



The Family Seguenziidae Verrill, 1884 in the Northeast Pacific, including a comment on excessive numbers of taxonomic data portals

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Abstract

The family Seguenziidae, including the genus *Adeuomphalus*, of the northeast Pacific are here revised. *Seguenzia megalococoncha* Rokop, 1972 is here synonymized under *S. cervola* Dall, 1919, *S. quinni* McLean, 1985 is here synonymized under *S. gioviae* Dall, 1919, *S. catalina* Dall, 1919 and *S. certoma* Dall, 1919 are synonymized under *S. stephanica* Dall, 1908. They represent either growth stages of one another, or are based on insignificant minor sculptural differences. A short commentary on the contraproductive proliferation of taxonomic data portals and the need for a single resource akin to GenBank is given.

Introduction

This contribution was started by the late James H. McLean as part of his *Northeast Pacific Gastropod* book project. The manuscript in outline form was significantly modified and few of McLean's taxonomic indications in the manuscript were accepted. Dimensions given are for maximum size in any axis. Abundance indications have been omitted because the number of samples from bathyal and abyssal depths is very small, which precludes any meaningful assessment of their true abundance.

Seguenziidae is a relatively small family with some 168 valid species listed in *World Register of Marine Species* (WoRMS) or *MolluscaBase*, which are identical for marine taxa (Bouchet 2018). It is generally a deep-water group, with relatively little material available. The most significant contributions have been those of Marshall (1983, 1991), Quinn (1983a, 1983b, 1987, 1991), and Poppe *et al.* (2006). The northeast Pacific fauna has had sporadic contributions by Dall (1908, 1919), Rokop (1972), Quinn (1983a, 1983b), McLean (1985), and Geiger (2017).

While the group once was considered a deep divergence within archaeogastropods in the subclass Seguenziina (Salvini-Plawen & Haszpurmar 1987), it is now recognized as a specialized off-shoot within the larger Trochoidea (Kano 2008, Geiger 2012). The latest classification in Bouchet (2018) continues with the proliferation of higher taxa in Vetigastropoda and places Seguenziidae in its own order Seguenziida, which regrettably obfuscates [one of McLean's favorite terms] the sister-group relationships with trochoidean lineages. As discussed elsewhere (Geiger 2012), the relationships of vetigastropod lineages remains far from settled. Many key lineages have never been included in any phylogeny (e.g., Pendromidae, Larocheidae) and each study, each using a particular array of taxa, produces radically different sistergroup relationships; see Geiger (2012) for detailed discussion. Accordingly, it would be better to abstain from rearranging vetigastropod higher taxa until multiple phylogenies with different markers and somewhat different taxa recover highly similar relationships. For this reason, I elect to ignore the ordinal taxa given in Bouchet (2018) as he erroneously suggests that we know the evolutionary history of larger vetigastropod lineages with any degree of certainty.

Abbreviations

- LACM: Natural History Museum of Los Angeles County, Malacology Department, California, USA.
MNHN: Muséum National d'Histoire Naturelle, Paris, France.
ZIN: Zoological Institute of the Russian Academy of Sciences, St. Petersburg, Russia.
USNM: United States National Museum of Natural History, Smithsonian Institution, Washington (DC), USA.
OD: Original designation.
SD: Subsequent designation.
M: Monotypy.

Systematics

Seguenziidae Verrill, 1884

(Figures 1–3)

Description. Shell trochiform, turbiniform, or planispiral, 2–10 mm, umbilicus narrow or anomphalous, interior nacreous except *Adeuomphalus*. Peritreme incomplete (entire in *Adeuomphalus*), aperture lacking a slit or foramen, but some genera with up to three labral sinuses. Operculum corneous, paucispiral.

Remarks. In the northeast Pacific, all sequenziid species occur on outer continental shelves at deep to abyssal depths, where they are detritivores (Quinn, 1983b). Specimens are seldom collected and the family is poorly known.

Carenzia Quinn, 1983

(Figure 1A–C)

Carenzia Quinn, 1983a: 355. Type species (OD): *Seguenzia carinata* Jeffreys, 1876. Amphi-Atlantic.

Description. Shell conical, smooth, whorl carinate, mid-whorl carination more or less distinct; base convex, umbilicus narrow; apertural sinuses at periphery, base indistinct.

Carenzia golikovi Geiger, 2017

(Figure 1A–B)

Carenzia golikovi Geiger, 2017: 228–229, figs 1–18. Holotype LACM 3317. 5180 m, abyssal plain W of Oregon, S of Gulf of Alaska, Alaska (45° 00' N, 153° 47.7' W to 45° 02.3' N, 153° 55.9' W).

Description. Shell to 5 mm, trochiform, whorls rounded, carination on mid shoulder; base convex, more than one dozen irregularly spaced, spiral lines of variable strength; umbilicus narrow, with indistinct funiculus; axial growth lines indistinct.

Distribution. Aleutian Trench (52°N, 176°W) to S Gulf of Alaska, Alaska (45°N, 154°W). 5100 m.

Carenzia inermis Quinn, 1983

(Figure 1C)

Carenzia inermis Quinn, 1983a: 362, figs 13–16. Holotype LACM 1806. Cascadia Abyssal Plain, Oregon, 2820 m.

Description. Shell to 7 mm, white, whorls inflated, suture impressed; base convex, basal angulation indistinct; umbilicus narrow, with funiculus arising from columellar wall. Mid-whorl carination of early whorls faint; later whorls nearly smooth, with weak spiral threads; growth lines showing V-shaped sinus below suture and less prominent basal sinus.

Distribution. Off Oregon (44.5°N, 125.5–128°W). 2800 m.

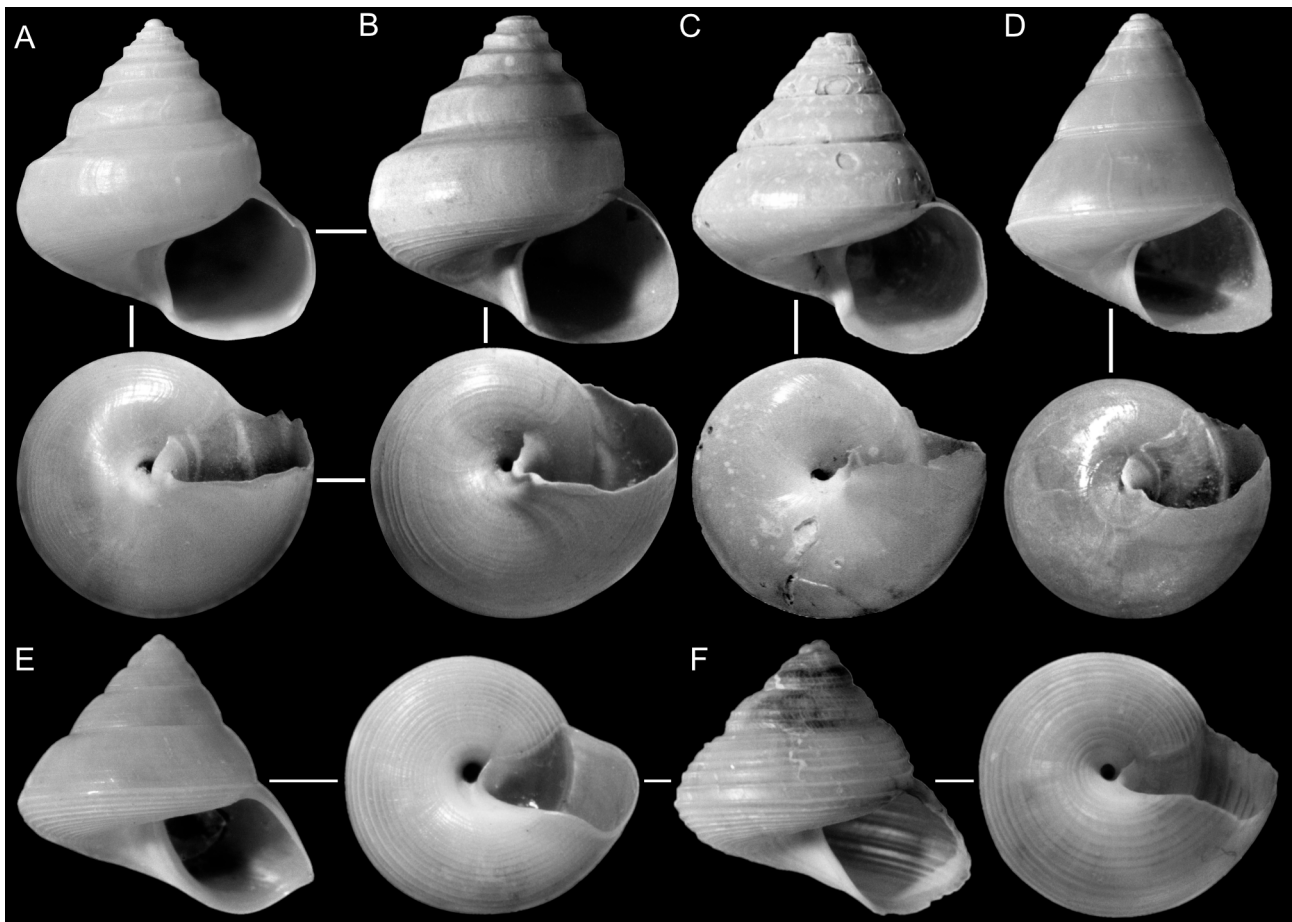


FIGURE 1. A–B. *Carenzia golikovi* Geiger, 2017. A. 5180 m, Abyssal plain W of Oregon, S of Gulf of Alaska, Alaska (approximately 45° N, 153.8° W) (LACM 3317, holotype), 5.3 mm. B. 5100 m, Aleutian Trench, Alaska [near western end of chain], (52° 12'N, 175° 44'E) (LACM 3318, paratype). C. *Carenzia inermis* Quinn, 1983. 2820 m, Cascadia Abyssal Plain, off Oregon (LACM 1806, holotype), 6.8 mm. D. *Asthelys careyi* Geiger, 2017. 5180 m, abyssal plain W of Oregon, S of Gulf of Alaska, Alaska (approximately 45° N, 153.8' W) (LACM 3320, holotype), 7.0 mm. E–F. *Oligomeria conoidea* Galkin & Golikov, 1985. E. 166 m, S of Attu Island, Aleutian Islands, Alaska (LACM 1997-163.7), 5.9 mm. F. 219 m, NE of Semisopchnoi Island, Aleutian Islands, Alaska (LACM Station 86-330), 4.7 mm.

***Asthelys* Quinn, 1987**
(Figure 1D)

Asthelys Quinn, 1987: 66. Type species (OD) *Basilissa munda* Watson, 1879. Atlantic Ocean.

Description: Shell small, biconical, bicarinate whorls macroscopically smooth, aperture trapezoidal.

***Asthelys careyi* Geiger, 2017**
(Figure 1D)

Asthelys careyi Geiger, 2017: 229–230, figs 23–24. Holotype LACM 3320. 5180 m, abyssal plain W of Oregon, S of Gulf of Alaska, Alaska.

Description. Shell 7 mm (holotype), white, with five smooth, slightly inflated whorls, suture weakly impressed, base convex, smooth; basal angulation slightly projecting, with small channel above; anomphalous; columella narrow.

Distribution. Abyssal plain off Oregon. 5180 m. Known only from holotype.

***Oligomeria* Galkin & Golikov, 1985**

(Figure 1E–F)

Oligomeria Galkin & Golikov, 1985: 22. Type species (OD): *O. conoidea* Galkin & Golikov, 1985. Kurile Islands, Russia.

Description. Shell trochiform biconical, predominant spiral sculpture, umbilicate. Monotypic genus.

***Oligomeria conoidea* Galkin & Golikov, 1985**

(Figure 1E–F)

Oligomeria conoidea Galkin & Golikov, 1985: 23, figs 1–3. Holotype ZIN 38605. Cape Kitov, Urip, Kurile Islands, Russia, 150 m.

Description. Shell to 4.7 mm, trochiform biconical; spiral cords or carinated cords, ~6 stronger ones on shoulder, ~15 weaker ones on base; faint axial sculpture predominantly on early whorls, umbilicus open, no periumbilical cord, no funiculus; columellar wall somewhat thickened, aperture subquadratic.

Distribution. Kurile Islands, Russia, to Aleutian Islands, Alaska (179°W). 88–220 m.

Remarks. The strength of the spiral sculpture varies, but is not sufficient to warrant taxonomic recognition, particularly giving the limited material available.

***Seguenzia* Jeffreys, 1876**

(Figure 2)

Seguenzia Jeffreys, 1876: 200. Type species (M): *S. formosa* Jeffreys, 1876. Northwest Atlantic.

Description. Shell to 10 mm, thin, fragile, umbilicate or anomphalous, external and internal surfaces with nacreous luster. Apertural lip bordering three labral sinuses often flaring in mature shells. Columella curved, ending abruptly. Sculpture of narrow spiral carinae, basal cords; fine spiral threads, sharp axial riblets curving parallel to labral sinuses.

Remarks. Species occur throughout the world on the lower continental slope and abyssal plain. *Seguenzia occidentalis* Dall, 1908 (see Keen 1971) is known from the Panamic Province. There are two groups of *Seguenzia*, 1) specimens with globular shells and with less prominent spiral keels: *S. cervola*, *S. macleani*, and 2) biconical shells with more prominent spiral keels: *S. giovia*, *S. stephanica*.

***Seguenzia cervola* Dall, 1919**

(Figure 2A–B)

Seguenzia cervola Dall, 1919: 344. Holotype USNM 209229. Off North Coronado Island, Baja California, 618–692 fms [= 1130–1265 m].

Seguenzia megalococoncha Rokop, 1972: 15, fig. 1. Holotype USNM 701260. SW of Farallon Islands, W of Pioneer Seamount, 3592–3798 m. New synonym.

Description. Shell to 10 mm, globular inflated, suture little impressed; spiral cords decreasing in strength from shoulder to base, one below suture, one on mid-shoulder, more than one dozen from periphery to base; crossed by finest axial lines; umbilicus open, bordered by more or less distinct periumbilical cord, partially covered by umbilical chink, funiculus present; columellar wall thickened, abruptly ending.

Distribution. Oregon (46°N) to Coronado Islands, Baja California (32°N). 1100–3800 m.

Remarks. *Seguenzia megalococoncha* is a small specimen of *S. cervola* as shown by the identical sculpture on the earlier portion of the teleoconch and the shared umbilical characters.

***Seguenzia macleani* Geiger, 2017**

(Figure 2C–D)

Seguenzia macleani Geiger, 2017: 231, figs 25–28. Holotype LACM 3321, 5100 m, Aleutian Trench, Alaska.

Description. Shell to 9.6 mm, globular inflated, suture little impressed; spiral cords decreasing in strength from shoulder to base, one on shoulder, one at suture, a good dozen on base; crossed by fine axial lines; umbilicus wide, no funiculus; columella not thickened.

Distribution. Western Aleutian Islands, Alaska (175°W) to off Oregon (45°N). Abyssal plain, 5100 m.

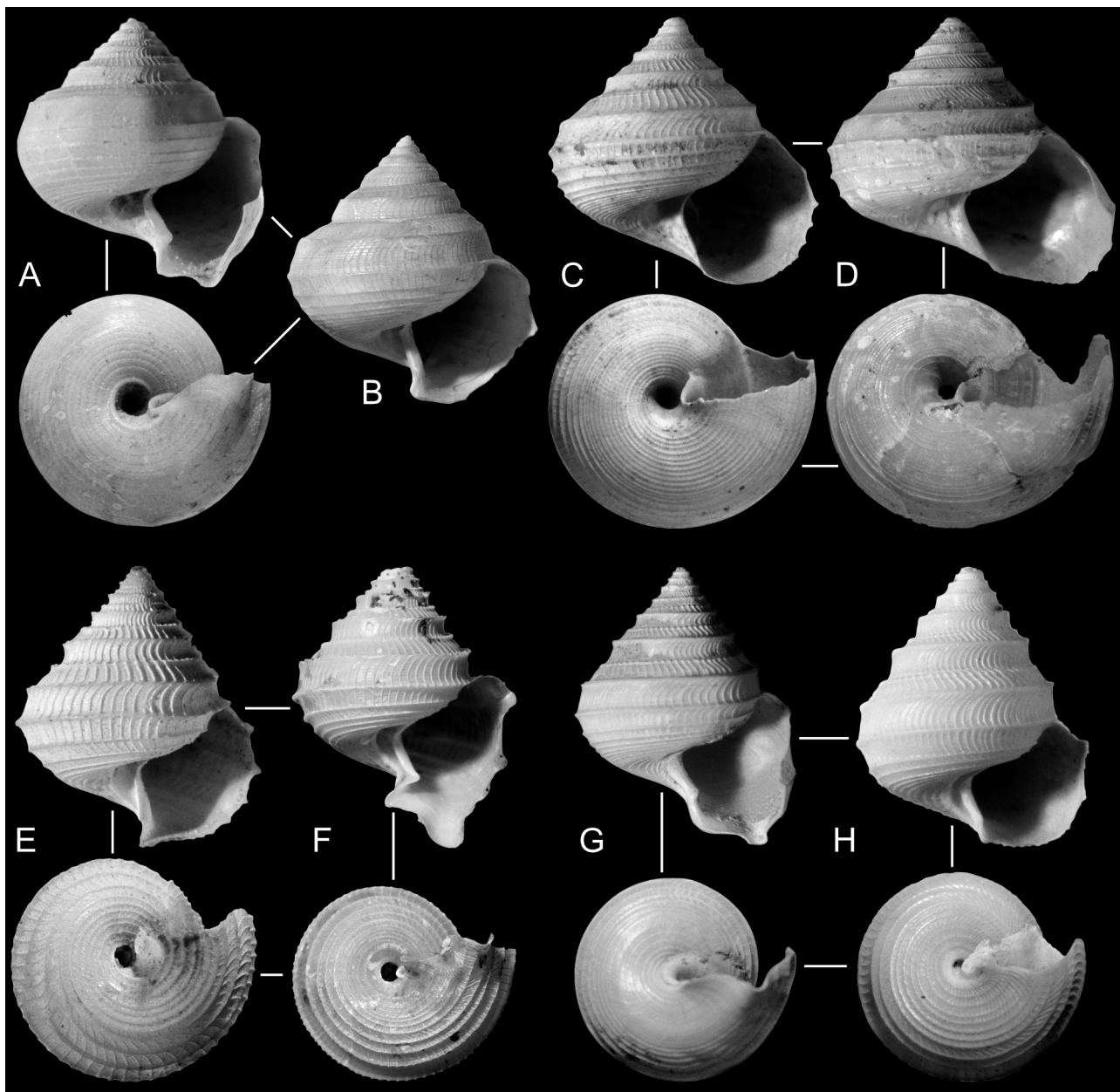


FIGURE 2. A–B. *Seguenzia cervola* Dall, 1919. A. 1130–1266 m, off North Coronado Island, Baja California (USNM 209229, holotype), 4.5 mm. B. 3592–3798 m, SW of Farallon Islands and W of Pioneer Seamount, off San Francisco County, California (USNM 701260, holotype of *S. megalococoncha*), 9.2 mm. C–D. *Seguenzia macleani* Geiger, 2017. C. 5100 m, Aleutian Trench at 175° 44' E (LACM 3321), holotype, 8.7 mm. D. 5180 m, abyssal plain W of Oregon, S of Gulf of Alaska (approximately 45° N, 153.8° W) (LACM 3486, paratype), 9.6 mm. E–F. *Seguenzia giovia* Dall, 1919. E. 874–1097 m, off Santa Catalina Island, Los Angeles County, California (USNM 209228, holotype), 6 mm. F. 3900 m, Tufts Abyssal Plain, W of Lincoln County, Oregon (LACM 2065, holotype of *S. quinni*), 7.6 mm. G–H. *Seguenzia stephanica* Dall, 1908. G. 2816 m, Cascadia Abyssal Plain, off Oregon (LACM 70-140.5), 7.1 mm. H. 5100 m, Aleutian Trench, Alaska at 44° N, 175° E (LACM), 5.2 mm.

***Seguenzia giovia* Dall, 1919**

(Figure 2E–F)

Seguenzia giovia Dall, 1919: 343–344. Holotype USNM 209228. Off Santa Catalina Island, California Channel Islands, 190–216 m [see remarks below].

Seguenzia quinni McLean, 1985: 337, fig. 2. Holotype LACM 2065. Tufts Abyssal Plain, W of Lincoln County, Oregon, 3900 m. New synonym.

Description. Shell to 7.5 mm, globular biconical; carinated spiral cords below suture, strongest on mid shoulder, from periphery to base approximately 10 of decreasing strength; fine spiral lines between cords; axial cordlets distinct; Umbilicus moderately wide, bordered by spiral carina, with funiculus; Columellar wall thickened, terminating as sharp spur. Flaring of lip variable depending on size, preservation of specimen.

Distribution. Off Oregon (45°N) to Southern California (33°N). 800–3900 m.

Remarks. *Seguenzia quinni* is a larger, better-preserved specimen of *S. giovia*; note the identical teleoconch sculpture and umbilical details. The type locality of *S. giovia* (*Albatross* 4408) is most likely erroneous because it is too shallow for seguenziids, and may be any of the *Albatross* 4400–4407 stations at depths of 450–650 fathoms (820–1190 m), all off Santa Catalina Island, Los Angeles County, California.

***Seguenzia stephanica* Dall, 1908**

(Figure 2G–H)

Seguenzia stephanica Dall, 1908: 325. Holotype USNM 123034. Ventana Bay, Baja California, 1820 m.

Seguenzia caliana Dall, 1919: 344. Holotype USNM 207674. Off San Diego, California, 417 fms [= 762 m]. New synonym.

Seguenzia certoma Dall, 1919: 343. Holotype USNM 211167. Off Point Loma, San Diego, California, 565–680 fms [= 1033–1243 m]. New synonym.

Description. Shell to 8 mm, globular biconical; carinated spiral cords below suture, strongest one mid shoulder, approximately 8–15 from periphery to umbilicus, count increasing with size; intercalated spiral lines at best faint; axial cordlets distinct. Umbilicus very narrow in small specimens, closed by callus in larger shells. Columellar wall thickened, terminating in sharp spur. Flaring of lip variable depending on size, preservation of specimen.

Distribution. Aleutian Islands, Alaska (175°E) to Peru (3° S). 750–5100 m.

Remarks. Smaller specimens have proportionally more pronounced spiral and axial sculpture. The types of the three nominate taxa represent growth stages of the same species.

***Adeuomphalus* Seguenza, 1876**

(Figure 3)

Adeuomphalus Seguenza, 1876: 10. Type species (M): *A. ammoniformis* Seguenza, 1876. Plio-Pleistocene deep-water fossil, southern Italy. [see Kano *et al.* (2009) for potential synonymy of *Transomalogyra* Palazzi & Gaglini, 1979 and unresolved erroneous identification of type species.]

Description. Shell to 3 mm, planispiral, teleoconch with axial cords, aperture D-shaped, with thin edge.

Remarks. The placement of the genus is not fully resolved and is included here under Seguenziidae for convenience; see Kano *et al.* (2009) for details. Of six species, one is known in the northeast Pacific.

***Adeuomphalus trochanter* Warén & Bouchet, 2001**

(Figure 3)

Adeuomphalus trochanter Warén & Bouchet, 2001: 132, figs 8f, 15l, 16d. Holotype MNHN 21051. Juan de Fuca Ridge, off Oregon (46°N, 130°W), 2068 m.

Description. As for genus.

Distribution. Juan de Fuca Ridge (46°N). Hydrothermal vents, 2000 m.



FIGURE 3. *Adeuomphalus trochanter* Warén & Bouchet, 2001. 2068 m, Juan de Fuca Ridge, off Oregon (MNHN 21051, holotype), 2.7 mm [SEM by Anders Warén].

Discussion

The systematics of seguenziids is mainly plagued by the lack of material. Accordingly, it is difficult to assess intraspecific variability and to determine species boundaries. I follow here the spirit of Dutch botanist's van Steenis, who has been quoted "It is not our task to find out how many species there are, but how few." (P. Hovenkamp pers. comm.), which could also be expressed as the "lumper" approach. The statistical approach to species delimitation, explained elsewhere (Geiger 2012: 25), also comes to bear. For example, if a small number of specimens is significantly different, the differences must be large. In the case of the *Seguenzia*, the presence/absence of an umbilicus seems to segregate two groups. A second but less clear-cut character is the strong apertural projections, which may, however, break off. The placement and relative strength of spiral cords and ridges can be used as an additional character, while their absolute strength is not indicative of any systematic differentiation. That last set of attributes has been the main source of synonyms, including additional proposed taxa in the McLean manuscript. It is not known, but also unlikely, that those McLean manuscript names were applied by him to specimens in other collections. All those manuscript names have been evaluated and found to be unwarranted, except those published in Geiger (2017).

The generic assignment of *Carenzia inermis* is uncertain. It occupies a position intermediate between *C. golikovi* with a subquadratic outline of whorls, and *Asthelys* with a more triangular outline of whorls and a rather distinct peripheral keel. *Carenzia inermis* is kept in *Carenzia* because of Quinn's assignment to this genus, who also described *Asthelys*. It is entirely unclear whether/which shell characters are meaningful in the systematics of seguenziids, or which morphological characters are indicative of generic boundaries.

On-line taxonomic data portals. In the current landscape of on-line taxonomic databases one cannot escape noting the proliferation of partially to heavily overlapping portals (e.g. Encyclopedia of Life, EUNomen, FishBase, fossilworks, ITIS, Kew Checklist of Selected Plant Families, MolluscaBase, Paleobiology Database, Species2000, Tree of Life, Wikipedia, WoRMS, ZipCodeZoo), to name but some of the most prominent examples. The overlap of the WoRMS and MolluscaBase databases is particularly striking. Given the checkboxes in the WoRMS taxon query for "extant" and "marine taxa", that when un-checked also include

fossils as well as freshwater and terrestrial taxa, it appears that MolluscaBase is an exact subset of WoRMS. Perhaps WoRMS could become WoRAS (World Register of All Species)? That abbreviation would be quite fitting as it is related to the computing term WORA (Write Once Run Anywhere). It would also reduce the number of competing portals and unify diverse taxonomic inventory efforts. As a malacologist, I would welcome for MolluscaBase to disappear, as all its entries are already included in WoRMS. Such a step in the right direction would send the appropriate and refreshing signal, as when CLEMAN became the broader WoRMS. Fusion and consolidation is highly desirable, if not required, to accelerate progress towards a truly comprehensive taxonomic inventory.

A problem with multiple data portals is that none of them are complete, and that specialists will not look over dozens of portals and contact all their administrators to root out problems. For instance the fossil abalone *Haliotis lomaensis* Anderson, 1902 is not found in either MolluscaBase or WoRMS, but is readily appearing in fossilworks. The species is far from obscure, as it has frequently been cited as one of the oldest abalone fossil (reviewed in Geiger & Groves 1999). The omission in MolluscaBase/WoRMS is not because no fossil abalone have been included. In fact, it contains obscure taxa such as the fossil *Haliotis matihetihensis* (Eagle, 1999). A single, combined taxonomic portal would not have such problems.

A comparison to other disciplines is highly illuminating. While nobody would dream of having COI/BOLD data separate from GenBank, this kind of provincial mentality is pervasive in the taxonomic community. The balkanization exists both along the geographic as well as along the taxonomic axes. The amount of duplication, superfluous work, and funding that is expended (or dare I say wasted?) on all those parallel efforts is staggering. Imagine how much further along we could be with a single portal. In the case of taxonomic data portals, too many cooks most definitely spoil the broth. We need a single, GenBank-like portal for all biota of the entire globe. One cannot help but to admire the genetics community for maintaining a single, well-organized, and working repository, which is universally accepted as the one and only repository for such data. Once there is a single taxonomic portal, then it also becomes more attractive for specialists to contribute to that single resource.

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