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Type Specimens of Hawaiian Land Snails in the Smithsonian Institution, National Museum of Natural History, with Lectotype Designations

*Norine W. Yeung, Robert H. Cowie,
Kenneth A. Hayes, and
Ellen E. Strong*

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ABSTRACT

Yeung, Norine W., Robert H. Cowie, Kenneth A. Hayes, and Ellen E. Strong. Type Specimens of Hawaiian Land Snails in the Smithsonian Institution, National Museum of Natural History, with Lectotype Designations. *Smithsonian Contributions to Zoology*, number 647, vi + 34 pages, 11 figures, 2017. — Pacific island land snail faunas are among the most threatened faunas in the world, having suffered a higher rate of extinction than any other major animal group. The Hawaiian land snails are among the most species-rich and most severely affected of these faunas, yet the current status of most of the Hawaiian species is unknown. Most of the major taxonomic studies on the fauna were undertaken 50–100 years ago and only certain groups were comprehensively studied. New research is uncovering undescribed species, both extant and extinct. The need for rigorous taxonomic treatment of the group is acute if the taxonomic and conservation status of the many species is to be ascertained, and the basis for such research is comprehensive study of type material. The Smithsonian's National Museum of Natural History holds type material of 39 nominal species-group taxa of Hawaiian land snails belonging to eight families; this annotated catalog provides details of this material. Of these taxa, 29 were described by Augustus Addison Gould from material collected by the U.S. Exploring Expedition of 1838–1842. For completeness, we also provide details for one lot of purported paralectotypes that are here inferred not to have been syntypes and one lot representing an unavailable infrasubspecific name. We designate lectotypes for 12 species-group taxa.

Cover images (left to right): Left of main Hawaiian Islands, top row (dimensions = shell height): *Newcombia cinnamomea bonomuniensis* (17.6 mm), *Pupa peponum* (2.7 mm), *Achatinella radiata* (17.8 mm), *Amastra obesa aurora* (10.9 mm), *Laminella concinna* (8.0 mm); bottom row (dimensions = shell height [first three shells] and shell width [last two shells]): *Achatinella nubilosa* (22.1 mm), *A. nucleola* (11.4 mm), *Pupa lyrata* (2.3 mm), *Helix rubiginosa* (5.6 mm), *Amastra rex* (13.7 mm). Right of main Hawaiian Islands, top row (dimensions = shell width): *Helix cryptoportica* (5.6 mm), *H. exaequata* (10.9 mm), *Vitrina caperata* (11.2 mm), *Helicina uberta* (4.8 mm); bottom row (dimensions = shell height): *Succinea canella* (9.7 mm), *S. explanata* (9.7 mm), *S. lumbalis* (11.8 mm).

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Type Specimens of Hawaiian Land Snails in the Smithsonian Institution, National Museum of Natural History, with Lectotype Designations

Norine W. Yeung,^{1,2,3*} Robert H. Cowie,² Kenneth A. Hayes,^{2,3,4} and Ellen E. Strong³

INTRODUCTION

Habitat destruction and the impacts of invasive species are the primary causes of biodiversity loss and species extinction across many taxa, particularly on Pacific islands (Cox and Elmqvist, 2000; Lydeard et al., 2004; Duncan et al., 2013). The spectacularly diverse assemblages of land snails on these islands have been particularly heavily affected, with many species already extinct and the remaining fauna disappearing rapidly (Lydeard et al., 2004; Régnier et al., 2009, 2015; Richling and Bouchet, 2013; Sartori et al., 2014). Among the Pacific islands, the most species-rich land snail fauna is that of the Hawaiian Islands, with more than 750 described species, over 99% of them endemic to the archipelago and many to single islands (Cowie et al., 1995). It has been suggested that up to 90% of these species may already be extinct (Lydeard et al., 2004).

The current biodiversity crisis, exemplified by this fauna, emphasizes the urgent need for taxonomic research to describe species before they vanish unknown (Solem, 1990; Hopkins and Freckleton, 2002; Rodman and Cody, 2003; Wheeler, 2004; Hawksworth and Cowie, 2013). The major taxonomic research on Hawaiian land snails was undertaken more than 50 years ago (e.g. Neal, 1934; Baker, 1940; Cooke and Kondo, 1960) and in some cases a century ago (e.g., Hyatt and Pilsbry, [1910]–1911; Pilsbry and Cooke, 1912–1914). It is therefore difficult to assess the number of species still extant, especially as some groups have yet to be studied in detail (e.g., Endodontidae and Punctidae; Solem, 1976, 1983), and because modern molecular and microscopy techniques (e.g., scanning electron microscopy) are discovering numerous undescribed and sometimes cryptic species, both extinct and extant. This lack of taxonomic clarity and the dearth of recent studies of the Hawaiian land snails hinder attempts to assess their conservation status accurately.

To begin conserving any fauna, a comprehensive compilation of information about type material must be developed to provide the framework for the necessary systematics assessments. Natural history museum collections play a vital role in the study of biodiversity and its loss by providing an indispensable resource of historical and current

¹ Bishop Museum, 1525 Bernice Street, Honolulu, Hawaii, 96817, USA.

² Pacific Biosciences Research Center, University of Hawaii, 3050 Maile Way, Gilmore 408, Honolulu, Hawaii, 96822, USA.

³ Smithsonian Institution, National Museum of Natural History, PO Box 37012, MRC 163, Washington, D.C., 20013, USA.

⁴ Department of Biology, Howard University, 415 College St. NW, Washington, D.C., 20059, USA.

*Correspondence: nyeung@hawaii.edu

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biological records (Davis, 1996; Ponder et al., 2001; Suarez and Tsutsui, 2004). Hawaiian land snail type materials have been deposited in several national and international malacological collections including the United States National Museum (USNM) collection at the National Museum of Natural History (NMNH), Smithsonian Institution.

Although the USNM malacological collection was not formally established as the Department of Mollusks until 1880, the museum began acquiring molluscan material almost as soon as the Smithsonian Institution was founded in 1846. The collection now contains more than 900,000 lots (Sturm, 2006) of which over 12,000 are primary type lots. The large size of this collection is partly due to it being the official repository for national governmental agencies and expeditions including the United States Exploring Expedition (1838–1842). The Mollusca of the Exploring Expedition, which were collected or obtained by J. P. Couthouy, were initially sent to the Peale museum in Philadelphia and subsequently transferred to the National Institution before being moved to the Smithsonian Institution in 1856 (Johnson, 1964). The Exploring Expedition Mollusca were described primarily by Augustus Addison Gould, including 32 Hawaiian land snail species described between 1843 and 1862 (Cowie et al., 1995), and many of the specimens on which the descriptions were based are housed within the USNM. Gould's material constitutes the greatest part of the Hawaiian land snail type material in the USNM. The primary objective of this catalog is to document this Hawaiian type material, as one in a series of catalogs of museum types representing this highly threatened fauna (e.g., Cowie et al., 2016).

APPROACH AND FORMAT OF ACCOUNTS

This catalog is a work of nomenclature and clarification of the status of type material; it is not a work of taxonomy and we have avoided making any new taxonomic judgments. All interpretations follow the *International Code of Zoological Nomenclature* (ICZN, 1999), hereafter, the *Code*. Primary types (i.e., holotype, syntype, lectotype; there are no neotypes) and secondary types (i.e., paratype, paralectotype) are included in this catalog.

The list is arranged alphabetically by family. Within each family, taxa are arranged alphabetically by species-group name. The heading of each entry consists of the name, author(s) and date of description, followed by the genus of the original combination, and the species for infraspecific taxa. The next line of the entry then consists of the name as given with the original genus (and species for subspecies, varieties, etc.) in which it was described, verbatim as published by the author, including subgenus if in the original description, using the original orthography, even if now considered incorrect according to the *Code* (e.g., diacritical marks, ligatures, incorrect gender ending, species name beginning with a capital), except that genus and species names are in italic even if printed otherwise in the original publication, and with the original status indicated (e.g., subspecies, “var.”) as

necessary, with upper/lower case and italic/plain font as in the original description. The name is followed by its author(s), date of publication, page number, and plate/figure number(s). Subsequent literature by the same author(s) bearing directly on the original description follows immediately after the bibliographic information, separated by a semicolon. Next the current taxonomic status is given, including generic and subgeneric placement, whether a valid taxon, and if not, the appropriate synonymy, with one or more citations supporting the status. Current status is taken to be that given by Cowie et al. (1995), with the exception of one taxon (*rubinia* Hyatt and Pilsbry, 1911; Amastridae) described as a variety and treated as “infraspecific” by Cowie et al. (1995) that is here cataloged as a subspecies in the light of the *Code* (Article [Art.] 45.6.4). This is followed by a listing of type material with USNM catalog number(s) and the number of specimens in each lot; all specimens are dry shells. The type locality follows within quotation marks, with the original orthography as provided in the original description, or as clarified by reference to other sources (e.g., original labels, localities within the known range of the taxon; *Code*, Recommendation [Rec.] 76A), or as restricted by the designation of a lectotype. Additional type locality information (e.g., clarifications, corrections, information from subsequent publications) is given in square brackets. Information on type material at other institutions (not necessarily comprehensive), corrections or additional information, changes in type status, information on lost or destroyed specimens, and so on, is included in a remarks section. In these remarks, species-group taxa are generally referred to in the generic combination of their original description.

THE SPECIES OF AUGUSTUS ADDISON GOULD

Some confusion, or at least ambiguity, has arisen in the literature regarding certain original numbers such as “A1197” (see also Johnson, 1964) associated with some of Gould's specimen lots (e.g., *Achatinella radiata* Gould). These appear to be catalog numbers originally given by Gould to lots containing specimens he described. These lots were probably loaned to Gould in Boston by the National Institution (see above), and on their return to the newly formed Smithsonian Institution in Washington these numbers were entered into the catalog ledgers some time after 1860 by P. P. Carpenter (Carpenter, 1864:530; Johnson, 1964:15). Some of these lots, with labels with Gould's original numbers, were distributed as duplicates to various museums, notably the New York State Museum, the type material of which is now on permanent loan to the Museum of Comparative Zoology of Harvard University (Johnson, 1964), although some of this material appears to have been lost during the transfer among museum collections (Hall, 1875).

The vast majority of Gould's U.S. Exploring Expedition type material of Hawaiian land snails in the USNM is cataloged under two sets of numbers, one in the USNM 5000 series and one in the USNM 20000 series. In the original handwritten USNM catalog ledger, many 20000 series lots are accompanied

by yet another “original number” preceded by the letter “f” (e.g., “f20”; *Succinea canella* Gould); the corresponding lots in the 5000 series have the same “original number” but with no prefix (e.g., “20”). Unlike the original catalog numbers, these “original numbers” correspond to the figure numbers of Gould’s illustrations published in 1856, with the “f” appearing to indicate “figure.” In most cases, the 20000 series lots contain multiple specimens and appear to have been separated from the original lots cataloged in the 5000 series, which now often contain only a single specimen that matches Gould’s (1856) figure. It is generally the latter specimen that is selected as the lectotype, when appropriate.

Most lots in the 20000 series are noted in the original handwritten USNM catalog ledger as having been received from the U.S. Exploring Expedition, but a number are either noted as also having been received from William Harper Pease or as having been received only from Pease. Born in New York in 1824, Pease moved to Hawaii in December 1849 (Kay and Clench, 1975:2–3), after most of Gould’s species had been described (Gould, 1844, 1845, 1846, 1847). So it seems most likely that Pease would have received the material on loan or on exchange from Gould after he had arrived in Hawaii and become interested in Hawaiian land snails, returning it subsequently, perhaps directly to the USNM. There, along with the material returned by Gould from Boston, it was cataloged by Carpenter, who, perhaps inadvertently, noted a few lots as having been received from Pease only, without noting their original receipt from the U.S. Exploring Expedition. Many of the 20000 series lots are annotated with original numbers (as explained above). Carpenter (1864:530) explained that “a considerable part of the shells professing to be the figured types of the new species were found together, with the artist’s marks corresponding with the plates and figures.” Accordingly, we consider 20000 series lots annotated with Gould’s original catalog and/or figure numbers to be type material. In several cases, lots with no original numbers are considered to be possible type material, as explained below.

LECTOTYPE FIXATION AND DESIGNATION

Additional confusion, regarding possible lectotype designation/fixation, has arisen as a result, in particular, of the catalog of Gould’s material by Johnson (1964). In a number of cases Johnson used the term “lectotype” clearly and validly, thereby designating the particular specimen as such. However, his use of the terms “holotype,” “figured holotype,” and “figured neoholotype” may not be valid lectotype designations/fixations, based on the relevant articles of the *Code* (Art. 74.5, 74.6), which are difficult to interpret. We have interpreted these two articles of the *Code* as follows in the context of this paper.

A holotype can be fixed only in the original publication when the nominal taxon is established (*Code*, Art. 73.1.3, Glossary). There are two ways in which an incorrect use of “holotype” can be a lectotype fixation: (1) under Art. 74.5, when the original description reveals that the taxon was based on more

than one specimen and a subsequent author made an explicit, intentional statement of selection; or (2) under Art. 74.6, when the original description does not imply that the taxon was based on more than one specimen, and when an author published before the year 2000 an inference that a syntype is the “holotype” or “the type”; if it is discovered that there was more than one syntype, this assumption becomes a lectotype designation, but only if the author had assumed that the original description was based on only one specimen.

An author writing “holotype” or “figured holotype” when no holotype was originally designated and when he or she knows that the type series had more than one specimen is in error: no specimen has been “unambiguously selected” under Art. 74.5, because in fact no selection has occurred, as the author considers the holotype to have been fixed by the original author. For example, Johnson (1964:148), in his treatment of *Helix setigera*, explicitly noted the “figured neoholotype, selected by Gould, USNM 5453”; this is not a lectotype designation under Art. 74.5. Furthermore, such usages cannot be lectotype designations under Art. 74.5 because Johnson (1964) did not misuse the term “holotype”—that is, intending it as a novel selection of the name-bearing type—as he also used “lectotype” in the same paper, clearly understanding the distinction.

Thus when Johnson used the terms “figured holotype” or “holotype,” such usages cannot be lectotype designations under Art. 74.5, but potentially can be lectotype fixations under Art. 74.6, although only if he accepted that the taxon was based on a single type specimen. In no case did Johnson explicitly do so when he used these terms and in most cases he also listed other type (“paratype”) material. Therefore, these are not lectotype designations under Art. 74.6 and thus lectotypes were neither designated under Art. 74.5 nor fixed under Art. 74.6.

Johnson (1994) clarified his former usage of the terms “figured holotype” or “holotype,” stating that if he could “locate the single figured or measured syntype, it was usually regarded as the holotype.” But he also acknowledged that this practice was no longer tenable under the 1985 *Code* (ICZN, 1985), and neither is it under the current *Code* (ICZN, 1999). Whether a specimen was part of the type series and therefore eligible for lectotype designation may be judged using external information (*Code* Art. 72.4.1.1), but whether the wording of a putative designation qualifies as a lectotype designation must be judged on the basis of information contained in the publication; one cannot retroactively change the status of such statements. However, Johnson (1964), in multiple places as cited herein, wrote “figured holotype” and also listed paratypes. This shows that he did not mean by “figured holotype” that the type series had only a single specimen, and therefore he did not designate lectotypes under Art. 74.6.

It is also necessary to clarify our interpretation of possible lectotype designations by Baker (1963). He often used “TOM,” which means “type because only one example was included in the original description, or was indicated by only one set of dimensions (of course the first) or by reference to a

(cited) illustration(s) of only one shell, in the definition proper, exclusive of additional remarks” (Baker, 1963:191). Therefore TOM does not mean that Baker necessarily accepted that there was a single specimen. However, Baker went a step further than Johnson in stating that any use of his abbreviations for type designations was a “TSD,” which means “type by subsequent selection, followed by ‘now’ if apparently first designated in these lists and/or preceded by name and reference, especially when selected previously. Of course, every usage of any of these abbreviations is a TSD in this list” (Baker, 1963:191). A “TSD” is broader than the current concept of a new lectotype designation, but in cases in which the “type” was “first designated in these lists” we treat “TSD” as a valid lectotype designation under Art. 74.5.

Additional details and explanations of our conclusions regarding the status of specimens as lectotypes are provided under the individual taxon entries, including cases involving other authors (Hyatt and Pilsbry, [1910]–1911; Pilsbry and Cooke, 1908, 1914–1916, 1918–1920; Baker, 1940, 1941).

In addition to clarifying possible lectotype designations of previous authors, we make a number of designations herein. This paper is part of an ongoing effort to update the systematics of the Hawaiian land snails, and appropriate designation of lectotypes is part of this overarching program of research (see Rec. 74G; ICZN, 2003). However, we have been circumspect and have not designated lectotypes in situations in which it is possible that more appropriate specimens may be present in other collections.

ACRONYMS AND ABBREVIATIONS

alt.	altitude
ANSP	Academy of Natural Sciences of Drexel University, Philadelphia
Art.	Article of the <i>Code</i>
BPBM	Bernice Pauahi Bishop Museum, Honolulu
BSNH	Boston Society of Natural History, Boston
<i>Code</i>	<i>International Code of Zoological Nomenclature</i> (ICZN, 1999)
lat.	latitude
long.	longitude
MCZ	Museum of Comparative Zoology, Harvard University, Cambridge, Mass.
n. comb.	new combination
NHMK	the Natural History Museum, London, UK (former acronym BMNH)
NMNH	National Museum of Natural History, Smithsonian Institution, Washington, D.C.
no.	number
n. var.	new variety
NYSM	New York State Museum, Albany
Rec.	Recommendation of the <i>Code</i>
spm(s)	specimen(s)
subg.	subgenus
USNM	U.S. National Museum (collections now held in the Smithsonian’s NMNH)
var.	variety

Systematic Catalog

FAMILY ACHATINELLIDAE

honomuniensis* Pilsbry and Cooke, 1912; *Newcombia cinnamomea

Newcombia cinnamomea var. *honomuniensis* Pilsbry and Cooke, 1912:12, pl. 14, figs. 6, 7.

Current taxonomic status: *Newcombia pfeifferi homomuniensis* Pilsbry and Cooke, 1912.

Valid subspecies (Pilsbry and Cooke, 1914:355; Cowie et al., 1995:62).

Type material: Paralectotypes USNM 673317 (8 spms; Figure 1A).

Type locality: “Honomuni” [which is on Molokai (Pilsbry and Cooke, 1912:11)].

Remarks: No holotype was designated but figures of two specimens were provided with the original description, captioned as “cotypes.” According to the original description, the type material was collected by D. Thaanum (Pilsbry and Cooke, 1912:12). However, the original handwritten USNM ledger indicates that USNM 673317 was received from Kuhns and Thaanum and the specimens were “paratypes.” The ledger confirms the locality as Honomuni, Molokai, Hawaii. Baker (1963:194) validly (as “TOM”) designated ANSP 110071a as the lectotype (see section in the Introduction regarding lectotype designations). An additional paralectotype, BPBM 36858 (1 spm), was collected and donated by D. Thaanum. The original species combination was listed incorrectly by Cowie et al. (1995:62) as *Newcombia pfeifferi* var. *honomuniensis*, which is the current placement of this taxon.

marmorata* Gould, 1847; *Achatinella

Achatinella marmorata Gould, 1847:200; 1852:85; 1856: pl. 7, figs. 94, 94a; 1862:34.

Current taxonomic status: *Partulina* (*Partulina*) *marmorata* (Gould, 1847). Valid species (Pilsbry and Cooke, 1912:42; Cowie et al., 1995:70).

Type material: Lectotype USNM 5496 (Figure 1B), here designated; paralectotype USNM 1418213 (1 spm, Figure 1C; ex USNM 5496).

Type locality: “Haleakala Mountains, Maui, Sandwich Islands” [=Hawaiian Islands].

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 7, figs. 94, 94a). Johnson (1964:109) noted “2 syntypes USNM 5496 slightly smaller than measured type.” There are no remarks in the original handwritten USNM ledger or on the printed labels identifying either of the specimens as figured. Neither the color

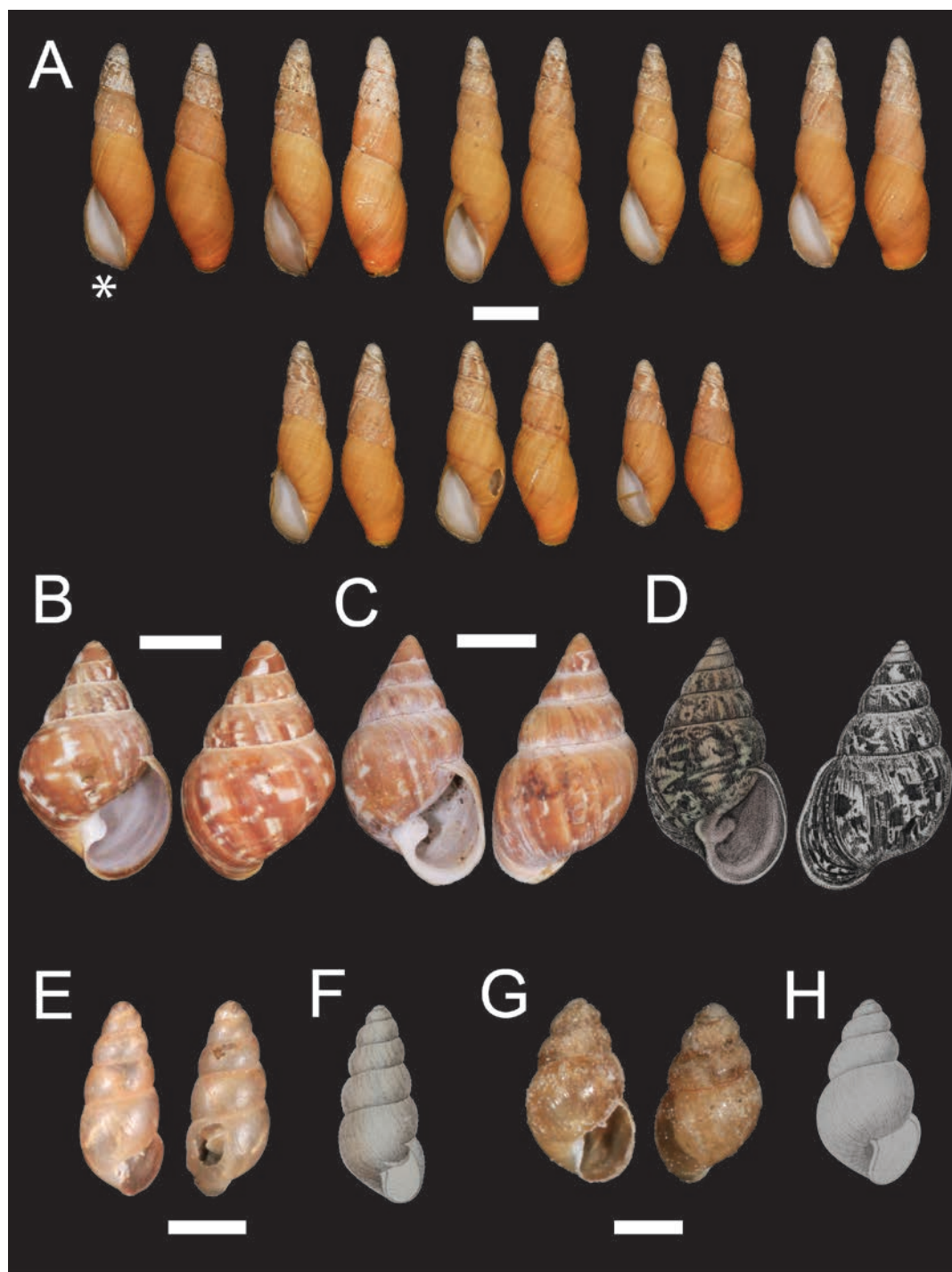


FIGURE 1. A. Paralectotypes (USNM 673317; 17.6 mm) of *Newcombia cinnamomea homomuniensis*. B. Lectotype (USNM 5496; 14.7 mm), here designated, of *Achatinella marmorata*. C. Paralectotype (USNM 1418213; 16.0 mm) of *A. marmorata*. D. Gould's (1856: pl. 7, figs. 94, 94a) figured *Achatinella marmorata*. E. Lectotype (USNM 5506; 2.5 mm) of *Pupa peponum*. F. Gould's (1856: pl. 7, fig. 104) figured *Pupa peponum*. G. Paralectotype (USNM 5506a; 2.7 mm) of *P. peponum*. H. Gould's (1856: pl. 7, fig. 104a) figured *Pupa peponum*. Dimensions are shell height (length). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: A–C, 5 mm; E and G, 1 mm.

patterning, which is highly stylized, nor the shell shape in Gould's (1856: figs. 94, 94a) illustrations (Figure 1D) is a perfect match for either of the shells and it is possible that they are composites incorporating elements from both. We here designate USNM 5496 as the lectotype (Figure 1B). The type material was collected by J. D. Brackenridge and J. Drayton (Gould, 1852:86) and the original handwritten ledger indicates that it was received from the U.S. Exploring Expedition, with "original number" 94, corresponding to Gould's (1856) illustration.

peponum Gould, 1847; Pupa

Pupa peponum Gould, 1847:197; 1852:93; 1856: pl. 7, figs. 104, 104a–e; 1862:34, 244.

Current taxonomic status: *Lamellidea* (*Lamellidea*) *peponum* (Gould, 1847). Valid species (Pilsbry and Cooke, 1914:156; Cowie et al., 1995:80).

Type material: Lectotype (Pilsbry and Cooke, 1914:157, pl. 35, figs. 1, 2) USNM 5506 (Figure 1E); paralectotype USNM 5506a (Figure 1G).

Type locality: Hilo or Oahu (Gould, 1852:93).

Remarks: No holotype was designated nor a figure provided with the original description. In the original description, Gould (1847:197) stated the type locality as "Sandwich Islands." Gould (1847:197) described the species as having "very variable characters" and subsequently (Gould, 1852:94; 1856: pl. 7, figs. 104, 104a–e) provided figures of multiple specimens, stating that he had specimens collected in Hilo, Hawaii, by C. Wilkes and on Oahu by J. D. Brackenridge. Sykes (1903:382) determined that Gould's illustrations of *P. peponum* represented three species, identifying the shells (note the plural) in Gould's figs. 104 and 104d as *Pupa peponum*. Pilsbry and Cooke (1914:157), aware of the multiple syntypes, noted "the type specimen, no. 5506 Smithsonian Institution" and indicated that this was the specimen figured by Gould (1856: pl. 7, fig. 104), thereby selecting it as the lectotype of *Pupa peponum* (and avoiding the problematic use of the term "holotype," as discussed in the section on lectotypes in the Introduction; Code, Art. 74.5). Johnson (1964:125) noted this lot as the "holotype." The original handwritten ledgers indicate that there were originally two specimens in this lot, received from the U.S. Exploring Expedition, with "original number" 104. Gould (1856: pl. 7, figs. 104, 104a) figured two entire shells. Pilsbry and Cooke (1914: pl. 35, figs. 1, 2) considered their figured shell (USNM 5506) to be that of Gould's fig. 104, but the other shell in USNM 5506 is not a definitive match for Gould's fig. 104a (see Figures 1F, 1H, respectively). A note with the lot, written by Y. Kondo in 1956, indicates that the smaller specimen is probably an immature specimen of *Pacificella variabilis* Odhner, 1922 (as *Tornatellinops*), though this species is not known from the Hawaiian Islands. This

smaller specimen was subsequently removed from the lot and designated as USNM 5506a (Figure 1G). USNM 5506 is listed in the ledger simply as originating from the "Sandwich Islands," but Gould (1852:94) stated that he had material from Hilo (island of Hawaii) and Oahu, indicating that the type locality could be on either of these islands. Johnson (1964:125) noted an additional "paratype" (MCZ 216798, ex Peabody Museum, Salem, Massachusetts, probably collected by J. P. Couthouy). However, this specimen is in fact a species of Eulimidae, which are marine. It is not clear why Johnson considered it a paratype of *P. peponum* and we do not consider it type material of this species.

radiata Gould, 1845; Achatinella

Achatinella radiata Gould, 1845:27; 1862:195.

Current taxonomic status: *Partulina* (*Partulina*) *radiata* (Gould, 1845). Valid species (Pilsbry and Cooke, 1912:49; Cowie et al., 1995:72).

Type material: Lectotype USNM 712806 (Figure 2A), here designated; paralectotypes USNM 1418215 (3 spms, Figure 2B; ex USNM 712806).

Type locality: "Sandwich Islands" [=Hawaiian Islands].

Remarks: No holotype was designated nor a figure provided with the original description. The "Type lot" (Johnson, 1964:138) appears to have been one of a number of lots of multiple taxa intended for distribution to the New York State Museum (NYSM) in 1863 (Hall, 1875:13; Johnson, 1964:15). Under the number A1197, this type lot was reported as "not to be found in the collection" in the NYSM annual report for 1873 (Hall, 1875:13) and was treated as "lost" by Johnson (1964:138). It has now been found in the USNM type collection as USNM 712806 (originally 4 spms) and the USNM handwritten ledger confirms the original number as A1197 ("type series 1845. PBSNH. 2:27" [i.e., Gould, 1845:27]). We here designate USNM 712806 as the lectotype, with the other three specimens of the original lot becoming paralectotypes and given the new number USNM 1418215. Four additional paralectotypes are in the MCZ (Johnson, 1996:195; MCZ 2982814, as "syntypes").

FAMILY AMASTRIDAE

abberans Hyatt and Pilsbry, 1911; Amastra affinis bigener

Amastra affinis bigener var. *abberans* Hyatt and Pilsbry, 1911:300, pl. 44, fig. 8.

Current taxonomic status: None; unavailable name.

Type material: None; unavailable name.

Type locality: None; unavailable name.

Remarks: We include this name in this catalog for completeness and to preempt potential confusion, as it was listed

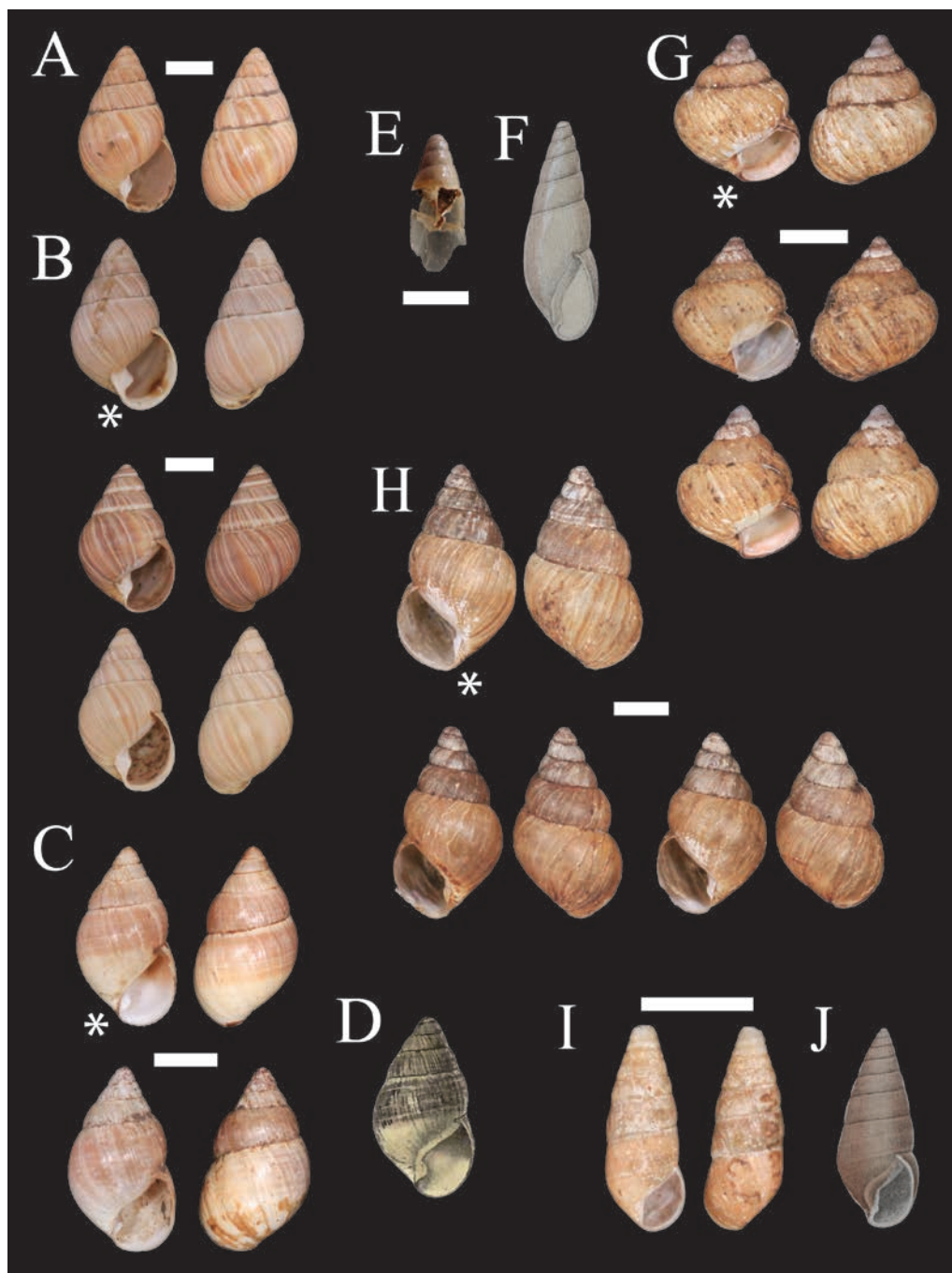


FIGURE 2. A. Lectotype (USNM 712806; 17.8 mm), here designated, of *Achatinella radiata*. B. Paralectotypes (USNM 1418215; ex 712806; 18.0 mm) of *A. radiata*. C. Non-type material (unavailable name; USNM 117264; 14.2 mm) of *Amastra affinis bigener* var. *abberans*. D. Hyatt and Pilsbry's (1911: pl. 44, fig. 8) figured *Amastra affinis bigener* var. *abberans*. E. Lectotype (USNM 5502; 10.5 mm), here designated, of *Achatinella acuminata*. F. Gould's (1856: pl. 7, fig. 100) figured *Achatinella acuminata*. G. Paralectotypes (USNM 308750; 10.9 mm) of *Amastra obesa aurora*. H. Paralectotypes (USNM 308754; 18.9 mm) of *Amastra subzoror auwahiensis*. I. Syntype (USNM 5501; 9.2 mm) of *Achatinella cerealis*. J. Gould's (1856: pl. 7, fig. 99) figured *Achatinella cerealis*. Dimensions are shell height (length). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: 5 mm.

as available by Cowie et al. (1995:90). The name was introduced under the heading “*A. a. bigener* Hyatt, n. var.” (i.e., infrasubspecific), although in the body of the text the Hyatt manuscript name “*A. bigener* var. *abberans*” was mentioned, leading Cowie et al. (1995:90) to treat it as available, although invalid as a synonym of *Achatinella affinis* Newcomb, 1854 (now placed in *Amastra*). However, it is clear that the name was used to denote an infrasubspecific entity, as Hyatt and Pilsbry (1911:383) in the plate legend listed it as “*Amastra a. bigener*,” and to our knowledge it was neither adopted prior to 1985 as the valid name for a species or subspecies nor treated as a senior homonym. Therefore, the name is unavailable (Code, Art. 10.2, 45.6).

Lot USNM 117264 represents the material on which the name was based, at least in part. According to the original USNM ledger, eight specimens were present when the lot was accessioned from the Lea collection, but only two specimens remain. Although the exact collection locality is unknown, the original description was placed in the section of the publication that described *Amastra* spp. from Maui (Hyatt and Pilsbry, 1911). The ledger indicates the locality simply as the “Sandwich Islands.” One of the two shells in USNM 117264 (Figure 2C) is the specimen figured (Figure 2D) by Hyatt and Pilsbry (1911: pl. 44, fig. 8).

acuminata* Gould, 1847; *Achatinella

Achatinella acuminata Gould, 1847:200; 1852:88; 1856: pl. 7, figs. 100, 100a.

Current taxonomic status: *Leptachatina* (*Leptachatina*) *acuminata* (Gould, 1847). Valid species (Cooke in Hyatt and Pilsbry, 1910:6; Cowie et al., 1995:120).

Type material: Lectotype USNM 5502 (Figure 2E), here designated.

Type locality: “Kauai, Sandwich Islands.”

Remarks: No holotype was designated nor a figure provided with the original description, although multiple figures of a single shell were provided subsequently by Gould (1856: pl. 7, figs. 100, 100a) and the colored figure (fig. 100) is here reproduced as Figure 2F. Cooke (in Hyatt and Pilsbry, 1910:6) noted the presence of a single broken shell in the Smithsonian collections, and failed to find additional material despite a careful search in the Gould collection of the New York State Museum. The original handwritten USNM ledger confirms that the specimen was already broken when it was accessioned; the ledger does not have any additional information regarding type status. It gives the locality simply as the “Sandwich Islands,” although the original description restricted it to Kauai, and indicates that the specimen was received from the U.S. Exploring Expedition, with “original number” 100. We here designate this single broken shell (USNM 5502) as the lectotype.

aurora* Pilsbry and Cooke, 1914; *Amastra obesa

Amastra obesa aurora Pilsbry and Cooke, 1914:18, pl. 4, figs. 9–12.

Current taxonomic status: *Amastra* (*Cyclamastra*) *obesa aurora* Pilsbry and Cooke, 1914. Valid subspecies (Cowie et al., 1995:100).

Type material: Paralectotypes USNM 308750 (3 spms, Figure 2G).

Type locality: “East Maui: Auwahi at about 4200 ft. elevation.”

Remarks: No holotype was designated, but figures of three specimens were provided with the original description. Pilsbry and Cooke (1914:18) reported “cotypes” in ANSP, BPBM, and Thaanum’s personal collection. The original handwritten USNM ledger indicates the status of the specimens in USNM 308750 as “cotypes” and that the collectors were D. Thaanum and D. B. Kuhns, and that they were received from A. Busck. August Busck was a microlepidopterist at the NMNH, and apparently had a shell collection. Without any information in the original description about collectors, it seems reasonable to conclude that these were the specimens noted by Pilsbry and Cooke as in Thaanum’s collection. This weight of evidence leads us to consider them as paralectotypes. Baker (1963:197) validly (as “TSD now”) designated ANSP 109838a as the lectotype (see section in the Introduction regarding lectotype designations).

auwahiensis* Pilsbry and Cooke, 1914; *Amastra subesoror

Amastra subesoror auwahiensis Pilsbry and Cooke, 1914:48, pl. 5, figs. 8–10.

Current taxonomic status: *Amastra* (*Heteramastra*) *subesoror auwahiensis* Pilsbry and Cooke, 1914. Valid subspecies (Cowie et al., 1995:103).

Type material: Paralectotypes USNM 308754 (3 spms, Figure 2H).

Type locality: “East Maui: Auwahi, at 4200 ft.”; “Auwahi is on the slope of Haleakala facing Hawaii, just above Ulupalakua.”

Remarks: No holotype was designated but figures of three specimens were provided with the original description. Pilsbry and Cooke (1914:48) did not mention where type material was deposited. The USNM ledger indicates the collectors of USNM 308754 as D. Thaanum and D. B. Kuhns, that they were received from A. Busck (see *aurora* Pilsbry and Cooke, 1914), and that the locality was “Auwahi, East Maui.” Baker (1963:197) validly (as “TSD now”) designated ANSP 109836a as the lectotype (see section in the Introduction regarding lectotype designations). We consider the specimens in USNM 308754 to be paralectotypes.

cerealis* Gould, 1847; *Achatinella

Achatinella cerealis Gould, 1847:201; 1852:90; 1856: pl. 7, figs. 99, 99a; 1862:35, 244.

Current taxonomic status: *Leptachatina* (*Leptachatina*) *cerealis* (Gould, 1847). Valid species (Cooke in Hyatt and Pilsbry, 1910:13; Cowie et al., 1995:121).

Type material: Possible syntype USNM 5501 (Figure 2I).

Type locality: “Waianai, Oahu” [*sic*, Waianae].

Remarks: No holotype was designated nor a figure provided with the original description, although figures of a single specimen were provided subsequently by Gould (1856: pl. 7, figs. 99, 99a). It has not been determined that the description was based on a single specimen, and the original description does not imply or require that it was based on more than one specimen. The specimen in USNM 5501 is not a good match for Gould’s (1856: pl. 7, fig. 99) figure and is probably not the figured specimen (Figure 2J), suggesting that there were in fact multiple syntypes, or that this specimen was not part of the type series. By noting the “Figured holotype USNM 5501,” Johnson (1964:53) inferred a “holotype,” but this statement is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). Additionally, because it probably is not the figured specimen and may not have been part of the type series (perhaps a different species), we refrain from designating it as the lectotype, treating it as only a possible syntype. The original handwritten ledger for USNM 5501 confirms Oahu as the locality and indicates that one specimen was received from the U.S. Exploring Expedition, with “original number” 99.

***circumcincta* Hyatt and Pilsbry, 1911;
*Laminella concinna***

Laminella concinna Color-var. *circumcincta* Hyatt and Pilsbry, 1911:337, pl. 54, figs. 12, 13.

Current taxonomic status: *Laminella concinna circumcincta* Hyatt and Pilsbry, 1911. Valid subspecies (Cowie et al., 1995:114).

Type material: Lectotype USNM 31404 (Figure 3A), here designated.

Type locality: “Lanai.”

Remarks: Hyatt and Pilsbry (1911:337) noted “no. 31404 U. S. Nat. Mus., from the Dall coll.” as a “typical example” of a unique color pattern of *Laminella concinna*, having three bands, whereas another specimen “in C. M. Cooke’s collection (no. 2201) lacks the broad median band.” Although both specimens are figured, Hyatt and Pilsbry (1911:337) did not designate a holotype. USNM 31404 appears to be Hyatt and Pilsbry’s (1911: fig. 12) figured specimen (Figure 3B). We here designate USNM 31404 as the lectotype. The original handwritten USNM ledger indicates that the type material was received from W. H. Dall. Hyatt and Pilsbry (1911:337) described this as a “Color-var.” and “form” but did not expressly give it infrasubspecific rank, nor does the content of the work reveal clearly that the name was proposed for an infrasubspecific entity. It is subspecific according to the *Code* (Art. 45.6.4).

ellipsoidea* Gould, 1847; *Achatinella

Achatinella ellipsoidea Gould, 1847:200; 1852:87; 1856: pl. 7, figs. 96, 96a; 1862:35.

Current taxonomic status: Synonym of *Helix textilis* Férussac, 1825 (now placed in *Amastra* subg. *Metamastra*) (Hyatt and Pilsbry, 1911:167; Cowie et al., 1995:106).

Type material: Lectotype (Hyatt and Pilsbry, 1911:167) USNM 5498 (Figure 3C).

Type locality: Oahu [possibly restricted to Nuuanu (Hyatt and Pilsbry, 1911:167)].

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 7, figs. 96, 96a). The original description does not imply or require that it was based on more than one specimen. Hyatt and Pilsbry (1911:167) stated that “. . . we have examined Gould’s figured type, is no. 5498 U.S. Nat. Mus.” and “the type is figured” (Hyatt and Pilsbry, 1911: pl. 40, figs. 17, 18), thereby designating a lectotype (*Code*, 74.5). Johnson (1964:72) subsequently, while also noting the “holotype” as USNM 5498, identified additional type material as MCZ 156364 (1 spm; ex Smithsonian Institution; paralectotype). Gould (1847:200) gave the type locality as “Maui.” However, Hyatt and Pilsbry (1911:167) concluded that USNM 5498 could not have been collected from Maui, being a form of *Amastra textilis* “exactly like some of the Nuuanu specimens.” Indeed, Gould (1852:87) acknowledged the close affinity of *Achatinella ellipsoidea* to *A. ventulus* (= *Amastra textilis*). On this basis we consider Oahu, as stated by Hyatt and Pilsbry (1911:167), although not explicitly, to be the type locality. The type material was collected by J. D. Brackenridge and Hale (Gould, 1852:87). USNM 5498 closely matches Gould’s (1856: pl. 7, fig. 96) figured specimen (Figure 3D). The original handwritten ledger indicates the lectotype was received from the U.S. Exploring Expedition, with “original number” 96.

evelynae* Cooke and Kondo, 1952; *Carelia

Carelia evelynae Cooke and Kondo, 1952:331, figs. 2a–f.

Current taxonomic status: *Carelia evelynae* Cooke and Kondo, 1952. Valid species (Cowie et al., 1995:111).

Type material: Paratypes USNM 666051 (2 spms, Figure 3E), 666052 (1 spm, Figure 3F).

Type locality: “Kauai, Polihale, base of Polihale Ridge: 500 ft. inland from ocean, 150 ft. alt.”

Remarks: Holotype BPBM 9092, by original designation; paratypes BPBM 212325–212329 (115 spms), 212298 (137 spms) (Cooke and Kondo, 1952:333). The original handwritten USNM ledger indicates that USNM 666051 and 666052 were separated from BPBM 212326 and 212298, respectively. The ledger confirms the locality as “Kavai [*sic*] Polihale Hawaii,” that the specimens were received from

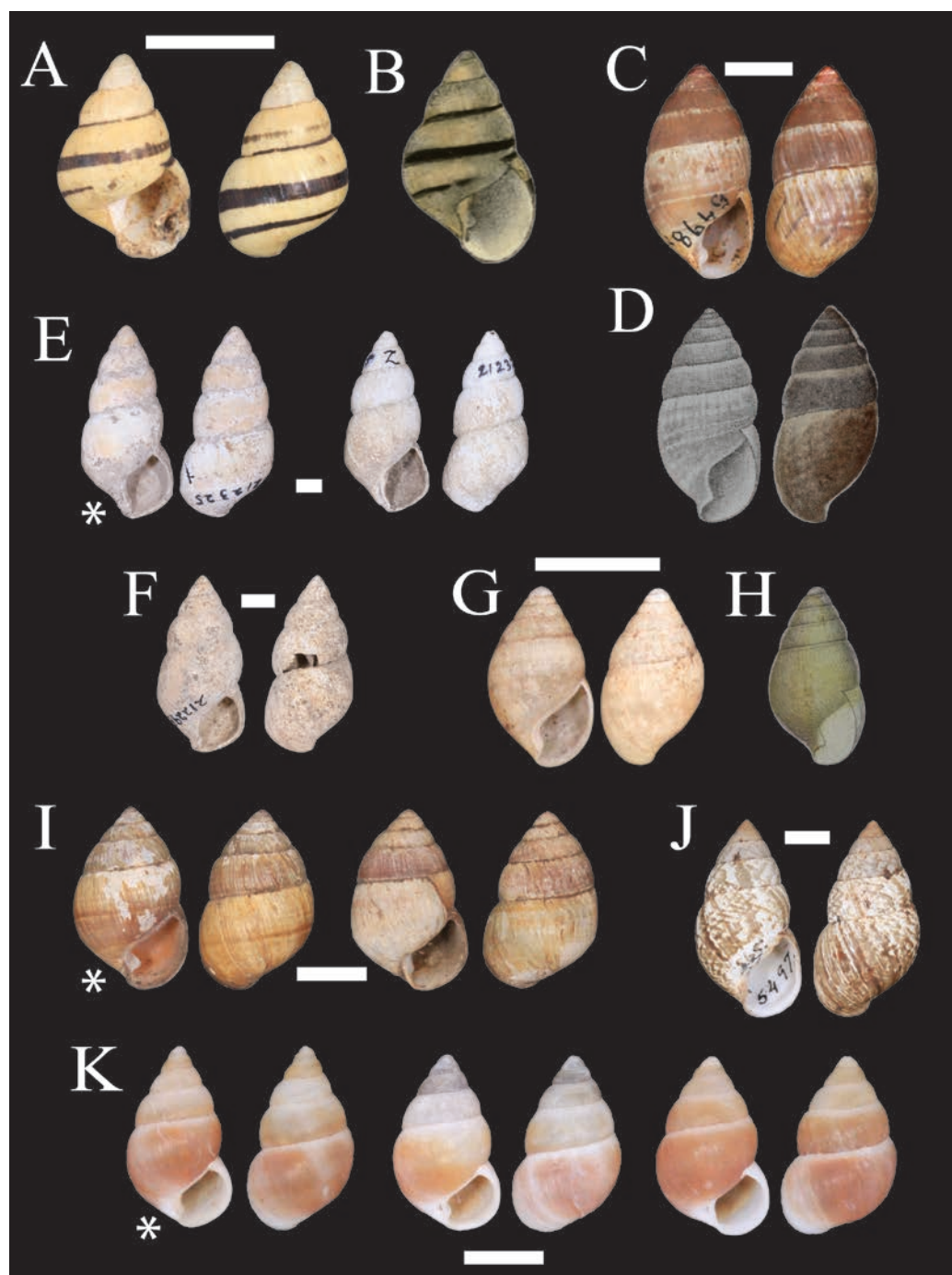


FIGURE 3. A. Lectotype (USNM 31404; 8.0 mm), here designated, of *Laminella concinna*. B. Hyatt and Pilsbry's (1911: pl. 54, fig. 12) figured *Laminella concinna* color-var. *circumcincta*. C. Lectotype (USNM 5498; 15.9 mm) of *Achatinella ellipsoidea*. D. Gould's (1856: pl. 7, figs. 96, 96a) figured *Achatinella ellipsoidea*. E. Paratypes (USNM 666051; 37.9 mm) of *Carelia evelynae*. F. Paratype (USNM 666052; 32.0 mm) of *C. evelynae*. G. Possible lectotype (USNM 5500; 7.3 mm) of *Achatinella guttula*. H. Gould's (1856: pl. 7, fig. 98) figured *Achatinella guttula*. I. Paralectotypes (USNM 611217; 13.2 mm) of *Achatinella microstoma*. J. Possible paralectotype (USNM 5497; 22.1 mm) of *Achatinella nubilosa*. K. Paralectotypes (USNM 611221; 11.4 mm) of *Achatinella nucleola*. Dimensions are shell height (length). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: 5 mm.

Bishop Museum, collected by G. F. Arnemann, and their status as paratypes.

guttula* Gould, 1847; *Achatinella

Achatinella guttula Gould, 1847:201; 1852:89; 1856: pl. 7, figs. 98, 98a; 1862:35, 244.

Current taxonomic status: *Leptachatina* (*Leptachatina*) *guttula* (Gould, 1847). Valid species (Cooke in Hyatt and Pilsbry, 1910:36; Cowie et al., 1995:123).

Type material: Possible lectotype (Cooke in Hyatt and Pilsbry, 1910:37) USNM 5500 (Figure 3G).

Type locality: East Maui (Cooke in Hyatt and Pilsbry, 1910:36).

Remarks: No holotype was designated and no figure was provided with the original description, although figures were provided subsequently by Gould (1856: pl. 7, figs. 98, 98a). Gould (1847:201) indicated “Maui, Sandwich Islands” as the type locality. The original description includes the phrase “*interdum castaneo zonata*,” which Gould (1852:89) rendered in English as “sometimes [a faint appearance of] revolving rufous bands,” indicating that there was more than one specimen in the type series. However, Cooke in Hyatt and Pilsbry (1910:37, pl. 2, fig. 34) noted “the type specimen in the National Museum, Washington” and reproduced “Gould’s figure of the type” (Gould, 1856: pl. 7, figs. 98, 98a), thereby designating the shell illustrated as the lectotype (*Code*, Art. 74.5). Johnson (1964:87) subsequently identified the figured “holotype” as USNM 5500 but also noted additional type material in the MCZ, including MCZ 169182 (22 spms, ex NYSM 195, original USNM no. A1175) and MCZ 142956 (2 spms, ex Smithsonian Institution). The original handwritten USNM ledger noted that the material was received from the U.S. Exploring Expedition, with “original number” 98. However, USNM 5500 does not closely match the illustrations of Gould (Figure 3H) and of Cooke, and Johnson may therefore have been incorrect in identifying it as the lectotype designated by Cooke. We therefore remain uncertain as to whether USNM 5500 is indeed the lectotype; however, no other possible type material could be found.

microstoma* Gould, 1845; *Achatinella

Achatinella microstoma Gould, 1845:28; 1852:87; 1862:196.

Current taxonomic status: Synonym of *Helix textilis* Férussac, 1825 (now placed in *Amastra* subg. *Metamastra*) (Gould, 1862:196; Hyatt and Pilsbry, 1911:165; Cowie et al., 1995:106).

Type material: Paralectotypes USNM 611217 (2 spms, Figure 3I).

Type locality: Oahu (Johnson, 1964:110, pl. 41, fig. 6).

Remarks: No holotype was designated nor a figure provided with the original description. Gould (1845:28) indicated the type locality as “Sandwich Islands.” Hyatt and Pilsbry (1911:166) reported that “the type of *A. microstoma* has been lost” without further elaboration; this is not a valid

lectotype designation, as a lectotype designation must have as its object the definition of that taxon (*Code*, Art. 74.3). Johnson (1964:110) validly (*Code*, Art. 74.5) designated MCZ 169244 as the lectotype and identified MCZ 169245 (10 spms) and USNM 611217 (2 spms, in the series received on permanent loan from the New York State Museum, via W. J. Clench) as paralectotypes, all derived from the same original lot (original number A1167 from “Oahu”).

nubilosa* Mighels, 1845; *Achatinella

Achatinella nubilosa Mighels, 1845:20.

Current taxonomic status: *Amastra* (*Amastra*) *nubilosa* (Mighels, 1845). Valid species (Hyatt and Pilsbry, 1911:259; Cowie et al., 1995:94).

Type material: Possible paralectotype USNM 5497 (1 spm, Figure 3J).

Type locality: Molokai (Hyatt and Pilsbry, 1911:259).

Remarks: No holotype was designated nor a figure provided with the original description. Mighels’ collection was sold to the Portland Society of Natural History but was destroyed by fire in 1854, although some material survived, having been previously donated to the collections of the AMNH, MCZ, and NHMUK (Johnson, 1949:214; Dance, 1966:294). Johnson (1949:227) identified two “poorly preserved cotypes” in the MCZ derived, as previously stated by Hyatt and Pilsbry (1911:260), from the collection of the Portland Society of Natural History (original catalog number 220). Johnson (1949:227, pl. 27, fig. 22) validly (*Code*, Art. 74.5) designated MCZ 165606 as the lectotype, although this may not have been one of the aforementioned “cotypes” as his figure suggests a shell in good condition, contrary to his own statement and to that of Hyatt and Pilsbry (1911:259). Johnson (1996:192) subsequently identified MCZ 156098 (10 specimens recorded in the MCZ collection ledger) as paralectotypes. Mighels (1845:20) indicated the type locality as “Oahu.” However, Hyatt and Pilsbry (1911:259) considered this to be an error and that the type locality is “Molokai.” Like other valid type material, USNM 5497 is cataloged in the 5000 series with material from the U.S. Exploring Expedition and has an “original number” 95 corresponding to Gould’s illustration (1856, pl. 7, fig. 95). However, there is no information for this lot in the original handwritten USNM ledger regarding locality or type status and there is no indication why it was interpreted as type material. Therefore, we consider USNM 5497 as only a possible paralectotype.

nucleola* Gould, 1845; *Achatinella

Achatinella nucleola Gould, 1845:28; 1862:196.

Current taxonomic status: *Amastra* (*Amastrella*) *nucleola* (Gould, 1845). Valid species (Hyatt and Pilsbry, 1911:153; Cowie et al., 1995:98).

Type material: Paralectotypes USNM 611221 (3 spms, Figure 3K).

Type locality: “Sandwich Islands.”

Remarks: No holotype was designated nor a figure provided with the original description. Hyatt and Pilsbry (1911:154) noted NYSM 1172 as “type,” but this is not a lectotype designation as they did not say “the type” and the lot contained multiple specimens. Johnson (1964:117) validly (*Code*, Art. 74.5) designated MCZ 169265 (ex NYSM 194, original no. A1172) as the lectotype and identified MCZ 169226 (30 spms) and USNM 611221 (3 spms, in the series received on permanent loan from the New York State Museum, via W. J. Clench) as paralectotypes, both separated from the same original lot as the lectotype. The original handwritten USNM ledger indicates the locality as Kauai, Hawaiian Islands, that the specimens were collected by Newcomb, and that they are paratypes.

rex Sykes, 1904; *Amastra*

Amastra (Kauaia) rex Sykes, 1904:159, two unnumbered text figures (Figure 4A).

Current taxonomic status: *Tropidoptera rex* (Sykes, 1904).

Valid species (Hyatt and Pilsbry, 1911:126 [as *Pterodiscus*]; Cowie et al., 1995:118).

Type material: Syntypes USNM 499926 (1 spm, Figure 4B), USNM 180852 (4 spms, Figure 4C).

Type locality: “Summit of Konahuanui, Oahu, Hawaiian Islands.”

Remarks: No holotype was designated but a figure was provided with the original description, in which Sykes (1904:160) stated that “this very interesting shell was collected by Mr. Ernest Lyman, and was kindly sent to me by Prof. H. W. Henshaw.” Although the term “shell” is used in the singular, it may not have been used to connote a single specimen, but rather in the sense of the species, as there is more than one lot of possible type material in the USNM as well as one lot in the NHMUK. The label of USNM 499926 notes this specimen as “Lyman Collection from Henshaw.” The original handwritten USNM ledger entry for USNM 499926 (recorded 19 January 1938) indicates that the specimen locality is Konahuanui, Oahu, received from Henshaw, collected by E. Lyman, and its status as “co-type.” A second lot in the USNM general collection (USNM 180852) also appears to be type material from “Konahuanui, Oahu, Sandw. Is.” received from Lyman through Henshaw and recorded in the USNM ledger on 30 December 1904. Whereas USNM 180852 was cataloged the same year as the publication of the original description, there is no type status indicated for it in the ledger as there is for USNM 499926. The significance of the lengthy interval between the entries of the two lots in the ledger is unclear. An additional syntype is in the Sykes collection of the Natural History Museum, London (NHMUK 1962195). No lectotype is here designated, pending study of the NHMUK syntype.

rubens Gould, 1845; *Achatinella*

Achatinella rubens Gould, 1845:27; 1862:195.

Current taxonomic status: *Amastra (Amastrella) rubens* (Gould, 1845). Valid species (Hyatt and Pilsbry, 1911:193; Cowie et al., 1995:99).

Type material: None found. Invalid lectotype designation by Johnson (1964:142). See remarks.

Type locality: “Sandwich Islands.”

Remarks: No holotype was designated nor a figure provided in the original description. Johnson (1964:142, pl. 42, fig. 6) designated MCZ 169350 as the lectotype and identified MCZ 169351 (20 spms) and USNM 611220 (2 spms, Figure 5A) as paralectotypes, all derived from the same lot (original no. A1471). An early handwritten label accompanying MCZ 169350 indicates that this lot bore the original number A1432 and, correctly, the species name *Achatinella viridans*. USNM 611220 is also *A. viridans*. A much later label (the most recent one) now associated with MCZ 169350 bears the original number A1432 but the species name *Achatinella rubens*. It has a subsequent annotation “[A 1471],” the original number for the *Achatinella rubens* lot. We consider this latter label to be in error, inasmuch as it is associated with the *Achatinella viridans* lot (A1432) but identifying the material as *Achatinella rubens*. The subsequent annotation on this label (“A1471”) reflects an assumption that the lot is the original *Achatinella rubens* lot. Furthermore, Hall (1875:13) indicated that A1471 was not found in the NYSM collection and so could not have been transferred from the NYSM to the MCZ.

Achatinella viridans and *Achatinella rubens* are very different species, the latter now placed in *Amastra*. Gould (1845:27) described *A. rubens* as possessing six whorls and a chestnut apex, with the remainder of the shell straw colored and irregularly covered with brown epidermis. In contrast, *Achatinella viridans* was described by Mighels (1845:20) as possessing five whorls, green in color with lighter streaks, with an aperture stained pink just within the margin, and a slightly thickened lip. Johnson (1964:142) apparently took the specimens in the *A. viridans* lot (A1432) to be *A. rubens* on the basis of the incorrect later label. His lectotype designation (Johnson, 1964:142) for *Achatinella rubens* of a specimen that was not a syntype is therefore invalid (*Code*, Art. 74.2).

A careful search of the USNM collections yielded no type material of *A. rubens*. The specimens in USNM 611220, considered to be paralectotypes by Johnson (1964:142), are also *A. viridans*. A thorough search of the MCZ collection is needed to determine if type material of this species is still there, although it appears unlikely. Designation of a neotype of *Achatinella rubens* Gould may be warranted.

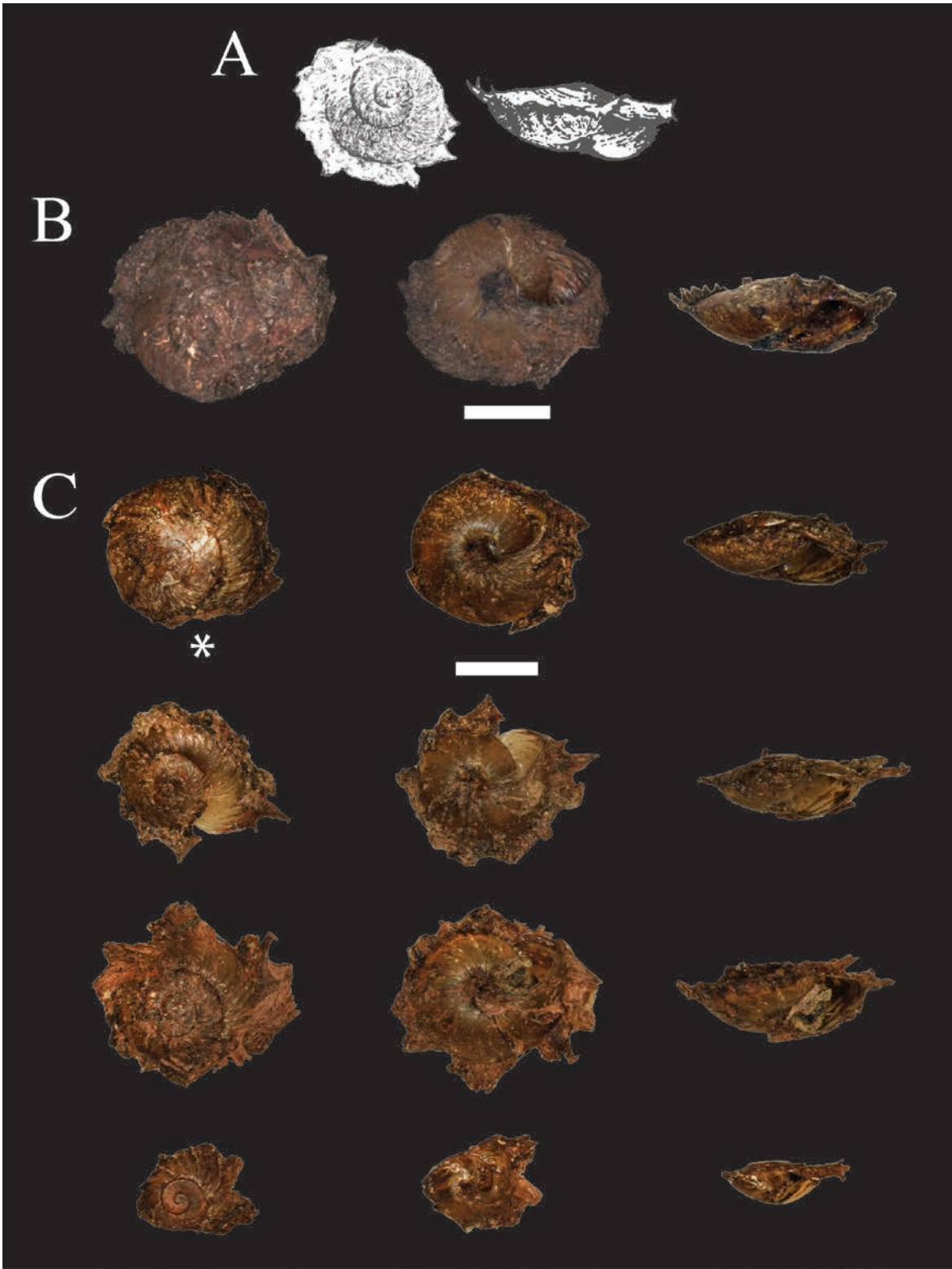


FIGURE 4. A. Sykes' (1904) unnumbered text figures of *Amastra rex*. B. Syntype (USNM 499926; 13.7 mm) of *A. rex*. C. Syntypes (USNM 180852; 11.0 mm) of *A. rex*. Dimensions are shell diameter (width). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: 5 mm.

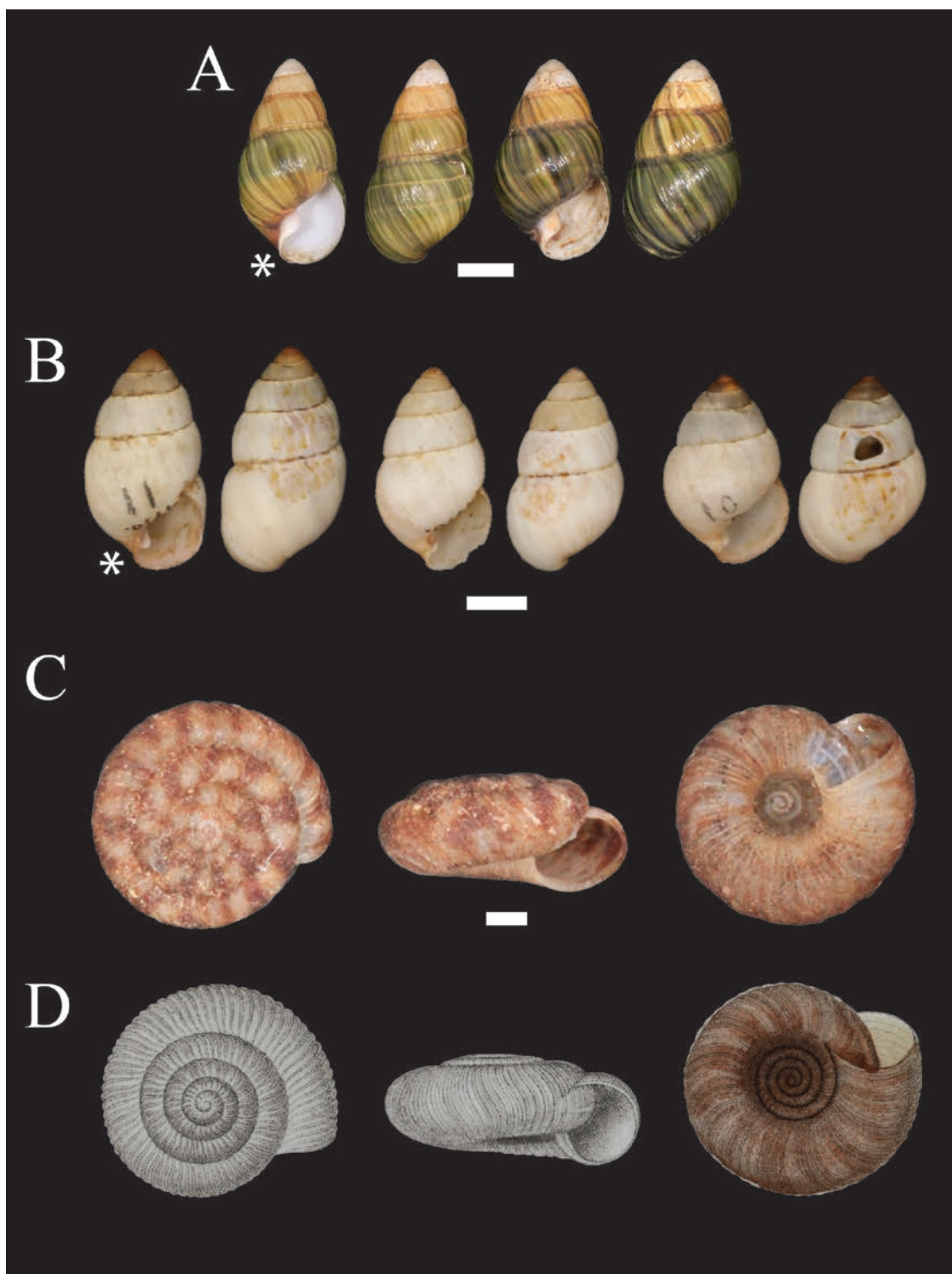


FIGURE 5. A. Johnson's (1964) invalidly designated "lectotype" (USNM 611220; 18.5 mm) of *Achatinella rubens*. B. Paralectotypes (USNM 4710; 18.6 mm) of *Amastra rubinia*. C. Possible syntype (USNM 5449; 5.6 mm) of *Helix rubiginosa*. D. Gould's (1856: pl. 4, figs. 49, 49a,b) figured *Helix rubiginosa*. Dimensions are shell height (length) (A, B) and width (C). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: A and B, 5 mm; C, 1 mm.

rubinia* Hyatt and Pilsbry, 1911; *Amastra

Amastra (*Amastrella*) *rubens* var. *rubinia* Hyatt and Pilsbry, 1911:193, pl. 32, fig. 16.

Current taxonomic status: *Amastra* (*Amastrella*) *rubens rubinia* Hyatt and Pilsbry, 1911. Valid subspecies (cf. Cowie et al., 1995:99, who were noncommittal about its status).

Type material: Paralectotypes USNM 4710 (3 spms, Figure 5B).

Type locality: “Kukuiala,” “Oahu.”

Remarks: Hyatt and Pilsbry (1911:193, pl. 32, fig. 16) mentioned “a series from Kukuiala” and provided dimensions for two specimens with catalog numbers ANSP 92481, which they illustrated, and USNM 4710. They did not designate a holotype. Baker (1963:199) designated ANSP 92481 as the lectotype (“TSD now”). There are two lots in the USNM: USNM 4710 and USNM 4710a. The original handwritten catalog ledger lists only USNM 4710, with two specimens from “Sandw Is” received from Dr. Newcomb (who collected shells in Hawaii between 1850 and 1856; Clarke, 1960:136), “original number” 92. USNM 4710a is not listed in the ledger. It is probable that two lots were inadvertently assigned the same catalog number, the second distinguished from the first by the addition of the suffix “a” when the error was discovered, but this addition was not noted in the ledger. The specimens in USNM 4710 (three of them, in contrast to the ledger entry), match the original description: “the outer layer of cuticle is almost wholly wanting, leaving the shell whitish or yellowish with more or less pink suffusion, most pronounced on the latter half of the last whorl.” The two specimens in USNM 4710a do not match the description, as the periostracum of both is much more intact. The significance of the “original number” 92 in the ledger and on one of the labels of USNM 4710a (which also says “*rubinia*”) is not clear. For other species in this catalog, these “original numbers” refer to figures of Gould (1856). However, Gould’s (1856) pl. 7, fig. 92 is an illustration of *Partula varia* Broderip, 1832 from Huahine, Society Islands. It is possible that one or more labels have been placed with the wrong shells. Despite this confusion we treat the three specimens labeled as USNM 4710 as paralectotypes of *rubinia* Hyatt and Pilsbry, and the two specimens labeled as USNM 4710a as having no type status.

FAMILY ENDODONTIDAE***rubiginosa* Gould, 1846; *Helix***

Helix rubiginosa Gould, 1846:173; 1852:50; 1856: pl. 4, figs. 49, 49a–c; 1862:21, 243.

Current taxonomic status: Synonym of *Helix jugosa* Mighels, 1845, now placed in *Cookeconcha* (Solem, 1976:222; Cowie et al., 1995:144).

Type material: Possible syntype USNM 5449 (Figure 5C).

Type locality: “Kauai, Sandwich Islands.”

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 4, figs. 49, 49a–c). It has not been determined that the description was based on a single specimen, and the original description does not imply or require that it was based on more than one specimen. Solem (1976:222) noted that USNM 5449 “is quite different from Gould’s . . . type figures” of *Helix rubiginosa* and considered (Solem, 1976:220) it to be a mislabeled specimen of *Helix hystrix* Pfeiffer, 1846 (synonym of *Helix setigera* Gould, see next entry), indicating that either there were multiple syntypes (i.e., the type series contained at least USNM 5449 and the shell illustrated), or the shell illustrated was seen only subsequent to the 1846 publication, or Gould mixed up his specimens prior to publishing the illustrations. Johnson (1964:53) inferred a “holotype” by “noting the “Figured holotype USNM 5449”; this is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). However, Solem (1976:222) regarded Johnson’s lectotype fixation as valid and that therefore *Helix rubiginosa* Gould was a synonym of *Helix hystrix*; but he nonetheless recommended “that the historical usage of these names be continued,” that is, that the synonymy not be recognized. Because Johnson’s action is here not considered to be a valid lectotype fixation, it is not necessary to consider the two taxa synonyms.

Cowie et al. (1995:144) followed Solem’s (1976:222) placement of *Helix rubiginosa* as a synonym of *Helix jugosa* Mighels, 1845 (now placed in *Cookeconcha*). We refrain from designating USNM 5449 as the lectotype of *Helix rubiginosa*, given that Solem (1976:220, 222) considered it mislabeled, and treat it as a probable syntype, pending further research to establish its true identity. *Helix rubiginosa* Gould, 1846 is a primary junior homonym of *Helix sericea* form *rubiginosa* Rossmässler, 1838.

The type material was collected by J. P. Couthouy (Gould, 1852:51) and the USNM ledger notes that it was received from the U.S. Exploring Expedition, with “original number” 49. Gould’s (1856: figs. 49, 49a, 49b) figures of the species he described as *Helix rubiginosa* are reproduced here as Figure 5D, although they do not appear to illustrate the species represented by USNM 5449 (Figure 5C). An additional lot of possible type material, USNM 20926, with “original number” f49, is cataloged in the original handwritten USNM ledger as “*rubiginosa* Gld” from “Sandw Is,” received from the U.S. Exploring Expedition, but it could not be found.

setigera* Gould, 1844; *Helix

Helix setigera Gould, 1844:174; 1852:55; 1856: pl. 4, figs. 52*, 52*a–c (as *Helix hystrix*); 1862:194.

Current taxonomic status: *Cookeconcha setigera* (Gould, 1844). Valid species; n. comb.

Type material: Lectotype USNM 20930 (Figure 6A), here designated; paralectotypes USNM 1418218 (2 spms, Figure 6B).

Type locality: “Sandwich Islands.”

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 4, figs. 52*, 52*a–c) for *Helix hystrix* Pfeiffer, 1846, which he treated as a synonym of *setigera* Gould, 1844 and the valid name, as he incorrectly considered the latter to be preoccupied (see below). The locality in the original description was “Sandwich Islands” (Gould, 1844:174), with the specific island not indicated. Gould (1852:56) mentioned specimens from East Maui that “differ somewhat from those originally examined” and are therefore not part of the type series, but whether the original specimens were also from East Maui is not clear. Johnson (1964:148) noted the “figured neoholotype, selected by Gould, USNM 5453,” although Gould did not select any name-bearing type specimen in any of his publications. The original description does not imply or require that it was based on more than one specimen, but subsequently Gould (1852:56) used the phrase “those originally examined,” which demonstrates that it was indeed based on more than one specimen. Furthermore, Johnson (1964:148–149) identified additional type material in the MCZ, including MCZ 169367 (6 spms; ex NYSM 278, original no. A 765) and MCZ 87861 (1 spm; ex BSNH 4197). Therefore, Johnson’s identification of a “neoholotype” is not a valid lectotype fixation according to either Art. 74.5 or Art. 74.6 of the *Code*. The type material was provided by J. D. Brackenridge and J. Drayton (Gould, 1852:56) and the original handwritten ledger indicates that it was received from the U.S. Exploring Expedition, “original number” 52. As discussed, these “original numbers” correspond to the numbers of Gould’s (1856) illustrations; Gould’s figs. 52 and 52a–m are labeled as *Helix bursatella* Gould, 1846, although they probably represent a number of species and forms (Solem, 1976:395). They are not the figures of *Helix “hystrix,”* which are figs. 52*, 52*a–c. Solem (1976:220), under the heading *Cookeconcha hystrix* (Pfeiffer, 1846), indicated a lectotype, USNM 5453, without explicitly stating that it was the lectotype of *Helix hystrix*. Two paragraphs further down the page he stated that the “lectotype of *Helix setigera* Gould, 1844 (not Sowerby, 1841) is juvenile.” Thus it is clear that Solem (1) accepted the homonymy noted by Gould, (2) accepted that Johnson’s identification of a “neoholotype” was a valid lectotype designation, and (3) when referring to the “lectotype” was in fact referring to *setigera* and not *hystrix*. Despite the logic of this interpretation, nowhere did Solem explicitly state that USNM 5453 was the lectotype of *Helix setigera* Gould, and therefore no lectotype was designated. Although Johnson (1964:148) referred to USNM 5453 (Figure 6C) as Gould’s “figured” specimen, it does not match Gould’s illustrations of *Helix hystrix*, which

are figs. 52*, 52*a–c (Figure 6D), not 52a–c as incorrectly cited by Johnson. Thus USNM 5453 is not type material of *Helix setigera*. An additional lot of possible type material, USNM 20930, listed as *Pityx hystrix*, “original number” f52*, from “Sandw Is” and received from “Pse” (= W. H. Pease) was found. Three specimens are in this lot (1 adult, 2 juvenile); the largest specimen is a good match for Gould’s figures of *Helix “hystrix”* and is here selected as the lectotype of *Helix setigera* Gould, 1844.

The name *Helix setigera* Gould, 1844 has been considered a junior primary homonym of *Helix setiger* Sowerby, 1841 (Gould, 1852:56; Solem, 1976:220; Cowie et al., 1995:144). Gould (1852:55) synonymized it with *Helix hystrix* Pfeiffer, 1846. *Helix hystrix* was described from “Ins. Sandwich” by Pfeiffer (1846:67), who attributed it to “Mighels (mss?)” and listed “*H. setigera* Gould in sched.” in synonymy. Thus, given the supposed homonymy, Gould (1852:56) used *hystrix* as the valid name, it being the next-oldest available name for this species. However, *setiger* Sowerby and *setigera* Gould are not homonyms, by the following reasoning. The name *setiger* Sowerby may be either a noun in apposition or an adjective in the masculine gender (*Code*, Art. 31.2.2). If treated as an adjective in combination with *Helix* (feminine), its gender would require mandatory change (*Code*, Art. 34.2.1) to *setigera*, rendering *setiger* Sowerby and *setigera* Gould homonyms. However, in the absence of evidence that it has been treated as an adjective, and the fact that it was originally introduced in combination with a feminine genus name, suggesting that it was intended as a noun in apposition, *setiger* Sowerby should be considered as such (*Code*, Art. 31.2.2). The names *setiger* and *setigera* are then deemed to be spelled differently (*Code*, Art. 57, Art. 58), the replacement of *setigera* Gould, 1844 by *hystrix* Pfeiffer, 1846 was not necessary, and *setigera* Gould is the valid name.

FAMILY HELICARIONIDAE

cicercula Gould, 1846; *Helix*

Helix cicercula Gould, 1846:171; 1852:43; 1856: pl. 5, figs. 73, 73a–c; 1862:20, 243.

Current taxonomic status: *Philonesia* (*Philonesia*) *cicercula* (Gould, 1846). Valid species (Cowie et al., 1995:159).

Type material: Syntype USNM 20948 (Figure 7A).

Type locality: “Mountains of Hawaii.”

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 5, figs. 73, 73a–c). Johnson (1964:54) noted the “figured holotype USNM 20948” but also noted MCZ 169080 (8 spms; ex NYSM 264, original no. A 754) as additional type material. Although the original description does not imply or require

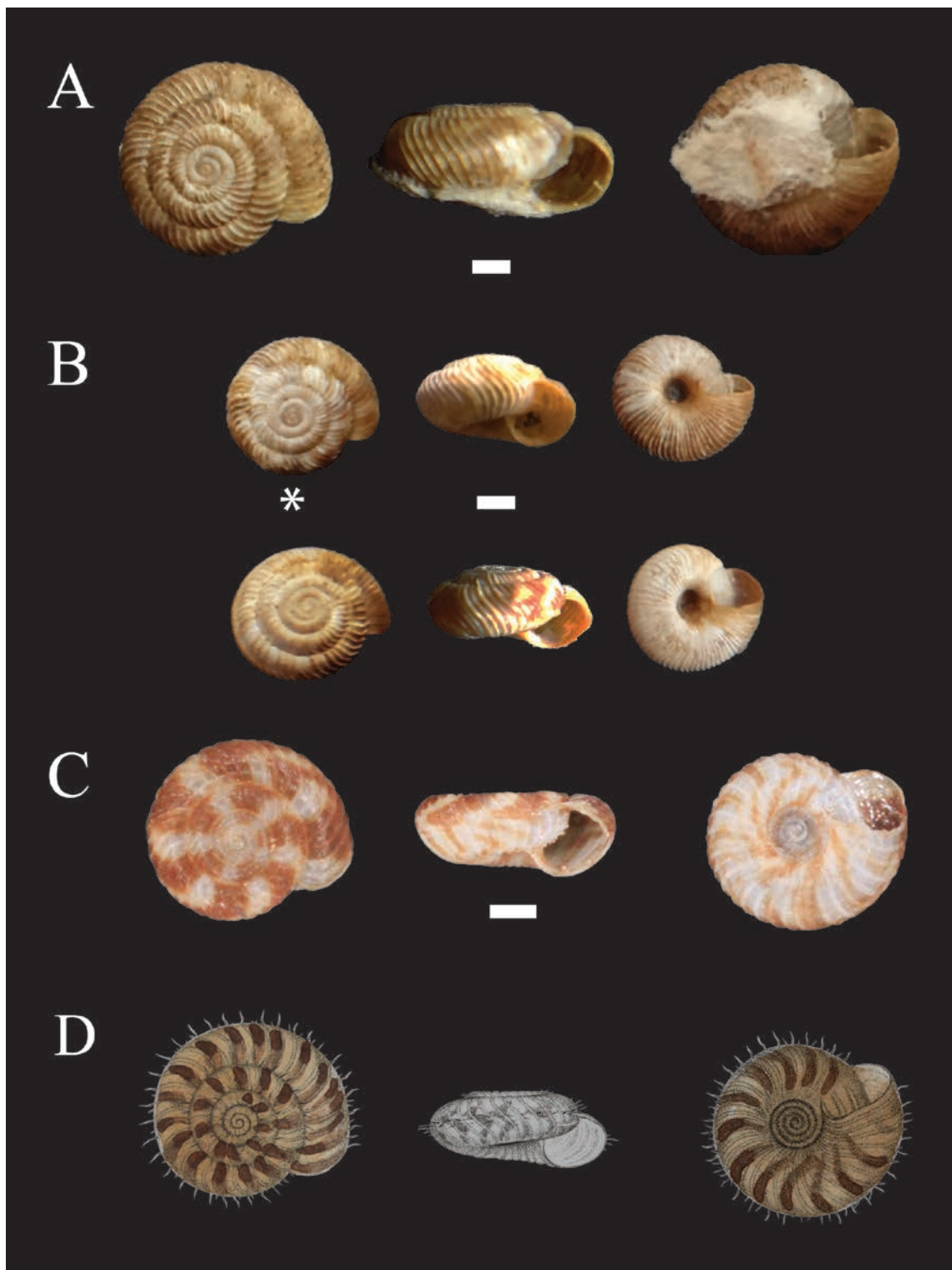


FIGURE 6. A. Lectotype (USNM 20930; 5.6 mm), here designated, of *Helix setigera*. B. Paralectotypes (USNM 1418218; 4.0 mm) of *H. setigera*. C. Non-type material (USNM 5453; 4.5 mm) of *H. setigera*. D. Gould's (1856: pl. 4, figs. 52*, 52*a,b) figured *Helix setigera*. Dimensions are shell diameter (width). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: 1 mm.

that it was based on more than one specimen, the fact that additional type material was recognized by Johnson means this is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). There are notable differences between Gould's figured specimen (Figure 7B) and USNM 20948: the shell is more tightly coiled and hence the width of the last whorl is smaller in USNM 20948, the periphery is higher and less carinate in USNM 20948, and the basal body whorl half a whorl back from the aperture is more inflated in USNM 20948. USNM 20948 may therefore not be Gould's (1856: pl. 5, figs. 73, 73a, 73b) figured specimen and we refrain from designating it as the lectotype and treat it as a syntype only. It is possible that a specimen in MCZ 169080 may be a better match to Gould's illustrations, although it is unclear whether MCZ 169080 was derived from the same lot as USNM 20948. The type material was collected by J. Drayton and J. D. Brackenridge (Gould, 1852:44) and the original handwritten ledger indicates that USNM 20948 was received from the U.S. Exploring Expedition, with "original number" f73. The ledger also lists USNM 5475, with "original number" 73, as "*cicercula*" from "Hawaii" from the U.S. Exploring Expedition; this lot is therefore the most likely to have contained the figured specimen, but it could not be found.

cryptoportica* Gould, 1846; *Helix

Helix cryptoportica Gould, 1846:171; 1852:44; 1856: pl. 5, figs. 72, 72a–c; 1862:20, 243.

Current taxonomic status: *Philonesia* (*Philonesia*) *cryptoportica* (Gould, 1846). Valid species (Baker, 1940:120; Cowie et al., 1995:159).

Type material: Lectotype USNM 5474 (Figure 7C), here designated.

Type locality: Mountains of Oahu, Sandwich Islands (Gould, 1852:45).

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 5, figs. 72, 72a–c). No locality was given in the original description but the locality was indicated in subsequent elaborations by Gould (1852:44). Johnson (1964:63) noted the "Figured holotype USNM 5474" but he also noted MCZ 169110 (2 spms; ex NYSM 233, original no. A 747) as "paratypes." Although the original description does not imply or require that it was based on more than one specimen, the fact that additional type material was recognized by Johnson means this is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). We therefore here designate USNM 5474 as the lectotype. The handwritten USNM ledger confirms that the type material was received from the U.S. Exploring Expedition. USNM 5474, with

"original number" 72, closely matches Gould's (1856: pl. 5, figs. 72, 72a–c) figured specimen (Figure 7D). An additional lot of possible type material, USNM 20958 (1 spm), but with no original numbers noted, which was listed in the original handwritten USNM ledger as "*Conulus cryptoporticus* Gld (non Pse)" from "Sandw Is" and received from the U.S. Exploring Expedition, could not be found.

exaequata* Gould, 1846; *Helix

Helix exaequata [sic] Gould, 1846:171; 1852:47; 1856: pl. 5, figs. 61, 61a–c; 1862:19, 243.

Current taxonomic status: *Hiona* (*Nesocyclus*) *exaequata* (Gould, 1846). Valid species (Baker, 1940:186; Cowie et al., 1995:156).

Type material: Possible paralectotypes USNM 5463 (Figure 7E; the larger of two specimens originally in this lot, incorrectly identified as *exaequata*), USNM 20947 (2 spms).

Type locality: Kauai, Wailua Valley (Baker, 1940:187).

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 5, figs. 61, 61a–c). Gould (1846:171) indicated the type locality as "Kauai, Sandwich Islands." The type material was collected by J. P. Couthouy (Gould, 1852:47) and the original handwritten ledger indicates that USNM 5463 was received from the U.S. Exploring Expedition, with "original number" 61. Baker (1940:188, pl. 42, figs. 7–9) illustrated the largest shell in NYSM 259 (original number A748; now MCZ 169134, 13 spms) and unambiguously and explicitly selected this specimen as the name-bearing type (lectotype) by stating that it "is taken as the type" (*Code*, Art. 74.5). Johnson (1964:73) noted a "Figured holotype USNM 5463," but since Baker had already designated a lectotype, this statement is irrelevant from the perspective of lectotype designation/fixation.

The original handwritten USNM ledger indicates that there were two specimens in USNM 5463 when it was cataloged. Baker (1940:188) also noted two shells but stated that "USNM 5463 contains the base of a broken shell that appears to have been a smaller specimen of this species [*Hiona exaequata*], possibly that figured in the U.S. Exploring Expedition shells, and a larger specimen of a very different shell (casually examined, it looked like my *H. pilsbryi*)." The single specimen remaining in USNM 5463 (Figure 7E) has a domed shell, not a discoidal one as in the original description of *Helix exaequata*, and is indeed a good match for the three illustrations of *Hiona pilsbryi* (Baker, 1940: pl. 38, fig. 4). It differs from the specimen in Gould's (1856: pl. 5, figs. 61, 61a, 61b) figure (Figure 7F), which is indeed discoidal and which also matches Baker's (1940: pl. 42, figs. 7–9) figures of *H. exaequata*. Consequently, the specimen remaining in USNM 5463 is probably the "larger specimen

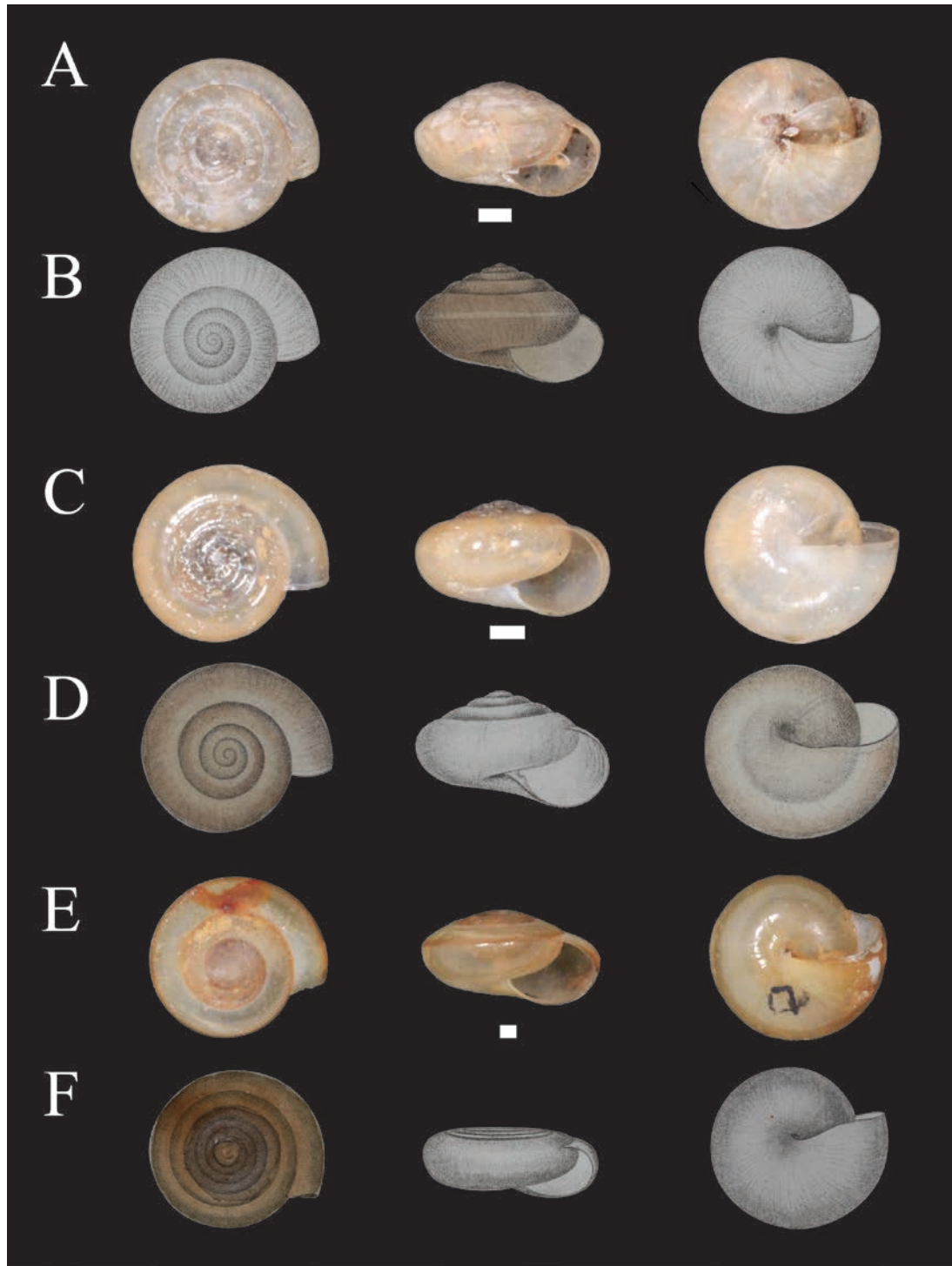


FIGURE 7. A. Syntype (USNM 20948; 5.7 mm) of *Helix cicercula*. B. Gould's (1856: pl. 5, figs. 73, 73a,b) figured *Helix cicercula*. C. Lectotype (USNM 5474; 5.6 mm), here designated, of *Helix cryptoportica*. D. Gould's (1856: pl. 5, figs. 72, 72a,b) figured *Helix cryptoportica*. E. Possible paralectotype (USNM 5463; 10.9 mm) of *Helix exaequata*. F. Gould's (1856: pl. 5, figs. 61, 61a,b) figured *Helix exaequata*. Dimensions are shell diameter (width). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: 1 mm.

of a very different shell” (Baker, 1940:188). If it indeed was part of the original lot, then it is a paralectotype of *H. exaequata*, though misidentified as that species. However, as it is so distinct from true *H. exaequata*, it is difficult to imagine Gould making such an error and it is more likely that it was misplaced in the box some time later and was not part of the original type series. A careful search of the USNM collections failed to produce the figured specimen or any additional type material of *Helix exaequata*, including the broken shell noted by Baker (1940:188). An additional lot of possible type material, USNM 20947 (2 spms), listed in the original handwritten USNM ledger as “exaequata Gld,” from “Hawaii” but with only one specimen indicated, was collected by the U.S. Exploring Expedition and received from “Pse” (=W. H. Pease). However, there are no original numbers associated with this lot and it is considered possible type material only. Johnson (1964:73) noted the presence of additional type material in the collections of the MCZ, including MCZ 169134 (13 spms; ex NYSM 259, original no. A748; the lectotype is the largest shell in this lot, as designated by Baker—see above) and MCZ 87862 (2 spms; ex BSNH 4368).

subtilissima* Gould, 1846; *Helix

Helix subtilissima Gould, 1846:177; 1852:48; 1856: pl. 5, figs. 62, 62a–c; 1862:24.

Current taxonomic status: *Euconulus* (*Nesoconulus*) *subtilissimus* (Gould, 1846). Valid species (Baker, 1941:215; Cowie et al., 1995:154).

Type material: Holotype (by monotypy) USNM 5464 (Figure 8A).

Type locality: “Maui, Sandwich Islands” [probably east Maui (Baker, 1941:215)].

Remarks: No holotype was designated but by saying “this little pellucid shell, though imperfect” Gould (1846:177, 1852:49) indicated that his description was based on just this single shell, which is therefore the holotype by monotypy. No figure was provided with the original description, although figures were provided subsequently by Gould (1856: pl. 5, figs. 62, 62a–c). Baker (1941:216) noted that “USNM 5464 and NYSM A-5881 consist of shells of the more depressed form, such as occurs at lower elevations on Haleakala (BBM [i.e., BPBM] 11286; [Baker, 1941:] pl. 53, figs. 1–3) and is represented in Gould’s figure; the USNM specimen is taken as type.” Because Gould (1846:177, 1852:49) based his description on just one specimen, the additional material noted by Baker in NYSM and BPBM can only be topotypical. The holotype was collected by J. Drayton (Gould, 1852:49) and the original handwritten ledger indicates that it was received from the U.S. Exploring Expedition. The specimen in USNM 5464, with “original number” 62, although badly damaged, matches Gould’s (1856: pl. 5, figs 62, 62a, 62b) figured specimen (Figure 8B).

FAMILY HELICINIDAE

uberta* Gould, 1847; *Helicina

Helicina uberta Gould, 1847:202; 1852:94; 1856: pl. 7, figs. 114, 114a–c; 1862:37.

Current taxonomic status: *Orobophana uberta* (Gould, 1847). Valid species (Neal, 1934:19; Cowie et al., 1995:18).

Type material: Lectotype (Pilsbry and Cooke, 1908:13) USNM 5516 (Figure 8C); possible paralectotype USNM 20202 (8 spms).

Type locality: “Maui, and Oahu Mountains” [possibly restricted to the “back of Leilehua, in the Waianae mountains” (Pilsbry and Cooke, 1908:13)].

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 7, figs. 114, 114a–c). However, Gould stated that he had specimens collected from Maui and Oahu, indicating that there were multiple syntypes. Pilsbry and Cooke (1908:13) noted “the type shell (No. 5516, Smithsonian Institution),” thereby designating the lectotype (Code, Art. 74.5), and Johnson (1964:162) recognized this specimen as the “Figured holotype USNM 5516.” Pilsbry and Cooke (1908:13) did not formally restrict the type locality, though stated that the “only locality at which typical forms are collected at present is in the Waianae mountains” and “Specimens from back of Leilehua, in the Waianae mountains, agree very closely with the type shell.” Johnson (1964:162) identified additional type material in the MCZ, including MCZ 169411 (5 spms), and two lots obtained from the Smithsonian Institution, MCZ 216585 (3 spms) and MCZ 186722 (1 spm), all derived from NYSM 292 (original no. G2626). Johnson (1964:172) noted that the locality on the original label, “Taheiti,” was an error. The type material was collected by Pickering and Case (Oahu) and Drayton (Maui) (Gould, 1852:95). USNM 5516, with “original number” 114, closely matches Gould’s (1856: pl. 7, figs 114, 114a, 114b) figured specimen (Figure 8D). An additional lot of possible type material, USNM 20202 (8 spms), is listed in the original handwritten USNM ledger as “*Helicina uberta*” from “Maui & Oahu” with 11 specimens from the U.S. Exploring Expedition. However, there are no original numbers associated with this lot and therefore we consider it only as possible type material.

FAMILY PUPILLIDAE

lyrata* Gould, 1843; *Pupa

Pupa lyrata Gould, 1843:139; 1844: pl. 16, fig. 16; 1862:189.

Current taxonomic status: *Lyropupa* (*Lyropupa*) *lyrata* (Gould, 1843). Valid species (Pilsbry and Cooke, 1920:233; Cowie et al., 1995:131).

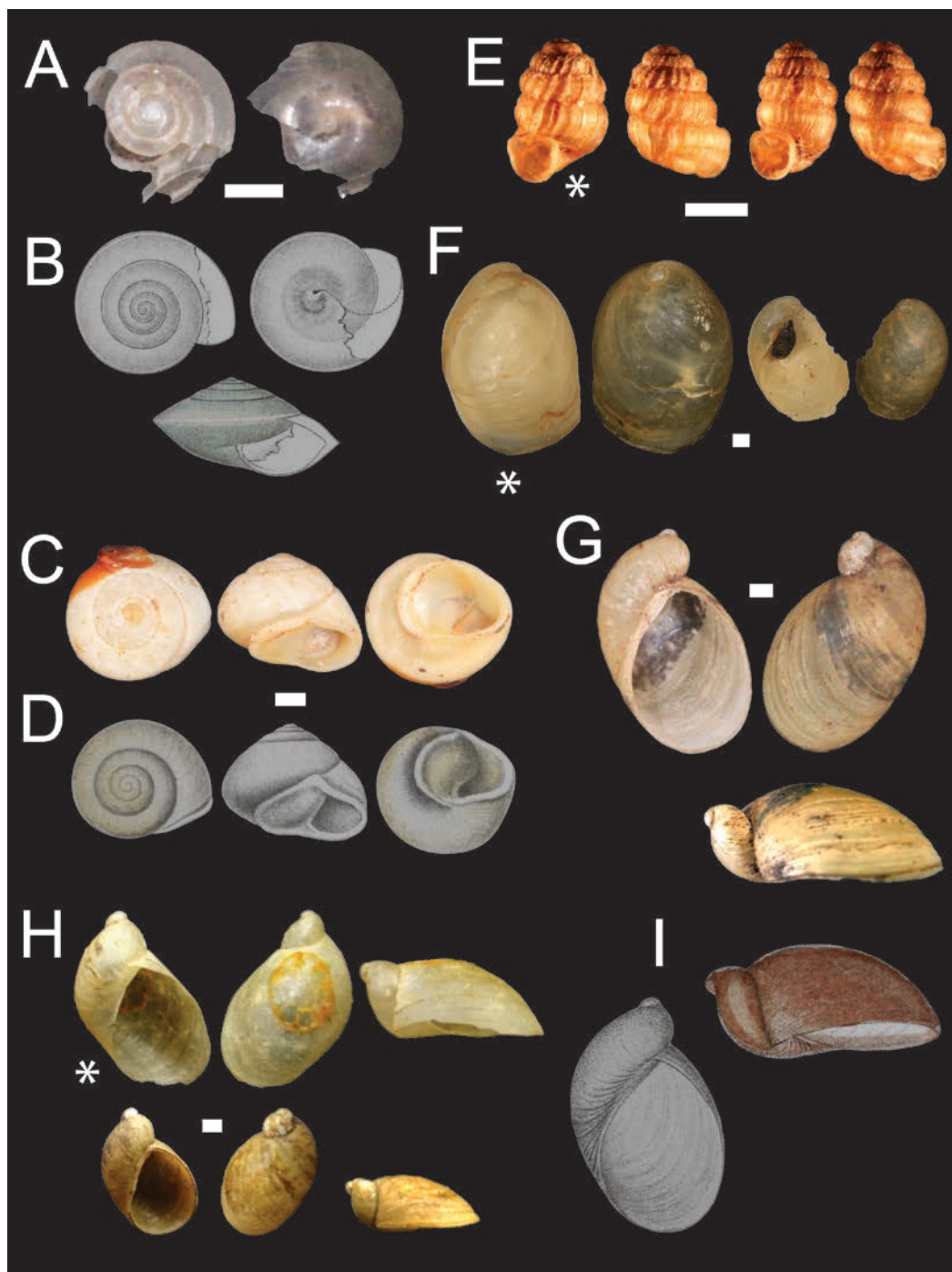


FIGURE 8. A. Holotype (USNM 5464; 2.6 mm) of *Helix subtilissima*. B. Gould's (1856: pl. 5, figs. 62, 62a,b) figured *Helix subtilissima*. C. Lectotype (USNM 5516; 4.8 mm) of *Helicina uberta*. D. Gould's (1856: pl. 7, figs. 114, 114a,b) figured *Helicina uberta*. E. Paralectotypes (USNM 64344; 2.3 mm) of *Pupa lyrata*. F. Syntypes (USNM 117931; 11.6 mm) of *Succinea aperta*. G. Lectotype (USNM 5420; 9.7 mm), here designated, of *Succinea canella*. H. Paralectotypes (USNM 20853; 9.0 mm) of *S. canella*. I. Gould's (1856: pl. 2, figs. 20, 20a) figured *Succinea canella*. Dimensions are shell diameter (C) and height (length; E–I). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: 1 mm.

Type material: Paralectotypes USNM 64344 (2 spms, Figure 8E).

Type locality: Oahu [possibly restricted to Nuuanu (Pilsbry and Cooke, 1920:234)].

Remarks: No holotype was designated nor a figure provided with the original description, although a figure was provided subsequently by Gould (1844: pl. 16, fig. 16). The locality given in the original description was listed simply as “Hawaiian Islands.” Gould (1862:189) subsequently refined the locality to “Maui, Sandwich Islands.” Pilsbry and Cooke (1920:234) noted that the original material was recorded from Kauai. However, they concluded that both Maui and Kauai were incorrect and that “*P. lyrata* was doubtless from Oahu, where typical examples have been taken in Nuuanu valley.” Pilsbry and Cooke (1920:235, pl. 19, figs. 4, 5) identified the “Type and paratypes no. 219, G. 2687” in NYSM and, by illustrating one of these specimens (fig. 4) as the “Type,” designated it as the lectotype (Code, Art. 74.5), with the shell illustrated as a “Paratype” (fig. 5) becoming a paralectotype. Johnson (1964:107) noted the “figured holotype MCZ 169233, ex NYSM 219, original no. G2687,” that is, the same specimen identified by Pilsbry and Cooke as the type, which by then had been transferred from NYSM to MCZ (Johnson, 1964:15). Johnson (1964:107) identified additional type material in the collections of the MCZ, including MCZ 169234 (1 spm; also ex NYSM 219, original no. G2687). The original USNM handwritten ledger indicates that USNM 64344 (2 spms) was also received from the U.S. Exploring Expedition, and we therefore consider these specimens as additional paralectotypes.

FAMILY SUCCINEIDAE

aperta Lea, 1838; *Succinea*

Succinea aperta Lea, 1838:101, pl. 23, fig. 107.

Current taxonomic status: *Succinea aperta* Lea, 1838. Valid species (Cowie et al., 1995:152).

Type material: Syntypes USNM 117931 (2 spms, Figure 8F).

Type locality: “Banks of Columbia River.”

Remarks: No holotype was designated but a figure was provided with the original description. Lea did not mention where type material was deposited. According to the original handwritten USNM ledger, two type specimens were received from the Lea collection, collected by Nuttall in “Oregon?” We refrain from designating either of these two specimens as a lectotype, which would be better done in the context of a study of North American Succineidae and following a search for additional syntype material.

Gould (1846:182) stated that *Succinea rotundata* Gould resembled *S. aperta* Lea. In a footnote, Gould (in Binney, 1851:66–67) stated that “*S. aperta* is undoubtedly a species belonging to the Sandwich Islands, described by me under the name *S. rotundata*.” Cowie et al. (1995:152)

included *Succinea aperta* as among taxa questionably included in the Hawaiian fauna and noted it as a possible synonym of *S. rotundata* Gould, 1846, on the authority of Baldwin (1893:24). For these reasons, we include *S. aperta* in this catalog of Hawaiian taxa, while acknowledging that it is probably not a Hawaiian species.

canella Gould, 1846; *Succinea*

Succinea canella Gould, 1846:184; 1852:27; 1856: pl. 2, figs. 20, 20a,b; 1862:29.

Current taxonomic status: *Succinea canella* Gould, 1846. Valid species (Cowie et al., 1995:150).

Type material: Lectotype USNM 5420 (Figure 8G), here designated; paralectotypes USNM 20853 (2 spms, Figure 8H).

Type locality: “Maui, Sandwich Islands.”

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 2, figs. 20, 49a,b). Johnson (1964:51) noted the “Figured holotype USNM 5420” but also identified additional type material in the collections of the MCZ, including MCZ 169072 (14 spms; ex NYSM 175, original no. G2643) and MCZ 161661 (2 spms; ex Smithsonian Institution). Although the original description does not imply or require that it was based on more than one specimen, because additional type material was recognized by Johnson, his noting of the “Figured holotype” is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). We therefore here designate USNM 5420 as the lectotype. It is unclear if the additional type material noted above was from the same lot as the lectotype. The original handwritten ledger indicates the lectotype as being received from the U.S. Exploring Expedition, with “original number” 20. USNM 5420 closely matches Gould’s (1856: pl. 2, figs. 20, 20a) figured specimen (Figure 8I). The two specimens in an additional lot, USNM 20853, original numbers “=G546 =f20,” received from the U.S. Exploring Expedition are considered paralectotypes.

cepulla Gould, 1846; *Succinea*

Succinea cepulla Gould, 1846:182; 1852:16; 1856: pl. 2, figs. 15, 15a,b; 1862:27, 244.

Current taxonomic status: *Succinea cepulla* Gould, 1846. Valid species (Cowie et al., 1995:150).

Type material: Syntypes USNM 5415 (1 spm, Figure 9A), USNM 20868 (2 spms, Figure 9B).

Type locality: “Hawaii.”

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 2, figs. 15, 15a,b). Johnson (1964:53) noted several syntypes in the MCZ and USNM, including USNM 5415, MCZ 169114 (8 spms, ex

NYSM 176, original no. G2644), MCZ 39646 (1 spm), and MCZ 216754 (1 spm), the last two lots received from the Smithsonian Institution. The type specimens were collected by C. Pickering and J. Drayton (Gould, 1852:17). The specimen in USNM 5415 is similar to Gould's (1856: pl. 2, figs. 15, 15a, 15b) figured specimen (Figure 9C) but is smaller than the measurements provided in the original description (Johnson, 1964:53), which were "Long. $\frac{1}{2}$, lat. $\frac{7}{20}$, alt. $\frac{1}{5}$ poll." [approximately 13 mm long, 9 mm wide, 5 mm high]. The respective dimensions of the USNM 5415 specimen are 10 mm, 7 mm, and 5 mm. This specimen is therefore not designated as a lectotype, pending further research, notably of the MCZ collections. The original handwritten ledger indicates that the type material was received from the U.S. Exploring Expedition, with "original number" 15. An additional lot, USNM 20868, original numbers "=G303, =-544, f15," is listed in the original handwritten ledger from "Hilo Hawaii" received from the U.S. Exploring Expedition. Ditto marks below the preceding line indicate that this is "*cepulla* Gld." We treat these as syntypes. Additionally, H. W. Henshaw noted on a label that he considered one of these specimens to not be conspecific but possibly an immature specimen of *Succinea vesicalis* Gould, 1846.

explanata* Gould, 1852; *Succinea

Succinea explanata Gould, 1852:13; 1856: pl. 2, figs. 31, 31a-c; 1862:223.

Current taxonomic status: *Catinella explanata* (Gould, 1852).

Valid species (Cowie et al., 1995:148).

Type material: Lectotype USNM 5431 (Figure 9D), here designated; paralectotype USNM 20870 (1 spm, Figure 9E).

Type locality: "Kauai, Sandwich Islands."

Remarks: The type material was collected by J. P. Couthouy and Gould (1852:13) noted that "Mr. Couthouy has labeled the shell as '*Testacella*.'" This might suggest that Gould had only a single shell, which therefore would be the holotype by monotypy. However, there are two lots, USNM 5431 and 20870, received from the U.S. Exploring Expedition. Johnson (1964:73), while noting the "Figured holotype USNM 20870," also identified additional type material as USNM 5431 (1 spm; "original number" 31) and MCZ 169135 (1 spm; ex NYSM 182, original number A1523), and MCZ 155126 (1 spm; ex Smithsonian Institution). Consequently, Johnson's (1964: 73) inference does not constitute valid lectotype fixation (see section in the Introduction regarding lectotype designations) and we therefore interpret Gould's statement above as using "shell" in the sense of the species. The shell in USNM 20870, with original numbers "=G405, 445" and f31, is missing its apex. It was not noted as broken in the original handwritten USNM ledger, so the specimen may have been damaged subsequently. We here designate USNM 5431, which matches Gould's figured specimen

(1856: pl. 2, 31, 31a, 31b; Figure 9F), as the lectotype and USNM 20870 is a paralectotype.

lumbalis* Gould, 1846; *Succinea

Succinea lumbalis Gould, 1846:183; 1852:17; 1856: pl. 2, figs. 18, 18a,b; 1862:28, 244.

Current taxonomic status: *Succinea lumbalis* Gould, 1846. Valid species (Cowie et al., 1995:151).

Type material: Possible syntype USNM 5418 (Figure 9G).

Type locality: "Kauai, Sandwich Islands."

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 2, figs. 18, 18a,b). The locality provided in the original description was "Kauai, Sandwich Islands" (Gould, 1846:183) but both Kauai and the additional locality "Mauna Kea, Hawaii" were noted subsequently (Gould, 1852:18), perhaps because Gould saw additional material in the interval between his 1846 and 1852 publications. Johnson (1964:105) noted the "Figured holotype USNM 5418" but also identified additional "paratypes MCZ 169231, ex NYSM 177, original no. G2646." However, Johnson's lectotype fixation is not valid (see section in the Introduction regarding lectotype designations). The original handwritten USNM ledger indicates the locality as "Hawaii" and that it was received from the U.S. Exploring Expedition. This probably refers to the island of Hawaii, not the Hawaiian Islands more generally, which probably would have been referred to as the Sandwich Islands, as in Gould's publications and usually in the original handwritten USNM ledger. The shell in USNM 5418 closely matches Gould's (1856: pl. 2, figs. 18, 18a) figured specimen (Figure 9H), and no other specimens of *Succinea lumbalis* could be found in the USNM. However, it is cataloged as from the island of Hawaii, not the type locality of Kauai, so it is probably not type material unless (1) "Kauai" in the original description was a mistake, or (2) Gould (1846:183) in the original description inadvertently failed to include "Mauna Kea, Hawaii" as a locality, or (3) "Mauna Kea, Hawaii" in the subsequent publication (Gould, 1852:18) was a mistake and our interpretation of the ledger "Hawaii" is wrong, or (4) the ledger "Hawaii" was also a mistake. We retain it as a possible syntype only.

oregonensis* Lea, 1841; *Succinea

Succinea oregonensis Lea, 1841:32; 1844:5.

Current taxonomic status: *Succinea oregonensis* Lea, 1841.

Valid species (Cowie et al., 1995:152).

Type material: Holotype (by monotypy) USNM 117935 (Figure 10A).

Type locality: "Oregon."

Remarks: No holotype was designated nor a figure provided with the original, very brief, Latin description. However,

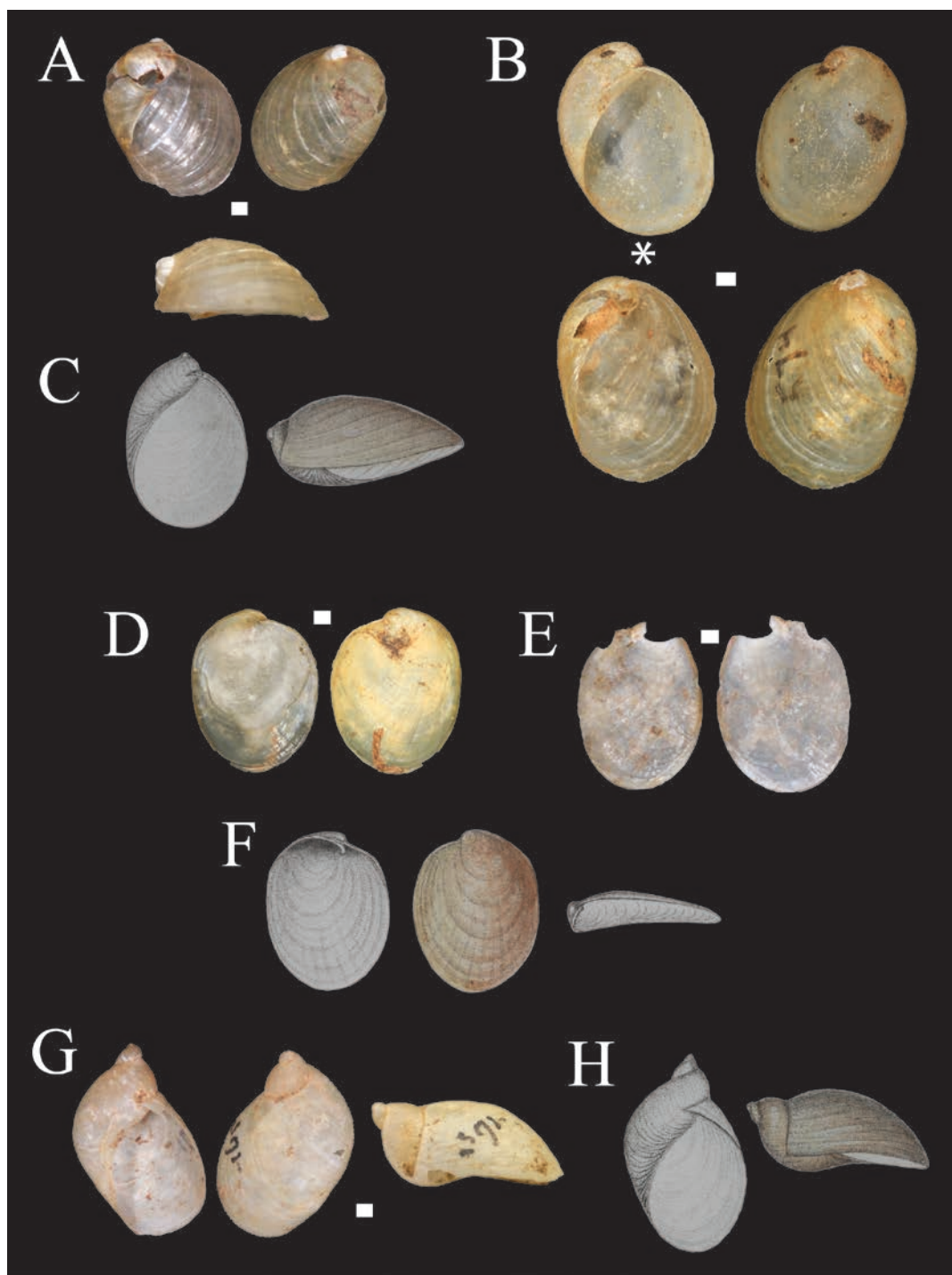


FIGURE 9. A. Syntype (USNM 5415; 10.1 mm) of *Succinea cepulla*. B. Syntypes (USNM 20868; 10.0 mm) of *S. cepulla*. C. Gould's (1856: pl. 2, figs. 15, 15a) figured *Succinea cepulla*. D. Lectotype (USNM 5431; 9.7 mm), here designated, of *Succinea explanata*. E. Paralectotype (USNM 20870; 9.5 mm) of *S. explanata*. F. Gould's (1856: pl. 2, figs. 31, 31a,b) figured *Succinea explanata*. G. Possible syntype (USNM 5418; 11.8 mm) of *Succinea lumbalis*. H. Gould's (1856: pl. 2, figs. 18, 18a,b) figured *Succinea lumbalis*. Dimensions are shell height (length). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: 1 mm.

the subsequent elaboration (Lea, [1844]:5) stated that a “single specimen only of this small species was given to me by Mr. Nuttall” while at the same time stating that material was present in “My Cabinet, and Cabinets of Prof. Nuttall, and Dr. Jay.” Under the assumption that Lea did not see the specimens of Nuttall or Jay, we interpret this to mean that the original description was based on the “single specimen,” as did Pilsbry (1948:842), and that Lea was simply acknowledging the presence of the species in the collections of Nuttall and Jay. The specimen is therefore the holotype by monotypy (*Code*, Art. 73.1.2). It was noted as “Lea’s type” and identified as USNM 117935 by Pilsbry (1948:842, fig. 457a). In the original handwritten USNM ledger, USNM 117935 is noted as being in the “type coll.” and collected by Nuttall.

The *Succinea oregonensis* of all authors subsequent to Lea is not the same species as that of Lea, according to Pilsbry (1948:842), who considered Lea’s *S. oregonensis* to have “not been collected again.” Several specimens of *Succinea* collected on Oahu in the BPBM collection have been labeled with an unpublished name attributed to C. F. Ancey, “*Succinea oostoma*.” (A label name is not nomenclaturally available, and mentioning the name in the present publication does not make it available; *Code*, Arts. 9.6, 16.1.) C. M. Cooke Jr. compared these specimens with material of *Succinea oregonensis* Lea, 1841, sent to him by H. A. Rehder, with “Hawaii” as the probable locality (C. M. Cooke Jr., unpublished notes; correspondence, 1947–1948, with H. A. Rehder, NMNH). Both Cooke and Rehder considered “*S. oostoma*” and *S. oregonensis* as the same species. It is possible that *S. oregonensis* Lea is actually a Hawaiian species. It is included here, pending further research.

rotundata* Gould, 1846; *Succinea

Succinea rotundata Gould, 1846:182; 1852: 15; 1856: pl. 2, figs. 14, 14a–c; 1862:27, 244.

Current taxonomic status: *Catinella rotundata* (Gould, 1846).

Valid species (Cowie et al., 1995:149).

Type material: Syntypes USNM 5414 (3 spms, Figure 10B), USNM 20866 (1 spm, Figure 10C).

Type locality: “Mountains of Oahu, Sandwich Islands.”

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 2, figs. 14, 14a–c). Johnson (1964:142) noted the “figured holotype USNM 5414” in fragments, but also noted a “paratype” (USNM 20866; incorrectly cited as USNM 208666), also damaged. Although the original description does not imply or require that it was based on more than one specimen, the fact that additional type material was recognized by Johnson means this is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). According to

the original handwritten USNM ledger, the specimens were already broken at the time the lot was cataloged and the number of specimens uncertain, as indicated by “?”. Three broken specimens but with intact embryonic whorls were found in USNM 5414, the largest badly damaged and the two smaller specimens in fragments. Due to their condition, it is difficult to assess whether any one of these three specimens matches Gould’s (1856: pl. 2, figs. 14, 14a, 14b) figured specimen (Figure 10D), Johnson’s noting of the “figured holotype” notwithstanding. We therefore refrain from designating a lectotype and treat the specimens in USNM 5414, with “original number” 14, and 20866, with “original number” f14, as syntypes. The type material was collected by C. Pickering (Gould, 1852:15) and the original handwritten ledger indicates that it was received from the U.S. Exploring Expedition.

Gould (in Binney, 1851:66–67) considered *Succinea rotundata* Gould to be a synonym of *Succinea aperta* Lea. Baldwin (1893:24) considered them only possibly synonymous and was followed by Cowie et al. (1995:152), who also did not definitively synonymize them, considering *aperta* as questionably belonging to the Hawaiian fauna.

venusta* Gould, 1846; *Succinea

Succinea venusta Gould, 1846:186; 1852:22; 1856: pl. 2, figs. 25, 25a,b; 1862:30.

Current taxonomic status: *Succinea venusta* Gould, 1846. Valid species (Cowie et al., 1995:152).

Type material: Lectotype USNM 5425 (Figure 10E), here designated; paralectotypes USNM 20860 (3 spms, Figure 10F).

Type locality: “Hawaii.”

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 2, figs. 25, 25a,b). Johnson (1964:165) noted the “figured holotype USNM 5425” but also identified additional type material in the MCZ, including MCZ 169417 (4 spms; ex NYSM 292, original no. G2648, erroneously labeled “Taheiti”) and MCZ 39647 (2 spms; ex Smithsonian Institution). Although the original description does not imply or require that it was based on more than one specimen, the fact that additional type material was recognized by Johnson means this is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). We therefore here designate USNM 5425 as the lectotype. The original handwritten USNM ledger confirms the locality as “Hawaii” and that the specimen was received from the U.S. Exploring Expedition, with “original number” 25. The specimen in USNM 5425 closely matches Gould’s (1856: pl. 2, figs. 25, 25a,b) figured specimen (Figure 10G). An additional lot, USNM 20860, original numbers “=G575, =4977, =f25,” is listed in the original handwritten USNM ledger as collected by the U.S. Explor-

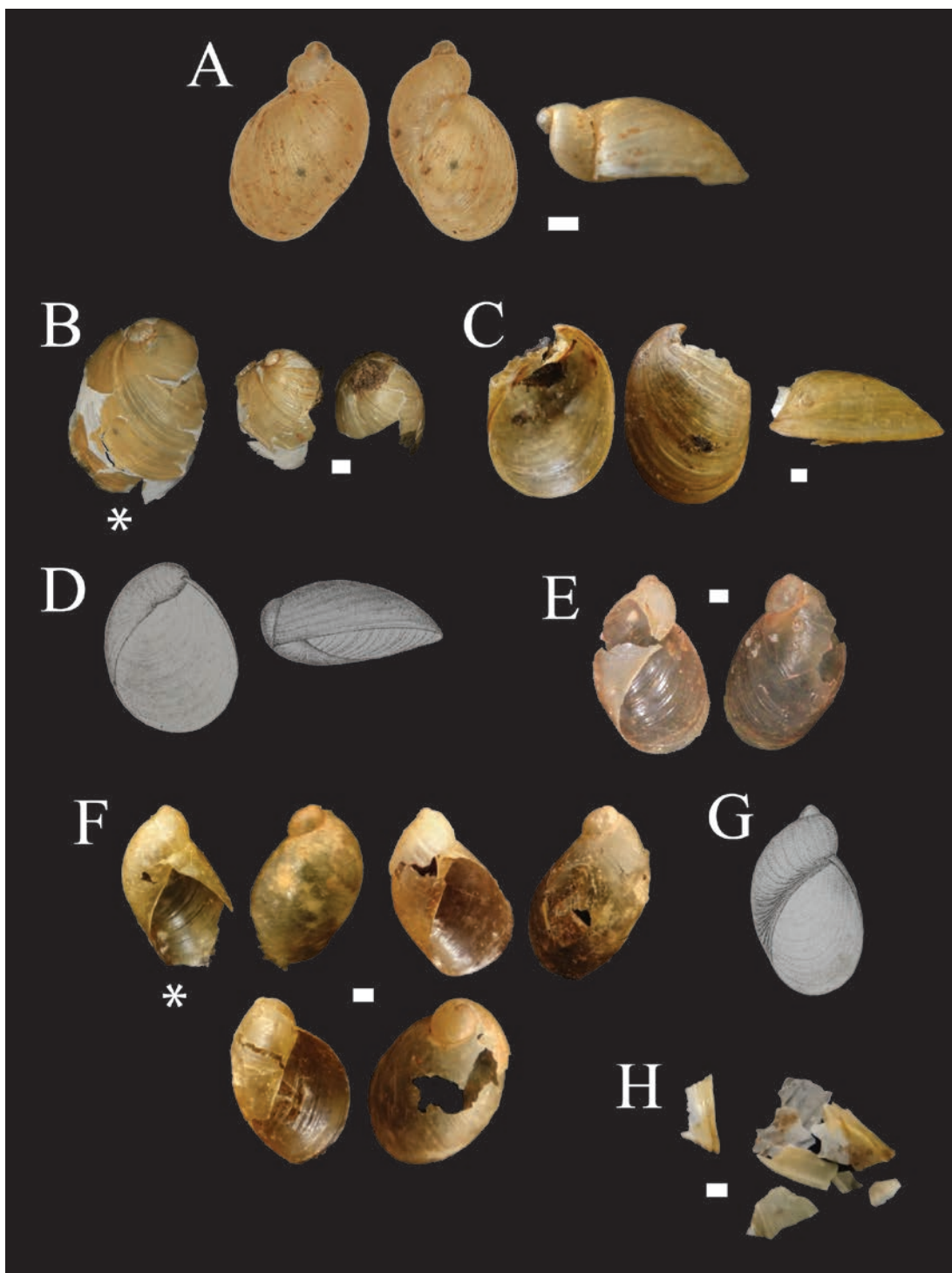


FIGURE 10. A. Holotype (USNM 117935; 6.7 mm) of *Succinea oregonensis*. B. Syntypes (USNM 5414; 10.1 mm) of *Succinea rotundata*. C. Syntype (USNM 20866; 10.9 mm) of *S. rotundata*. D. Gould's (1856: pl. 2, figs. 14, 14a,b) figured *Succinea rotundata*. E. Lectotype (USNM 5425; 9.5 mm), here designated, of *Succinea venusta*. F. Paralectotypes (USNM 20860; 7.9 mm) of *S. venusta*. G. Gould's (1856: pl. 2; fig. 25) figured *Succinea venusta*. H. Syntype (USNM 5417) of *Succinea vesicalis*. Dimensions are shell height (length). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: 1 mm.

ing Expedition and received from “Pse” (=W. H. Pease); we treat these specimens as paralectotypes.

vesicalis Gould, 1846; *Succinea*

Succinea vesicalis Gould, 1846:183; 1852:21; 1856: pl. 2, figs. 17, 17a; 1862:28, 244.

Current taxonomic status: *Succinea vesicalis* Gould, 1846. Valid species (Cowie et al., 1995:152).

Type material: Syntype USNM 5417 (Figure 10H).

Type locality: Mauna Kea, elevation of 7000 ft., Hawaii, Sandwich Islands (Gould, 1852:21).

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 2, figs. 17, 17a). In the original description, the locality was given as “Mauna Kea, Hawaii” (Gould, 1846:183) but it was subsequently refined by Gould (1852:21). It has not been determined that the description was based on a single specimen, and the original description does not imply or require that it was based on more than one specimen, so by noting the “Figured holotype USNM 5417,” Johnson (1964:53) inferred a “holotype.” However, this was not a valid lectotype fixation as he did not explicitly accept that the original description was based on a single specimen, and it has not been considered subsequently that the original description was based on more than one specimen (*Code*, Art. 74.6). As it is in fragments, we refrain from designating USNM 5417 as the lectotype, and following the *Code* (Rec. 73F), treat it as a syntype, pending further research. According to the original handwritten USNM ledger, the specimen was already broken at the time it was cataloged, and was received from the U.S. Exploring Expedition, with “original number” 17. The type material was obtained by J. P. Couthouy (Gould, 1852:21).

FAMILY ZONITIDAE

caperata Gould, 1846; *Vitrina*

Vitrina caperata Gould, 1846:181; 1852:10; 1856: pl. 1, fig. 9, 9a; 1862:26.

Current taxonomic status: *Godwinia caperata* (Gould, 1846). Valid species (Cowie et al., 1995:164).

Type material: Lectotype USNM 5409 (Figure 11A), here designated.

Type locality: “Kauai, Sandwich Islands.”

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 1, figs. 9, 9a). Johnson (1964:51) noted the “Figured holotype USNM 5409” but also identified MCZ 135612 (5 spms; ex BSNH from Smithsonian Institution) as additional type material. Although the original description does not imply or require

that it was based on more than one specimen, the fact that additional type material was recognized by Johnson means this is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). We therefore designate USNM 5409 as the lectotype. The type material was collected by J. P. Couthouy (Gould, 1852:11). The original handwritten ledger indicates that the type was received from the U.S. Exploring Expedition, with “original number” 9. The specimen in USNM 5409 closely matches Gould’s (1856: pl. 1, figs. 9, 9a) figured specimen in shape, size, whorl expansion, and faint longitudinal sculpture (Figure 11B).

pauxilla Gould, 1852; *Helix*

Helix pauxillus Gould, 1852:40; 1856: pl. 3, figs. 46, 46a–c; 1862:19, 243.

Current taxonomic status: *Nesovitrea pauxilla* (Gould, 1852).

Valid species (Cowie et al., 1995:165).

Type material: See *pusilla* Gould, 1846.

Type locality: See *pusilla* Gould, 1846.

Remarks: New name for *Helix pusilla* Gould, 1846, which is a primary junior homonym of *Helix pusilla* Lowe, 1831. *Helix pauxilla* Gould, 1852 therefore has the same name-bearing type and type locality as *Helix pusilla* Gould, 1846.

pusilla Gould, 1846; *Helix*

Helix pusillus Gould, 1846:171; 1852:40; 1856: pl. 3, figs. 46, 46a–c (as *Helix pauxillus*); 1862:19, 243.

Current taxonomic status: *Nesovitrea pauxilla* (Gould, 1852).

Valid species (Cowie et al., 1995:165).

Type material: Lectotype USNM 20964 (Figure 11C), here designated.

Type locality: “[M]ountains of East Maui, Sandwich Islands” (Gould, 1852:41).

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 3, figs. 46, 46a–c). The locality provided in the original description was “mountains of Maui, Sandwich Islands” and it was subsequently refined by Gould (1852:41). Johnson (1964:136) noted the “Figured holotype USNM 20964” but also identified additional type material in the collections of the MCZ, including MCZ 169288 (12 spms; ex NYSM, original no. A781) and MCZ 169287 (3 spms; ex NYSM 240, original no. A784). Although the original description does not imply or require that it was based on more than one specimen, the fact that additional type material was recognized by Johnson means this is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). The original handwritten USNM ledger lists an additional specimen, USNM 5446, with “original number” 46, identified as “*Helix pauxillus*” from “Sandwich I.” but notes that it was

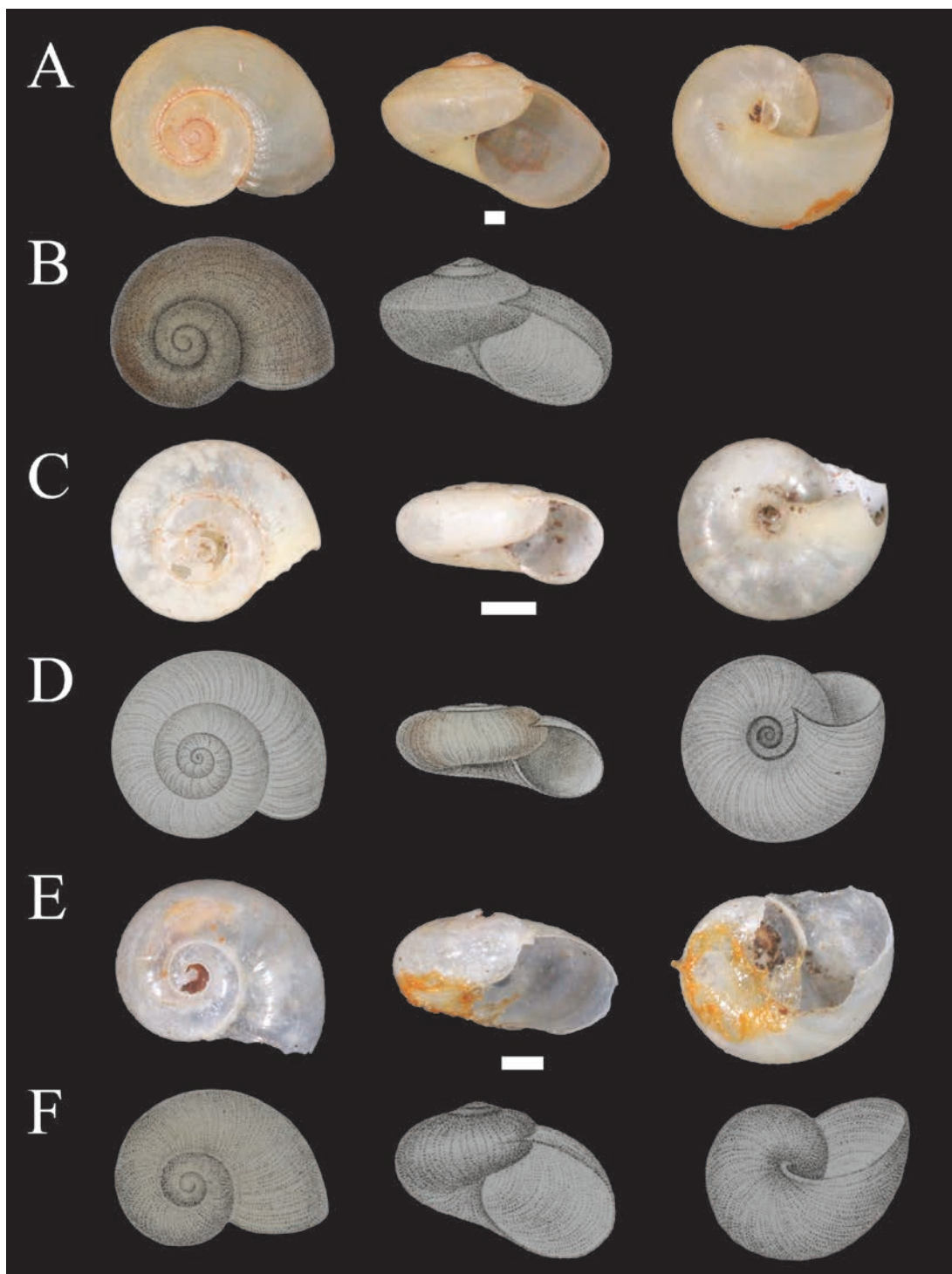


FIGURE 11. A. Lectotype (USNM 5409; 11.2 mm), here designated, of *Vitrina caperata*. B. Gould's (1856: pl. 1, figs. 9, 9a) figured *Vitrina caperata*. C. Lectotype (USNM 20964; 3.9 mm), here designated, of *Helix pusilla*. D. Gould's (1856 pl. 3, figs. 46, 46a,b) figured *Helix pusilla*. E. Lectotype (USNM 20874; 5.0 mm), here designated, of *Vitrina tenella*. F. Gould's (1856: pl. 1, figs. 10, 10a,b) figured *Vitrina tenella*. Dimensions are shell diameter (width). If more than one shell in the lot is figured, dimension is of the shell indicated by an asterisk. Scale bars: 1 mm.

“Destroyed (Dec. ’75)” with the entry initialed “J. G. S.” We therefore here designate USNM 20964 as the lectotype. Although the destroyed USNM 5446 presumably was the figured specimen, USNM 20964, with “original number” f46, was received from the U.S. Exploring Expedition and is a reasonable match to Gould’s (1856: pl. 3, figs. 46, 46a, 46b) figured specimen (Figure 11D), although the aperture is damaged.

Helix pusilla Gould, 1846 is a primary junior homonym of *Helix pusilla* Lowe, 1831, and was replaced by *Helix pauxilla* Gould, 1852 (as *pauxillus*). The name-bearing type (lectotype) of *H. pusilla* Gould, 1846 is therefore also the lectotype of *H. pauxilla* Gould, 1852 (*Code*, Art. 72.7).

tenella* Gould, 1846; *Vitrina

Vitrina tenella Gould, 1846:181; 1852:11; 1856: pl. 1, figs. 10, 10a–c; 1862:26.

Current taxonomic status: *Vitrina tenella* Gould, 1846. Valid species (Cowie et al., 1995:164).

Type material: Lectotype USNM 20874 (Figure 11E), here designated.

Type locality: “Kauai, Sandwich Islands.”

Remarks: No holotype was designated nor a figure provided with the original description, although figures were provided subsequently by Gould (1856: pl. 1, figs. 10, 10a–c). It has not been determined that the description was based on a single specimen, and the original description does not imply or require that it was based on more than one specimen. Johnson (1964:53) noted a “Figured holotype USNM 20874,” thereby inferring a “holotype.” However, he did not explicitly accept that the original description was based on a single specimen and, although we now know that there was additional type

material, his inference is not a valid lectotype fixation (see section in the Introduction regarding lectotype designations). The original handwritten USNM catalog ledger entry for USNM 20874, with “original number” f10, states “(from diagnosis: type lost).” The entry for USNM 5410, with “original number” 10, is annotated “specimen lost”; this specimen was presumably the figured specimen. Although damaged, USNM 20874 is a reasonable match to Gould’s (1856: pl. 1, figs. 10, 10a, 10b) figured specimen (Figure 11F). The type material was collected by J. P. Couthouy (Gould, 1852:12) and the original handwritten ledger indicates that it was received from the U.S. Exploring Expedition. We here designate USNM 20874 as the lectotype.

The taxonomic status of this species is not clear. Cooke (1921:269) noted the same positioning of the right tentacle retractor in *Vitrina tenella* and *V. alaskana*, but noted that *V. tenella* was no doubt endemic to Hawaii and not of recent introduction (Cooke, 1921:271). Similarly, Baker (1941:322) did “not dare describe the Hawaiian species [*Vitrina tenella*] as distinct from *V. alaskana* Dall” and stated that there are “Apparently no specific differences between *V. tenella* from Hawaii and *V. alaskana* from Western N.A.” He concluded that the Hawaiian species was introduced by birds and that the lack of anatomical characters differentiating the two supported the likelihood that this was a recent event. He pointed out that *tenella* has priority, clearly considering them to be synonyms although without a formal synonymy (Baker, 1958:146). Roth and Sadeghian (2006:62) synonymized *V. alaskana* with *V. pellucida* and, hence, Christensen (2013) concluded that *tenella* is a synonym of *pellucida*. However, none of these species has been assessed using molecular data and we follow Cowie et al. (1995) in considering *V. tenella* a valid species, pending further research.

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