagou* Yu, 2000**
http://species-id.net/wiki/Shirozuella_nibagou
Figs 18–20, 41–43, 68

Shirozuella nibagou: Yu et al., 2000: 188.

Diagnosis. This species is easily distinguished from other *Shirozuella* by black body and elytron with a yellowish curved spot (Figs 18–19).

Description. TL: 1.88mm, TW: 1.19mm, TH: 0.76mm, TL/TW: 1.58; PL/PW: 0.56; EL/EW: 1.03.

Body small, elongate oval, weakly convex. Dorsum covered with relatively sparse pubescence (Figs 18–20). Head black. Pronotum and scutellum black. Elytron blackish, with a curved large yellowish brown spot situated between 2/5 and 4/5 elytral length to apex. Underside uniformly dark.

Head moderately large, 0.36× elytral width (HW/EW=2.77); frontal surface of head capsule flattened and rather weakly anteriorly inclined below; punctures on frons fine and sparse, separated by 2.0–3.0× a diameter, with sparse long setae in punctures; eyes relatively large, narrowly separated; widest interocular distance 1.3× narrowest width. Pronotum 0.69× elytral width (PW/EW=1: 1.44), pronotal punctures very fine, inconspicuous, smaller than those on head. Scutellum moderately large, triangular, visible from above. Punctures on elytra large, irregular, obviously larger than those on head, separated by 0.2–0.5× a diameter.

Surface of prosternum slightly mat and shagreened, punctures inconspicuous, with sparse short setae. Mesoventrite shiny and glabrous, punctures inconspicuous, with several short setae. Metaventrite broad and glabrous, median part concave, with complete median discrimen; punctures sparse and fine, with short sparse setae. Abdominal postcoxal line complete, reaching to 1/2 length of ventrite 1, then recurved basally (Fig. 41).

Male genitalia: Penis short and stout, penis capsule indistinct, apex rounded by membrane (Fig. 42); penis guide in lateral view slender, widest at base, tapering to apex, apex pointed and slightly curved; parameres slender, sparsely setose; penis guide

in ventral view short and stout, parallel at basal 6/7, then converging sharply to teat-like tip (Fig. 43).

Female genitalia: Coxities elongate, tapering to blunt, darker apices, styli small and distinct, with short terminal setae; spermatheca not sclerotized.

Types examined. Holotype: 1♂, **China, Sichuan:** Nibagou, Baoxing, [30°41.31'N, 102°42.87'E], ca viii.1997, Guo H. leg. (BAAF). **Paratype:** 1♀, same data as holotype.

Distribution. China (Sichuan).

Shirozuella tibetina **sp. n.**

urn:lsid:zoobank.org:act:BE699A24-2054-47FD-B1F2-D744ABBD67D0
http://species-id.net/wiki/Shirozuella_tibetina
Figs 21–23, 44–48, 68

Diagnosis. This species is close to *S. nibagou* in general appearance, but it can be distinguished from the latter as follows: posterior margin of abdominal postcoxal line reaching to 4/5 ventrite length (Fig. 44), and elytral spots are not curved (Figs 21–22). In *S. nibagou*, posterior margin of abdominal postcoxal line reaching to 1/2 ventrite length (Fig. 41), and elytral spots are curved (Figs 18–19). The male genitalia are also diagnostic.

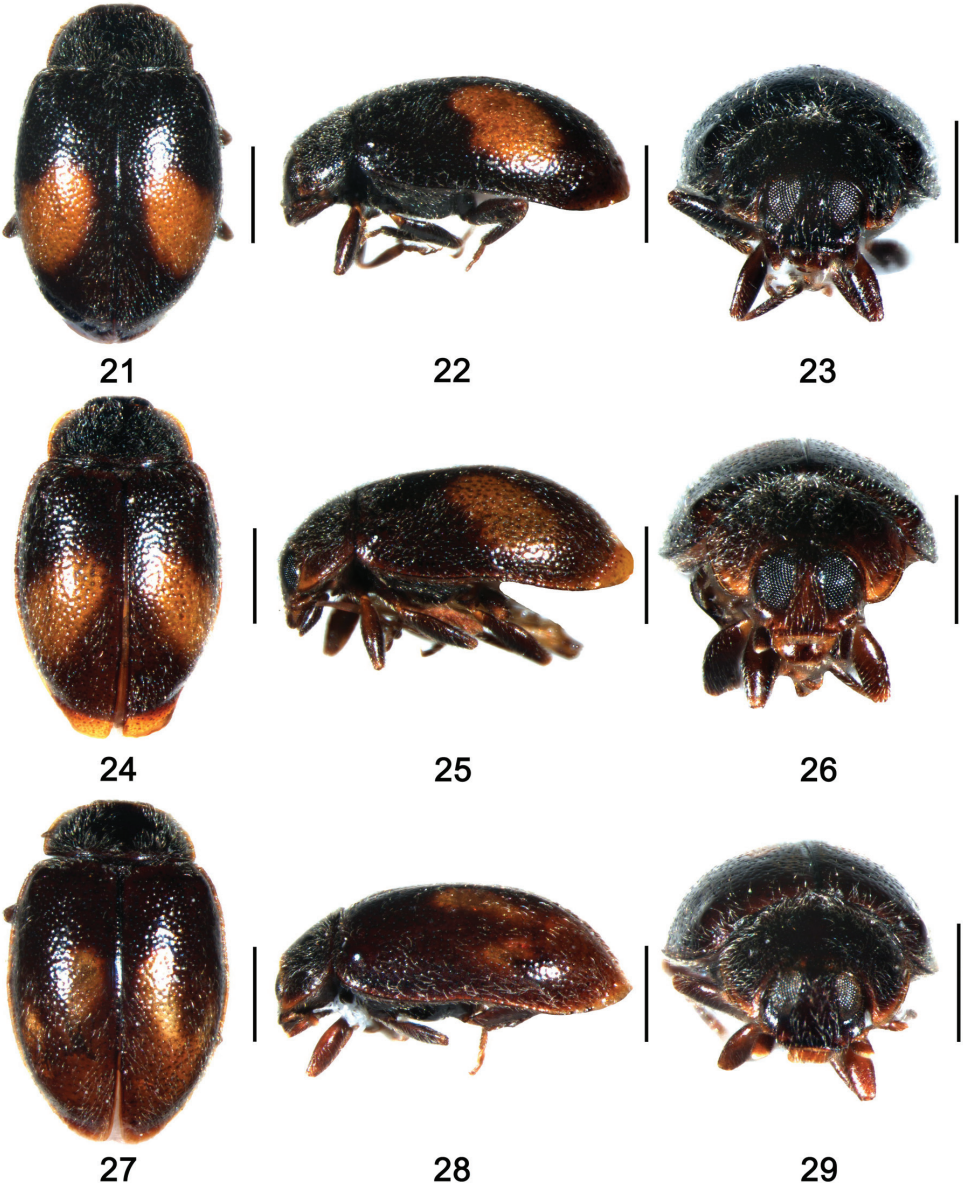
This species is also similar to *S. schawalleri* (Canepari & Milanese, 1997) in general appearance, but it can be distinguished from the latter by elytra with a curved yellowish brown spot and elongated triangular coxities. In *S. schawalleri*, spots on elytra are straight and oblique and outer margins of coxities arcuate.

Description. TL: 1.68–1.75mm, TW: 1.02–1.12mm, TH: 0.66–0.76mm, TL/TW: 1.41–1.44; PL/PW: 0.51–0.52; EL/EW: 1.18–1.19.

Body small, elongate oval, weakly convex, dorsum covered with sparse pubescence (Figs 21–23). Head black with maxillary palpus brown. Pronotum black with anterior slightly brown, scutellum black. Elytron black, with a curved yellowish brown spot situated between 2/5 and 4/5 elytral length to apex. Ventral surface dark, except elytral epipleura and legs brown.

Head moderately large, 0.38× elytral width (HW/EW=2.62); frontal surface of head capsule flattened and rather weakly anteriorly inclined below; punctures on frons fine, separated by 2.0–4.0× a diameter, with sparse long setae in punctures; eyes relatively large, narrowly separated; widest interocular distance about 1.5× narrowest width. Pronotum 0.68× elytral width (PW/EW=1: 1.48), pronotal punctures very fine, smaller than those on head, separated by 2.0–4.0× a diameter. Scutellum moderately large, triangular. Punctures on elytra moderately large, obviously larger than those on pronotum, separated by 1.5–2.5× a diameter.

Pro- and mesoventrite slightly shagreened, punctures inconspicuous, with sparse short setae. Metaventrite broad and glabrous, median part concave, with complete median discrimen; punctures fine and sparse, separated by about 2.0–4.0× a diameter,



Figures 21–29. 21–23 *S. tibetina* sp. n. **21** dorsal view; **22** lateral view **23** frontal view **24–26** *S. unciforma* sp. n. **24** dorsal view **25** lateral view **26** frontal view **27–29** *S. quadrimacularis* Yu **27** dorsal view **28** lateral view **29** frontal view. Scale bars: 0.5mm.

with short sparse setae. Abdominal postcoxal line complete, reaching to 4/5 length of ventrite 1 (Fig. 44).

Male genitalia: Penis short and stout, penis capsule distinct, apex blunt and slightly swollen (Fig. 45); penis guide in lateral view stout, widest at basal 2/5, apex pointed

and curved (Fig. 46); parameres slender, sparsely setose at apex, distinctly longer than penis guide (Fig. 46); penis guide in ventral view short and stout, parallel at basal 10/11, then converging sharply to pointed apex (Fig. 47).

Female genitalia: Coxities elongate, subtriangular, about 3.5 × as long as wide, tapering to blunt, darker apices, styli small and distinct, with short terminal setae (Fig. 48); spermatheca not sclerotized.

Types. Holotype: China, Tibet: 1♂, Xiayadong town, Yadong, [28°29.29'N, 97°1.36'E], ca 2800m, 1.x.2009, Wang XM et al. leg.(SCAU). **Paratypes: Tibet:** 1♂6♀♀, same data as holotype (SCAU); 2♀♀, North of Chayu City, [28°42.03'N, 97°27.77'E], ca 2300m, 18.x.2007, Wang XM leg. (SCAU); 1♂1♀, Le Village, Cuona, [27°48.63'N, 91°44.98'E], ca 2400m, 3.x.2009, Wang XM et al. Leg. (SCAU).

Distribution. China (Tibet).

Etymology. The specific epithet is in reference to Tibet, the type locality of this ladybird.

Shirozuella unciforma sp. n.

urn:lsid:zoobank.org:act:21E76C93-6EB3-4933-820B-46F86E2E142F
http://species-id.net/wiki/Shirozuella_unciforma
Figs 24–26, 49–53, 68

Diagnosis. This species is close to *S. tibetina*, but it can be distinguished from the latter as follows: elytral apex is distinct yellow (Figs 24–25), penis apex is slightly swollen and penis guide's apex unciform (Figs 50–51). Coxities are also diagnostic (Fig. 53).

Description. TL: 1.65–1.75mm, TW: 1.12–1.29mm, TH: 0.66–0.73mm, TL/TW: 1.36–1.47; PL/PW: 0.52–0.55; EL/EW: 1.05–1.12.

Body small, elongate oval, weakly convex, dorsum covered with relatively sparse pubescence (Figs 24–26). Head brown to black. Pronotum black with anterior corners clearly yellowish brown, scutellum black. Elytron brown to black, with an elongate oblique yellowish brown spot situated between 2/5 and 4/5 elytral length to apex. Pro- and mesoventrite brown, metaventrite black, elytral epipleura brown. Legs brown with coxae yellow.

Head moderately large (Fig. 26), about 0.31× elytral width (HW/EW=3.25); frontal surface of head capsule slightly convex and rather weakly anteriorly inclined below; punctures on frons fine, separated by 2.0–2.5× a diameter, with sparse long setae in punctures; eyes relatively large, narrowly separated; widest interocular distance about 1.5× narrowest width. Pronotum relatively small, 0.62× elytral width (PW/EW=1:1.63), pronotal punctures very fine, smaller than those on head, separated by 1.5–3.5× a diameter. Scutellum moderately large, triangular, visible from above. Elytra rather elongate and weakly convex, with conspicuous swelling near humeral edge. Punctures on elytra moderately large, irregular, obviously larger than those on pronotum, separated by 1.5–2.5× a diameter.

Pro- and mesoventrite slightly shagreened, punctures inconspicuous, with several short setae. Metaventrite broad and glabrous, median part concave, with complete median discrimen; punctures sparse and fine, separated by 2.5–3.0× a diameter, with short sparse setae. Abdominal postcoxal line complete, reaching to 4/5 length of ventrite 1 (Fig. 49).

Male genitalia: Penis short and stout, penis capsule inconspicuous, apex rounded (Fig. 50); penis guide in lateral view stout, widest at base, gradually tapering to 4/5 length, then abruptly narrowed, apex unciform (Fig. 51); parameres slender, straight, sparsely setose at basal half, distinctly longer than penis guide; penis guide in ventral view short and stout, almost parallel at basal 4/5, then converging sharply to apex, apex slightly blunt (Fig. 52).

Female genitalia: Coxities elongate, subtriangular, about 2.5× as long as wide, tapering to blunt apices, styli very small and inconspicuous, each with short terminal setae (Fig. 53); spermatheca not sclerotized.

Types. Holotype: 1♂, **China. Tibet:** Hanmi, Motuo County, [29°21.87'N, 95°7.75'E], ca 2100m, 13.x.2009, Wang XM leg. (SCAU). **Paratype**: 1♀, same data as holotype.

Distribution. China (Tibet).

Etymology. The specific epithet is formed from the Latin adjective *unciformus*, referring to unciform apex of penis guide.

Shirozuella quadrimacularis **Yu, 2000**

http://species-id.net/wiki/Shirozuella_quadrimacularis
Figs 27–29, 54–58, 68

Shirozuella quadrimacularis: Yu et al., 2000: 187; Ren et al. 2009: 42.

Diagnosis. This species can be distinguished from other *Shirozuella* by elytra black with four longitudinal yellow spots (Figs 27–28).

Description. TL: 1.86mm, TW: 1.2mm, TH: 0.71mm, TL/TW: 1.55; PL/PW: 0.42; EL/EW: 1.25.

Body small, elongate oval, weakly convex. Dorsum covered with relatively sparse pubescence (Figs 27–28). Head black with mouth parts brown. Pronotum black, with lateral margins and anterior corners brown. Scutellum black. Elytron blackish, with two longitudinal yellow spots, one situated at middle of elytral length, less than its width from suture, the other spot smaller, situated slightly past middle, distance to lateral margin slightly more than width of spot, elytral apex slightly yellow. Ventral surfaces uniformly black, except elytral epipleura brown. Legs brown with coxae and tarsi yellow.

Head moderately large (Fig. 29), 0.40× elytral width (HW/EW=2.50); frontal surface of head capsule slightly convex and rather weakly anteriorly inclined below; punctures on frons fine and inconspicuous, with sparse long setae in punctures; eyes

relatively large, narrowly separated; widest interocular distance about 1.5× narrowest width. Pronotum 0.68× elytral width (PW/EW=1: 1.48), pronotal punctures extremely fine, separated by 3.0–5.0× a diameter. Scutellum moderately large, triangular. Punctures on elytra moderately large, irregular, obviously larger than those on pronotum, separated by 1.0–2.0× a diameter.

Pro- and mesoventrite slightly shagreened, punctures inconspicuous, with sparse short setae. Metaventrite broad and glabrous, median part concave, with complete median discrimen; punctures sparse and fine, with short sparse setae. Abdominal postcoxal line complete, v-shaped, touching 2/3 length of ventrite 1 (Fig. 45).

Male genitalia: Penis short and stout, penis capsule small, apex rounded by membrane (Fig. 55); penis guide in lateral view stout, gradually narrowing to apex, apex pointed and curved (Fig. 56); parameres slender, sparsely setose at apex, distinctly longer than penis guide (Fig. 56); penis guide in ventral view short and stout, parallel at basal 10/11, then converging sharply to pointed apex (Fig. 57).

Female genitalia: Coxities elongate, about 3.5× as long as wide, tapering to blunt apices, styli small and distinct, with short terminal setae (Fig. 58); spermatheca not sclerotized.

Types examined. Holotype: China. Yunnan: 1♀, Lijiang, iv.1996, Yu GY leg. (BAAF).

Other specimens examined. China, Sichuan: 1♀, Dafengding, Meigu, [28°31.03'N, 103°18.22'E], ca 2400m, 21.ix.2007, Wang XM leg. (SCAU); 1♂1♀, Pass 30km SW Mianning [28°27.87'N, 101°58.51'E], ca 3000–3400m, 11–13. VII.2007, S. Murzin leg. (SCAU).

Distribution. China (Sichuan, Yunnan).

Shirozuella parenthesis Yu, 2000

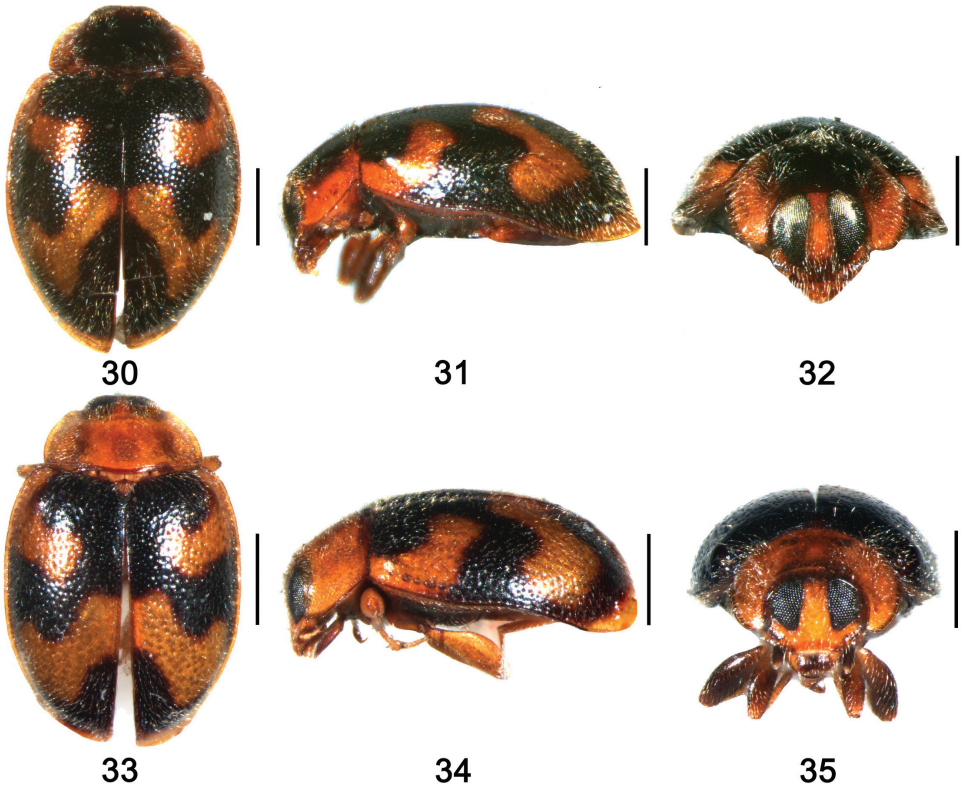
http://species-id.net/wiki/Shirozuella_parenthesis
Figs 30–32, 59–63, 68

Shirozuella parenthesis Yu, 2000[1999]: 62.

Diagnosis. This species can be identified by pronotum yellowish brown, with a large quadrate black spot and black elytron with two large curved yellowish brown strips (Figs 30–31).

Description. TL: 1.81–2.31mm, TW: 1.24–1.58mm, TH: 0.82–0.89mm, TL/TW: 1.46–1.47; PL/PW: 0.51–0.52; EL/EW: 1.10–1.15.

Body small, elongate oval, weakly convex. Dorsum covered with relatively sparse pubescence (Figs 30–31). Head brown, with maxillary palpus dark brown. Pronotum yellowish brown, with a large quadrate black spot. Scutellum dark brown. Elytron black, with two large curved yellowish brown strips, one C-shaped, situated around out margin of humeral callus, connected to basal margin of elytron, another one v-shaped, situated between 2/5 and 4/5 elytral length to apex; apex of elytron narrowly yellowish brown. Ventral surfaces uniformly dark brown, except elytral epipleura and legs brown.

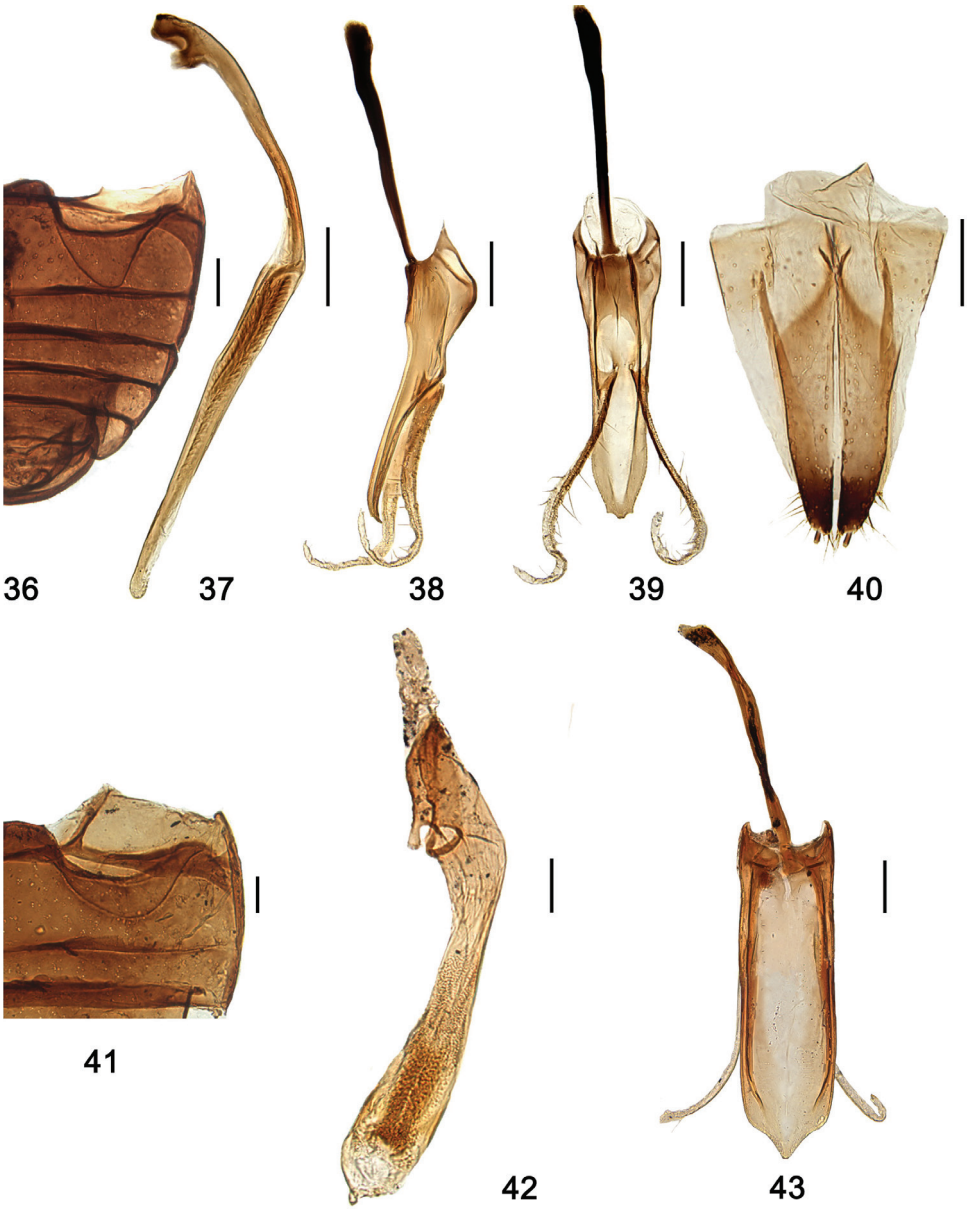


Figures 30–35. 30–32 *S. parenthesis* Yu **30** dorsal view **31** lateral view **32** frontal view **33–35** *S. guoyuei* sp. n. **33** dorsal view **34** lateral view **35** frontal view. Scale bars: 0.5mm.

Head moderately large (Fig. 32), 0.37× elytral width (HW/EW=2.68); frontal surface of head capsule flatten and rather weakly anteriorly inclined below; punctures on frons fine and dense, separated by 1.5–2.0× a diameter, with sparse long setae in punctures; eyes relatively large, distinctly broader than interocular distance; widest interocular distance about 1.6× narrowest width. Pronotum relatively small, 0.67× elytral width (PW/EW=1: 1.50), pronotal punctures very fine, smaller than those on head, separated by 2.0–5.0× a diameter. Scutellum moderately large, triangular. Punctures on elytra moderately large, obviously larger than those on pronotum, separated by 1.0–3.0× a diameter.

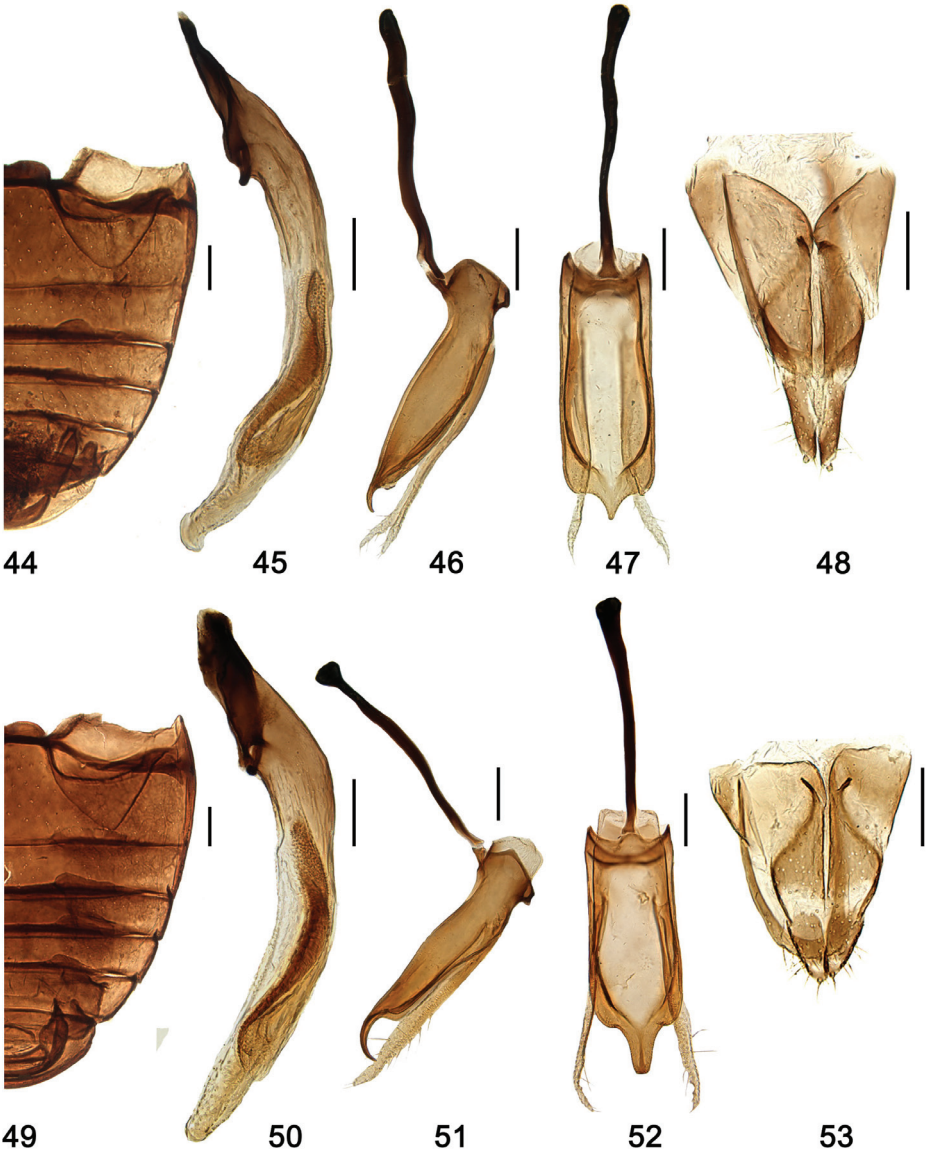
Pro- and mesoventrite slightly shagreened, punctures inconspicuous, with sparse short setae. Metaventrite broad and glabrous, median part flatten, with complete median discrimen; punctures on lateral area moderated large, separated by about 1.5–3.0× a diameter, with short sparse setae. Abdominal postcoxal line complete, reaching to 2/3 length of ventrite 1, then recurved basally (Fig. 59).

Male genitalia: Penis long and slender, penis capsule inconspicuous (Fig. 60); penis guide in lateral view slender, widest at base, tapering to apex, apex pointed and



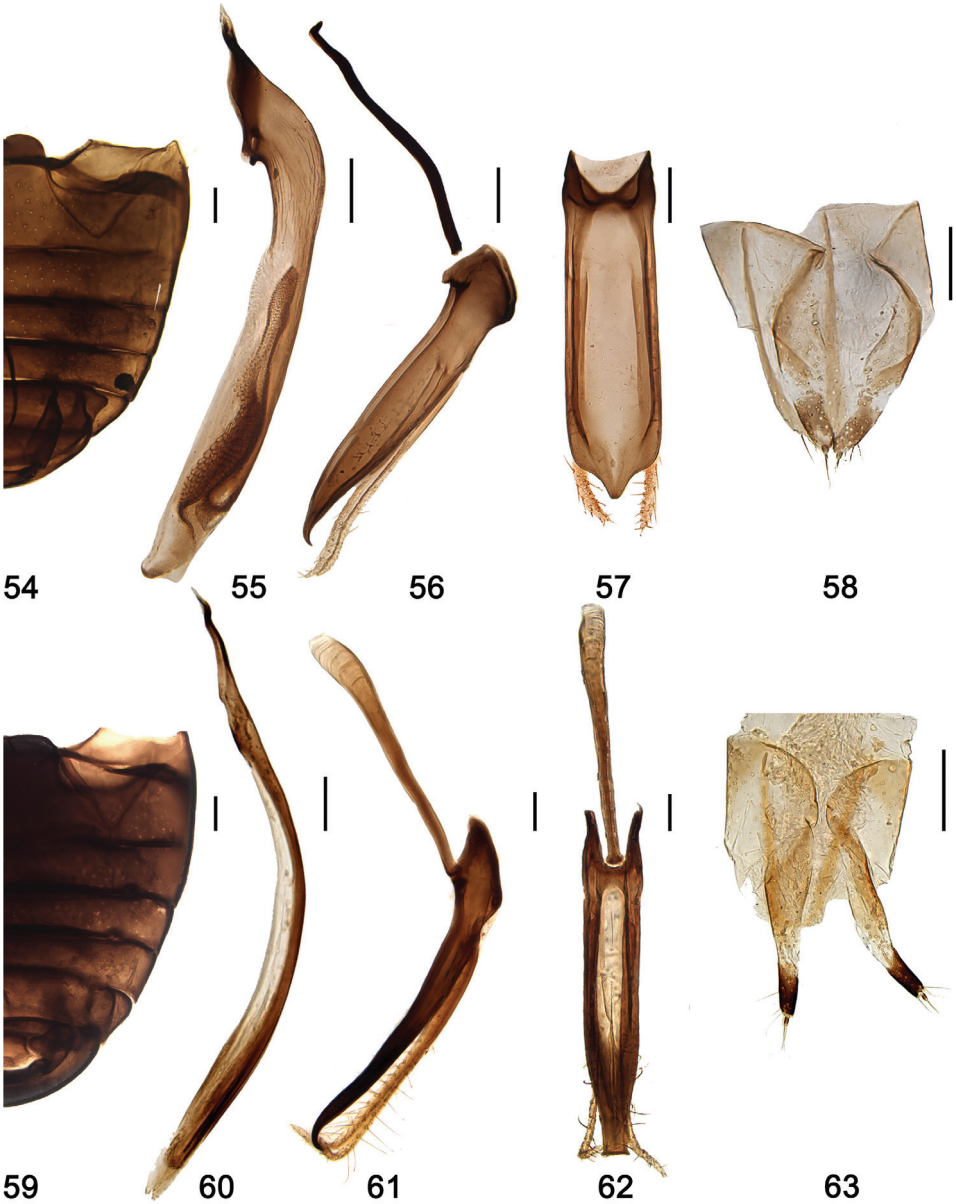
Figures 36–43. 36–40 *S. motuoensis* sp. n. **36** abdomen **37–39** male genitalia **37** penis **38** tegmen, lateral view **39** tegmen, ventral view **40** female genitalia: ovipositor **41–43** *S. nibagou* Yu **41** abdomen **42–43** male genitalia **42** penis **43** tegmen, ventral view. Scale bars: 0.1 mm.

curved (Fig. 61); parameres slender, sparsely setose at apical half, longer than penis guide, apex curved (Fig. 61); penis guide in ventral view almost parallel at basal 3/4, then gradually narrowing to apex, apex truncated (Fig. 62).



Figures 44–53. 44–48 *S. tibetina* sp. n. **44** abdomen **45–47** male genitalia **45** penis **46** tegmen, lateral view **47** tegmen, ventral view **48** female genitalia: ovipositor. **49–53** *S. unciforma* sp. n. **49** abdomen; **50–52** male genitalia: **50** penis **51** tegmen, lateral view **52** tegmen, ventral view **53** female genitalia: ovipositor. Scale bars: 0.1 mm.

Female genitalia: Coxities elongate, subtriangular, about 5.3× as long as wide, tapering to blunt, darker apices, styli small and distinct, each with short terminal setae (Fig. 63); spermatheca not sclerotized.



Figures 54–63. 54–58 *S. quadrimacularis* Yu **54** abdomen **55–57** male genitalia **55** penis **56** tegmen, lateral view **57** tegmen, ventral view **58** female genitalia: ovipositor **59–63** *S. parenthesis* Yu **59** abdomen **60–62** male genitalia **60** penis **61** tegmen, lateral view **62** tegmen, ventral view **63** female genitalia ovipositor. Scale bars: 0.1 mm.

Types examined. Holotype: 1♀, **China, Henan:** Huangshian, Laojieling, Taiping Town, Xixia County, [33°37.53'N, 111°46.17'E], ca 1500m, 19.vii.1998, Yu GY leg. (BAAF).

Figures 64–67. *S. guoyuei* sp. n. **64** abdomen **65–67** male genitalia **65** penis **66** tegmen, lateral view **67** tegmen, ventral view. Scale bars: 0.1 mm.

Other specimens examined. 1♂2♀♀, **China, Shanxi:** Lishan National Natural Reserve, Yuanqu, [35°28.39'N, 112°9.45'E], ca 800–1400m, 3.viii.2011, Wang XM et al. leg. (SCAU).

Distribution. China (Henan, Shanxi).

***Shirozuella guoyuei* sp. n.**
urn:lsid:zoobank.org:act:4A74A1CF-AAD1-4CD7-BFC9-0D275A23FB1A
http://species-id.net/wiki/Shirozuella_guoyuei
Figs 33–35, 64–68

Diagnosis. This species is colse to *S. parenthesis* in general appearance, but it can be distinguished from the latter by the distance between eyes (Fig. 35), yellow pronotum (Fig. 33), stout penis and penis guide (Figs 65–67).

Description. TL: 1.94mm, TW: 1.32mm, TH: 0.73mm, TL/TW: 1.48; PL/PW: 0.53; EL/EW: 1.15.

Body small, elongate oval, weakly convex. Dorsum covered with relatively sparse pubescence (Figs 33–34). Head brown, with terminal maxillary palpomere dark brown. Pronotum and scutellum yellow. Elytron black, with two large curved yellowish stripes, one c-shaped, situated around outer margin of humeral callus, connected to lateral margin of elytron, another one v-shaped, situated between 2/5 and 4/5 elytral

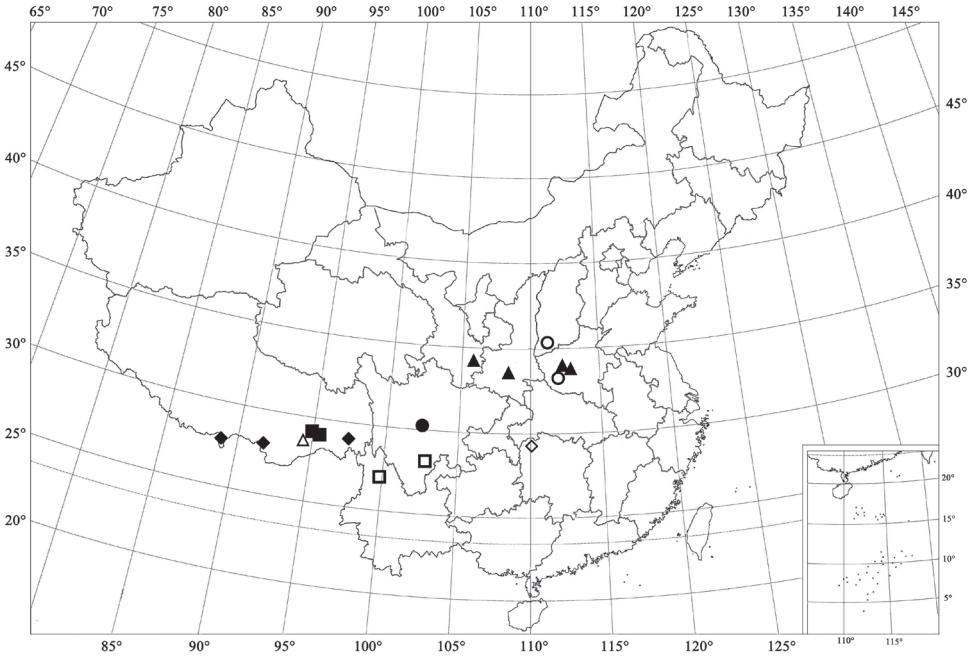


Figure 68. Distribution map. ▲ *S. bimaculata* Yu ■ *S. motuoensis* sp. n. ● *S. nibagou* Yu ♦ *S. tibetina* sp. n. △ *S. unciforma* sp. n. □ *S. quadrimacularis* Yu ○ *S. parenthesis* Yu ◊ *S. guoyuei* sp. n.

length to apex, connected to elytral suture; apex of elytron yellow. Underside uniformly dark brown, except elytral epipleura and legs yellow.

Head moderately large (Fig. 35), 0.35× elytral width (HW/EW=2.86); frontal surface of head capsule slightly convex and rather weakly anteriorly inclined below; punctures on frons fine, separated by 0.5–1.5× a diameter, with sparse long setae in punctures; eyes relatively large, distinctly broader than interocular distance; widest interocular distance 3.2× narrowest width. Pronotum 0.66× elytral width (PW/EW=1: 1.51), pronotal punctures fine, smaller than those on head, separated by 1.0–3.0× a diameter. Scutellum moderately large, triangular. Punctures on elytra moderately large, irregular, obviously larger than those on pronotum, separated by 1.0–2.0× a diameter.

Pro- and mesoventrite mat and shagreened, punctures inconspicuous, with sparse short setae. Metaventrite broad and glabrous, median part concaved, with complete median discrimen; punctures sparse and fine, separated by 2.0–3.0× a diameter, with short sparse setae. Abdominal postcoxal line complete, v-shaped, nearly reaching to posterior margin of ventrite 1 (Fig. 64).

Male genitalia: Penis short and stout, slightly curved, without penis capsule (Fig. 65); penis guide in lateral view widest at base, gradually narrowed to apex, apex pointed and curved (Fig. 66); parameres slender, sparsely setose at apical half, longer

than penis guide, apex curved (Fig. 66); penis guide in ventral view almost parallel at basal 6/7, then gradually narrowing to apex, apex truncated (Fig. 67).

Female genitalia: unknown.

Types. Holotype: 1♂, **China, Hunan:** Tianpingshan, Zhangjiajie, [29°43.02'N, 109°49.14'E], ca 950m, 14.viii.2001, Peng ZQ leg. (SCAU).

Distribution. China (Hunan).

Etymology. The species is named after Dr. Yu Guoyue, an outstanding coccinellid taxonomist of China

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BOOK REVIEW

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Book review: Gerlach J, Marusik Y (Eds) (2010) Arachnida and Myriapoda of the Seychelles islands. Siri Scientific Press, 435 pp.

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The Seychelles islands are located in the Indian Ocean, some 1,500 kilometres east of Africa and northeast of the island of Madagascar. They are particularly interesting from a biogeographical perspective, with ancient affinities to Africa and Asia, recent colonizing species from the Indo-Pacific and modern introductions. Until recently, relatively little was known about the biodiversity of these islands. However, this has changed through the publication of a series of monographs on the Seychelles fauna, presenting the latest information on all the terrestrial and freshwater animals of the islands. In this volume on the Arachnida and Myriapoda of the Seychelles islands, 14 expert scientists from 11 different countries have provided contributions that cover all 433 species of spiders, scorpions, mites, centipedes, millipedes and related groups currently recorded from the islands, including systematic keys, diagnostic illustrations and descriptions for most species, in addition to distribution records.

The volume opens with a brief history of arachnid and myriapod collecting in the Seychelles islands followed by summary data for the numbers of indigenous, endemic and introduced species for all the orders covered and a brief classification scheme for the Arachnida. The following chapters cover the various different orders as follows: Araneae (M.I. Saaristo [deceased], 300 pp., 216 species), Amblypygi (P. Weygoldt, 5 pp.), Opiliones (J. Gerlach, 8 pp.), Scorpiones (L. Prendini, 10 pp.), the smaller

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arachnid orders including Pseudoscorpiones, Schizomida and Palpigradi (M. Harvey, 10 pp.), Acari: Holothyroidea (J. Gerlach, P. Lehtinen & M. Madl, 7 pp.), Acari: Oribatida (W. Niedbala, 6 pp.), additional Acari (J. Gerlach, 5 pp.), Geophilomorpha (L. Bonato & A. Minelli, 16 pp.), Lithobiomorpha & Scutigerimorpha (P. Stoev & J. Gerlach, 3 pp.), Scolopendromorpha (J.G.E. Lewis, 8 pp.), Diplopoda (S. Golovatch & J. Gerlach, 16 pp.), Symphyla and Pauropoda (J. Gerlach, 6 pp.). Each chapter is fully referenced with its own reference list at the end.

Thus, the majority of the book is devoted to arachnids and spiders in particular, although this is a true reflection of the relative diversity of these groups on the islands. In total, 362 arachnids and 71 myriapod species are documented. In terms of formal taxonomic/nomenclatural changes, one new synonymy is established in the spider family Filistatidae, two new genera of holothyrid mites are described, in addition to three new combinations in the latter group. The book is richly illustrated throughout with clear line drawings, which will permit identification of most of the species covered. The last chapter includes assessments of species conservation status as defined by the International Union for the Conservation of Nature (IUCN) for the indigenous and endemic taxa. There is a comprehensive index.

On the downside, some chapters are more thorough than others, but this is presumably a reflection of the state of knowledge and/or the availability of taxonomic experts with experience in this geographical region. For example, many of the mite species are merely listed as known records without any associated figures, although this still represents a valuable systematic inventory for this group as locality data and citing references are provided. Furthermore, not all Diplopoda are figured and some of the figures provided for this group are rather small. Overall the book is well produced and the editing is tight, although some of the figures and and several of the photographs have not reproduced as well as they may have done, and some e.g. in the Diplopoda chapter are rather small, but they all still serve their intended purpose. Most of the figures are new, although several have been reproduced from other works. It is also the first book to provide complete coverage of the known spider fauna of any single country in the Southern Hemispere. In summary, it provides a comprehensive synthesis of current arachnological and myriapodological knowledge for this previously poorly known region. This review was written by an arachnologist, but I expect the book will be of use to invertebrate taxonomists and biogeographers and deserves a place on the shelves of any serious arachnological or myriapodological taxonomic library.

Price: £60.00 (available directly from the publisher: http://www.siriscientificpress.co.uk)