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Tractolira delli, a new Volutidae (Mollusca: Gastropoda: Neogastropoda) from the abyssal plains off Antarctica

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Abstract

A new deep-sea species of Volutidae in the genus *Tractolira* is named from material collected by the United States Antarctic Program in and around the Ross Sea, eastern Antarctica, and from one locality in the Subantarctic region. *Tractolira delli* new species is most similar to *T. sparta* Dall, 1896, from which it differs in having a relatively wider shell, less prominent spiral sculpture, with narrower threads, and by the absence of strong axial ribs at least on the first three teleoconch whorls. The other Antarctic congener, *Tractolira germonae*, has a thicker, dark-brown periostracum (instead of a thin, light-yellow one), a proportionally smaller inductura, and lacks surface sculpture.

Key words*:* Antarctica, Antarctic, sub-Antarctic, Odontocymbiolinae

Introduction

The originally monotypic genus *Tractolira* was erected by Dall (1896) to include *Tractolira sparta* Dall, 1896, a species occurring in abyssal depths of the tropical eastern Pacific Ocean. Harasewych (1987) named a second species of the genus, *T. germonae*, from the subantarctic South Sandwich Islands. Two years later, Leal and Bouchet (1989) named *T. tenebrosa*, a species collected off Brazil in 2370–3270 m.

As a result of the efforts of the United States Antarctic Program (USAP), a large number of species of shallow- and deep-sea mollusks was collected by the USNS ELTANIN during the 1960s and 1970s. A large part of this material, now stored at the Smithsonian Museum Support Center in Suitland, Maryland, was studied and described by Dell (1990). In his landmark work on Antarctic Mollusca Dell treated, but left unnamed, a novel

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volutid species as "*Tractolira* sp." The discovery of additional specimens in the USAP collections have allowed us to describe and name that species, drawing comparisons with its congeners based on shell, anatomical, and radular characters.

Abbreviations for depository institutions are: SIO = Scripps Institute of Oceanography, San Diego, California, USA; USNM = National Museum of Natural History, Smithsonian Institution, Washington (DC), USA.

Systematics

Family Volutidae Rafinesque, 1815
Subfamily Odontocymbiolinae Clench and Turner, 1964
Genus *Tractolira* Dall, 1896
Type species: *T. sparta* Dall, 1896 (Monotypy)

***Tractolira delli* new species**
(Figures 1, 2, 5, 7, 10)

Tractolira sp., Dell 1990: 217, fig. 372.

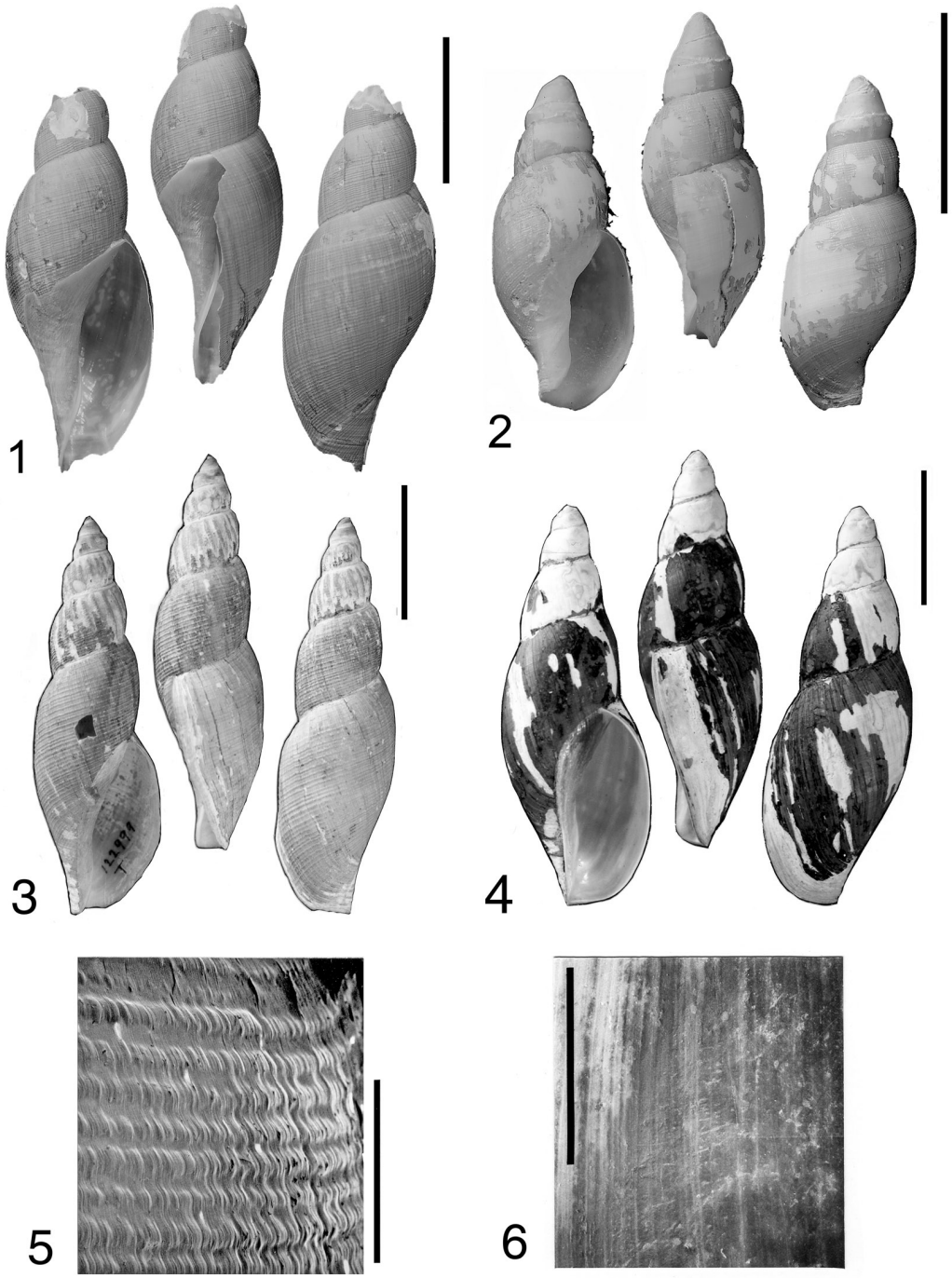
Holotype: USNM 860631, USNS ELTANIN cruise 27, station 1939, 01 Feb. 1967, live collected specimen (Figures 1, 7).

Measurements: 51.6 mm length, 20.2 mm width (the spire is broken, approximately 2 teleoconch whorls are missing; estimated length is 57.8 mm).

Paratypes: Paratype 1, USNM 860632, off Victoria Land, Antarctica, 72º58'–72º57' S, 174º24'–174º25' E, USNS ELTANIN cruise 32, sta. 1999, 1772–1775 m, 5' Blake trawl, 11 Jan. 1968 (Figures 2, 5); paratype 2, USNM 860633, off Ruppert Coast, Marie Byrd Land, Antarctica, 59º48'–59º51' S, 144º45'–144º49' W, USNS ELTANIN cruise 20, sta. 134, 3200–3259 m, 5' Blake trawl, 03 Oct. 1965; paratype 3, USNM 860634, Scott Island Bank, off Victoria Land, Antarctica, 69º03'–69º05' S, 179º41'–179º22' E, USNS ELTANIN cruise 27, sta. 1939, 3519–3596 m, 10' Blake trawl, 01 Feb. 1967 (type locality; live collected specimen); paratype 4, USNM 860635, off Victoria Land, Antarctica, 72º27'–72º26' S, 177º04'–177º12' E, USNS ELTANIN cruise 32, sta. 2121, 1883–1890 m, 10' Blake trawl, 12 Feb. 1968.

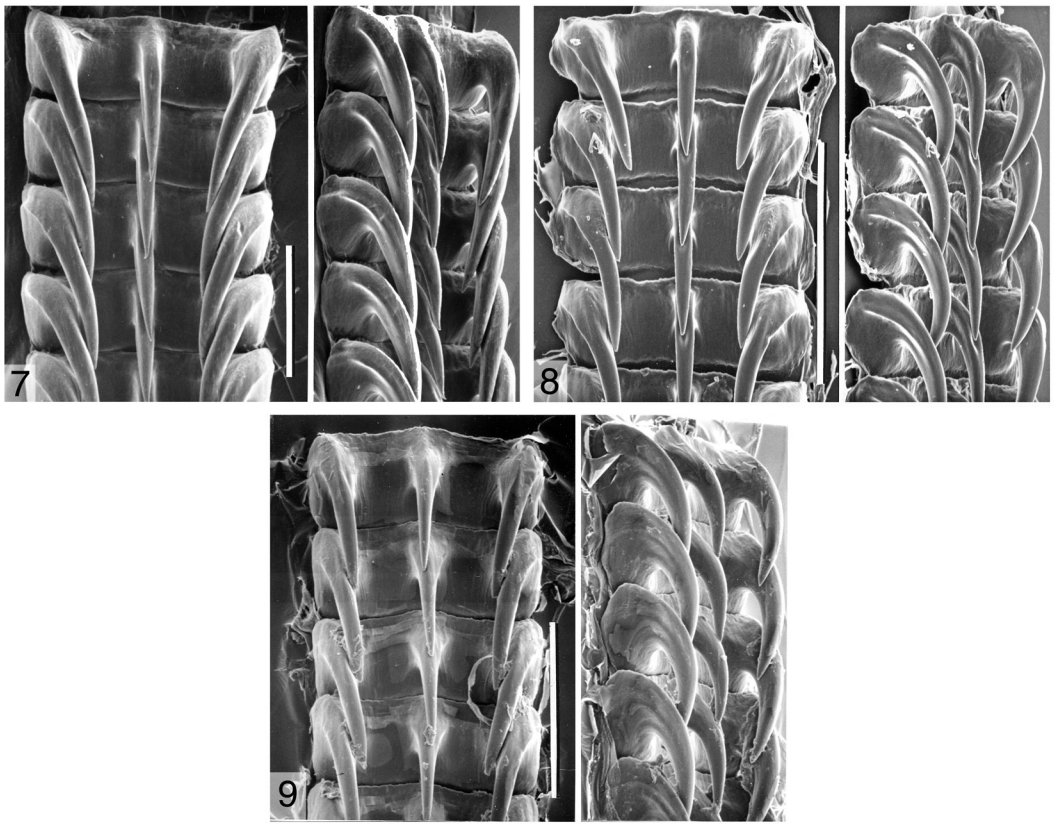
Other Records: USNM 886106, off Sturge Island, Balleny Islands, off Victoria Land, Antarctica, 66º52'–66º49' S, 164º32'–164º26' E, USNS ELTANIN sta. 1949, 2507–2525 m, 10' Blake trawl, 05 Feb. 1967 (material examined by Dell [1990].

Type Locality (Figure 10): Scott Island Bank, eastern Ross Sea, Antarctica, 69º03'–69º05' S, 179º41'–179º22' E, 3519–3596 m.



FIGURES 1–6. Shells of *Tractolira* species. **1, 2, 5.** *Tractolira delli* new species. **1.** Holotype, USNM 860631, 52.4 mm length (broken shell), Scott Island Bank, eastern Ross Sea, Antarctica, 69º03'–69º05' S, 179º41'–179º22' E, 3519–3596 m. Scale bar = 20 mm. **2.** Paratype 1, off Victoria Land, Antarctica, USNM 860632, 72º58'–72º57' S, 174º24'–174º25' E. Scale bar = 10 mm. **5.** Paratype 1, detail of shell surface on penultimate whorl. Scale bar = 1 mm. **3.** *Tractolira sparta* Dall, 1896, holotype, USNM 122999, 60.0 mm length, USNS ALBATROSS station 3360, 24 Feb. 1891,"Gulf of Panama to Acapulco", Mexico. **4, 6.** *Tractolira germonae* Harasewych, 1987. **4.** Holotype, USNM 859076, 59.1 mm length, east of Candlemas Island, South Sandwich Islands. Scale bar = 20 mm. **6.** USNM 860623, detail of shell surface on penultimate whorl. Scale bar = 1 mm.

Description: Shell to 57 mm length and 20 mm width, thin, elongate, fusiform. Spire elevated, aperture length/spire length about 1.3. Spire angle about 30º. Surface eroded where not covered by periostracum. Protoconch conical, broken or eroded on most specimens. Teleoconch with up to 5.5 moderately convex whorls. Suture impressed. Axial sculpture of fine raised threads. Spiral sculpture of raised threads, 32–38 on penultimate whorl, 65 on body whorl. Intersection of axial and spiral elements gives finely and smoothly cancellated aspect to entire shell. Aperture oval-elongate, length/width about 3. Outer lip thin. Inner lip smooth, with thin, transparent inductura along parietal region. Columella smooth, with raised white siphonal fold. Inner shell surface smooth. Periostracum thin, pale yellowish-brown. Eroded surfaces white.



FIGURES 7–9. Radulae of *Tractolira* species, dorsal and 45° oblique views. **7.** *Tractolira delli* new species, holotype, USNM 860631. **8.** *Tractolira sparta* Dall, 1896, SIO M1639, off Ensenada, Baja California Norte, Mexico. **9.** *Tractolira germonae* Harasewych, 1987, USNM 881012, off South Sandwich Islands. Scale bars = 200 μm.

External anatomy (holotype ♀): Incomplete soft parts (lacking upper whorls of digestive gland and gonad) comprise 1½ whorls, mantle cavity spans 1 whorl, tapering posteriorly, running alongside voluminous kidney, which spans ¼ whorl. Foot (L/W ca. 1.5) broad anteriorly, tapering posteriorly, with prominent propodial groove. Operculum absent. Animal yellowish tan in color, without discernible pattern. Sole of foot glandular. Siphon long, muscular, contracted, about 1/5 shell length. Siphonal appendages paired, slightly dorso-ventrally flattened, roughly equal in length and width, flanking left cephalic tentacle. Tentacles short, tapering, with semicircular lateral lappets, flanking broad hood. Eyes absent.

Mantle cavity: Arrangement of mantle cavity organs similar to *T. germonae* (see Harasewych 1987: 3–4). Mantle edge thickened, muscular, smooth. Osphradium large, slightly broader above than below osphradial ganglion. Ctenidium slightly narrower, and slightly longer than osphradium, tapers posteriorly. Hypobranchial gland transversely pleated, without evidence of purple secretion. Pericardium as in *T. germonae*.

Alimentary system: The disposition of the organs of the alimentary system of *T. delli* is identical to that of *T. germonae* (see Harasewych 1987: 4–5, figs. 8–11). Differences are limited to the presence of proportionally larger salivary glands as well as broader and longer accessory salivary glands in *T. delli*.

Female reproductive system: Preserved portions of female alimentary system as in *T. germonae* (see Harasewych 1987: 5–6, fig. 12). Narrow oviduct enters large, wedge-shaped albumen gland at rear of mantle cavity. Anterior to the albumen gland, which forms the anterior wall of the kidney, the pallial oviduct is joined by ingesting gland, then expands to form a broad capsule gland and is joined by the bursa copulatrix, a muscular diverticulum, before opening into the mantle cavity via the female opening just anterior and ventral to the anus. The rectum runs along the inner surface of, and is enveloped by the pallial portion of the female gonoduct.

Male reproductive system (USNM 886106 ♂): Testicular duct passes alongside pericardium prior to entering rear of mantle cavity. Prostate gland opens to mantle cavity via ventral slit, runs beneath posterior portion of rectum. Vas deferens diverges posterior to anus, descends to floor of mantle cavity, runs to base of short, dorso-ventrally flattened penis with inconspicuous papilla.

Kidney: Kidney very large, ¼ the length and ½ the maximum width of the mantle cavity. Nephridial gland narrow, situated along the pericardium, dorsal and ventral pleated areas, large, with broad lamellae. Kidney opening over renal vein.

Geographical Distribution (Figure 10): Antarctica: Ross Sea; Off Oates Coast; SW of Balleny Islands (60º–72º S, 144º–177º E).

Depth Range: 1772–3596 m.

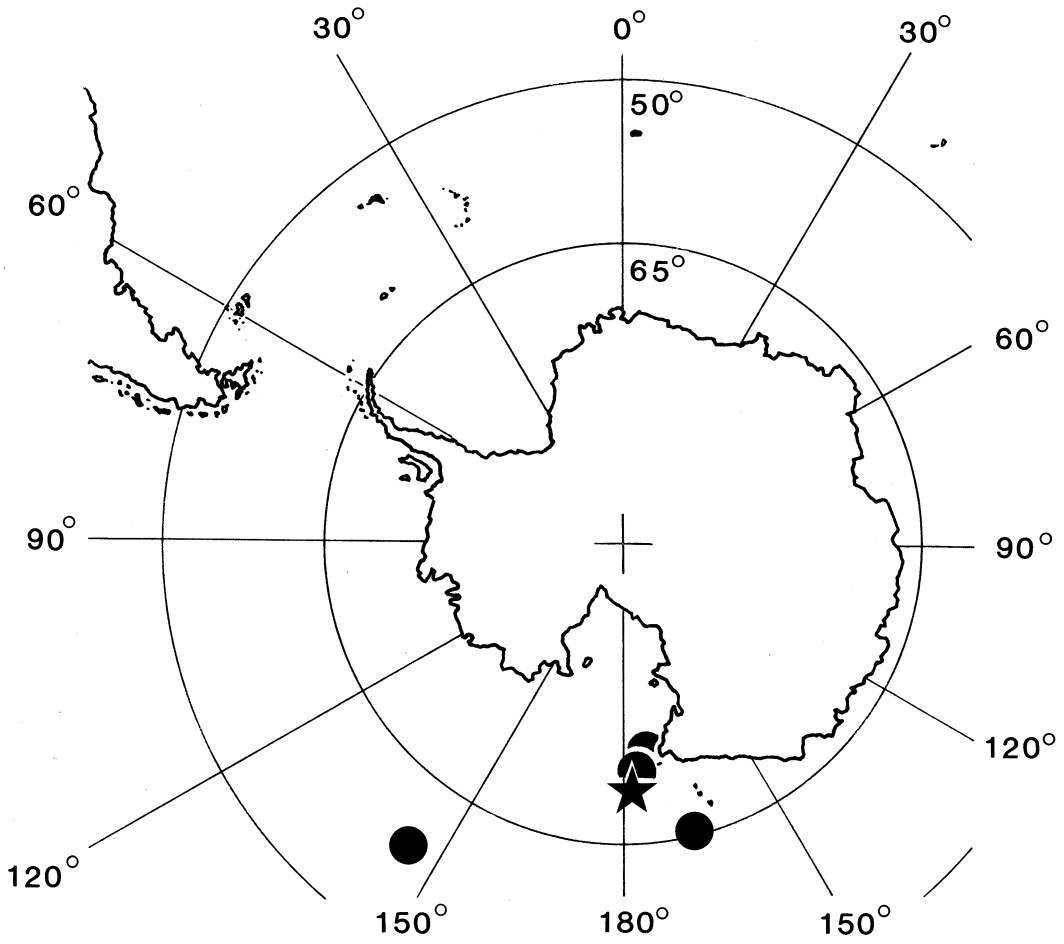


FIGURE 10. Distribution of *Tractolira delli* new species. Star indicates type locality.

Etymology: The new species is named after the late Dr. Richard K. Dell, formerly Honorary Research Associate at the National Museum of New Zealand, Wellington, for his many contributions to the study of Antarctic mollusks and the family Volutidae.

Remarks: The new species is readily distinguishable from other *Tractolira* by its conspicuously reticulated shell (Figures 1, 2, 5), thin yellowish periostracum, and large size. The species of *Tractolira* occurring geographically closest to the range of the new species is *T. germonae* Harasewych, 1987 (Figures 4, 6), which inhabits abyssal depths off the South Sandwich Islands. This latter species, however, is characterized by a thicker, dark-brown periostracum, a shell lacking prominent spiral sculpture, "flatter" whorl profile, and a less extensive inductura along the parietal shield. Morphologically, the shell of *T. delli*, new species, is closest to *T. sparta* Dall, 1896 (Figure 3), from abyssal depths of the eastern Pacific. Notwithstanding some general similarity, *T. sparta* has a relatively narrower shell, more prominent spiral sculpture, with wider threads, and presence of

strong axial ribs at least on the first three teleoconch whorls. The radula of *T. delli* new species (Figure 7) more closely resembles the radula of *T. germonae* (Figure 9), as both have a broader, thicker, weakly chevron shaped basal plate, while *T. sparta* (Figure 8) has a thinner, more rectangular basal plate. Anatomically, *T. delli*, new species, differs from *T. germonae* in having notably larger kidney, salivary glands, and accessory salivary glands. The anatomies of *T. sparta* and *T. tenebrosa* are not known.

Dall (1907: 365) believed *"Voluta" alta* Sowerby, 1844, from early Tertiary, shallow water deposits of Chile, to be the ancestor of *Tractolira*. Harasewych (1987: 8) proposed that *Tractolira* colonized the abyssal regions of the Peru Basin during the early Tertiary, and that *T. germonae* differentiated following the displacement tectonic fragments of Pacific Ocean floor into the southwestern Atlantic during the Cenozoic.

The discovery of *T. delli* in the Southeastern Pacific Basin suggests the vicariant separation of eastern Pacific species of *Tractolira* by the Chile Rise. A robust phylogeny of the living *Tractolira* would provide insights into the biogeography of the abyssal fauna of the region.

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