

New records of deepwater gastropods (Mollusca: Gastropoda) from fisheries bycatch in northern Chile

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Abstract. Our knowledge of deep-sea invertebrate biodiversity, particularly for molluscs in the southeastern Pacific, is still scant. Many deepwater molluscan species from off the Chilean coast are known exclusively from the bycatch of commercial fisheries, and many of them remain only known from their original descriptions. In this work, we present new geographical and bathymetric records for four rarely collected deepwater gastropod species—*Aeneator castillai* McLean & Andrade, 1982, *Aeneator martae* Araya, 2013, *Calliotectum vernicosum* Dall, 1890, and *Maurea delli* (McLean & Andrade, 1982)—collected as bycatch offshore of Arica, Caldera, and Huasco, all in northern Chile. *Calliotectum vernicosum* is reported for the first time from Chilean waters, and the new record represents the southernmost for this species, which previously was only known from Ecuador and Peru. *Aeneator martae* is reported for the first time from outside its type locality. The northern distributional ranges of *A. castillai* and *M. delli* are extended by approximately 320 km and 550 km, respectively, north of their previously known occurrences.

Key words. Range extension, Volutidae, Tudicidae, deep sea

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INTRODUCTION

The marine deepwater biodiversity of northern Chile remains poorly studied, particularly the invertebrate faunas. Apart of a few species described in 19th century expeditions (Dall 1890, 1908), most of the described deep-sea molluscs from this area have been obtained in recent times as bycatch of commercial fisheries, and some species are only known from their original descriptions (Rehder 1971; Stuardo & Villarroel 1974; McLean & Andrade 1982). The logistical challenges and high costs associated with deep-sea research hinder basic research on this environment, and thus there are scarce studies focussing on this fauna from northern Chile. While inherently biased towards larger, charismatic, or shelled species, bycatch sourced from commercial fisheries provides a glimpse into deepwater biodiversity and offer a valuable opportunity to document poorly known macro-

invertebrate communities, including molluscs (Andrade 1986; Queirolo *et al.* 2011; Araya 2016).

In this work, we provide information that extends the distributional ranges of four deepwater gastropod species: *Aeneator castillai* McLean & Andrade, 1982, *Aeneator martae* Araya, 2013, *Calliotectum vernicosum* Dall, 1890, and *Maurea delli* (McLean & Andrade 1982).

MATERIALS AND METHODS

Specimens of deepwater gastropods, in varying condition of preservation but with only shells and opercula retained, were collected as bycatch by fishermen in the commercial Nylon Shrimp (*Heterocarpus reedi* Bahamonde, 1955) and Patagonian Toothfish (*Dissostichus eleginoides* Smitt, 1898) fisheries off of Arica (18° S), Caldera (27° S), and Huasco (28° S) in northern Chile. Due to commercial confidential-

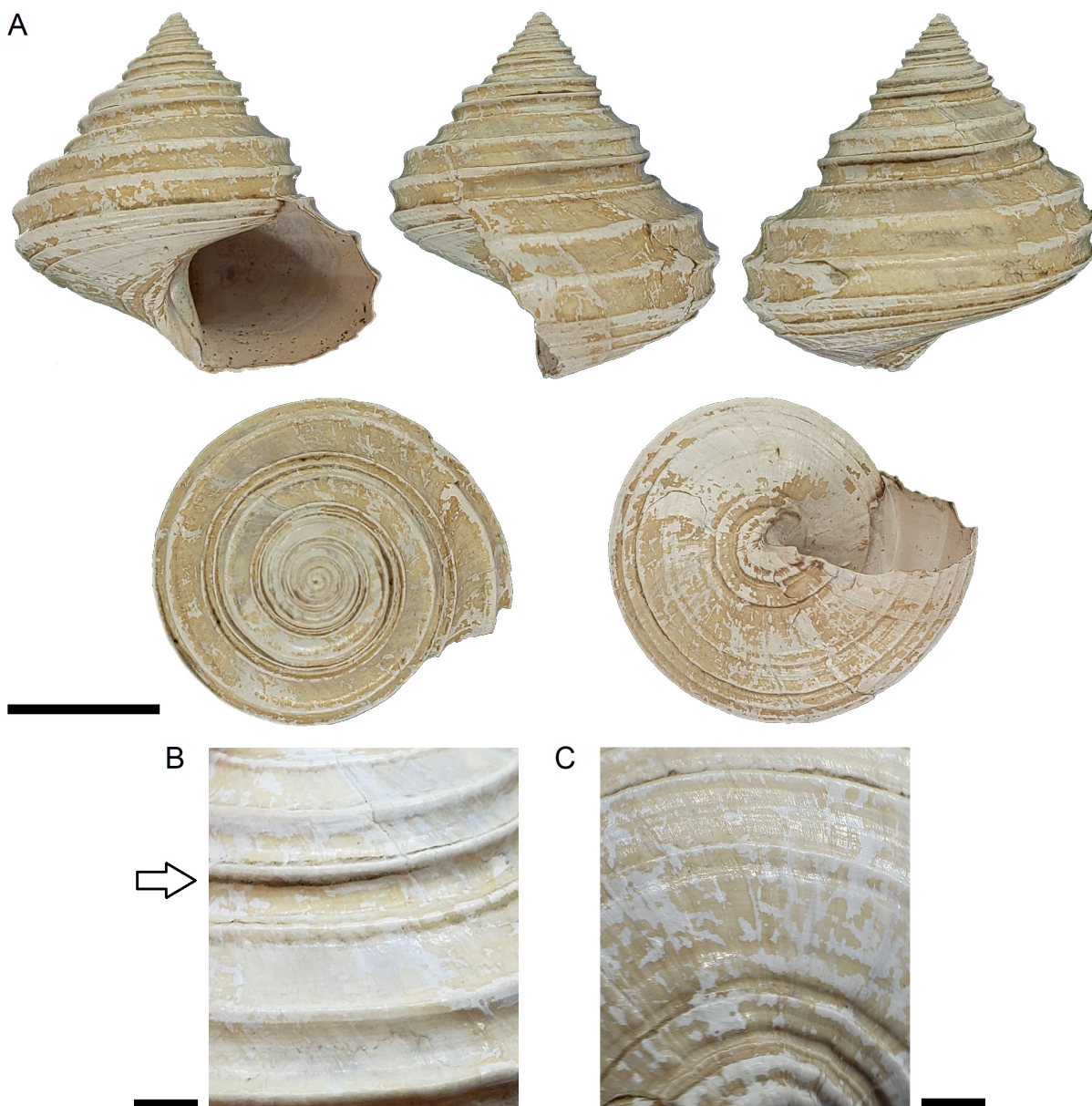


Figure 1. *Maurea delli* (McLean & Andrade, 1982), from off Caldera, northern Chile (JFA100F23). **A**, in apertural, lateral, abapertural, apical, and umbilical views. **B**, detail of sculpture on last (below the arrow) and preceding whorl (above the arrow). **C**, detail of sculpture on base. Scale bars: A = 10 mm; B, C = 5 mm.

ity regarding fishing grounds, geographic coordinates refer to the port of origin or landing where the specimens were obtained, which, in any case, are not far from the fishing site. Voucher specimens are deposited in the Museo Nacional de Historia Natural (MNHN), Santiago, Chile. Additional material is in the reference collections of the authors (JFA, RS). The terminology and measurements of shells follow Bouchet & Poppe (1995), McLean & Andrade (1982), and Araya (2013), while the systematics follow Kantor *et al.* (2022), and Marshall (2016).

RESULTS

Family Calliostomatidae Thiele, 1924

Genus *Maurea* W.R.B. Oliver, 1926

Type species. *Trochus tigris* Gmelin, 1791, by original designation.

Maurea delli (J.H. McLean & H. Andrade, 1982)

Figure 1A–C

Calliostoma (Otukaia) delli J.H. McLean & H. Andrade 1982: 7–8, figs 13–15—Vilvens 2001: 178, figs 5, 6.

Calliostoma delli—Andrade 1986: 44; Branch *et al.* 1991: 56; Véliz & Vásquez 2000: 765, fig 2E.

New record. CHILE, Región de Atacama, off Caldera (27° 04' S, 070° 50' W); c. 300 m depth; live collected in shrimp trawl nets; January 2006; leg. S. Castillo, 2011; JFA100F23, 1 specimen.

Geographic and bathymetric distribution. *Maurea delli* was previously known from the type locality, off Los Vilos (31° 56' S, 071° 54' W), south to Constitución (35° 20' S), central Chile (McLean & Andrade 1982; Véliz & Vásquez 2000), and from a single record outside of Chilean waters

from the subantarctic Marion Island (Prince Edward Islands) (Branch *et al.* 1991). Our specimen from off Caldera extends the distribution of *M. delli* north by 551 km (about four degrees of latitude). This species has been found at depths of 200–450 m (Véliz & Vásquez 2000).

Remarks. The three prominent keeled spiral cords and the rather large size distinguish this species from all the other calliostomatid species found in northern Chile.

Family Tudiclidae Cossmann, 1901

Genus *Aeneator* H.J. Finlay, 1926

Type species. *Verconella marshalli* Murdoch, 1924, by original designation.

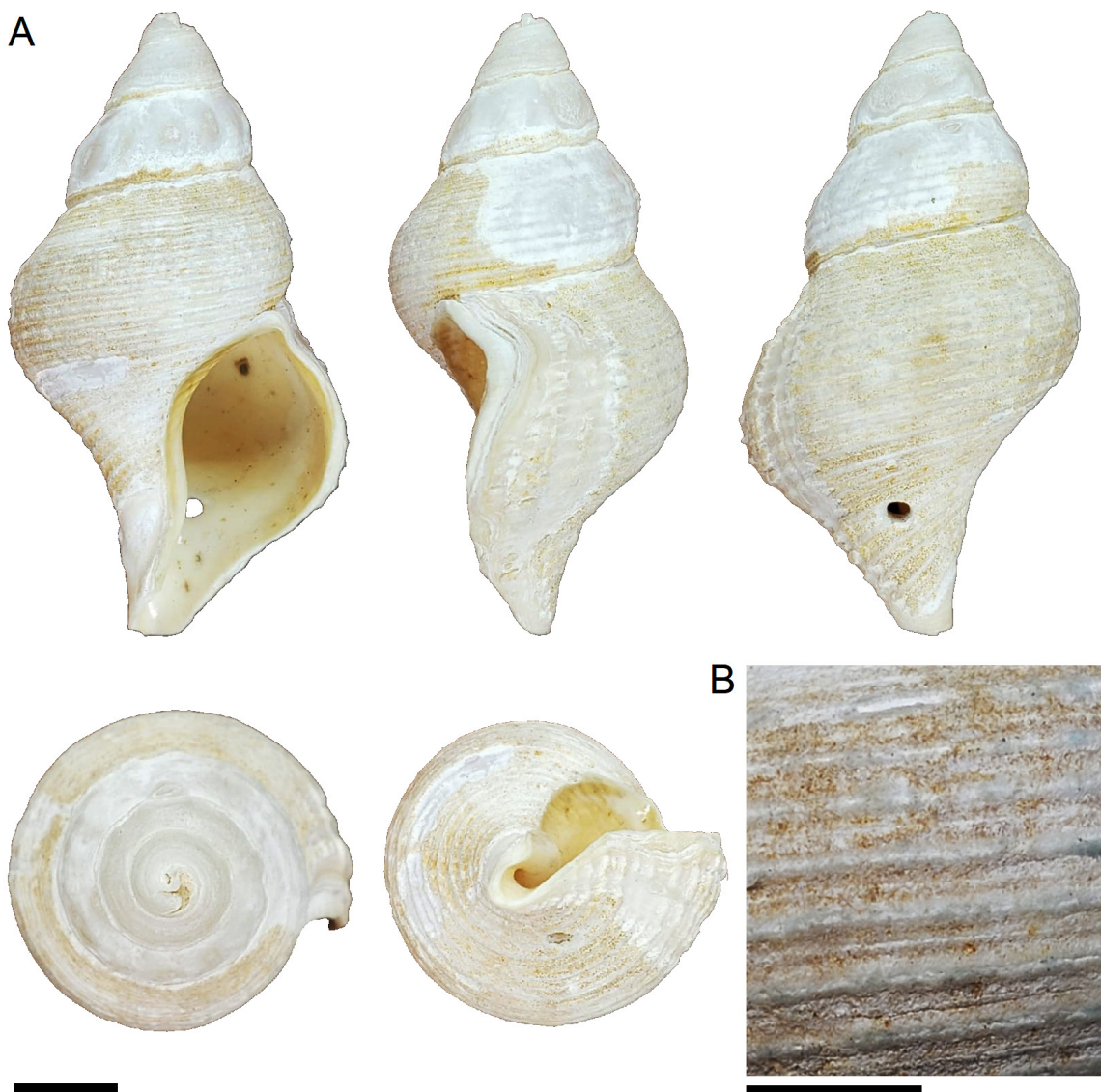


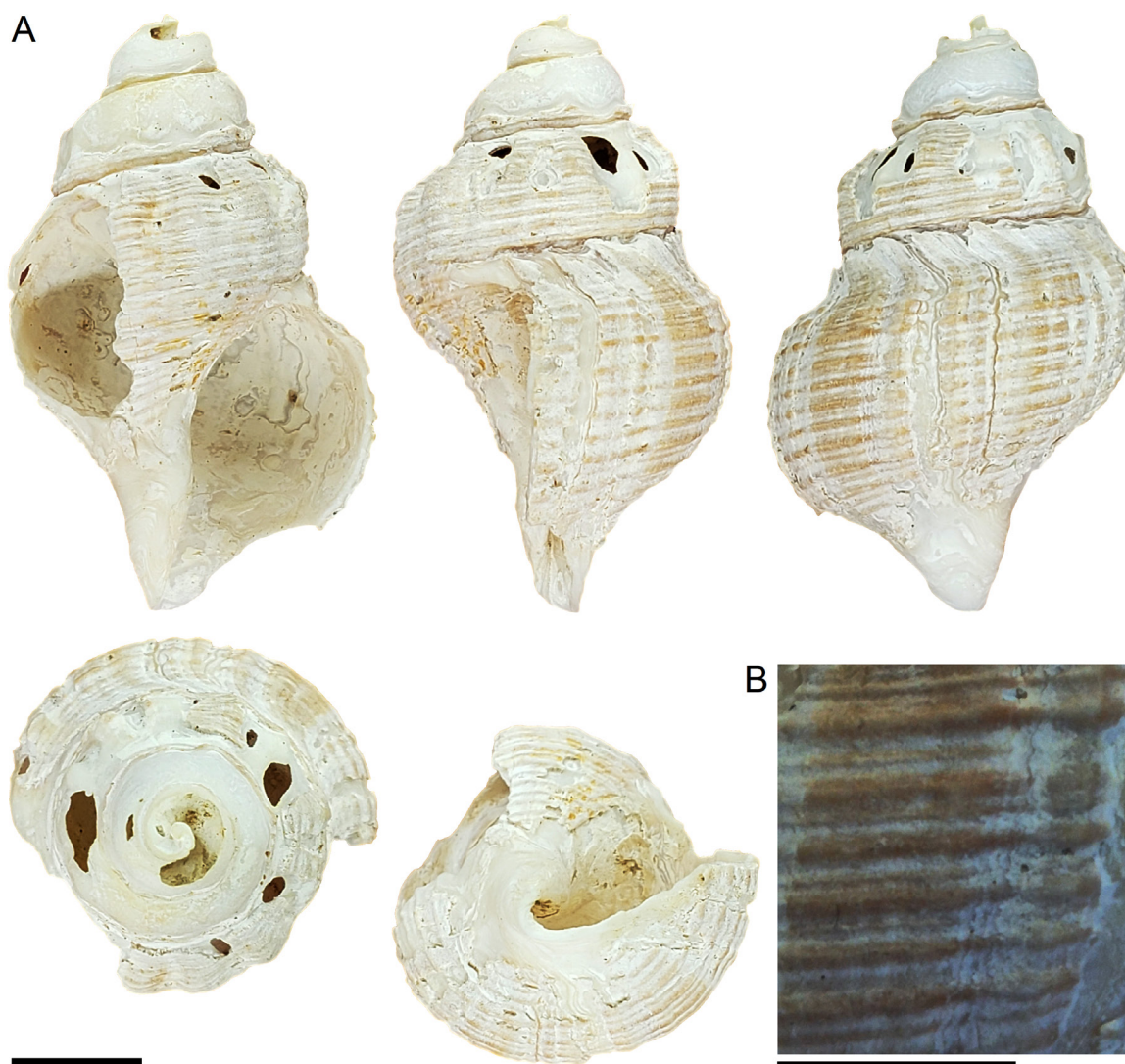
Figure 2. *Aeneator castillai* McLean & Andrade, 1982 from off Caldera, northern Chile (MNHNCNCL-MOL 205498). **A**, in apertural, lateral, abapertural, and umbilical views. **B**, detail of sculpture on dorsum of last whorl. Scale bars: A = 10 mm; B = 5 mm.

***Aeneator castillai* J.H. McLean & H. Andrade, 1982**

Figure 2A, B

Aeneator castillai J.H. McLean & H. Andrade 1982: 14–15, figs 45–50—Araya 2013: figs 15, 33, 34.**New record.** CHILE, Región de Atacama, off Caldera (27° 04' S, 070° 50' W), c. 300 m depth; live collected in shrimp trawl nets; January 2010; MNHNCL-MOL 205498, 1 specimen.**Geographical and bathymetric distribution.** This species was originally described from off Papudo (32° 31' S, 071° 54' W), central Chile, and is known north to Coquimbo (29° 55' S), northern Chile, and south to 33° 22' S in central Chile (McLean & Andrade 1982; Araya 2013). Our specimen represents the northernmost known occurrenceof *A. castillai*, extending the species' distribution by about 321 km. *Aeneator castillai* is known to occur at depths of 200–450 m (Araya 2013).**Remarks.** The shell of the examined specimen is the smallest reported for *A. castillai*, and it differs slightly from the specimens examined by Araya (2013) in having more numerous spiral ribs (20 vs 18), the absence of a marked peripheral keel, and a smaller, paler aperture.***Aeneator martae* Araya, 2013**

Figure 3A, B

Aeneator martae Araya 2013: 91, figs 1–14, 18.**New record.** CHILE; Región de Atacama, S off of Huasco (28° 36' S, 071° 20' W), c. 350 m depth; empty shell, in**Figure 3.** *Aeneator martae* Araya 2013 from south off Huasco, northern Chile (MNHNCL-MOL 205499). **A**, in apertural, lateral, abapertural, and umbilical views. **B**, detail of sculpture on dorsum of last whorl. Scale bar: A = 10 mm; B = 5 mm.

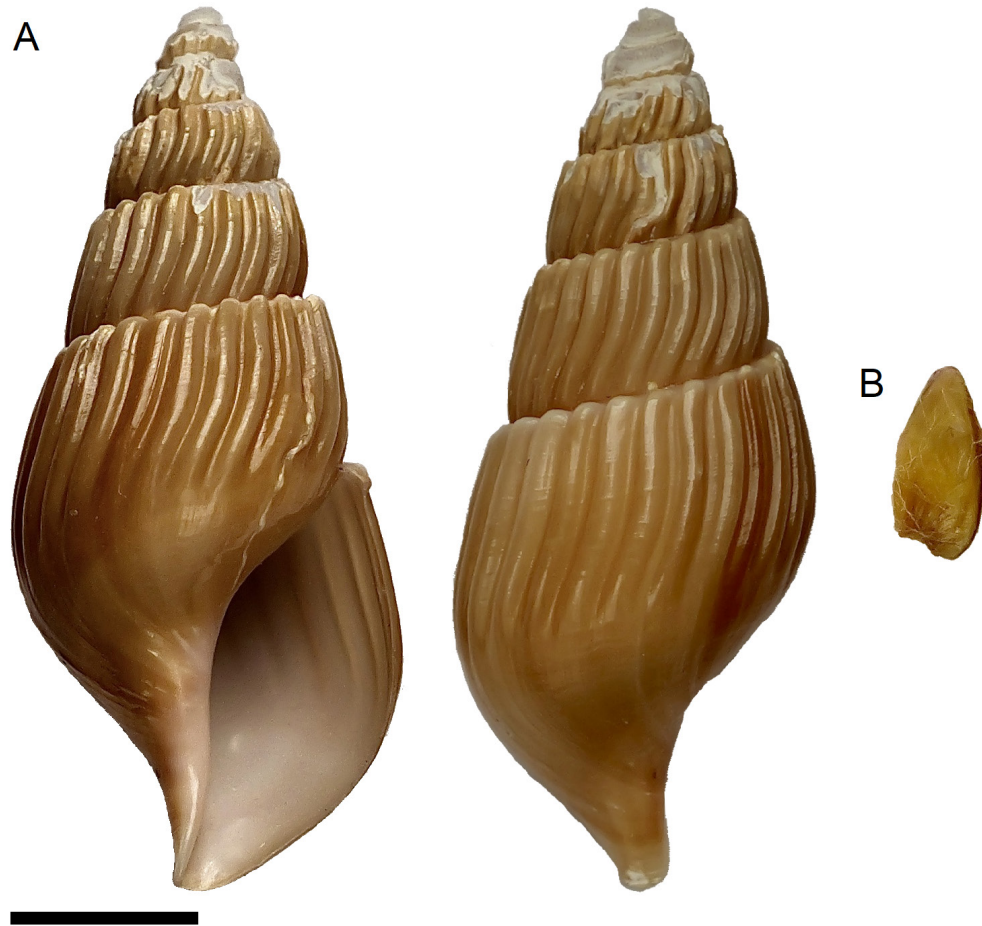


Figure 4. *Calliotectum vernicosum* (Dall, 1890) from off Arica, northern Chile (RS 112121c). **A**, in apertural and abapertural views. **B**, operculum, outer side. Scale bar = 10 mm.

shrimp trawl nets; January 2016; MNHNCL-MOL 205499, 1 specimen.

Geographical and bathymetric distribution. This species was originally described from off Caldera (27° 04' S, 070° 50' W) (Araya 2013). Our specimen is the first record of *A. martae* since its description and extends the distribution of the species to south of Huasco, c. 177 km (about one degree of latitude). This species was previously known from depths of 550–600 m (Araya 2013), but our specimen was collected much shallower, at a depth of 350 m.

Remarks. The examined shell, long dead and eroded, is in poor condition. However, it agrees with most of the diagnostic characteristics originally described for the species, such as the small size and the slightly angulate whorls with prominent axial ribs (Araya 2013). The presence of a subsutural ramp, which produces a somewhat keeled periphery, differentiates *A. martae* from all the other *Aeneator* species found in Chile.

Family Volutidae Rafinesque, 1815

Genus *Calliotectum* Dall, 1890

Type species. *Mangilia* (*Calliotectum*) *vernicosum* Dall, 1890, by original designation.

Calliotectum vernicosum (Dall, 1890)

Figure 4B

Mangilia (*Calliotectum*) *vernicosum* Dall 1890: 304–306, pl. V, fig 8.

Calliotectum vernicosum—Weaver & Dupont 1970: 175, fig 40, pls 75A, 75B—Bouchet & Poppe 1995: 519–520, figs 1, 2, 57–62.

New record. CHILE, Región de Arica y Parinacota, off Arica (18° 28' S, 070° 19' W), 1300 m depth, live collected in longlines; 2003; RS 112121c, 1 specimen.

Geographical and bathymetric distribution. This species was previously known from near the Galapagos Islands (00° 24' S, 089° 06' W), Ecuador, south to off Puerto Pizarro

(10° 45.8'S, 078° 36.4'W), Peru (Bouchet & Poppe 1995). Our new record is the first from Chilean waters and the southernmost known occurrence of *C. vernicosum*, extending this species' distribution by c. 1,200 km (about eight degrees of latitude). This species has been found at depths of 800–1485 m (Bouchet & Poppe 1995).

Remarks. Although the newly reported specimen is rather small for *C. vernicosum*, it has all the characters of the species and is also very similar to the small holotype (height 48 mm; Dall 1890). This species can be differentiated from the two other volutid species occurring in northern and central Chile, *Miomelon alarconi* Stuardo & Villarroel, 1974, and *Miomelon philippianum* (Dall, 1890), by its smaller shell with a very distinctly channelled, impressed suture, strong sculpture of opisthocline axial plaits on the upper part of the whorls, and the presence of an operculum.

DISCUSSION

Given the sparse documentation of bathyal ecosystems of Chile, new geographic records of four species of deepwater gastropod from off the north coast of the country is unsurprising. It is probable that these species have larger geographic or bathymetric ranges than known, especially since deepwater species, in general, are often broadly distributed. For example, *Cornisepta guzmani* Araya & Geiger, 2013 and *Lepidozona balaenophila* Schwabe & Sellanes, 2006, described both from deepwater at central Chile, have been found north to Colombia and western Mexico, respectively (Suárez-Mozo and Hendrickx 2016; Gracia & Suárez-Mozo 2026). Alternatively, the four species examined in this work may be naturally rare, at low densities or sporadically distributed. For example, *M. delli* is notably rare, as Véliz & Vásquez (2000) had available only a single specimen for examination in their study of northern Chilean trochids. *Aeneator castillai* and *C. vernicosum* show a similar pattern, having been documented only as uncommon bycatch or from just a few specimens (McLean & Andrade, 1982; Bouchet & Poppe 1995). Considering that *Calliotectum* is a tropical–subtropical genus, additional warm-water genera may yet be discovered in the bathyal waters of northern Chile or its oceanic islands. Recent surveys in the Juan Fernández and Desventuradas archipelagos support this possibility, as new records there have recently doubled the number of molluscan species from these islands (Zelaya *et al.* 2024).

Although shallow-water marine ecosystems are much more threatened than those of the deep sea, bottom trawling and pollution are genuine threats to deepwater ecosystems, and deep-sea mining is an emerging threat (Sigwart *et al.*

2017). Off the coast of northern Chile, bottom trawling by shrimp and prawn fisheries is an ongoing threat (Queirolo *et al.* 2011). With this in mind, and the sparsity of information about the deep sea, the identification and documentation of the deepwater fauna is essential for establishing a baseline of biodiversity knowledge, and to assess the potential effects of anthropogenic threats. We note that there is a clear preservation bias in the bycatch of deep-water fisheries towards shelled molluscs; there are no records, for example, of nudibranchs or seaslugs in this bycatch.

Our study highlights the need to survey material in collections, including private ones, and the need for salvaging and preserving bycatch fauna which potentially may contain important new records or new species. The present work also contributes to inventory of the Chilean malacological fauna by the addition of one species.

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