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Type specimens of fossil "Architectibranchia" and Cephalaspidea (Mollusca, Heterobranchia) in the Academy of Natural Sciences of Philadelphia

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Abstract

The type specimens of fossil "Architectibranchia" and Cephalaspidea (Mollusca: Heterobranchia) deposited in the Academy of Natural Sciences of Philadelphia, USA, are listed herein. The collection includes types of circa 60 species, from the families: Acteonellidae, Acteonidae, Bullidae, Cylichnidae, Haminoeidae, Philinidae, Retusidae, Rhizoridae, Ringiculidae and Scaphandridae. The catalogue is presented in systematic order, with information on the original description, type locality, type stratum and age, catalog number in the collection, and current taxonomic status. Further taxonomic notes are offered when pertinent. Several species are illustrated here for first time. The new combinations *Roxania hornii* (Gabb, 1864) and *Volvulella minutissima* (Gabb, 1860) are proposed. Some species that have previously been assigned to Acteonidae are revised here, resulting in the following new combinations: *Odostomia milium* (Lea, 1846), *Chrysallida sculpta* (Lea, 1846) and *Pyrgulina angulata* (Lea, 1846). The list of taxa is also presented in other arrangements (alphabetically by specific epithets and by authorship and date) to facilitate locating information.

Introduction

The collection of fossil mollusks in the Academy of Natural Sciences of Philadelphia (ANSP; Philadelphia, PA, USA) houses about 80,000 lots, mostly of gastropods. Despite containing fossils from diverse localities worldwide, most stems from the Mesozoic and Cenozoic eras of the USA. The collection counts with original material (including type specimens) of several 19th and early 20th century paleontologists, such as Timothy A. Conrad, William M. Gabb, Henry C. Lea, Isaac Lea and Henry A. Pilsbry.

It is an international consensus that all museums should publish inventories of their type specimens. Since many invertebrate species have convoluted taxonomic histories often with inadequate descriptions and illustrations (or no illustration at all), and little modern taxonomic analysis, it is deemed that such catalogues will benefit or prompt future studies.

Some catalogues have been published regarding the Recent mollusks of the ANSP collection, focusing on specific authors or families (Borrero and Rosenberg 2015, Callomon 2015, Snyder and Callomon 2015), and the entire collection is presently searchable online. A catalogue of the ANSP invertebrate fossil types was published by Richards (1968), as well as more specific ones dealing with type specimens of a single author (e.g., Moore 1962, for Conrad's types) or a restricted period (e.g., Johnson 1905, for the Cretaceous). These catalogues sometimes fail to cite the type specimens of some species, might present conflicting information, and, due to their broad scope, offer very

little extra information on the species' taxonomy. Therefore, we present here an annotated catalogue of the fossil "Architectibranchia" and Cephalaspidea gastropod types housed in the ANSP Invertebrate Paleontology collection. When necessary, new combinations are proposed. Moreover, some species that have previously been assigned to Acteonidae are revised, resulting in new combinations.

Material and methods

The present catalogue offers information on the original description of each species, the ANSP catalog number for the type material lots, type locality and stratum, age and current taxonomical status (following the most recent revisions, where they exist). At least one type specimen (holotype, lectotype or syntype) of each nominal species is figured here, with further type specimens figured only when they add information. Several species are figured here for the first time.

The type catalogue is arranged in three ways to facilitate locating information: (1) by current systematic position (with additional information and comments and, when necessary, proposed new combinations); (2) alphabetically by specific epithet; (3) by authorship and date of the nominal species.

Some species whose types are housed in the ANSP collection were originally classified in Architectibranchia or Cephalaspidea, but clearly do not belong to them. They are listed further below and, as some of them have never received a taxonomical reassessment, they are reclassified here.

The classification used here follows Bouchet et al. (2005, 2017), complemented (when available) by taxonomic revisions that deal specifically with the fossil taxa. The taxa represented in the ANSP collection are: Architectibranchia (Acteonellidae, Acteonidae, Ringiculidae) and Cephalaspidea (Bullidae, Cylichnidae, Haminoeidae, Philinidae, Retusidae, Rhizoridae, Scaphandridae).

Type localities and strata are provided as precisely as possible and when the original descriptions were not very precise, we added information from previous authors, specimens labels, or our own research (new information is always clearly indicated as such). Moreover, some locality and formation names were updated to conform to current conventions; the original names are also indicated. Likewise, the age of the strata are given with as much resolution as possible. However, several localities have not been studied in detail since then; in these cases, a coarser age span (e.g., period) is indicated.

Previous catalogues and species lists (e.g., Palmer 1937, Moore 1962, Richards 1968) often refer to the type specimens in different manners, without discussing the reasoning behind their choice. Herein, we indicated these previous assesments in quotation marks. One issue can be generalized here, though, regarding the use of the word "holotype" by previous catalogues when confronted by a single specimen in the collection. This practice is erroneous and all the original specimens are considered syntypes (even if there is only a single one) herein, unless explicetely indicated on the original description that a single specimen was available (in which case, it is a holotype).

Unfortunately, some of the types supposedly housed in the ANSP collection could not be found in the present study and are thus considered lost. They are: *Acteon costellatus* Conrad, 1833; *Acteon modicellus* Conrad, 1860; *Bulla mortoni* Forbes, 1845 and *Retusa sulcata fossilis* Pilsbry, 1922.

Systematic list of taxa

List of taxa by systematic arrangement

Heterobranchia
Superfamily Acteonoidea d'Orbigny, 1843
Family Acteonidae d'Orbigny, 1843
Genus *Acteocina* Gray, 1847

Acteocina cederstromi Richards, 1947

Figure 1A–B

Acteocina cederstromi Richards, 1947: 34, pl. 11, fig. 9.

Type locality. Bacons Castle, Virginia, depth 115 ft. (ca. 35 m); stratum: Yorktown Formation; age: Late Miocene to Middle Pliocene.

Type material. Holotype, ANSP IP16771 (as "type" in Richards 1968: 113).

Current taxonomic status. *Acteocina candei* (d'Orbigny, 1841) (Campbell 1993).

Acteocina chowanensis Richards, 1947

Figure 1C–D

Acteocina chowanensis Richards, 1947: 34, pl. 11. fig. 10.

Type locality. Edenton, well 11 (as "well 3" in original description), depth 46–58 ft. (ca. 14–17.5 m), U. S. Marine Base, North Carolina, USA; stratum: Chowan River Formation; age: Pliocene.

Type material. Holotype, ANSP IP16754 (as "type" in Richards 1968: 113).

Current taxonomic status. *Acteocina canaliculata* (Say, 1826) (Mikkelsen and Mikkelsen 1984).

Acteocina crassiplica (Conrad, 1848)

Figure 1E–F

Bulla crassiplica Conrad, 1848a: 282.

Type locality. Dr. Smith's plantation, 6 miles northeast of Vicksburg, Warren County, Mississippi, USA; stratum: Vicksburg Group; age: Oligocene.

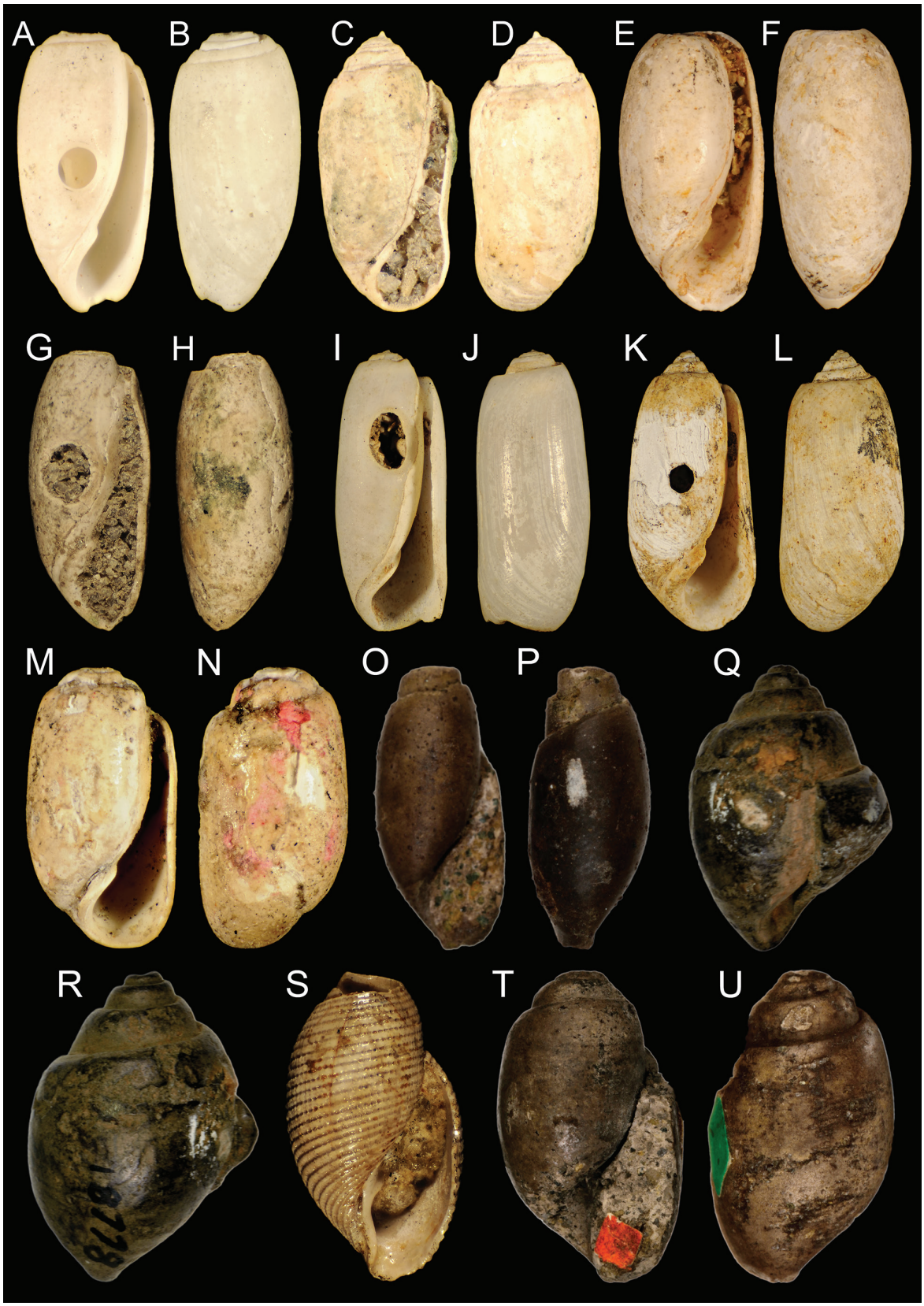

Figure 1. Types. **A–B.** Holotype of *Acteocina cederstromi*, H 4.0 mm, ANSP IP16771. **C–D.** Holotype of *Acteocina chowanensis*, H 3.8 mm, ANSP IP16754. **E–F.** Lectotype of *Acteocina crassiplica*, H 6.0 mm, ANSP IP13412. **G–H.** Paratype of *Acteocina kirkwoodiana*, H 5.0 mm, ANSP IP15935. **I–J.** Holotype of *Acteocina puruha*, H 7.6 mm, ANSP IP13684. **K–L.** Holotype of *Acteocina subbullata*, H 9.9 mm, ANSP IP3193. **M–N.** Syntype of *Acteocina weatherlli*, H 4.6 mm, ANSP IP14431. **O–P.** Syntype of *Acteon biplicatus*, H 17.2 mm, ANSP IP19466; also, syntype of *A. gabbana*. **Q–R.** Syntype of *Acteon cretacea*, H 19.1 mm, ANSP IP18778. **S.** Holotype of *Acteon elegans*, H 6.0 mm, ANSP IP6011. **T–U.** Syntype of *Acteon forbesiana*, H 9.2 mm, ANSP IP18777.

Type material. Lectotype, ANSP IP13412 (designation in Moore 1962: 51, Richards 1968: 119, MacNeil and Dockery 1984: 240); paralectotypes, ANSP 13413, 6 shells (as "paratype" in Richards 1968: 119, MacNeil and Dockery 1984: 240).

Current taxonomic status. *Acteocina crassiplica* (Conrad, 1848) (MacNeil and Dockery 1984).

Acteocina kirkwoodiana Richards & Harbison, 1944

Figure 1G–H

Acteocina kirkwoodiana Richards & Harbison, 1944: 9, figs 1, 5–6.

Type locality. Brandywine Lighthouse well, depth 385 feet [ca. 117 m], Delaware Bay, New Jersey, USA; stratum: Kirkwood Formation; age: Miocene.

Type material. Paratype, ANSP IP15935, 1 shell (Richards and Harbison 1944: 14, fig. 1, 5; as "paratypes" in Richards and Harbison 1944: figs 1, 5; as "cotype" in Richards 1968: 148).

Current taxonomic status. —*Acteocina kirkwoodiana* Richards & Harbison, 1944.

Acteocina puruha Pilsbry & Olsson, 1941

Figure 1I–J

Acteocina puruha Pilsbry & Olsson, 1941: 13, pl. 8, fig. 1.

Type locality. Punta Blanca, Ecuador; stratum: Canoa Formation; age: Late Pliocene.

Type material. Holotype, ANSP IP13684 (as "type" in Richards 1968: 179).

Current taxonomic status. *Acteocina puruha* Pilsbry & Olsson, 1941.

Acteocina subbullata Pilsbry & Johnson, 1917

Figure 1K–L

Acteocina subbullata Pilsbry & Johnson, 1917: 150–151.

Type locality. Dominican Republic; stratum: "Santo Domingan Beds" (either Cercado or Gurabo Formations); age: Miocene/Pliocene.

Type material. Holotype, ANSP IP3193 (as "type" in Richards 1968: 192).

Current taxonomic status. *Acteocina bullata* (Kiener, 1834) (Woodring 1970).

Acteocina weatherlli (Lea, 1833)

Figure 1M–N

Acteon weatherlli Lea, 1833: 213, pl. 6, fig. 224.

Type locality. Monmouth Co., Deal, New Jersey, USA; stratum: uncertain; age: Miocene(?).

Type material. Syntype, ANSP IP14431, 1 shell (as "type" in Richards 1968: 205).

Current taxonomic status. *Acteocina canaliculata* (Say, 1826) (Mikkelsen and Mikkelsen 1984 as *A. wetherlli* [sic]).

Genus *Acteon* Montfort, 1810

Acteon biplicatus (Gabb, 1860)

Figure 1O–P

Acteonina biplicata Gabb, 1860a: 93, pl. 2, fig. 13 [non d'Orbigny].

Type locality. —New Jersey, USA; stratum: "Lower Green Marls" (Navesink Formation); age: Cretaceous.

Type material. Syntypes, ANSP IP19466 (as "type" in Richards 1968: 107), 1 shell, ANSP 19467, 1 shell.

Current taxonomic status. *Acteon gabbana* Whitfield, 1892 (Whitfield 1892, Richards and Ramsdell 1962).

Acteon costellatus Conrad, 1833

Acteon costellatus Conrad, 1833b: 45.

Type locality. Claiborne Bluff, Alabama River, Monroe County, Alabama, USA; stratum: Gosport Sand (uppermost Claiborne Group); age: Eocene.

Type material. Lost (Harris 1895a: 13, Palmer 1937: 501, Moore 1962: 50).

Current taxonomic status. *Acteon costellatus* Conrad, 1833 is considered a *species inquirenda* (Salvador and Cunha 2016).

Acteon cretacea Gabb, 1862

Figure 1Q–R

Acteon cretacea Gabb, 1862: 318.

Type locality. Crosswicks, New Jersey, USA; stratum: "Lower Green Marls" (Navesink Formation); age: Cretaceous.

Type material. Syntypes, ANSP IP18778, 2 shells (as "types" in Richards 1968: 120).

Current taxonomic status. *Acteon cretacea* Gabb, 1862 (Richards and Ramsdell 1962, Richard and Shapiro 1963).

Acteon elegans (Lea, 1833)

Figure 1S

Monoptygma elegans Lea, 1833: 203, pl. 6, fig. 217.

Type locality. Monroe Co., Claiborne Bluff, Alabama, USA; stratum: Gosport Sand (uppermost Claiborne Group); age: Eocene.

Type material. Holotype, ANSP IP6011 (as "lectotype" [error] in Palmer 1937: 499; as "type" in Richards 1968: 128).

Current taxonomic status. *Acteon pomilius* Conrad, 1833 (Palmer and Brann 1966).

Acteon forbesiana Whitfield, 1892

Figure 1T–U

Actaeon forbesiana Whitfield, 1892: 157, pl. 19, figs 17–22.

Type locality. Walnford, New Jersey, USA; stratum: "Lower Green Marls" (Navesink Formation); age: Cretaceous.

Type material. Syntypes, ANSP IP18777, 4 shells (as "types" in Richards 1968: 113).

Current taxonomic status. *Acteon cretacea* Gabb, 1862 (Weller 1907, Richards and Ramsdell 1962).

Acteon gabbana Whitfield, 1892

Figure 1O–P

Actaeon gabbana Whitfield, 1892: 156, pl. 19, figs 23–25.

Type locality. Tinton Falls, New Jersey, USA; stratum: "Lower Green Marls" (Navesink Formation); age: Cretaceous.

Type material. Syntypes (also of *Acteonina biplicata* Gabb, 1860), ANSP 19466 (as "type" in Richards 1968: 135), 1 shell, ANSP IP19467, 1 shell.

Current taxonomic status. *Acteon gabbana* Whitfield, 1892 (Weller 1907, Richards and Ramsdell 1962), nom. nov. pro *Acteonina biplicata* Gabb, 1860 [non d'Orbigny].

Acteon glans Lea, 1846

Figure 2A

Acteon glans Lea, 1846: 256, pl. 36, fig. 58.

Type locality. Petersburg, Dinwiddie County, Virginia, USA; stratum: Yorktown Formation; age: Late Miocene to Middle Pliocene.

Type material. Holotype, ANSP IP1517.

Current taxonomic status. *Acteon glans* Lea, 1846.

Acteon idoneus Conrad, 1833

Figure 2B–C

Acteon idoneus Conrad, 1833b: 45.

Type locality. Claiborne Bluff, Alabama River, Alabama, USA; stratum: Gosport Sand (uppermost Claiborne Group); age: Eocene.

Type material. Syntypes, ANSP IP30547 (as "lectotype" in Palmer 1937: 500; as "lectotype?" in Moore 1962: 65), 1 shell, ANSP IP53814, 5 shells (all as "syntypes" in Richards 1968: 144). The designation as lectotype by Palmer (1937) is likely mistaken (Moore 1962; Richards 1968).

Current taxonomic status. *Acteon idoneus* Conrad, 1833 (Palmer 1937, Palmer and Brann 1966, Dockery 1977).

Acteon lineatus Lea, 1833

Figure 2D–E

Acteon lineatus Lea, 1833: 112, pl. 4, fig. 97.

Type locality. Claiborne, Alabama, USA; stratum: uncertain [likely Gosport Sand (uppermost Claiborne Group)]; age: Eocene.

Type material. Lectotype, ANSP IP5541, 1 shell (designation by Palmer 1937: 500; as "holotype" in Richards 1968: 152); paralectotypes, ANSP IP5442, 1 shell, ANSP IP5443, 1 shell, ANSP IP5444, 1 shell (each as "paratype" in Richards 1968: 152).

Current taxonomic status. *Acteon idoneus* Conrad, 1833 (Palmer 1937, Palmer and Brann 1966).

Acteon modicellus Conrad, 1860

Actaeon modicellus Conrad, 1860: 287.

Type locality. Tippah County, Mississippi, USA; stratum: "dark gray marl"; age: Late Cretaceous.

Type material. Lost (Sohl 1964).

Current taxonomic status. *Acteon modicellus* Conrad, 1860, nomen dubium (Sohl 1964).

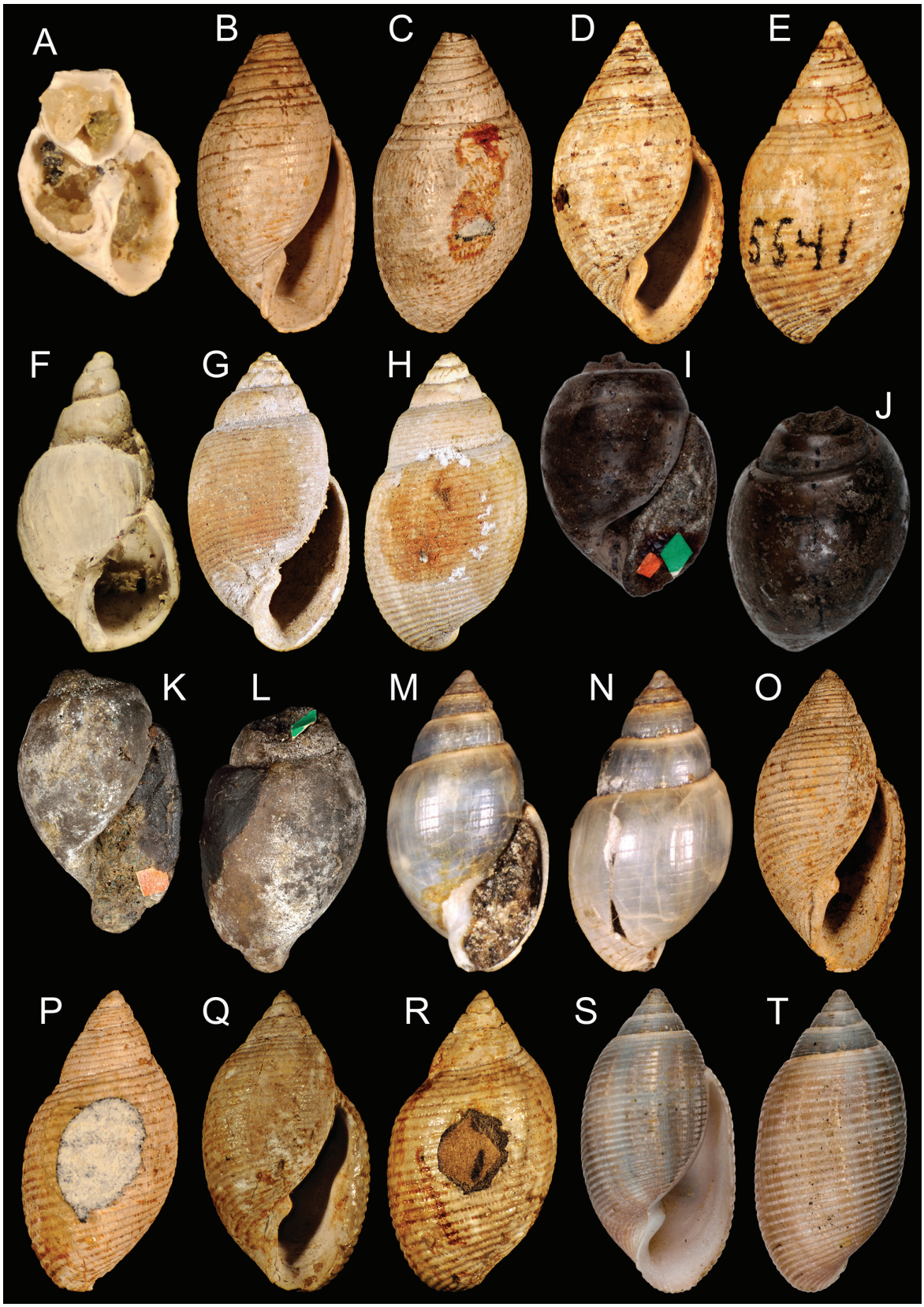

Figure 2. Types. **A.** Holotype of *Acteon glans*, H 1.9 mm, ANSP IP1517. **B–C.** Syntype of *Acteon idoneus*, H 11.1 mm, ANSP IP30547. **D–E.** Lectotype of *Acteon lineatus*, H 8.6 mm, ANSP IP5541. **F.** Holotype of *Acteon nitens*, H 4.0 mm, ANSP IP1516. **G–H.** Syntype of *Acteon novellus*, H 12.0 mm, ANSP IP1600. **I–L.** Syntype of *Acteon ovoidea*, H 23 mm, ANSP IP56167. 32–33. Same, H 21.0 mm, ANSP IP56166; also, holotype of *A. subovoides*. **M–N.** Lectotype of *Acteon politus*, H 8.2 mm, ANSP IP4266. **O–P.** Syntype of *Acteon pomilius*, H 10.1 mm, ANSP IP30546. **Q–R.** Syntype of *Acteon punctatus*, H 8.8 mm, ANSP IP5537. **S–T.** Holotype of *Acteon subtornatilis*, H 18.1 mm, ANSP IP3183.

Acteon nitens Lea, 1846
Figure 2F

Acteon nitens Lea, 1846: 257, pl. 36, fig. 60.

Type locality. Petersburg, Dinwiddie County, Virginia, USA; stratum: Yorktown Formation; age: Late Miocene to Middle Pliocene.

Type material. Holotype, ANSP IP1516.

Current taxonomic status. *Acteon nitens* Lea, 1846.

Acteon novellus Conrad, 1834
Figure 2G–H

Acteon novellus Conrad, 1834: 142.

Type locality. Suffolk, Virginia, USA; stratum: uncertain; age: Miocene/Pliocene(?).

Type material. Syntypes, ANSP IP1600, 1 shell (as "holotype" in Gardner 1948: 277, pl. 38, figs 24, 26), ANSP IP79768, 2 shells (all as "syntypes" in Moore 1962: 80; as "types" in Richards 1968: 165).

Current taxonomic status. —*Acteon novellus* Conrad, 1834 (Moore 1962).

Acteon ovoidea Gabb, 1862
Figure 2I–L

Actaeon ovoidea Gabb, 1862: 319.

Type locality. New Jersey, USA; stratum: "Lower Green Marls" (Navesink Formation); age: Cretaceous.

Type material. Syntypes, ANSP IP56166, 1 shell, ANSP IP56167, 1 shell.

Current taxonomic status. *Acteon cretacea* Gabb, 1862 (Weller 1907, Richards and Ramsdell 1962).

Acteon politus (Gabb, 1869)
Figure 2M–N

Ringinella polita Gabb, 1869: 174–175, 231, pl. 28, fig. 60.

Type locality. Colusa County, California, USA; stratum: Shasta Group (Shasta Formation); age: Cretaceous.

Type material. Lectotype, ANSP IP4266 (designation in Stewart 1926: 431, fig. 18); paralectotype, ANSP IP79514, 11 shells (as "types lot" in Richards 1968: 176).

Current taxonomic status. *Acteon politus* (Gabb, 1869) (Anderson 1958).

Acteon pomilius Conrad, 1833
Figure 2O–P

Acteon pomilius Conrad, 1833b: 45.

Type locality. Claiborne Bluff, Alabama River, Monroe County, Alabama, USA; stratum: Gosport Sand (uppermost Claiborne Group); age: Eocene.

Type material. Syntypes, ANSP IP30546 (as "lectotype?" in Moore 1962: 88), ANSP IP53815, 5 shells (all as "syntypes" in Richards 1968: 177).

Current taxonomic status. *Acteon pomilius* Conrad, 1833 (Palmer and Brann 1966).

Acteon punctatus Lea, 1833
Figure 2Q–R

Acteon punctatus Lea, 1833: 111, pl. 4, fig. 96.

Type locality. Claiborne Bluff, Alabama River, Monroe County, Alabama, USA; stratum: Gosport Sand (uppermost Claiborne Group); age: Eocene.

Type material. Syntypes, ANSP IP5537, 1 shell (as "holotype" in Richards 1968: 179, and in Palmer and Brann 1966: 482), ANSP IP5538, 1 shell, ANSP IP5539, 1 shell, ANSP IP5540, 1 shell (as "paratype" in Richards 1968: 179).

Current taxonomic status. Valid as *Acteon pomilius punctatus* Lea, 1833 (Palmer and Brann 1966), but possible synonym of *Acteon pomilius* Conrad, 1833 (Harris 1895a).

Acteon subovoides Whitfield, 1892
Figure 2I–L

Actaeon subovoides Whitfield, 1892: 155, pl. 19, figs 14–16.

Type locality. New Jersey, USA; stratum: "Lower Green Marls" (Navesink Formation); age: Cretaceous.

Type material. Holotype, ANSP IP56166 [also a syntype of *Actaeon ovoidea* Gabb, 1862].

Current taxonomic status. *Acteon cretacea* Gabb, 1862 (Weller 1907, Richards and Ramsdell 1962).

Acteon subtornatilis Pilsbry & Johnson, 1917
Figure 2S–T

Acteon subtornatilis Pilsbry & Johnson, 1917: 150.

Type locality. Dominican Republic; stratum: "Santo Domingan Beds" (either Cercado or Gurabo Formations); age: Miocene/Pliocene.

Type material. Holotype, ANSP IP3183 (as "type" in Pilsbry 1922: 310, 431, pl. 23, fig. 15; Richards 1968: 193).

Current taxonomic status. *Acteon subtornatilis* Pilsbry & Johnson, 1917 (Pilsbry 1922).

Genus *Nucleopsis* Conrad, 1860

***Nucleopsis subvaricatus* (Conrad, 1860)**
Figure 3A–B

Acteonina subvaricata Conrad, 1860: 294, pl. 47, fig. 22.

Type material. Lectotype, ANSP IP30692 (designation in Palmer 1937: 503, pl. 90, fig. 18; see also Moore 1962: 100, Salvador and Cunha 2016: figs 2A–E); paralectotypes, ANSP IP30693, 2 shells (Richards 1968: 193; Salvador and Cunha 2016: figs 2F–G).

Type locality. Claiborne, Alabama, USA; stratum: likely Gosport Sand (uppermost Claiborne Group); age: Eocene.

Current taxonomic status. *Nucleopsis subvaricatus* (Conrad, 1860) (Salvador and Cunha 2016).

Genus *Rictaxis* Dall, 1871

***Rictaxis andersoni* (Conrad, 1847)**
Figure 3C–D

Actaeon andersoni Conrad, 1847: 287.

Type locality. Vicinity of Vicksburg, Warren County, Mississippi, USA; stratum: Vicksburg Group; age: Oligocene.

Type material. Holotype, ANSP IP13411 (Conrad 1848b: 117, pl. 11, fig. 37, Moore 1962: 38, Richards 1968: 100, MacNeil and Dockery 1984: 232, pl. 39, fig. 10).

Current taxonomic status. *Rictaxis andersoni* (Conrad, 1847) (MacNeil and Dockery 1984).

***Rictaxis oryza* (Gabb, 1872)**
Figure 3E–F

Actaeonidea oryza Gabb, 1872: 245.

Type locality. Cibao region, Dominican Republic; stratum: uncertain [likely either Cercado or Gurabo Formations]; age: Miocene/Pliocene.

Type material. Syntype, ANSP IP3181 (as "type" in Pilsbry 1922: 310, pl. 23, fig. 12; Richards 1968: 167).

Remarks. Type species of genus *Actaeonidea* Gabb, 1872, by monotypy.

Current taxonomic status. *Rictaxis oryza* (Gabb, 1872) (Pilsbry 1922, Woodring 1970).

Genus *Tornatellaea* Conrad, 1860

***Tornatellaea bella* Conrad, 1860**
Figure 3G–H

Tornatellaea bella Conrad, 1860: 294, pl. 47, fig. 23

Type locality. Alabama(?), USA; stratum: uncertain [likely Gosport Sand (uppermost Claiborne Group)]; age: Eocene.

Type material. Lectotype, ANSP IP30691 (designation by Palmer 1937: 502, pl. 90, fig. 21; as "holotype" in Richards 1968: 177; see also Moore 1962: 41, Salvador and Cunha 2016: fig. S1N–O).

Remarks. Type species of genus *Tornatellaea*, by monotypy.

Current taxonomic status. *Tornatellaea bella* Conrad, 1860 (Salvador and Cunha 2016).

***Tornatellaea impressa* (Gabb, 1864)**
Figure 3I–J

Acteon impressus Gabb, 1864: 142, pl. 21, fig. 106.

Type locality. North fork of Cottonwood Creek, Shasta County, California, USA; stratum: uncertain [likely Shasta Formation]; age: Early Cretaceous.

Type material. Lectotype, ANSP IP4286 (designation by Stewart 1926: 434, pl. 24, fig. 8); paralectotypes, ANSP IP79476, 6 shells (Richards 1968: 144).

Current taxonomic status. *Tornatellaea impressa* (Gabb, 1864) (Anderson 1958).

Genus *Volvaria* Lamarck, 1801

***Volvaria reticulata* Johnson, 1899**
Figure 3K–L

Volvaria reticulata Johnson, 1899: 71, pl. 1, fig. 1.

Type locality. Moseley's Ferry, Brazos River, Burleson Co., Texas, USA; stratum: Stone City Beds (middle Claiborne Group); age: Middle Eocene.

Type material. Holotype, ANSP IP6467 (as "type" in Richards 1968: 182).

Current taxonomic status. *Volvaria reticulata* Johnson, 1899 (Palmer and Brann 1966).

Family Acteonellidae Gill, 1871 †
Genus *Acteonella* d'Orbigny, 1843

***Acteonella oviformis* Gabb, 1869**
Figure 3M–N

Acteonella oviformis Gabb, 1869: 173, 232, pl. 28, fig. 58.

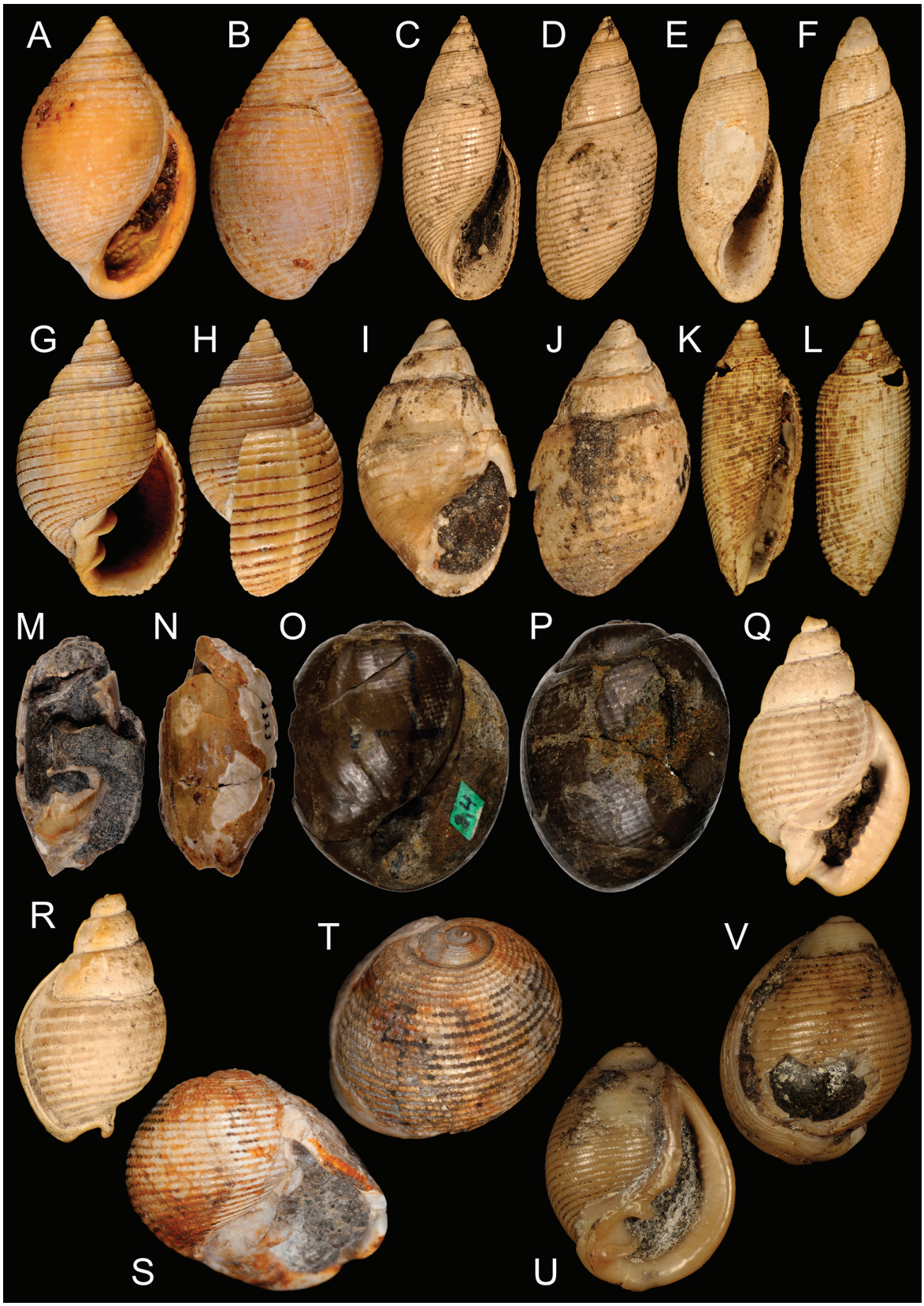

Figure 3. Types. **A–B.** Lectotype of *Nucleopsis subvaricatus*, H 10.8 mm, ANSP IP30692. **C–D.** Holotype of *Rictaxis andersoni*, H 10.5 mm, ANSP IP13411. **E–F.** Syntype of *Rictaxis oryza*, H 6.8 mm, ANSP IP3181. **G–H.** Lectotype of *Tornatellaea bella*, H 12.5 mm, ANSP IP30691. **I–J.** Lectotype of *Tornatellaea impressa*, H 10.7 mm, ANSP IP4286. **K–L.** Holotype of *Volvaria reticulata*, H 7.2 mm, ANSP IP6467. **M–N.** Holotype of *Acteonella oviformis*, H 42.1 mm, ANSP IP4323. **O–P.** Syntype of *Avellana bullata*, H 25.4 mm, ANSP IP289. **Q–R.** Syntype of *Avellana costata*, H 4.5 mm, ANSP IP691. **S–T.** Lectotype of *Biplica obliqua*, H 9.9 mm, ANSP IP4263. **U–V.** Lectotype of *Biplica mathewsonii*, H 11.6 mm, ANSP IP4262.

Type locality. Cottonwood Creek, Shasta County, California, USA; stratum: uncertain [either Shasta or Chico Formations]; age: Cretaceous.

Type material. Holotype, ANSP IP4323 (Stewart 1926: 432, pl. 21, fig. 13; Richards 1968: 168).

Current taxonomic status. *Acteonella oviformis* Gabb, 1869 (Anderson 1958).

Superfamily Ringiculoidea Philippi, 1853
Family Ringiculidae Philippi, 1853
Genus *Avellana* d'Orbigny, 1843

***Avellana bullata* (Morton, 1834)**
Figure 3O–P

Tornitella? *bullata* Morton, 1834: 48, pl. 5, fig. 3.

Type locality. Merchantville, New Jersey, USA; stratum: uncertain [likely Navesink Formation]; age: Cretaceous.

Type material. Syntypes, ANSP IP289, 1 shell, ANSP IP19702, 1 shell (as "type" in Whitfield 1892: 163, pl. 20, figs 3–4; Richards 1968: 108; Richards and Ramsdell 1962: 93).

Current taxonomic status. *Avellana bullata* (Morton, 1834) (Richards and Ramsdell 1962).

***Avellana costata* (Johnson, 1898)**
Figure 3Q–R

Cinulia costata Johnson, 1897: 264 [nomen nudum].
Cinulia costata Johnson, 1898: 462, fig. 1.

Type locality. Mount Laurel well, New Jersey, USA; stratum: uncertain; age: Cretaceous.

Type material. Syntypes, ANSP IP691, 1 shell, ANSP IP79408, 2 shells (as "type" in Richards and Ramsdell 1962: 94).

Current taxonomic status. *Avellana costata* (Johnson, 1898) (Richards and Ramsdell 1962).

Genus *Biplica* Popenoe, 1957

***Biplica obliqua* (Gabb, 1864)**
Figure 3S–T

Cinulia obliqua Gabb, 1864: 111, pl. 19, fig. 64.

Type locality. Tuscan Springs, Tehama Co., California, USA; stratum: uncertain; age: Late Cretaceous.

Type material. Lectotype, ANSP IP4263 (designation by Stewart 1926: 436, pl. 24, fig. 14; see also Richards 1968: 166; Popenoe 1957: 435).

Current taxonomic status. *Biplica obliqua* (Gabb, 1864) (Popenoe 1957).

***Biplica mathewsonii* (Gabb, 1864)**
Figure 3U–V

Cinulia mathewsonii Gabb, 1864: 111, 225, pl. 19, fig. 65.

Type locality. Bull's Head Point, Martinez, California, USA; stratum: uncertain [likely Chico Formation]; age: Cretaceous.

Type material. Lectotype, ANSP IP4262 (designation by Stewart 1926: 437, pl. 24, fig. 11).

Remarks. Popenoe (1957: 434) points out that Gabb's material from Bull's Head Point could represent a non-Cretaceous locality/horizon or be Paleogene material mixed with Gabb's Cretaceous specimens.

Current taxonomic status. *Biplica mathewsonii* (Gabb, 1864) (Popenoe 1957).

Genus *Cinulia* Gray, 1840

***Cinulia naticoides* (Gabb, 1860)**
Figure 4A–B

Actaenia naticoides Gabb, 1860c: 299, pl. 48, fig. 2.

Type locality. Mullica Hill, New Jersey, USA; stratum: uncertain [likely Navesink Formation]; age: Cretaceous.

Type material. Syntypes, ANSP IP18784, 2 shells (as "type" in Richards 1968: 164).

Current taxonomic status. *Cinulia naticoides* (Gabb, 1860) (Clark 1916, Richards and Ramsdell 1962).

***Cinulia rectilabrum* Gabb, 1869**
Figure 4C–D

Cinulia rectilabrum Gabb, 1869: 264, pl. 35, fig. 10.

Type locality. Arivechi, Eastern Sonora, Mexico; stratum: uncertain [either Cañada de Tarachi or El Potrero Grande Units]; age: Late Cretaceous.

Type material. Syntype(?), ANSP IP4753 (as "type?" in Richards 1968: 181).

Current taxonomic status. *Cinulia rectilabrum* Gabb, 1869 (Stanton 1947).

Genus *Ringicula* Deshayes, 1838

***Ringicula hypograpta* Brown & Pilsbry, 1912**
Figure 4E–F

Ringicula hypograpta Brown & Pilsbry, 1912: 505, text fig. 2.

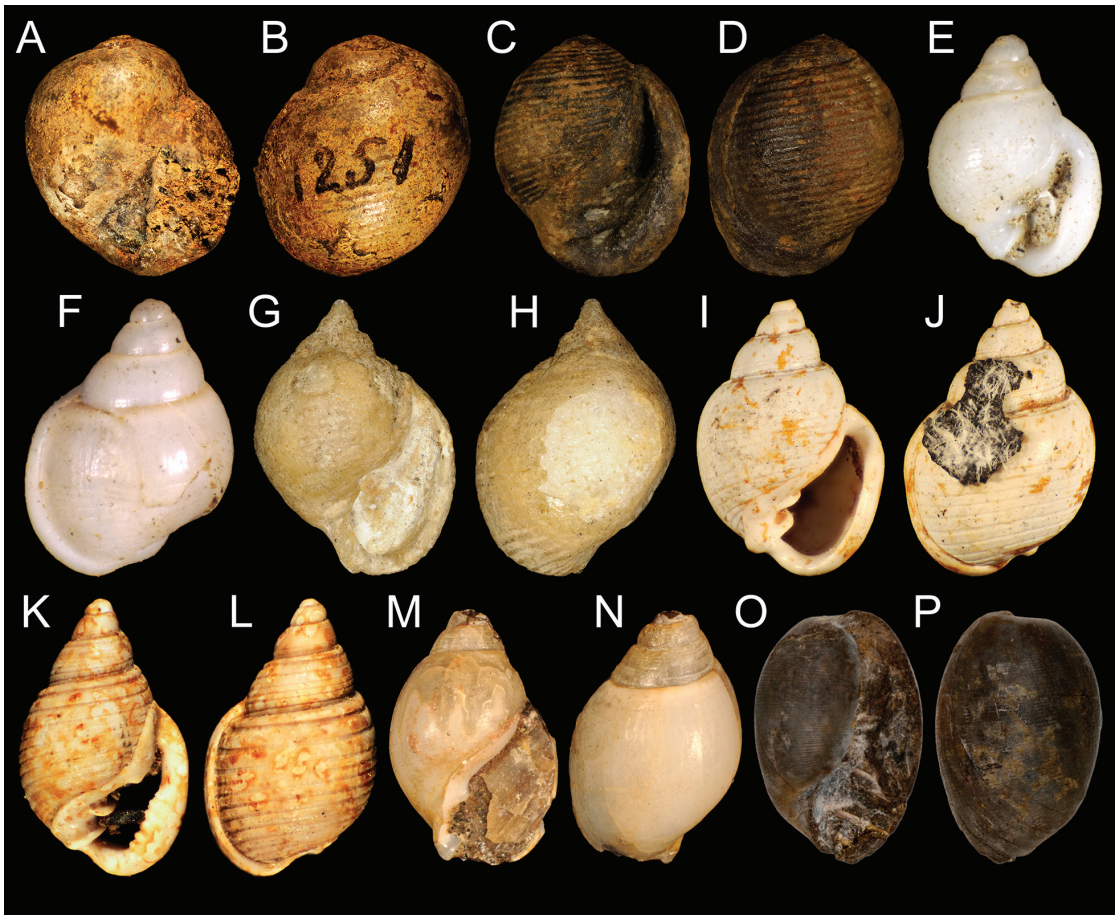

Figure 4. Types. **A–B.** Syntype of *Cinulia naticoides*, H 9.0 mm, ANSP IP18784. **C–D.** Syntype(?) of *Cinulia rectilabrum*, H 9.9 mm, ANSP IP4753. **E–F.** Holotype of *Ringicula hypograpta*, H 2.0 mm, ANSP IP3841. **G–H.** Syntype of *Ringicula lata*, H 15.4 mm, ANSP IP30695. **I–J.** Lectotype of *Ringicula mississippiensis*, H 3.7 mm, ANSP IP13414. **K–L.** Syntype of *Ringicula trapaquara*, H 2.3 mm, ANSP IP6468. **M–N**. Lectotype of *"Ringicula" varia*, H 7.1 mm, ANSP IP4264. **O–P.** Holotype of *Roxania hornii* new comb., H 20.1 mm, ANSP IP4232.

Type locality. Scott's locality 3, excavation of the lower locks at Gatun, Canal Zone, Panama; stratum: Gatun Formation; age: Late Miocene.

Type material. Holotype, ANSP IP3841 (as "type" in Richards 1968: 143).

Current taxonomic status. *Ringicula* (*Ringiculella*) *semistriata* d'Orbigny, 1841 (Woodring 1970).

Ringicula lata (Conrad, 1865)

Figure 4G–H

Actaeon (*Nucleopsis*) *latus* Conrad, 1865a: 34.

Type locality. Alabama(?), USA; stratum: uncertain; age: Early Eocene(?).

Type material. Syntype, ANSP IP30695, 1 shell (as "holotype" in Palmer 1937: 502, Richards 1968: 150; as "probable holotype" in Moore 1962: 69; see also Salvador and Cunha 2016: fig. S1K–M).

Current taxonomic status. *Ringicula lata* (Conrad, 1865) (Salvador and Cunha 2016).

Ringicula mississippiensis Conrad, 1848

Figure 4I–J

Ringicula mississippiensis Conrad, 1848a: 287.

Type locality. Dr. Smith's plantation, 6 miles northeast of Vicksburg, Warren County, Mississippi, USA; stratum: Vicksburg Group; age: Oligocene.

Type material. Lectotype, ANSP IP13414 (designation by Moore 1962: 77; as "lectotype" in MacNeil and Dockery 1984: 235, Moore 1962: 77; as "holotype" in Richards 1968: 161); paralectotypes, ANSP IP13415, 8 shells (as "paratype" in Richards 1968: 161; MacNeil and Dockery 1984: 235; see also Conrad 1848b: 117, pl. 11, fig. 36).

Current taxonomic status. *Ringicula* (*Ringiculella*) *mississippiensis* Conrad, 1848 (MacNeil and Dockery 1984).

***Ringicula trapaquara* Harris, 1895**
Figure 4K–L

Ringicula trapaquara Harris, 1895a: 76, pl. 8, fig. 7.

Type locality. Moseleys Ferry, Brazos River, Texas; stratum: lower Claiborne Formation; age: Eocene.

Type material. Syntypes, ANSP IP6468, 8 shells (as *R. trapaquaria* [sic], "paratype" in Richards 1968: 198).

Current taxonomic status. *Ringicula trapaquara* Harris, 1895 (Palmer 1937).

***Ringicula varia* Gabb, 1864**
Figure 4M–N

Ringicula varia Gabb, 1864: 112, pl. 29, fig. 222a–b.

Type locality. Cow Creek, Shasta County, California, USA; stratum: Chico Formation; age: Cretaceous.

Type material. Lectotype, ANSP IP4264 (designation by Stewart 1926: 435, pl. 24, fig. 3; see also Richards 1968: 202).

Current taxonomic status. Uncertain, as "*Ringicula*" *varia* Gabb, 1864 (Stewart 1930).

Order Cephalaspidea P. Fischer, 1883
Superfamily Bulloidea Gray, 1827
Family Bullidae Gray, 1827
Genus *Roxania* Leach, 1847

***Roxania hornii* (Gabb, 1864), new comb.**
Figure 4O–P

Bulla hornii Gabb, 1864: 143, pl. 29, fig. 235.

Type locality. Kern County, California, USA; stratum: Tejon Formation; age: Eocene.

Type material. Holotype, ANSP IP4232 (Stewart 1926: 439, pl. 29, fig. 9; Richards 1968: 142).

New taxonomic status. *Roxania hornii* (Gabb, 1864) new comb. This species was placed in the genus *Abderospira* Dall, 1898 (e.g., Stewart 1926, Keen and Bentson 1944), which is now considered a synonym of *Roxania* (Valdés 2008).

Genus *Bulla* Linnaeus, 1758

***Bulla macrostoma* Gabb, 1860**
Figure 5A–B

Bulla macrostoma Gabb, 1860c: 301, pl. 48, fig. 15.

Type locality. Prairie Bluff, Alabama, USA; stratum: uncertain ("white limestone"); age: Cretaceous.

Type material. Holotype, ANSP IP30727 (as "type" in Richards 1968: 155).

Current taxonomic status. *Bulla macrostoma* Gabb, 1860 (Stephenson 1914).

Genus *Bullopsis* Conrad, 1858

***Bullopsis cretacea* Conrad, 1858**
Figure 5C–D

Bullopsis cretacea Conrad, 1858: 334.

Type locality. Owl Creek, near Ripley, Tippah County, Mississippi, USA; stratum: "dark gray sandy marl" (Owl Creek Formation); age: Cretaceous.

Type material. Holotype, IPANSP 18924 (Conrad 1860: pl. 46, fig. 27; as "type" in Richards 1968: 120).

Current taxonomic status. *Bullopsis cretacea* Conrad, 1858 (Stephenson 1955, Sohl 1964).

Family Retusidae Thiele, 1925
Genus *Retusa* Brown, 1827

***Retusa biforis* Pilsbry & Johnson, 1917**
Figure 5E–F

Retusa biforis Pilsbry & Johnson, 1917: 151

Type locality. Dominican Republic. Type stratum: "Santo Domingan Beds" (either Cercado or Gurabo Formations); age: Miocene/Pliocene.

Type material. Holotype, ANSP IP3192 (as "type" in Richards 1968: 106).

Current taxonomic status. *Retusa biforis* Pilsbry & Johnson, 1917 (Pilsbry 1922).

***Retusa sulcata fossilis* Pilsbry, 1922**

Retusa sulcata var. *fossilis* Pilsbry 1922: 311.

Type locality. Dominican Republic; stratum: "Santo Domingan Beds" (either Cercado or Gurabo Formations); age: Miocene/Pliocene.

Type material. Holotype and paratypes, ANSP IP3186 (3 shells; lost).

Current taxonomic status. Uncertain, likely valid as *Retusa sulcata fossilis* Pilsbry, 1922.

***Retusa galba* (Conrad, 1833)**
Figure 5G–H

Volvaria galba Conrad, 1833a: 34, pl. 18, fig. 2.

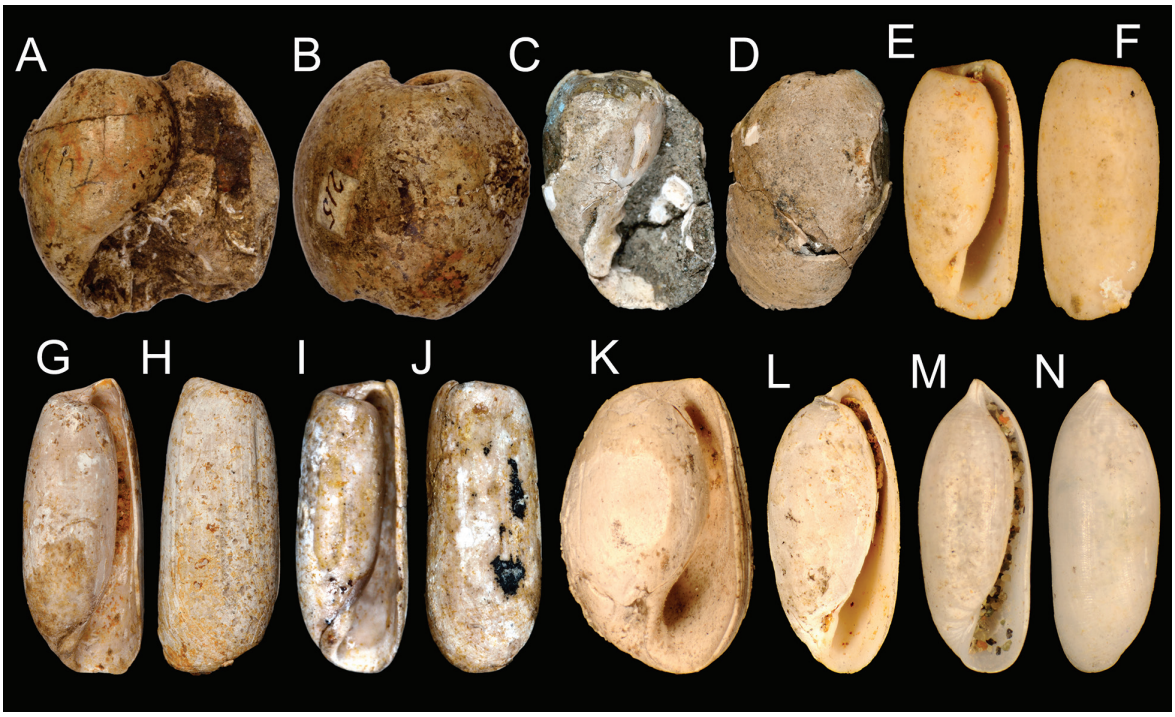

Figure 5. Types. **A–B.** Holotype of *Bulla macrostoma*, H 26.2 mm, ANSP IP30727. **C–D.** Holotype of *Bullopsis cretacea*, H 18.0 mm, ANSP IP18924. **E–F.** Holotype of *Retusa biforis*, H 2.9 mm, ANSP IP3192. **G.** Paralectotype of *Retusa galba*, H 14.3 mm, ANSP IP53816. **H.** Lectotype of *Retusa galba*, H 15.0 mm, ANSP IP30548. **I–J.** Lectotype of *Retusa sthillairii*, H 14.0 mm, ANSP IP5486. **K.** Syntype of *Retusa subspissa*, H 4.8 mm, ANSP IP30641. **L.** Holotype of *Volvulella cylichnoides*, H 4.2 mm, ANSP IP3177. **M–N.** Syntype of *Volvulella cylindrica*, H 4.7 mm, ANSP IP3179.

Type locality. Claiborne Bluff, Alabama River, Monroe County, Alabama, USA; stratum: Gosport Sand (uppermost Claiborne Group); age: Middle Eocene.

Type material. Lectotype, ANSP IP30548 (designation by Palmer and Brann 1966: 878; as "lectotype?" in Moore 1962: 62); paralectotypes, ANSP IP53816, 3 shells, ANSP IP53817, 1 shell, ANSP IP30549, 8 shells (all as "probable syntypes" in Richards 1968: 136).

Current taxonomic status. *Retusa* (*Cylichnina*) *galba* (Conrad, 1833) (Palmer and Brann 1966).

Retusa sthillairii (Lea, 1833)

Figure 5I–J

Bulla St. Hillairii Lea, 1833: 98, pl. 4, fig. 78.

Type locality. Monroe Co., Claiborne Bluff, Alabama, USA; stratum: Gosport Sand (uppermost Claiborne Group); age: Eocene.

Type material. Lectotype, ANSP IP5486, 1 shell (designation by Palmer 1937: 481; as "holotype" in Palmer and Brann 1966: 878); paralectotypes, ANSP IP5487, 1 shell, ANSP IP5488, 1 shell, ANSP IP5489, 1 shell, ANSP IP5490, 1 shell, ANSP IP5491, 1 shell, ANSP IP5487, 1 shell (all [including ANSP IP5486] as "types" in Richards 1968: 191).

Current taxonomic status. *Retusa galba* (Conrad, 1833) (Palmer and Brann 1966).

Retusa subspissa (Conrad, 1846)

Figure 5K

Bulla subspissa Conrad, 1846: 20, pl. 1, fig. 29.

Type locality. Calvert Cliffs, Maryland, USA; stratum: Calvert Formation; age: Miocene.

Type material. Syntype, ANSP IP30641, 1 shell (as "probable holotype" in Moore 1962: 100; as "type?" in Richards 1968: 193).

Current taxonomic status. *Retusa subspissa* (Conrad, 1846), but possible synonym of *Retusa conulus* (Deshayes, 1824) (Martin 1904).

Family Rhizoridae Dell, 1952
Genus *Volvulella* Newton, 1891

Volvulella cylichnoides (Pilsbry & Johnson, 1917)

Figure 5L

Volvula cylichnoides Pilsbry & Johnson, 1917: 151.

Type locality. Dominican Republic; stratum: "Santo Domingan Beds" (either Cercado or Gurabo Formations); age: Miocene/Pliocene.

Type material. Holotype, ANSP IP3177 (as "type" in Richards 1968: 121); paratype, ANSP IP79027, 1 shell.

Current taxonomic status. *Volvulella cylichnoides* (Pilsbry & Johnson, 1917), but could be a synonym of *Retusa yaquensis* Maury, 1917 (Pilsbry 1922).

Volvulella cylindrica (Gabb, 1872)

Figure 5M–N

Volvula cylindrica Gabb, 1872: 246 [non Carpenter, 1865; non E.A. Smith, 1871].

Type locality. Dominican Republic; type stratum: uncertain [likely either Cercado or Gurabo Formations]; age: Miocene/Pliocene.

Type material. Syntype, ANSP IP3179, 1 shell (as "type" in Richards 1968: 121).

Current taxonomic status. *Volvulella persimilis* (Mörch, 1875) (Dall 1889, Pilsbry 1922).

Volvulella micratracta Brown & Pilsbry, 1912

Figure 6A

Volvulella micratracta Brown & Pilsbry, 1912: 504, text fig. 1.

Type locality. Scott's locality 3, excavation of the lower locks at Gatun, Canal Zone, Panama; stratum: Gatun Formation; age: Late Miocene.

Type material. Holotype, ANSP IP3842 (as "type" in Richards 1968: 158).

Current taxonomic status. *Volvulella micratracta* Brown & Pilsbry, 1912 (Woodring 1970).

Volvulella minutissima (Gabb, 1860), new comb.

Figure 6B

Volvula minutissima Gabb, 1860b: 386–387, pl. 67, fig. 52.

Type locality. Caldwell County, Texas, USA; stratum: uncertain; age: Eocene.

Type material. Syntype, ANSP IP13267, 1 shell (as "type" in Richards 1968: 159).

New taxonomic status. *Volvulella minutissima* (Gabb, 1860), new comb. Harris (1895b) considered the species valid. The genus *Volvulella* Newton, 1891 is a replacement name for *Volvula* A. Adams, 1850 non Gistel, 1848 (Valdés 2008).

Volvulella ornata (Pilsbry & Johnson, 1917)

Figure 6C–D

Volvula ornata Pilsbry & Johnson, 1917: 151.

Type locality. Dominican Republic; stratum: "Santo Domingan Beds" (either Cercado or Gurabo Formations); age: Miocene/Pliocene.

Type material. Holotype, ANSP IP3178 (as "type" in Richards 1968: 167); paratypes, ANSP IP81665, 6 shells.

Remarks. Pilsbry and Johnson (1917) did not clearly indicate which one of their specimens is the holotype, merely indicating the presence of a "Type". Judging by the conventions used elsewhere in their paper, we here consider the holotype to be the specimen measured by these authors. Besides the holotype, Pilsbry and Johnson (1917) mentioned seven specimens, one of which is presently missing.

Current taxonomic status. *Volvulella ornata* (Pilsbry & Johnson, 1917) (Pilsbry 1922).

Volvulella parallela (Pilsbry & Johnson, 1917)

Figure 6E

Volvula parallela Pilsbry & Johnson, 1917: 151.

Type locality. Dominican Republic; stratum: "Santo Domingan Beds" (either Cercado or Gurabo Formations); age: Miocene/Pliocene.

Type material. Holotype, ANSP IP3188 (as "type" in Richards 1968: 169); paratypes, ANSP IP79026, 2 shells.

Current taxonomic status. *Volvulella cylindrica parallela* (Pilsbry & Johnson, 1917) (Woodring 1970).

Volvulella tritica (Olsson & Harbison, 1953)

Figure 6F

Volvula tritica Olsson & Harbison, 1953: 163, pl. 25, figs 3–3a.

Type locality. St. Petersburg, Pinellas County, Florida, USA; stratum: North St. Petersburg Beds; age: Plio-Pleistocene.

Type material. Holotype, ANSP IP19104; paratypes, ANSP IP79270, 2 shells (all as "types" in Richards 1968: 199).

Current taxonomic status. *Volvulella tritica* (Olsson & Harbison, 1953) (Portell and Kittle 2010).

Superfamily Haminoeoidea Pilsbry, 1895
Family Haminoeidae Pilsbry, 1895
Genus *Atys* Montfort, 1810

Atys cinctorii Pilsbry & Johnson, 1917

Figure 6G

Atys cinctorii Pilsbry & Johnson, 1917: 152.

Type locality. Dominican Republic; stratum: "Santo Domingan Beds" (either Cercado or Gurabo Formations); age: Miocene/Pliocene.

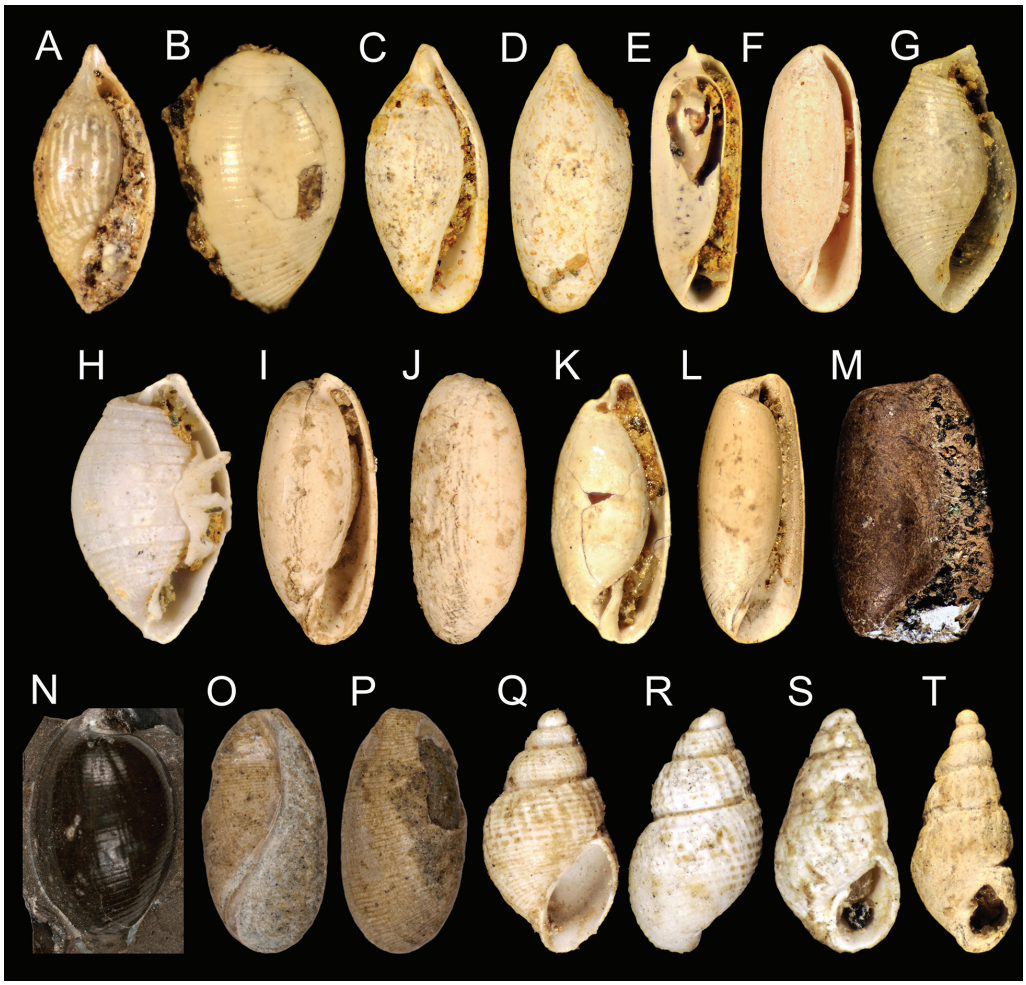

Figure 6. Types. **A.** Holotype of *Volvulella micratracta*, H 1.5 mm, ANSP IP3842. **B.** Syntype of *Volvulella minutissima* new comb., H 2.3 mm, ANSP IP13267. **C–D.** Holotype of *Volvulella ornata*, H 3.2 mm, ANSP IP3178. **E.** Holotype of *Volvulella parallela*, H 2.1 mm, ANSP IP3188. **F.** Holotype of *Volvulella tritica*, H 4.1 mm, ANSP IP19104. **G.** Holotype of *Atys cinctorii*, H 2.6 mm, ANSP IP3185. **H.** Syntype of *Atys sulculorum*, H 2.5 mm, ANSP IP3317. **I–J.** Syntype of *Cylichna cylindrus*, H 4.7 mm, ANSP IP1554. **K.** Syntype of *Cylichna dekayi*, H 5.0 mm, ANSP IP6008. **L.** Syntype of *Cylichna kellogii*, H 5.7 mm, ANSP IP13266. **M.** Holotype of *Cylichna recta*, H 8.0 mm, ANSP IP18782. **N.** Syntype of *Bulla occidentalis*, H 10.0 mm, ANSP IP17139. **O–P.** Lectotype of *Cylichna costata*, H 16.0 mm, ANSP IP4338. **Q–R.** Syntype of *Acteon sculptus*, H 1.9 mm, ANSP IP1515. **S.** Syntype of *Acteon milium*, H 2.1 mm, ANSP IP1520. **T**. Holotype of *Acteon angulatus*, H 2.4 mm, ANSP IP1521.

Type material. Holotype, ANSP IP3185 (as "type" in Richards 1968: 113).

Current taxonomic status. *Atys cinctorii* Pilsbry & Johnson, 1917 (Pilsbry 1922).

Atys sulculorum Pilsbry & Johnson, 1917

Figure 6H

Atys sulculorum Pilsbry & Johnson, 1917: 152.

Type locality. Dominican Republic; stratum: "Santo Domingan Beds" (either Cercado or Gurabo Formations); age: Miocene/Pliocene.

Type material. Syntypes, ANSP IP3317, 2 shells (as "type" in Richards 1968: 194).

Current taxonomic status. *Atys doliolum* (Maury, 1917) (Woodring 1970).

Superfamily Cylichnoidea H. Adams & A. Adams, 1854
Family Cylichnidae H. Adams & A. Adams, 1854
Genus *Cylichna* Lovén, 1846

Cylichna cylindrus (Lea, 1846)

Figure 6I–J

Bulla cylindrus Lea, 1846: 250–251, pl. 35, fig. 43.

Type locality. Petersburg, Dinwiddie County, Virginia, USA; stratum: Yorktown Formation; age: Late Miocene to Middle Pliocene.

Type material. Syntypes, ANSP IP1554, 1 shell (Gardner 1948: 279, pl. 38, fig. 27; as "type" in Richards 1968: 122), ANSP IP79382, 1 shell (Gardner 1948: 279, pl. 38, fig. 28).

Current taxonomic status. *Cylichna cylindrus* (Lea, 1846) (Gardner 1948).

Cylichna dekayi (Lea, 1833)

Figure 6K

Bulla dekayi Lea, 1833: 200, pl. 6, 215.

Type locality. Claiborne, Alabama, USA; stratum: Claiborne Group; age: Eocene.

Type material. Syntypes, ANSP IP6007, 1 shell (as "holotype" in Richards 1968: 123), ANSP IP6008, 1 shell (as "paratype" in Richards 1968: 123).

Current taxonomic status. *Cylichna* (*Mnestia*) *dekayi* (Lea, 1833) (Glibert 1962).

Cylichna kellogii (Gabb, 1860)

Figure 6L

Bulla kellogii Gabb, 1860b: 386, pl. 67, fig. 50.

Type locality. Texas, USA; stratum: uncertain; age: Eocene.

Type material. Syntype, ANSP IP13266, 1 shell (as "type" in Richards 1968: 148).

Current taxonomic status. *Cylichna* (*Acrotrema*) *kellogii* (Gabb, 1860) (Gardner 1945).

Cylichna recta (Gabb, 1860)

Figure 6M

Bulla recta Gabb, 1860c: 303, pl. 48, fig. 16.

Type locality. Burlington County, New Jersey, USA; stratum: "Lower Green Marls" (Navesink Formation); age: Cretaceous.

Type material. Holotype, ANSP IP18782 (as "type" in Richards 1968: 181).

Current taxonomic status. *Cylichna recta* (Gabb, 1860) (Wade 1926, Richards and Ramsdell 1962).

Superfamily Philinoidea Gray, 1850
Family Philinidae Gray, 1850
Genus *Philine* Ascanius, 1772

Philine gabbi Cossmann, 1895

Philine (*Megistostoma*) *gabbi* Cossmann, 1895: 127.

Type locality. Martinez, California, USA; stratum: uncertain; age: Eocene.

Type material. Syntypes ANSP IP4216 (of *M. striatum* Gabb, 1864), 2 shells (lost).

Remarks. This was a new name for *Megistostoma striatum* Gabb, 1864, when transferred to the genus *Philine* [non *striata* Deshayes, 1824]. However, the name *P. gabbiana* (Stoliczka, 1868) has precedence over it (see below).

Current taxonomic status. *Philine* (*Megistostoma*) *gabbiana* (Stoliczka, 1868) (Keen and Bentson 1944).

Philine gabbiana Stoliczka, 1868

Bullaea Gabbiana Stoliczka, 1868: 434.

Type locality. Martinez, California, USA; stratum: uncertain; age: Eocene.

Type material. Syntypes ANSP IP4216 (of *M. striatum* Gabb, 1864), 2 shells (lost).

Remarks. This was coined as a new name for *Megistostoma striatum* Gabb, 1864, when transferred to the genus *Bullaea* Lamarck, 1801 [non *striata* Deshayes]. *Bullaea* is presently considered a synonym of *Philine*.

Current taxonomic status. *Philine* (*Megistostoma*) *gabbiana* (Stoliczka, 1868) (Keen and Bentson 1944).

Megistostoma striatum Gabb, 1864

Megistostoma striata [sic] Gabb, 1864: 144, 229, pl. 21, fig. 108.

Type locality. Martinez, California, USA; stratum: uncertain; age: Eocene.

Type material. Syntypes, ANSP IP4216 (lost), 2 shells (Stewart 1926: 442: pl. 26, fig. 2; as "holotype" and "paratype" in Keen and Bentson 1944: 170; as "holotypes" in Richards 1968: 191).

Remarks. Type species of *Megistostoma* Gabb, 1864. The correct epithet is *striatum* (not *striata*), since the ending -*stoma* is neuter.

Current taxonomic status. *Philine* (*Megistostoma*) *gabbiana* (Stoliczka, 1868) (Keen and Bentson 1944), new name for *M. striatum* Gabb, 1864 (see above).

Family Scaphandridae G.O. Sars, 1878
Genus *Ellipsoscapha* Stephenson, 1941

Ellipsoscapha mortoni (Forbes, 1845)

Bulla mortoni Forbes, 1845: 63, fig. A.

Type locality. New Jersey, USA; stratum: uncertain [likely Navesink Formation]; age: Cretaceous.

Type material. Holotype not found; could be in Charles Lyell's fossil collections (John Sime, pers. comm.), presently in the Natural History Museum (London, UK) and Oxford University Museum of Natural History (Oxford, UK).

Current taxonomic status. *Ellipsoscapha mortoni* (Forbes, 1845) (Richards and Ramsdell 1962, Sohl 1964).

***Ellipsoscapha occidentalis* (Meek & Hayden, 1856)**
Figure 6N

Bulla occidentalis Meek & Hayden, 1856 (non A. Adams, 1850): 69.

Type locality. Yellowstone River (150 miles above its mouth), near Glendive, Montana, USA; stratum: Pierre Shale; age: Late Cretaceous.

Type material. Syntypes, ANSP IP17139, 2 shells.

Current taxonomic status. *Ellipsoscapha occidentalis* (Meek & Hayden, 1856) (Sohl 1967). Substitution of the junior primary homonym is not mandatory if the conditions of Article 23.9.5 ICZN (1999) are met, but a request for a ruling of the Commission under its plenary powers to validate the junior homonymous name would be necessary.

Genus *Scaphander* Montfort, 1810

***Scaphander costatus* (Gabb, 1864)**
Figure 6O–P

Cylichna costata Gabb, 1864: 143, pl. 2, fig. 107.

Type locality. Martinez, Contra Costa County, California, USA; stratum: Tejon Formation s. l.; age: Eocene.

Type material. Lectotype, ANSP IP4338 (designation by Stewart 1926: 437, pl. 27, fig. 3; see also Richards 1968: 118); paralectotypes, ANSP IP79477, 8 shells.

Remarks. Type species of subgenus *Mirascapha* Stewart, 1927.

Current taxonomic status. *Scaphander* (*Mirascapha*) *costatus* (Gabb, 1864) (Squires 1984).

Species transferred to other gastropod groups

Here are listed the species (with type material in the ANSP collection) that were originally classified in "Architectibranchia" and Cephalaspidea, but that actually do not belong to them. Some of them have already undergone taxonomical revision and are listed concisely in Table 1, while others are reclassified below.

Panpulmonata
Superfamily Pyramidelloidea Gray, 1840
Family Pyramidellidae Gray, 1840
Genus *Chrysallida* Carpenter, 1856

***Chrysallida sculpta* (Lea, 1846), new comb.**
Figure 6Q–R

Acteon sculptus Lea, 1846: 257, pl. 36, fig. 59.

Type locality. Petersburg, Dinwiddie County, Virginia, USA; stratum: Yorktown Formation; age: Late Miocene to Middle Pliocene.

Type material. Syntypes, ANSP IP1515, 2 shells (as "types" in Richards 1968: 186).

Taxonomical reassessment. This species is better classified in the genus *Chrysallida* due to the following conchological features (Robba 2013): a weak or absent columellar fold, teleoconch sculpture consisting of collabral ribs and spiral cords of similar strength. Most species of *Chrysallida* are strongly sculptured, as the present specimens, with the ribs forming nodes where crossing the spiral cords and tending to fade away near the base.

Genus *Odostomia* Fleming, 1813

***Odostomia milium* (Lea, 1846), new comb.**
Figure 6S

Acteon milium Lea, 1846: 257, pl. 36, fig. 61.

Type locality. Petersburg, Dinwiddie County, Virginia, USA. Type stratum: Yorktown Formation. Age: Late Miocene to Middle Pliocene.

Type material. Syntypes, ANSP IP1520, 1 shell, ANSP IP79385, 1 shell (lost, not found in the vial).

Taxonomical reassessment. This species is better classified in the genus *Odostomia* due to the following conchological features (Robba 2013): verall ovate-conical shell with moderately convex whorls, suture with a blunt subsutural margin, slit-like umbilicus, and prominent columellar fold.

Genus *Pyrgulina* A. Adams, 1863

***Pyrgulina angulata* (Lea, 1846), new comb.**
Figure 6T

Acteon angulatus Lea, 1846: 256, pl. 36, fig. 57.

Type locality. Petersburg, Dinwiddie County, Virginia, USA. Type stratum: Yorktown Formation. Age: Late Miocene to Middle Pliocene.

Type material. Holotype, ANSP IP1521.

Taxonomical reassessment. This species is better classified in the genus *Pyrgulina* due to the following conchological features (Robba 2013): elongated (somewhat

Table 1. Species (with type material in the ANSP collection) that were originally classified in Architectibranchia and Cephalaspidea, but that after revision were reclassified in other groups. The species are arranged in alphabetical order of the specific epithets, with information on their original description, type specimens in the ANSP collection, current taxonomic status, and references of such status. Abbreviations: Hol = holotype; Lec = lectotype; Pal = Paralectotype(s); Par = paratype(s); Syn = syntype(s).

Original description	Type material (ANSP)	Current taxonomic status	Family	Reference(s)
calafia, "*Acteonina*" Stewart, 1926: 432, pl. 21, fig. 12	4287 (Hol)	*Paosia calafia* (Stewart, 1926)	Pseudomelaniidae	Squires and Saul (2004)
californica, *Acteonina* Gabb, 1864: 128, pl. 29, fig. 230a–b	4259 (Pal)	*Paosia californica* (Gabb, 1864)	Pseudomelaniidae	Squires and Saul (2004)
curta, *Globiconcha* Gabb, 1862: 319	31393 (Hol)	*Tylostoma elevatum* (Shumard, 1853)	Tylostomatidae	Stanton (1947)
elevatus, *Acteon* Lea, 1833: 113, pl. 4, fig. 98	5545 (Lec); 5546 to 5549 (Pal)	*Pyramidella larvata* Conrad, 1833	Pyramidellidae	Palmer (1937), Palmer and Brann (1966)
globosus, *Acteon* Lea, 1846: 255, pl. 36, fig. 55	1518 (Syn)	*Iselica globosa* (Lea, 1846)	Amathinidae	Lee (2015)
granulatus, *Acteon* Lea, 1846: 255, pl. 36, fig. 54	1533 (Syn)	*Odostomia granulatus* (Lea, 1846)	Pyramidellidae	Holmes (1860)
laevis, *Actaeon* Lea, 1841: 94, pl. 1, fig. 4	lost (Hol)	*Odostomia laevis* (Lea, 1847)	Pyramidellidae	Palmer (1937)
linteus, *Solidulus* Conrad, 1858: 334, pl. 35, fig. 10	lost (Hol)	*Eoacteon linteus* (Conrad, 1858)	Acteoninidae	Stephenson (1955), Sohl (1964)
magnoplicatus, *Acteon* Lea, 1841: 94, pl. 1, fig. 5	13158 (Hol)	*Odostomia* (*Evalea*) *melanella* (Lea, 1833)	Pyramidellidae	Palmer (1937)
melanellus, *Acteon* Lea, 1833: 113, pl. 4, fig. 99	5550 (Lec); 5551 to 5557 (Pal)	*Odostomia* (*Evalea*) *melanella* (Lea, 1833)	Pyramidellidae	Palmer (1937)
pygmaeus, ?*Acteon* Lea, 1833: 114, pl. 4, fig. 101	5559 (Hol)	*Pyramidella larvata* Conrad, 1833	Pyramidellidae	Palmer (1937), Palmer and Brann (1966)
simplex, *Acteon* Lea, 1843: 8	1519 (Syn)	*Odostomia simplex* (Lea, 1843)	Pyramidellidae	Ward and Blackwelder (1987)
striatus, *Acteon* Lea, 1833: 114, pl. 4, fig. 100	5558 (Hol)	*Odostomia* (*Evalea*) *melanella alveata* (Lea, 1833)	Pyramidellidae	Palmer (1937), Palmer and Brann (1966)
turbinatus, *Acteon* Lea, 1843: 256, pl. 36, fig. 56	1522 (Syn)	*Odostomia turbinatus* (Lea, 1846)	Pyramidellidae	Ward and Blackwelder (1987)

turreted) conical shell, convex whorls, distinct subsutural shelf, deep suture, preence of a columellar fold present, teleoconch sculpture consisting of axial ribs (including on the base) overridden by spiral threads.

Campbell (1993: 68) considers *Acteon angulatus* Lea 1846 a synonym of *Melanella angulata* (Lea, 1846) (Eulimidae), which is clearly not the case. The present species lacks the diagnostic conchological features of the latter genus (and of eulimids in general), such as: a high spire, a smooth teleoconch with fine axial marks, and the absence of a columellar fold (Warén 1984, Geiger 2016).

List of taxa by species-group names

Here is presented a list of the species whose types can be found in the ANSP collection, arranged alphabetically by specific epithet. Species appear first in their original generic allocation and then in their current systematic position. An "*" after the specific epithet indicates that the type material is lost.

andersoni, *Actaeon* Conrad, 1848a: 287. ***Rictaxis andersoni* (Conrad, 1848).** Acteonidae.

bella, *Tornatellaea* Conrad, 1860: 294. ***Tornatellaea bella* Conrad, 1860.** Acteonidae.

biforis, *Retusa* Pilsbry & Johnson, 1917: 151. ***Acteon gabbana* Whitfield, 1892.** Retusidae.

biplicata, *Acteonina* Gabb, 1860a: 93. ***Acteocina canaliculata* (Say, 1826).** Acteonidae.

bullata, *Tornitella*? Morton, 1834: 48. ***Avellana bullata* (Morton, 1834).** Ringiculidae.

calafia, "*Acteonina*" Stewart, 1926: 432. ***Paosia calafia* (Stewart, 1926).** Pseudomelaniidae.

cederstromi, *Acteocina* Richards, 1947. ***Acteocina candei* (d'Orbigny, 1841).** Acteocinidae.

chowanensis, *Acteocina* Richards, 1947: 34. ***Acteocina canaliculata* (Say, 1826).** Acteocinidae.

cinctorii, *Atys* Pilsbry & Johnson, 1917: 152. ***Atys cinctorii* Pilsbry & Johnson, 1917.** Haminoeidae.

costata, *Cinulia* Johnson, 1898: 462. ***Avellana costata* (Johnson, 1898).** Ringiculidae.

costata, *Cylichna* Gabb, 1864: 143. ***Scaphander* (*Mirascapha*) *costatus* (Gabb, 1864).** Scaphandridae.

costellatus*, *Acteon* Conrad, 1833b: 45. Status uncertain. Acteonidae.

crassiplica, *Bulla* Conrad, 1848a: 282. ***Acteocina crassiplica* (Conrad, 1848).** Bullidae.

cretacea, *Acteon* Gabb, 1862: 318. ***Acteon cretacea* Gabb, 1862.** Acteonidae.

cretacea, *Bullopsis* Conrad, 1858: 334. ***Bullopsis cretacea* Conrad, 1858.** Bullidae.

cylichnoides, *Volvula* Pilsbry & Johnson, 1917: 151. ***Volvulella cylichnoides* (Pilsbry & Johnson, 1917).** Rhizoridae.

cylindrica, *Volvula* Gabb, 1872: 246 [non Carpenter, 1865]. ***Volvulella persimilis* (Mörch, 1875).** Rhizoridae.

cylindrus, *Bulla* Lea, 1846: 250. ***Cylichna cylindrus* (Lea, 1846).** Cylichnidae.

dekayi, *Bulla* Lea, 1833: 200. ***Cylichna* (*Mnestia*) *dekayi* (Lea, 1833).** Cylichnidae.

elegans, *Monoptygma* Lea, 1833: 203. ***Acteon pomilius* Conrad, 1833.** Acteonidae.

forbesiana, *Actaeon* Whitfield, 1892: 157. ***Acteon cretacea* Gabb, 1862.** Acteonidae

fossilis*, *Retusa sulcata* Pilsbry, 1922: 311. ***Retusa sulcata fossilis* Pilsbry, 1922.** Retusidae.

gabbana, *Actaeon* Whitfield, 1892: 156. ***Acteon gabbana* Whitfield, 1892**. Acteonidae.

gabbi, *Philine* (*Megistostoma*) Cossmann, 1895: 127. ***Philine* (*Megistostoma*) *gabbiana* (Stoliczka, 1868).** Philinidae.

gabbiana, *Bullaea* Stoliczka, 1868: 434. ***Philine* (*Megistostoma*) *gabbiana* (Stoliczka, 1868).** Philinidae.

galba, *Volvaria* Conrad, 1833a: 34. ***Retusa galba* (Conrad, 1833).** Retusidae.

glans, *Acteon* Lea, 1846: 256. ***Acteon glans* Lea, 1846.** Acteonidae.

hornii, *Bulla* Gabb, 1864: 143. ***Roxania hornii* (Gabb, 1864) new comb.** Scaphandridae.

hypograpta, *Ringicula* Brown & Pilsbry, 1912: 505. ***Ringicula* (*Ringiculella*) *semistriata* d'Orbigny, 1841.** Ringiculidae.

idoneus, *Acteon* Conrad, 1833b: 45. ***Acteon idoneus* Conrad, 1833.** Acteonidae

impressus, *Acteon* Gabb, 1864: 142. ***Tornatellaea impressa* (Gabb, 1864).** Acteonidae.

kirkwoodiana, *Acteocina* Richards & Harbison, 1944: 9. ***Acteocina kirkwoodiana* Richards & Harbison, 1944.** Acteocinidae.

kellogii, *Bulla* Gabb, 1860b: 386. ***Cylichna* (*Acrotrema*) *kellogii* (Gabb, 1860).** Cylichnidae.

latus, *Actaeon* (*Nucleopsis*) Conrad, 1865a: 34. ***Ringicula lata* (Conrad, 1865).** Ringiculidae.

lineatus, *Acteon* Lea, 1833: 112. ***Acteon idoneus* Conrad, 1833.** Acteonidae.

macrostoma, *Bulla* Gabb, 1860c: 301. ***Bulla macrostoma* Gabb, 1860.** Bullidae.

mathewsonii, *Cinulia* Gabb, 1864: 111. ***Biplica mathewsonii* (Gabb, 1864).** Ringiculidae.

micratracta, *Volvulella* Brown & Pilsbry, 1912. ***Volvulella micratracta* Brown & Pilsbry, 1912.** Rhizoridae.

minutissima, *Volvula* Gabb, 1860b: 386. ***Volvulella minutissima* (Gabb, 1860) new comb.** Rhizoridae.

mississippiensis, *Ringicula* Conrad, 1848a: 287. ***Ringicula* (*Ringiculella*) *mississippiensis* Conrad, 1848.** Ringiculidae.

modicellus*, *Actaeon* Conrad, 1860: 287. ***Acteon modicellus* Conrad, 1860.** Acteonidae.

mortoni*, *Bulla* Forbes, 1845: 63. ***Haminoea mortoni* Forbes, 1845.** Haminoeidae.

naticoides, *Actaenia* Gabb, 1860c: 299. ***Cinulia naticoides* (Gabb, 1860).** Ringiculidae.

nitens, *Acteon* Lea, 1846. ***Acteon nitens* Lea, 1846.** Acteonidae.

novellus, *Acteon* Conrad, 1834: 142. ***Acteon novellus* Conrad, 1834.** Acteonidae.

obliqua, *Cinulia* Gabb, 1864: 111. ***Biplica obliqua* (Gabb, 1864).** Ringiculidae

occidentalis, *Bulla* Meek & Hayden, 1856: 69. ***Ellipsoscapha occidentalis* (Meek & Hayden, 1856).** Scaphandridae.

ornata, *Volvula* Pilsbry & Johnson, 1917: 151. ***Volvulella ornata* (Pilsbry & Johnson, 1917).** Rhizoridae.

oryza, *Acteonidea* Gabb, 1872: 245. ***Rictaxis oryza* (Gabb, 1872).** Acteonidae.

oviformis, *Acteonella* Gabb, 1869: 173. ***Acteonella oviformis* Gabb, 1869.** Acteonellidae.

ovoidea, *Actaeon* Gabb, 1862: 319. ***Acteon cretacea* Gabb, 1862.** Acteonidae.

parallela, *Volvula* Pilsbry & Johnson, 1917: 151. ***Volvulella cylindrica parallela* (Pilsbry & Johnson, 1917).** Rhizoridae.

polita, *Ringinella* Gabb, 1869: 174. ***Acteon politus* (Gabb, 1869).** Acteonidae.

pomilius, *Acteon* Conrad, 1833b: 45. ***Acteon pomilius* Conrad, 1833.** Acteonidae.

punctatus, *Acteon* Lea, 1833: 111. ***Acteon pomilius punctatus* Lea, 1833.** Acteonidae.

puruha, *Acteocina* Pilsbry & Olsson, 1941: 13. ***Acteocina puruha* Pilsbry & Olsson, 1941.** Acteocinidae.

recta, *Bulla* Gabb, 1860c: 303. ***Cylichna recta* (Gabb, 1860).** Cylichnidae.

rectilabrum, *Cinulia* Gabb, 1869: 264. ***Cinulia rectilabrum* (Gabb, 1869).** Ringiculidae.

reticulata, *Volvaria* Johnson, 1899: 71. ***Volvaria reticulata* Johnson, 1899.** Acteonidae.

sthillairii, *Bulla* Lea, 1833: 98. ***Retusa* (*Cylichnina*) *galba* (Conrad, 1833).** Retusidae.

striata, *Megistostoma* Gabb, 1864: 144. ***Philine* (*Megistostoma*) *gabbiana* (Stoliczka, 1868).** Philinidae.

subbullata, *Acteocina* Pilsbry & Johnson, 1917: 150. ***Acteocina bullata* (Kiener, 1834).** Acteocinidae.

subovoides, *Actaeon* Whitfield, 1892: 155. ***Acteon cretacea* Gabb, 1862.** Acteonidae.

subspissa, *Bulla* Conrad, 1846: 20. ***Retusa subspissa* (Conrad, 1846).** Retusidae.

subtornatilis, *Acteon* Pilsbry & Johnson, 1917: 150. ***Acteon subtornatilis* Pilsbry & Johnson, 1917.** Acteonidae.

subvaricata, *Acteonina* Conrad, 1860: 294. ***Nucleopsis subvaricatus* (Conrad, 1860).** Acteonidae.

sulculorum, *Atys* Pilsbry & Johnson, 1917: 152. ***Atys doliolum* (Maury, 1917).** Haminoeidae.

trapaquara, *Ringicula* Harris, 1895a: 76. ***Ringicula trapaquara* (Harris, 1895a).** Ringiculidae.

tritica, *Volvula* Olsson & Harbison, 1953: 163. ***Volvulella tritica* (Olsson & Harbison, 1953).** Rhizoridae.

varia, *Ringicula* Gabb, 1864: 112. ***Ringicula varia* Gabb, 1864.** Ringiculidae.

weatherlli, *Acteon* Lea, 1833: 213. ***Acteocina canaliculata* (Say, 1826).** Acteocinidae.

List of taxa by authorship

Here the list of types is arranged by author (alphabetically) and date; see "References" section for full citation. Species appear in their original generic allocation; see text for current systematic status and placement. An "*" indicates that the type material is lost.

Brown, A. P. & Pilsbry, H. A.

1912 ***hypograpta***, *Ringicula*
1912 ***micratracta***, *Volvulella*

Conrad, T. A.

1833a ***galba***, *Volvaria*
1833b ***costellatus***, *Acteon**
1833b ***idoneus***, *Acteon*
1833b ***pomilius***, *Acteon*
1834 ***novellus***, *Acteon*
1846 ***subspissa***, *Bulla*
1848a ***andersoni***, *Actaeon*
1848a ***crassiplica***, *Bulla*
1848a ***mississippiensis***, *Ringicula*
1858 ***cretacea***, *Bullopsis*
1860 ***bella***, *Tornatellaea*
1860 ***modicellus***, *Actaeon**
1860 ***subvaricata***, *Acteonina*
1865a ***latus***, *Actaeon* (*Nucleopsis*)

Cossmann, M.

1895 ***gabbi***, *Philine* (*Megistostoma*)

Forbes, E.

1845 ***mortoni***, *Bulla**

Gabb, W. M.

1860a ***biplicata***, *Acteonina*
1860b ***kellogii***, *Bulla*
1860b ***minutissima***, *Volvula*
1860c ***macrostoma***, *Bulla*
1860c ***naticoides***, *Actaenia*
1860c ***recta***, *Bulla*
1862 ***cretacea***, *Acteon*
1862 ***curta***, *Globiconcha*
1862 ***ovoidea***, *Actaeon*
1864 ***costata***, *Cylichna*
1864 ***hornii***, *Bulla*
1864 ***impressus***, *Acteon*
1864 ***mathewsonii***, *Cinulia*
1864 ***obliqua***, *Cinulia*
1864 ***striata***, *Megistostoma*
1864 ***varia***, *Ringicula*
1869 ***oviformis***, *Acteonella*
1869 ***polita***, *Ringinella*
1869 ***rectilabrum***, *Cinulia*
1873 ***cylindrica***, *Volvula*
1873 ***oryza***, *Acteonidea*

Harris, G. D.

1895a ***trapaquara***, *Ringicula*

Johnson, C. W.

1898 ***costata***, *Cinulia*
1898 ***reticulata***, *Volvaria*

Lea, H. C.

1846 ***cylindrus***, *Bulla*
1846 ***glans***, *Acteon*
1846 ***nitens***, *Acteon*

Lea, I.

1833 ***dekayi***, *Bulla*
1833 ***elegans***, *Monoptygma*
1833 ***lineatus***, *Acteon*
1833 ***punctatus***, *Acteon*
1833 ***sthillairii***, *Bulla*
1833 ***weatherlli***, *Acteon*

Meek, F. B. & Hayden, F. V.

1856 ***occidentalis***, *Bulla*

Morton, S. G.

1834 ***bullata***, *Tornitella*?

Olsson, A. A. & Harbison, A.

1953 ***tritica***, *Volvula*

Pilsbry, H. A.

1922 ***fossilis***, *Retusa sulcata**

Pilsbry, H. A. & Johnson, C. W.

1917 ***biforis***, *Retusa*
1917 ***cinctorii***, *Atys*
1917 ***cylichnoides***, *Volvula*
1917 ***ornata***, *Volvula*
1917 ***parallela***, *Volvula*
1917 ***subbullata***, *Acteocina*
1917 ***subtornatilis***, *Acteon*
1917 ***sulculorum***, *Atys*

Pilsbry, H. A. & Olsson, A. A.

1941 ***puruha***, *Acteocina*

Richards, H. G.

1947 ***cederstromi***, *Acteocina*
1947 ***chowanensis***, *Acteocina*

Richards, H. G. & Harbison, A.

1944 ***kirkwoodiana***, *Acteocina*

Stoliczka, F.

1868 ***gabbiana***, *Bullaea*

Whitfield, R. P.

1892 ***forbesiana***, *Actaeon*
1982 ***gabbana***, *Actaeon*
1982 ***subovoides***, *Actaeon*

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