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Report of ten years of Mollusca collection in Icelandic waters by the Marine and Freshwater Research Institute

Christiane Delongueville, Steinunn H. Ólafsdóttir, Roland Scaillet

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Report of ten years of Mollusca collection in Icelandic waters by the Marine and Freshwater Research Institute

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HAFRANNSÓKNASTOFNUN
Rannsókna- og ráðgjafarstofnun hafs og vatna
MARINE & FRESHWATER RESEARCH INSTITUTE

To*: Jónbjörn Pálsson, Fisheries scientist at the Marine and Freshwater Research Institute of Iceland, without whom all this would not have been possible.*

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Unnið fyrir

Hafrannsóknastofnun - Marine and Freshwater Research Institute &
Royal Belgian Institute of Natural Sciences, Brussels, Belgium

Ágrip

Á 10 ára tímabili (október 2013 – mars 2022) var einökum af lindýrum safnað af fiski- og botndýrafræðingum Hafrannsóknastofnunar úr meðafla við togveiðar við mat á fiskistofnum við Ísland. Söfnun fór fyrst og fremst fram við rannsóknir á djúpslóð í haustralli, sem og á grynnri miðum norðvestur af Íslandi í vorralli. Einnig var safnað úr nokkrum leiðöngrum við stofnmat humars (*Nephrops norvegicus*) í maí og úr flatfiskaralli í ágúst. Stærð möskva trollanna leyfði aðallega söfnun stærri eintaka. Minni lindýr (< 10 mm) söfnuðust í maga og þörmum fangaðra fiska, aðallega ýsu (*Melanogrammus aeglefinus*) og skrápflúru (*Hippoglossoides platessoides*). Skoðuð voru steinar, skeljarusl, draugaveiðinet, svampar, kórallar, þang og þarafestur sem komu í netin til að kanna hvort þar leyndust lindýr. Í öllum tilfellum er greint frá ástandi lindýranna, hvort þau voru lifandi eða dauð (tóm skel).

Abstract

Over a period of 10 years (October 2013 – March 2022) sampling effort was operated by the Fisheries and Benthic scientists of the Marine and Freshwater Research Institute (MFRI) to keep molluscs specimens collected as by-catch when trawling during fish stock assessment around Iceland.

*These trawls were primarily made during deep-sea surveys (autumn campaign), as well as on shallower fishing grounds north-west of Iceland (March campaign). Some campaigns in May for stock evaluation of lobster (*Nephrops norvegicus*) and in August for flat fish surveys also contributed with samples.*

*The size of the mesh of the trawls allowed mainly collection of macro-molluscs. Smaller molluscs (< 10 mm) were collected in the stomach and gut of captured fish, mainly haddock (*Melanogrammus aeglefinus*) and long rough dab (*Hippoglossoides platessoides*). By-catches from different origins (stones, shell debris, ghost fishing nets, sponges, corals, seaweeds, kelp holdfast, sweep ups) were photographed and analysed to isolate eventual hidden molluscs. The state of the sampled molluscs, alive or dead (empty shells), is reported in all cases.*

Lykilorð

Mollusca, Bivalvia, Gastropoda, Scaphopoda, Polyplacophora, Cephalopoda, by-catch, distribution

Undirskrift verkefnisstjóra

Steinunn H. Ólafsdóttir

Undirskrift sviðsstjóra

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ABSTRACT

Over a period of 10 years (October 2013 – March 2022) sampling effort was operated by the Fisheries and Benthic scientists of the Marine and Freshwater Research Institute (MFRI) to keep molluscs specimens collected as by-catch when trawling during fish stock assessment around Iceland.

These trawls were primarily made during deep-sea surveys (autumn campaign), as well as on shallower fishing grounds north-west of Iceland (March campaign). Some campaigns in May for stock evaluation of lobster (*Nephrops norvegicus*) and in August for flat fish surveys also contributed with samples.

The size of the mesh of the trawls allowed mainly collection of macro-molluscs. Smaller molluscs (< 10 mm) were collected in the stomach and gut of captured fish, mainly haddock (*Melanogrammus aeglefinus*) and long rough dab (*Hippoglossoides platessoides*). By-catches from different origins (stones, shell debris, ghost fishing nets, sponges, corals, seaweeds, kelp holdfast, sweep ups) were photographed and analysed to isolate eventual hidden molluscs. The state of the sampled molluscs, alive or dead (empty shells), is reported in all cases.

This Mollusca survey led to various information:

- Mapping of the range of molluscs in the areas covered by the MFRI in Icelandic waters with commentaries on specific species. 202 species (107 Gastropoda, 82 Bivalvia, 7 Polyplacophora, 4 Scaphopoda and 2 Cephalopoda) were found during 25 campaigns and reported on distribution maps.

- Production of pictures and explanations to help benthic biologists to determine the identity of molluscs they may encounter in their studies and field trips. Thematic posters included at the end of this work can be used by anyone interested in sea life around Iceland.

- Genetic samples of Icelandic Buccinoidea were incorporated in a large integrative study concerning the phylogeny of this superfamily. They allowed Kantor *et al*. (2022) to create, among other things, a new family of Buccinoidea by raising the sub-family Colinae to the level of family: Colidae.

- Several specimens of *Anomalisipho* facilitated an in-depth study of this genus and allowed the identification of criteria to differentiate *A. verkruezeni* from *A. virgatus* in the North-East Atlantic.

- Different interpretations concerning the determination of some molluscs such as *Hanleya nagelfar*, *Colus glaber* or *Modiolus laevigatus* are questioned and argued.

- Several species new for the Icelandic fauna, such as *Calliostoma caroli*, *Halicardia flexuosa*, *Xyloredo ingolfia* (today *X. nooi*), and *Idas cylindricus,* were reported in different publications.

- Information on the biology of *Choristella leptalea* and the feeding habits of *Scaphander lignarius* were also the subject of publications.

Abbreviations

BIOICE: Benthic Invertebrates of Icelandic waters
IINH: Icelandic Institute of Natural History, Garðabær, Iceland
MFRI: Marine and Freshwater Research Institute, Hafnarfjörður, Iceland
MNHN : Muséum national d'Histoire naturelle, Paris, France
MOM : Musée Océanographique de Monaco, Monaco
NHMD: Natural History Museum of Denmark, Copenhagen, Denmark
NHMK: Natural History Museum of Kópavogur, Iceland
NHMW: Natural History Museum Wales, United Kingdom
SMNH: Swedish Museum of Natural History, Stockholm, Sweden
UMB: University Museum Bergen, Norway

Other abbreviations

LRD: long rough dab
Lv: left valve
St: collection station
Rv: right valve
R/V: research vessel

INTRODUCTION

In June 2010, a Belgian mollusc specialist and an Icelandic fisheries scientist at the Marine Research Institute (MRI; currently Marine and Freshwater Research Institute, MFRI) met by coincidence during Fisherman's Day in Iceland. This meeting led to a collaboration with the fisheries scientist having access to surveys and material, and the malacologist having the know-how to identify marine molluscs. Together they initiated the most extensive sampling and registration of Mollusca around Iceland since the Benthic Invertebrates in Icelandic waters (BIOICE) project (1991–2004). Later, other fisheries scientists contributed to the project by continuing to collect Mollusca during the different surveys over a total period of 10 years. The Belgian biologists for their part continued to identify the specimens collected and sent annual reports to the MFRI.

In addition to the publications on Zoology of Iceland by Thorson (1941) and Madsen (1949), Ingimar Óskarsson (1892–1981), a botanist and shell expert, published a book on Icelandic Bivalvia in 1952 and on Gastropoda in 1962. These books were eventually all published together in a single volume with additions (Óskarsson, 1982). More recent revisions have been published in scientific journals on specific groups within Mollusca based on the BIOICE material sampled around Iceland between 1991 and 2004. These revisions are based on samples taken from shallow- to deep-water within the Icelandic EEZ (Exclusive Economic Zone).

A first publication concerning six MFRI research surveys (2013–2015) was published in 2021 reporting on a total of 95 Mollusca species.

Today, a new report presents the results of the sampling from autumn 2013 to spring 2022 where a total of 202 species of five Mollusca classes (Bivalvia, Gastropoda, Scaphopoda, Polyplacophora and Cephalopoda) have been collected and identified.

MATERIAL AND METHODS

Collection and identification of the material

Molluscs were collected by several fisheries and benthic scientists, when on board, during twenty-five surveys conducted by the Marine and Freshwater Research Institute in 2013–2022.

The samples were taken as by-catch during bottom trawling for fish and lobster. The stomach and gut contents from various fish species [mainly *Hippoglossoides platessoides* (O. Fabricius, 1780) (long rough dab - LRB) and *Melanogrammus aeglefinus* (Linnaeus, 1758) (haddock)] were investigated and molluscs therein were collected. In addition, remains of crushed shells, sponges, and other benthic material in the trawl ("sweep ups") were examined for molluscs. As this collection of molluscs was outside the general data collection conducted in the surveys, mollusc material was only collected when fisheries scientists had the opportunity to do so. Therefore, the ranges reported for each species are merely indicative and give only a partial idea of their total distribution.

The molluscs were placed in plastic bags and frozen on board the vessel. Most of the samples were prepared in Iceland and then transferred to Belgium for identification of specimens.

Later, the specimens were identified to species level or to the lowest taxonomic level possible by Christiane Delongueville and Roland Scaillet. To facilitate identification of the species, a table (Appendix 1) was made to put in concordance the currently accepted scientific names of the molluscs with the corresponding names in Óskarsson's publication (1982), the only existing comprehensive reference for Icelandic molluscs (Bivalvia and Gastropoda). Despite some modifications in the present nomenclature, old references such as Friele (1882) and Sars (1878) are most valuable for the determination of most of the common species present in Icelandic waters, thanks to their very precise iconographies. Finally, the species list was unified with the World Register of Marine Species (WoRMS 2023) to confirm the updated list of accepted species names. Some of the names are different to what is considered as valid in WoRMS, in each case an explanation is given to justify the names used. All molluscs were alive when sampled except when otherwise indicated. When the specimens were completely broken, they were nevertheless identified (when possible) and reported.

The maps with the collected molluscs are presented in Appendix 3.

A type specimen for each species of mollusc was photographed and put on thematic posters (Appendix 2) and the precise coordinates of the molluscs illustrated in this article can be found in Appendix 4.

When mention is made in the text of haddock or LRB, it means material found in their digestive tracts.

Research surveys (Maps p. 126–127)

Twenty-five stations where molluscs were collected are reported.

The annual autumn groundfish stock assessments in deep-water around Iceland were made on the R/V Árni Friðriksson (Fig. 1). Samples were collected from 200 to 1500 m depth: A10-2013, A10-2015, A11-2016, A13-2017, A12-2018, A11-2020, and A15-2021. A commercial trawler was hired for the TL2-2014, TG1-2019, and TB2-2021 deep-sea campaigns.

The annual spring groundfish stock assessment surveys were made on the R/V Árni Friðriksson. Samples were collected in the western part of Iceland from 50 to 500 m depth: A3-2014, A2-2015, A3-2016, A5-2017, A4-2018, A3-2020, A5-2021, and A3-2022. A commercial trawler was hired for the TG1-2021 cruise.

Annual lobster [*Nephrops norvegicus* (Linnaeus, 1758)] surveys were made on the R/V Dröfn off south and southwest Iceland. Samples were collected from 110 to 280 m depth: D4-2014, D2-2015, and D1-2016.

The flat fish surveys all around Iceland were done in the summer between 7 and 220 m depth on the R/V Bjarni Sæmundsson (Fig.1): B12-2017, B11-2018, and B9-2019.

Figure 1. From the left to the center : R/V Bjarni Sæmundsson - R/V Árni Friðriksson

****

RESULTS

Chapter I. Gastropoda

Among the Gastropoda caught by the MFRI nets, the dominant group in number of species and number of specimens is by far that of the superfamily Buccinoidea.

Buccinoidea, a superfamily recently revised (Figs 2–4B)

In 2018, soft tissue samples were taken by the authors for DNA analysis on specimens of Buccinidae Rafinesque, 1815 from Iceland collected by the MFRI (or species considered to belong to that family at that time) to add them to those already gathered by the MNHN, other institutions and private sources to conduct a large molecular integrative phylogeny study covering for the first time the Buccinoidea superfamily in its entirety (Kantor *et al*., 2022: 790). A new phylogenetic classification was consequently proposed, including 20 taxa of family rank and 23 of subfamily rank. Several taxa previously considered as subfamilies were raised to families. For example, the Colinae Gray, 1857 (including the genera *Colus* Röding, 1798 and *Turrisipho* Dautzenberg & H. Fischer, 1912) became Colidae Gray, 1857 and this due to the large sampling from Iceland made by the authors (7 species sequenced).

Uncertainty remains concerning the placement of the genera, *Troschelia* Mörch, 1876, *Liomesus* W. Stimpson, 1865, *Anomalisipho* Dautzenberg & H. Fischer, 1912 and *Mohnia dalli* (Friele, 1881) in the larger Buccinoidea phylogeny.

- Due to a lack of material, Kantor *et al*. (2022: 824) could not include *Troschelia berniciensis* (W. King, 1846) in their molecular analysis. This is why a soft tissue sample for DNA analysis was taken by the author in 2021 (St A15-2021-460, 719–697 m) and sent to the MNHN in the hope of confirming whether it belongs to the family Buccinidae or not (Fig. 2: St A11-2016-532, 880–933 m, 39.8 mm) (Map p. 109)

- For *Liomesus ovum* (W. Turton, 1825), soft tissue material is eagerly awaited by the MNHN to

Figure 2.

Figure 3.

Figure 4A

Figure 4B

- confirm or reject its placement in the Buccinidae family (Fig. 3: St A3-2014-23, 375–405 m, 35.5 mm) (Map p. 106).

- In the multigene analysis (Kantor *et al*. 2022: 824), the type species of *Anomalisipho*, *Anomalisipho verkruezeni* (Kobelt, 1876) from St A4-2018-76 was sequenced and ends up isolated in the phylogenetic tree, forming a long branch sister to *Buccinum* Linnaeus, 1758 albeit without support. The operculum, with terminal nucleus, differs from the operculum of Buccininae (subcentral nucleus) and speaks against including *Anomalisipho* in that subfamily, which among other things refrained also Kantor *et al*. (2022: 824) to allocate *Anomalisipho* to any subfamily without additional data (Fig. 4A: St A4-2018-76, 246–246 m, 61.5 mm) (Map p. 106).

- In the multigene analysis (Kantor *et al*., 2022: 814), *Turrisipho dalli* (Friele, 1881) was tentatively transferred to *Mohnia*. It appears in the phylogenetic tree in the Buccinidae family (subfamily Siphonaliinae) (Kantor *et al.*, 2022: 797). This position is further based on an overall shell similarity, paucispiral operculum and a similar protoconch morphology. Very few specimens of *Mohnia dalli* were found (only four empty shells) (Fig. 4B: St A5-2017-44, 240–212 m, 25.1 mm) (Map p. 110).

No change occurred during the 2022 revision within the families Columbellidae and Nassariidae which also belong to the superfamily Buccinoidea. Their representatives in Iceland will be illustrated later in the chapter “shallow-water Gastropoda” (Fig. 35 R–S).

Buccinidae (Table 1) (Maps p. 106–110)

Table 1. Buccinidae caught 2013–2022

Family Buccinidae	Subfamily Buccininae	*Buccinum*	*finmarkianum*	Verkrüzen, 1875
		Buccinum	*fragile*	Verkrüzen, 1878
		Buccinum	*hydrophanum*	Hancock, 1846
		Buccinum	*kjennerudae*	Bouchet & Warén, 1985
		Buccinum	*nivale*	Friele, 1882
		Buccinum	*alicei*	Dautzenberg & H. Fischer, 1912
		Buccinum	*tumidulum*	G.O. Sars, 1878
		Buccinum	*undatum*	Linnaeus, 1758
	Subfamily Beringiinae	*Beringius*	*turtoni*	(W. Bean, 1834)
		Beringius	*bogasoni*	Warén & S.M. Smith, 2006
	Subfamily Siphonaliinae	*Mohnia*	*dalli*	(Friele, 1881)
	Subfamily Neptuneinae	*Neptunea*	*despecta*	(Linnaeus, 1758)
	Subfamily Volutopsiinae	*Volutopsius*	*norwegicus*	(Gmelin, 1791)
		Volutopsius	*scotiae*	Fraussen, McKay & Drewery, 2013
	Subfamily Liomesinae	*Liomesus*	*ovum*	(W. Turton, 1825)
	Subfamily [Unassigned] Buccinidae	*Anomalisipho*	*verkruezeni*	(Kobelt, 1876)
		Anomalisipho	*virgatus*	(Friele, 1879)
		Troschelia	*berniciensis*	(W. King, 1846)

Over the 10 years covered by this report, 18 species of Buccinidae ended up in the nets of the MFRI research vessels (Table 1).

Warén (1993: 188) rightly and wisely asserts that "*the genus* Buccinum *is infamous for the taxonomical difficulties involved with most species, especially in northern areas as Iceland, north of the Faroes and north of about 68°N in Norway.*" This statement is verified once again by the difficulties we encountered in determining certain specimens such as those of the *Buccinum nivale*/*Buccinum alicei* complex (see discussion below) and some others still called *Buccinum* sp.

Among the members of the family, certain species have only been collected in a very small number of specimens, less than 10 (*B. fragile* Verkrüzen, 1878, *B. kjennerudae* Bouchet & Warén, 1985) and often even less than 5 (*B. tumidulum* G.O. Sars, 1878, *B. alicei* Dauzenberg & Fischer, 1912), which attests to their rarity but also to the fragility of their shells (except for *B. kjennerudae*). The trawl is often a destructive tool for the most fragile species, often depriving the animal of a large part of its shell and depriving also quite frequently the shell of its protoconch, which makes determinations very difficult and sometimes even impossible.

Buccinum alicei (Fig. 5 A–E) (Map p. 107)

Concerning the synonymy of *Buccinum alicei* Dautzenberg & H. Fischer, 1912 with *Buccinum nivale* Friele, 1882 (WoRMS) we remain challenged by the description of Dautzenberg and H. Fischer (1912: 136) who speak of a relatively large empty shell (type 63 mm) bearing a shiny and bristly epidermis (*epidermide setoso lutescente*) (Fig. 5 A), while Friele (1882: 32) speaks of a small shell (type 11 mm) for *B. nivale* [a young specimen as specified by Warén (1993: 192)] bearing a smooth periostracum

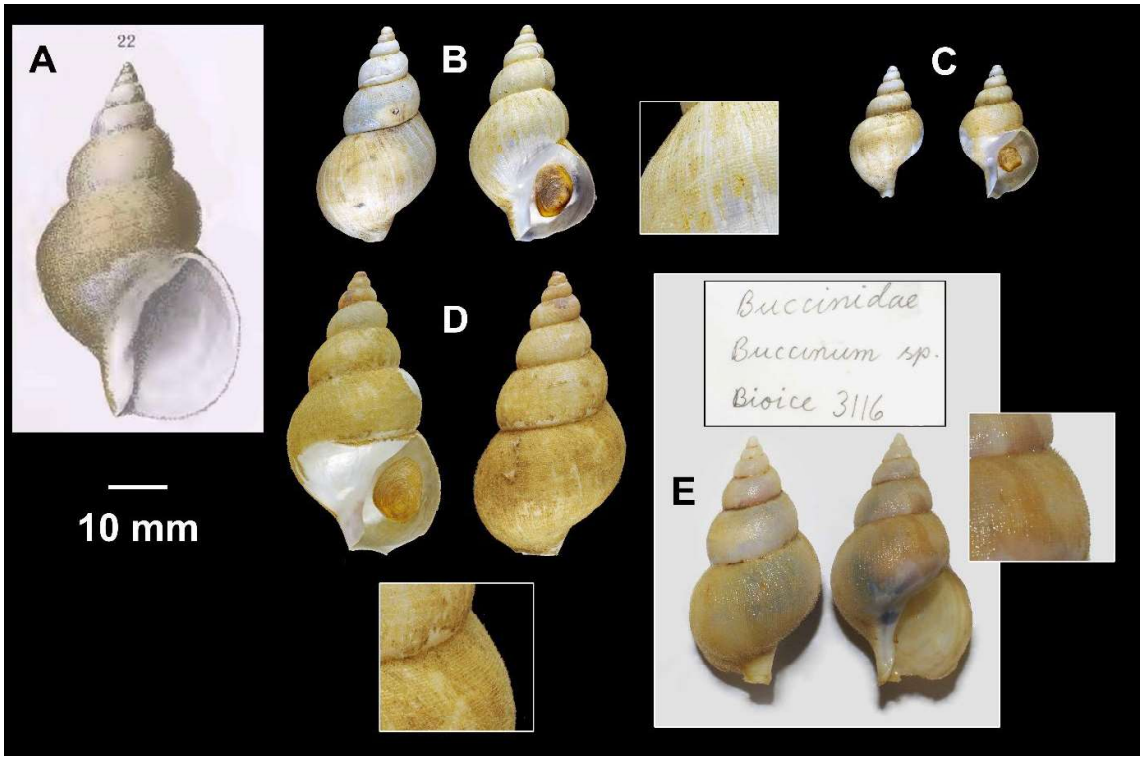

Figure 5. A–E. *Buccinum alicei*. A. Original figure in Dautzenberg & H. Fischer, 1912, north of Spitzberg, 430 m, 63.0 mm. B–C. St A3-2014-67, 344–374 m. B. 36.9 mm. C. 23.4 mm. D. St TB2-2021-86, 430–443 m, 51.3 mm. E. *Buccinum* sp. BIOICE 3116, set 67°42,42'N-19°46,70'W, hauled 67°42,23'N-19°48,81'W, 622–598 m, 45.0 mm, IINH

(*epidermide laevi*) and having an oval operculum with nucleus in lower extremity position (Fig. 6 A). In the BIOICE collection, we examined one specimen labeled *Buccinum* sp. (Fig. 5 E) which we consider identical to the one illustrated by Dautzenberg & H. Fischer (Fig. 5 A). It would be worth considering a deeper revision of this topic. In the meantime, we maintained *B. alicei* for the specimens with a bristly periostracum (Fig. 5 B–E) and more particularly for those of large size (> 35.0 mm).

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Buccinum nivale (Fig. 6 A–B, Fig. 7 A–E) (Map p. 107) **and *Buccinum* sp.** (Fig. 6 C)

In our previous reports, *Buccinum nivale* was tentatively attributed to 3 small buccinid specimens. In 2022, we saw a specimen of *B. nivale* from east Iceland in the BIOICE collection (Fig. 6 B) showing all the characteristics of the species stated by Warén (1993: 191), highly fragile shell of small size, almost smooth with rapidity enlarging whorls, covered by a fine spiral striation. This leads us to reconsider our opinion regarding one previously determined shell (Fig. 6 C) in Delongueville *et al*. (2021: 10). Although small (but not enough), white, fragile, smooth, finely striated, its proportions do not correspond to those of the BIOICE specimen nor to that of the definition of the species. We prefer reconsidering it as indeterminate.

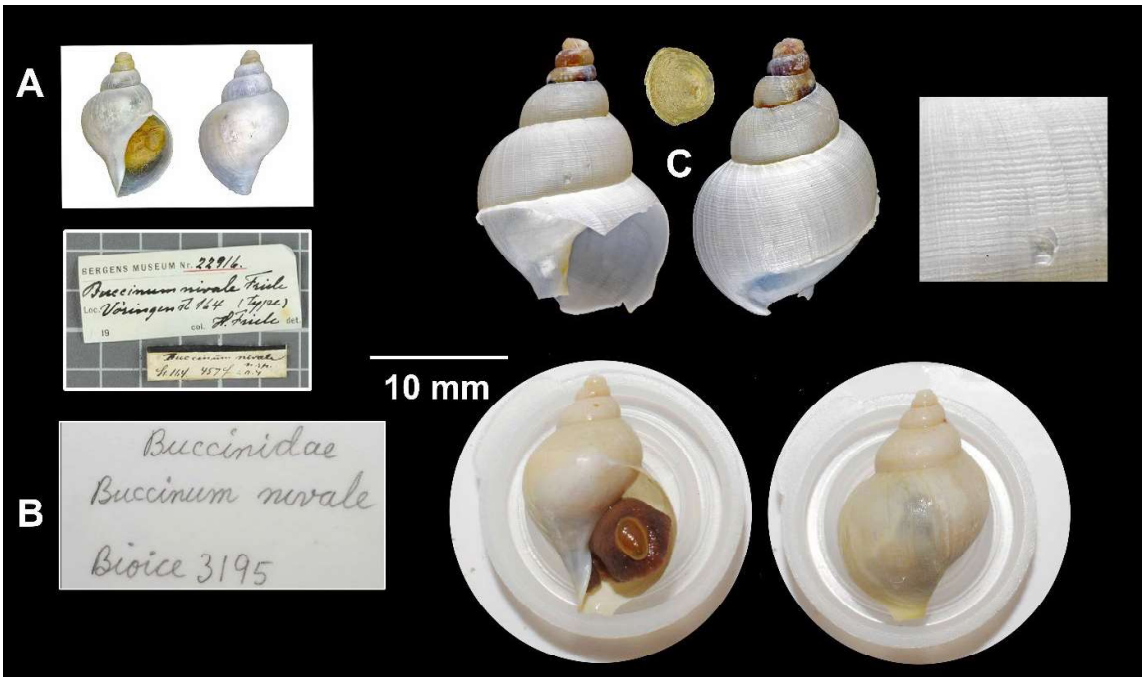

Figure 6. A–B. *Buccinum nivale*. A. Original figure and labels in Friele, 1882, shell 11.0 mm. UMB 22916. B. BIOICE 3195, set 65°39,50'N-9°6,60'W, hauled 65°38,97'N-9°6,78'W, 818–818 m, 18.0 mm. Scale bar, 10 mm, IINH. C. *Buccinum* sp. St A13-2017-617, 301–349 m, 20.5 mm.

Among the two other specimens, one shell (Fig. 7 C–E) showed similarities to the BIOICE specimen (Fig. 7A) and to the specimen in the K. Fraussen collection (Fig. 7 B) in terms of small size, the snow white colour of the test, and the microsculpture (Fig. 7 E). When the animal is inside the shell, the colour is ivory (Thorson, 1944: 104). The shape of its columella was identical, the foot of the animal presented trends towards black color, and the operculum was oval (too much) with a completely eccentric nucleus (excluding thus a form of *B. hydrophanum*). Despite some recorded differences (the width of the operculum, and the somewhat greater slenderness of the shell), we are keeping the name *B. nivale* while waiting for other specimens whose examination would validate or invalidate the diagnosis.

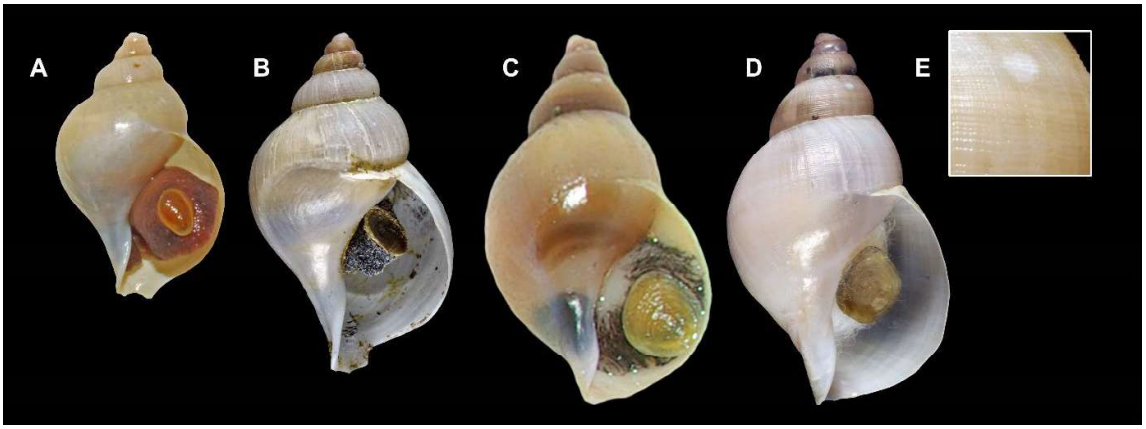

Figure 7. A–E. *Buccinum nivale*. A. BIOICE 3195, 18.0 mm. B. Shetland (60°05'N-05°57'W, 1120 m, 23.1 mm – collection Koen Fraussen KF-7807). C–E. St A10-2013-610, 346–376 m, 25.2 mm. C. Shell just defrosted. D. Same shell, cleaned. E. Detail of its microsculpture.

Buccinum tumidulum (Fig. 8 A–C) (Map p. 107)

Examination of the type material of G.O. Sars by Warén (1989: 18) showed that *Buccinum tumidulum* G.O. Sars, 1878 was the same species that Thorson (1941: 93) identified as *B. totteni*, and that Óskarsson (1982: 263) reported from north of Þistilfjörður. The two MFRI specimens were collected in the same area (NE Iceland). The true *B. totteni* is a NE American species and does not live in Iceland.

Buccinum fragile (Fig. 8 D–F) (Map p. 108)

As its name suggests, *B. fragile* Verkrüzen, 1878 has a relatively thin shell. Only 6 specimens were collected, 2 in the northeast (362-395 m) and 4 in the northwest (325-672 m) of Iceland.

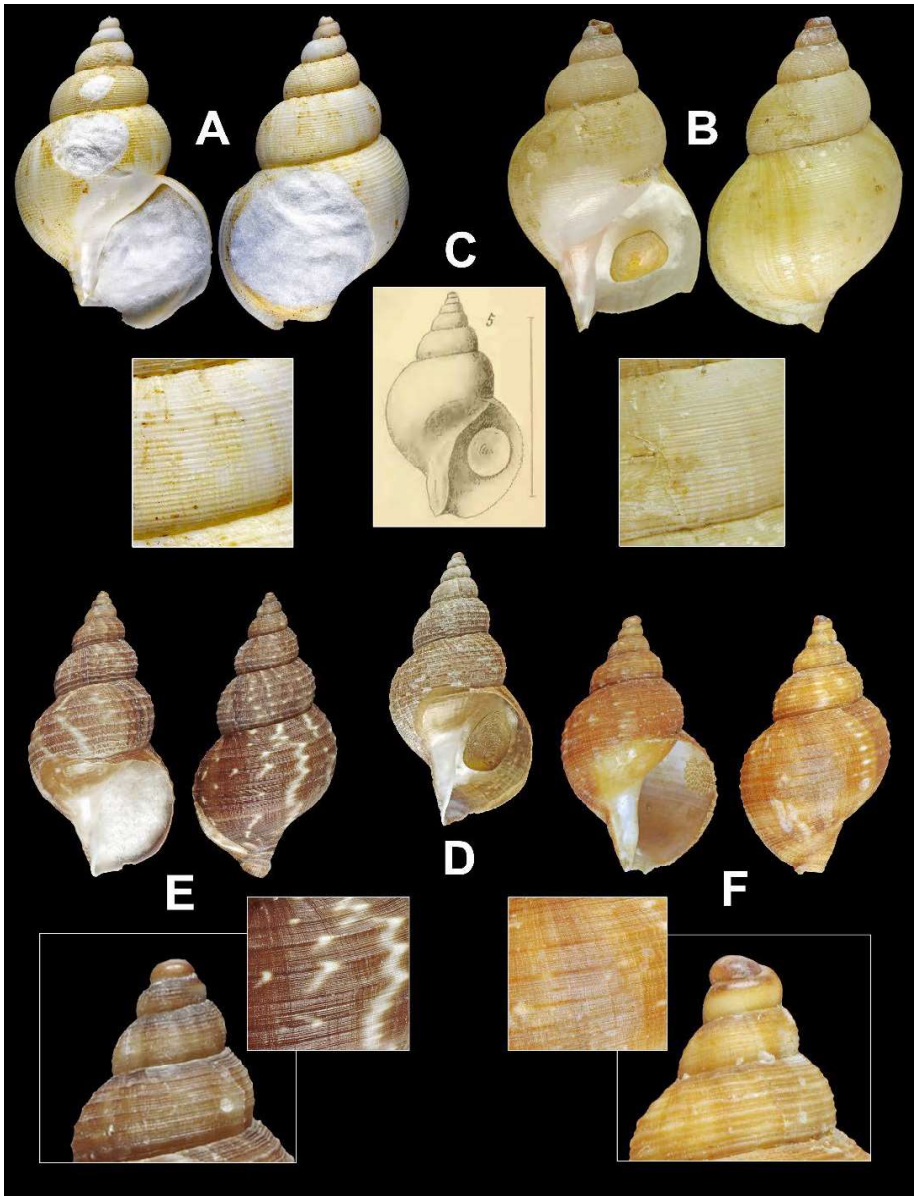

Figure 8. A–C. *Buccinum tumidulum*. A. St A11-2016-641, 313–304 m, 42.7 mm. B. St A11-2020-654, 523–450 m, 36.7 mm. C. Original figure in G.O. Sars, 1878 (Tab 25, fig. 5). D–F. *Buccinum fragile*. D. St A11-2016-632, 362–395m, 41.8 mm. E. St A11-2016-554, 325–295 m, 53.9 mm. F. St A13-2017-509, 483–483 m, 17.2 mm.

Buccinum finmarkianum (Fig. 9 A–D) **and** ***Buccinum hydrophanum*** (Fig. 9 E–F) (Map p. 108)

Buccinum finmarkianum Verkrüzen, 1875 was caught between 75 and 1175 m (n = 385). More than 90% of the shells were found between 150 and 600 m. The species also shows a large variation in shape and colour. *Buccinum hydrophanum* Hancock, 1846 was caught between 234 and 1005 m (n = 450). More than 90% of the shells were found between 350 and 900 m. The species is less polymorphic than the preceding one and has a round operculum with a central nucleus. Both species are common in North and North-West Iceland and on the Faroe-Iceland ridge.

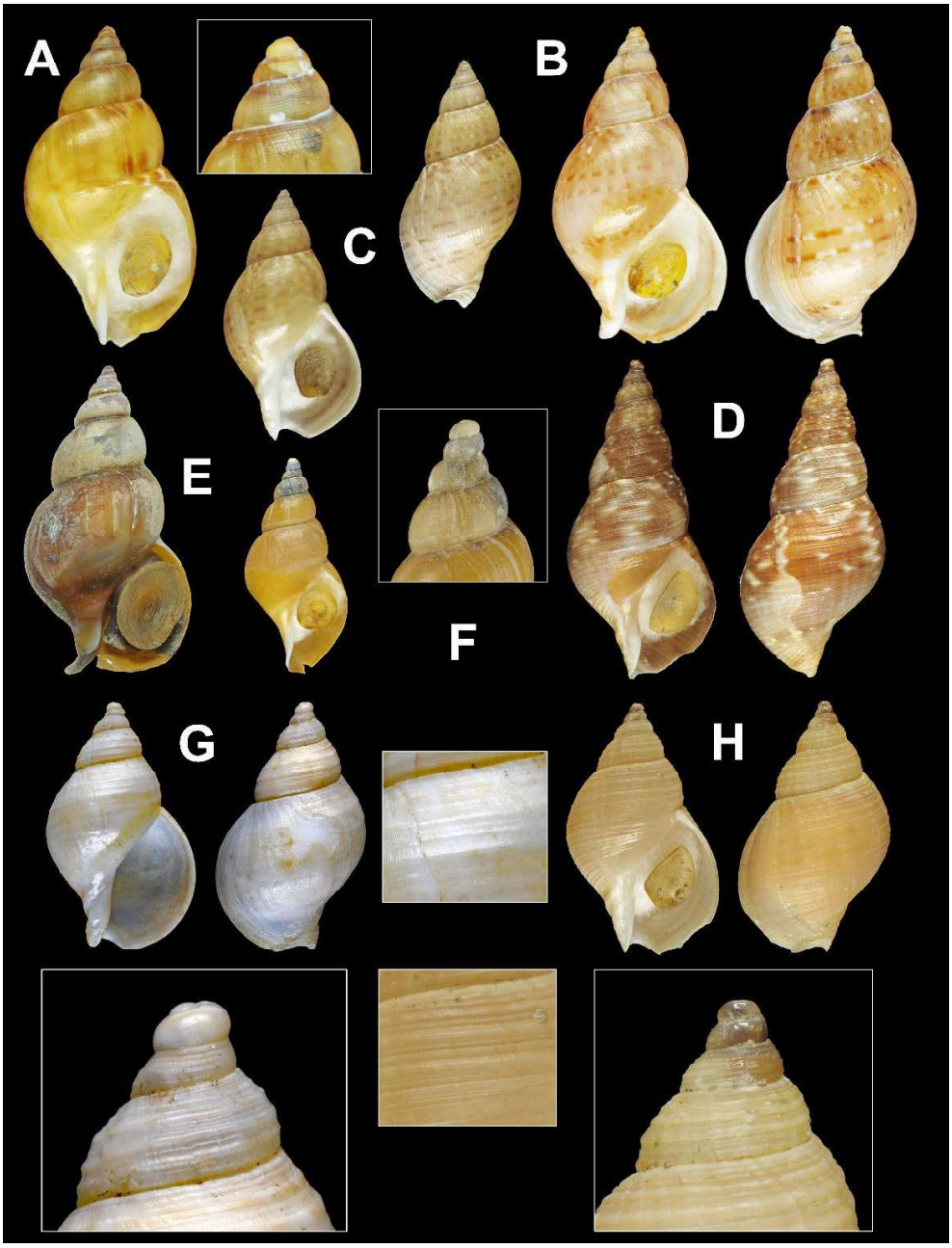

Figure 9. A–D. *Buccinum finmarkianum*. A–B. St A11-2020-695, 507–528 m. A. 29.3 mm. B. 32.6 mm. C. St A11-2016-681, 455–460 m, 37.9 mm. D. St A10-2013-601, 513–464 m, 51.9 mm. E–F. *Buccinum hydrophanum*. E. St A3-2014-67, 344–374 m, 57.7 mm. F. St A12-2018-651, 548–500 m, 34.6 mm. G–H. *Buccinum kjennerudae*. G. St A13-2017-514, 1175–1237 m, 28.2 mm. H. St A12-2018-716, 756–745 m, 25.5 mm.

Buccinum kjennerudae (Fig. 9 G–H) (Map p. 108)

Buccinum kjennerudae Bouchet & Warén, 1985 is an uncommon deep-water species reported from the Davis Strait (West Greenland) to North Norway in 600–1100 m (Bouchet & Warén, 1985: 190), and from Southeastern (958–1032 m), Northwestern Iceland (300 m) (J. Bogason's material), and from the western part of the Faroe-Iceland Ridge (1 adult specimen alive, BIOFAR, 997 m) (Warén, 1993: 189). The MFRI live sample came from the same area, a little further north, on the Faroe-Iceland Ridge (756–

745 m), and 6 others (empty) from deep-water (1175–1281 m) between North-West Iceland and East Greenland.

Buccinum undatum (Fig. 10 A–E) (Map p. 109)

Based on the samples collected over the past 10 years (n = 250), *Buccinum undatum* Linnaeus, 1758 were caught between 10 and 482 m. More than 90% of the shells were found between 10 and 150 m. The species is very polymorphic which has given rise to many form names and varieties without taxonomic value.

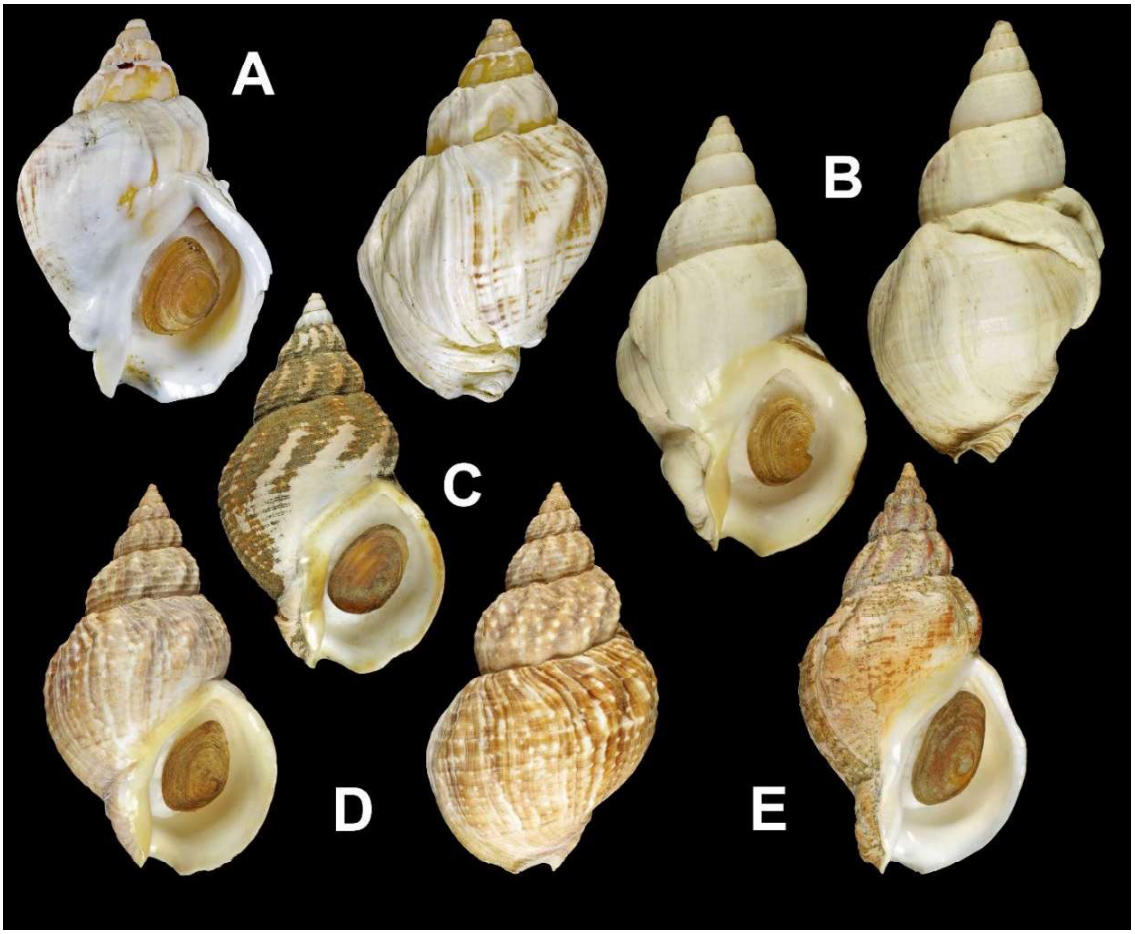

Figure 10. *Buccinum undatum*. A. St B12-2017-942, 34 m, 51.9 mm. B. St A3-2014-95, 63–69 m, 65.4 mm. C. St D4-2014-50, 116-136 m, 78.4 mm. D. St A3-2014-34, 69–95 m, 71.0 mm. E. St A3-2014-91, 48–47 m, 59.9 mm.

Anomalisipho verkruezeni (Fig. 11 A–B) **and** ***Anomalisipho virgatus*** (Fig. 11 C–D) (Map p. 106)

Regardless of the phylogenetic modifications made by Kantor *et al.* (2022), several samples of *Anomalisipho* collected during the MFRI campaigns allowed us to study carefully this genus in the North Atlantic Ocean and to identify the criteria to confirm *Anomalisipho virgatus* (Friele, 1879) as distinct from *Anomalisipho verkruezeni* (Kobelt, 1876) based on shape, sculpture, colour, periostracum, morphological characteristics of the operculum and the way erosion has impact on the outer layer of the shell (Fraussen *et al*., 2021).

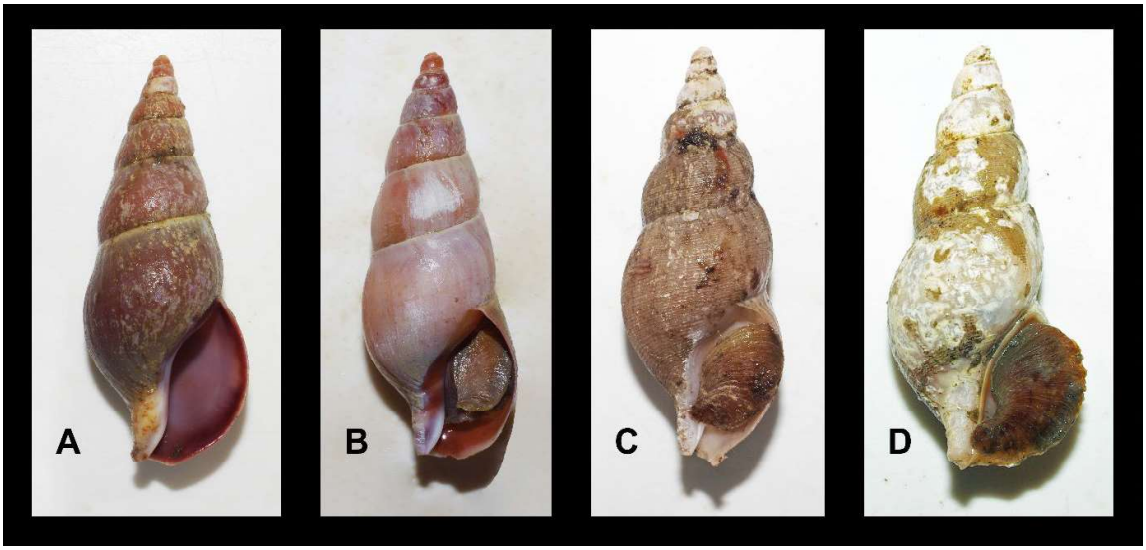

Figure 11. A–B. *Anomalisipho verkruezeni*. A. St A5-2021-63, 229–217 m, 62.0 mm. B. St. A10-2015-601, 595–560 m, 61.4 mm. C–D. *Anomalisipho virgatus*. C. St A5-2017-71, 372–346 m, 43.9 mm. D. St A3-2014-67, 344–374 m, 42.5 mm.

Beringius bogasoni (Fig. 12 A–G) (Map p. 107)

Beringius bogasoni Warén & S.M. Smith, 2006, a North-East Atlantic deep-water species recently described by Warén & Smith (2006) from Scotland and Iceland was collected alive in West Iceland in 2017 (Fig. 12 F. St A13-2017-514, 1175–1237 m) and 2018 (Fig. 12 E. St A12-2018-543, 1150–1148 m). This species was named in honour of Jón Bogason (1923 – 2009), an Icelandic autodidact naturalist, who gave to the authors one shell collected during his work at the Marine Research Institute (today named MFRI). This specimen was later deposited at the IINH, Garðabær (Fig. 12 A.).

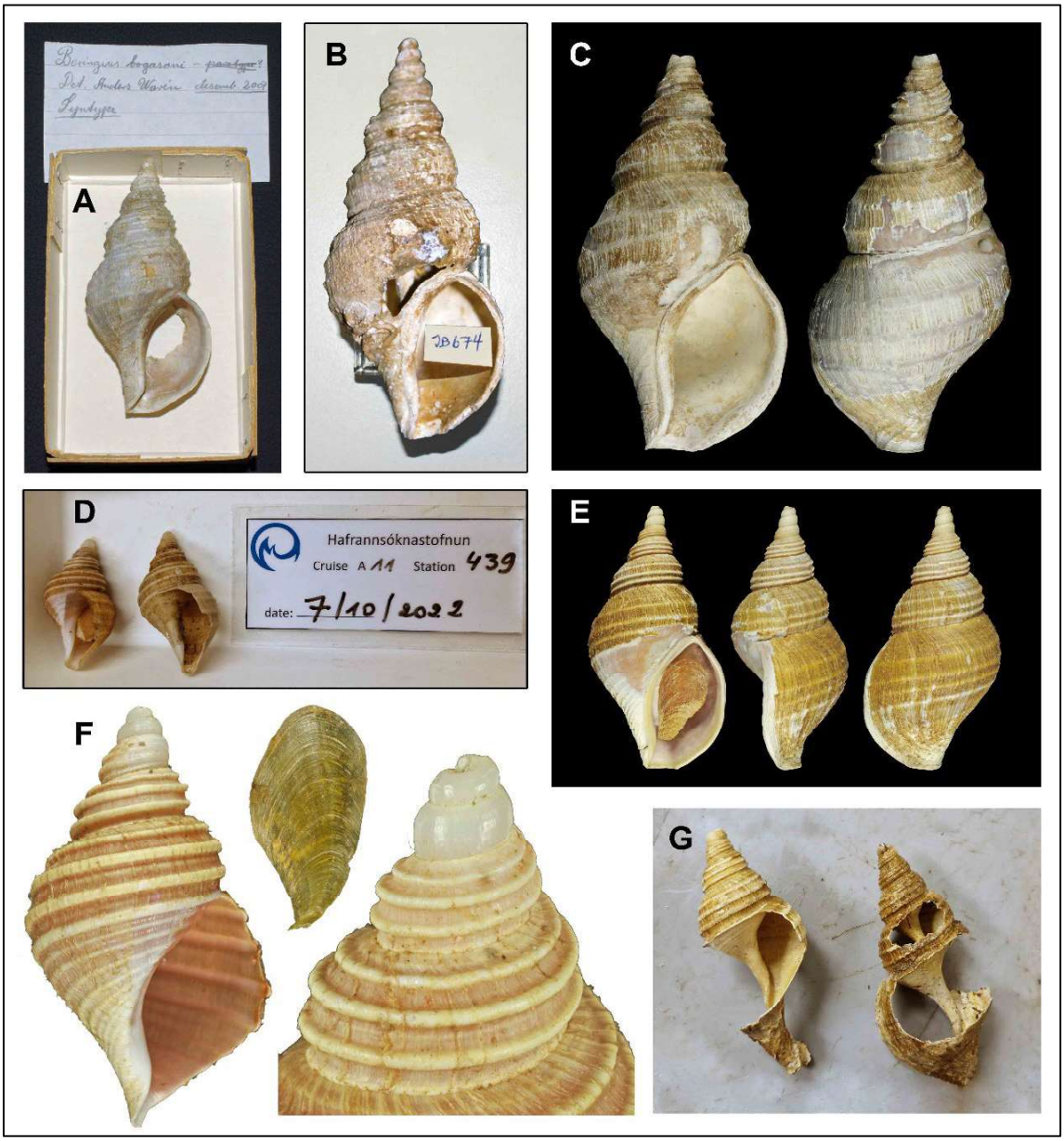

Figure 12. A–G. *Beringius bogasoni.* A. Paratype (Warén & Smith, 2006: 190, fig. 6), 64°44,7'N-28°07,2'W (1075 m), IINH, Garðabær. (At the museum, "paratype" was replaced by "syntype" on the label). B. Coll. Jón Bogason, JB 674, NHMK. C. St A10-2015-550, 1306–1281 m, 88.8 mm. D. St A11-2022-439, 1205–1273 m, 47.4 mm, 51.6 mm. E. St A12-2018-543, 1150–1148 m, 92.0 mm. F. St A13-2017-514, 1175–1237 m, 40.4 mm, (specimen sequenced). G. St A11-2022-440, 1252–1176 m, 76.6 mm, and 77.3 mm. (D and G are not part of this survey but figured here for illustration.)

Beringius turtoni (Fig. 13 A) **and** ***Beringius ossiania*** (Fig. 13 B) (Map p. 107)

Beringius turtoni (W. Bean, 1834) and *Beringius ossiania* (Friele, 1879) are today considered as the same species (Warén & Smith, 2006: 186), nevertheless their external aspect is quite different. *B. ossiania* bears coarser and more spaced spiral cords like some specimens found in the Barents Sea. Its siphonal canal is broader with a different shaped aperture. According to Bouchet & Warén (1985: 197),

this name should not be used for specific separation. However, both names are circulating in the literature. These two different phenotypes are found in Icelandic waters and shown in Fig. 13.

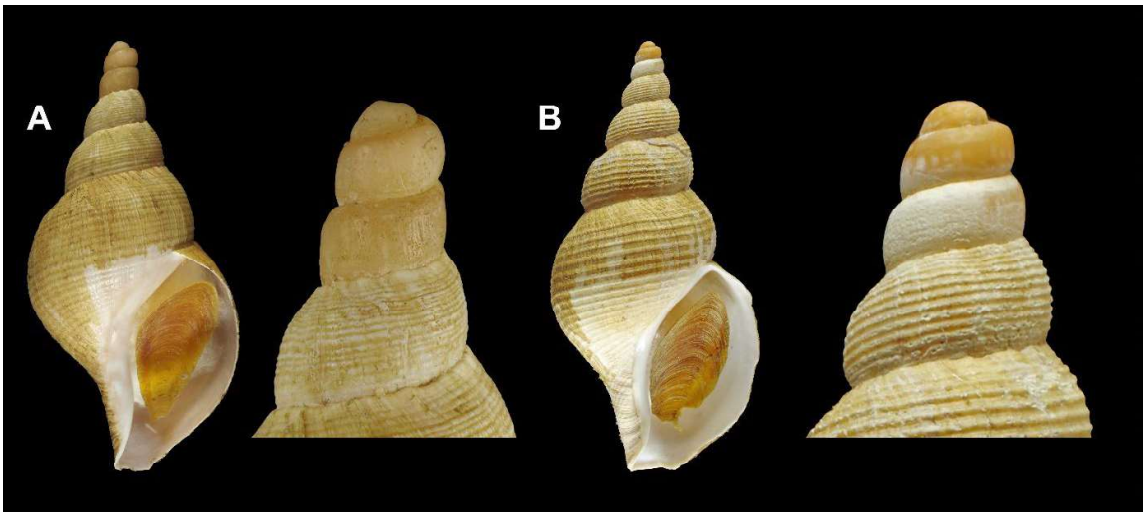

Figure 13. A. *Beringius turtoni*. St A10-2015-588, 409–372 m, 66.7 mm. B. *Beringius ossiania*, St A5-2017-75, 239–254 m, 88.7 mm.

Volutopsius norwegicus (Fig. 14 A–H) (Map p. 110)

Volutopsius norwegicus (Gmelin, 1791), exhibits relatively high intraspecific variability (shape, colour, size, and shape of the operculum). Specimens with very large bulbous protoconch are not uncommon (form *largillierti*). According to Bouchet & Warén (1985) for molluscs having an intracapsular, non-planktotrophic development, the size of the protoconch is directly correlated with the amount of nutriment available for their development and the use of the protoconch as a taxonomic characteristic for defining a species is not significant in this case.

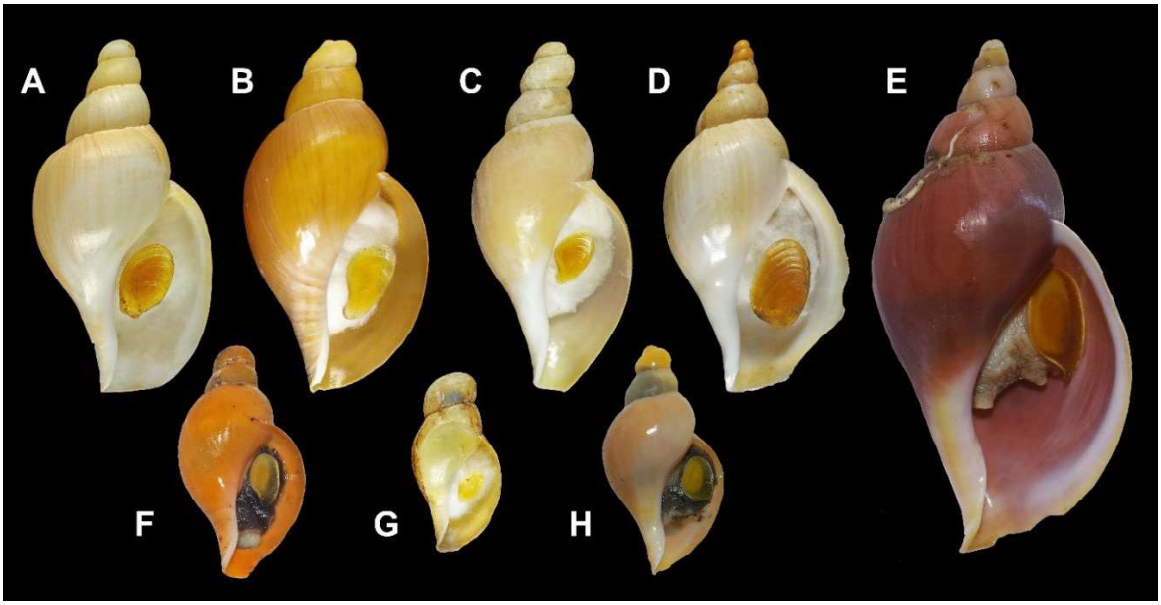

Figure 14. *Volutopsius norwegicus*. A. St A11-2022-427, 306–305 m, 65.0 mm. B. St A10-2015-605, 656–608 m, 67.3 mm. C. St A10-2015-619, 737–781 m, 68.2 mm. D. St A3-2014-28, 118–107 m, 63,0 mm. E. St A12-2018-752, 527–470 m, 93.0 mm. F. St A11-2020-651, 551–601 m, 49.0 mm. G. St TG1-2019-70, 625–645 m, 30.5 mm. H. St A10-2013-593, 315–304 m, 43.0 mm. (A. is not part of this survey but figured here for illustration.)

Volutopsius scotiae (Fig. 15 A–C) (Map p. 110)

Volutopsius scotiae Fraussen, McKay & Drewery, 2013 is a species described from Scotland and for which their authors also examined two empty specimens from an unknown locality offshore near Iceland (Fraussen *et al.*, 2013: 456). The presence around Iceland was made more accurate by the discovery in 2021 of two additional empty specimens from West Iceland caught in the MFRI nets (Fig. 15 A-B). The surface of the body whorl of *V. scotiae* is covered with more than 130 spiral cords while that of *V. norwegicus* is smooth with sometimes tiny spiral grooves and occasional weak spiral fold. A specimen from Scotland is represented here for comparative purpose (Fig. 15 C).

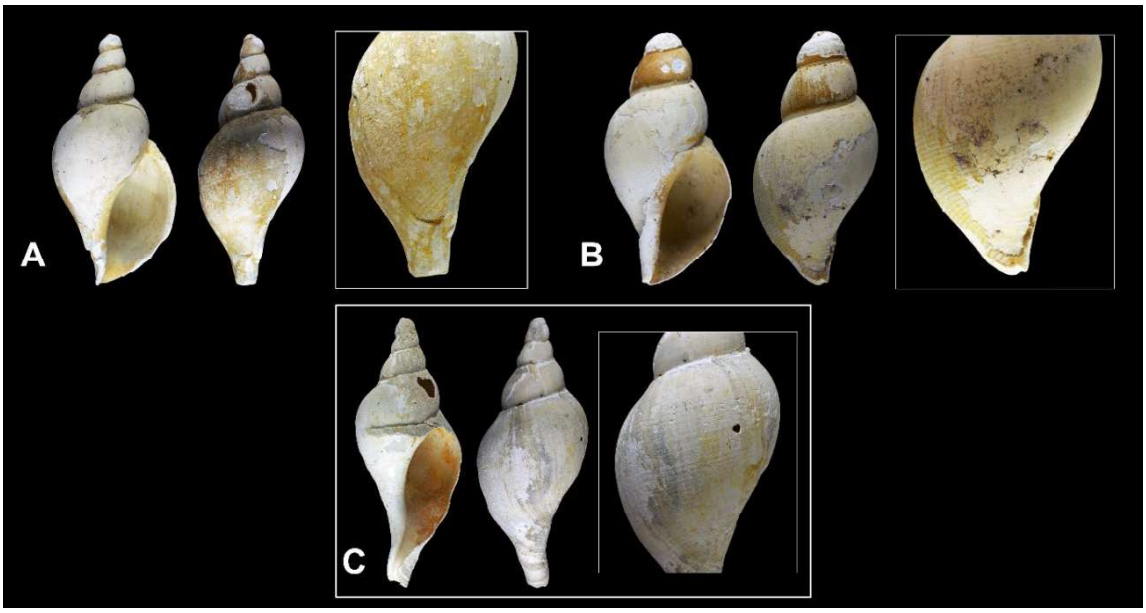

Figure 15. *Volutopsius scotiae*. A. St A15-2021-449, 1014–1051 m, 64.1 mm. B. St A15-2021-469, 1077–1074 m, 29.8 mm. C. Specimen from Scotland, 56°14'N-09°21'W, 1050 m, 74.9 mm.

Neptunea despecta (Fig. 16 A–M) (Map p. 109)

Neptunea despecta (Linnaeus, 1758) is a species widely distributed all around Iceland from the coastal zone to greater depths (992 m) showing a large variation of shapes, which has given rise to numerous forms and varieties without taxonomic value. From shallow to medium depths, the shells are strongly shouldered and highly varicose (form *fornicata*) (Fig. 16 A–G), at greater depths (but not always, see Fig. 16 H–I) the shape of the shell becomes more rounded and covered by numerous spiral cords.

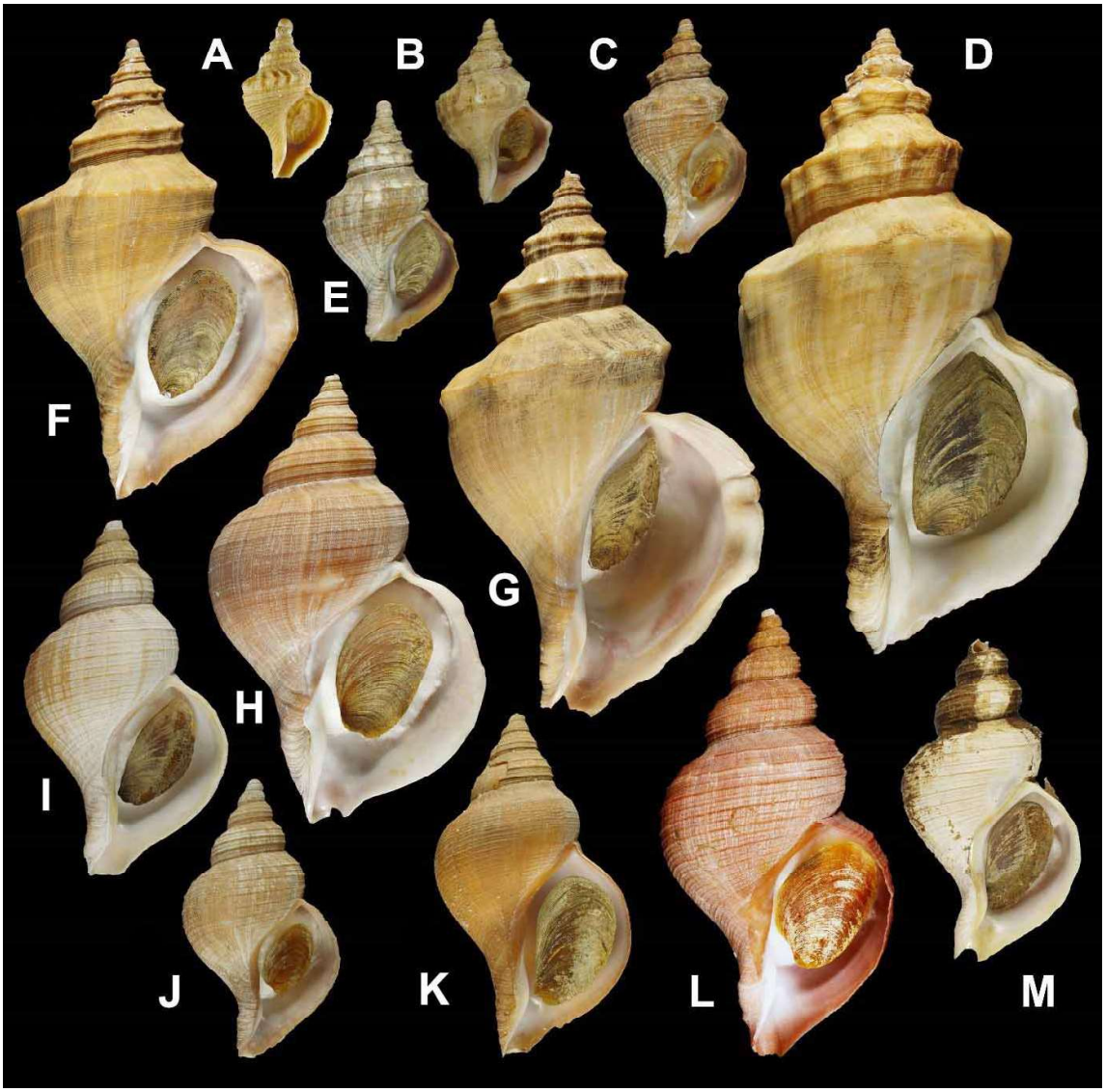

Figure 16. *Neptunea despecta*. A. St A4-2018-117, 194–237 m, 37.3 mm. B. St A3-2014-95, 63–69 m, 46.8 mm. C. St A3-2014-11, 127–129 m, 53.3 mm. D. St D4-2014-46, 145–152 m, 170.0 mm. E. St A3-2014-77, 184–174 m, 54.3 mm. F. St D4-2014-30, 146–152 m, 120.6 mm. G. St D4-2014-33, 151–178 m, 140.0 mm. H. St D4-2014-47, 148–135 m, 128.0 mm. I. St A10-2013-593, 315–304 m, 84.8 mm. J. St. A10-2015-631, 857–945 m, 68.4 mm. K. St A13-2017-657, 577–610 m, 82.0 mm. L. St A10-2015-671, 712–724 m, 116.2 mm. M. St A10-2013-618, 563–671 m, 81.7 mm.

Troschelia berniciensis (Fig. 17 A–B) (Map p. 109)

Such a variation of shapes related to depths is also observed for the species *Troschelia berniciensis* (W. King, 1846).

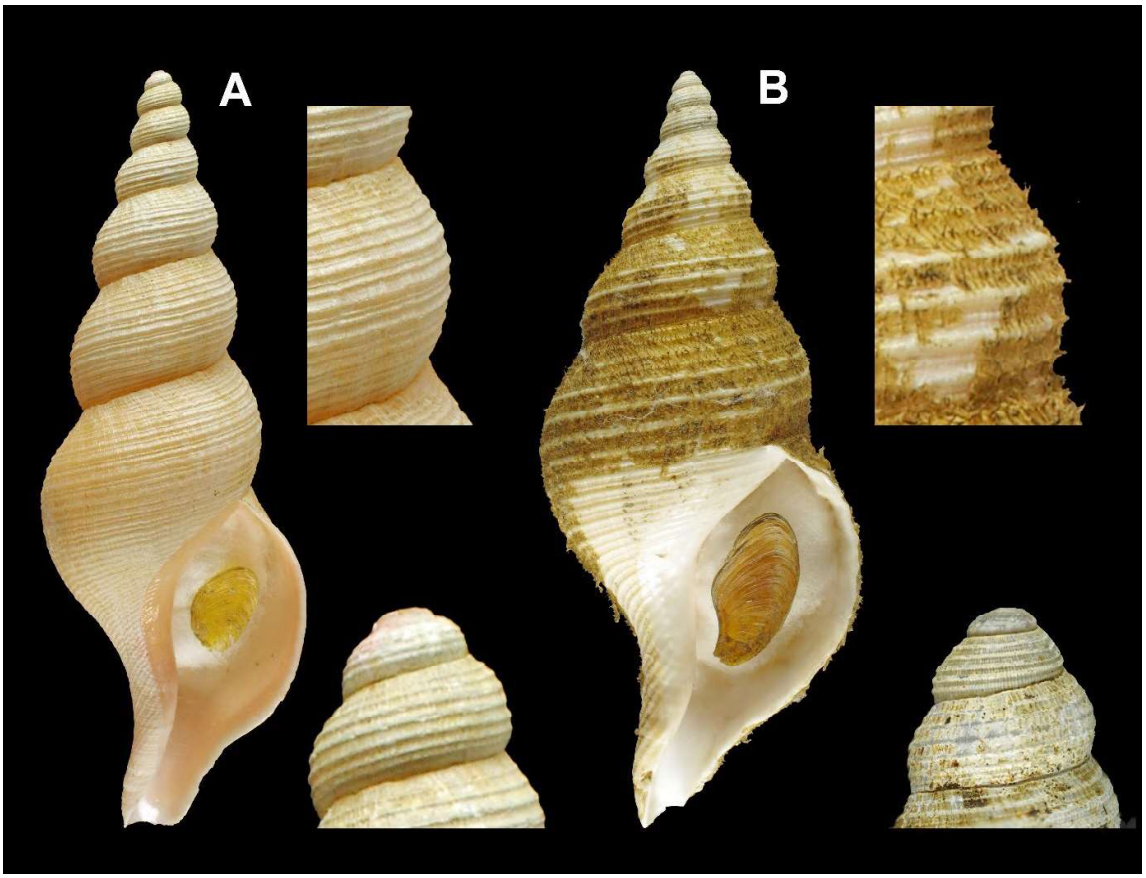

Figure 17. *Troschelia berniciensis*. A. St A15-2021-460, 719–697 m, 84.7 mm (sequenced specimen). B. Near Vestmannaeyjar, 100 m, 94.8 mm.

Missing Buccinidae from the MFRI catches (Fig. 18)

It is the case of *Buccinum cyaneum* Bruguière, 1789, a species sometimes difficult to distinguish from certain varieties of *Buccinum undatum* Linnaeus, 1758, probably only present in the circumlittoral area, although Thorson (1941: 89) and Óskarsson (1982: 265) report some deeper catches. After a careful new verification of all our trawled *B. undatum,* no specimen could be identified as belonging to this species. One empty shell collected by the first author on the beach at Husavik (1995.08.12) is presented to illustrate the distinctive characters of the species, small size,

Figure 18

spaced spiral grooves, hairy periostracum, inside of the mouth brownish and general colour tending towards blue (Fig. 18, Husavik, 18.7 mm).

It is also the case for *Buccinum abyssorum* A.E. Verrill & S. Smith, 1884, *Buccinum oblitum* Sykes, 1911, and different representatives of the genus *Mohnia* Friele, 1879, all species that live at depths rarely or not at all reached during the usual trawling operations or which for some (*Mohnia*) are too small and escape the mesh of the nets.

According to Óskarsson (1982: 320), *Buccinum humphreysianum* Bennett, 1824 appears only very rarely in the fishermen nets (3 records off Eastern Iceland at 460, 215 and 170 m in 1972 and 1975). No catch was recorded by the MFRI between 2013 and 2022.

Colidae, a distinct family (Table 2) (Maps p. 110–112)

Over the 10 years covered by this report, 10 species of Colidae ended up in the nets of the MFRI research vessels (Table 2).

Table 2. Colidae caught 2013–2022

Family Colidae	*Colus*	*glaber*	(Verkrüzen, 1876)
	Colus	*holboelli*	(Møller, 1842)
	Colus	*islandicus*	(Mohr, 1786)
	Colus	*jeffreysianus*	(P. Fischer, 1868)
	Colus	*sabini*	(J.E. Gray, 1824)
	Colus	*turgidulus*	(Friele, 1877)
	Turrisipho	*fenestratus*	(W. Turton, 1834)
	Turrisipho	*lachesis*	(Mörch, 1869)
	Turrisipho	*moebii*	(Dunker & Metzger, 1875)
	Turrisipho	*voeringi*	Bouchet & Warén, 1985

The Genus *Colus* (Fig. 19 A–M, Fig. 20 A–C) (Maps p. 111–112)

We continue to use *Colus glaber* (Verkrüzen, 1876) (Fig. 19 D–E) for the Icelandic form of *Colus gracilis* (da Costa, 1778), although it might be better to call it *C. gracilis* form *glaber*. Indeed, *C. gracilis* and *C. glaber* are synonyms, with *C. gracilis* as the accepted name (WoRMS). Bouchet & Warén (1985: 228) confirmed the high variability of *C. gracilis* with several morphologically different geographical and bathymetrical forms. They stated that the name *glaber* was used for a form that reaches Faroes, Shetland, and Iceland where the shell tends to become smoother, with flatter whorls, which could deserve an eventual subspecific distinction. Thus, we also took samples of soft tissues sent to the MNHN for future genetic differentiation.

Of all the *Colus* Röding, 1798 collected in Iceland, *Colus islandicus* (Mohr, 1786) (Fig. 19 A–C) is by far the most evenly distributed species around the island with a wide bathymetric range. *C. turgidulus* (Friele, 1877) (Fig. 19 F–G) and *C. sabini* (J.E. Gray, 1824) (Fig. 19I–K) seem to prefer the northern and eastern regions of the island at depths exceeding 400 meters. *Colus holboelli* (Møller, 1842) (Fig. 19 L–M), distributed all around the island, is apparently less frequent and lives at shallower depths (10 to 500 m) (Bouchet & Warén, 1985:228).

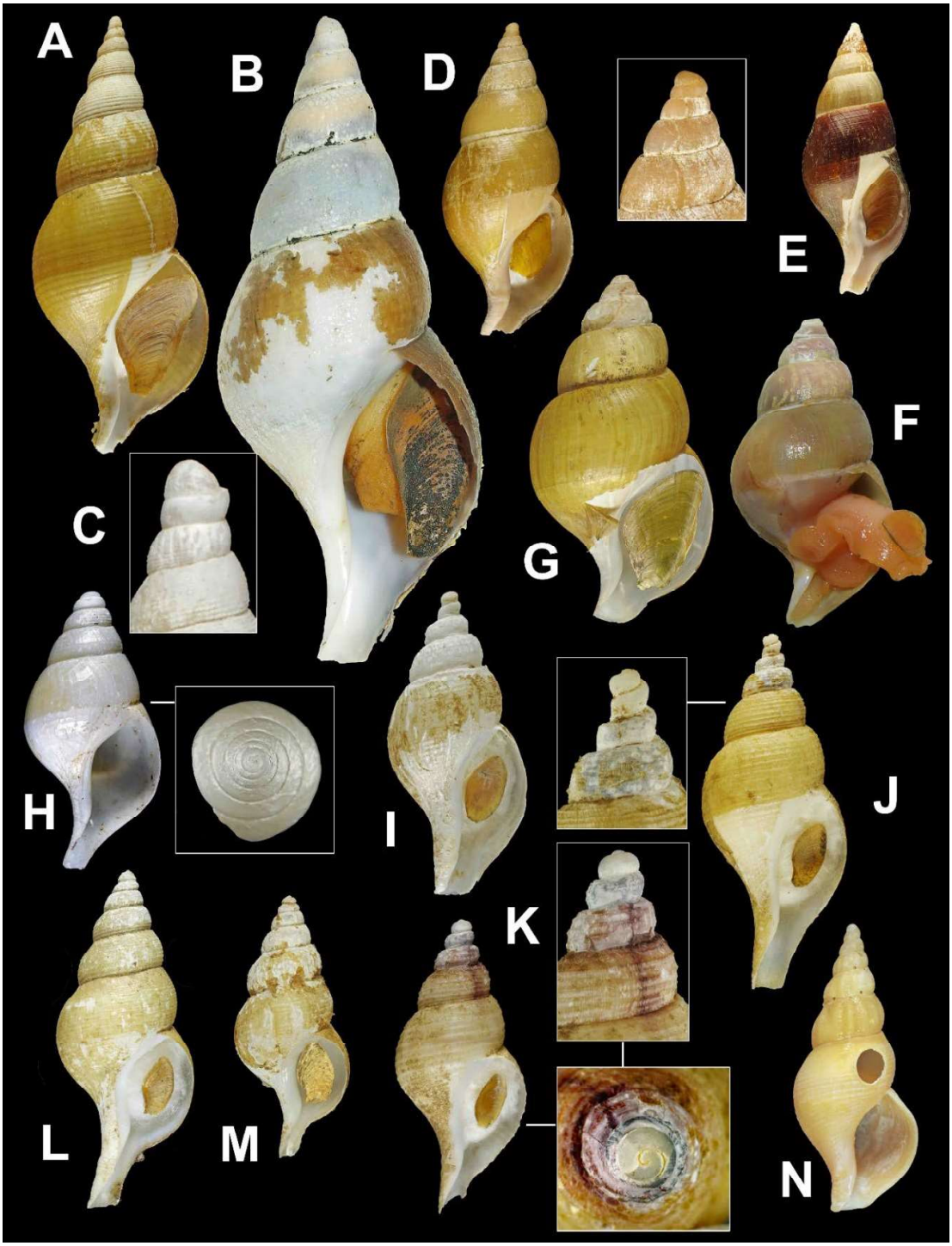

Figure 19. A–M. Genus *Colus*. A–C. *Colus islandicus*. A. St A4-2018-132, 272–276 m, 100.0 mm. B. St A10-2013-664, 575–590 m, 145.0 mm. C. St A12-2018-515, 833–960 m, protoconch of a 95.0 mm shell. D–E. *Colus glaber/gracilis*. D. St A3-2016-53, 268–273 m, 67.5 mm. E. St A4-2018-90, 116–127 m, 58.4 mm. F–G. *Colus turgidulus*. F. St A10-2013-602, 901–970 m, 54.2 mm (alive). G. St A13-2017-578, 906–942 m, 61.2 mm (specimen sequenced). H. *Colus jeffreysianus*. Shell and protoconch, St A12-2018-534, 987–986 m, 28.8 mm. I–K. *Colus sabini*. I. St A11-2016-602, 760–782 m, 34.5 mm. J. St TB2-2021-86, 430–443 m, 50.1 mm, shell and protoconch. K. St A10-2015-669, 467–440m, 33.2 mm, shell and protoconch. L–M. *Colus holboelli*. L. St A3-2014-67, 344–374 m, 40.0 mm. M. St A4-2018-75, 236–243 m, 35.7 mm. N. Retimohniidae. *Retifusus latericeus*. St A2-2015-124, 63–69 m, 20.4 mm.

In Iceland, *Colus jeffreysianus* (P. Fischer, 1868) lives in deep-water. The species is not mentioned in Óskarsson's book (1982). On the first protoconch whorl, the spire of the shell is visible, which is not the case with *C. glaber* (Verkrüzen, 1876)*/C. gracilis* (da Costa, 1778) having always a bulbus or inflated apex. This difference is evident on the shell represented in Fig. 20 D. They differ also from *Colus turgidulus* (Friele, 1877) by the presence of a quite long siphonal canal and by the heaviness of the shell. One specimen (Fig. 20 C) collected by the INGOLF expeditions (1895–1896) * from West Iceland is illustrated in Bouchet & Warén (1985: 240, fig. 620). It is very similar to the specimens obtained by the MFRI cruise (Fig. 20 A–B) in a region very close to that of the INGOLF expeditions (Fig. 20 C).

* Note: the gastropod material of these expeditions has never been worked up. It is preserved in the NHMD.

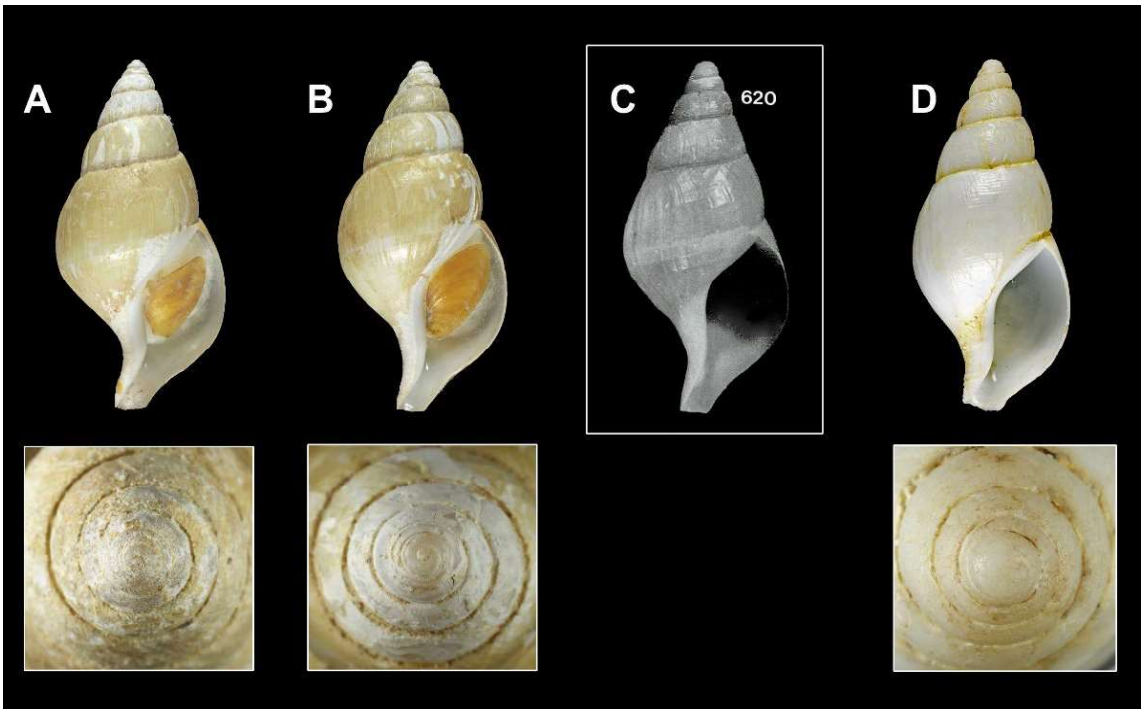

Figure 20. A–C. *Colus jeffreysianus*. A–B. St A10-2015-550, 1306–1281 m. A. 52.6 mm. B. 48.7 mm. C. INGOLF, St 10, 64°24'N-28°50'W, 1484 m, 39.0 mm. D. *Colus glaber*. St A10-2015-586, 1123–1099 m, 44.8 mm.

The Genus *Turrisipho* (Fig. 21 A–K) (Map p. 110)

Four species of *Turrisipho* Dautzenberg & Fischer, 1912 were caught by the MFRI nets. No more than 13 specimens each for *Turrisipho moebii* (Dunker & Metzger, 1875) (Fig. 21 C–G) and *Turrisipho fenestratus* (W. Turton, 1834) (Fig. 21 A–B) between 100 and 500 m; 6 specimens of *Turrisipho lachesis* (Mörch, 1869) (Fig. 21 H) down to 800 m and several (135 specimens up to 80 mm high) for the very fragile *Turrisipho voeringi* Bouchet & Warén, 1985 (Fig. 21 I–K) during the sampling of deep-water (500 to 1100 m).

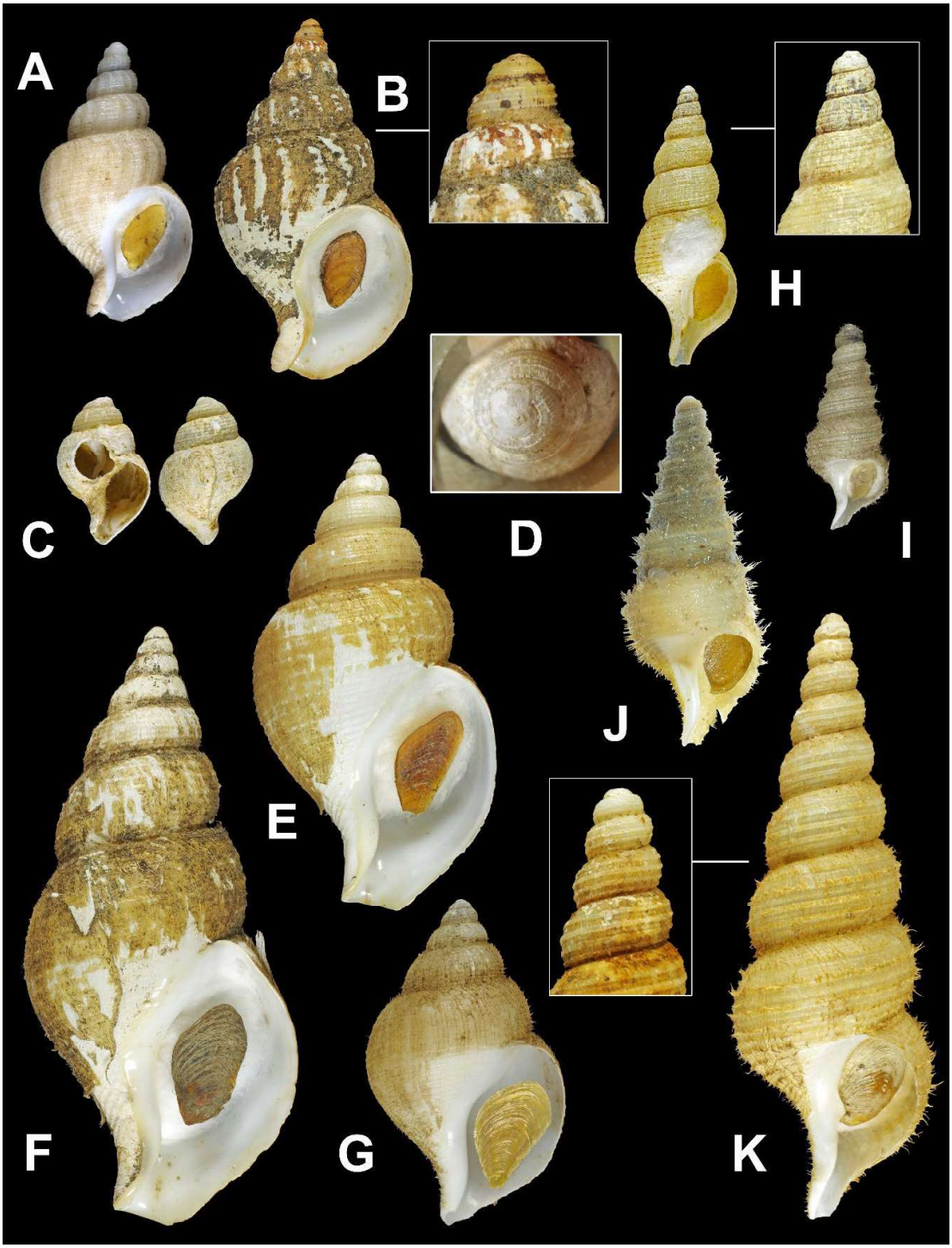

Figure 21. A–K. Genus *Turrisipho*. A–B. *Turrisipho fenestratus*. A. St A3-2016-115, 174–177 m, 32.7 mm. B. Shell and protoconch. St A2-2015-53, 112–107 m, 42.1 mm. C–G. *Turrisipho moebii*. C–D. St A15-2021-459, 432–366 m, 10.7 mm. E. St A3-2014-27, 266–296 m, 60.4 mm. F. St D2-2015-5, 170–142 m, 80.7 mm. G. St A13-2017-653, 152–149 m, 35.4 mm (specimen sequenced). H. *Turrisipho lachesis*. Shell and protoconch. St A12-2018-708, 808–826 m, 37.5 mm. I–K. *Turrisipho voeringi*. I. St A11-2016-640, 945–930 m, 20.2 mm. J. St A10-2013-646, 529–578 m, 38.9 mm. K. Shell and protoconch. St A11-2016-631, 376–392 m, 52.3 mm.

Retimohniidae, a distinct family (Fig. 22) (Map p. 112)

Figure 22

In their revision of the superfamily Buccinoidea, Kantor *et al*. (2022: 801) established the Retimohniidae as a new family, one species of which ended up in the nets of the MFRI, *Retifusus latericeus* (Møller, 1842) (Fig. 19 N). This coastal species lives in areas much less explored by the MFRI, only one specimen was found (St A2-2015-124, 63–69 m), but it is not a rare species in shallow-water around Iceland [Fig. 22, specimen from Breiðafjörður (close to Stykkishólmur), 17.1 mm].

Calliostomatidae (Fig. 23 A–D) (Map p. 98)

One specimen of *Calliostoma caroli* Dautzenberg, 1927 was caught alive at the depth of 1150 m (St A12-2018-543) west of Iceland (Fig. 23 A). It constitutes the first mention for Icelandic waters. Together with two other specimens [SMNH 76365 (Fig. 23 C) and SMNH 76362] collected further south on the Reykjanes Ridge (59°02'N-30°48'W – 1125 m and 58°33'N-31°33'W – 1170 m) and the syntype [MOM INV-19923 (Fig. 23 D)] off the Azores (38°35'30"N-28°05'45"W – 1250 m) (Dautzenberg, 1927: 197), this notification establishes for this Calliostomatidae a Northeast Atlantic range in deep-water around the Mid-Atlantic Ridge from Iceland to the Azores (Fig. 23 B) (Delongueville & Scaillet, 2019a).

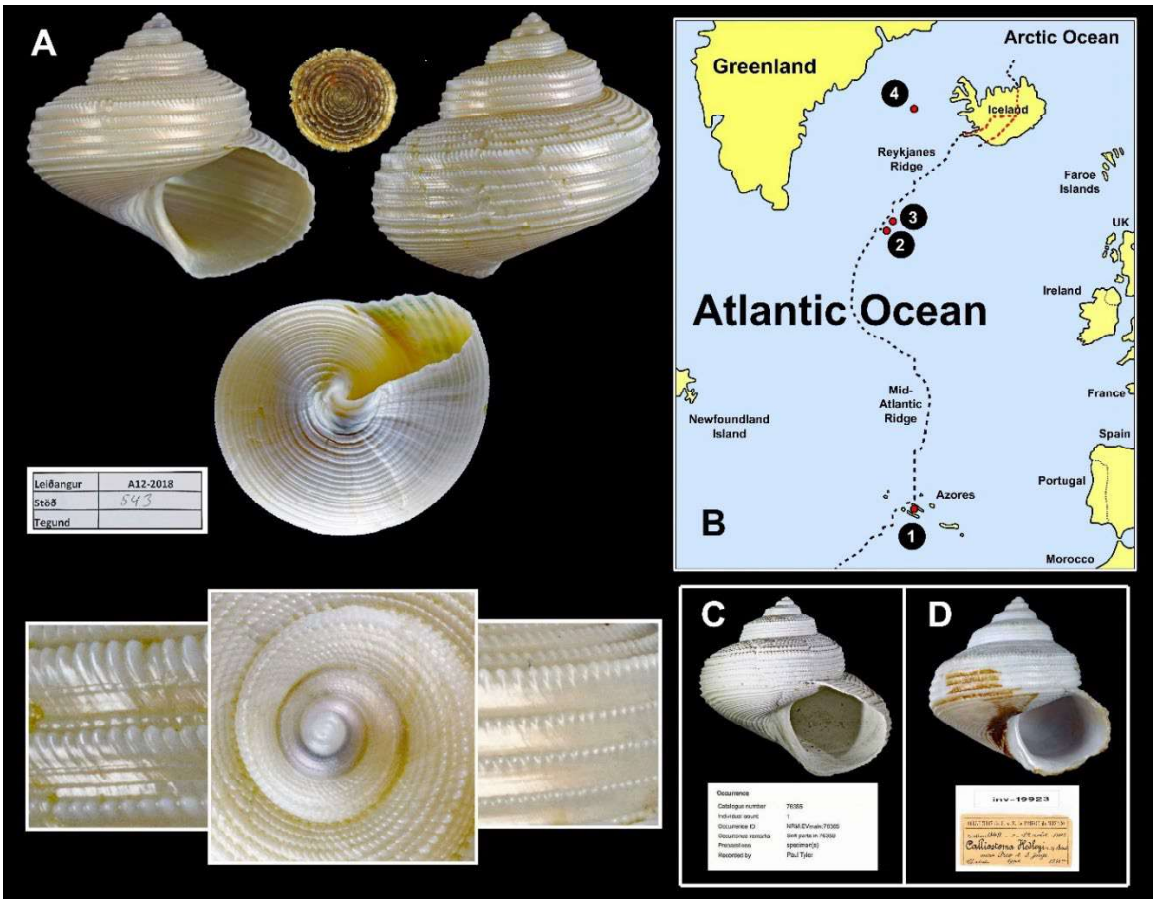

Figure 23. *Calliostoma caroli*. A. St A12-2018-543, 1150–1148 m, 26.3 mm. B. Distribution around the Mid-Atlantic Ridge. C. SMNH 76365, 1125 m, 25.3 mm. D. MOM, INV-19923, type, 1250 m, 24.4 mm.

Fissurellidae living on colonial Scleractinia (Fig. 24 A–E) (Map p. 97)

In Iceland, *Desmophyllum pertusum* (Linnaeus, 1758) (Fig. 24 A) and *Solenosmilia variabilis* Duncan, 1873 (to a lesser extent) (Fig. 24 B) form reefs along the southern and western slope of the Icelandic continental shelf (Fig. 24 C) and along the Mid-Atlantic Ridge between mainly 100 and 800 m depth. Seabed mapping campaigns were carried out by MFRI researchers between 2009 and 2012 using a Remotely Operated Vehicle (ROV) and a three-legged steel frame (CAMPOD) equipped with cameras (Ólafsdóttir *et al.* 2020 and 2021) These works have led to the geolocation of some of these vulnerable marine ecosystems and to the delimitation of 14 areas of exceptional interest that are now fully protected and prohibited for trawlers and longliners. The location of these coral spots is not yet fully known and it happens that one or another branch of *Desmophyllum* is hooked by a trawl. The gastropods most frequently collected on these corals are sessile species (Fissurellidae) such as *Emarginula crassa* J. Sowerby, 1813 (Fig. 24 D) and *Puncturella noachina* (Linnaeus, 1771) (Fig. 24 E).

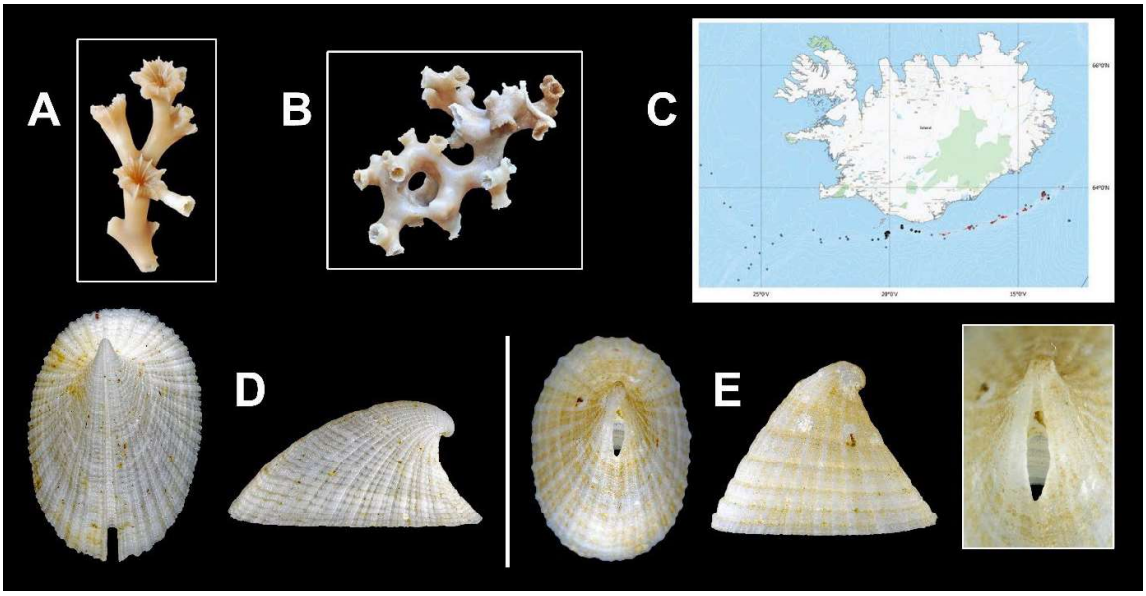

Figure 24. A. *Desmophyllum pertusum*. B. *Solenosmilia variabilis*. C. Geolocation of coral reefs around Iceland (Ólafsdóttir *et al.* 2020: 70). D. *Emarginula crassa*. St A10-2015-55, 678–520 m, 14.6 mm. E. *Puncturella noachina*. St B11-2006-611, 278–269 m, 8.9 mm (older station not included in the study, figured for illustration).

Choristellidae (Fig. 25 A–C) (Map p. 97)

Two specimens of *Choristella leptalea* K. J. Bush, 1897 were caught alive in an empty egg case of elasmobranch [*Rajella fyllae* (Lütken, 1887) (Fig. 25 A)] in southwest Iceland at the depth of 848 m (St A15-2021-452) (Fig. 25 B–C). This constitutes the first mention of live specimens from Icelandic waters. The biology of the Choristellidae is very particular since they live specifically inside empty egg cases of rays or sharks. Our investigations to understand these relationships between elasmobranchs and gastropods led us to locate other specimens previously collected in the south of Iceland (63°N–21°W) at the depth of 819 m (BIOICE cruise B-9-93, station 563, sample 2415) and kept at the SMNH under reference nr 35303 (no link with elasmobranch egg case was specifically reported for those specimens). At that time, these samples, like many others of the same origin, remained unfortunately unpublished. Thanks to a loan from the SMNH, these samples could be measured, photographed and their origin

published. The species was therefore added to the marine Icelandic fauna (Delongueville & Scaillet, 2022).

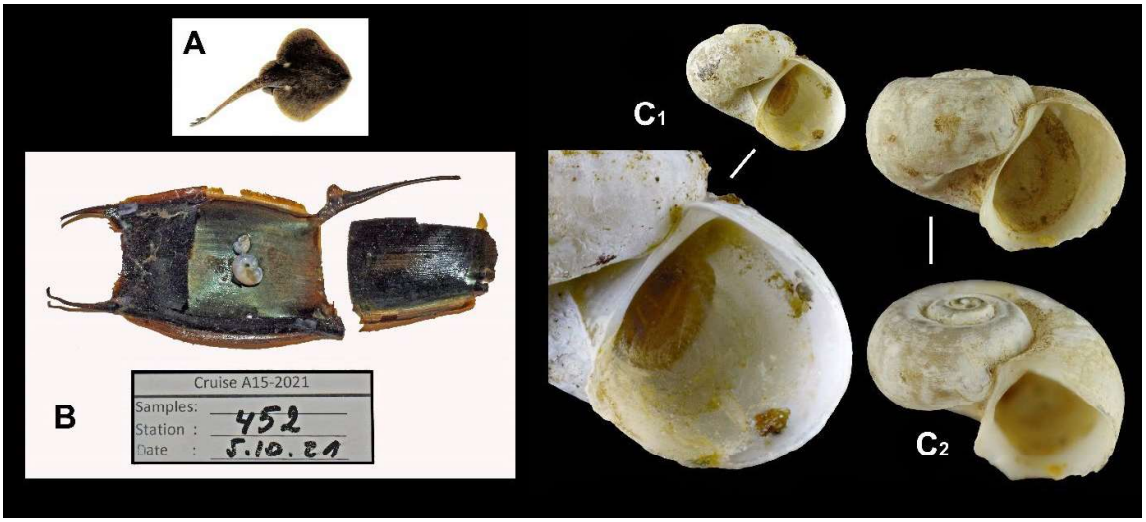

Figure 25. *Choristella leptalea*. A. *Rajella fyllae* (in Jónsson & Pálsson. 2013: 113). B. Egg case of *Rajella fyllae* containing two *Choristella leptalea* specimens. C1. Small specimen, 3.8 x 4.8 mm. C2. Larger specimen, 5.6 x 7.9 mm.

Aporrhaidae (Fig. 26 A) (Map p. 103)

Aporrhais pespelecani (Linnaeus, 1758) frequents the muddy bottoms in shallow-water south and south-west of Iceland up to 133 m depth (Thorson, 1941: 56). Our specimens came from the same region, the deepest collected alive at St D4-2014-38, 126–125 m. The rarely found *Aporrhais serresiana* (Michaud, 1828), usually living at greater depths (200–1000 m) south of Iceland (Bouchet & Warén, 1993: 708), was absent from the MFRI catches.

Epitoniidae (Fig. 26 B) (Map p. 101)

Boreoscala greenlandica (Perry, 1811) is a well-documented species in north, west and east coasts of Iceland (Bouchet & Warén, 1986: 518). Only three occurrences of empty shells were reported from MFRI trawls and two others from digestive tracts of dab fished between 30 and 43 m.

Newtoniellidae (Fig. 26 C) (Map p. 100)

Laeocochlis sinistrata (Nyst, 1835) is a sinistral species (as its name suggests) that was found by MFRI twice between Iceland and Greenland at St TL2-2014-67 (1098–1046 m) and St A13-2017-493 (1034–1060 m), but also ones at shallower depths in west Iceland (St A3-2014-39, 205–154 m). None of these specimens were alive.

Skeneidae (Fig. 26 D) (Map p. 99)

Skenea ferruginea Warén, 1991 is a very small planorbiform shell with the whorls covered by ferruginous deposits exclusively known by material from Iceland and eastern Greenland (150–1000m) (Warén, 1991: 66).

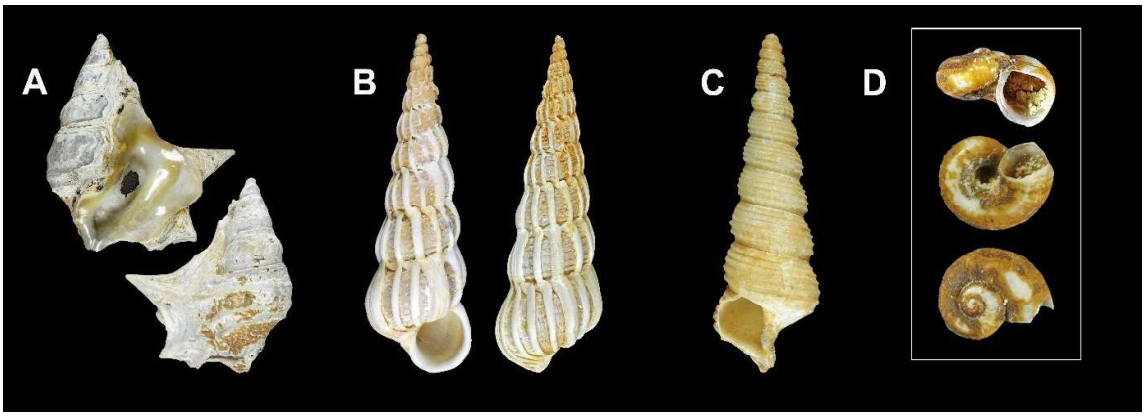

Figure 26. A. *Aporrhais pespelecani*. St D4-2014-38, 126–125 m, 34.1 mm. B. *Boreoscala greenlandica*. St TD1-85-91, 153–193 m, 47.1 mm (older station not included in the study, figured for illustration). C. *Laeocochlis sinistrata*. St A3-2014-39, 205–154 m, 18.6 mm. D. *Skenea ferruginea*. St A3-2014-23, 375–405 m, 1.5 mm (enlarged).

Capulidae (Fig. 27 A–H) (Map p. 103)

In the Capulidae family, *Capulus simplex* Locard, 1898, a deep-water species differing from *C. ungaricus* (Linnaeus, 1758) by a peculiarity of the protoconch, was not found in MFRI samples. *Torellia delicata* (R.A. Philippi, 1844), a finely reticulated shell covered by a hairy periostracum (Fig. 27 A–D), was taken only once in the deep-water of western Iceland. *Ariadnaria conica* (Møller, 1842) (Fig. 27 G) was recovered from a haddock stomach in north Iceland. *Ariadnaria borealis* (Broderip & G.B. Sowerby I, 1829) (Fig. 27 H) and *C. ungaricus* were found more frequently in shallow-water. *Trichotropis bicarinata bicarinata* (G.B. Sowerby I, 1825) refers to a solid shell living in shallow-water (10–100 m) from western Greenland to northern Canada, Alaska, north Pacific, Sea of Okhotsk, and north Japan. In eastern Greenland, northern, eastern, and southeastern Iceland there exists, in deeper waters (50–300 m) a quite different form for which the subspecific epithet *tenuis* is used (*T. bicarinata tenuis* E.A. Smith, 1877) (Warén, 1991: 82). As opposed to the nominal form, *T. bicarinata tenuis* has a very fragile not keeled shell with a surface traversed by a conspicuous and regular oblique axial sculpture, its aperture is wide and rounded. The two specimens collected by the MFRI over 10 years of trawling were taken in the deep-water north of the island (Fig. 27 E–F).

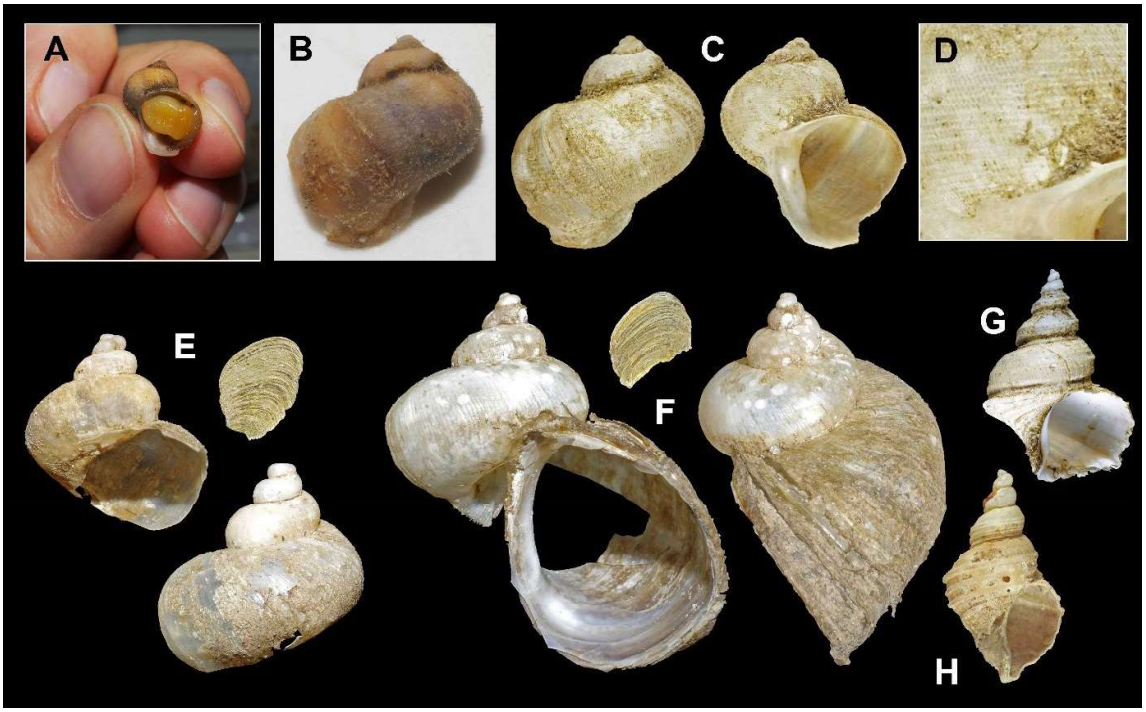

Figure 27. A–D. *Torellia delicata*. St A12-2018-515, 833–960 m, 12.7 mm. A–B. alive C–D. cleaned with detail of the shell surface. E–F. *Trichotropis bicarinata tenuis* (operculated). St A11-2016-602, 760–782 m. E. 13.2 mm. F. 25.4 mm. G. *Ariadnaria conica*. St A3-2016-115, 174–177 m, 13.0 mm. H. *Ariadnaria borealis*. St A3-2014-92, 44–17 m, 12.2 mm.

Velutinidae (Fig. 28 A–F) (Map p. 104)

Among some species of the family Velutinidae, the shell is partially or even totally covered by the mantle. This is the case of *Onchidiopsis glacialis* (M. Sars, 1851) (Velutininae) (Fig. 28 A–C) and *Calyptoconcha pellucida* (A.E. Verrill, 1880) (Lamellariinae) (Fig. 28 D–E) (Bouchet & Warén, 1993: 739). Both species were collected in relatively deep-water only once over all the campaigns studied here: *O. glacialis* at St A12-2018-600, 618–639 m, and *C. pellucida* at St A12-2018-727, 408–415 m. They arrived on board intact, which was never the case for the few specimens (four) of *Piliscus radiatus* (M. Sars, 1851) (Velutininae) (Fig. 28 F), each time crushed in the mass of the material collected between 482 and 949 m. Although some investigators consider this species to be synonymous with *P. commodus* (Middendorff, 1851), Gulbin & Golikov (1997: 48) prefer to regard it as a separated species.

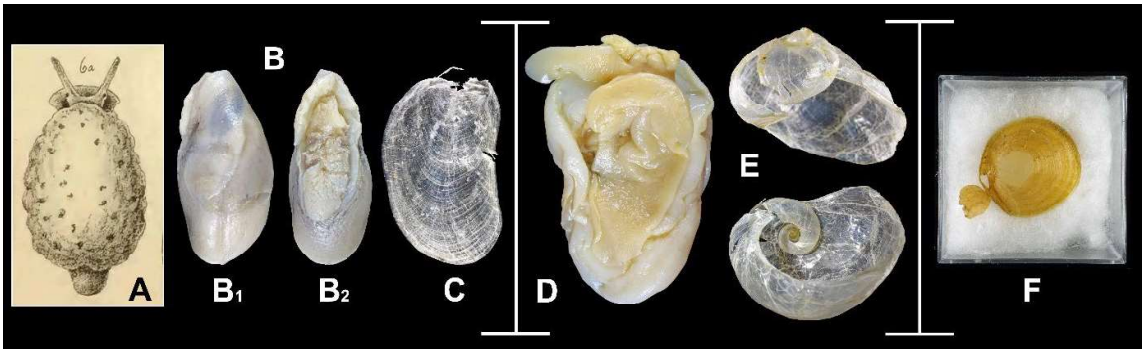

Figure 28. Velutinidae. A–C. *Onchidiopsis glacialis*. A. Original figure in G.O. Sars, 1878 (tab. 12, 6a). B. St A12-2018-600, 618–639 m. B1–B2. Animal, 23.9 mm. B1. lateral view. B2. Ventral view. C. Shell, external view, 15.9

mm. D–E. *Calyptoconcha pellucida*. St A12-2018-727, 408–415 m. D. Animal, ventral view, 35.0 mm. E. Internal shell, lateral and ventral view, 25.6 mm. F. *Piliscus radiatus*. St A11-2016-553, 482–479 m, 14.0 mm.

Naticidae (Fig. 29 A–G / Table 3) (Maps p. 104–105)

It is quite difficult to comment on the bathymetric distribution of the different species, considering that 53% (158 out of 298) of the specimens were collected from fish stomachs. However, without being mistaken we can say that *Euspira nitida* was never found below 75 m, that only two specimens

Table 3. Naticidae caught 2013–2022

Naticidae	*Amauropsis*	*islandica*	(Gmelin, 1791)
	Bulbus	*smithii*	T. Brown, 1839
	Cryptonatica	*affinis*	(Gmelin, 1791)
	Euspira	*montagui*	(Forbes, 1838)
	Euspira	*nitida*	(Donovan, 1803)
	Euspira	*pallida*	(Broderip & G.B. Sowerby I, 1829)
	Euspira	*tenuistriata*	(Dautzenberg & Fischer, 1911)

(out of 5) of *E. tenuistriata* were caught alive at 151–165 m, and that *Bulbus smithii* was found deeper with 18% of specimens collected alive (not in fish stomachs) from 300 m down to 695 m.

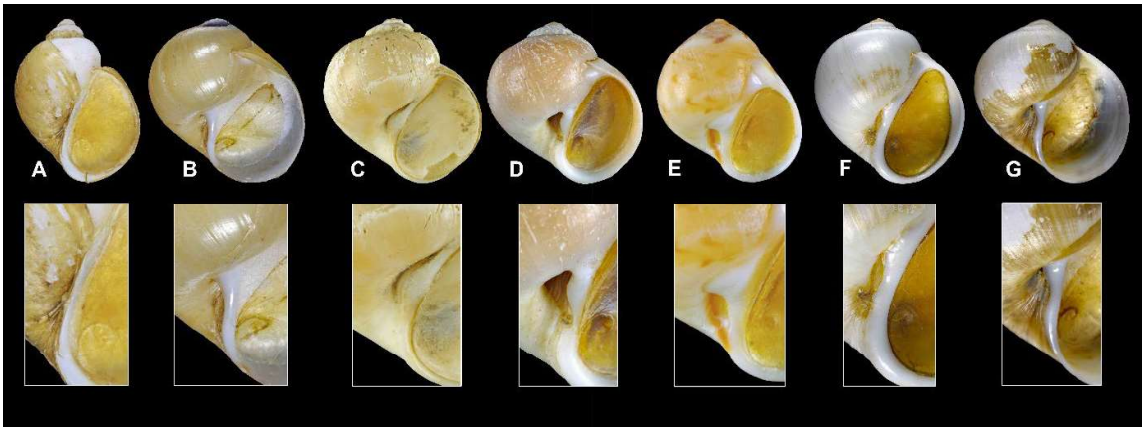

Figure 29. A–G. Naticidae. A. *Amauropsis islandica*. St A3-2020-90, 75–71 m, 10.4 mm. B. *Bulbus smithii*. St A2-2015-59, 155–190 m, 14.5 mm. C. *Cryptonatica affinis*. St A2-2015-90, 371–341 m, 14.1 mm. D. *Euspira montagui*. St A3-2016-68. 105–102 m, 6.2 mm. E. *Euspira nitida*. St B9-2019-785, 62–66 m, 9.0 mm. F. *Euspira pallida*. St. A3-2014-90, 54–45 m, 22.9 mm. G. *Euspira tenuistriata*. St. A3-2014-79, 151–165 m, 14.7 mm.

Superfamily Conoidea. (Fig. 30 A–M / Table 4) (Maps p. 115–117)

To understand the difficulties in the determination process for shells belonging to the superfamily Conoidea J. Fleming, 1882, different parameters must be considered: the group is large, it covers both boreal and arctic fauna, mainly in the family Mangeliidae including the genera *Curtitoma* Bartsch, 1941, *Propebela* Iredale, 1918 and *Oenopota* Mörch, 1852. Moreover, the shells of the species considered may present variations in shape and the determinations are not always easy to carry out. Moreover, the representation of the different species is not always the same in different publications. To help in the determination we used both ancient and modern works: Sars, 1878, Friele, 1886, Bouchet & Warén, 1980, Bogdanov, 1990, Høisæter 2016, and Sneli *et al*., 2005. Apart from Óskarsson 1982 and Sneli *et al*., 2005 who had already done a summary work on the fauna around Iceland, none of the

references are specific to this country, but all are of considerable help and lead us to present determinations as our best guess.

Table 4. Conoidea caught 2013–2022

Conoidea	Mangeliidae	*Curtitoma*	*decussata**	(Couthouy, 1839)
		Curtitoma	*trevelliana*	(W. Turton, 1834)
		Curtitoma	*violacea*	(Mighels & C.B. Adams, 1842)
		Oenopota	*tenuicostata*	(G.O. Sars, 1878)
		Oenopota	*declivis*	(Lovén, 1846)
		Oenopota	*elegans*	(Møller, 1842)
		Oenopota	*pingelii*	(Møller, 1842)
		Propebela	*angulosa*	(G.O. Sars, 1878)
		Propebela	*exarata*	(Møller, 1842)
		Propebela	*nobilis*	(Møller, 1842)
	Raphitomidae	*Cyrillia*	*aequalis*	(Jeffreys, 1867)
		Thesbia	*nana*	(Lovén, 1846)
	Drilliidae	*Spirotropis*	*confusa sarsi*	Warén, 1975

* Thorson (1941: 108) mentioned the presence of *Bela decussata* Couthouy, 1839 as common off the north and east coasts of Iceland [= "*Bela viridula* Møller" G.O. Sars, 1878 – tab. 16 fig. 7], species that Merkuljev (2017: 15) considers as *Curtitoma georgossiani*.

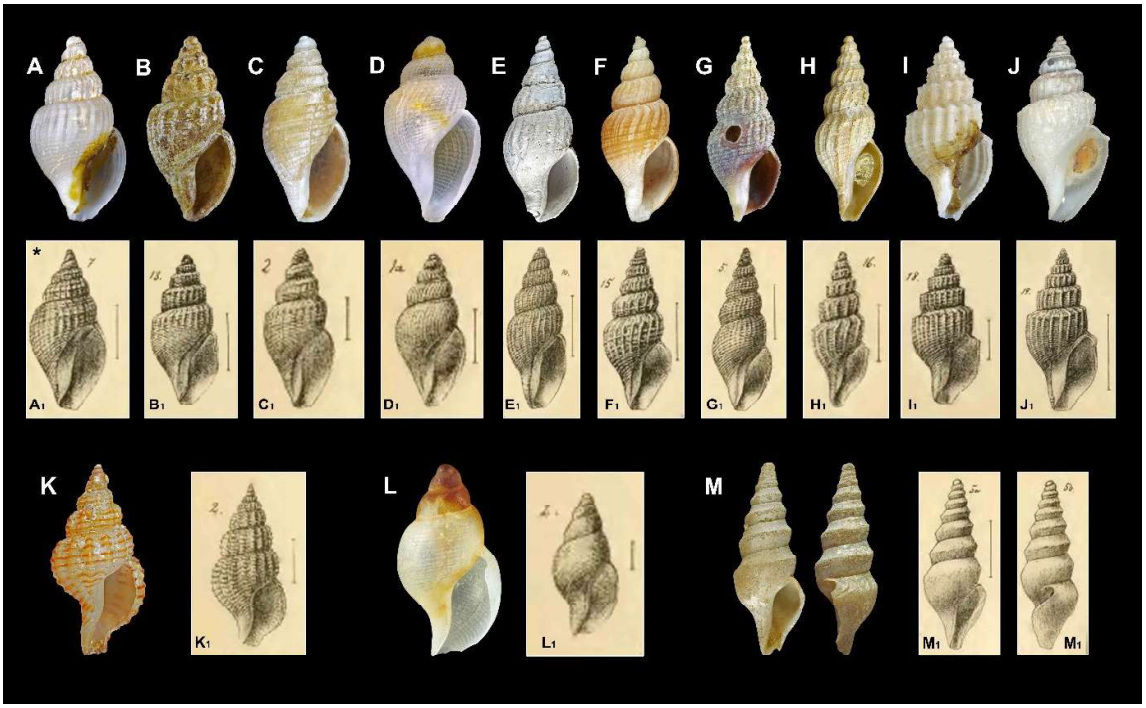

Figure 30. A–M. Conoidea. A-J. Mangeliidae. A. *Curtitoma decussata*. St. A4-2018-125, 222–187 m, 7.0 mm. B. *Curtitoma trevelliana*. St A4-2018-125, 222–187 m, 7.8 mm. C. *Curtitoma violacea*. St A5-2017-44, 240–212 m, 5.8 mm. D. *Oenopota tenuicostata*. St A3-2022-125, 220–202 m, 4.7 mm. E. *Oenopota declivis*. St B12-2017-1003, 22–21 m, 14.3 mm [plaice (*Pleuronectes platessa* Linnaeus, 1758)]. F. *Oenopota elegans*. St A3-2016-116, 198–214 m, 10.9 mm (haddock). G. *Oenopota pingelii*. St B12-2017-995, 31–29 m, 14.3 mm (dab). H. *Propebela angulosa*. St A5-2021-73, 166–148 m, 12.1 mm. I. *Propebela exarata*. St A4-2018-125, 222–187 m, 10.2 mm. J. *Propebela nobilis*. St A2-2015-90, 371–341 m, 16.2 mm. K–L. Raphitomidae. K. *Cyrillia aequalis*. St A3-2020-90, 75–71 m, 5.7 mm. L. *Thesbia nana*. St. A5-2021-45, 233–236 m, 3.7 mm (haddock). M. Drilliidae. *Spirotropis*

confusa sarsi. St A5-2017-44, 240–212 m, 16.8 mm. (A1–M1. Equivalent figures in G.O. Sars, 1878. A1–J1. As *Bela*. K1. As *Clathurella linearis*, M1. As *Spirotropis carinata*.)

Cephalaspidea (Fig. 31 A-J / Table 5) (Maps p. 118–120)

Apart from the Scaphandridae, *Scaphander lignarius* and *S. punctostriatus*, shells of 15 to 25 mm mentioned in another chapter, all the species reported here are small Cephalaspidea (Heterobranchia) (2 to 7 mm) living on the surface of the bottom, digging the sediments to find their prey: Cylichnidae, Diaphanidae, Eoscaphandridae (Cylichnoidea H. Adams & A. Adams, 1854) (Fig. 31 A–D) or even Laonidae, Philinidae and Scaphandridae [Philinoidea Gray, 1850 (1815)] (Fig. 31 E–J). All were collected from the digestive tract of haddock (*Melanogrammus aeglefinus*), long rough dab (*Hippoglossoides platessoides*) and dab [*Limanda limanda* (Linnaeus, 1758)], an ingenious way to obtain small molluscs buried in the sediment otherwise inaccessible with trawls. Some of these species have gizzard plates, others do not.

Table 5. Cephalaspidea caught 2013–2022

	Cylichnoidea	Cylichnidae	*Cylichna*	*alba*	(T. Brown, 1827)
		Diaphanidae	*Diaphana*	*hiemalis*	(Couthouy, 1839)
Cephalaspidea			*Diaphana*	*minuta*	(T. Brown, 1827)
		Eoscaphandridae	*Cylichnoides*	*occultus*	(Mighels & C.B. Adams, 1842)
	Philinoidea	Laonidae	*Laona*	*quadrata*	(S.V. Wood, 1839)
			Praephiline	*finmarchica*	(M. Sars, 1859)
			Retusophiline	*lima*	(T. Brown, 1827)
		Philinidae	*Hermania*	*scabra*	(O.F. Müller, 1784)

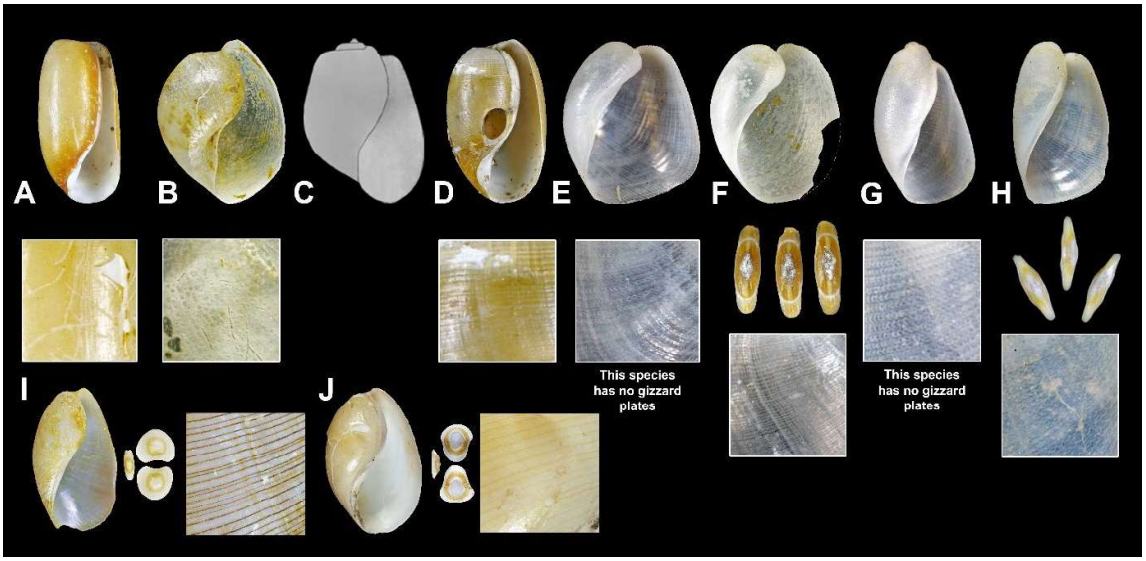

Figure 31. A–J. Cephalaspidea. A. *Cylichna alba*. St B12-2017-995, 31–29 m, 7.2 mm (dab). B. *Diaphana hiemalis*. St A3-2020-174, 184–133 m, 2.9 mm (haddock). C. *Diaphana minuta*. St A5-2021-74, 170–192 m, 1.6 mm (haddock). D. *Cylichnoides occultus*. St B12-2017-995, 31–29 m, 6.2 mm (dab). E. *Laona quadrata*. St D2-2015-15, 152–181 m, 5.6 mm (haddock). F. *Praephiline finmarchica*. St A5-2021-74, 170–192 m, 3.2 mm + gizzard plates (haddock). G. *Retusophiline lima*. St B12-2017-994, 43–39 m, 4.8 mm (dab). H. *Hermania scabra*. St D2-2015-15, 152–181 m, 4.4 mm + gizzard plates (haddock). I. *Scaphander lignarius*. St A5-2021-74, 170–192 m, 8.1 mm + gizzard plates (haddock). J. *Scaphander punctostriatus*. St A2-2015-82, 147–160 m, 28.3 mm + gizzard plates (haddock).

***Scaphander*'s meals can reveal happy surprises** (Fig. 32 A–D) (Map p. 120)

Scaphander lignarius (Linnaeus, 1758) and *Scaphander punctostriatus* (Mighels & C.B. Adams, 1842) are carnivorous burrowing Heterobranchia living on the surface of the soft bottom where they dig in the sediment in search of Foraminifera, Mollusca, Polychaeta with (or without) calcareous tubes and other small invertebrates. Their digestive tract has the particularity of having at the end of the oesophagus a gizzard (Fig. 32 A) serving to crush the calcareous envelope of their prey.

Among the 31 specimens of *S. lignarius* (collected between 120 to 300 m), 3 of them contained prey not yet crushed: one specimen of *Haliella stenostoma* (Jeffreys, 1858) (Gastropoda, Eulimidae parasite of Ophiuroidea) (Fig. 32 B) (Delongueville & Scaillet, 2014), one specimen of *Propebela angulosa* (G.O. Sars, 1878) (Gastropoda, Mangeliidae) (Fig. 32 C), and one specimen of *Crenella decussata* (Montagu, 1808) (Bivalvia, Mytilidae) (Fig. 32 D). Another specimen of *C. decussata* was found in a *S. punctostriatus* St A3-2016-106, 222–242 m, 2.7 mm (not photographed).

Taking advantage of this type of alimentary chain is one more technique we used to collect "small" shells without having the possibility of using a specific dredge.

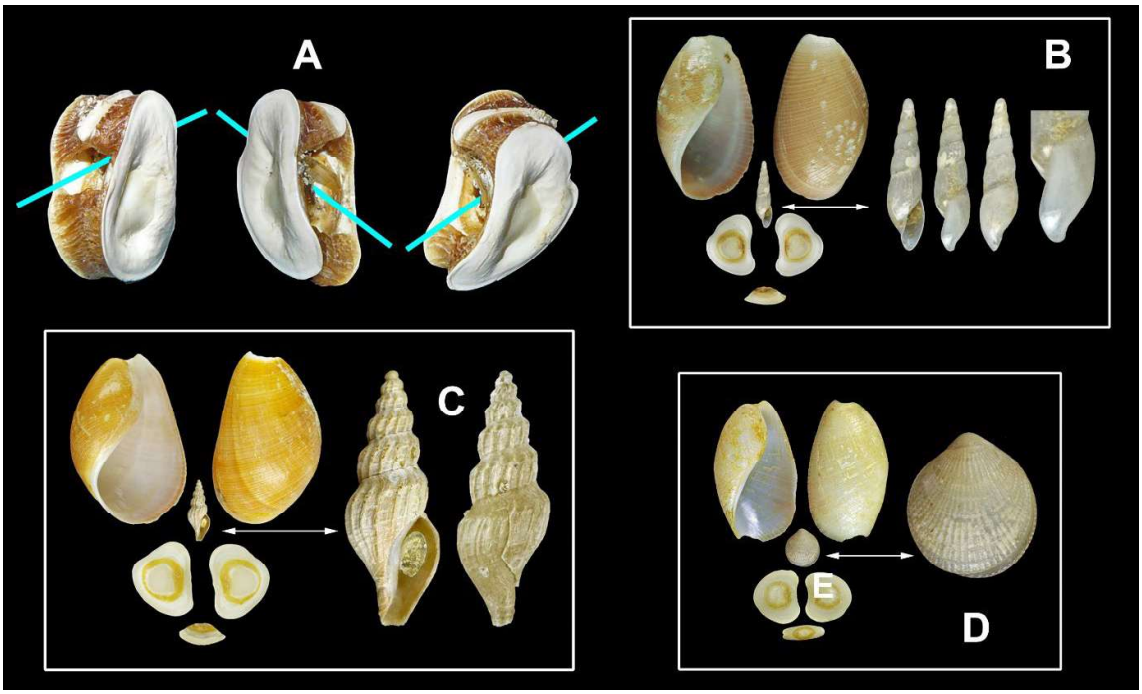

Figure 32. *Scaphander lignarius* and their prey. A Gizzard. B–D. Prey found in the gizzard with their relative sizes. B. *Haliella stenostoma*. St A3-2014-47, 249–251 m, 6.2 mm. C. *Propebela angulosa*. St A5-2021-73, 166–148 m, 12.1 mm. D. *Crenella decussata*. St A5-2021-74, 170–192 m, 2.4 mm.

Doridoxidae (Fig. 33 A–B) (Map p. 121)

Three specimens of a Nudibranchia from the deep-sea were caught at St A12-2018-600, 618–639 m. Based on the excellent iconography proposed by Valdes *et al*. (2017: 9, fig.8), the species was identified as *Doridoxa ingolfiana* Bergh, 1899, today considered as a junior synonym of *D. walteri* (A. Krause, 1892) (Korshunova & Martynov, 2020: 35).

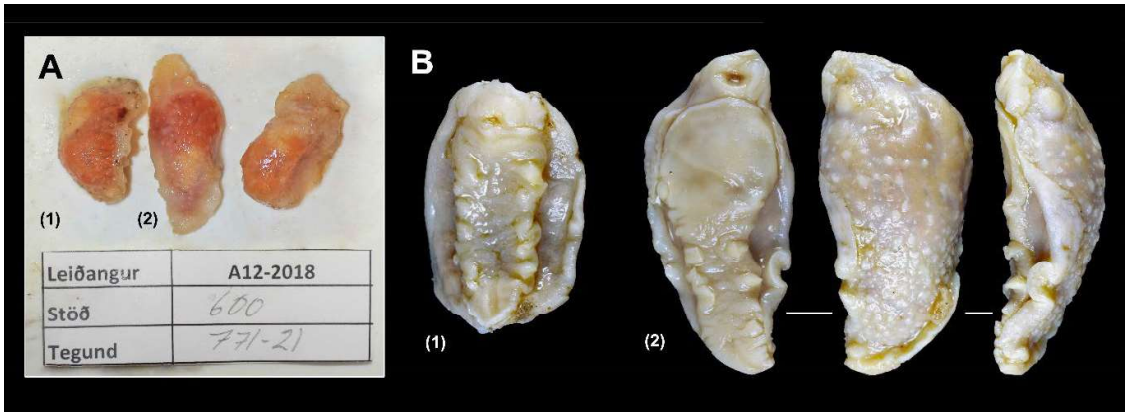

Figure 33. A–B. *Doridoxa walteri*. St. A12-2018-600, 618–639 m. A. Freshly defrosted specimens, notice the reddish colour. B. Aspect after alcoholic conservation. (1) 19.5 mm, ventral view. (2). 27.3 mm, dorsal, ventral, and lateral view.

Shallow-water Gastropoda (Fig. 34 A–C, Fig. 35 A–U / Table 6)

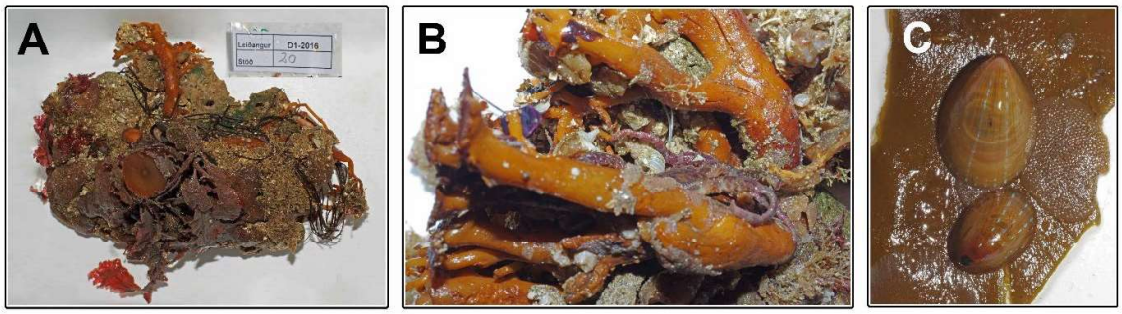

Figure 34. A–B. Kelp holdfast. St D1-2016-20, 21–21 m. A. Holdfast. B. Holdfast with *Boreotrophon truncatus*. C. Kelp with *Patella pellucida*. St B12-2017-953, 12–12 m.

During flat-fish campaigns shallow-water was prospected. Bryozoa, seaweed and kelp holdfast frequently accompanied the catches. Gastropods from many families living in this "biological" material were brought on board (Fig. 35 A–U).

Table 6. Shallow-water Gastropoda caught 2013–2022

Patellidae	*Patella*	*pellucida*	Linnaeus, 1758	Map p. 96
Lepetidae	*Iothia*	*fulva*	(O.F. Müller, 1776)	Map p. 96
	Lepeta	*caeca*	(O.F. Müller, 1776)	Map p. 96
Trochidae	*Steromphala*	*tumida*	(Montagu, 1803)	Map p. 98
Margaritidae	*Margarites*	*costalis*	(A. Gould, 1841)	Map p. 99
	Margarites	*groenlandicus*	(Gmelin, 1791)	Map p. 99
Colloniidae	*Moelleria*	*costulata*	(Møller, 1842)	Map p. 100
Littorinidae	*Lacuna*	*vincta*	(Montagu, 1803)	Map p. 102
	Littorina	*obtusata*	(Linnaeus, 1758)	Map p. 102
	Littorina	*palliata*	(Say, 1822)	Map p. 102
Rissoidae	*Obtusella*	*intersecta*	(S. V. Wood, 1857)	Map p. 102
	Onoba	*semicostata*	(Montagu, 1803)	Map p. 102
Velutinidae	*Velutina*	*velutina*	(O.F. Müller, 1776)	Map p. 104
Muricidae	*Boreotrophon*	*clathratus*	(Linnaeus, 1767)	Map p. 105
	Boreotrophon	*truncatus*	(Strøm, 1768)	Map p. 105
	Scabrotrophon	*fabricii*	(Møller, 1842)	Map p. 105
Nassariidae	*Tritia*	*incrassata*	(Strøm, 1768)	Map p. 113
Columbellidae	*Amphissa*	*acutecostata*	(R.A. Philippi, 1844)	Map p. 113
	Astyris	*rosacea*	(A. Gould, 1840)	Map p. 113
Cancellariidae	*Admete*	*viridula*	(O. Fabricius, 1780)	Map p. 114
Pyramidellidae	*Odostomia*	*turrita*	Hanley, 1844	Map p. 117

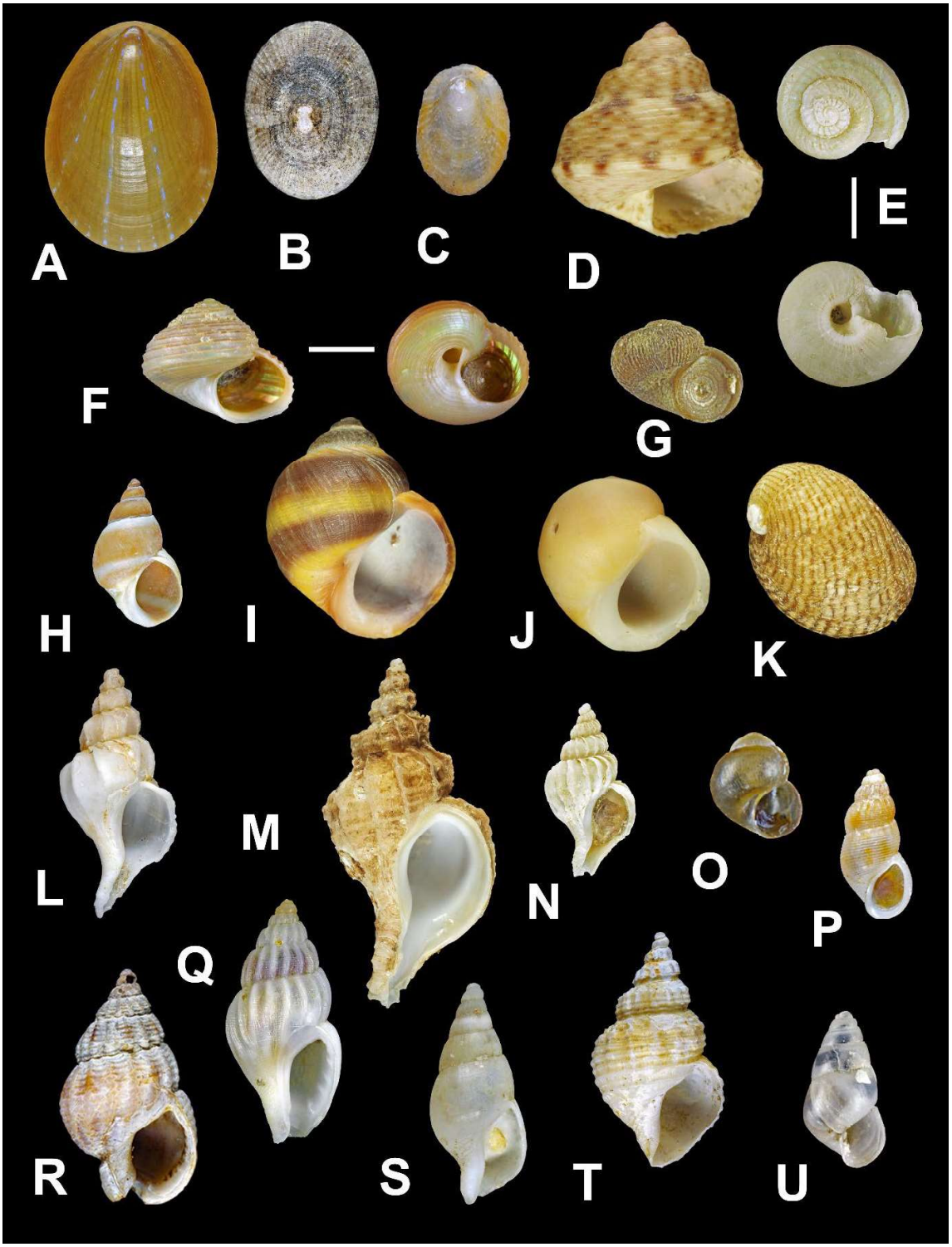

Figure 35. Shallow-water Gastropoda. A. *Patella pellucida*. St B12-2017-953, 12–12 m, 18.4 mm. B. *Lepeta caeca*. St D1-2016-12, 13–26 m, 7.5 mm. C. *Iothia fulva*. St A2-2015-56, 80–81 m, 3.7 mm. D. *Steromphala tumida*. St D1-2016-21, 12–9 m, 8.8 mm. E. *Margarites costalis*. St B9-2019-705, 39–31 m, 3.8 mm. F. *M. groenlandicus*. St B12-2017-978, 24–28 m, 5.1 mm. G. *Moelleria costulata*. St D1-2016-15, 23–45 m, 1.8 mm (enlarged). H. *Lacuna vincta*. St D1-2016-20, 21–21 m, 9.0 mm. I. *Littorina obtusata (palliata)*. St D1-2016-21, 12–9 m, 13.3 mm. J. *L. obtusata*. St D1-2016-28, 16–28 m, 11.7 mm. K. *Velutina velutina*. St D1-2016-15, 23–45 m, 6.3 mm. L.

Boreotrophon clathratus. St D1-2016-15, 23-45 m, 17.3 mm. M. *Scabrotrophon fabricii*. St A3-2014-34, 69–95 m, 27.0 mm. N. *Boreotrophon truncatus*. St D1-2016-20, 21–21 m, 8.0 mm. O. *Obtusella intersecta*. St D1-2016-15, 23–45 m, 0.9 mm (enlarged). P. *Onoba semicostata*. St D1-2016-15, 23–45 m, 2.8 mm (enlarged). Q. *Amphissa acutecostata*. St B12-2017-914, 75–74 m, 9.8 mm. R. *Tritia incrassata*. St A3-2014-34, 69–95m, 10.3 mm. S. *Astyris rosacea*. St A3-2020-90, 75–71 m, 8.3 mm. T. *Admete viridula*. St. B12-2017-987, 46–49 m, 10.9 mm. U. *Odostomia turrita*. St D1-2016-15, 23–45 m, 2.4 mm (enlarged).

Digestive tract content of haddock and long rough dab (Fig. 36 A–B, Fig. 37 A–F / Table 7)

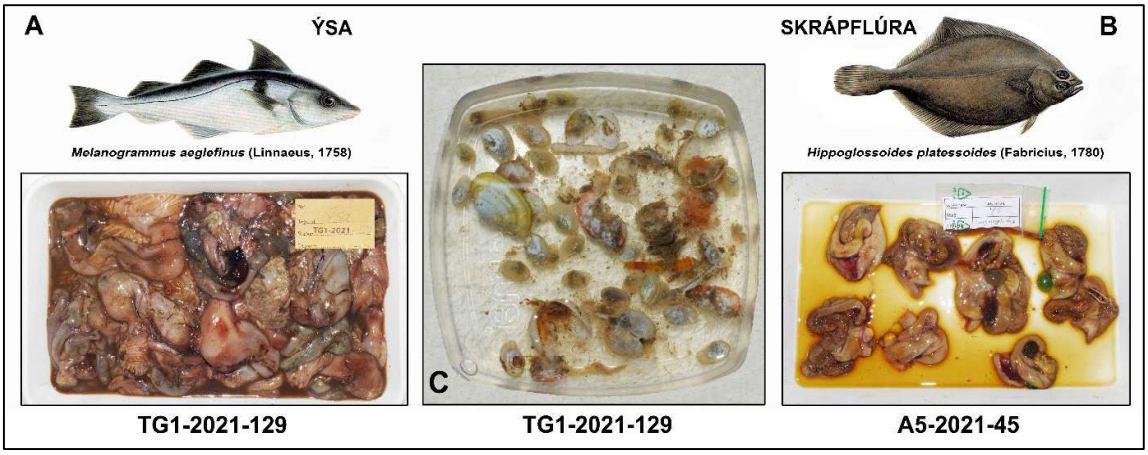

Figure 36. A. Digestive tracts of haddock. B. Digestive tracts of long rough dab. C. Example of recovered molluscs from digestive tracts.

Haddock (Fig. 36 A) and long rough dab (LRD) (Fig. 36 B) (Jónsson & Pálsson, 2013: 266, 439) feed mainly by grazing and plowing the sediments on the seafloor in search of their prey, polychaetes, small crustaceans, echinoderms, molluscs (among other animals) as their stomach contents demonstrate (Fig. 36 C as an example among others). By experience, we have learned that it is more productive to take the entire digestive tract rather than stomachs only. This method almost doubles the number of mollusc specimens found. In many cases the stomach is already empty while many molluscs or at least their shells are still in transit in the intestine.

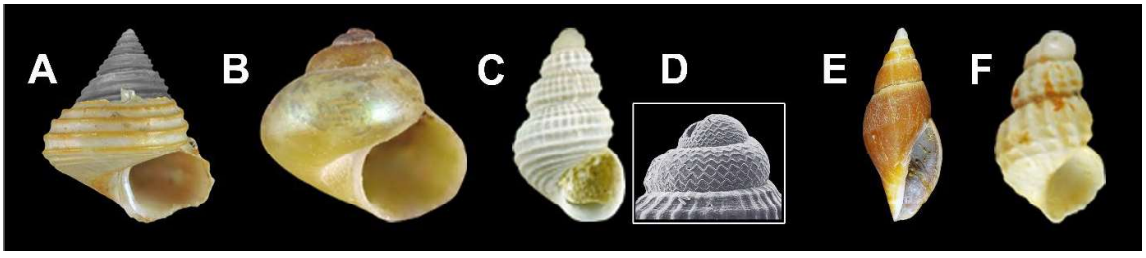

Figure 37. A–F. Some Gastropoda found in digestive tract of fish. A. *Calliostoma occidentale*. St A3-2022-189, 136–142 m, +/- 12.0 mm. B. *Margarites olivaceus*. St A3-2022-125, 220–202 m, 3.3 mm. C–D. *Alvania jeffreysi*. C. St. A5-2021-28, 202–204 m, 2.4 mm. D. *A. jeffreysi*, protoconch in Bouchet & Warén 1993: 629, fig. 1396. E. *Volutomitra groenlandica*. St A2-2015-53, 112–107 m, 18.4 mm. F. *Chrysallida hoeisaeteri*. St A5-2021-28, 202–204 m, 1.3 mm.

Over the 10 years studied, 107 species of Gastropoda were identified from MFRI cruises of which 81 were found in trawl (= 76%) and 26 additional (24%) in fish digestive tracts (Table 7).

Table 7. Additional Gastropoda species caught in digestive tract of fishes 2013–2022

Calliostomatidae	*Calliostoma*	*occidentale*	(Mighels & C.B. Adams, 1842)	Map p. 98
Margaritidae	*Margarites*	*groenlandicus*	(Gmelin, 1791)	Map p. 99
	Margarites	*olivaceus*	(T. Brown, 1827)	Map p. 99
Trochidae	*Steromphala*	*tumida*	(Montagu, 1803)	Map p. 98
Littorinidae	*Littorina*	*obtusata*	(Linnaeus, 1758)	Map p. 102
	Littorina	*obtusata palliata*	(Say, 1822)	Map p. 102
Capulidae	*Ariadnaria*	*conica*	(Møller, 1842)	Map p. 103
Rissoidae	*Alvania*	*jeffeysi*	(E. Waller, 1864)	Map p. 102
Volutomitridae	*Volutomitra*	*groenlandica*	(Møller, 1842)	Map p. 114
Drilliidae	*Spirotropis*	*confusa sarsi*	Warén, 1975	Map p. 115
Mangeliidae	*Oenopota*	*declivis*	(Lovén, 1846)	Map p. 116
	Oenopota	*elegans*	(Møller, 1842)	Map p. 116
	Oenopota	*pingelii*	(Møller, 1842)	Map p. 116
	Oenopota	*tenuicostata*	(G.O. Sars, 1878)	Map p. 116
Raphitomidae	*Cyrillia*	*aequalis*	(Jeffreys, 1867)	Map p. 117
	Thesbia	*nana*	(Lovén, 1846)	Map p. 117
Cylichnidae	*Cylichna*	*alba*	(T. Brown, 1827)	Map p. 118
Diaphanidae	*Diaphana*	*hiemalis*	(Couthouy, 1839)	Map p. 118
	Diaphana	*minuta*	T. Brown, 1827	Map p. 118
Eoscaphandridae	*Cylichnoides*	*occultus*	(Mighels & C.B. Adams, 1842)	Map p. 119
Laonidae	*Laona*	*quadrata*	(S.V. Wood, 1839)	Map p. 119
	Retusophiline	*lima*	(T. Brown, 1827)	Map p. 119
Philinidae	*Hermania*	*scabra*	(O.F. Müller, 1784)	Map p. 120
Limacinidae	*Limacina*	*retroversa*	(J. Fleming, 1823)	Map p. 121
Pyramidellidae	*Chrysallida*	*hoeisaeteri*	Warén, 1991	Map p. 117
	Ondina	*divisa*	(J. Adams, 1797)	Map p. 117

Volutopsius norwegicus photographed at 594 m depth on the Greenland-Iceland Ridge during the BENCHMARK survey on R/V G.O. Sars in 2021. The BENCHMARK project is a collaboration between MFRI, Greenland Institute of Natural Resources (GINR) and the Zoological Society of London (UK, ZLS), funded by the EUROFLEETS+.

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Chapter II - Bivalvia

Digestive tract content of haddock (Fig. 36 A) **and long rough dab** (Fig. 36 B / Table 8)

Over the 10 years studied, 82 species of Bivalvia were identified from MFRI cruises of which 57 were found in trawl (= 70%) and 25 additional (30%) in fish digestive tracts (Table 8).

Table 8. Additional Bivalvia species caught in digestive tract of fishes 2013–2022

Yoldiidae	*Yoldiella*	*intermedia*	(M. Sars, 1865)	Map p. 79
	Yoldiella	*lucida*	(Lovén, 1846)	Map p. 79
	Yoldiella	*nana*	(M. Sars, 1865)	Map p. 79
Nuculidae	*Ennucula*	*corticata*	(Møller, 1842)	Map p. 78
	Nucula	*tumidula*	Malm, 1861	Map p. 78
Limopsidae	*Limopsis*	*minuta*	(R.A. Philippi, 1836)	Map p. 80
Propeamussiidae	*Cyclopecten*	*hoskynsi*	(Forbes, 1844)	Map p. 84
	Similipecten	*greenlandicus*	(G.B. Sowerby II, 1842)	Map p. 84
	Similipecten	*similis*	(Laskey, 1811)	Map p. 84
Limidae	*Limatula*	*gwyni*	(Sykes, 1903)	Map p. 85
	Limea	*crassa*	(Forbes, 1844)	Map p. 85
Mytilidae	*Dacrydium*	*ockelmanni*	Mattson & Warén, 1977	Map p. 81
	Dacrydium	*vitreum*	(Möller, 1842)	Map p. 81
	Musculus	*discors*	(Linnaeus, 1767)	Map p. 82
Cardiidae	*Goethemia*	*elegantula*	(Møller, 1842)	Map p. 88
Lasaeidae	*Montacuta*	*substriata*	(Montagu, 1808)	Map p. 87
	Tellimya	*ferruginosa*	(Montagu, 1808)	Map p. 87
	Tellimya	*tenella*	(Lovén, 1846)	Map p. 87
Thyasiridae	*Axinopsida*	*orbiculata*	(G.O. Sars, 1878)	Map p. 86
	Mendicula	*ferruginosa*	(Forbes, 1844)	Map p. 86
	Thyasira	*gouldii*	(R.A. Philippi, 1845)	Map p. 86
	Thyasira	*obsoleta*	(Verrill & K.J. Bush, 1898)	Map p.86
Psammobiidae	*Gari*	*fervensis*	(Gmelin, 1791)	Map p. 89
Semelidae	*Abra*	*nitida*	(O.F. Müller, 1776)	Map p. 90
	Abra	*prismatica*	(Montagu, 1808)	Map p. 90

Nuculida and Nuculanida (Fig. 38 A–I / Table 9) (Maps p. 78–79)

Table 9. Nuculida and Nuculanida caught 2013–2022

Nuculida	Nuculidae	*Ennucula*	*corticata*	(Møller, 1842)
		Ennucula	*tenuis*	(Montagu, 1808)
		Nucula	*tumidula*	Malm, 1861
Nuculanida	Nuculanidae	*Nuculana*	*minuta*	(O.F. Müller, 1776)
		Nuculana	*pernula*	(O.F. Müller, 1779)
	Yoldiidae	*Yoldia*	*hyperborea*	(A. Gould, 1841)
		Yoldiella	*intermedia*	(M. Sars, 1865)
		Yoldiella	*lucida*	(Lovén, 1846)
		Yoldiella	*nana*	(M. Sars, 1865)

Yoldia hyperborea (large species, up to 50 mm) (Fig. 38 F) was collected by trawl in shallow-water (10–120 m) with one exception, a juvenile specimen found in the stomach of a dab. *Nuculana minuta* (Fig. 38 D), *N. pernula* (Fig. 38 E), and *Ennucula tenuis* (Fig. 38 B) (medium size species also collected by trawl) were mostly found in stomach of dab and plaice caught between 14 and 75 m. All the other members of the group were found in the digestive tract of haddock and LRD fished in deeper water (150–300 m): *Ennucula corticata* (Fig. 38 A) (2 records), *Nucula tumidula* (Fig. 38 C) (1 record), *Yoldiella intermedia* (Fig. 38 G) (1 record), *Y. nana* (Fig. 38 H) (few records), and *Y. lucida* (Fig. 38 I) (several records).

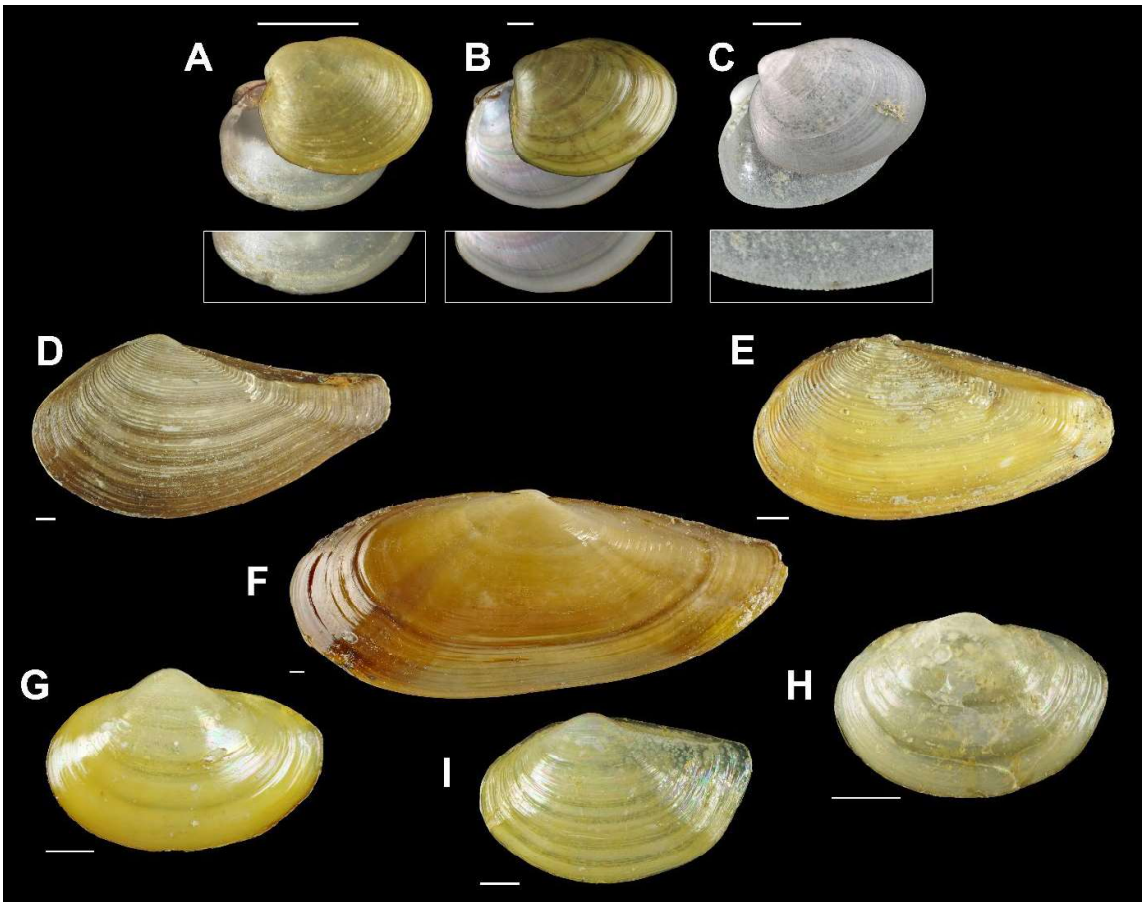

Figure 38 A–I. Protobranchia. A. *Ennucula corticata* (smooth margin). St A5-2017-44, 240–212 m, 3.0 mm (haddock). B. *Ennucula tenuis* (smooth margin). St D1-2016-17, 20–20 m, 6.6 mm (plaice). C. *Nucula tumidula* (crenulated margin). St A5-2021-28, 202–204 m, 3.4 mm (haddock). D. *Nuculana minuta*. St B12-2017-982, 64–56 m, 21.1 mm. E. *Nuculana pernula*. St D4-2014-52, 188–175 m, 13.9 mm (haddock). F. *Yoldia hyperborea*. St A4-2018-100, 113–118 m, 41.2 mm. G. *Yoldiella intermedia*. St TG1-2021-129, 187–164 m, 6.1 mm (haddock). H. *Yoldiella nana*. St A5-2021-74, 170–192 m, 4.1 mm (haddock). I. *Yoldiella lucida*. St A5-2021-74, 170–192 m, 7.0 mm (haddock). (Scale bar 1 mm).

Arcida (Fig. 39 A–E / Table 10) (Maps p. 80)

Table 10. Arcida caught 2013–2022

Arcida	Arcidae	*Asperarca*	*nodulosa*	(O.F. Müller, 1776)
		Bathyarca	*frielei*	(Friele, 1877)
		Bathyarca	*glacialis*	(J.E. Gray, 1824)
		Bathyarca	*pectunculoides*	(Scacchi, 1835)
	Limopsidae	*Limopsis*	*minuta*	(R.A. Philippi, 1836)

Asperarca nodulosa (Fig. 39 B) is mainly found on coral debris (*Desmophyllum pertusum*) or stones collected between 400 and 700 m. At similar depths (400–950 m), the trawl brought back *Bathyarca fielei* (Fig. 39 C). *Bathyarca pectunculoides* (Fig. 39 D) caught around 400–500m is a species resembling the previous one but much smaller and of somewhat different shape, with a less dense periostracum (it is also found in the stomachs of haddock fished between 150 and 300 m). Finally, many specimens of *Bathyarca glacialis* (Fig. 39 E) were collected around 350–500 m and a loose valve of *Limopsis minuta* (Fig. 39 A) was found in a stomach of haddock fished at 202–204 m.

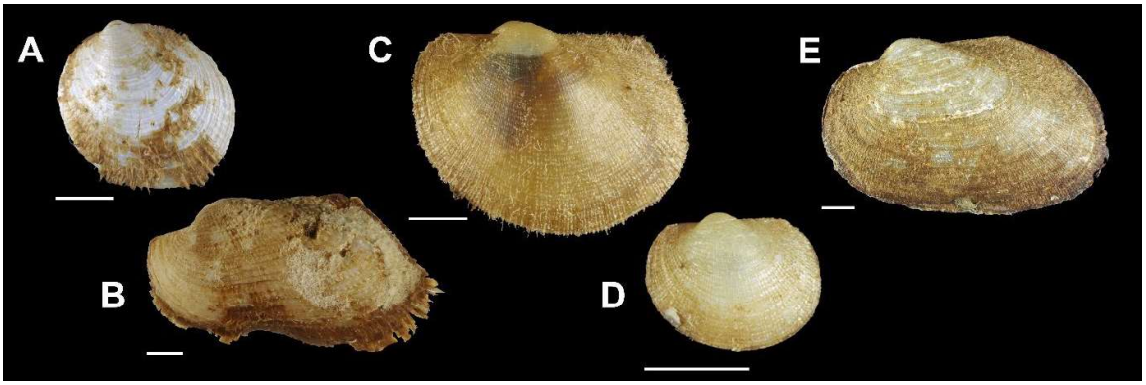

Figure 39. A. *Limopsis minuta.* St A5-2021-28, 202–204 m, 7.0 mm (haddock). B *Asperarca nodulosa*. A3-2014-23, 375–405 m, 14.4 mm. C. *Bathyarca frielei*. St A11-2016-640, 945–920 m, 10.6 mm. D. *Bathyarca pectunculoides*. St A3-2014-28, 118–107 m, 3.5 mm (haddock). E. *Bathyarca glacialis*. St A3-2014-67, 344–374 m, 21.0 mm. (Scale bar 2 mm)

Mytilidae (Fig. 40 A–J / Table 11) (Maps p. 81–82)

Table 11. Mytilidae caught 2013–2022

Mytilidae	*Crenella*	*decussata*	(Montagu,1808)
	Dacrydium	*ockelmanni*	Mattson & Warén, 1997
	Dacrydium	*vitreum*	(Möller, 1842)
	Idas	cf. *cylindricus*	Pelorce & Poutiers, 2009
	Modiolula	*phaseolina*	(R.A. Philippi, 1844)
	Modiolus	*modiolus*	(Linnaeus, 1758)
	Musculus	*discors*	(Linnaeus, 1767)
	Musculus	*laevigatus*	(J.E. Gray, 1824)
	Musculus	*niger*	(J.E. Gray, 1824)
	Mytilus	*edulis*	Linnaeus, 1758

Ten species of Mytilidae were caught during the 25 cruises, from the smallest found in the digestive tracts of fish [*Crenella decussata* (Fig. 40 E), *Dacrydium vitreum* (Fig. 40 B), *D. ockelmanni* (Fig. 40 C), and *Musculus discors* (Fig. 40 G)] to the largest, survivors of the trawls [*Modiolula phaseolina* (Fig. 40 F), *Idas* cf. *cylindricus* (Fig. 40 D), *Musculus laevigatus* (Fig. 40 H), *Mytilus edulis* (Fig. 40 J), *Musculus niger* (Fig. 40 I), and *Modiolus modiolus* (Fig. 40 A)].

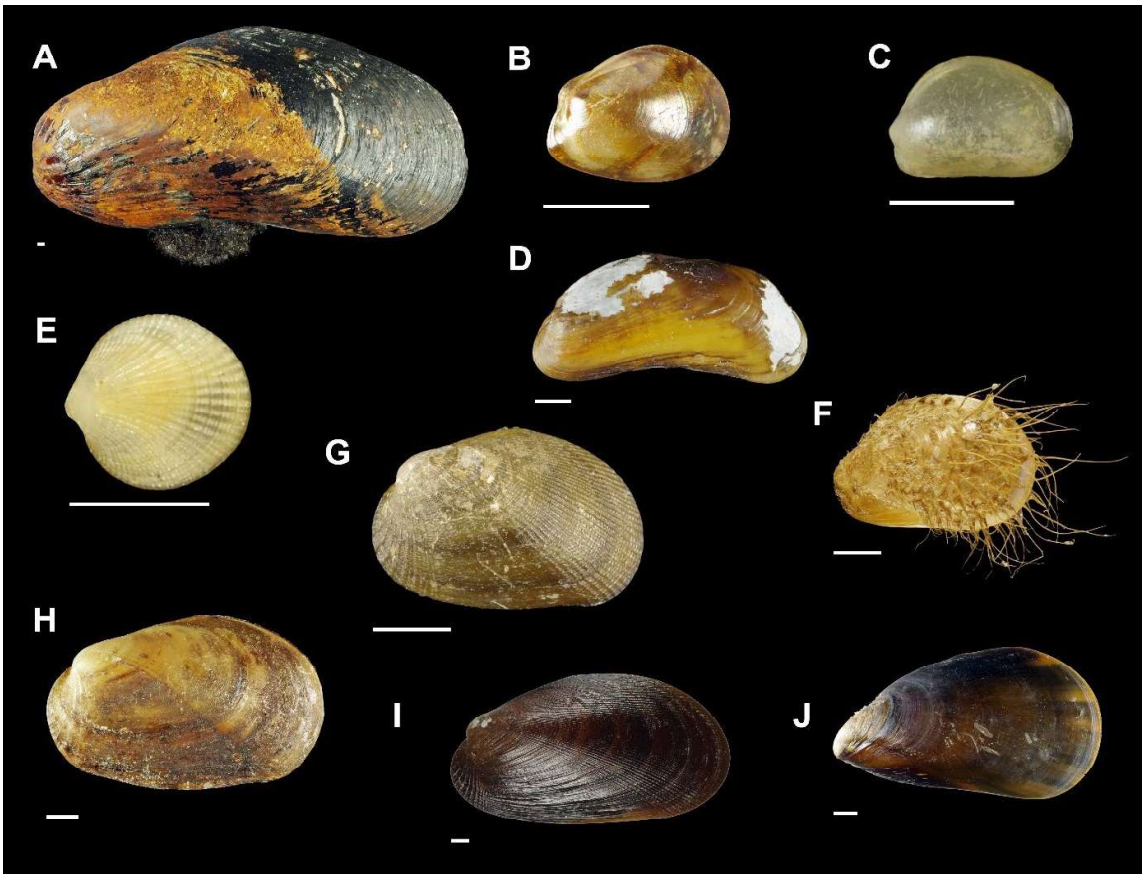

Figure 40. A. *Modiolus modiolus*. St B9-2019-719, 35–31 m, 124.0 mm. B. *Dacrydium vitreum*. St A5-2021-45, 233–236 m, 3.7 mm (haddock). C. *Dacrydium ockelmanni*. St A3-2014-27, 266–296 m, 2.9 mm (haddock). D. *Idas* cf. *cylindricus*. St D4-2014-53, 188–211 m, 17.3 mm (on cetacean bone). E. *Crenella decussata*. St A3-2016-106, 222–242 m, 2.7 mm (gizzard of *Scaphander punctostriatus*). F. *Modiolula phaseolina*. St A3-2014-40, 210–215 m, 9.8 mm (trawl). G. *Musculus discors*. St B12-2017-994, 43–39 m, 7.1 mm (flat fish). H. *Musculus laevigatus*. St A3-2014-92, 44–17 m, 19.9 mm (trawl). I. *Musculus niger*. St B12-2017-982, 64–56 m, 35.2 mm (trawl). J. *Mytilus edulis*. St D1-2016-20, 21–21 m, 24.6 mm (trawl). (Scale bar 2 mm)

A toothed whale bone colonized by *Idas* cf. *cylindricus* (Fig. 41 A–F) (Map p. 81)

Five species of Mytilidae belonging to the subfamily Bathymodiolinae Kenk & B.R. Wilson, 1985 are known in the Northeastern Atlantic in association with organic material such as sunken wood (*Idas argenteus* Jeffreys, 1876 and *I. lamellosus* Verrill, 1882) or sunken cetacean “whale” blubber, or cetacean bones [*Adipicola pelagica* (Forbes, 1854), *I. cylindricus* Pelorce & Poutiers, 2009, *Nypamodiolus simpsoni* (J.T. Marshall, 1900)] on which they feed with the help of chimiosymbiotic bacteria. Some of them living in European waters were reviewed by Warén (1991: 115–118).

An Odontoceti bone was brought on board at St D4-2014-53, 188–211 m (Fig. 41 A–B). Five specimens identified as *Idas* cf. *cylindricus* were collected (Delongueville & Scaillet, 2019b) (specimen 1 out of 5, Fig. 41 E, specimen 2 out of 5, Fig. 41F). Four specimens were attached to the bone by their byssus composed of a few fine filaments (Fig. 41 C) and a fifth specimen was inserted into a foramen of the bone (Fig. 41 D). Since this capture in 2014, no other cetacean bones were collected. We use *Idas* cf. *cylindricus*, considering that Pelorce & Poutiers (2009: 976) described the species based on Mediterranean specimens and that Nolf & Kreps (2011: 2) mentioned its presence in the Bay of Biscay.

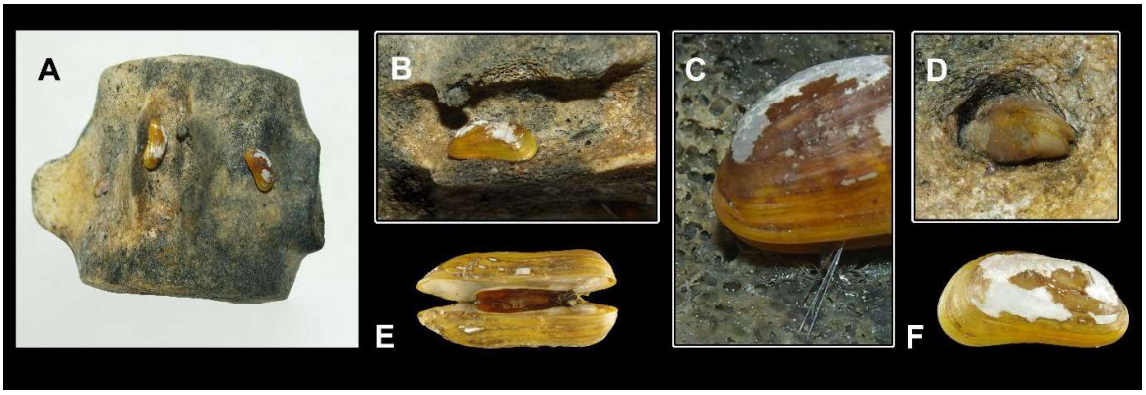

Figure 41. A. *Idas* cf. *cylindricus*. St D4-2014-53, 188–21 m. Odontoceti bone (9.6 cm) with 3 apparent specimens of *Idas*. B–C. Specimens attached to the bone by their byssus. D. Specimen inserted in a foramen of the bone. E. Specimen 1 out of 5, 17.3 mm, internal view showing the enlarged ligament. F. Specimen 2 out of 5, 16.2 mm.

Dacrydium vitreum* and *Dacrydium ockelmanni (Fig. 42 A–C) (Map p. 81)

Particular attention should be paid to specimens of *Dacrydium*, which in Iceland belong to three different sympatric but also syntopic species (Salas & Gofas, 1997: 266): *Dacrydium vitreum* (Möller, 1842) (Fig. 42 A–B), *Dacrydium ockelmanni* Mattson & Warén, 1977 (Fig. 42 C) and *Dacrydium viviparum* Ockelmann, 1983 (not illustrated). They differ in various characteristics of the shape of the shell. *D. vitreum,* unlike *D. Ockelmanni*, is plump, with a prominent and broadly rounded anteroventral region, a slightly convex ventral margin, umbones located above the horizontal midline and presence on the early teleoconch of a microsculpture made of fine concentric striae and minute radial threads often difficult to see with light microscopy. This last characteristic is particularly well illustrated by Salas & Gofas (1997: 264, fig. 6). This radial microsculpture is absent from *D. ockelmanni*. *D. vitreus* lives in Western, Northern, and Eastern Iceland (depth range usually 5–200 m), *D. ockelmanni* was found in Southern Iceland (depth range 40–400 m) and along the Reykjanes Ridge (depth range 200–400 m) (Warén, 1991: 115).

Figure 42. A-B. *Dacrydium vitreum*. A. St. A5-2021-45, 233–236 m, 3.7 mm (haddock). B. St A3-2022-78, 250–270 m, 3.1 mm (LRD). C. *Dacrydium ockelmanni*. St A3-2014-27, 266–296 m, 2.9 mm (haddock). (Scale bar 1 mm)

Musculus laevigatus (Fig. 43 A–C) **and *Musculus discors*** (Fig. 40 G) (Map p. 82)

M. laevigatus (J.E. Gray, 1824) is not accepted as a valid name in WoRMS, where it is considered as a synonym of *M. discors* (Linnaeus, 1767). Some questions regarding the classification are yet unanswered, and the discussion remains open, as this taxonomic update from WoRMS underlines: "*There has been quite a lot of discussion about the systematics and nomenclature of* M. discors*, especially concerning the status of* Mytilus discors *Linnaeus, 1767 s.s.,* Modiola laevigata *Gray, 1824,* Modiola substriata *Gray, 1824 and* Modiolaria corrugata *Stimpson, 1851. Sometimes, all these forms are considered as independent species. But frequently, one or more of these species can be seen as a variety or a subspecies, especially* Musculus discors*. Until now, there is no good solution for this problem."* (http://www.marinespecies.org/aphia.php?p=taxdetails&id=140472 13.02.2021).
We use *M. laevigatus* for the phenotype showing a smooth posterior end (Fig. 43 A) and *M. discors* for the one with a striated posterior end (Fig. 40 G). Similar phenotypes of *M. laevigatus* appear in Greenland (Fig. 43 B) and Svalbard too (Fig. 43 C).

Figure 43. *Musculus laevigatus*. A. St A3-2014-92, 44–17 m, 19.9 mm. B. Amitsivartik (East Greenland), 17.7 mm. C. Longyearbyen (Spitsbergen, Svalbard, Norway), 25.4 mm. (Scale bar 5 mm)

Limidae (Fig. 44 A–C, Fig. 45) (Map p. 85)

Two broken loose valves of the very small shell *Limea crassa* (Forbes, 1844) (Fig. 44 A) were collected once in a haddock stomach fished at 202–204 m (Western Iceland, St A5-2021-28). The maximum size for this species living in deep-water from 100 to 3500 m is 4.0 mm (Madsen, 1949: 40–41). *Limatula gwyni* (Sykes, 1903) was also found in haddock stomachs in Southern, Western, and Northern Iceland (Fig. 44 B).

Acesta excavata (J.C. Fabricius, 1779) (Fig. 44 C) was occasionally trawled between 250 and 1000 m in the coral reef area on the western continental slope of the island. It is the largest bivalve for Iceland, the largest specimen collected by the MFRI trawlers measured 160.0 mm (St TL2-2014-43, 676–596 m), which is certainly not the maximum size that this species can reach.

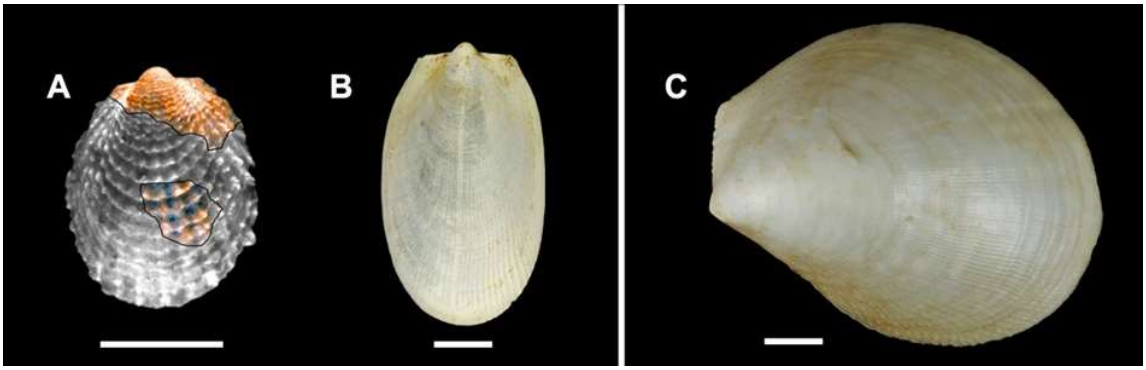

Figure 44. A. *Limea crassa*. Fragments from St A5-2021-28, 202–204 m (haddock) 4.0 mm. B. *Limatula gwyni*. St D4-2014-52, 188–175 m, 9.2 mm (haddock). (A–B. scale bar 2 mm) C. *Acesta excavata*. St A10 -2013-568, 489–477 m, 135.0 mm. (C. scale bar 20 mm)

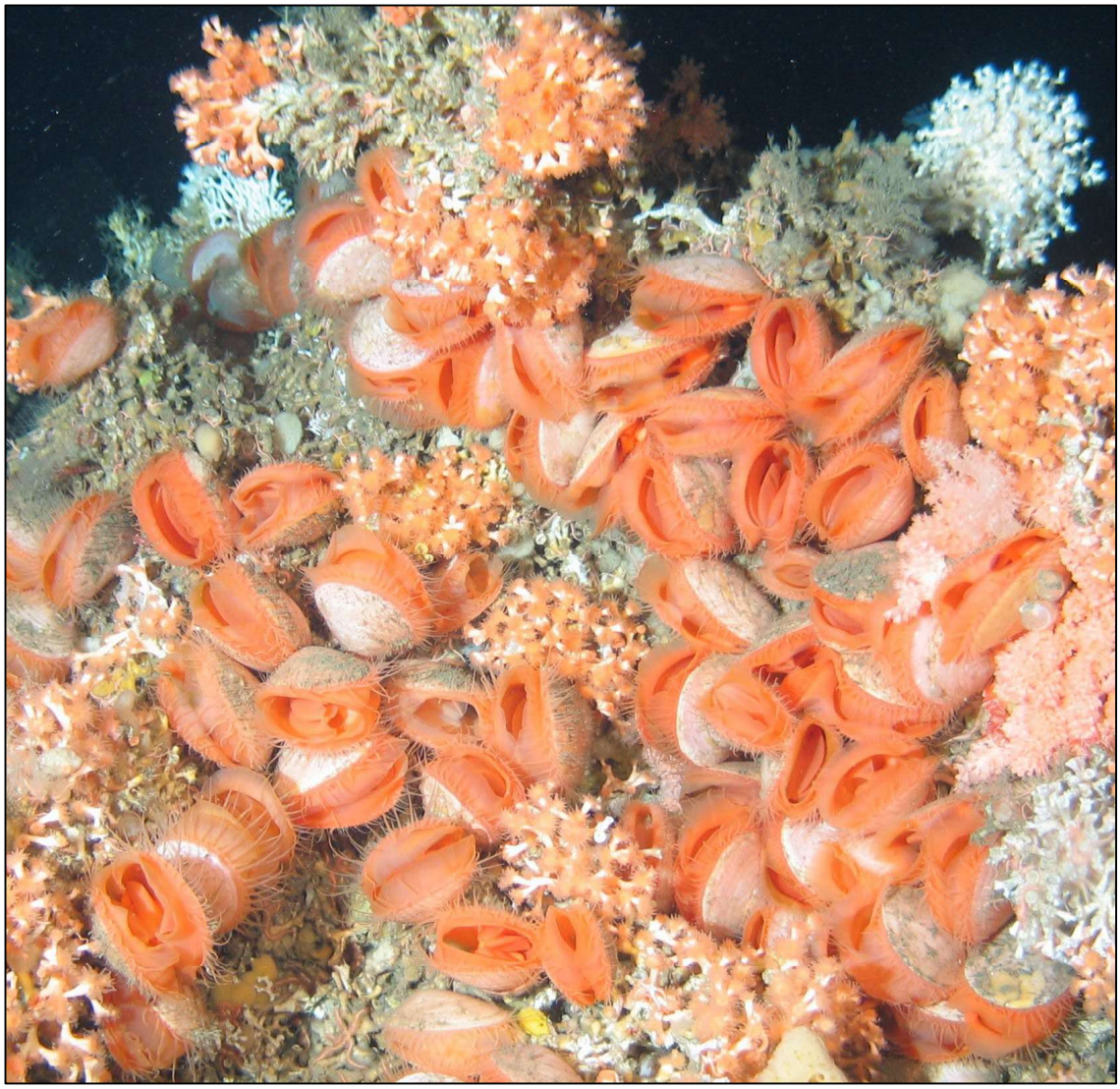

Figure 45. *Acesta excavata* alive in coral reef (Picture MFRI)

Pectinida (Table 12)

The analysis of the samples collected between 1992 and 2006 as part of the collaborative research program on collecting and identifying benthic invertebrates around Iceland (BIOICE) revealed the presence of 17 Pectinoidea species around the island (Dijkstra *et al*. 2009: 207). MFRI cruises brought on board 10 of these 17 species and one species of Anomiidae (Table 12) during the 10 years of campaigns.

Pectinidae (Figs 46 A–B, 47 A–B, 48 A–E, 49 A–G) (Maps p. 82–84)

Table 12. Pectinoidea caught 2013–2022

	Pectinidae	*Chlamys*	*islandica*	(O.F. Müller, 1776)
		Delectopecten	*vitreus*	(Gmelin, 1791)
		Karnekampia	*sulcata*	(O.F. Müller, 1776)
		Palliolum	*striatum*	(O.F. Müller, 1776)
		Palliolum	*tigerinum*	(O.F. Müller, 1776)
Pectinoidea		*Pseudamussium*	*peslutrae*	(Linnaeus, 1771)
	Propeamussiidae	*Catillopecten*	*eucymatus*	(Dall, 1898)
		Cyclopecten	*hoskynsi*	(Forbes, 1844)
		Similipecten	*greenlandicus*	(G.B. Sowerby II, 1842)
		Similipecten	*similis*	(Laskey, 1811)
	Anomiidae	*Heteranomia*	*squamula*	(Linnaeus, 1758)

The two large species, *Chlamys islandica* (Fig. 48 A) and *Pseudamussium peslutrae* (Fig. 48 B–E) were both caught by trawl between 10 and 300 m mainly in Northwestern Iceland for the first, and between 160 and 700 m all along the continental slope west of Iceland for the second. The latter presented very beautiful variations of shape, sculpture and colour, as illustrated in Fig. 48 B–E.

Karnekampia sulcata (Fig. 49 C–E) was frequently caught between 200 and 600 m in *Desmophyllum pertusum* reefs on the western continental slope of the country. The colour of the specimens varied from white to yellow and from yellow to red.

Delectopecten vitreus (Figs 46 A–B, 47 A–B, 49 A–B) was found at greater depths (between 300 to 1300 m) attached to coral debris, on Porifera (Fig. 46 A), or even on ghost fishing nets (Fig. 46 B).

Figure 46. *Delectopecten vitreus*. A. St A10-2013-538, 1330–1312 m, 14.5 mm. B. St A15-2021-467, 1013–981 m, 20.9 mm.

The sculpture of the valves is subject to large variation, from relatively smooth (Fig. 47 B–B1) to entirely covered with commarginal rows of small vesicles (Fig 47 A–A1).

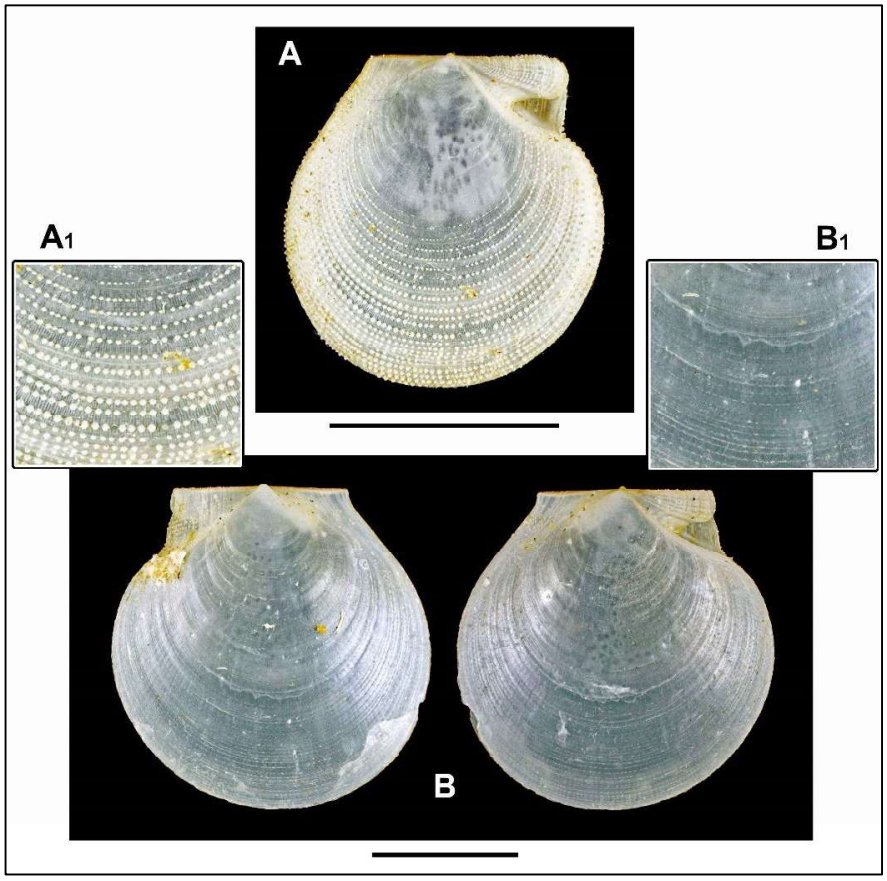

Figure 47. *Delectopecten vitreus*. A–A1. St A10-2013-538, 1330–1312 m, 14.5 mm. B–B1. St A15-2021-467, 1013–981 m, 20.9 mm. (Scale bar 10 mm)

Among others, *Palliolum striatum* (Fig. 49 F) was collected in cod stomach (*Gadus morhua* Linnaeus, 1758) (St A13-2017-634, 338–330 m) and *Palliolum tigerinum* (Fig. 49 G) in haddock stomach (St A3-2014-28, 118–107 m).

Propeamussiidae (Fig. 50 A-F) (Map p. 84)

Shell like *Catillopecten eucymatus* (deep-water species) (Fig. 50 A) and *Similipecten greenlandicus* (Fig. 50 E–F) are very fragile. According to Dijkstra *et al*. (2009: 209) "*this has given many authors the impression that the right valve is smaller than the left one, but they are actually rather much the same size, but the contraction when preserved causes the margin of the right valve to break off commarginaly*…" (Fig. 50 A, F). One specimen of *C. eucymatus* was found fixed to a ghost fishing net at St A15-2021-467, 1013–981 m (Fig. 50 A) and all specimens of *S. greenlandicus* came from the digestive tract of fishes (several stations between 187 and 270 m).

Cyclopecten hoskynsi (Fig 50 B–C) was collected once in the stomach of a long rough dab caught at 247–292 m and *Similipecten similis* (Fig. 50 D) once in the stomach of a plaice (50–50 m), and in the digestive tract of haddock and LRD caught between 100 and 300 m. In most species of Propeamussiidae the microsculpture of the right valve and that of the left valve are completely different, which facilitates the determination (Fig. 50 A1–A2, B1–B2, E1, E2).

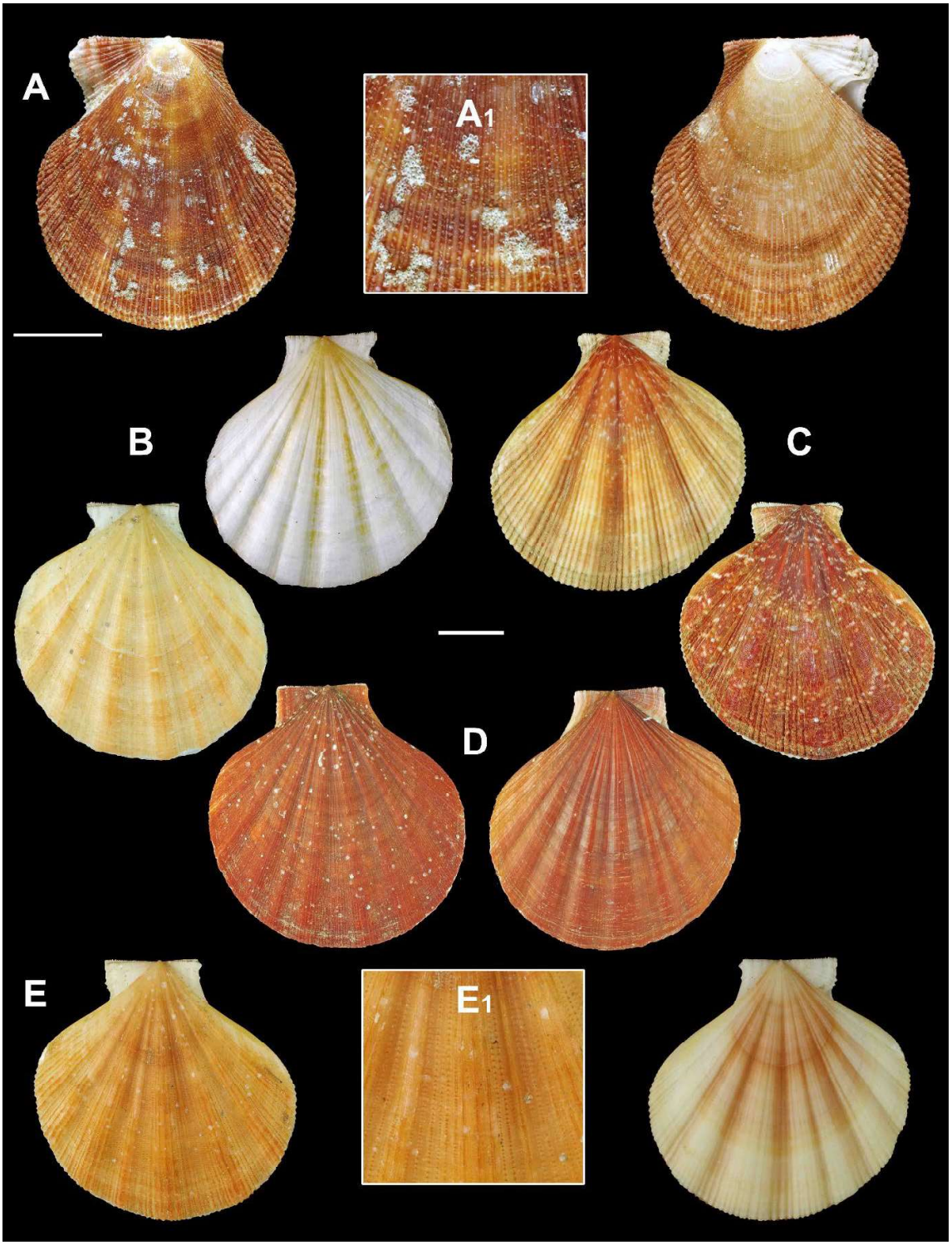

Figure 48. Pectinidae. A. *Chlamys islandica*. St A3-2014-95, 63–69 m, 38.6 mm. A1. Microsculpture of Lv. B–E. *Pseudamussium peslutrae*. B. St A3-2014-23, 375–405 m, 42.5 mm. C. St A3-2014-14, 161–147 m, 47.7 mm. D–E. St A3-2014-23, 375–405 m. D. 45.4 mm. E. 43.3 mm. E1. Microsculpture of Lv. (Scale bar 10 mm)

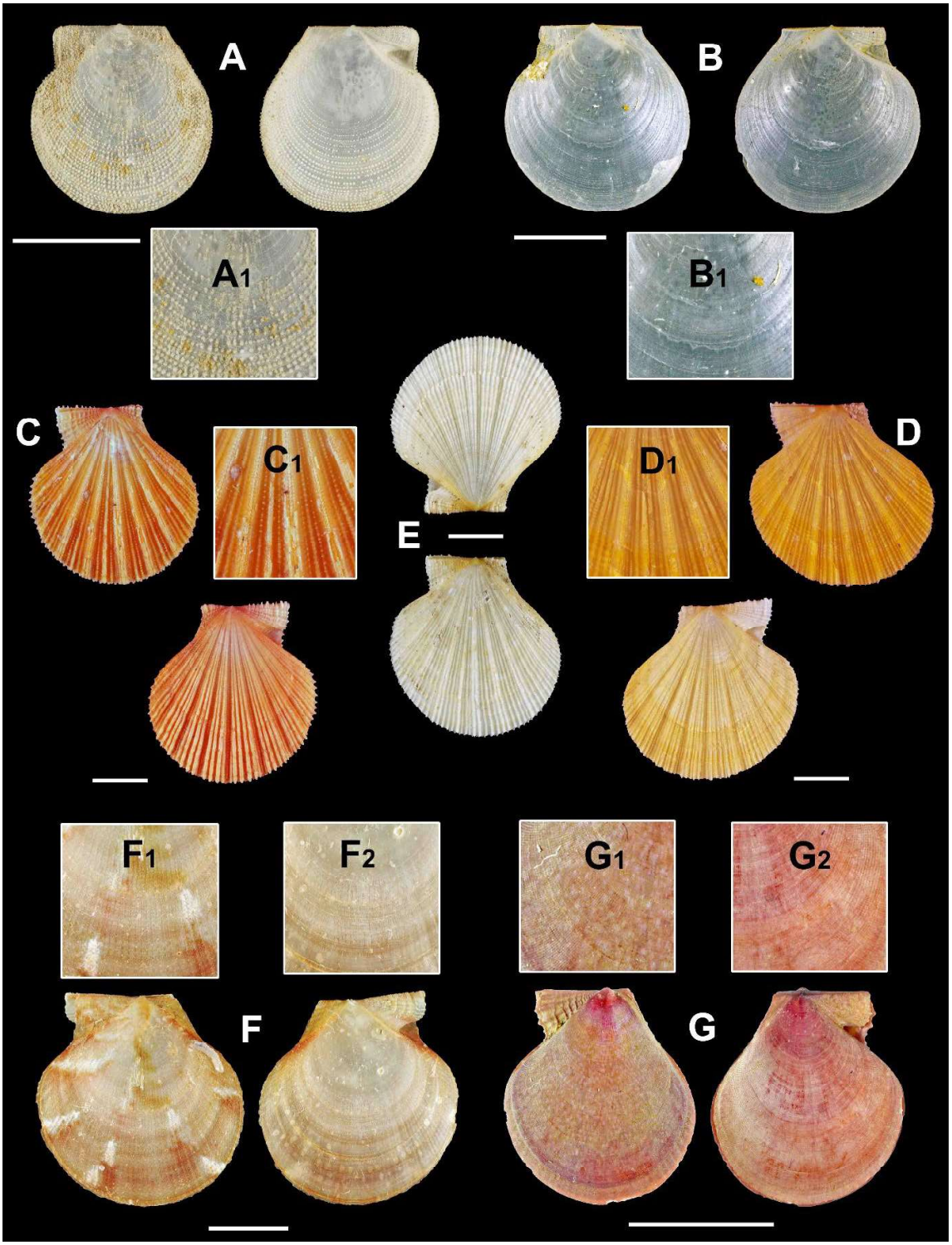

Figure 49. Pectinidae. A–B. *Delectopecten vitreus*. A. St A10-2013-538, 1330–1312 m, 14.5 mm. A1. Microsculpture of Lv. B. St A15-2021-467, 1013–981 m, 20.9 mm. B1. Microsculpture of Lv. C–E. *Karnekampia sulcata*. C. St A3-2014-52, 311–240 m, 27.3 mm. C1. Microsculpture of Lv. D–E. St A3-2014-23, 375–405 m. D. 27.3 mm. D1. Microsculpture of Lv. E. 28.8 mm. F. *Palliolum striatum*. St A3-2014-53, 229–234 m, 22.0 mm. F1.–F2. Microsculpture of Lv and Rv. G. *Palliolum tigerinum*. St A3-2014-28, 118–107 m, 12.7 mm (haddock). G1–G2. Microsculpture of Lv and Rv. (Scale bar 10 mm)

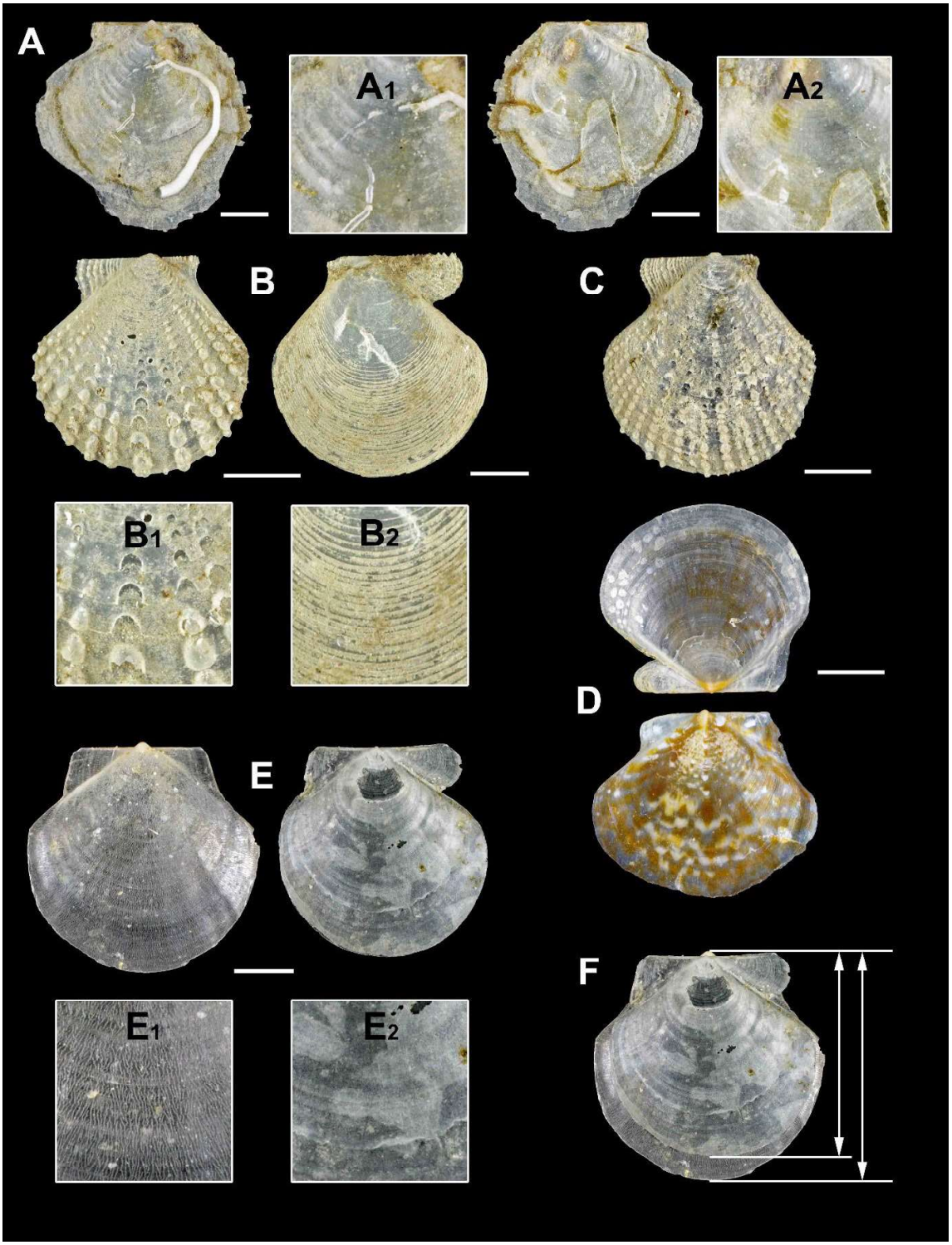

Figure 50. Propeamussiidae. A. *Catillopecten eucymatus*. St A15-2021-467, 1013–981 m, 8.5 mm, A1–A2 Microsculpture of Lv and Rv. B–C. *Cyclopecten hoskynsi*. St A13-2017-484, 247–292 m (LRD). B. 6.1 mm, B1. Microsculpture of Lv, 6.1 mm, B2. Microsculpture of Rv, 7.3 mm. C. 6.4 mm. D. *Similipecten similis*. St A13-2017-484, 247–236 m, 6.7 mm (LRD). E–F. *Similipecten greenlandicus*. St A5-2021-57, 241–267 m (LRD). E1. Microsculpture of Lv, 8.2 mm. E2. Microsculpture of Rv, 7.2 mm. G. Same shell 8.2 mm. (Scale bar 2 mm)

Anomiidae (Fig. 51 A–B) (Map p. 84)

Heteranomia squamula (**Anomiidae**) was present on many bivalves (*Acesta* a.o.), gastropods (*Neptunea* a.o.), and other shells coming from roughly all collecting stations. All were alive but most of them were not reported, the occurrence on the map is consequently not representative.

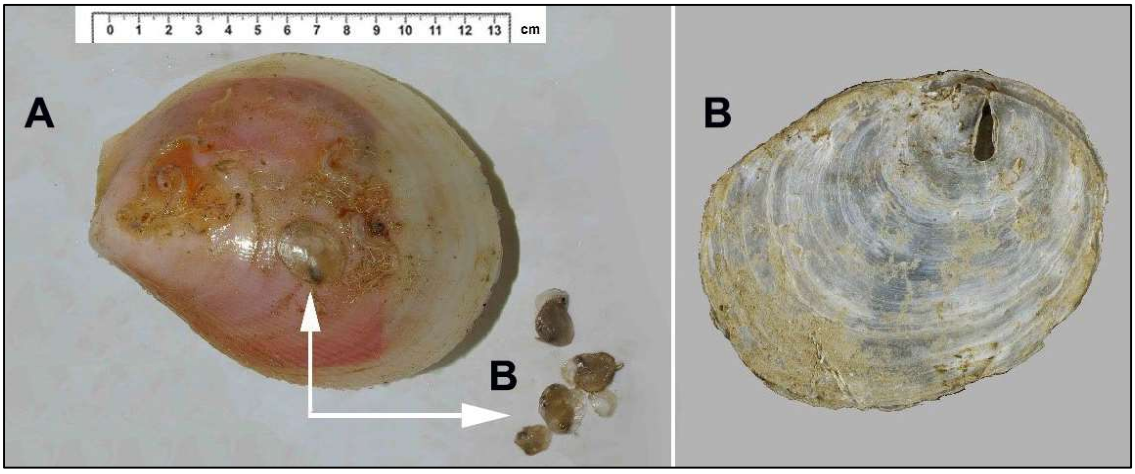

Figure 51. A. *Acesta excavata* (alive) St A10-2013-568, 489–477, 135.0 mm covered with *Heteranomia squamula*. B. *Heteranomia squamula*. Same station, 20.6 mm.

Astartidae (Fig. 52 A–G / Table 13) (Maps p. 85–86)

Table 13. Astartidae caught 2013–2022

Astartidae	*Astarte*	*acuticostata*	Friele, 1877	Fig. 52 A
	Astarte	*borealis*	(Schumacher, 1817)	Fig. 52 B
	Astarte	*crenata*	(J.E. Gray, 1824)	Fig. 52 C
	Astarte	*elliptica*	(T. Brown, 1827)	Fig. 52 D
	Astarte	*montagui*	(Dillwyn, 1817)	Fig. 52 E
	Astarte	*subaequilatera*	G.B. Sowerby II, 1854	Fig. 52 F
	Astarte	*sulcata*	(da Costa, 1778)	Fig. 52 G

The *Astarte* complex is quite complicated due to diverging opinions of authors and contradictory iconographies in the literature. We decided to follow the opinion of Huber (2010: 650). When discussing *A. crenata* he wrote: "*Following Dall and European authors, the NW Atlantic* subaequilatera *and the NE Atlantic* crebricostata *are here separated as valid species. From the material seen so far, the Iceland specimens are perceived to represent* subaequilatera*, but not true* crenata *and not* crebricostata." Nevertheless, NHMW cited *A. crenata* in Iceland and the Faroes. Typical specimens of all Icelandic Astartidae are illustrated for clarification (Fig. 52 A–G).

A. borealis and *A. montagui* were mainly caught in shallow-water (10-75 m); *A. crenata* (few specimens), *A. elliptica*, and *A. sulcata* from shallow-water (10 m) to medium deep-water (down to 300 m). *A. acuticostata* (one occurrence, 656–608 m) lives deeper, and *A. subaequilatera* was mainly collected between 150 to 1000 m.

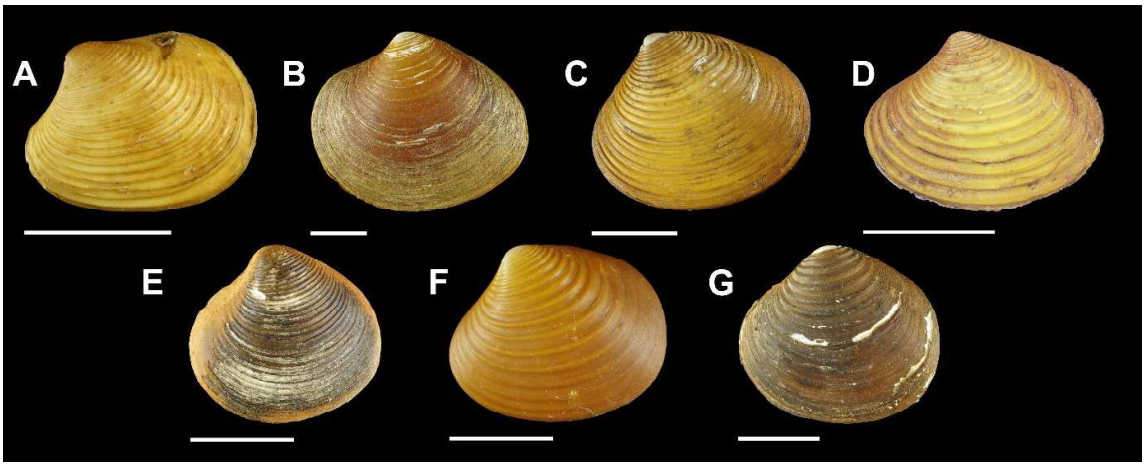

Figure 52 A–G. Astartidae. A. *Astarte acuticostata*. St A10-2015-605, 656–608 m, 15.7 mm. B. *A. borealis*. St A3-2014-92, 44–17 m, 40.0 mm. C. *A. crenata*. St A3-2016-107, 248–247 m, 28.1 mm. D. *A. elliptica*. St A2-2015-82, 147–160 m, 18.2 mm. E. *A. montagui*. St D1-2016-13, 13–26 m, 18.4 mm. F. *A. subaequilatera*. St A3-2014-23, 375–405 m, 20.9 mm. G. *A. sulcata*. St. A3-2014-11, 127–129 m, 25.5 mm. (Scale bar 10 mm)

Thyasiridae (Fig 53 A–E / Table 14) (Map p. 86)

Table 14. Thyasiridae caught 2013–2022

Thyasiridae	*Axinopsida*	*orbiculata*	(G.O. Sars, 1878)	Fig. 53 A
	Mendicula	*ferruginosa*	(Forbes, 1844)	Fig. 53 B
	Thyasira	*gouldii*	(R.A.Philippi, 1845)	Fig. 53 C
	Thyasira	*obsoleta*	(Verrill & K.J. Bush, 1898)	Fig. 53 D
	Thyasira	*sarsii*	(R.A. Philippi, 1845)	Fig. 53 E

Many species of Thyasiridae live preferentially in cold water, in muddy sediments from shallow to deep-water. *Thyasira gouldii* (up to 10 mm) and *Axinopsida orbiculata* (up to 6 mm) living between 2 to 50 m (Madsen, 1949: 55) were extracted from stomachs of plaice. *Thyasira sarsii* (larger species, up to 18 mm) was trawled between 20 and 120 m. *Mendicula ferruginosa* covered with a layer of iron oxide and *Thyasira obsoleta* were caught in stomachs of haddock fished between 150 and 300 m. Some

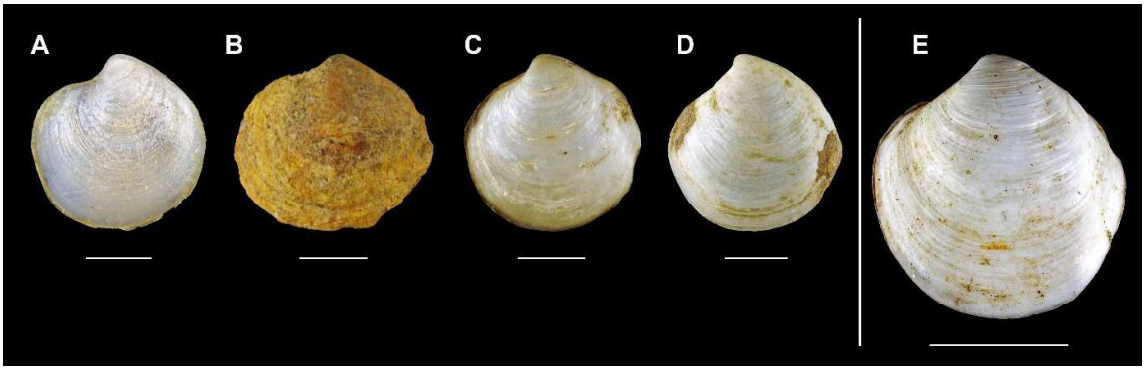

Figure 53. Thyasiridae. A. *Axinopsida orbiculata*. St B9-2019-715, 26–23 m, 2.8 mm (flat fish). B. *Mendicula ferruginosa.* St A3-2022-189, 136–142 m, 2.0 mm (haddock). C. *Thyasira gouldii*. St D1-2016-17, 20–20 m, 5.2 mm (plaice). D. *T. obsoleta*. St A5-2021-45, 233–236 m, 4.7 mm, (haddock). E. *T. sarsii*. St A3-2014-91, 48–47 m, 17.7 mm. (A–D. Scale bar 1 mm, E. Scale bar 10 mm)

species (*T. gouldii* and *T. sarsii*) are chemosymbiotic species, meaning that they live in symbiosis with bacteria concentrated in their gills providing them with nutrients and energy and allowing them to live in muddy bottoms at the limit of anoxic sediments (Oliver & Killeen, 2002: 14–15).

Lasaeidae (Figs 54 A–G, 55 A–B / Table 15) (Map p. 87)

Table 15. Lasaeidae caught 2013–2022

Lasaeidae	*Kellia*	*suborbicularis*	(Montagu, 1803)
Montacutinae	*Altenaeum*	*dawsoni*	(Jeffreys, 1864)
	Montacuta	*substriata*	(Montagu, 1808)
	Tellimya	*ferruginosa*	(Montagu, 1808)
	Tellimya	*tenella*	(Lovén, 1846)

Some of the Montacutinae are known to be commensals of other invertebrates, a common type of host being sea urchins (Oliver *et al*., 2012: 2): *Montacuta substriata* (Fig. 54 G) associated with *Spatangus purpureus* O.F. Müller, 1776 and *Echinocardium flavescens* (O.F. Müller, 1776) (Tebble, 1976: 89), *Tellimya ferruginosa* (Fig. 54 F) associated with *Echinocardium cordatum* (Pennant, 1777) (Tebble, 1976: 91) or even *Tellimya tenella* (Fig. 54 E) associated with *Brissopsis lyrifera* (Forbes, 1841) (Ockelmann, 1965: 215). All these Spatangoida inhabit the Icelandic waters except *E. cordatum* (Hansson, 1999). The three Montacutinae mentioned above were all found in haddock stomachs together with sea urchin debris.

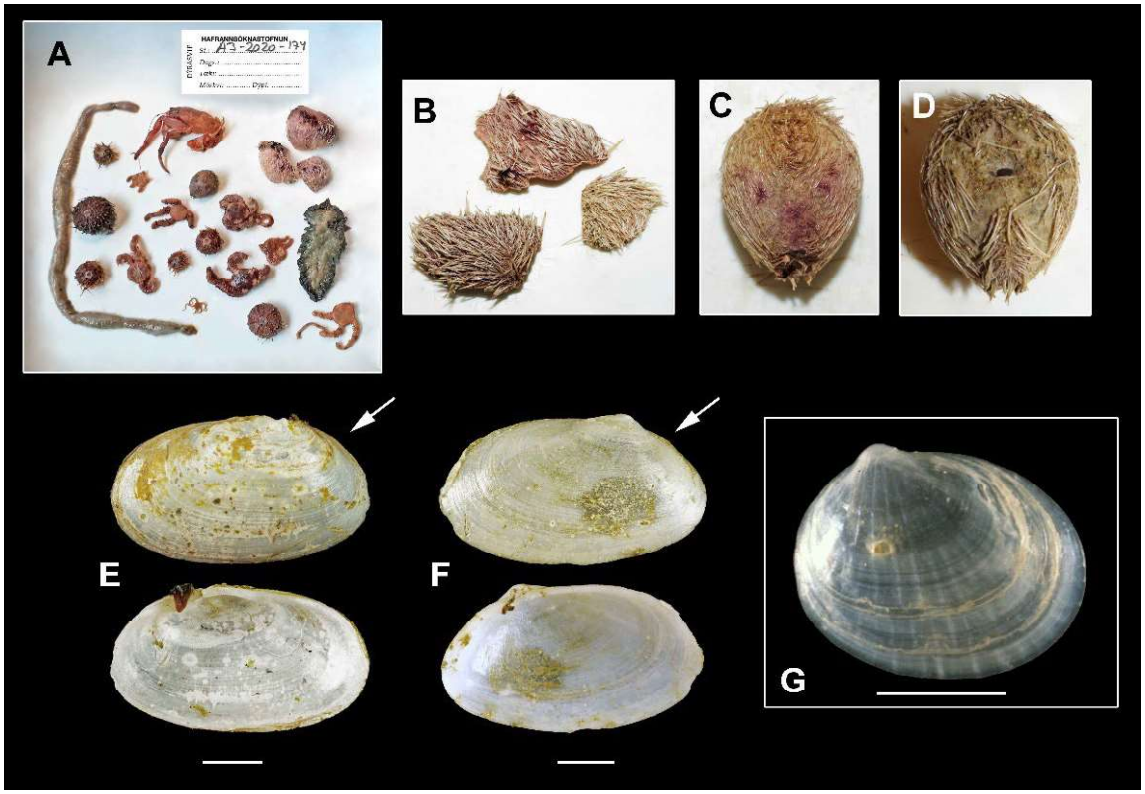

Figure 54. A. Stomach content of haddock St A3-2020-174, 184–133 m. B–D. Spatangoidea present. E. *Tellimya tenella*. St A3-2020-174, 184–133 m, 4.6 mm. F. *Tellimya ferruginosa*. St. A3-2022-125, 220–202 m, 4.6 mm. G. *Montacuta substriata*. Specimen from Scotland (Lewis, Outer Hebrides) for illustration, 2.2 mm. (Scale bar 1 mm)

Indeed, in addition to the molluscs present in the stomachs of the fish, the remains of all the organisms that make up their meal [crustaceans, polychaetes, and numerous echinoderms (Ophiuroidea, Echinoida, and Spatangoida, etc.)] were identified (Fig. 54 A–D). At St A5-2021-74, 170–192 m, *T. tenella* was present together with irregular sea urchin debris more than likely attributable to *Brissus lyrifera*. *T. tenella* is not present in Óskarsson's book (1982) nor in Madsen (1949). This is the first mention for Iceland. Its posterodorsal margin is perfectly rounded by opposition to that of *T. ferruginosa* (arrows Fig. 54 E, F).

Some other species of Lasaeidae like *Altenaeum dawsoni* (Fig. 55 A) caught in shallow-water or *Kellia suborbicularis* (Fig. 55 B) live "free" in sediment trapped in empty shells, kelp holdfast or Hydrozoa tufts without being specifically associated with any other invertebrates.

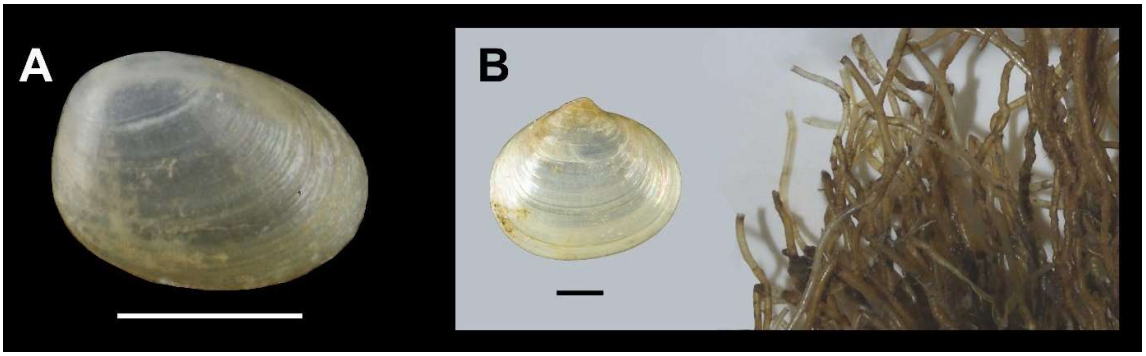

Figure 55. A. *Altenaeum dawsoni*. St D1-2016-15, 23–45 m, 1.7 mm. B. *Kellia suborbicularis*. St D2-2015-5, 170–142 m, 4.2 mm, trapped among a tuft *Tubularia indivisa* Linnaeus, 1758. (Scale bar 1 mm)

Cardiidae (Fig. 56, Fig. 57 A–H / Table 16) (Maps p. 87–88)

Table 16. Cardiidae caught 2013–2022

Cardiidae	*Acanthocardia*	*echinata*	(Linnaeus, 1758)
	Ciliatocardium	*ciliatum*	(O. Fabricius, 1780)
	Goethemia	*elegantula*	(Møller, 1842)
	Papillicardium	*minimum*	(R.A. Philippi, 1836)
	Parvicardium	*pinnulatum*	(Conrad, 1831)
	Serripes	*groenlandicus*	(Mohr, 1786)

All three larger species belonging to the family were collected by trawl, *Acanthocardia echinata* (Fig. 57 A, D) between 20 and 150 m off Western and Southern Iceland, *Ciliatocardium ciliatum* (Fig. 57 B–E) between 15 and 120 m, and *Serripes groenlandicus* (Fig. 57 C) between 50 and 60 m in the Westfjords, in agreement with the data proposed by Madsen (1949: 59–60, 63–64). The species of smaller size, also caught by trawl, *Papillicardium minimum* (Fig. 57 G) (alive at 151–165 m, St A3-2014-79, Northern Iceland) and *Parvicardium pinnulatum* (Fig. 57 H) (alive at 112–112 m, St A2-2015-117 and at 230–228 m, St A4-2018-70, Northwestern Iceland) were mainly obtained from stomachs of haddock and LRD fished between 140 and 405 m (most often around 200 m) or from plaice and dab in shallower waters (20 to 40 m). *Goethemia elegantula* (Fig. 57 F), considered as a rare species, was collected in haddock stomachs, once in the north (St A5-2021-45, 233–236 m, 1 loose valve), and once in the northeast (St TG1-2021-129, 187–164 m, 1 loose valve).

Cerastoderma edule (Linnaeus, 1758) which lives in the intertidal zone not prospected by the MFRI, was never collected even during campaigns in very shallow-water. The species was already reported by Óskarsson (1982: 85) at Gufunes in 1948 and in other places in Northwestern Iceland. It is considered as an invasive species (Thorarinsdóttir *et al*., 2014: 98).

Figure 56. *Cerastoderma edule*. Reykjavik, Gufunes, 1966-08, alive, 32.1 mm.

Figure 56.

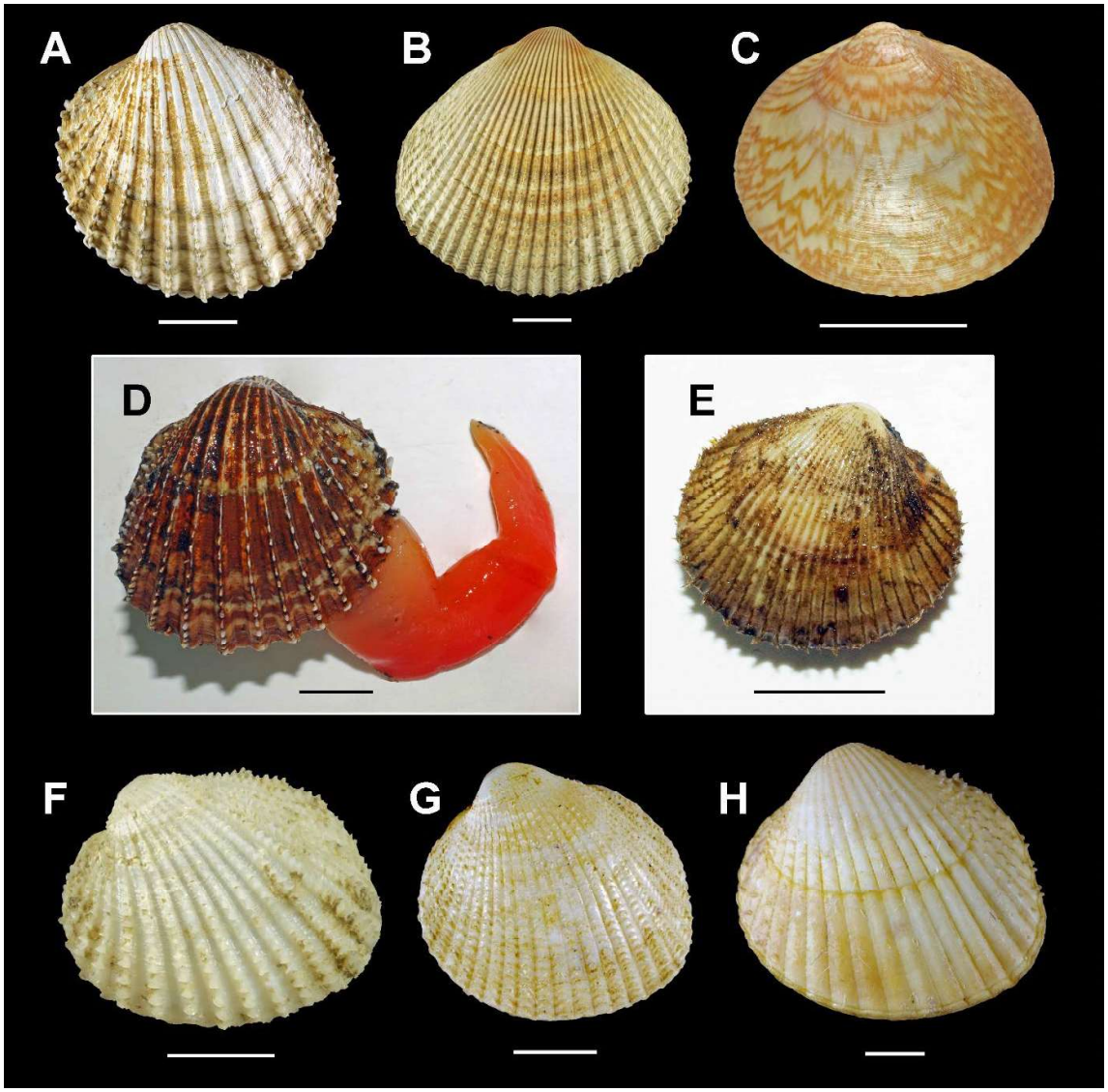

Figure 57. Cardiidae. A. *Acanthocardia echinata*. St A3-2014-11, 127–129 m, 38.8 mm. B. *Ciliatocardium ciliatum*. St B12-2017-977, 50–50 m, 54.2 mm. C. *Serripes groenlandicus*. St B11-2018-877, 21–20 m, 21.5 mm. D. *A. echinata* (alive). St B9-2019-645, 28–19 m, 38.5 mm. E. *C. ciliatum* (alive). St B9-2019-646, 15–28 m, 22.8 mm. (Scale bar A–E 10 mm) F. *Goethemia elegantula*. St TG1-2021-129, 187–164 m, 5.9 mm (haddock). G. *Papillicardium minimum*. St A3-2014-79, 151–165 m, 6.6 mm. H. *Parvicardium pinnulatum*. St A2-2015-117, 112–112 m, 9.7 mm. (Scale bar F–H 2 mm)

Mactridae (Fig. 58 A–B) (Map p. 91)

Madsen, referring to the nomenclature in use at the time of his publication (1949: 69), reports that "Spisula solida *occurs in two forms:* S. solida *s. str., and* S. solida *f.* elliptica *Brown. It is the latter form which is distributed in Iceland; only some few of the specimens found off the south coast (Vestmannaeyjar) are referable to* solida *s. str.*" Tebble (1966: 131–132) made a clear description of both *Spisula solida* (Linnaeus, 1758) and *Spisula elliptica* (T. Brown, 1827), two different accepted species, exposing the conchological differences between them.

Following Madsen's opinion, we confirm that all but two specimens collected by MFRI vessels refer to *Spisula elliptica* (Fig. 58 A). The two samples reported as *Spisula solida* (Fig. 58 B) came, indeed, from Southern Iceland (St B12-2017-852, 17–34 m and St B12-2017-868, 51–49 m). As compared with *S. elliptica*, their shells are heavier, with a more pronounced triangular shape and with cardinal teeth in the left valve reaching no more than half-way down the hinge plate (Fig. 58 A–B, black arrows).

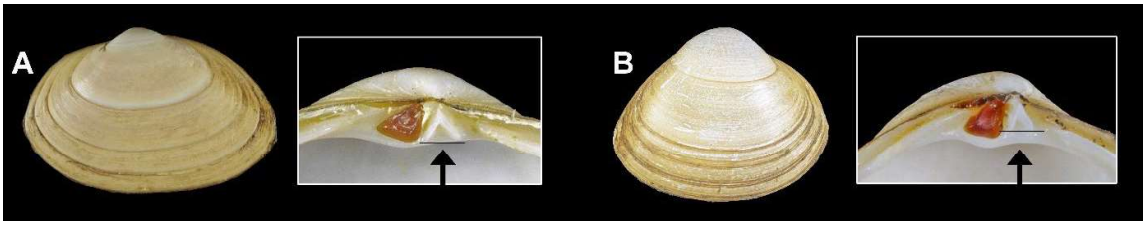

Figure 58. A. *Spisula elliptica*. St A3-2014-95, 63–69 m, 22.2 mm. B. *S. solida*. St B12-2017-868, 51–49, 23.5 mm.

Arcticidae (Fig. 59 A–C) (Map p. 90)

In Iceland, a specimen of *Arctica islandica* (Linnaeus, 1767) was the subject of an astonishing publication: its age was evaluated at 374 years (radiometrically confirmed) (Schöne *et al.*, 2005). In 2011, the age of another specimen from Grimsey Island (66°32'N - 18°00'W) was estimated to 507 years, it is the longest-lived non-colonial animal known whose precise age has been determined (Butler, 2011: 4). It is by counting the growth lines (Fig. 59 C) under microscope that the researchers arrived at such confirmed results.

Specimens from the same region captured at St B9-2019-711 (Fig. 59 B) and St B9-2019-712 (Fig. 59 A) are represented without presuming of their age.

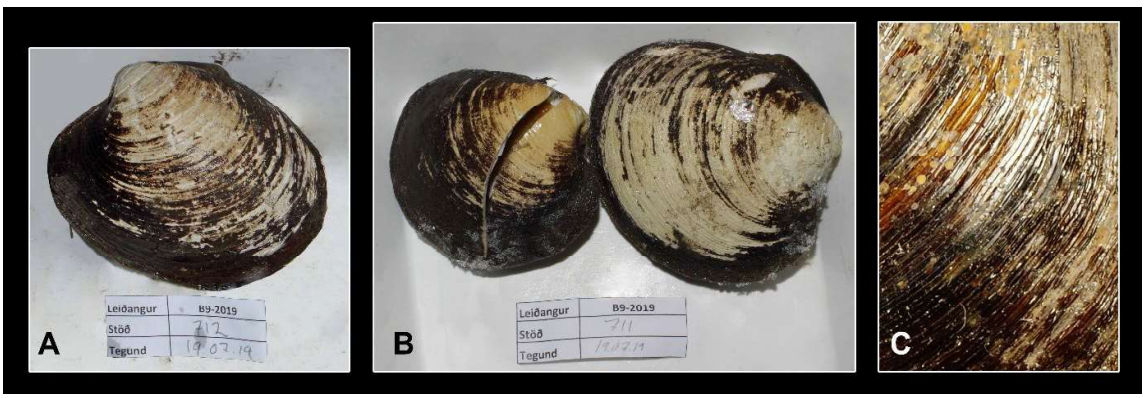

Figure 59. *Arctica islandica*. A. St B9-2019-712, 38–29 m, 87.5 mm. B. St B9-2019-711, 21–24 m, 66.7 mm, and 83.3 mm. C. Close up showing the growth lines.

Myidae (Fig. 60 A–C) (Map p. 92)

Mya truncata Linnaeus, 1758 (Fig. 60 A) is also a quite polymorphic species, which led in the past to the description of another form more elongated and posteriorly truncated than the typical rhomboidal form, called *Mya truncata ovata* A.S. Jensen, 1900 (Madsen, 1949: 76). Today, this unaccepted taxon is replaced by *Mya pseudoarenaria* Schlesch, 1931 (Fig. 60 B), a true species more closely related to *M. truncata* than to *Mya arenaria* Linnaeus, 1758 (Fig. 60 C). This last species, whose appearance in Eastern Iceland seems relatively recent (1958) (Óskarsson, 1982: 100–101) may be found in low abondance at several places almost all the way around Iceland (Jensen, 2010: 3). It was never caught during MFRI flatfish fishing campaigns in shallow-water. The impressions of the paleal sinus and paleal line inside the valves are used, among other things, to establish the differences between the three species (Backeljau *et al*., 1986: 5).

Figure 60. A. *Mya truncata*. St B12-2017-841, 11–25 m, 16.7 mm. B. *Mya pseudoarenaria*. St A3-2014-91, 47–48 m, 66.0 mm. C. *Mya arenaria*. Blikastaðir (Faxaflói) 63.8 mm (for illustration). (Scale bar 10 mm)

Xylophagaidae (Fig. 61 A–C, Fig. 62 B) (Map p. 93) **and Teredinidae** (Fig. 62 A) (Map p. 92)

Xyloredo ingolfia R.D. Turner, 1972 was reported from Northern Iceland in a piece of wood at St A11-2016-596, 487–492 m (Fig. 61 B) for the first time after its initial discovery in 1896 in material collected by the INGOLF Expeditions (South of Eyrarbakki, Iceland, 1783 m) (Delongueville & Scaillet, 2018).

The genus *Xyloredo* R.D. Turner, 1972 which looks like a Teredinidae in superficial appearance, is characterized by a burrow with a fine ringed calcareous tube covered externally by a shiny cuticle (Fig. 61 C), by the lack of pallets for closing the burrow and by the lack of apophyses in the internal part of the shell for the attachment of the foot muscle (Fig. 61 A).

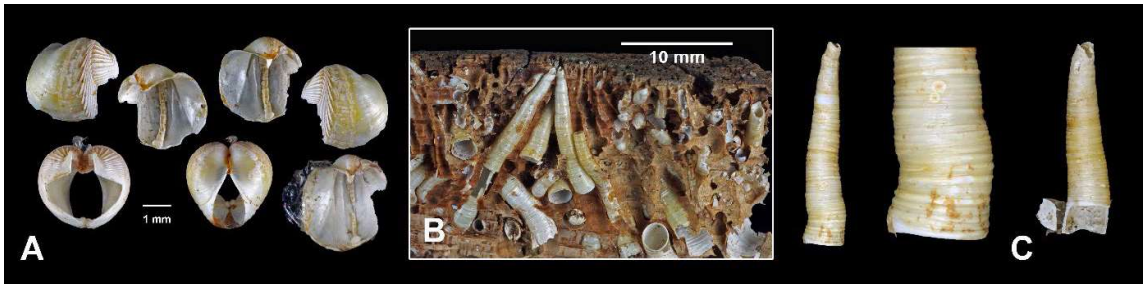

Figure 61. *Xyloredo nooi*. St A11-2016-596, 487–492 m. A. Shell, 3.3 x 3.2 mm. B. Small wooden board 40 mm long, 20 mm thick. C. Ringed tubes covered with shiny cuticle.

Based on some morphological differences, Turner (1972) described together with *X. ingolfia* two other similar species, *X. nooi* (found in the Bahamas at 1737 m), and *X. naceli* (found along the coast of California at 2072.6 m). Their completely disjunct distribution contributed also to their recognition as distinct species. Today, genetic analysis of different specimens of the genus revealed minimal molecular divergences between them, which led to placing these species in synonymy. Priority was given to *Xyloredo nooi* R.D. Turner, 1972 which was chosen as the type species of the genus (Voight 2022: 165). It was additionally confirmed that the shape of the valves could change considerably during their growth (Voight 2022: 166), a fact that Turner (1972: 3) had already suspected without being able to demonstrate it at that time.

X. nooi (Fig. 62 B) does not seem to be rare as confirmed by a new record reported from St A13-2017-629, 816–835 m. A careful examination of the sculpture and the diameter of the tubes makes detection possible at first glance in a piece of wood with a mixed colonization, and to differentiate it immediately from other Teredinidae, such as *Nototero norvagica* (Spengler, 1792) for example (Fig. 62 A).

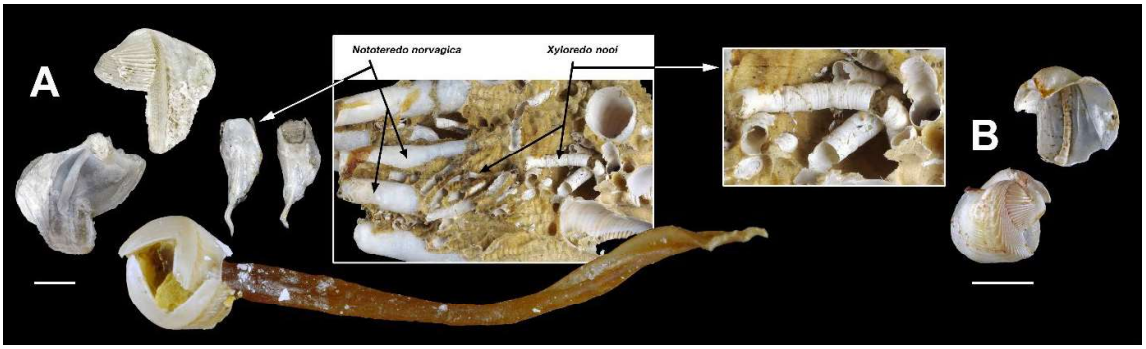

Figure 62. Piece of wood with mixed colonization. St A13-2017-629. A. *Nototeredo norvagica*. 6.2 mm. B. *Xyloredo nooi*. 3.2 mm. (Scale bar 2 mm)

Hiatellidae (Fig. 63 A–C, Fig. 64) (Map p. 93)

Hiatella arctica (Linnaeus, 1767) is a highly polymorphic species widely distributed in the Arctic seas, the boreal Atlantic Ocean to the Atlantic African coasts, and into the Mediterranean Sea. At the present time, in our reports about Icelandic specimens, we did not differentiate between *H. arctica* and *H. rugosa* (Linnaeus, 1767) because we were unable to find the reference allowing us to establish a decisive distinction between the two species. All specimens are named *H. arctica*. Just like Madsen (1949: 74), we only note the existence of two diametrically opposed morphs, one of relatively small size collected in deep to moderately deep-water, bearing one to two keels of spines on the posterior part of the shell (Fig. 63 A), and another one devoid of these characters, of larger size with a more elongated and more cylindrical shape generally found in shallow-water (Fig. 63 B–C). No two identical specimens exist, and intermediate forms are not uncommon (Fig. 63 B). Óskarsson (1982: 99) put them in synonymy. More recently, some other authors even say that there could be 3 different species (Sneli *et al*. 2005: 154) and further molecular data (Laakkonen *et al.* 2016) clearly indicate that a species complex is involved, still in need of taxonomic clarification. We did not take a position while remembering that we have probably at least 2 different species under one name in the molluscs collected around Iceland.

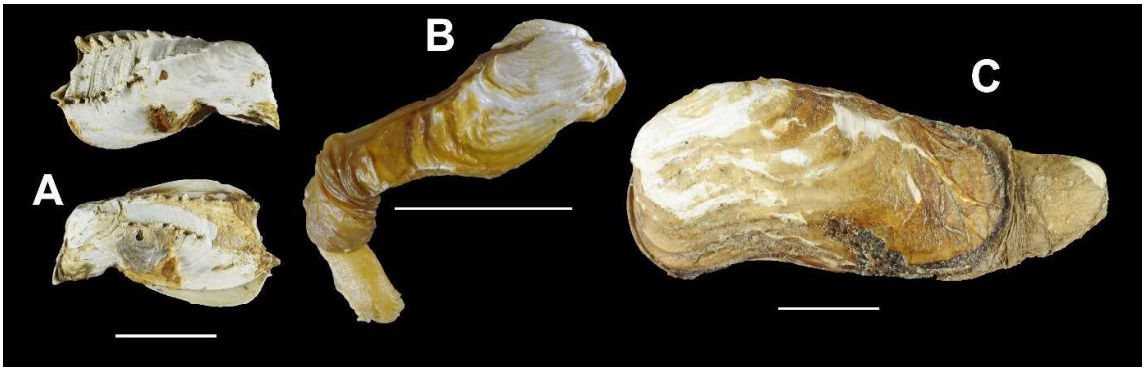

Figure 63. A–C. *Hiatella arctica*. A. St D4-2014-43, 224–198 m, 20.3 mm, B. St D1-2016-15, 23–45 m, 13.0 mm. C. St B11-2018-847, 17–30 m, 37.0 mm. (Scale bar 10 mm)

On the other hand, there is no problem of determination for *Panomya norvegica* (Spengler, 1793) (Fig. 64), a large species also belonging to the Hiatellidae family.

Figure 64.

Figure 64. *Panomya norvegica*. St D2-2015-6, 144–151 m, 85.0 mm.

Verticordiidae (Fig. 65 A–B) (Map p. 95)

Originally known from the east coast of the United States (off Nova Scotia, East of Georges Bank, …) and from the eastern Atlantic Ocean (South Africa, Tropical Africa, Mauritania) (Soot-Ryen, 1966: 17–20), *Halicardia flexuosa* (A.E. Verrill & S. Smith, 1881) is a bathyal bivalve (500–2000 m) [even abyssal 2000–4000 m (Oliver et al, 2016)]. It was reported alive for the first time from Western Iceland by Delongueville & Scaillet (2016) at St A10-2015-550, 1306–1281 m (Fig. 65 A–B), and since then (2016–2018) on a line adjoining the 1000 m isobath on the western part of the Icelandic continental slope (four additional occurrences, 1 shell alive, another empty, and two loose valves). The presence of the species was also documented in the Bay of Biscay, in the boundaries of the Avilés Canyon System at 1200 m (Arias *et al.*, 2019: 431), St Vincent Cape at 1592 m in 1984 (Salas, 1996: 81) and on the Galicia Bank (Gofas *et al*., 2021: 98, specimen already collected in 2011 at 1720 m).

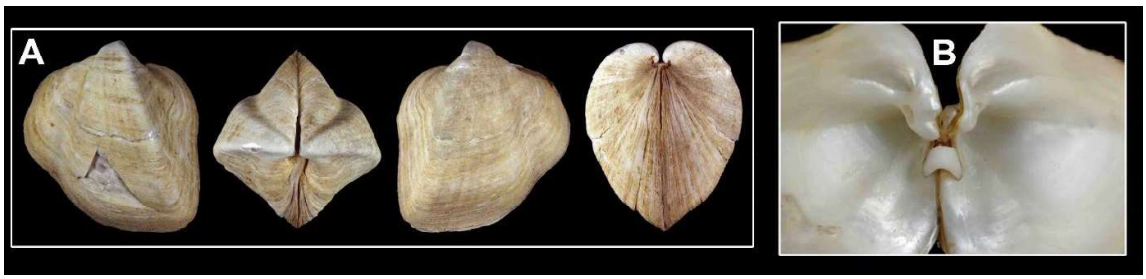

Figure 65. A. *Halicardia flexuosa*. St A10-2015-550, 1306–1281, 33.2 x 35.3 x 31.3 mm. B. Same shell, internal view.

Cuspidariidae (Fig. 66 A–C) (Map p. 95) **and Poromyidae** (Fig. 66 D) (Map p. 94)

Distinguishing between *Cuspidaria arctica* (M. Sars, 1859), *C. obesa* (Lovén, 1846), and *C. glacialis* (G.O. Sars, 1878) remains almost impossible as opinions differ from one author to another. Madsen (1949: 84) already stated that *C. glacialis* and *C. arctica* should be considered as forms of *C. obesa*, "*the three species overlap in their variations to such an extent that they cannot be distinguished with any reasonable certainty*". Sneli *et al*. (2005: 157–158) reports the 3 species as living in Iceland, Oliver (2016) excludes *C. glacialis* from Iceland, Warén (WoRMS iconography) (Fig. 66 B) proposes a representation of *C. arctica* from Svalbard, and Wlodarska-Kowalczuk (WoRMS iconography) (Fig. 66 C) another one for *C. obesa* from the same region. By comparing them, we made the decision to call the specimens from St A2-2015-90 and St A11-2016-605 (704–586 m) *C. arctica* (Fig. 66 A).

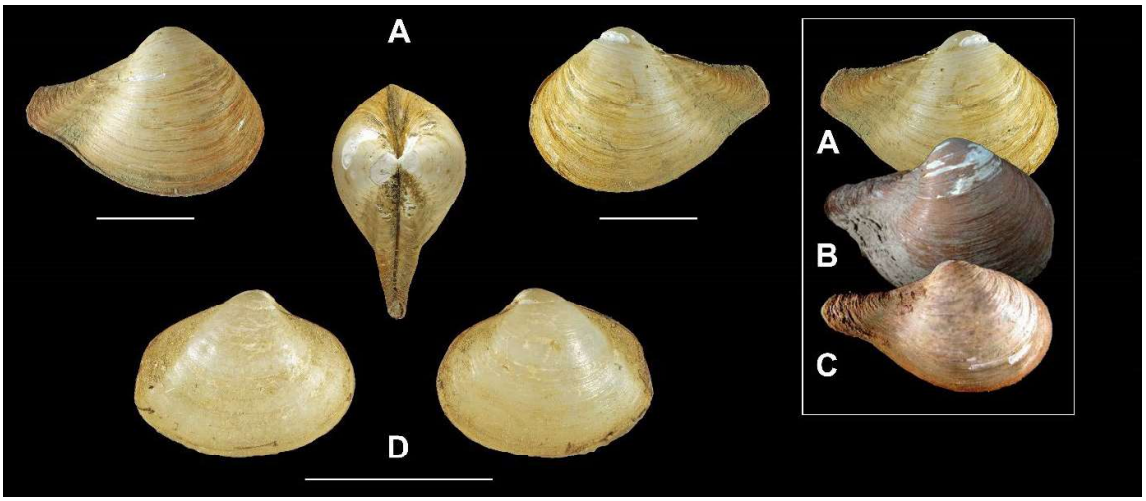

Figure 66. A. *Cuspidaria arctica*. St A2-2015-90, 371–341 m, 25.2 mm. B. WoRMS iconography for *C. arctica.* C. WoRMS iconography for *C. obesa*. D. *Poromya granulata*. St A3-2014-79, 151–165 m, 11.6 mm. (Scale bar 10 mm)

The identification of *Poromya granulata* (Nyst & Westendorp, 1839) (Fig. 66 D), a species occurring on the outer part of the shelf all around Iceland (Madsen, 1949: 84), was easier as the sculpture of the shell is so characteristic and gives to the touch an aspect of sand paper.

Rich bivalve community in shallow-water (Fig. 67 A–I / Table 17)

Flatfish fishing campaigns in shallow-water, between 10 and 70 m, (such as B12-2017 or B9-2019) were very productive in terms of quantity of bivalve species caught (Table 17). Most of them were commented and illustrated in the previous chapters except for a few of them within the families Tellinidae (Fig. 67 B) (Map p. 89), Psammobiidae (Fig. 67 A, C) (Map p. 89), Veneridae (Fig. 67 D–E) (Map p. 91), Thraciidae (Fig. 67 F–G) (Map p. 94), and Semelidae (Fig. 67 H–I) (Map p. 90).

Table 17. Shallow-water Bivalvia caught 2013–2022

Nuculidae	*Ennucula*	*tenuis*	(Montagu, 1808)	Map p. 78
Nuculanidae	*Nuculana*	*minuta*	(O.F. Müller, 1776)	Map p. 78
	Nuculana	*pernula*	(O.F. Müller, 1779)	Map p. 78
Yoldiidae	*Yoldia*	*hyperborea*	(A. Gould, 1841)	Map p. 79
Mytilidae	*Crenella*	*decussata*	(Montagu,1808)	Map p. 81
	Modiolus	*modiolus*	(Linnaeus, 1758)	Map p. 81
	Musculus	*discors*	(Linnaeus, 1767)	Map p. 82
	Musculus	*laevigatus*	(J.E. Gray, 1824)	Map p. 82
	Musculus	*niger*	(J.E. Gray, 1824)	Map p. 82
	Mytilus	*edulis*	Linnaeus, 1758	Map p. 81
Pectinidae	*Chlamys*	*islandica*	(O.F. Müller, 1776)	Map p. 82
Anomiidae	*Heteranomia*	*squamula*	(Linnaeus, 1758)	Map p. 84
Astartidae	*Astarte*	*borealis*	(Schumacher, 1817)	Map p. 85
	Astarte	*elliptica*	(T. Brown, 1827)	Map p. 85
	Astarte	*montagui*	(Dillwyn, 1817)	Map p. 86
Cardiidae	*Acanthocardia*	*echinata*	(Linnaeus, 1758)	Map p. 87
	Ciliatocardium	*ciliatum*	(O. Fabricius, 1780)	Map p. 88
	Papillicardium	*minimum*	(R.A. Philippi, 1836)	Map p. 88
	Parvicardium	*pinnulatum*	(Conrad, 1831)	Map p. 88
	Serripes	*groenlandicus*	(Mohr, 1786)	Map p. 88
Mactridae	*Spisula*	*elliptica*	(T. Brown, 1827)	Map p. 91
Tellinidae	*Macoma*	*calcarea*	(Gmelin, 1791)	Map p. 89
Psammobiidae	*Gari*	*fervensis*	(Gmelin, 1791)	Map p. 89
	Gari	*tellinella*	(Lamarck, 1818)	Map p. 89
Semelidae	*Abra*	*nitida*	(O.F. Müller, 1776)	Map p. 90
	Abra	*prismatica*	(Montagu, 1808)	Map p. 90
Arcticidae	*Arctica*	*islandica*	(Linnaeus, 1767)	Map p. 90
Veneridae	*Mysia*	*undata*	(Pennant, 1777)	Map p. 91
	Timoclea	*ovata*	(Pennant, 1777)	Map p. 91
Myidae	*Mya*	*pseudoarenaria*	Schlesch, 1931	Map p. 92
	Mya	*truncata*	Linnaeus, 1758	Map p. 92
Thraciidae	*Thracia*	*myopsis*	Møller, 1842	Map p. 94
	Thracia	*villosiuscula*	(MacGillivray, 1827)	Map p. 94
Hiatellidae	*Hiatella*	*arctica*	(Linnaeus, 1767)	Map p. 93

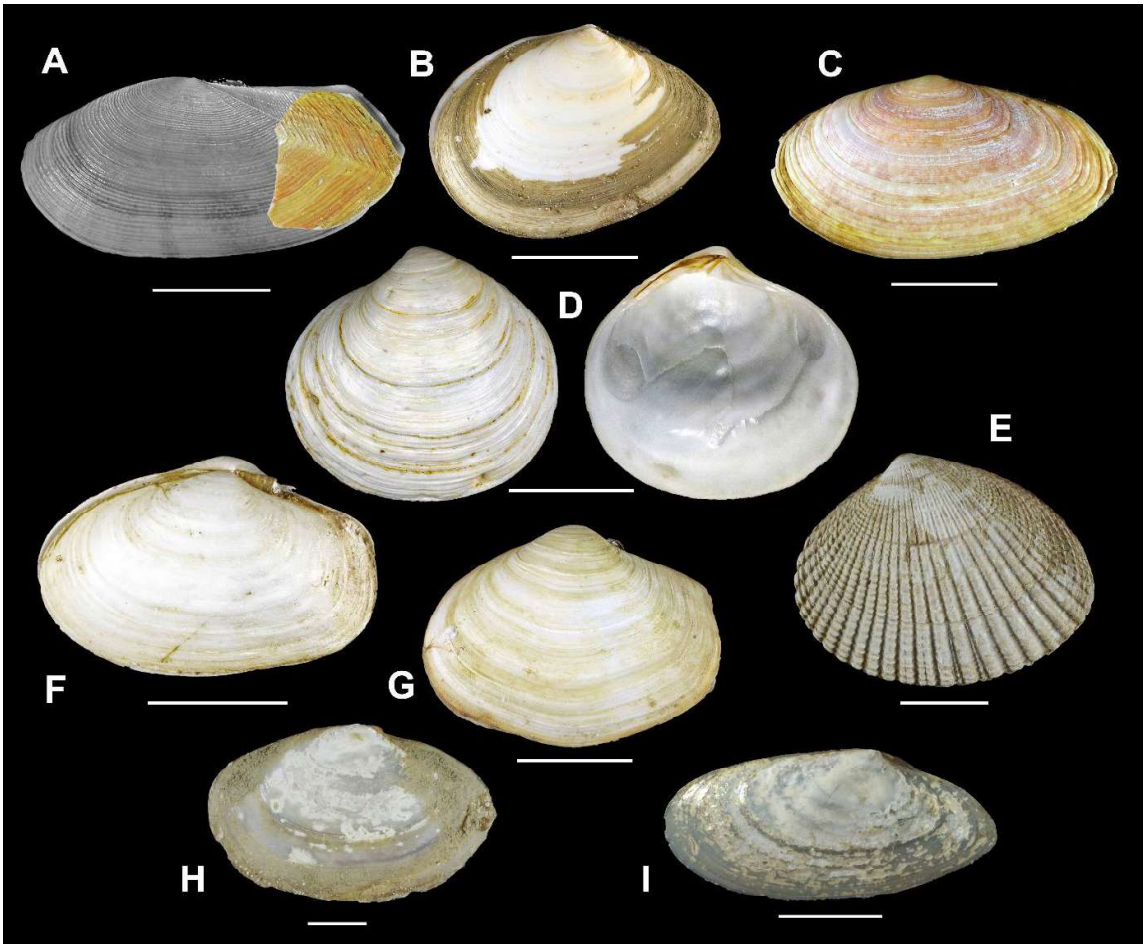

Figure 67. A. *Gari fervensis*. St B9-2019-771, 42–43 m, +/- 35.0 mm (fragment in haddock). B. *Macoma calcarea*. St A3-2014-90, 54–45 m, 32.6 mm. C. *Gari tellinella*. St A3-2014-35, 115–24 m, 34.2 mm. D. *Mysia undata*. St B12-2017-849, 41–42 m, 21.1 mm. E. *Timoclea ovata*. St A3-2014-6, 70–80 m, 10.8 mm (haddock). F. *Thracia villosiuscula*. St B11-2018-869, 59–55 m, 24.8 mm. G. *Thracia myopsis*. St B12-2017-982, 64–56 m, 26.4 mm. H. *Abra nitida*. St D4-2014-14, 193–194 m, 9.6 mm (LRD). I. *Abra prismatica*. St TL2-2014-7, 196–166 m, 7.4 mm (haddock). (A–D, F–G, scale bar 10 mm; E, H–I, scale bar 2 mm)

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Chapter III. Scaphopoda (Fig. 68 A–D / Table 18) (Maps p. 122)

Table 17. Scaphopoda caught 2013–2022

Dentaliidae	*Antalis*	*agilis*	(M. Sars, 1872)	Fig. 68 A
	Antalis	*entalis*	(Linnaeus, 1758)	Fig. 68 B
	Fissidentalium	*candidum*	(Jeffreys, 1877)	Fig. 68 C
Gadilidae	*Siphonodentalium*	*lobatum*	(G.B. Sowerby II, 1860)	Fig. 68 D

Scaphopoda were all easily identified by their size, the presence or absence of curvature of the test, the structural aspect of the apical part of the shell (with a notch, large or small; with a pipe, or finely chiseled), and by the depth at which they were caught.

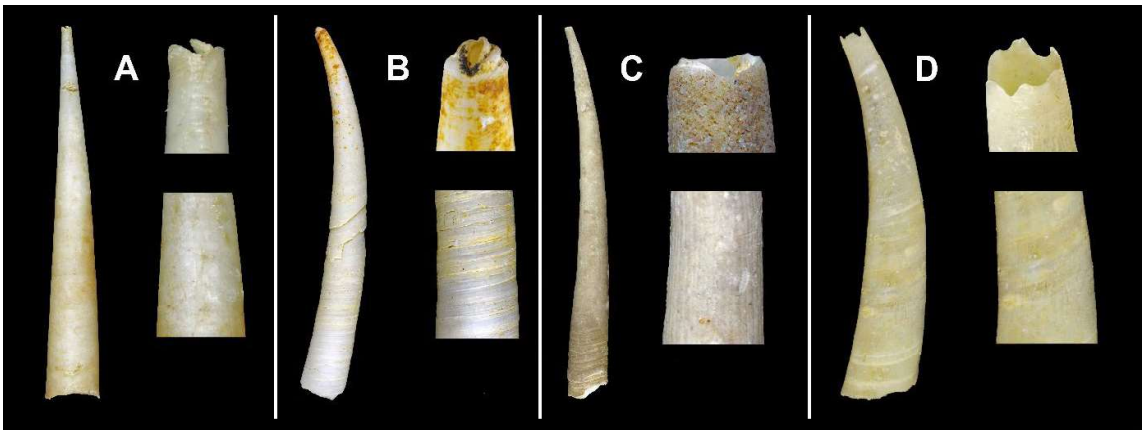

Figure 68. A. *Antalis agilis*. St A3-2014-39, 205–154 m, 24.6 mm. B. *Antalis entalis*. St B12-2017-987, 46–49 m, 40.6 mm. C. *Fissidentalium candidum*. St A10-2015-550, 1306–1281 m, 97.2 mm. D. *Siphonodentalium lobatum*. St TG1-2021-129, 187–164 m, 13.8 mm (haddock).

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Chapter IV. Polyplacophora (Figs 69 A–C, Fig. 70 A–F / Table 19) (Maps p. 123–124)

Table 18. Polyplacophora caught 2013–2022

Hanleyidae	*Hanleya*	*hanleyi*	(W. Bean, 1844)
	Hanleya	*nagelfar*	(Lovén, 1846)
Ischnochitonidae	*Stenosemus*	*albus*	(Linnaeus, 1767)
Leptochitonidae	*Leptochiton*	*arcticus*	(G.O. Sars, 1878)
	Leptochiton	*asellus*	(Gmelin,1791)
Tonicellidae	*Boreochiton*	*ruber*	(Linnaeus, 1767)
	Tonicella	*marmorea*	(O. Fabricius, 1780)

Hanleyidae. *H. nagelfar* (Fig. 69 A–B1, B2) and ***H. hanleyi*** (Fig. 69 C)**, one or two separate species?** (Maps. p. 124)

Warén & Klitgaard (1991: 55) who remained unable to find morphologic characters other than size separating the different species (or forms sic) of *Hanleya*, revealed that *H. nagelfar* (species or form) was strongly associated with certain choristid sponges in deep-water. Either *H. nagelfar* is a single phenotype species with body size related to food availability (sponge) in deep-water, or two very similar species are involved as suggested by some other evidences.

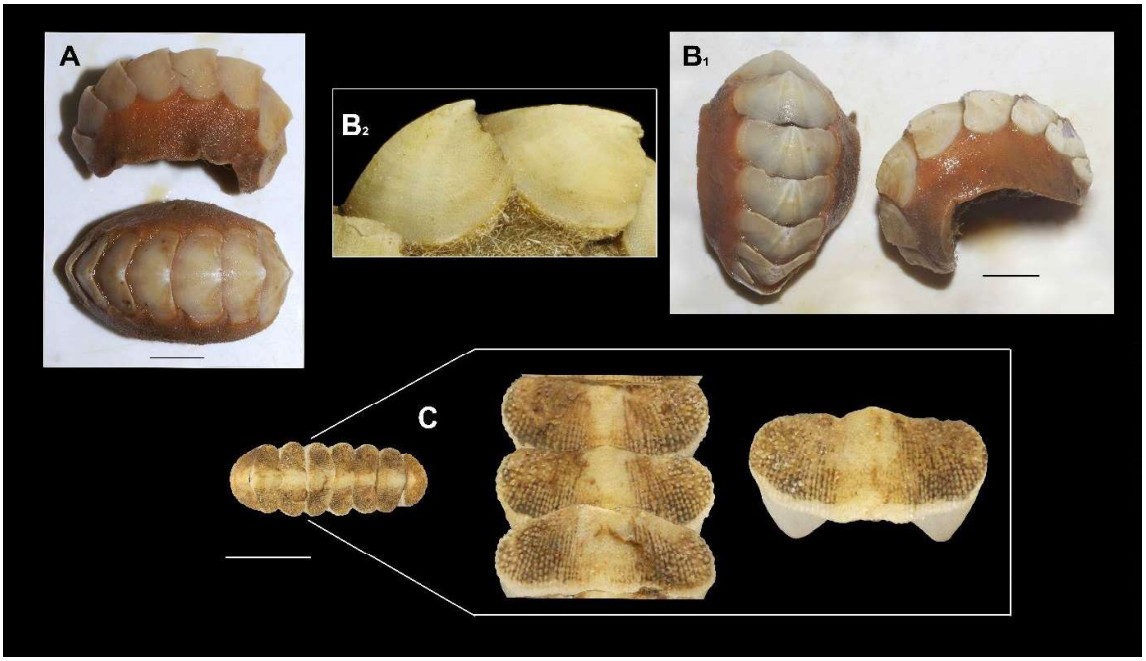

Figure 69. A–B1, B2. *Hanleya nagelfar*. A. St TL2-2014-67, 1098–1046 m, +/- 50.0 mm. B1. St A10-2015-566, 975–949 m, +/- 50.0 mm. B2. Same specimen, enlarged. C. *Hanleya hanleyi*. St A5-2021-45, 233–236 m, +/- 20.0 mm (haddock). (Scale bar 10 mm)

Sirenko *et al*. (2016: 57) indicate that the similarity of relevant features among small specimens of *H. hanleyi* and *H. nagelfar* suggests the two species are synonymous. Larvae developing at depths >100 m would develop into large *nagelfar*-like specimens, and those developing at shallower depths would remain small like typical *H. hanleyi* (Sirenko *et al*., 2016: 65). Whatever the preferred hypothesis, the

two groups of researchers consider to be a need for further investigation of the biology and natural history of this animal.

Keeping this in mind, we collected different anatomical samples of soft parts of the two forms and sent them to the MNHN for genetic analysis. We keep here both names as valid.

Polyplacophora in shallow-water (Fig. 70 A–F / Table 19) (Maps p. 123–124)

In Iceland, *Boreochiton ruber* (Fig. 70 C) and *Tonicella marmorea* (Fig. 70 D) live from the intertidal zone down to a hundred meters (0–100 m and 0–80 m respectively) (Sneli & Guðmundsson, 2018). They were caught together with *Stenosemus albus* (Fig. 70 E) in kelp holdfast. This latter lives in Iceland between 30 and 495 m. *Leptochiton asellus* (Fig. 70 A–B) (65–320 m) and *L. arcticus* (Fig. 70 F) (65–1144 m) live at greater depths (Sneli & Guðmundsson, 2018). They were found on other molluscs (Fig. 70 A) or caught in stomachs of haddock fished between 170 and 220 m (Fig. 70 F).

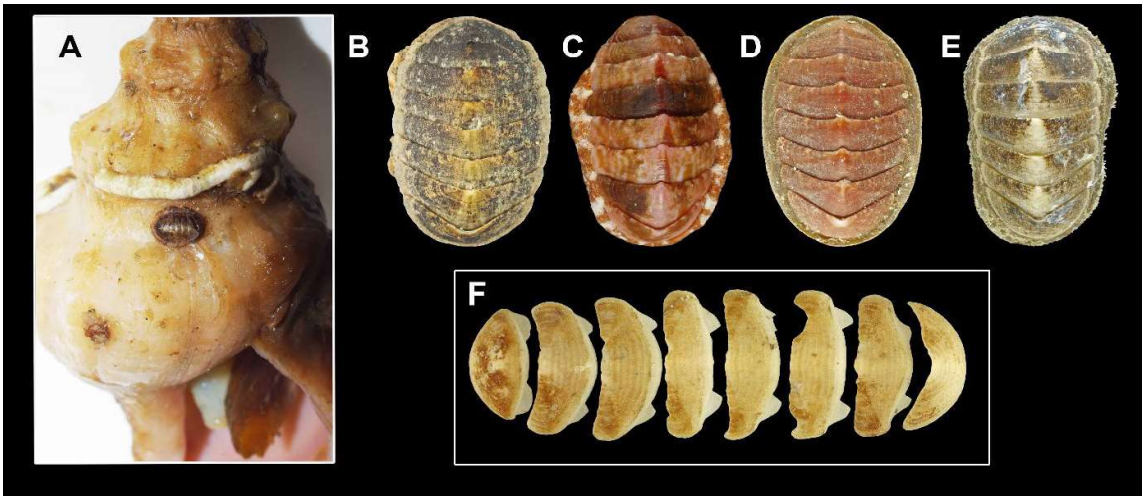

Figure 70. A. *Leptochiton asellus* on *Neptunea despecta*. St A5-2021-89, 130–147 m. B. *Leptochiton asellus*. St B12-2017-987, 46–49 m, 8.7 mm. C. *Boreochiton ruber*. St A3-2014-92, 44–17 m, 7.8 mm. D. *Tonicella marmorea*. St D1-2016-12, 13–26 m, 11.2 mm. E. *Stenosemus albus*. St D1-2016-12, 13–26 m, F. *Leptochiton arcticus*. St A5-2021-74, 170–192 m, +/- 20.0 mm (haddock).

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Chapter V. Cephalopoda (Fig. 71 A–B / Table 20) (Maps p. 125)

Originally, there was no intention to study the captures of cephalopods because it is an area that is beyond our competence, and because the size that they can reach was an obstacle to the conservation of specimens. However, occasional captures of a few deep-sea small octopuses have allowed the identification of *Bathypolypus bairdii* (Fig. 71 A) and *Graneledone verrucosa* (Fig. 71 B), and it would have been regrettable not to report them.

Table 19. Cephalopoda caught 2013–2022

Bathypolypodidae	*Bathypolypus*	*bairdii*	(A.E. Verrill, 1873)
Megaleledonidae	*Graneledone*	*verrucosa*	(A.E. Verrill, 1881)

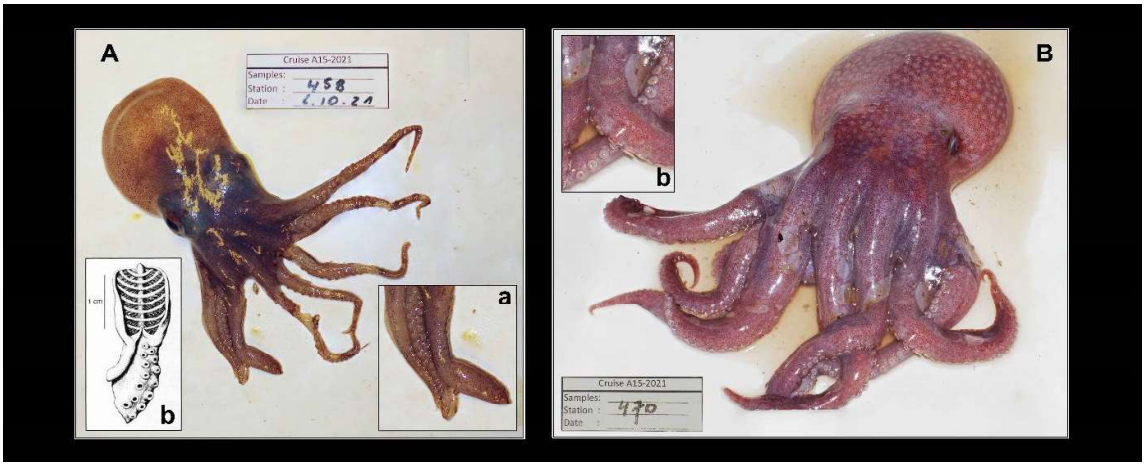

Figure 71. A. *Bathypolypus bairdii.* St A15-2021-458, 768–783 m. Aa. 2 rows of suckers on the arms and 8 lamellae in the hectocotylus of the male. Ab. Hectocotylus as represented by Muus (2002: 188). B. *Graneledone verrucosa*. St A15-2021-470, 1039–1071 m. Bb. 1 row of suckers on the arms [bathymetry in accordance with Collins *et al*. (2001: 108)].

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DISCUSSION

This report includes the findings of Mollusca specimens collected opportunistically over a period of 10 years (2013–2022) and during twenty-five fisheries survey campaigns around Iceland. As the sampling was not conduced systematically, and the sampling method was not designed to sample small invertebrates, the data represent only a haphazard sampling of species presence. However, the number of species of Bivalvia and small Gastropoda was higher than foreseen due to analysis of fish digestive tract content and specimens associated with sweep-ups. Samples were collected from various substrates, such as whale bone, sponge, coral, wood, kelp holdfast, empty shells, and other types of debris.

CONCLUSION

To obtain the most accurate overview of the Icelandic marine malacofauna, all possible ecological niches must be investigated when trawling. Deeper water (below 1500 m) should be explored too. In addition, to capture molluscs that have so far escaped the trawl nets, other types of survey should be done using more specific instruments (such as a Van Veen grab or suitable dredges). Finally, a sea-shore inventory could complete the data obtained by trawling.

But above all, it is the perseverance in the use of techniques that have proven themselves that must prevail. The surveys must continue and will do so.

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Appendix 1. List of mollusc's species collected in Iceland during 25 groundfish and *Nephrops* surveys in 2013–2022, along with corresponding Icelandic vernacular names presented in Óskarsson's book (1982)

Today's systematic classification			Óskarsson's classification		Islandic names
Bivalvia			**Bivalvia**		
Nuculidae			**Nuculidae**		
Ennucula	*corticata*	(Møller, 1842)	*Nucula*	*delphinodonta*	Hnotskel
Ennucula	*tenuis*	(Montagu, 1808)	*Nucula*	*tenuis*	Gljáhnytla
Nucula	*tumidula*	Malm, 1861	*Nucula*	*tumidula*	Tannhnytla
Nuculanidae			**Nuculanidae**		
Nuculana	*minuta*	(O.F. Müller, 1776)	*Leda*	*minuta*	Tr[onusystir
Nuculana	*pernula*	(O.F. Müller, 1779)	*Leda*	*pernula*	Trönuskel
Yoldiidae			**Yoldiidae**		
Yoldia	*hyperborea*	(A. Gould, 1841)	*Yoldia*	*hyperborea*	Kolkuskel
Yoldiella	*intermedia*	(M. Sars, 1865)	*Portlandia*	*intermedia*	Kólgutodda
Yoldiella	*lucida*	(Lovén, 1846)	*Portlandia*	*lucida*	Glittoda
Yoldiella	*nana*	(M. Sars, 1865)	-	-	-
Arcidae			**Arcidae**		
Asperarca	*nodulosa*	(O.F. Müller, 1776)	*Arca*	*nodulosus*	Vörtubirða
Bathyarca	*frielei*	(Friele, 1877)	-	-	-
Bathyarca	*glacialis*	(J.E. Gray, 1824)	*Arca*	*glacialis*	Jökulbirða
Bathyarca	*pectunculoides*	(Scacchi, 1835)	*Arca*	*pectunculoides*	Hörpubirða
Limopsidae			**Limopsidae**		
Limopsis	*minuta*	(R.A. Philippi, 1836)	*Limopsis*	*minuta*	Þrúðarskel
Mytilidae			**Mytilidae**		
Crenella	*decussata*	(Montagu,1808)	*Crenella*	*decussata*	Auðnuskel
Dacrydium	*ockelmanni*	Mattson & Warén, 1977	-	-	-
Dacrydium	*vitreum*	(Möller, 1842)	*Dacrydium*	*vitreum*	Glitskel
Idas	cf. *cylindricus*	Pelorce & Poutiers, 2009	-	-	-
Modiolula	*phaseolina*	(R.A. Philippi, 1844)	*Modiola*	*phaseolina*	Öðlingur
Modiolus	*modiolus*	(Linnaeus, 1758)	*Modiola*	*modiolus*	Aða eða öðuskel
Musculus	*discors*	(Linnaeus, 1767)	*Modiolaria*	*discors*	Silkihadda
Musculus	*laevigatus*	(J.E. Gray, 1824)	*Modiolaria*	*discors var laevigata*	Silkihadda, afbrigði
Musculus	*niger*	(J.E. Gray, 1824)	*Modiolaria*	*nigra*	Dökkhadda
Mytilus	*edulis*	Linnaeus, 1758	*Mytilus*	*edulis*	Kræklingur
Pectinidae			**Pectinidae**		
Chlamys	*islandica*	(O.F. Müller, 1776)	*Pecten*	*islandicus*	Hörpudiskur
Delectopecten	*vitreus*	(Gmelin, 1791)	*Pecten*	*vitreus*	Glitdiskur
Karnekampia	*sulcata*	(O.F. Müller, 1776)	*Pecten*	*aratus*	Bárudiskur
Palliolum	*striatum*	(O.F. Müller, 1776)	*Pecten*	*striatus*	Rákadiskur
Palliolum	*tigerinum*	(O.F. Müller, 1776)	*Pecten*	*tigerinus*	Flekkudiskur
Pseudamussium	*peslutrae*	(Linnaeus, 1771)	*Pecten*	*septemradiatus*	Geisladiskur
Propeamussiidae			**Propeamussiidae**		
Catillopecten	*eucymatus*	(Dall, 1898)	-	-	-
Cyclopecten	*hoskynsi*	(Forbes, 1844)	*Pecten*	*imbrifer*	Bóludiskur
Similipecten	*greenlandicus*	(G.B. Sowerby II, 1842)	*Pecten*	*groenlandicus*	Grœlandsdiskur
Similipecten	*similis*	(Laskey, 1811)	*Pecten*	*similis*	Kringludiskur
Anomiidae			**Anomiidae**		
Heteranomia	*squamula*	(Linnaeus, 1758)	*Anomia*	*squamula*	Gluggaskel
Limidae			**Limidae**		
Acesta	*excavata*	(J.C. Fabricius, 1779)	*Lima*	*excavata*	Ægisdrekka
Limatula	*gwyni*	(Sykes, 1903)	*Lima*	*gwyni*	Njarðardrekka
Limea	*crassa*	(Forbes, 1844)	*Lima*	*sarsi*	Sarsdrekka
Astartidae			**Astartidae**		
Astarte	*acuticostata*	Friele, 1877	-	-	-
Astarte	*borealis*	(Schumacher, 1817)	*Astarte*	*borealis*	Gimburskel
Astarte	*crenata*	(J.E. Gray, 1824)	*Astarte*	*crenata*	Fœriskel
Astarte	*elliptica*	(T. Brown, 1827)	*Astarte*	*elliptica*	Dorraskel
Astarte	*montagui*	(Dillwyn, 1817)	*Astarte*	*montagui*	Lambaskel
Astarte	*subaequilatera*	G.B. Sowerby II, 1854	*Astarte*	*crenata var. subaequilatera*	Fœriskel
Astarte	*sulcata*	(da Costa, 1778)	*Astarte*	*sulcata*	Sauðaskel
Thyasiridae			**Thyasiridae**		
Axinopsida	*orbiculata*	(G.O. Sars, 1878)	*Axinopsis*	*orbiculata*	Búldusystir
Mendicula	*ferruginosa*	(Forbes, 1844)	*Axinulus*	*ferruginosus*	Hrímskel

Thyasira	*gouldii*	(R.A. Philippi, 1845)	*Thyasira*	*flexuosa* var. *gouldi*	-
Thyasira	*obsoleta*	(Verrill & K.J. Bush, 1898)	-	-	-
Thyasira	*sarsii*	(R.A. Philippi, 1845)	*Thyasira*	*flexuosa var. sarsi*	Hrukkubúlda, afbrigði
Lasaeidae			**Lasaeidae**		
Altenaeum	*dawsoni*	(Jeffreys, 1864)	-	-	-
Kellia	*suborbicularis*	(Montagu, 1803)	*Kellia*	*suborbicularis*	Bugnisskel
Montacuta	*substriata*	(Montagu, 1808)	*Montacuta*	*substriata*	Gáranurta
Tellimya	*ferruginosa*	(Montagu, 1808)	*Montacuta*	*ferruginosa*	Ryðskel
Tellimya	*tenella*	(Lovén, 1846)	-	-	-
Cardiidae			**Cardiidae**		
Acanthocardia	*echinata*	(Linnaeus, 1758)	*Cardium*	*echinatum*	Ígulskel
Ciliatocardium	*ciliatum*	(O. Fabricius, 1780)	*Cardium*	*ciliatum*	Báruskel
Goethemia	*elegantula*	(Møller, 1842)	*Cardium*	*elegantulum*	Fagurskel
Papillicardium	*minimum*	(R.A. Philippi, 1836)	*Cardium*	*minimum*	Grýtuskel
Parvicardium	*pinnulatum*	(Conrad, 1831)	*Cardium*	*fasciatum*	Pétursskel
Serripes	*groenlandicus*	(Mohr, 1786)	*Serripes*	*groenlandicum*	Krókskel
Mactridae			**Mactridae**		
Spisula	cf. *solida*	(Linnaeus, 1758)	*Spisula*	*solida*	Tígulskel
Spisula	*elliptica*	(T. Brown, 1827)	*Spisula*	*elliptica*	Tígulskel ?
Tellinidae			**Tellinidae**		
Macoma	*calcarea*	(Gmelin, 1791)	*Macoma*	*calcaria*	Halloka
Psammobiidae			**Psammobiidae**		
Gari	*tellinella*	(Lamarck, 1818)	*Psammobia*	*tellinella*	Gliámeyla
Gari	*fervensis*	(Gmelin, 1791)	*Psammobia*	*ferroensis*	Stúfmeyla
Semelidae			**Semelidae**		
Abra	*nitida*	(O.F. Müller, 1776)	*Abra*	*nitida*	Lýsuskel
Abra	*prismatica*	(Montagu, 1808)	*Abra*	*prismatica*	Ýsuskel
Arcticidae			**Arcticidae**		
Arctica	*islandica*	(Linnaeus, 1767)	*Cyprina*	*islandica*	Kúfskel
Veneridae			**Veneridae**		
Mysia	*undata*	(Pennant, 1777)	*Mysia*	*undata*	Bylgjuskel
Timoclea	*ovata*	(Pennant, 1777)	*Venus*	*ovata*	Freyjuskel
Myidae			**Myidae**		
Mya	*pseudoarenaria*	Schlesch, 1931	*Mya*	*truncata ovata*	Smyrslingur
Mya	*truncata*	Linnaeus, 1758	*Mya*	*truncata*	Smyrslingur
Teredinidae			**Teredinidae**		
Nototeredo	*norvagica*	(Spengler, 1792)	*Teredo*	*norvegica*	Trémaðkur
Xylophagaidae			**Xylophagaidae**		
Xyloredo	*nooi*	R.D. Turner, 1972	-	-	-
Hiatellidae			**Hiatellidae**		
Hiatella	*arctica*	(Linnaeus, 1767)	*Saxicava*	*arctica*	Rataskel
Panomya	*norvegica*	(Spengler, 1793)	*Panopaea*	*norvegica*	Redduskel
Thraciidae			**Thraciidae**		
Thracia	*myopsis*	Møller, 1842	*Thracia*	*myopsis*	Hrukkusnekkja
Thracia	*villosiuscula*	(MacGillivray, 1827)	*Thracia*	*villosiuscula*	Hvítsnekkja
Poromyidae					
Poromya	*granulata*	(Nyst & Westendorp, 1839)	*Poromya*	*granulata*	Drafnarskel
Verticordiidae			**Verticordiidae**		
Halicardia	*flexuosa*	(A.E. Verrill & S. Smith, 1881)	-	-	-
Cuspidariidae			**Cuspidariidae**		
Cuspidaria	*arctica*	(M. Sars, 1859)	*Cuspidaria*	*obesa var. arctica*	*Risakesja*

Today's systematic classification			Óskarsson's classification		Islandic names
Gastropoda			**Gastropoda**		
Patellidae			**Patellidae**		
Patella	*pellucida*	Linnaeus, 1758	*Helcion*	*pellucidum*	þarahetta
Lepetidae			**Lepetidae**		
Iothia	*fulva*	(O.F. Müller, 1776)	*Pilidium*	*fulvum*	Goðahetta
Lepeta	*caeca*	(O.F. Müller, 1776)	*Lepeta*	*coeca*	Haðarhetta
Fissurellidae			**Fissurellidae**		
Emarginula	*crassa*	J. Sowerby, 1813	*Emarginula*	*crassa*	Glæsimotra
Puncturella	*noachina*	(Linnaeus, 1771)	*Puncturella*	*noachina*	Ljóramotra
Choristellidae					
Choristella	*leptalea*	K.J. Bush, 1897	-	-	-
Trochidae			**Trochidae**		
Steromphala	*tumida*	(Montagu, 1803)	*Gibbula*	*tumida*	Fédugga
Calliostomatidae			**Trochidae**		
Calliostoma	*caroli*	Dautzenberg, 1927	-	-	-
Calliostoma	*occidentale*	(Mighels & C.B. Adams, 1842)	*Calliostoma*	*occidentale*	Perlutoppa
Margaritidae			**Trochidae**		
Margarites	*costalis*	(A. Gould, 1841)	*Margarites*	*cinereus*	Kjalsilfri
Margarites	*groenlandicus*	(Gmelin, 1791)	*Margarites*	*groenlandicus*	Baugassilfri
Margarites	*olivaceus*	(T. Brown, 1827)	*Margarites*	*olivaceus*	Grœnsilfri
Skeneidae					
Skenea	*ferruginea*	Warén, 1991	-	-	-
Colloniidae			**Turbinidae**		
Moelleria	*costulata*	(Møller, 1842)	*Moelleria*	*costulata*	Gróttudoppa
Newtoniellidae			**Cerithiidae**		
Laeocochlis	*sinistrata*	(Nyst, 1835)	*Laeocochlis*	*granosa*	Döglingur
Epitoniidae			**Scalidae**		
Boreoscala	*greenlandica*	(Perry, 1811)	Scala	groenlandica	Skrautgylfi
Eulimidae			**Melanellidae**		
Haliella	*stenostoma*	(Jeffreys, 1858)	*Melanella*	*stenostoma*	Gormlyngvi
Littorinidae			**Littorinidae / Lacunidae**		
Lacuna	*vincta*	(Montagu, 1803)	*Lacuna*	*divaricata*	Þarastrútur
Littorina	*obtusata*	(Linnaeus, 1758)	*Littorina*	*obtusata*	Þangdoppa
Littorina	*obtuata palliata*	(Say, 1822)	*Littorina*	*palliata*	Möttuldoppa
Rissoidae			**Rissoidae**		
Alvania	*jeffeysi*	(E. Waller, 1864)	*Alvania*	*jeffreysi*	Djúpkrota
Obtusella	*intersecta*	(S.V. Wood, 1857)	*Setia*	*griegi*	Faxaperla
Onoba	*semicostata*	(Montagu, 1803)	*Onoba*	*striata*	Bárusnotra
Aporrhaidae			**Aporrhaidae**		
Aporrhais	*pespelecani*	(Linnaeus, 1758)	*Aporrhais*	*pespelecani*	Vœngbarði
Capulidae			***Capulidae / Trichotropidae***		
Ariadnaria	*borealis*	(Broderip & G.B. Sowerby I, 1829)	*Trichotropis*	*borealis*	Barðakati
Ariadnaria	*conica*	(Møller, 1842)	*Trichotropis*	*conica*	Keilukati
Capulus	*ungaricus*	(Linnaeus, 1758)	*Capulus*	*hungaricus*	Hnýfilbobbi
Torellia	*delicata*	(R.A. Philippi, 1844)	*Torellia*	*vestita*	Sœvarlubbi
Trichotropis	*bicarinata tenuis*	E.A. Smith, 1877	*Trichotropis*	*bicarinata tenuis*	Dvalinskati
Velutinidae			**Lamellariidae / Lepetidae**		
Calyptoconcha	*pellucida*	(A.E. Verrill, 1880)	-	-	-
Limneria	*undata*	(T. Brown, 1839)	*Velutina*	*undata*	Skelkúfa
Onchidiopsis	*glacialis*	(M. Sars, 1851)	*Onchidiopsis*	*groenlandica*	Grœnlandsskjaldi
Piliscus	*radiatus*	(M. Sars, 1851)	*Pilidium*	*radiatum*	Krókhetta
Velutina	*velutina*	(O.F. Müller, 1776)	*Velutina*	*velutina*	Hornkúfa
Naticidae			**Naticidae**		
Amauropsis	*islandica*	(Gmelin, 1791)	*Amauropsis*	*islandica*	Frónpatti
Bulbus	*smithii*	T. Brown, 1839	*Acrybia*	*flava*	Ámupoppa
Cryptonatica	*affinis*	(Gmelin, 1791)	*Natica*	*clausa*	Meyjarpatta
Euspira	*montagui*	(Forbes, 1838)	*Lunatia*	*montagui*	Beltispoppa
Euspira	*nitida*	(Donovan, 1803)	*Lunatia*	*nitida*	Stjörnupoppa
Euspira	*pallida*	(Broderip & G.B. Sowerby I, 1829)	*Lunatia*	*pallida*	Groenlandspoppa
Euspira	*tenuistriata*	(Dautzenberg & H. Fischer, 1911)	*Lunatia*	*tenuistriata*	Rákapoppa
Muricidae			**Muricidae**		
Boreotrophon	*clathratus*	(Linnaeus, 1767)	*Boreotrophon*	*clathratus*	Kambdofri
Boreotrophon	*truncatus*	(Strøm, 1768)	*Boreotrophon*	*truncatus*	Gáradofri

Scabrotrophon	*fabricii*	(Møller, 1842)	*Boreotrophon*	*fabricii*	Baugadofri
Ptychatractidae			**Vasidae**		
Metzgeria	*alba*	(Jeffreys, 1873)	*Metzgeria*	*pusilla*	Trjónuglammi
Buccinidae			**Buccinidae**		
Anomalisipho	*verkruezeni*	(Kobelt, 1876)	*Sipho*	*verkruezeni*	Gljákóngur
Anomalisipho	*virgatus*	(Friele, 1879)	*Sipho*	*altus*	Djúpkóngur
Beringius	*bogasoni*	Warén & S.M. Smith, 2006	-	-	-
Beringius	*turtoni*	(W. Bean, 1834)	*Beringius*	*turtoni*	Gullskati
Buccinum	*alicei*	Dautzenberg & H. Fischer, 1912	-	-	-
Buccinum	*finmarkianum*	Verkrüzen, 1875	*Buccinum*	*finmarchianum*	Finnakóngur
Buccinum	*fragile*	Verkrüzen 1878	-	-	-
Buccinum	*hydrophanum*	Hancock, 1846	*Buccinum*	*hydrophanum*	Sléttikóngur
Buccinum	*kjennerudae*	Bouchet & Warén, 1985	-	-	-
Buccinum	*nivale*	Friele, 1882	-	-	-
Buccinum	*tumidulum*	G.O. Sars, 1878	*Buccinum*	*totteni*	Þistilkóngur
Buccinum	*undatum*	Linnaeus, 1758	*Buccinum*	*undatum*	Beitukóngur
Liomesus	*ovum*	(W. Turton, 1825)	*Liomesus*	*ovum*	Sléttihnubbur
Mohnia	*dalli*	(Friele, 1881)	*Sipho*	*dalli*	Stallakóngur
Neptunea	*despecta*	(Linnaeus, 1758)	*Neptunea*	*despecta*	Hafkóngur
Troschelia	*berniciensis*	(W. King, 1846)	*Troschelia*	*berniciensis*	Bylgjunati
Volutopsius	*norwegicus*	(Gmelin, 1791)	*Volutopsius*	*norvegicus*	Ránarbuðli
Volutopsius	*scotiae*	Fraussen, McKay & Drewery, 2013	-	-	-
Colidae			**Buccinidae**		
Colus	*glaber*	(Verkrüzen, 1876)	*Sipho*	*glaber*	Starkóngur
Colus	*holboelli*	(Møller, 1842)	*Sipho*	*tortuosus*	Bugðukóngur
Colus	*islandicus*	(Mohr, 1786)	*Sipho*	*islandicus*	Péturskóngur
Colus	*jeffreysianus*	(P. Fischer, 1868)	-	-	-
Colus	*sabini*	(J.E. Gray, 1824)	*Sipho*	*togatus*	Bárðarkóngur
Colus	*turgidulus*	(Friele, 1877)	*Sipho*	*turgidulus*	Digrikóngur
Turrisipho	*fenestratus*	(W. Turton, 1834)	*Sipho*	*fusiformis*	Bárukóngur
Turrisipho	*lachesis*	(Mörch, 1869)	*Sipho*	*lachesis*	Skuldarkóngur
Turrisipho	*moebii*	(Dunker & Metzger, 1875)	*Sipho*	*sarsi / ebur*	Sarskóngur - Mjallarkóngur
Turrisipho	*voeringi*	Bouchet & Warén, 1985	*Sipho*	*lachesis non S undulatus*	Skuldarkóngur
Retimohniidae			**Buccinidae**		
Retifusus	*latericeus*	(Møller, 1842)	*Sipho*	*latericeus*	Blökkukóngur
Nassariidae			**Nassidae**		
Tritia	*incrassata*	(Ström, 1768)	*Nassa*	*incrassata*	Brimgagar
Columbellidae			**Columbellidae**		
Amphissa	*acutecostata*	(R.A. Philippi, 1844)	*Pyrene*	*costulata*	Öldudúfa
Astyris	*rosacea*	(A. Gould, 1840)	*Pyrene*	*rosacea*	Mardúfa
Volutomitridae			**Volutidae**		
Volutomitra	*groenlandica*	(Møller, 1842)	*Volutomitra*	*groenlandica*	Dumbur
Cancellariidae			**Cancellariidae**		
Admete	*viridula*	(O. Fabricius, 1780)	Admete	viridula	Bauti
Drilliidae			**Pleurotomidae**		
Spirotropis	*confusa sarsi*	Warén, 1975	*Spirotropis*	*carinata*	Kjalsörvi
Mangeliidae			**Pleurotomidae**		
Curtitoma	*decussata*	(Couthouy, 1839)	*Lora*	*decussata*	Grœnbeli
Curtitoma	*trevelliana*	(W. Turton, 1834)	*Lora*	*trevelyana*	Gábeli
Curtitoma	*violacea*	(Mighels & C.B. Adams, 1842)	*Lora*	*violacea bicarinata*	Blábeli
Oenopota	*declivis*	(Lovén, 1846)	*Lora*	*declivis*	Langbeli
Oenopota	*elegans*	(Møller, 1842)	*Lora*	*elegans*	Fagurbeli
Oenopota	*pingelii*	(Møller, 1842)	*Lora*	*pingelii*	Hábeli
Oenopota	*tenuicostata*	(G.O. Sars, 1878)	*Lora*	*tenuicostata*	Krotbeli
Propebela	*angulosa*	(G.O. Sars, 1878)	*Lora*	*angulosa*	Hornbeli
Propebela	*exarata*	(Møller, 1842)	-	-	-
Propebela	*nobilis*	(Møller, 1842)	*Lora*	*nobilis*	Eðalbeli
Raphitomidae			**Pleurotomidae**		
Cyrillia	*aequalis*	(Jeffreys, 1867)	*Philbertia*	*linearis*	Randabokkur
Thesbia	*nana*	(Lovén, 1846)	*Thesbia*	*nana*	Rákahörvi
Pyramidellidae			**Pyramidellidae**		
Chrysallida	*hoeisaeteri*	Warén, 1991	-	-	-
Odostomia	*turrita*	Hanley, 1844	-	-	-
Ondina	*divisa*	(J. Adams, 1797)	*Menestho*	*insculpta*	Gárastrýta

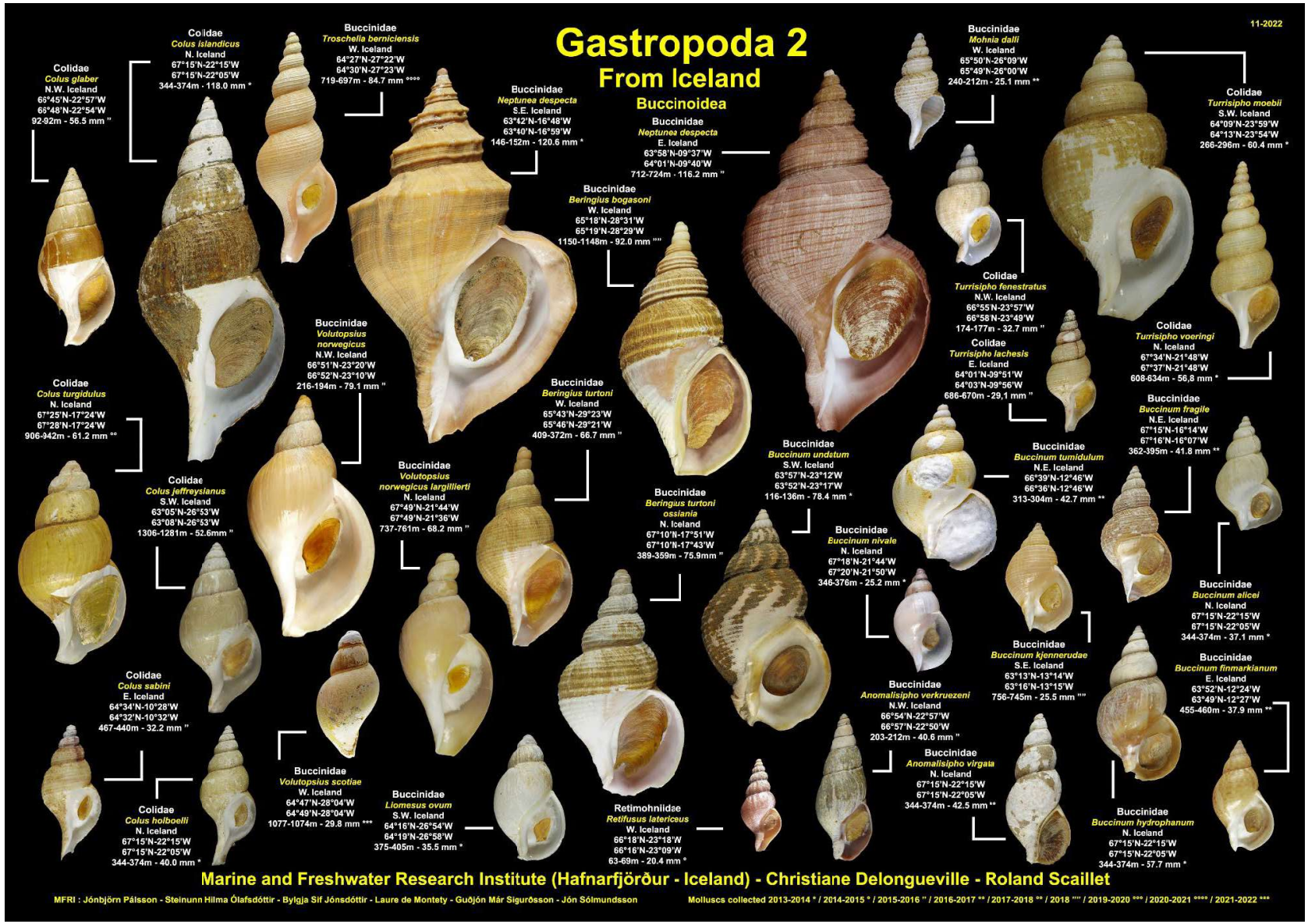
Cylichnidae			**Scaphandridae**		
Cylichna	*alba*	(T. Brown, 1827)	*Cylichna*	*alba*	Hvítstúfa
Diaphanidae			**Diaphanidae**		
Diaphana	*hiemalis*	(Couthouy, 1839)	*Diaphana*	*hiemalis*	Húnasoppa
Diaphana	*minuta*	T. Brown, 1827	*Diaphana*	*hyalina*	Langstúfa
Eoscaphandridae			**Scaphandridae**		
Cylichnoides	*occultus*	(Mighels & C.B. Adams, 1842)	*Cylichna*	*insculpta*	Krotstúfa
Laonidae			**Philinidae**		
Laona	*quadrata*	(S.V. Wood, 1839)	*Philine*	*quadrata*	Tígullaufa
Praephiline	*finmarchica*	(M. Sars, 1859)	*Philine*	*finmarchica*	Rákalaufa
Retusophiline	*lima*	(T. Brown, 1827)	*Philine*	*lima*	Topplaufa
Philinidae			**Philinidae**		
Hermania	*scabra*	(O.F. Müller, 1784)	*Philine*	*scabra*	Kamblaufa
Scaphandridae			**Scaphandridae**		
Scaphander	*lignarius*	(Linnaeus, 1758)	*Scaphander*	*lignarius*	Ægiskuggur
Scaphander	*punctostriatus*	(Mighels & C.B. Adams, 1842)	*Scaphander*	*punctostriatus*	Ránarkuggur
Limacinidae			-		
Limacina	*retroversa*	(J. Fleming, 1823)	-	-	-
Doridoxidae			-		
Doridoxa	*walteri*	(A. Krause, 1892)	-	-	-

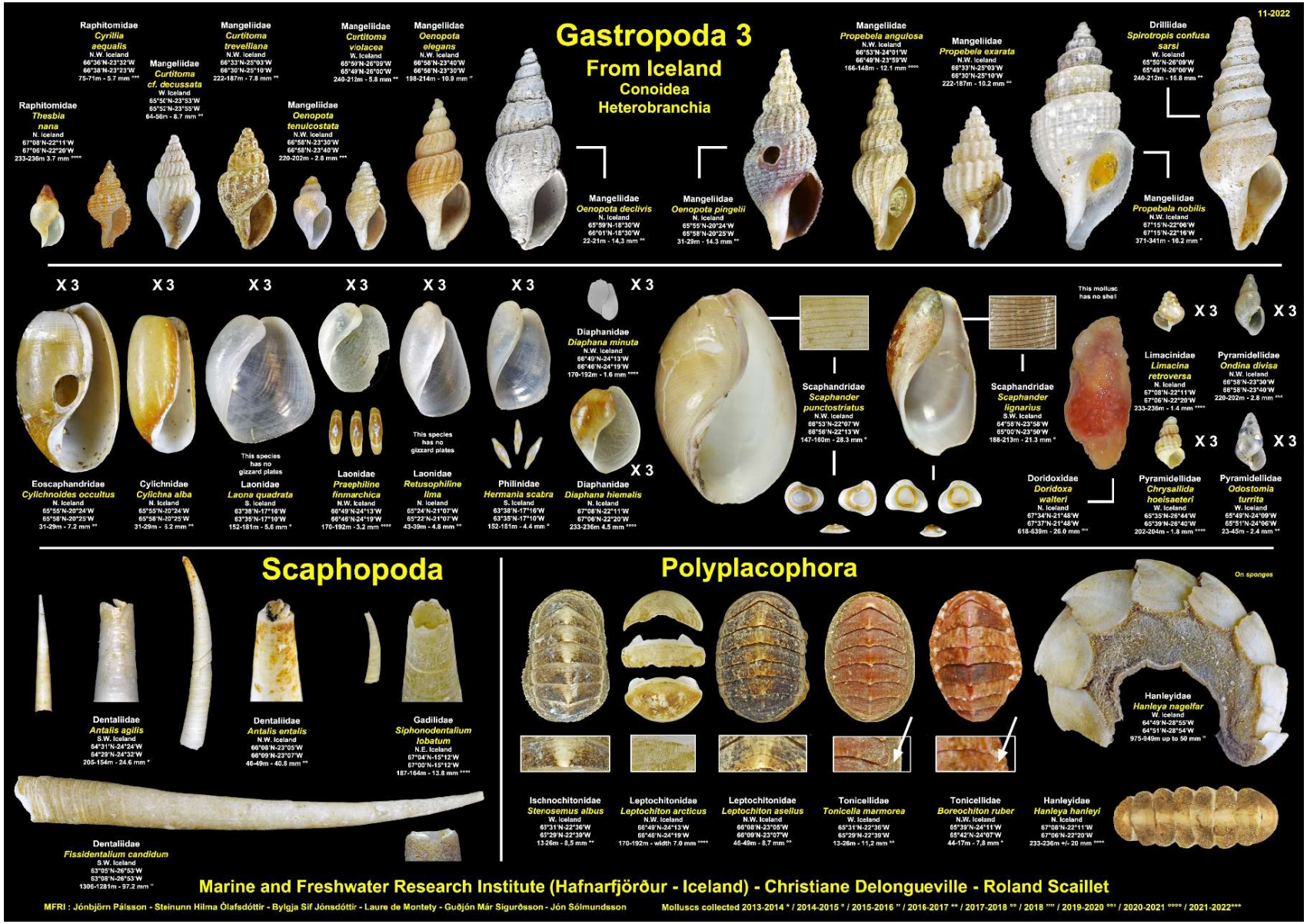
Today's systematic classification			**Óskarsson's classification**		**Islandic names**
Scaphopoda			**Scaphopoda**		
Dentaliidae					
Antalis	*agilis*	(M. Sars, 1872)	-	-	-
Antalis	*entalis*	(Linnaeus, 1758)	-	-	-
Fissidentalium	*candidum*	(Jeffreys, 1877)	-	-	-
Gadilidae					
Siphonodentalium	*lobatum*	(G.B. Sowerby II, 1860)	-	-	-

Today's systematic classification			**Óskarsson's classification**		**Islandic names**
Polyplacophora			**Polyplacophora**		
Hanleyidae					
Hanleya	*hanleyi*	(W. Bean, 1844)	-	-	-
Hanleya	*nagelfar*	(Lovén, 1846)	-	-	-
Ischnochitonidae					
Stenosemus	*albus*	(Linnaeus, 1767)	-	-	-
Leptochitonidae					
Leptochiton	*arcticus*	(G.O. Sars, 1878)	-	-	-
Leptochiton	*asellus*	(Gmelin,1791)	-	-	-
Tonicellidae					
Boreochiton	*ruber*	(Linnaeus, 1767)	-	-	-
Tonicella	*marmorea*	(O. Fabricius, 1780)	-	-	-

Today's systematic classification			**Óskarsson's classification**		**Islandic names**
Cephalopoda			**Cephalopoda**		
Bathypolypodidae					
Bathypolypus	*bairdii*	(A.E. Verrill, 1873)	-	-	-
Megaleledonidae					
Graneledone	*verrucosa*	(A.E. Verrill, 1881)	-	-	-

Appendix 2. Posters with all species illustrated


Gastropoda 2
From Iceland
Buccinoidea
11-2022
Colidae
Colus glaber
N.W. Iceland
66°45'N-22°57'W
66°48'N-22°54'W
92-92m - 56.5 mm ”
Colidae
Colus islandicus
N. Iceland
67°15'N-22°15'W
67°15'N-22°05'W
344-374m - 118.0 mm *
Buccinidae
Troschelia berniciensis
W. Iceland
64°27'N-27°22'W
64°30'N-27°23'W
719-697m - 84.7 mm °°°°
Buccinidae
Neptunea despecta
S.E. Iceland
63°42'N-16°48'W
63°40'N-16°59'W
146-152m - 120.6 mm *
Buccinidae
Neptunea despecta
E. Iceland
63°58'N-09°37'W
64°01'N-09°40'W
712-724m - 116.2 mm ”
Buccinidae
Beringius bogasoni
W. Iceland
65°18'N-28°31'W
65°19'N-28°29'W
1150-1148m - 92.0 mm ”””
Buccinidae
Mohnia dalli
W. Iceland
65°50'N-26°09'W
65°49'N-26°00'W
240-212m - 25.1 mm **
Colidae
Turrisipho moebii
S.W. Iceland
64°09'N-23°59'W
64°13'N-23°54'W
266-296m - 60.4 mm *
Colidae
Turrisipho fenestratus
N.W. Iceland
66°55'N-23°57'W
66°58'N-23°49'W
174-177m - 32.7 mm ”
Colidae
Turrisipho lachesis
E. Iceland
64°01'N-09°51'W
64°03'N-09°56'W
686-670m - 29,1 mm ”
Colidae
Turrisipho voeringi
N. Iceland
67°34'N-21°48'W
67°37'N-21°48'W
608-634m - 56,8 mm *
Buccinidae
Volutopsius norwegicus
N.W. Iceland
66°51'N-23°20'W
66°52'N-23°10'W
216-194m - 79.1 mm ”
Buccinidae
Beringius turtoni
W. Iceland
65°43'N-29°23'W
65°46'N-29°21'W
409-372m - 66.7 mm ”
Buccinidae
Buccinum undatum
S.W. Iceland
63°57'N-23°12'W
63°52'N-23°17'W
116-136m - 78.4 mm *
Buccinidae
Buccinum tumidulum
N.E. Iceland
66°39'N-12°46'W
66°36'N-12°46'W
313-304m - 42.7 mm **
Buccinidae
Buccinum fragile
N.E. Iceland
67°15'N-16°14'W
67°16'N-16°07'W
362-395m - 41.8 mm **
Colidae
Colus turgidulus
N. Iceland
67°25'N-17°24'W
67°28'N-17°24'W
906-942m - 61.2 mm °°
Colidae
Colus jeffreysianus
S.W. Iceland
63°05'N-26°53'W
63°08'N-26°53'W
1306-1281m - 52.6mm ”
Buccinidae
Volutopsius norwegicus fargillierti
N. Iceland
67°49'N-21°44'W
67°49'N-21°36'W
737-761m - 68.2 mm ”
Buccinidae
Beringius turtoni ossiania
N. Iceland
67°10'N-17°51'W
67°10'N-17°43'W
389-359m - 75.9mm ”
Buccinidae
Buccinum nivale
N. Iceland
67°18'N-21°44'W
67°20'N-21°50'W
346-376m - 25.2 mm *
Buccinidae
Buccinum alicei
N. Iceland
67°15'N-22°15'W
67°15'N-22°05'W
344-374m - 37.1 mm *
Buccinidae
Buccinum kjennerudae
S.E. Iceland
63°13'N-13°14'W
63°16'N-13°15'W
756-745m - 25.5 mm ””
Buccinidae
Buccinum finmarkianum
E. Iceland
63°52'N-12°24'W
63°49'N-12°27'W
455-460m - 37.9 mm **
Colidae
Colus sabini
E. Iceland
64°34'N-10°28'W
64°32'N-10°32'W
467-440m - 32.2 mm ”
Colidae
Colus holboelli
N. Iceland
67°15'N-22°15'W
67°15'N-22°05'W
344-374m - 40.0 mm *
Buccinidae
Volutopsius scotiae
W. Iceland
64°47'N-28°04'W
64°49'N-28°04'W
1077-1074m - 29.8 mm ***
Buccinidae
Liomesus ovum
S.W. Iceland
64°16'N-26°54'W
64°19'N-26°58'W
375-405m - 35.5 mm *
Retimohniidae
Retifusus latericeus
W. Iceland
66°18'N-23°18'W
66°16'N-23°09'W
63-69m - 20.4 mm °
Buccinidae
Anomalisipho verkruezeni
N.W. Iceland
66°54'N-22°57'W
66°57'N-22°50'W
203-212m - 40.6 mm ”
Buccinidae
Anomalisipho virgata
N. Iceland
67°15'N-22°15'W
67°15'N-22°05'W
344-374m - 42.5 mm **
Buccinidae
Buccinum hydrophanum
N. Iceland
67°15'N-22°15'W
67°15'N-22°05'W
344-374m - 57.7 mm *
Marine and Freshwater Research Institute (Hafnarfjörður - Iceland) - Christiane Delongueville - Roland Scaillet
MFRI : Jónbjörn Pálsson - Steinunn Hilma Ólafsdóttir - Bylgja Sif Jónsdóttir - Laure de Montety - Guðjón Már Sigurðsson - Jón Sólmundsson
Molluscs collected 2013-2014 * / 2014-2015 ° / 2015-2016 ” / 2016-2017 ** / 2017-2018 °° / 2018 ”” / 2019-2020 °°° / 2020-2021 °°°° / 2021-2022 ***


11-2022
Gastropoda 3
From Iceland
Conoidea
Heterobranchia
Raphitomidae
Cyrillia aequalis
N.W. Iceland
66°36'N-23°32'W
66°38'N-23°23'W
75-71m - 5.7 mm ***
Raphitomidae
Thesbia nana
N. Iceland
67°08'N-22°11'W
67°06'N-22°20'W
233-236m 3.7 mm ****
Mangeliidae
Curtitoma cf. decussata
W Iceland
65°52'N-23°53'W
65°52'N-23°55'W
64-96m - 8.7 mm **
Mangeliidae
Curtitoma trevelliana
N.W. Iceland
66°33'N-25°03'W
66°30'N-25°10'W
222-187m - 7.8 mm **
Mangeliidae
Oenopota tenuicostata
N.W. Iceland
66°58'N-23°30'W
66°58'N-23°40'W
220-202m - 2.8 mm ***
Mangeliidae
Curtitoma violacea
W. Iceland
65°59'N-26°09'W
65°49'N-26°00'W
240-212m - 5.8 mm **
Mangeliidae
Oenopota elegans
N.W. Iceland
66°58'N-23°40'W
66°58'N-23°30'W
198-214m - 10.9 mm **
Mangeliidae
Oenopota declivis
N. Iceland
65°59'N-18°30'W
66°01'N-18°30'W
22-21m - 14,3 mm **
Mangeliidae
Oenopota pingelii
N. Iceland
65°55'N-20°24'W
65°58'N-20°25'W
31-29m - 14.3 mm **
Mangeliidae
Propebela angulosa
N.W. Iceland
66°53'N-24°01'W
66°49'N-33°59'W
166-148m - 12.1 mm ****
Mangeliidae
Propebela exarata
N.W. Iceland
66°33'N-25°03'W
66°30'N-25°10'W
222-187m - 10.2 mm **
Drilliidae
Spirotropis confusa sarsi
W. Iceland
65°50'N-26°09'W
65°49'N-26°06'W
240-212m - 16.8 mm **
Mangeliidae
Propebela nobilis
N.W. Iceland
67°15'N-22°06'W
67°15'N-22°18'W
371-341m - 16.2 mm *
X 3
Eoscaphandridae
Cylichnoides occultus
N. Iceland
65°55'N-20°24'W
65°58'N-20°25'W
31-29m - 7.2 mm **
Cylichnidae
Cylichna alba
N. Iceland
65°55'N-20°24'W
65°58'N-20°25'W
31-29m - 5.2 mm **
Laonidae
Laona quadrata
S. Iceland
63°38'N-17°16'W
63°35'N-17°10'W
152-181m - 5.6 mm *
This species has no gizzard plates
Laonidae
Praephiline finmarchica
N.W. Iceland
66°49'N-24°13'W
66°46'N-24°19'W
170-192m - 3.2 mm ****
Laonidae
Retusophiline lima
N. Iceland
65°24'N-21°07'W
65°22'N-21°07'W
43-39m - 4.8 mm **
This species has no gizzard plates
Phillinidae
Hermania scabra
S. Iceland
63°38'N-17°16'W
63°35'N-17°10'W
152-181m - 4.4 mm *
Diaphanidae
Diaphana minuta
N.W. Iceland
66°49'N-24°13'W
66°46'N-24°19'W
170-192m - 1.6 mm ****
Diaphanidae
Diaphana hiemalis
N. Iceland
67°08'N-22°11'W
67°06'N-22°20'W
233-236m 4.5 mm ****
Scaphandridae
Scaphander punctostriatus
N.W. Iceland
66°53'N-22°07'W
66°56'N-22°13'W
147-160m - 28.3 mm *
Scaphandridae
Scaphander lignarius
S.W. Iceland
64°58'N-23°38'W
65°00'N-23°50'W
188-213m - 21.3 mm *
This mollusc has no shell
Doridoxidae
Doridoxa walteri
N. Iceland
67°34'N-21°48'W
67°37'N-21°48'W
618-638m - 26.0 mm **
Limacinidae
Limacina retroversa
N. Iceland
67°08'N-22°11'W
67°06'N-22°20'W
233-236m - 1.4 mm ****
Pyramidellidae
Ondina divisa
N.W. Iceland
66°58'N-23°30'W
66°58'N-23°40'W
220-202m - 2.8 mm ***
Pyramidellidae
Chrysallida hoeisaeteri
W. Iceland
65°35'N-26°44'W
65°39'N-26°40'W
202-204m - 1.8 mm ****
Pyramidellidae
Odostomia turrita
W. Iceland
65°49'N-24°09'W
65°51'N-24°06'W
23-45m - 2.4 mm **
Scaphopoda
Dentaliidae
Antalis agilis
S.W. Iceland
64°31'N-24°24'W
64°29'N-24°32'W
205-154m - 24.6 mm *
Dentaliidae
Antalis entalis
N.W. Iceland
66°08'N-23°05'W
66°09'N-23°07'W
46-49m - 40.8 mm **
Gadilidae
Siphonodentalium lobatum
N.E. Iceland
67°04'N-15°12'W
67°00'N-15°12'W
187-164m - 13.8 mm ****
Dentaliidae
Fissidentalium candidum
S.W. Iceland
63°05'N-26°53'W
63°08'N-26°53'W
1306-1281m - 97.2 mm **
Polyplacophora
On sponges
Ischnochitonidae
Stenosemus albus
W. Iceland
65°31'N-22°36'W
65°29'N-22°39'W
13-26m - 8,5 mm **
Leptochitonidae
Leptochiton arcticus
N.W. Iceland
66°49'N-24°13'W
66°46'N-24°19'W
170-192m - width 7.0 mm ****
Leptochitonidae
Leptochiton asellus
N.W. Iceland
66°08'N-23°05'W
66°09'N-23°07'W
46-49m - 8.7 mm **
Tonicellidae
Tonicella marmorea
W. Iceland
65°31'N-22°36'W
65°29'N-22°39'W
13-26m - 11,2 mm **
Tonicellidae
Boreochiton ruber
N.W. Iceland
65°39'N-24°11'W
65°42'N-24°07'W
44-17m - 7,8 mm *
Hanleyidae
Hanleya hanleyi
N. Iceland
67°08'N-22°11'W
67°06'N-22°20'W
233-236m +/- 20 mm ****
Hanleyidae
Hanleya nagelfar
W. Iceland
64°49'N-28°55'W
64°51'N-28°54'W
975-949m up to 50 mm *
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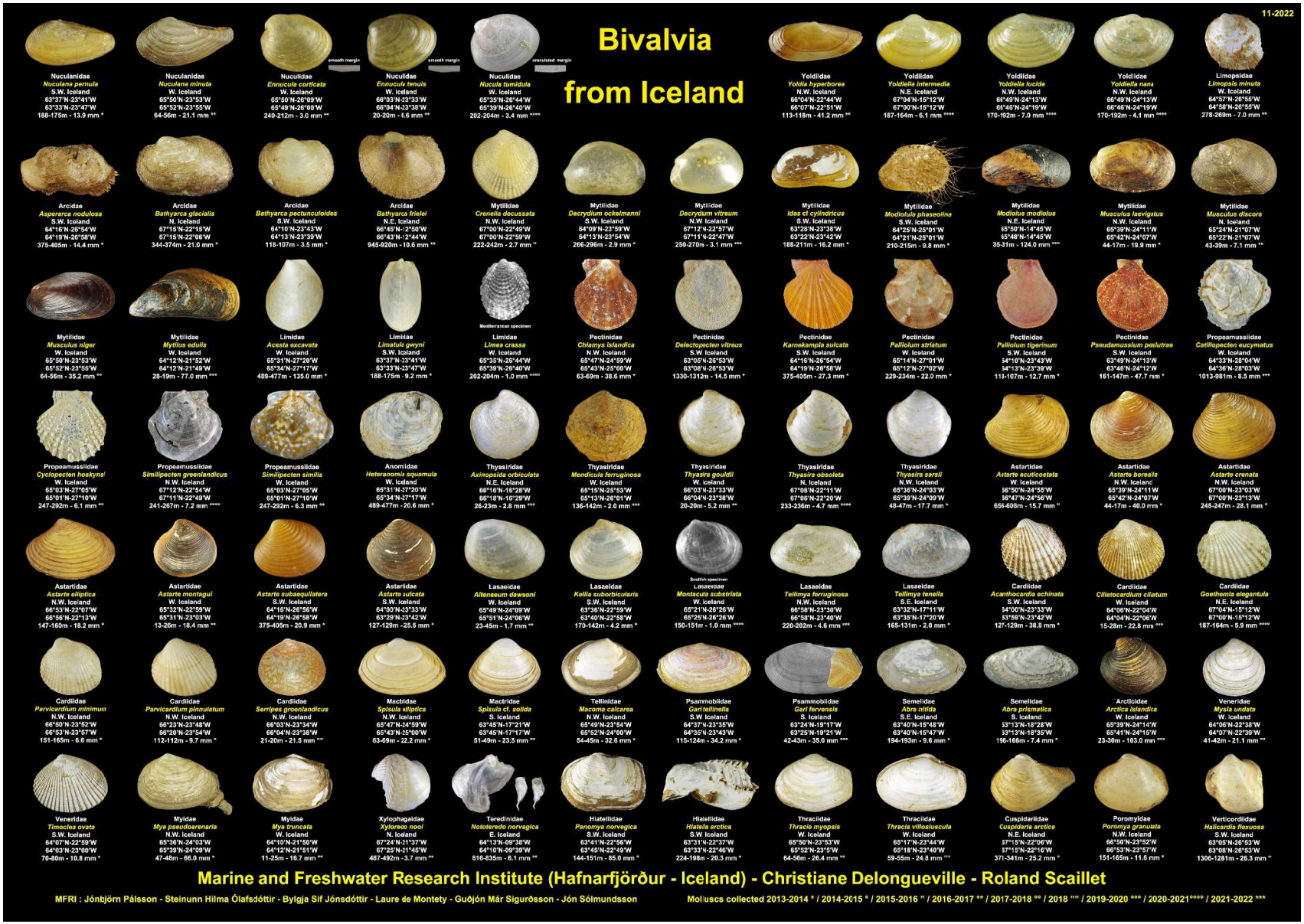
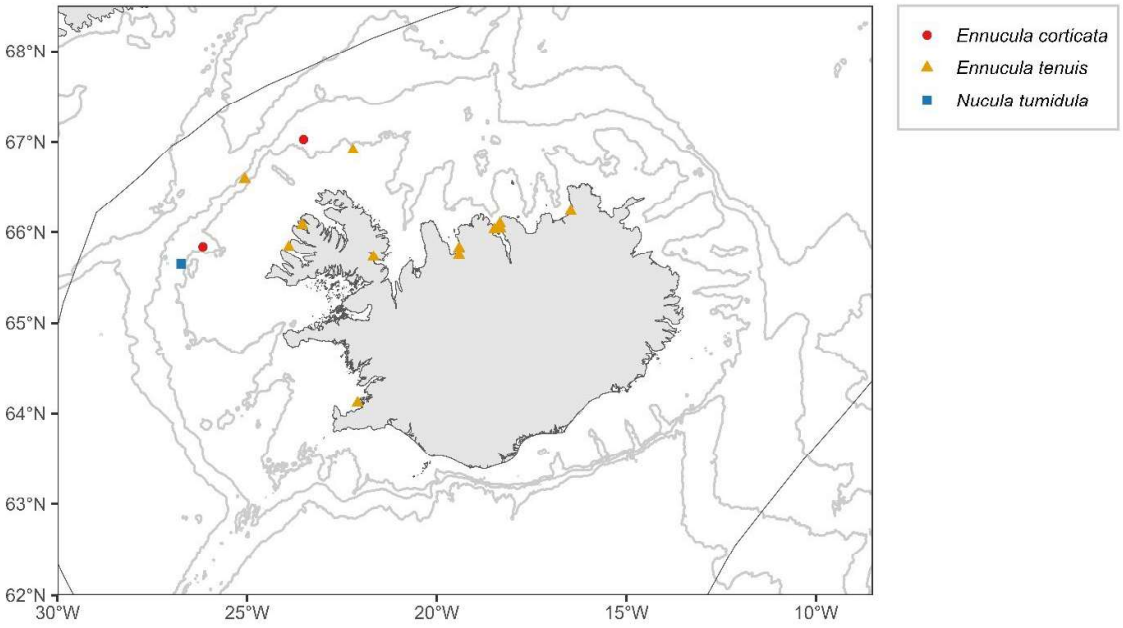
Molluscs collected 2013-2014 * / 2014-2015 ° / 2015-2016 " / 2016-2017 ** / 2017-2018 °° / 2018 "" / 2019-2020 °°° / 2020-2021 °°°° / 2021-2022***


11-2022
Bivalvia
from Iceland
Nuculanidae
Nuculana pernula
S.W. Iceland
63°37'N-23°41'W
63°33'N-23°47'W
188-175m - 13.9 mm *
Nuculanidae
Nuculana minuta
W. Iceland
65°50'N-23°53'W
65°52'N-23°55'W
64-56m - 21.1 mm **
Nuculidae
Ennucula corticata
W. Iceland
65°50'N-26°09'W
65°49'N-26°09'W
240-212m - 3.0 mm **
smooth margin
Nuculidae
Ennucula tenuis
W. Iceland
66°03'N-23°33'W
66°04'N-23°38'W
20-20m - 6.6 mm **
smooth margin
Nuculidae
Nucula tumidula
W. Iceland
65°35'N-26°44'W
65°39'N-26°40'W
202-204m - 3.4 mm ****
crenulated margin
Yoldiidae
Yoldia hyperborea
N.W. Iceland
66°04'N-22°44'W
66°07'N-22°51'W
113-118m - 41.2 mm **
Yoldiidae
Yoldiella intermedia
N.E. Iceland
67°04'N-15°12'W
67°00'N-15°12'W
187-164m - 6.1 mm ****
Yoldiidae
Yoldiella lucida
N.W. Iceland
66°49'N-24°13'W
66°46'N-24°19'W
170-182m - 7.0 mm ****
Yoldiidae
Yoldiella nana
N.W. Iceland
66°49'N-24°13'W
66°46'N-24°19'W
170-192m - 4.1 mm ****
Limopsidae
Limopsis minuta
W. Iceland
64°57'N-26°55'W
64°58'N-26°55'W
278-269m - 7.0 mm **
Arcidae
Asperarca nodulosa
S.W. Iceland
64°16'N-26°54'W
64°19'N-26°58'W
375-465m - 14.4 mm *
Arcidae
Bathyarca glacialis
N.W. Iceland
67°15'N-22°15'W
67°15'N-22°06'W
344-374m - 21.0 mm *
Arcidae
Bathyarca pectunculoides
S.W. Iceland
64°10'N-23°43'W
64°13'N-23°39'W
118-107m - 3.5 mm *
Arcidae
Bathyarca frielei
N.E. Iceland
66°45'N-12°50'W
66°43'N-12°44'W
945-920m - 10.6 mm **
Mytilidae
Crenella decussata
W. Iceland
67°00'N-22°49'W
67°00'N-22°59'W
222-242m - 2.7 mm *
Mytilidae
Dacrydium ockelmenni
S.W. Iceland
64°09'N-23°59'W
64°13'N-23°54'W
266-296m - 2.9 mm *
Mytilidae
Dacrydium vitreum
N.W. Iceland
67°12'N-22°57'W
67°11'N-22°47'W
250-270m - 3.1 mm ***
Mytilidae
Idas cf cylindricus
S.W. Iceland
63°28'N-23°38'W
63°22'N-23°42'W
188-211m - 16.2 mm *
Mytilidae
Modiolula phaseolina
S.W. Iceland
64°25'N-25°01'W
64°21'N-25°01'W
210-215m - 9.8 mm *
Mytilidae
Modiolus modiolus
N.E. Iceland
65°50'N-14°45'W
65°48'N-14°45'W
35-31m - 124.0 mm °°°
Mytilidae
Musculus laevigatus
N.W. Iceland
65°39'N-24°11'W
65°42'N-24°07'W
44-17m - 19.9 mm *
Mytilidae
Musculus discors
N. Iceland
65°24'N-21°07'W
65°22'N-21°07'W
43-39m - 7.1 mm **
Mytilidae
Musculus niger
W. Iceland
65°03'N-23°53'W
65°52'N-23°55'W
64-56m - 35.2 mm °°
Mytilidae
Mytilus edulis
W. Iceland
64°12'N-21°32'W
64°12'N-21°49'W
28-19m - 77.0 mm °°°
Limidae
Acesta excavata
W. Iceland
63°31'N-27°20'W
65°34'N-27°17'W
489-477m - 135.0 mm *
Limidae
Limatula gwyni
S.W. Iceland
63°37'N-23°41'W
63°33'N-23°47'W
188-175m - 9.2 mm *
Limidae
Limea crassa
W. Iceland
65°35'N-26°44'W
65°38'N-26°40'W
202-204m - 1.0 mm °°°°
Mediterranean specimen
Pectinidae
Chlamys islandica
S.W. Iceland
65°47'N-24°59'W
65°43'N-25°00'W
63-69m - 38.6 mm *
Pectinidae
Delectopecten vitreus
S.W. Iceland
63°05'N-25°53'W
63°08'N-26°53'W
1330-1312m - 14.5 mm *
Pectinidae
Karnekampia sulcata
W. Iceland
64°16'N-26°54'W
64°19'N-26°58'W
375-405m - 27.3 mm *
Pectinidae
Palliolum striatum
W. Iceland
65°14'N-27°01'W
65°12'N-27°02'W
229-234m - 22.0 mm *
Pectinidae
Palliolum tigerinum
S.W. Iceland
64°16'N-23°43'W
64°13'N-23°39'W
118-107m - 12.7 mm *
Pectinidae
Pseudamussium peslutrae
S.W. Iceland
63°49'N-24°11'W
63°46'N-24°12'W
161-147m - 47.7 mm *
Propeamussiidae
Catillopecten eucymatus
W. Iceland
64°33'N-28°04'W
64°36'N-28°03'W
1013-981m - 8.5 mm ***
Propeamussiidae
Cyclopecten hoskynsi
W. Iceland
65°03'N-27°05'W
65°01'N-27°10'W
247-292m - 6.1 mm °°
Propeamussiidae
Similipecten greenlandicus
N.W. Iceland
67°12'N-22°54'W
67°11'N-22°49'W
241-267m - 7.2 mm °°°°
Propeamussiidae
Similipecten similis
W. Iceland
65°03'N-27°05'W
65°01'N-27°10'W
247-292m - 6.3 mm **
Anomiidae
Heteranomia squamula
W. Iceland
65°31'N-37°20'W
65°34'N-37°17'W
489-477m - 20.6 mm *
Thyasiridae
Axinopsida orbiculata
N.E. Iceland
66°16'N-16°28'W
66°18'N-16°29'W
26-23m - 2.8 mm °°°
Thyasiridae
Mendicula ferruginosa
W. Iceland
65°15'N-25°53'W
65°13'N-26°01'W
136-142m - 2.0 mm °°°
Thyasiridae
Thyasira gouldii
W. Iceland
66°03'N-23°33'W
66°04'N-23°38'W
20-20m - 5.2 mm **
Thyasiridae
Thyasira obsoleta
N. Iceland
67°08'N-22°11'W
67°06'N-22°20'W
233-236m - 4.7 mm °°°°
Thyasiridae
Thyasira sarsii
N.W. Iceland
65°36'N-24°03'W
65°39'N-24°09'W
48-47m - 17.7 mm *
Astartidae
Astarte acuticostata
W. Iceland
66°56'N-24°55'W
66°47'N-24°56'W
656-608m - 15.7 mm °°
Astartidae
Astarte borealis
N.W. Iceland
65°39'N-24°11'W
65°42'N-24°07'W
44-17m - 40.0 mm *
Astartidae
Astarte crenata
N.W. Iceland
67°00'N-23°03'W
67°00'N-23°13'W
248-247m - 28.1 mm °
Astartidae
Astarte elliptica
N.W. Iceland
66°53'N-22°07'W
66°56'N-22°13'W
147-160m - 18.2 mm *
Astartidae
Astarte montagui
W. Iceland
65°32'N-22°59'W
65°31'N-23°03'W
13-26m - 18.4 mm **
Astartidae
Astarte subaequilatera
S.W. Iceland
64°16'N-26°56'W
64°19'N-26°58'W
375-405m - 20.9 mm *
Astartidae
Astarte sulcata
S.W. Iceland
64°09'N-23°33'W
63°29'N-23°42'W
127-129m - 25.5 mm *
Lasaeidae
Alteneaum dewsoni
W. Iceland
65°49'N-24°09'W
65°51'N-24°06'W
23-45m - 1.7 mm **
Lasaeidae
Kellia suborbicularis
S.W. Iceland
63°36'N-22°59'W
63°40'N-22°58'W
170-142m - 4.2 mm *
Lasaeidae
Montacuta substriata
W. Iceland
67°21'N-26°26'W
65°25'N-26°26'W
150-151m - 1.0 mm ****
Scottish specimen
Lasaeidae
Tellimya ferruginosa
N.W. Iceland
66°58'N-23°30'W
66°58'N-23°40'W
220-202m - 4.6 mm °°°
Lasaeidae
Tellimya tenella
S.E. Iceland
63°32'N-17°11'W
63°35'N-17°20'W
165-131m - 2.0 mm *
Cardiidae
Acanthocardia echinata
S.W. Iceland
64°06'N-23°33'W
63°58'N-23°42'W
127-129m - 38.8 mm *
Cardiidae
Ciliatocardium ciliatum
W. Iceland
64°06'N-22°04'W
64°04'N-22°04'W
15-28m - 22.8 mm °°°
Cardiidae
Goethemia elegantula
N.E. Iceland
67°04'N-15°12'W
67°00'N-15°12'W
187-164m - 5.9 mm ****
Cardiidae
Parvicardium minimum
N.W. Iceland
66°50'N-23°52'W
66°53'N-23°57'W
151-165m - 6.6 mm *
Cardiidae
Parvicardium pinnulatum
N.W. Iceland
66°23'N-23°48'W
66°26'N-23°54'W
112-112m - 9.7 mm *
Cardiidae
Serripes groenlandicus
N.W. Iceland
66°03'N-23°34'W
66°04'N-23°38'W
21-20m - 21.5 mm °°
Mactridae
Spisula elliptica
N.W. Iceland
65°47'N-24°59'W
65°43'N-25°00'W
63-69m - 22.2 mm *
Mactridae
Spisula cf. solida
S. Iceland
63°45'N-17°21'W
63°45'N-17°17'W
51-49m - 23.5 mm **
Tellinidae
Macoma calcarea
N.W. Iceland
65°49'N-24°54'W
65°52'N-24°00'W
54-45m - 32.6 mm *
Psammobiidae
Gari tellinella
S.W. Iceland
64°37'N-23°35'W
64°35'N-23°43'W
115-124m - 34.2 mm *
Psammobiidae
Gari fervensis
S. Iceland
63°24'N-19°17'W
63°25'N-19°21'W
42-43m - 35.0 mm °°°
Semelidae
Abra nitida
S.E. Iceland
63°40'N-15°48'W
63°40'N-15°47'W
194-193m - 9.6 mm *
Semelidae
Abra prismatica
S. Iceland
63°13'N-18°28'W
63°13'N-18°35'W
198-166m - 7.4 mm *
Arcticidae
Arctica islandica
W. Iceland
65°39'N-24°14'W
65°41'N-24°15'W
23-30m - 103.0 mm °°°
Veneridae
Mysia undata
W. Iceland
64°06'N-22°38'W
64°07'N-22°39'W
41-42m - 21.1 mm °°
Veneridae
Timoclea ovata
S.W. Iceland
64°07'N-22°59'W
64°03'N-23°00'W
70-80m - 10.8 mm *
Myidae
Mya pseudoarenaria
N.W. Iceland
65°36'N-24°03'W
65°39'N-24°09'W
47-48m - 66.0 mm *
Myidae
Mya truncata
W. Iceland
64°10'N-21°50'W
64°12'N-21°51'W
11-25m - 16.7 mm °°
Xylophagaidae
Xylopreco nooi
N. Iceland
67°24'N-21°37'W
67°25'N-21°45'W
487-492m - 3.7 mm °°
Teredinidae
Nototeredo norvagica
E. Iceland
64°13'N-09°38'W
64°10'N-09°39'W
816-835m - 6.1 mm °°
Hiatellidae
Panomya norvegica
S.W. Iceland
63°41'N-22°56'W
63°45'N-22°49'W
144-151m - 85.0 mm *
Hiatellidae
Hiatella arctica
S.W. Iceland
63°31'N-22°37'W
63°33'N-22°46'W
224-198m - 20.3 mm *
Thraciidae
Thracia myopsis
W. Iceland
65°50'N-23°53'W
65°52'N-23°5'W
64-56m - 26.4 mm °°
Thraciidae
Thracia villosiuscula
W. Iceland
65°17'N-22°44'W
65°18'N-23°40'W
59-55m - 24.8 mm °°°
Cuspidariidae
Cuspidaria arctica
N.E. Iceland
37°15'N-22°06'W
37°15'N-22°16'W
371-341m - 25.2 mm *
Poromyidae
Poromya granulata
N.W. Iceland
66°50'N-23°52'W
66°53'N-23°57'W
151-165m - 11.6 mm *
Verticordiidae
Halicardia flexuosa
S.W. Iceland
63°05'N-26°53'W
63°08'N-26°53'W
1306-1281m - 26.3 mm °°
Marine and Freshwater Research Institute (Hafnarfjörður - Iceland) - Christiane Delongueville - Roland Scaillet
MFRI : Jónbjörn Pálsson - Steinunn Hilma Ólafsdóttir - Bylgja Sif Jónsdóttir - Laure de Montety - Guðjón Már Sigurðsson - Jón Sólmundsson
Moluscs collected 2013-2014 * / 2014-2015 ° / 2015-2016 °° / 2016-2017 ** / 2017-2018 °° / 2018 °°° / 2019-2020 °°° / 2020-2021°°°° / 2021-2022 ***

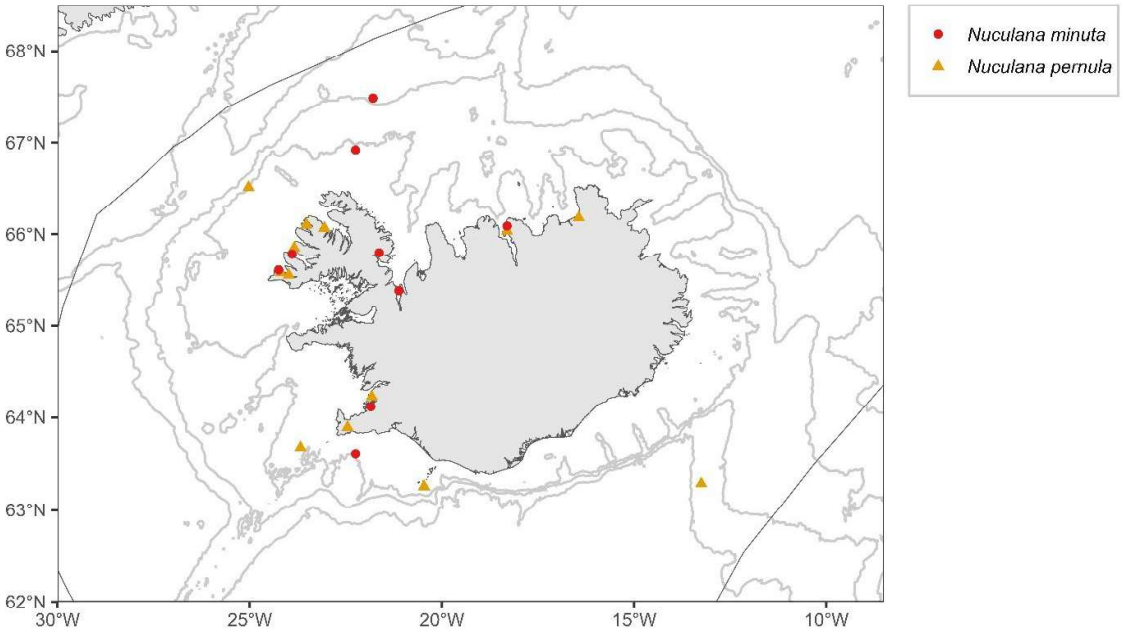
Appendix 3. Maps showing species occurrences

Bivalvia

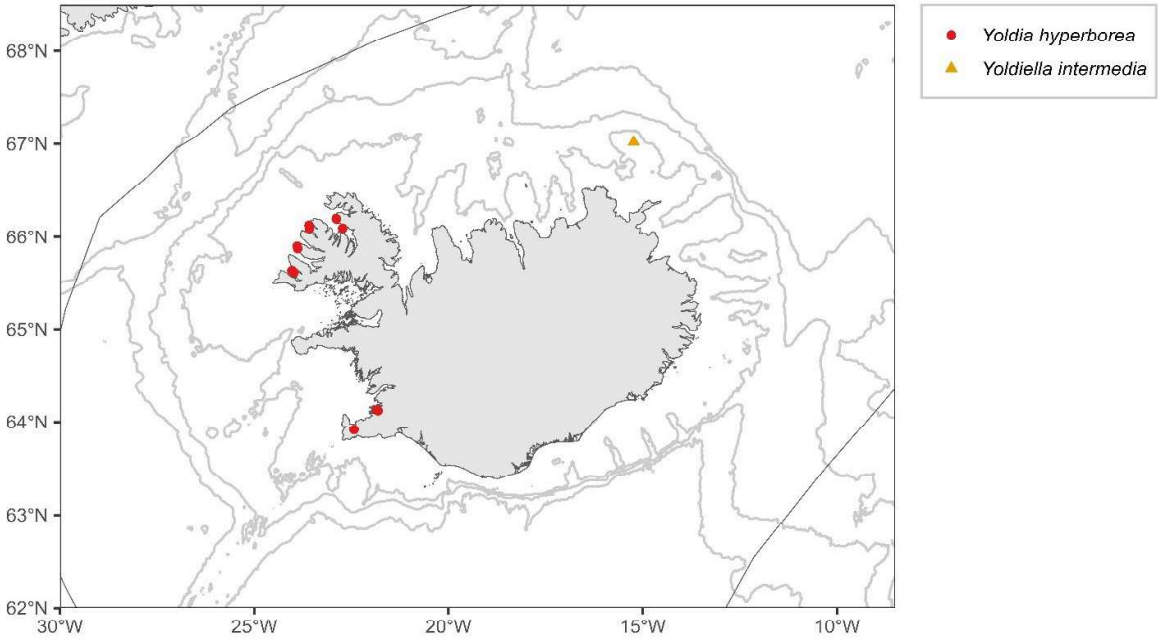
Nuculida - Nuculidae



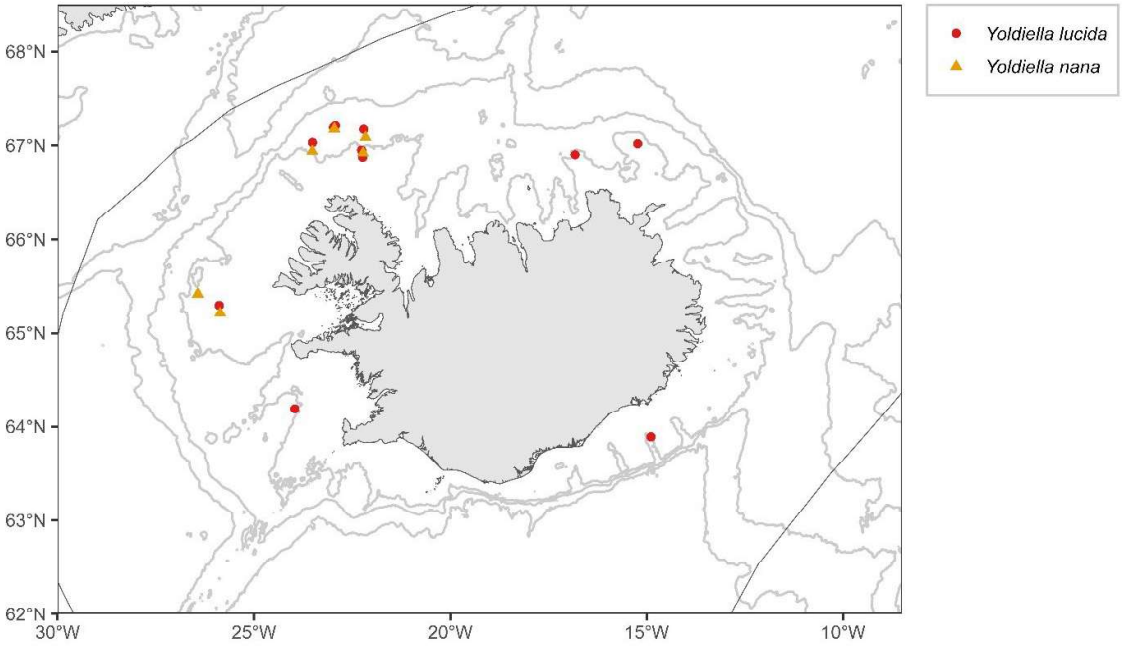
Nuculanida - Nuculanidae



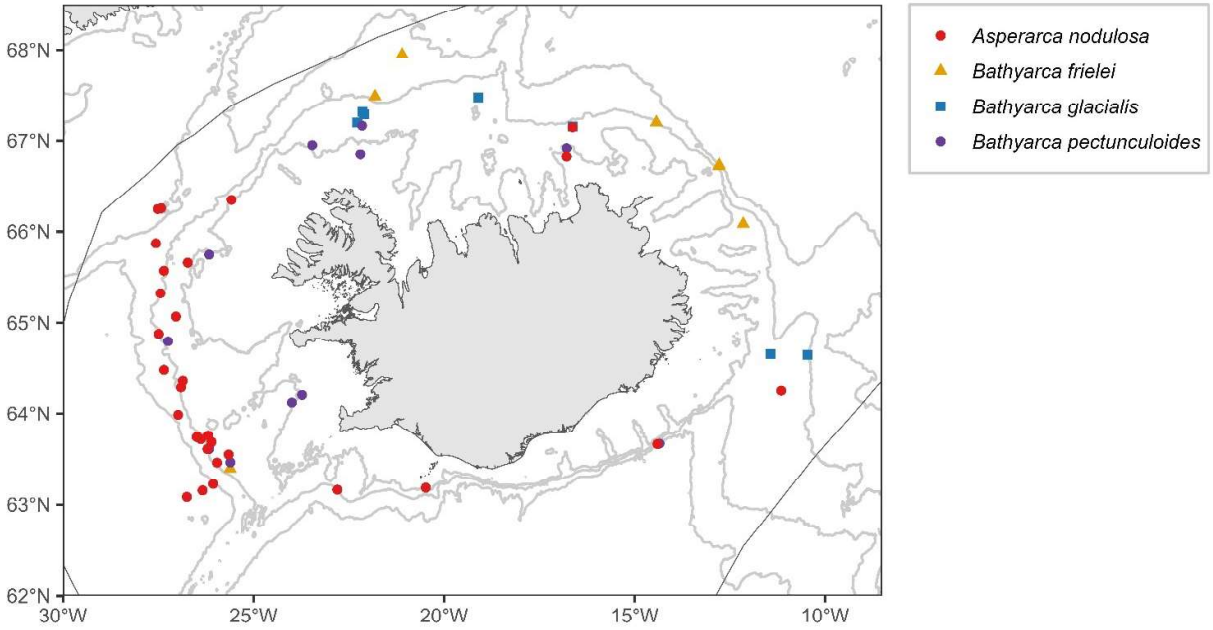
Nuculanida - Yoldiidae



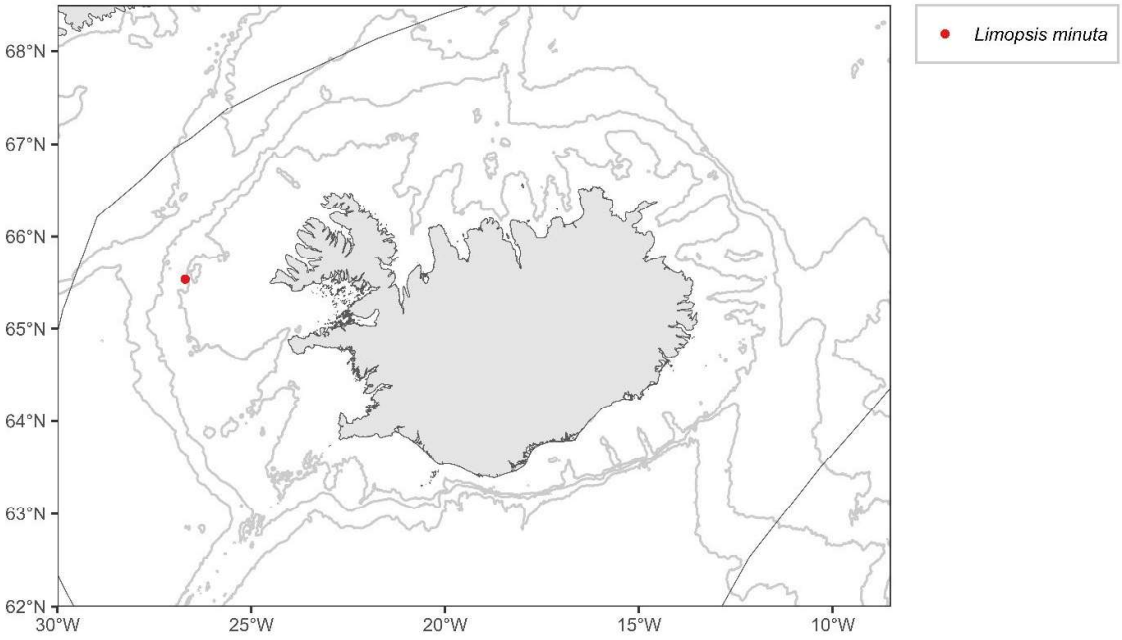
Nuculanida - Yoldiidae



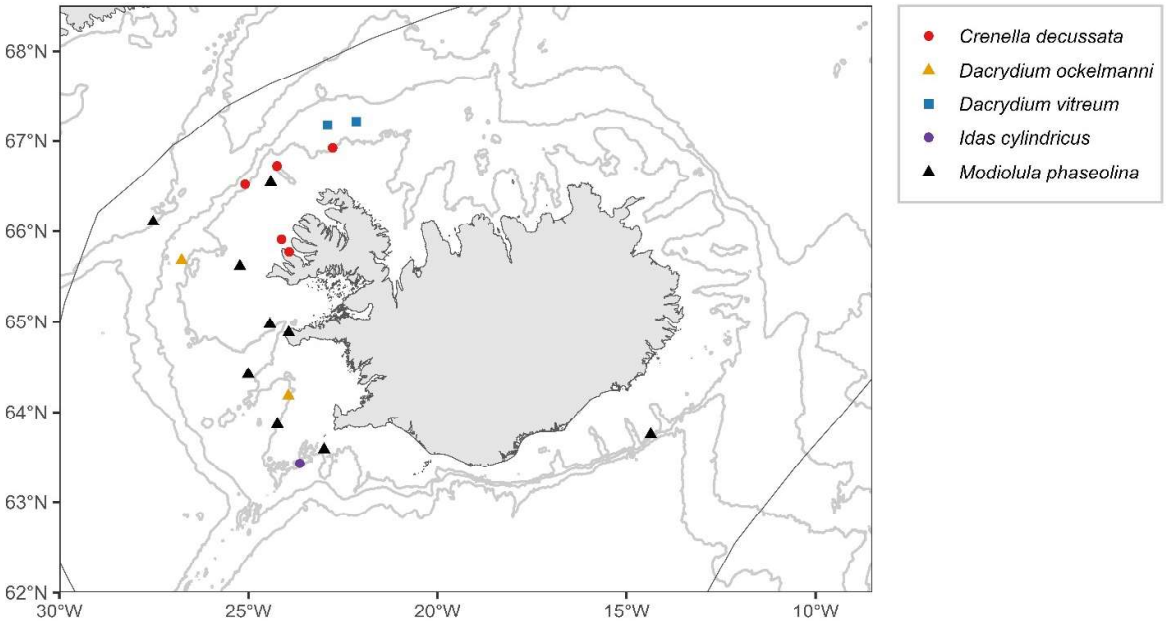
Arcida - Arcidae



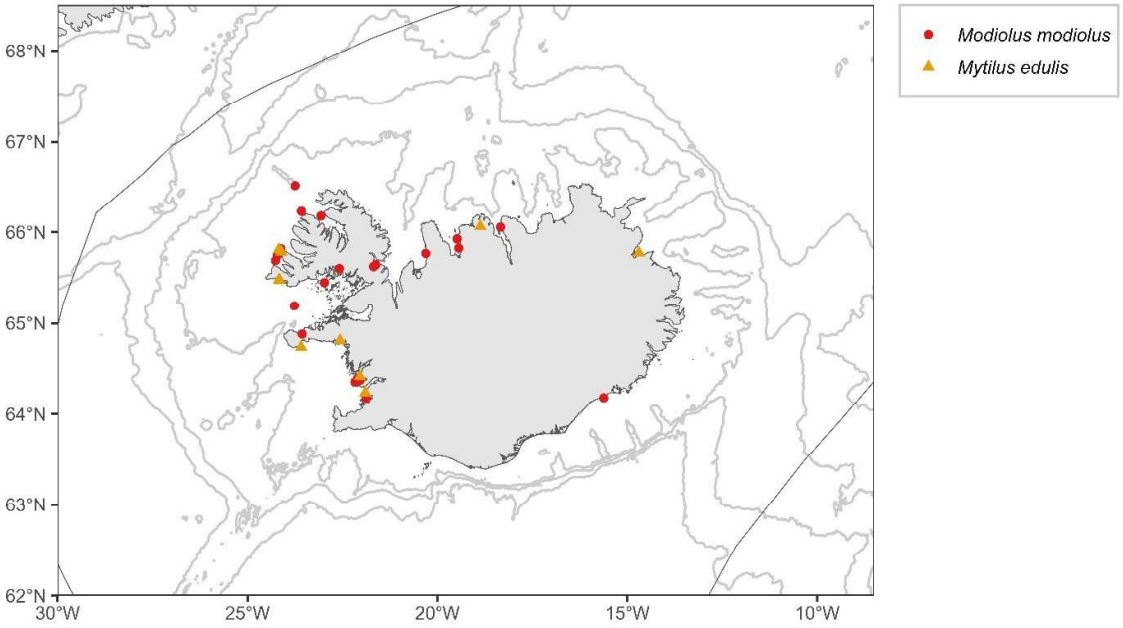
Arcida - Limopsidae



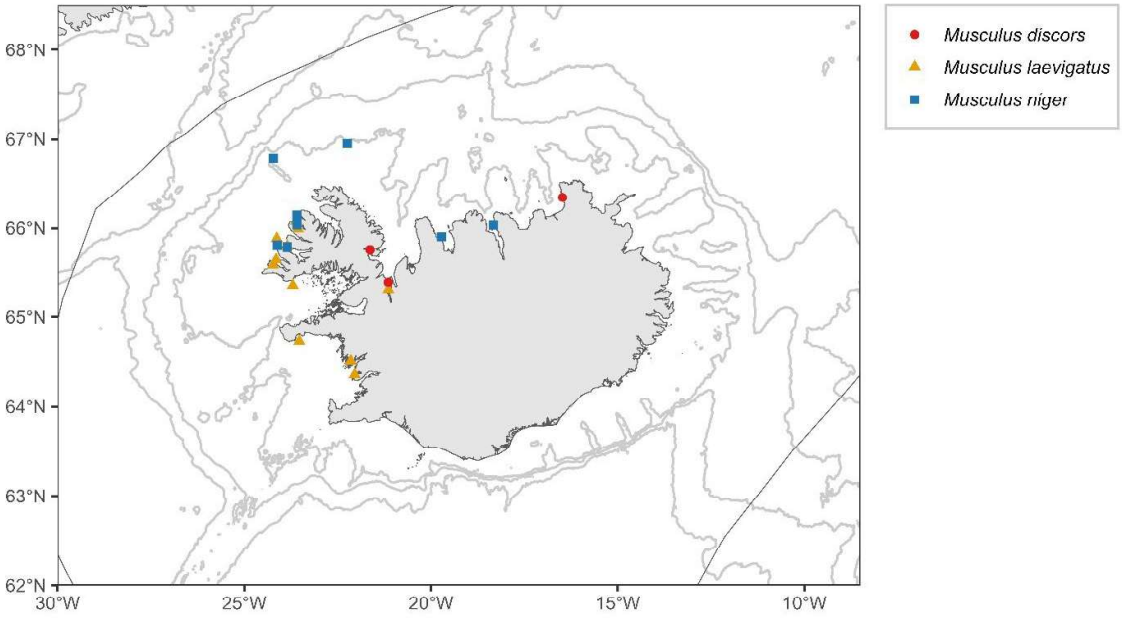
Mytilida - Mytilidae



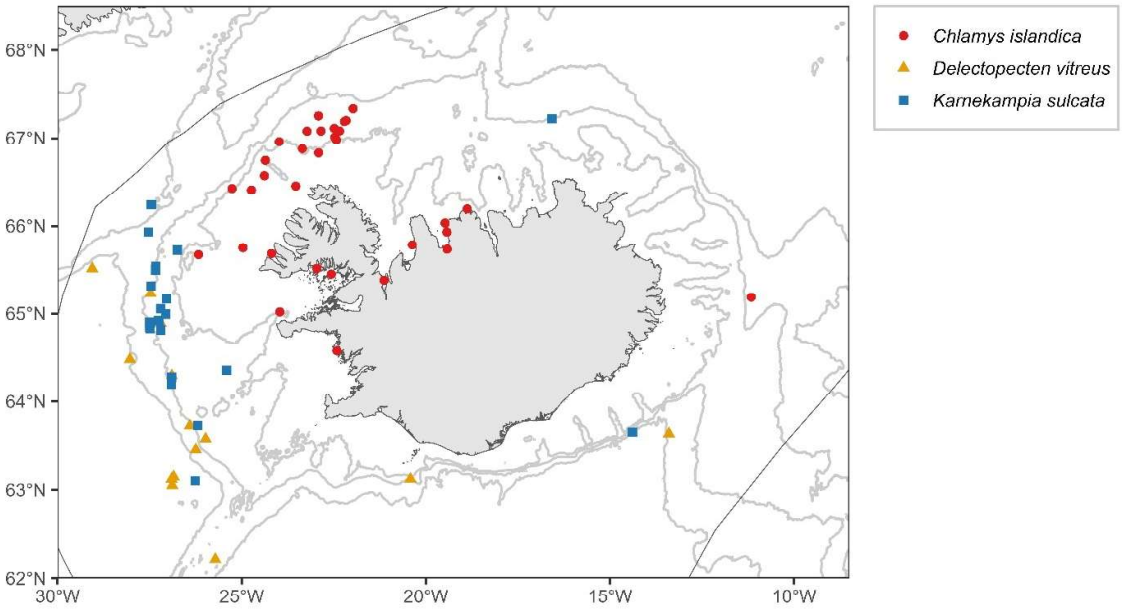
Mytilida - Mytilidae



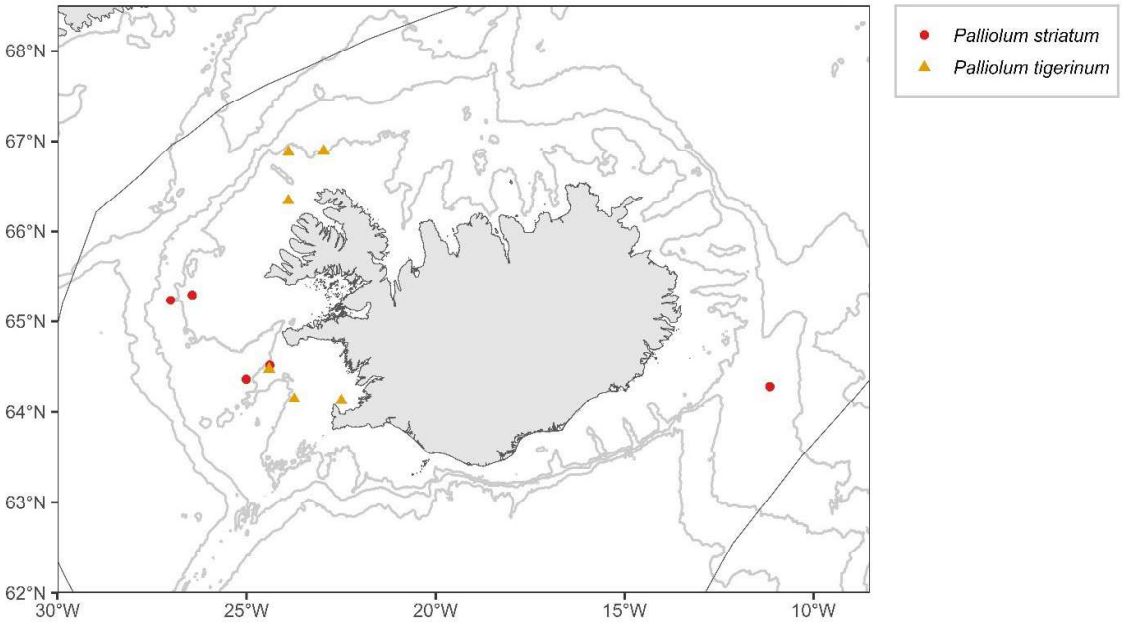
Mytilida - Mytilidae



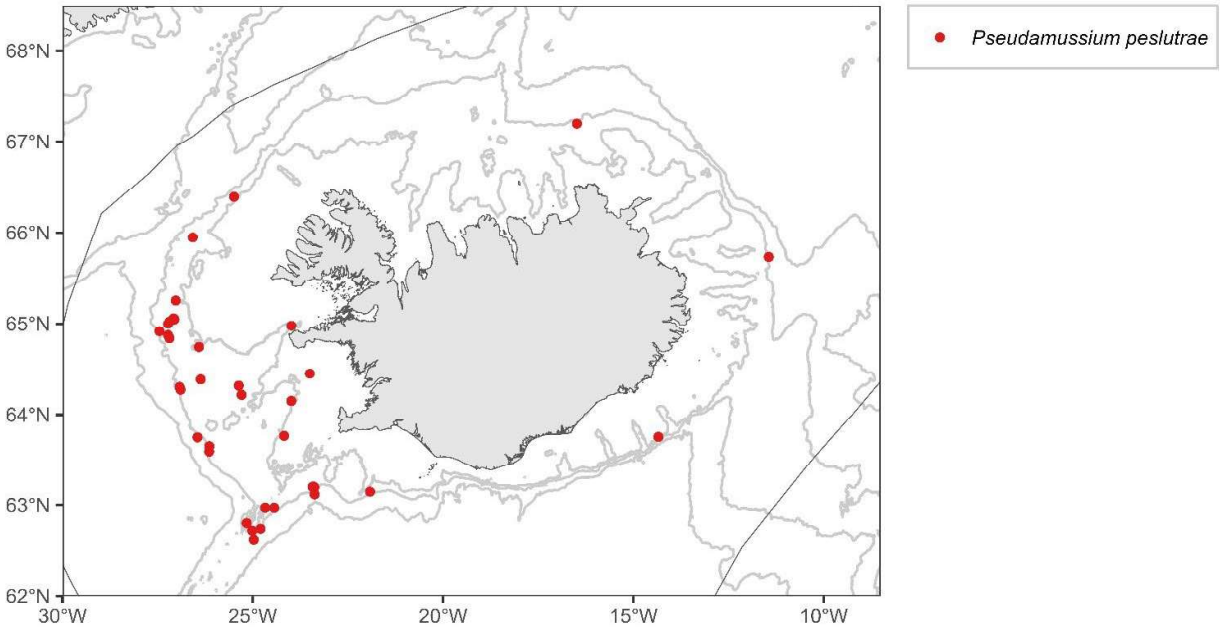
Pectinida - Pectinidae



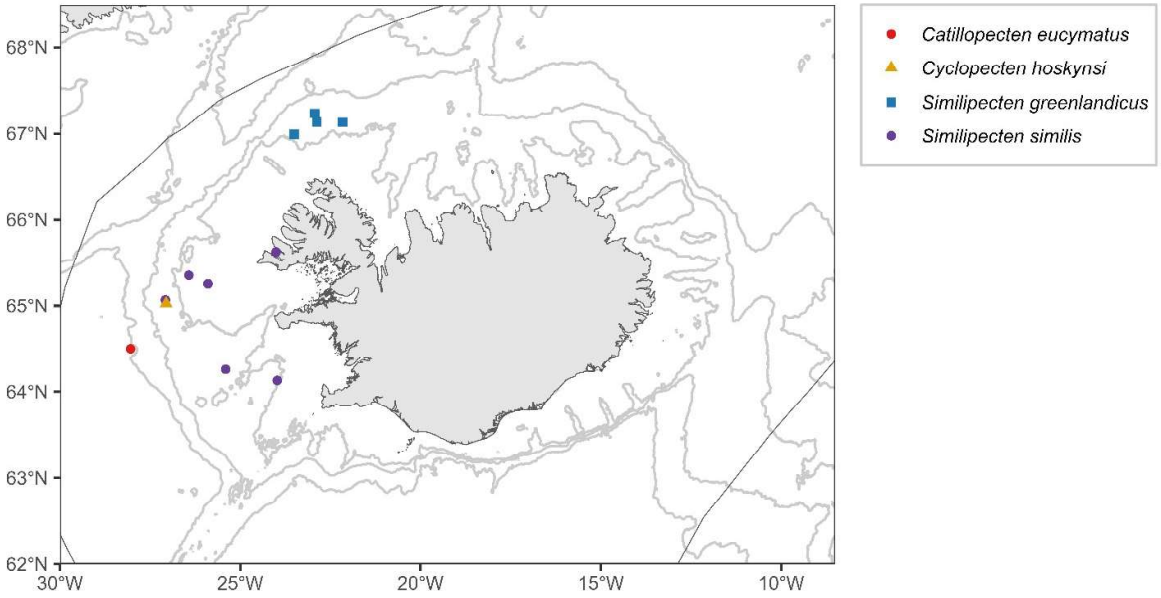
Pectinida - Pectinidae



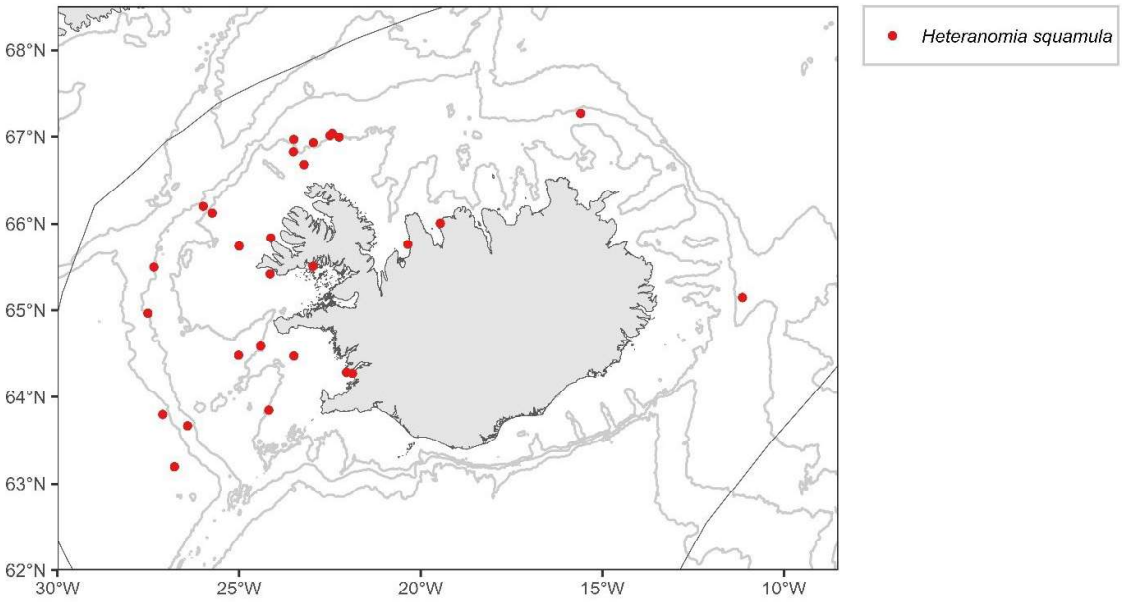
Pectinida - Pectinidae



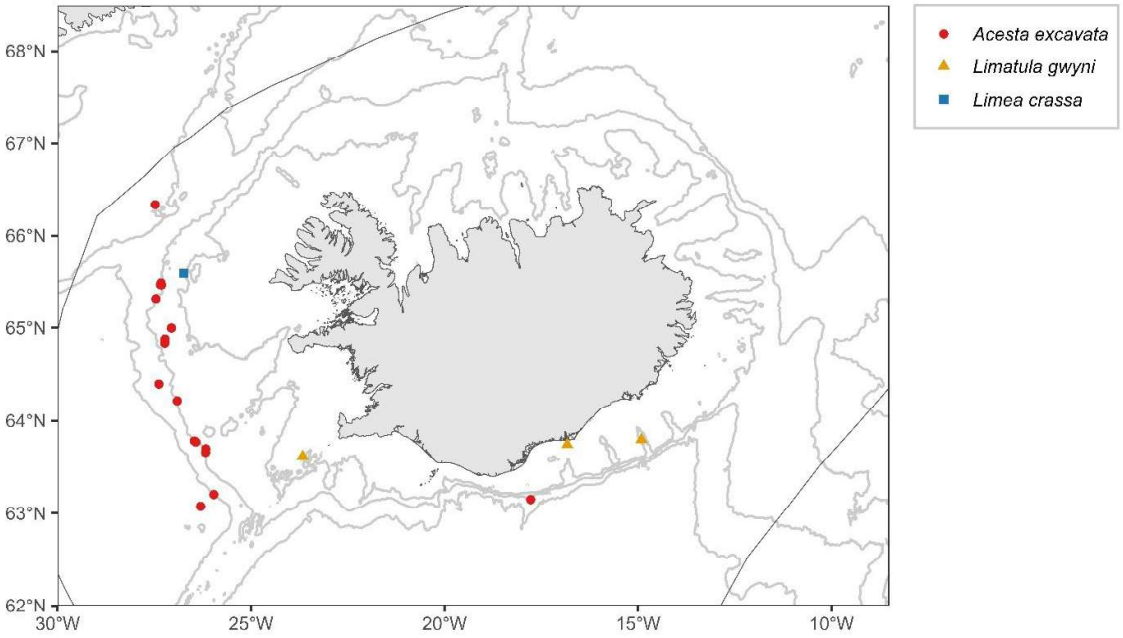
Pectinida - Propeamussiidae



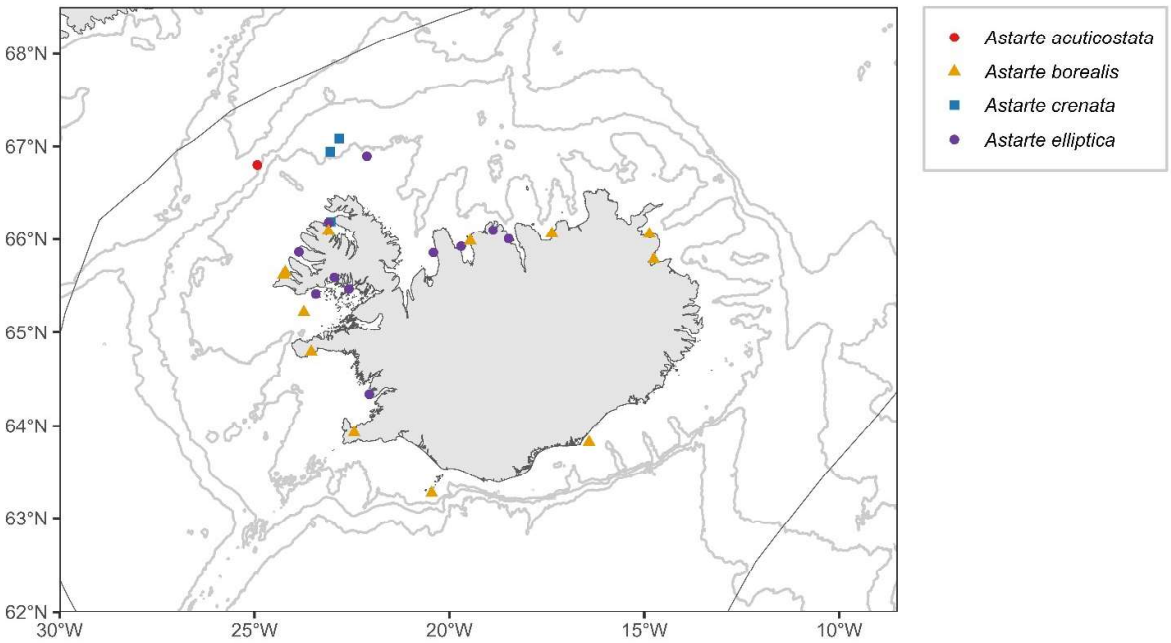
Pectinida - Anomiidae



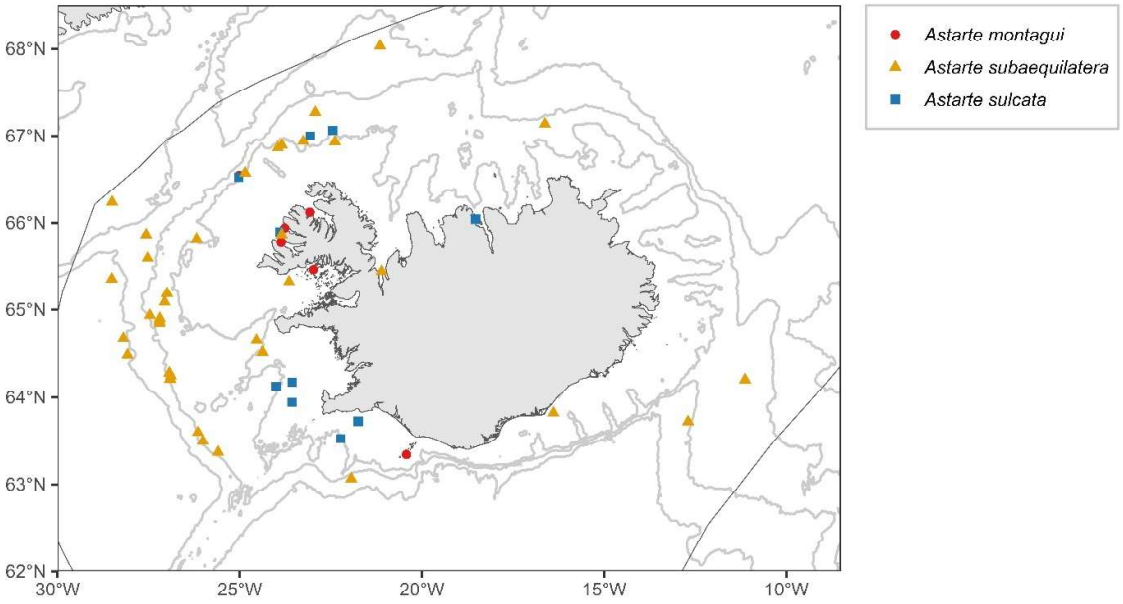
Limida - Limidae



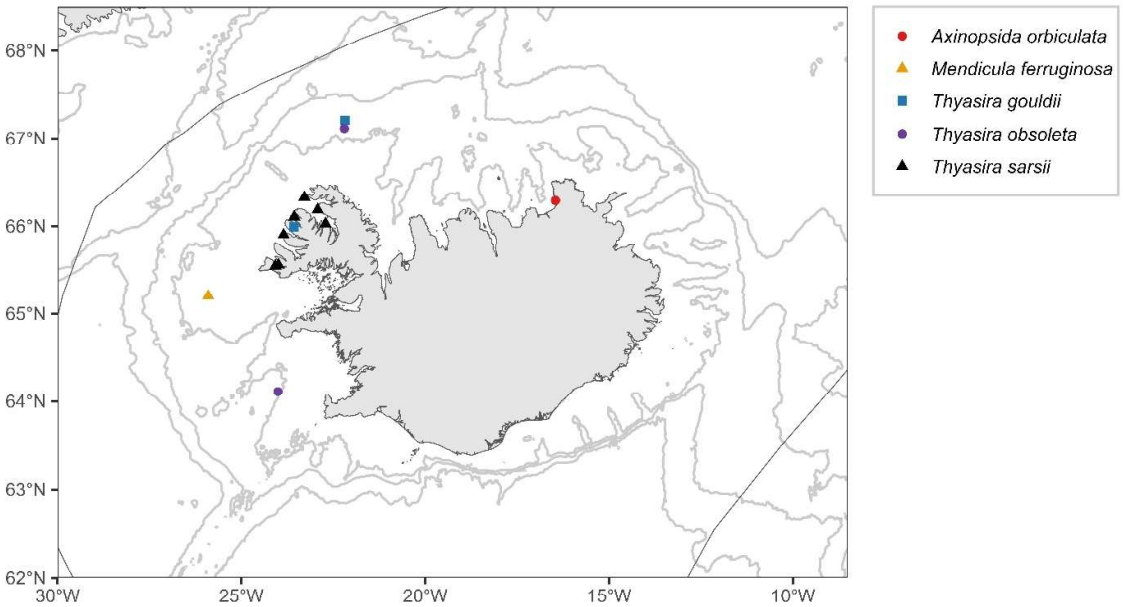
Carditida - Astartidae



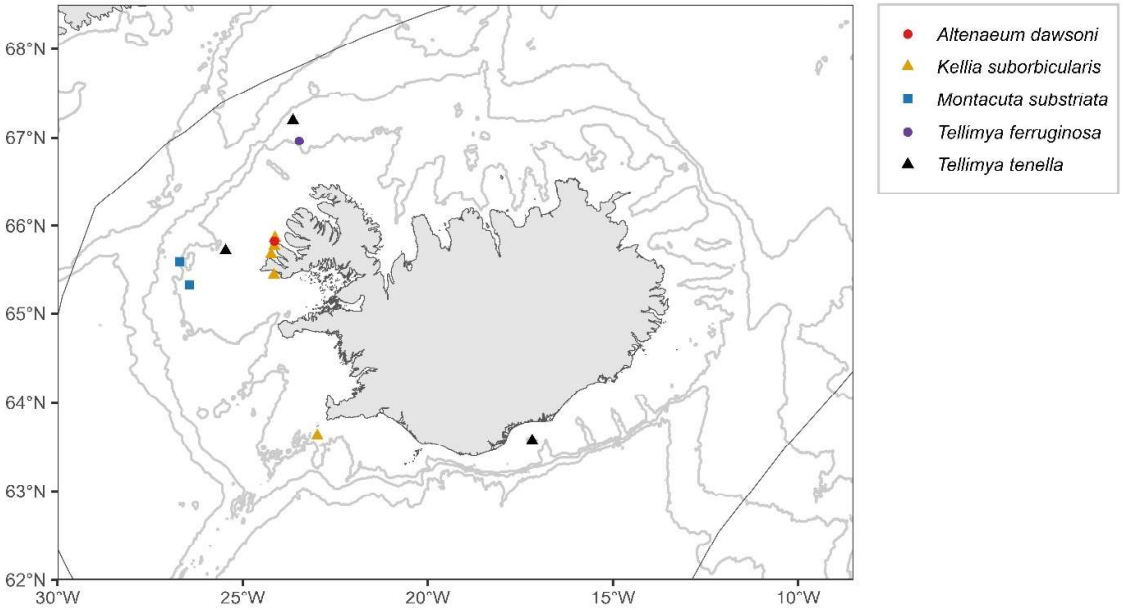
Carditida - Astartidae



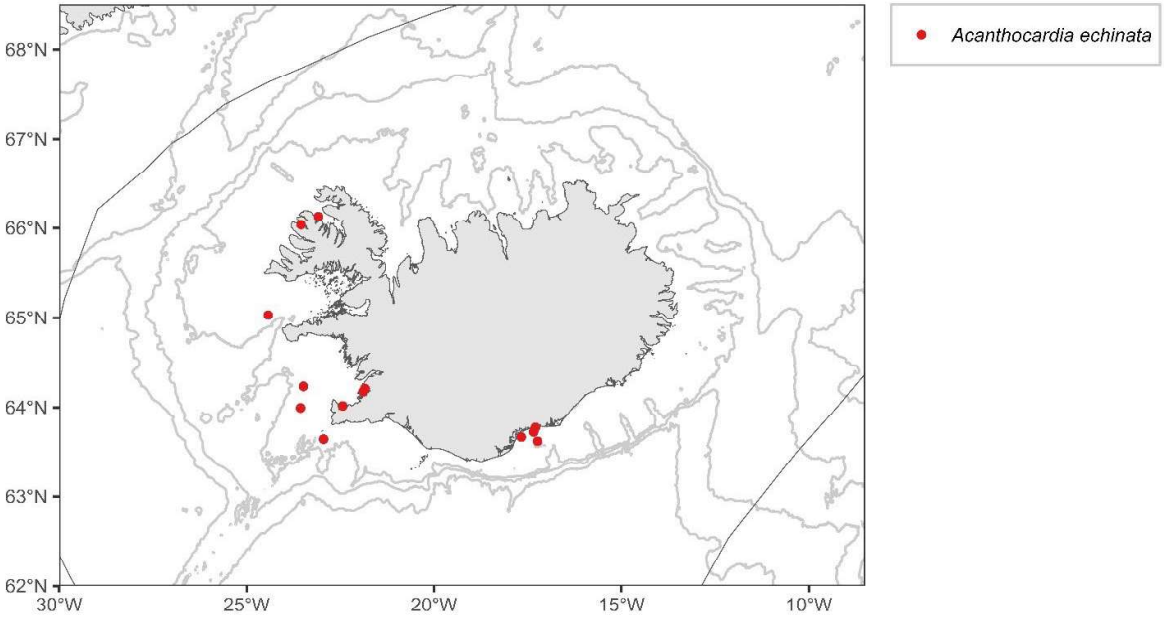
Lucinida - Thyasiridae



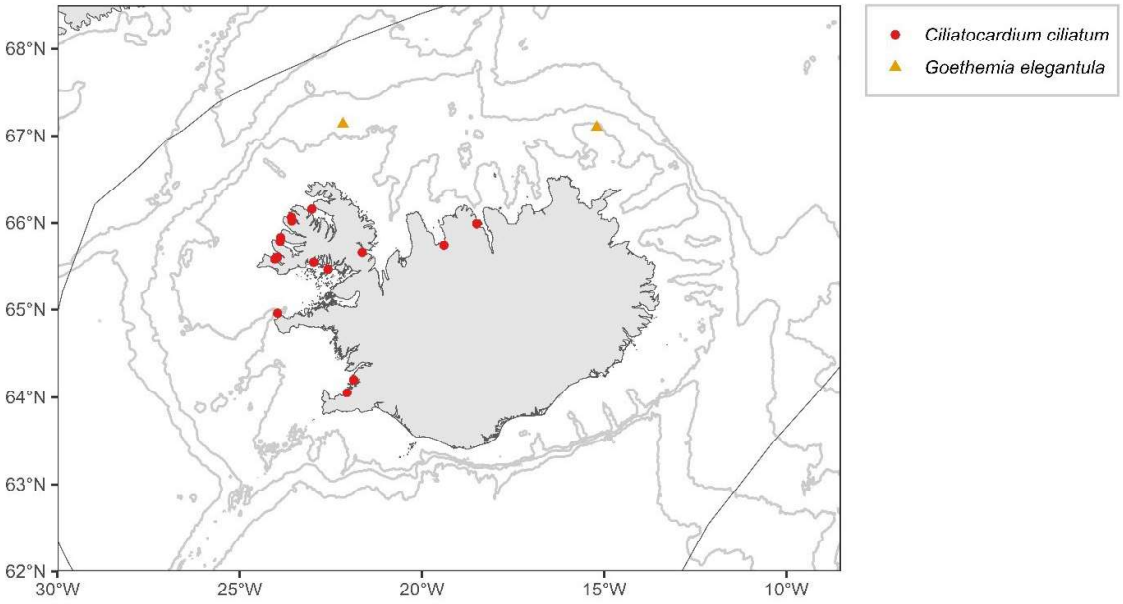
Galeommatida - Lasaeidae



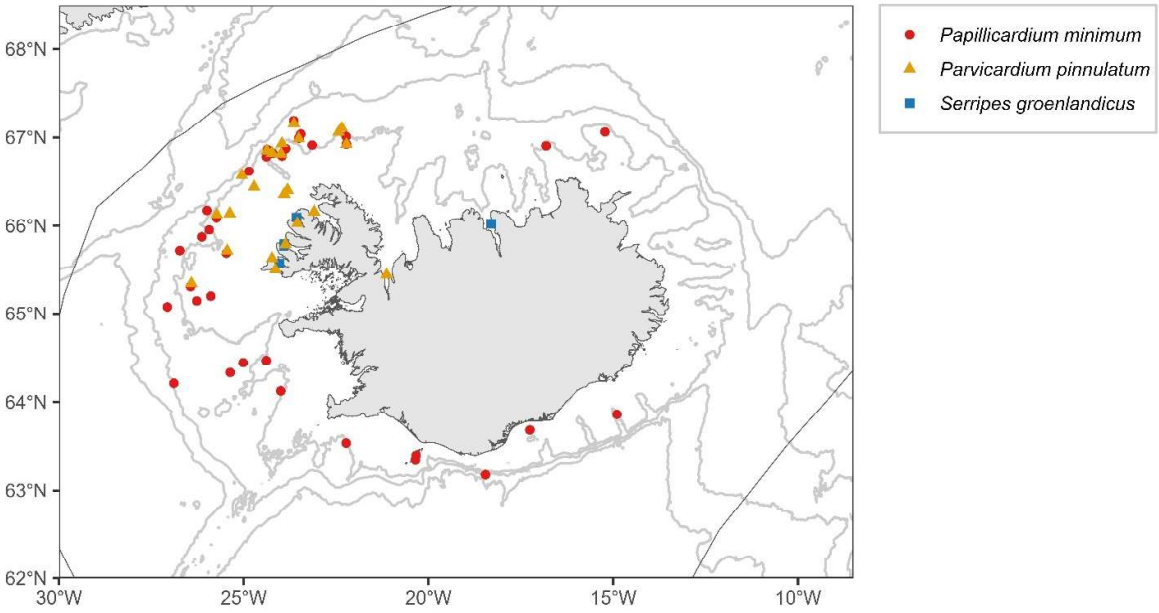
Cardiida - Cardiidae



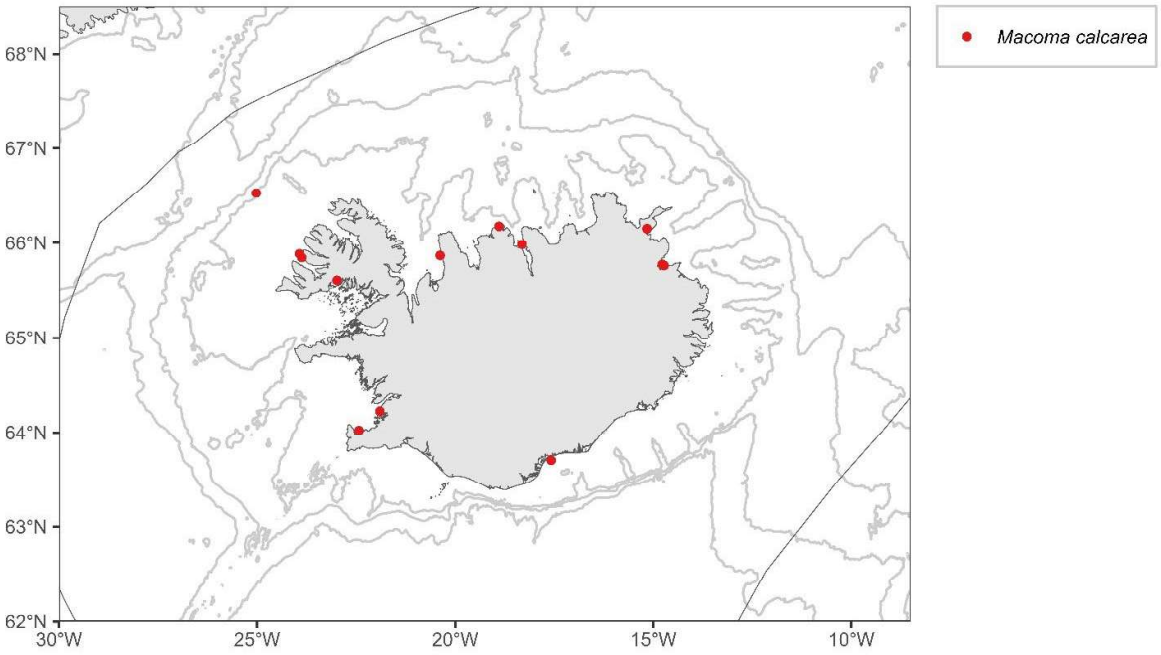
Cardiida - Cardiidae



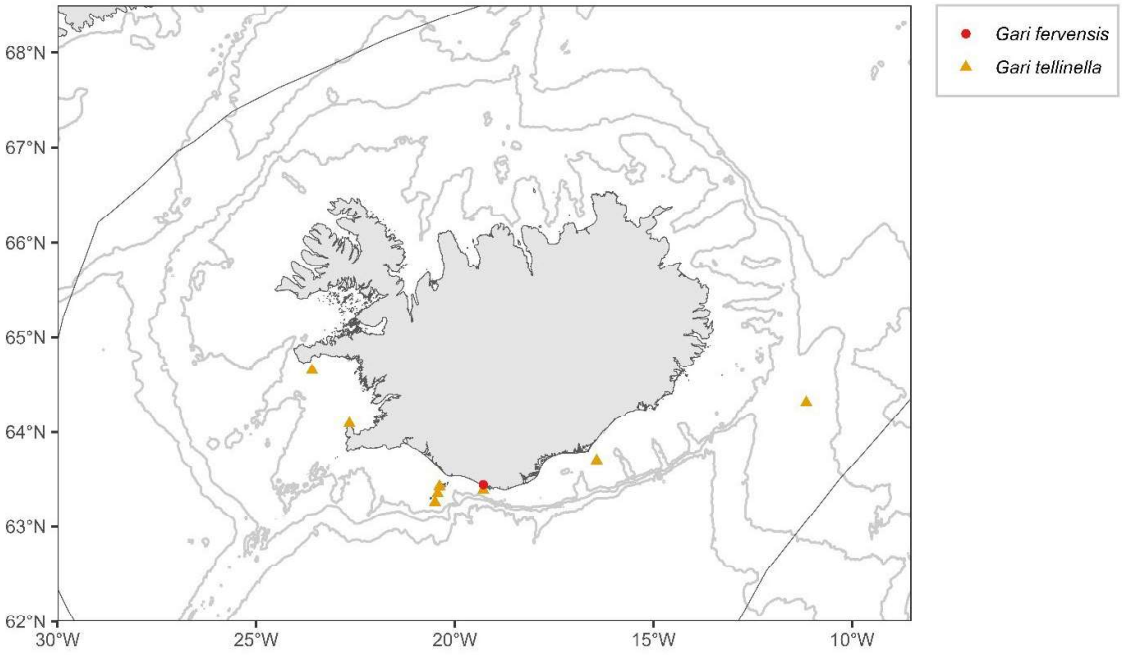
Cardiida - Cardiidae



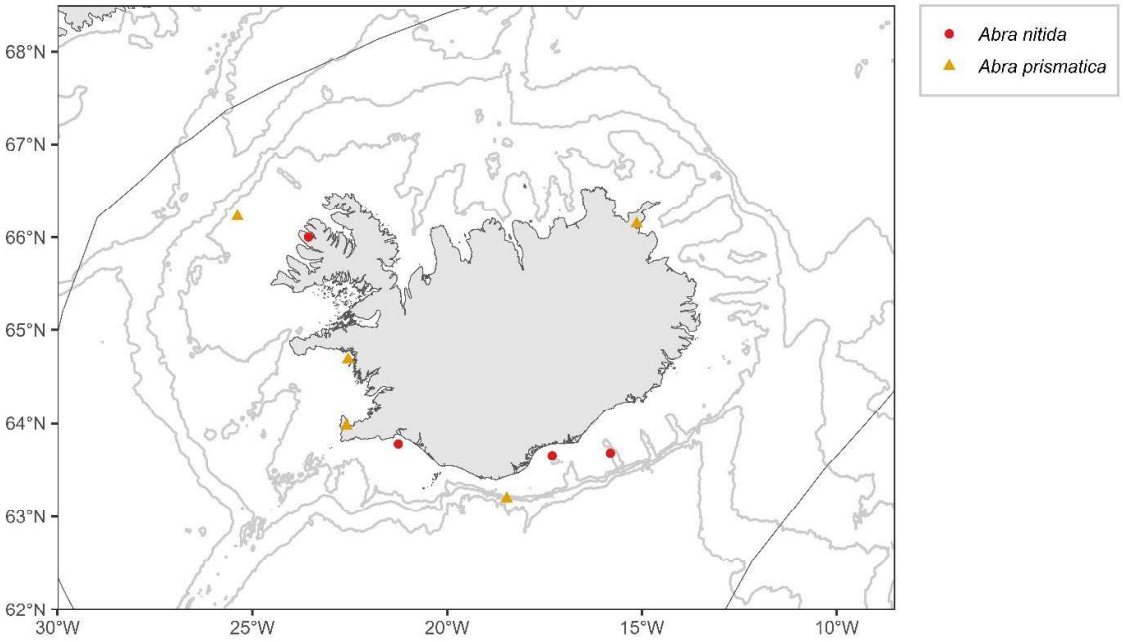
Cardiida - Tellinidae



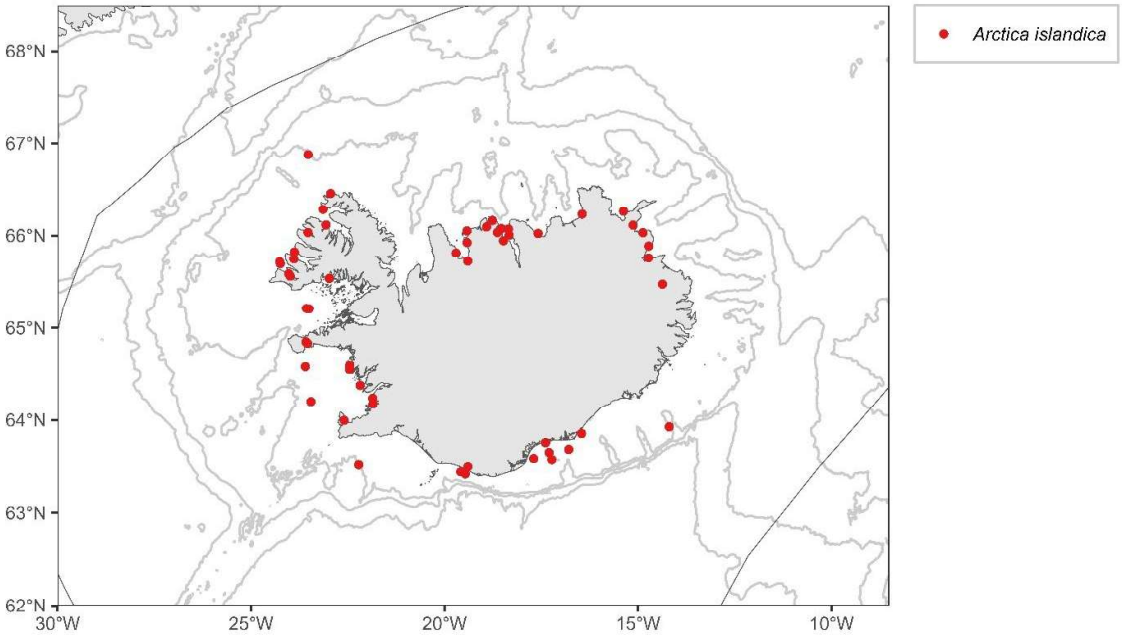
Cardiida - Psammobiidae



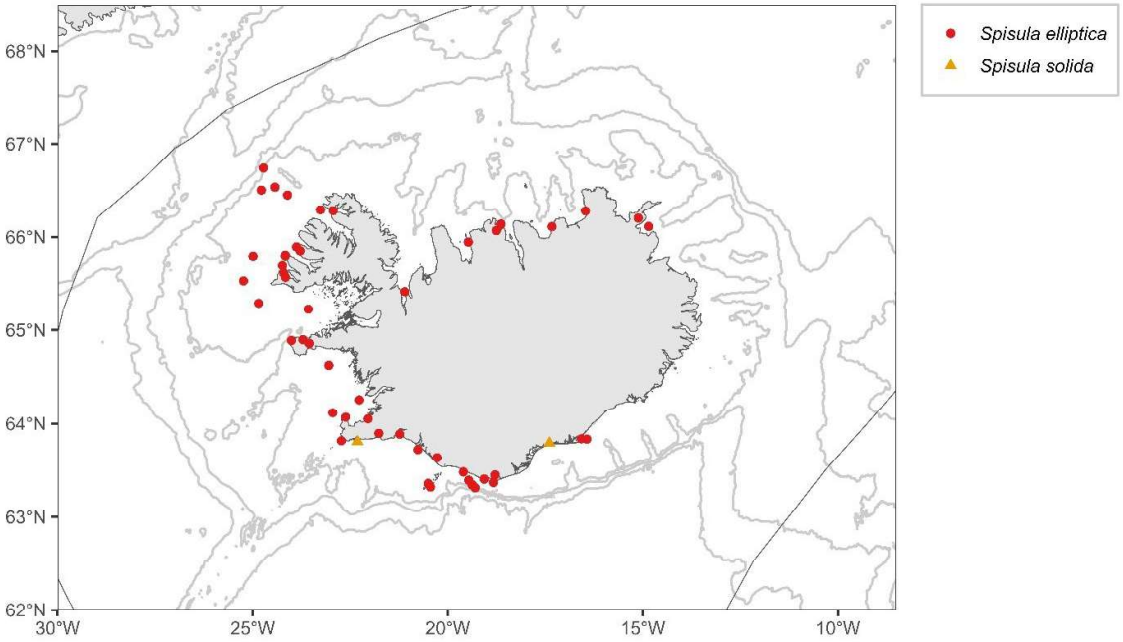
Cardiida - Semelidae



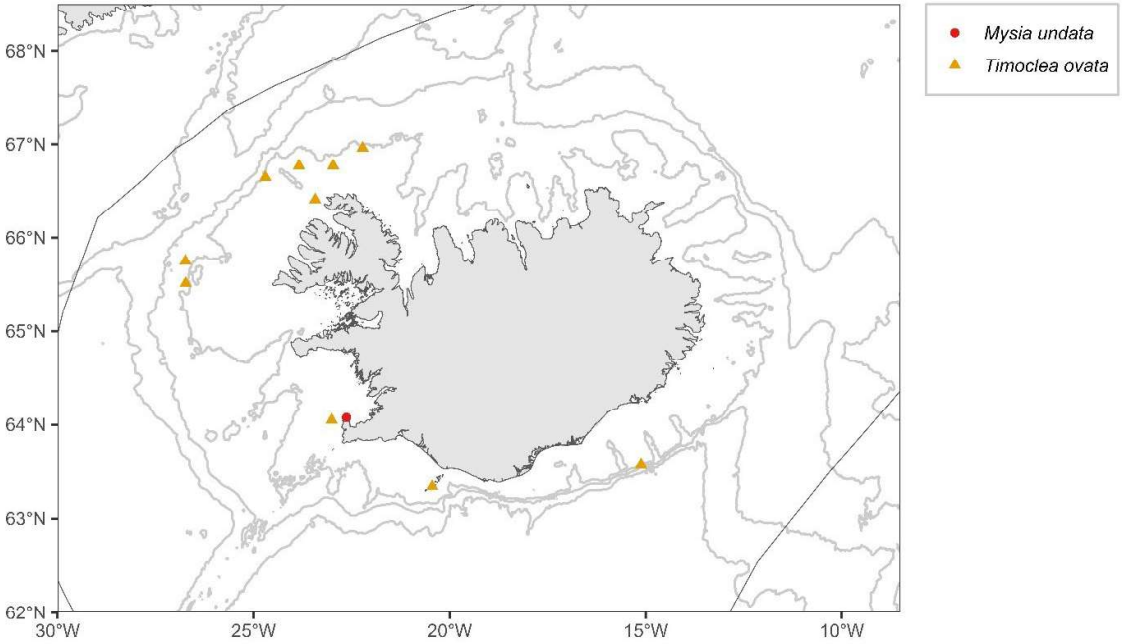
Venerida - Arcticidae



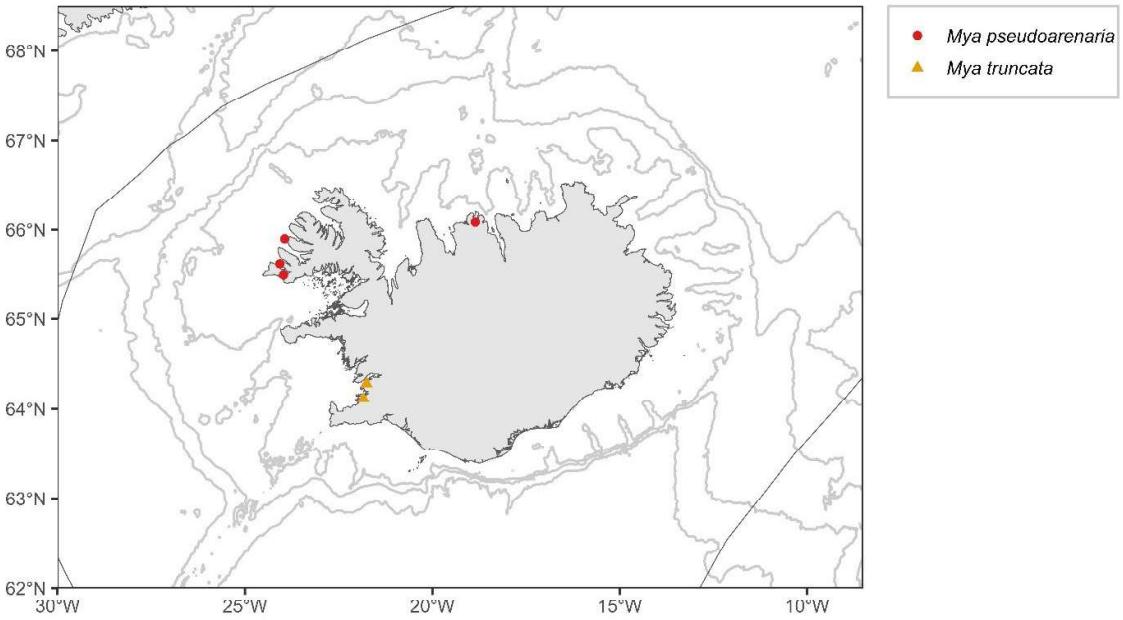
Venerida - Mactridae



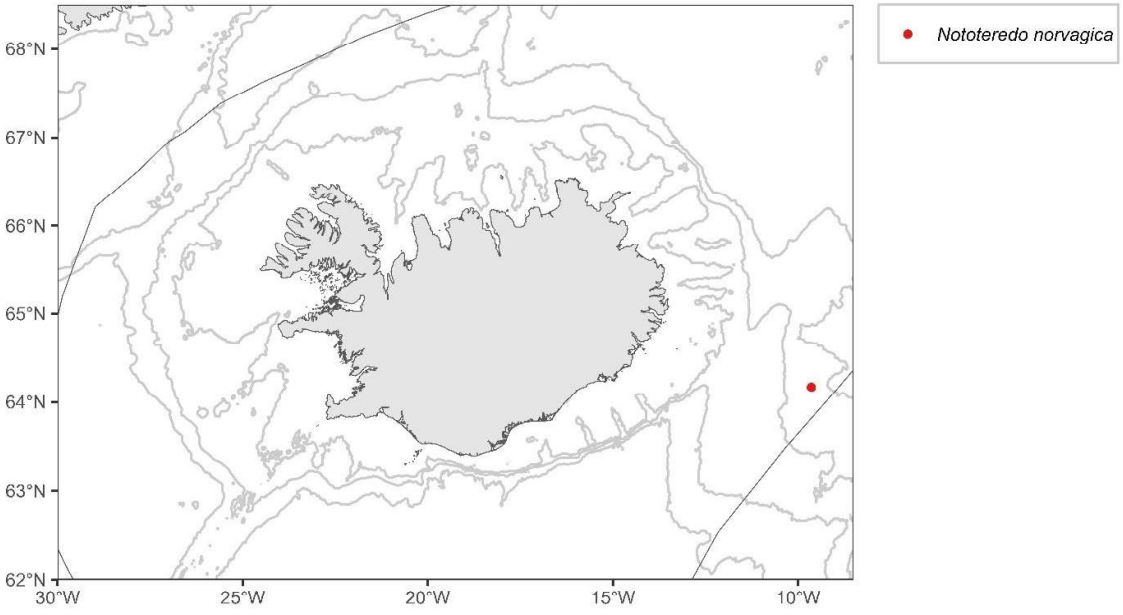
Venerida - Veneridae



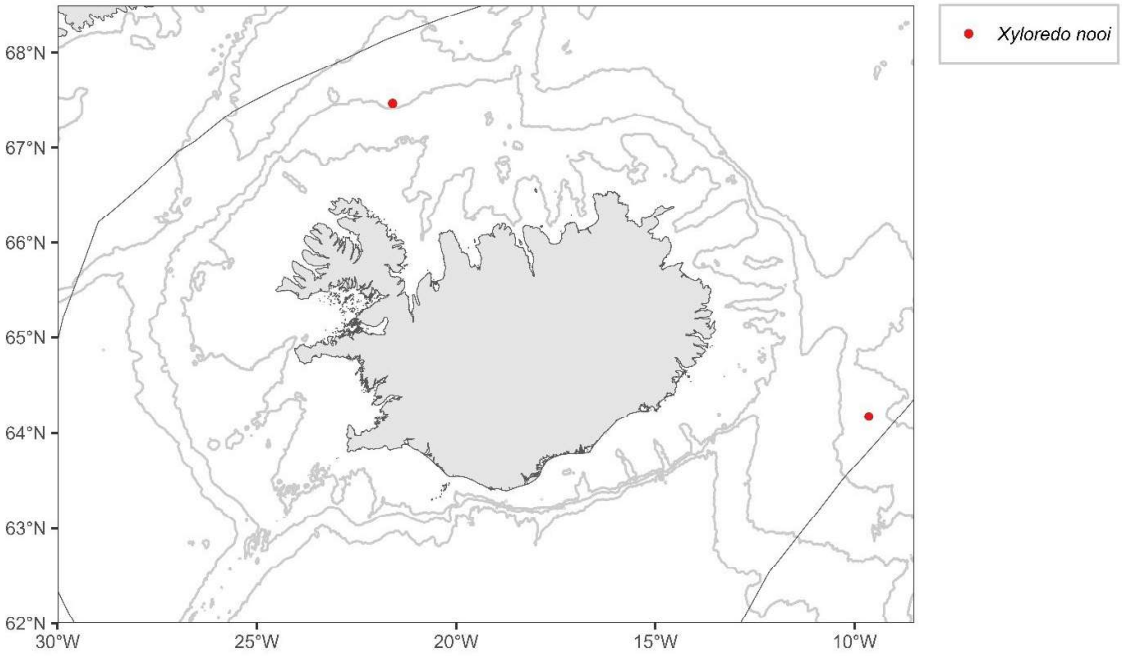
Myida - Myidae



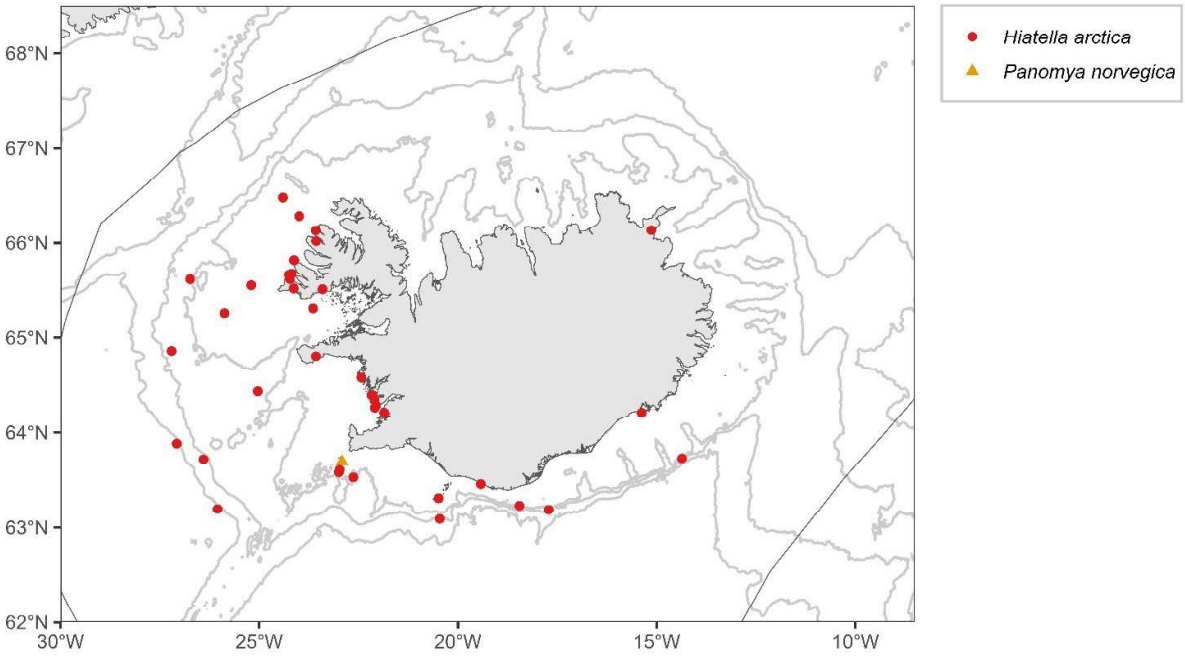
Myida - Teredinidae



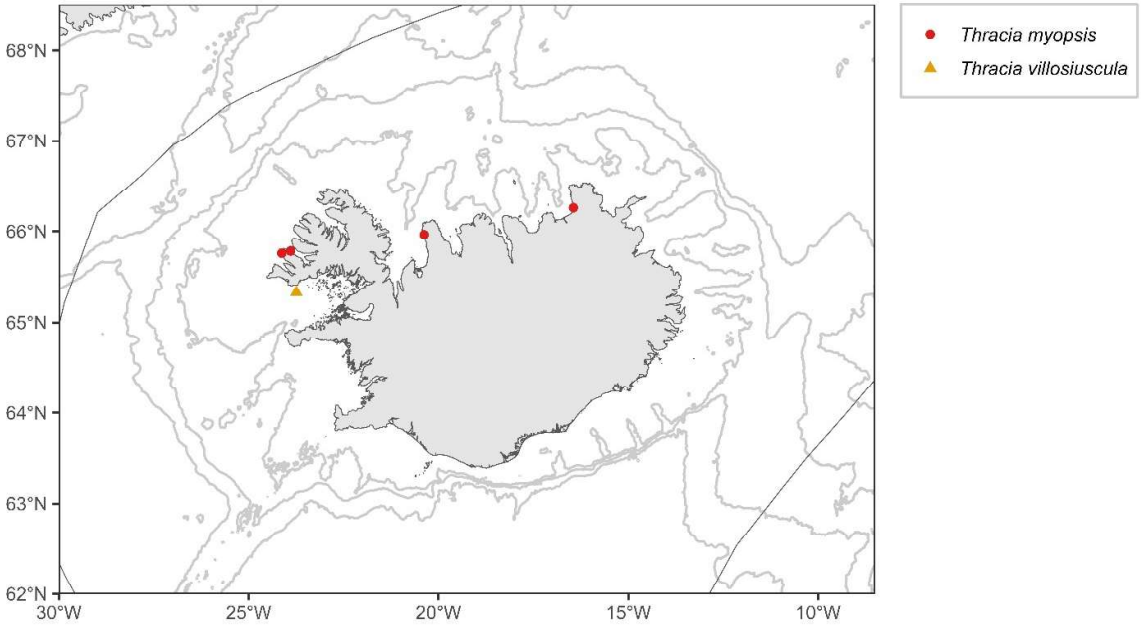
Myida - Xylophagaidae



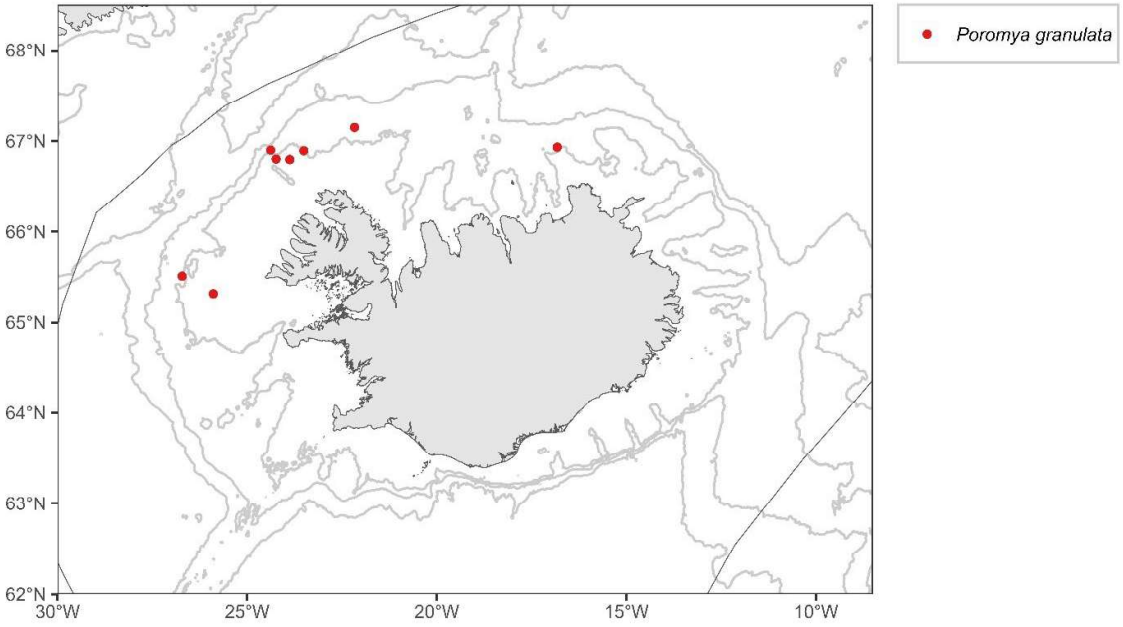
Adapedonta - Hiatellidae



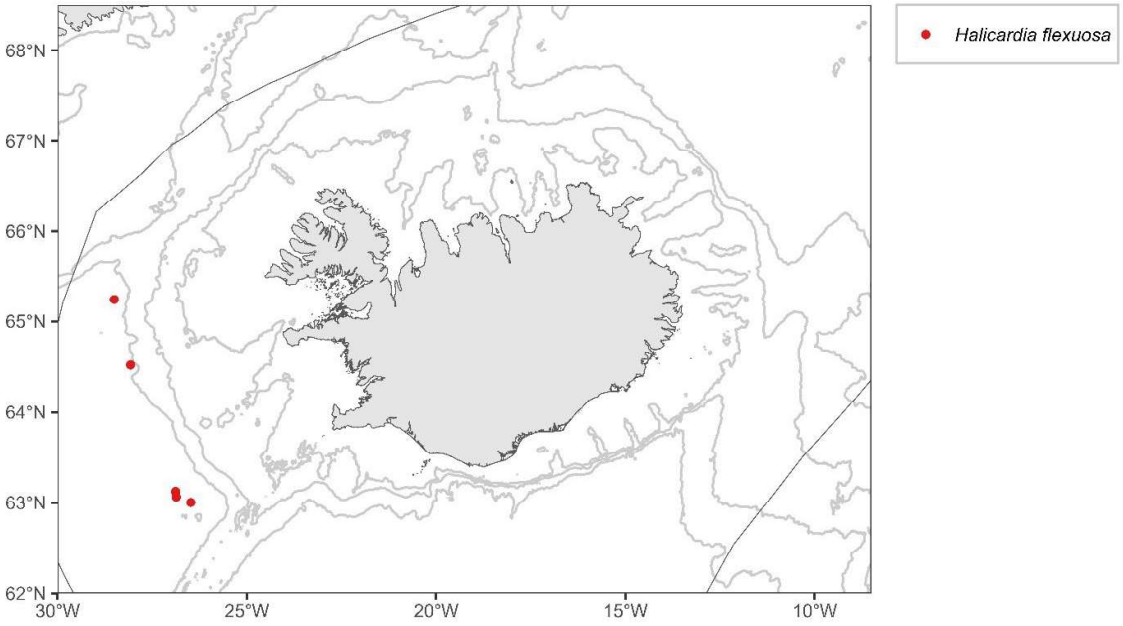
Anomalodesmata - Thraciidae



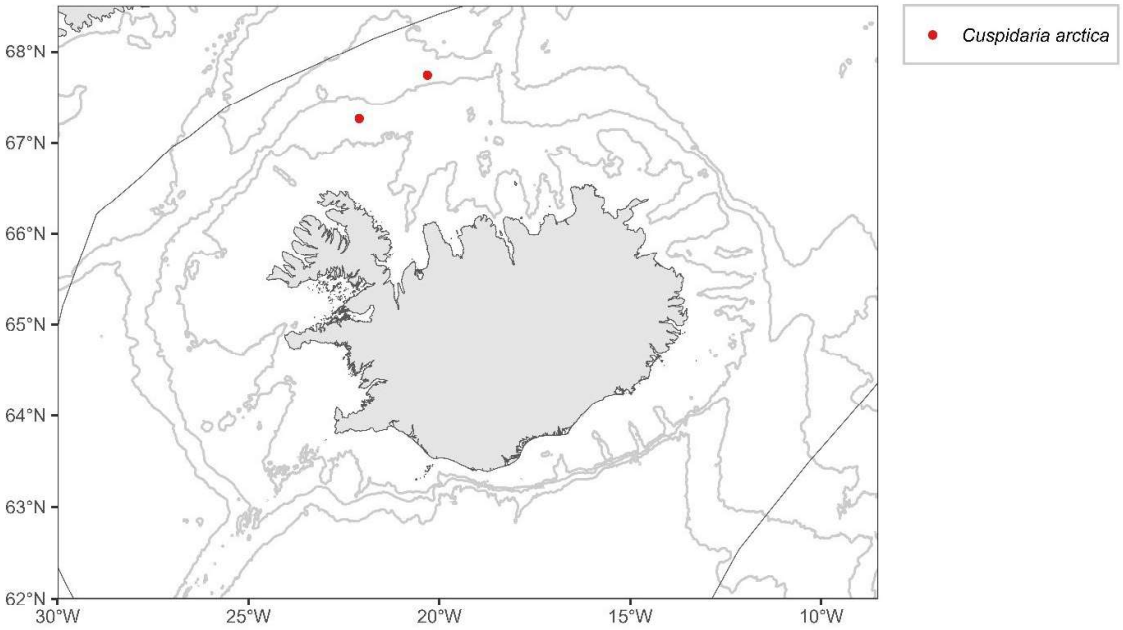
Anomalodesmata - Poromyidae



Anomalodesmata - Verticordiidae

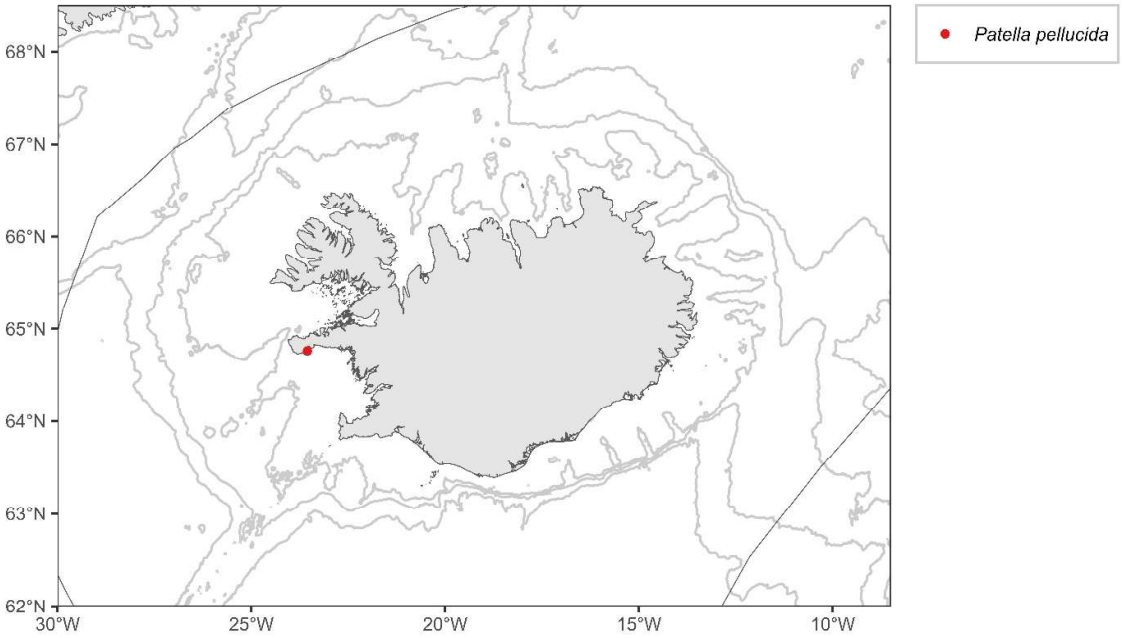


Anomalodesmata - Cuspidariidae

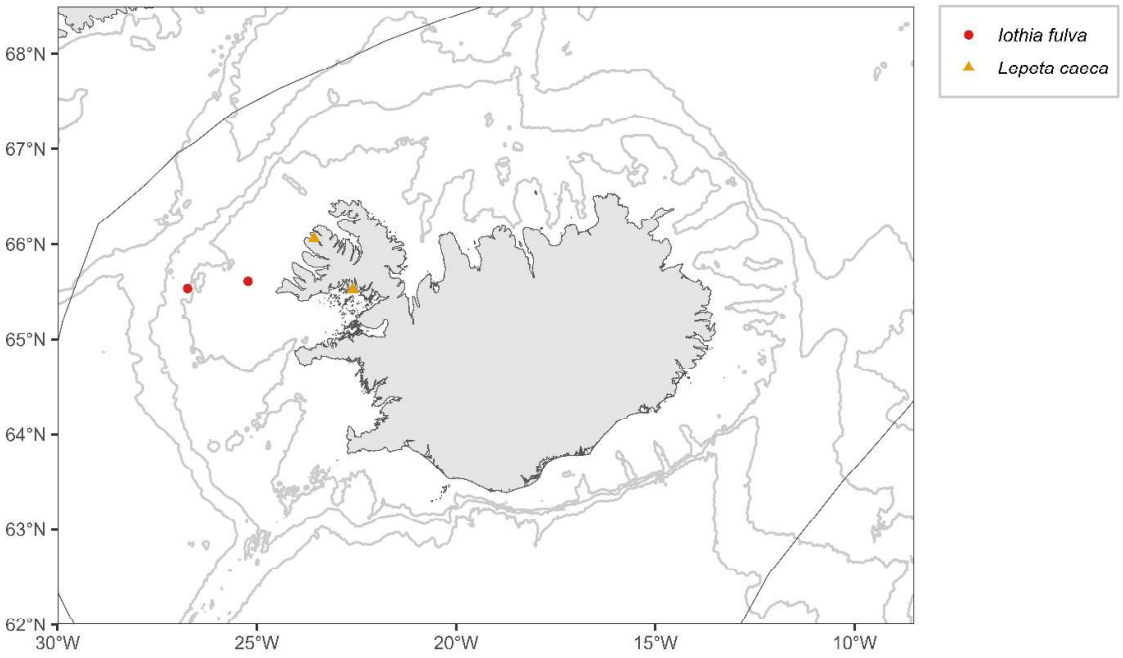


Gastropoda

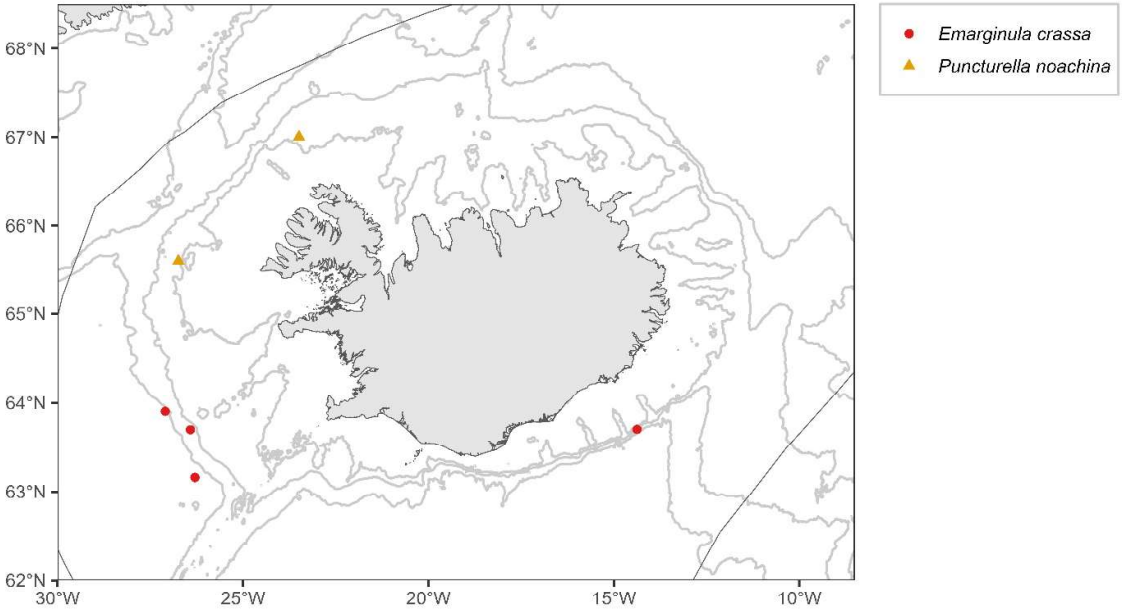
Patellogastropoda - Patellidae



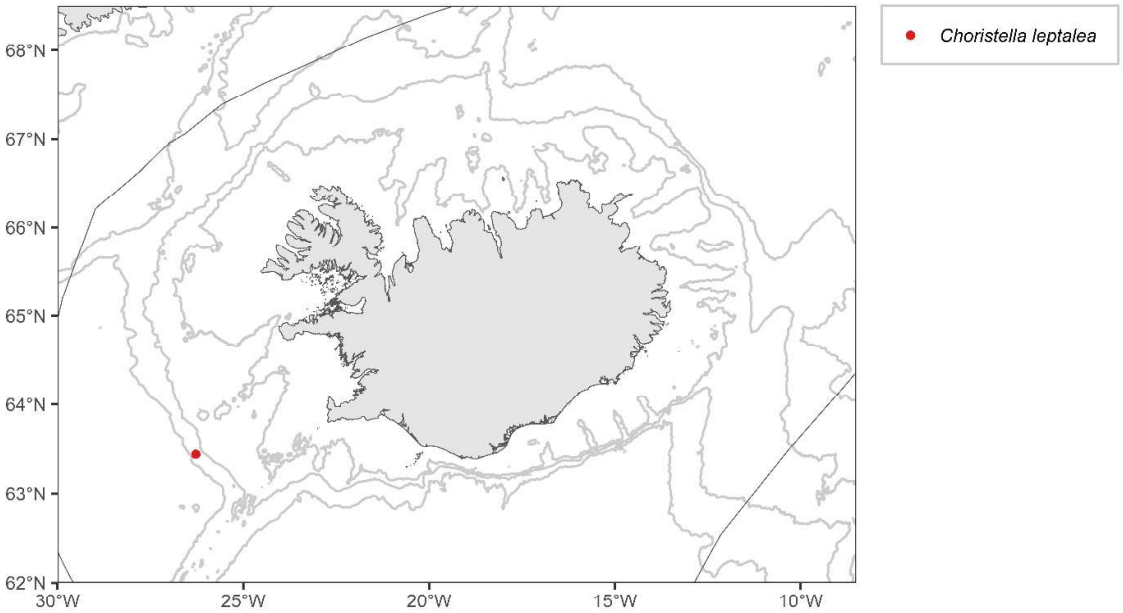
Patellogastropoda - Lepetidae



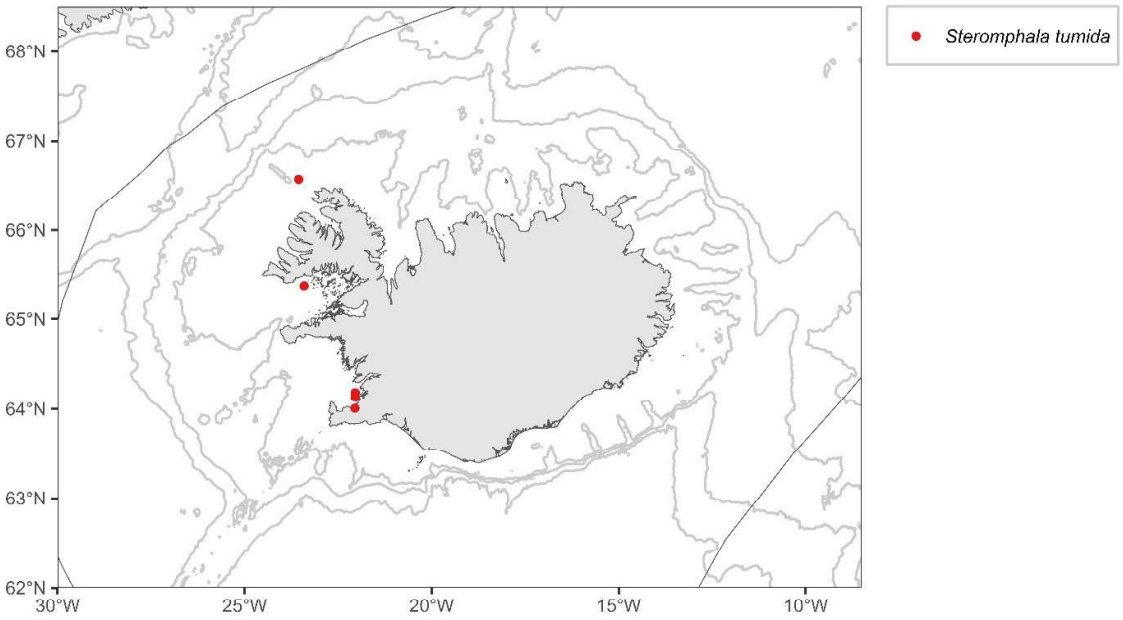
Lepetellida - Fissurellidae



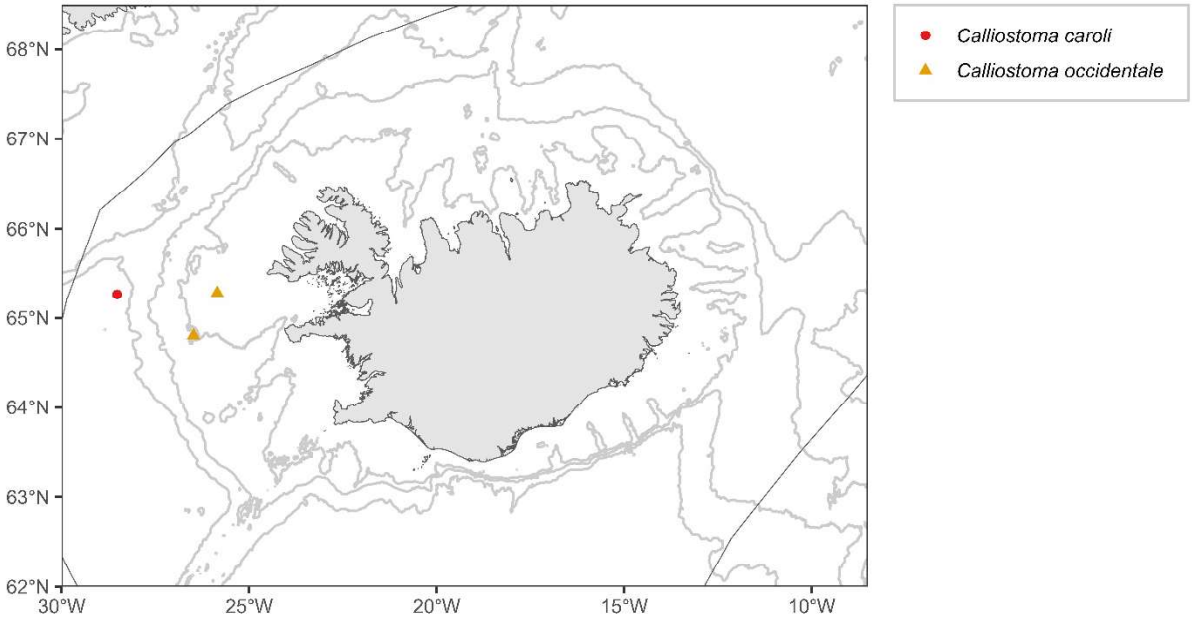
Seguenziida - Choristellidae



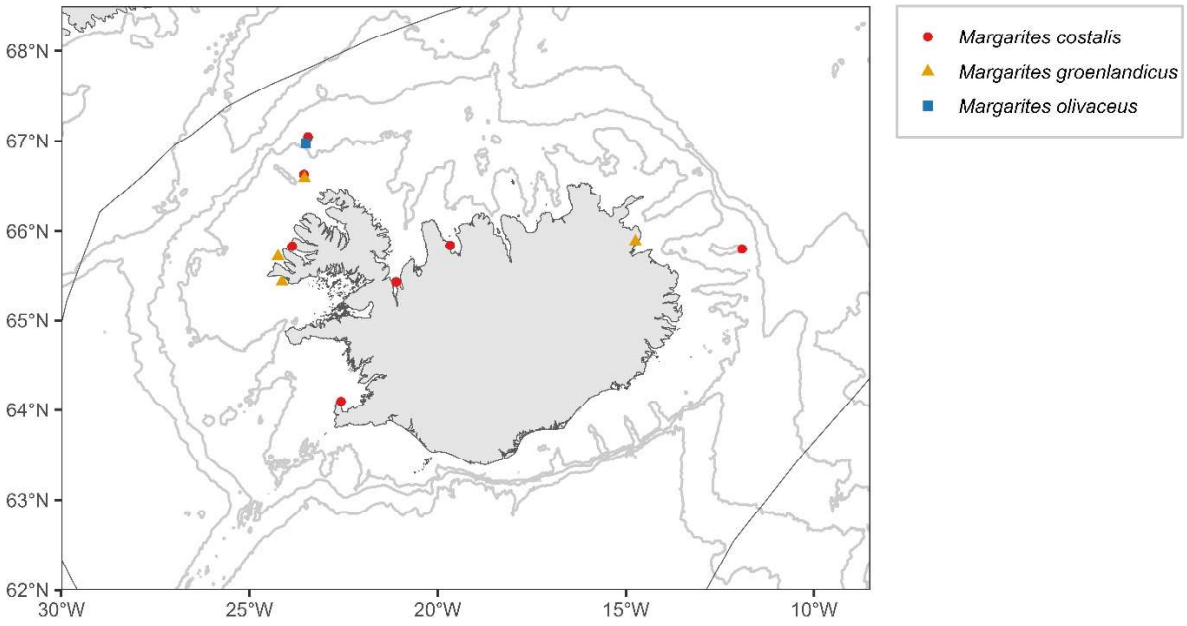
Trochida - Trochidae



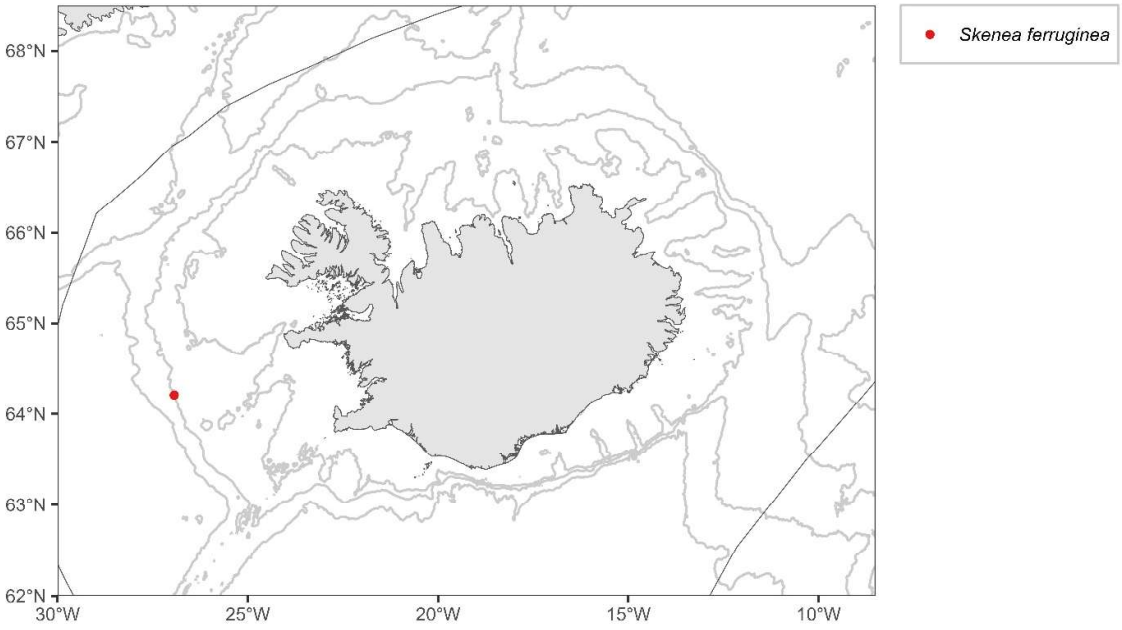
Trochida - Calliostomatidae



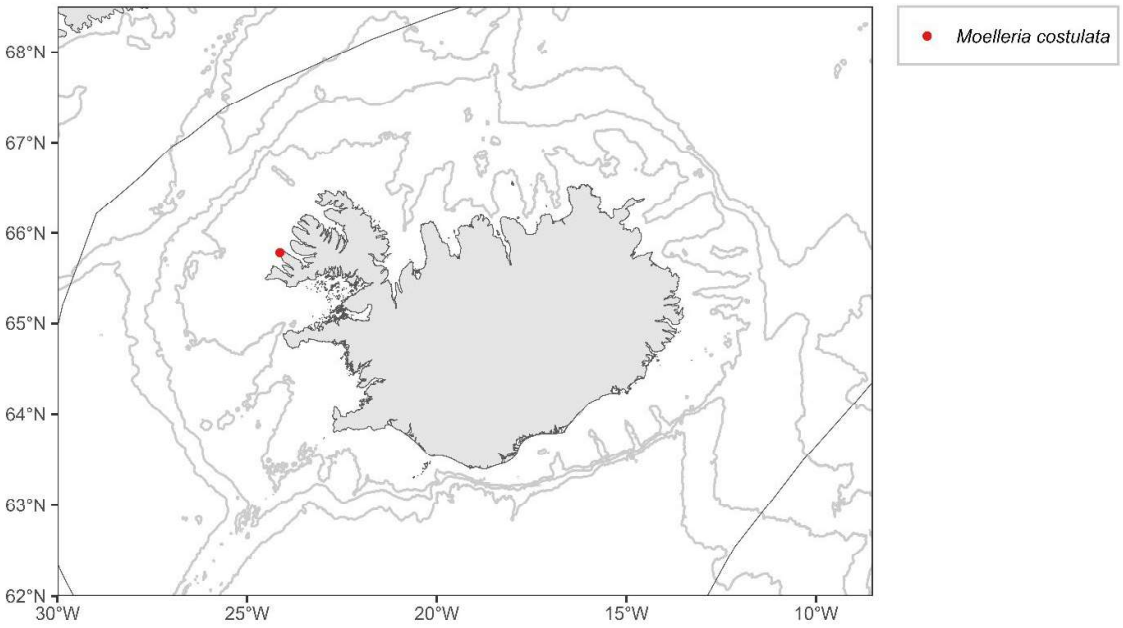
Trochida - Margaritidae



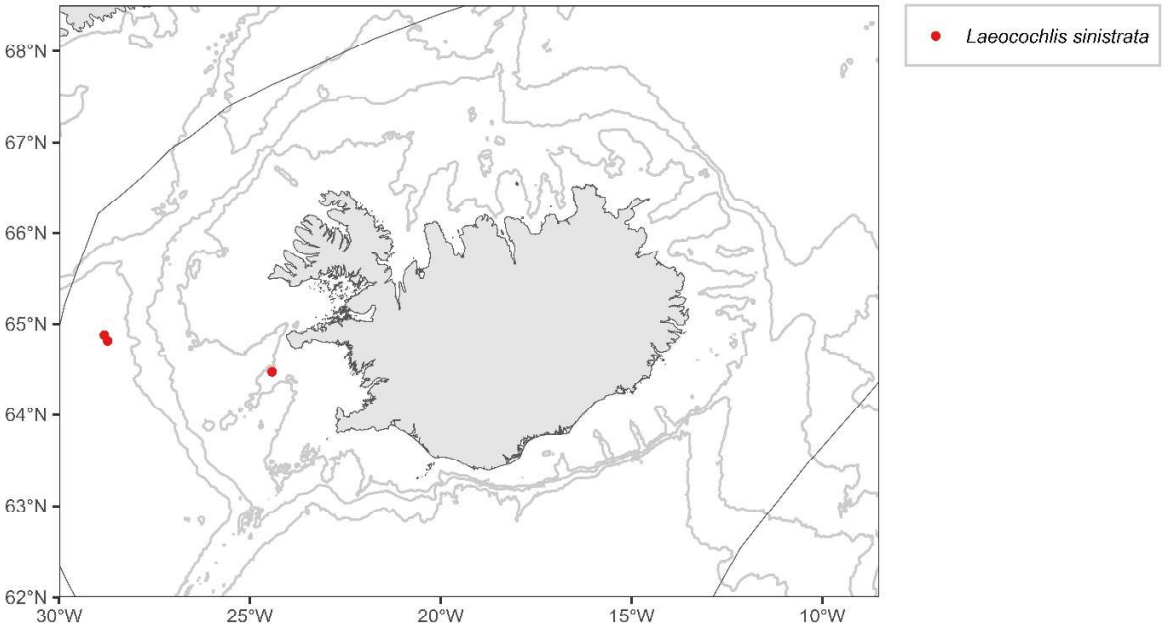
Trochida - Skeneidae



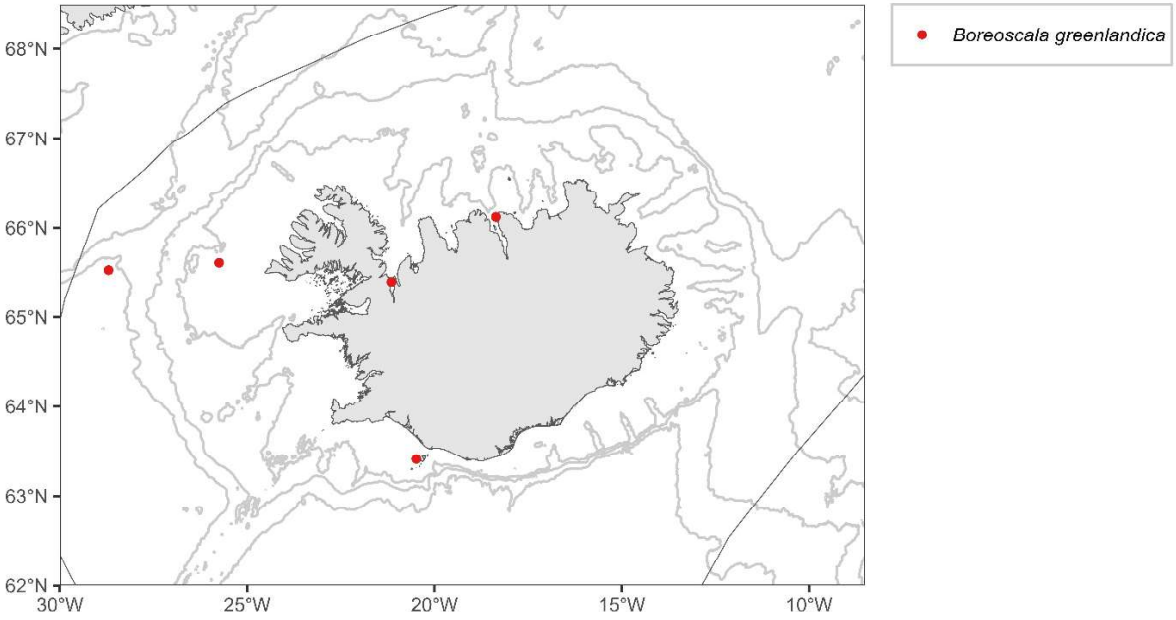
Trochida - Colloniidae



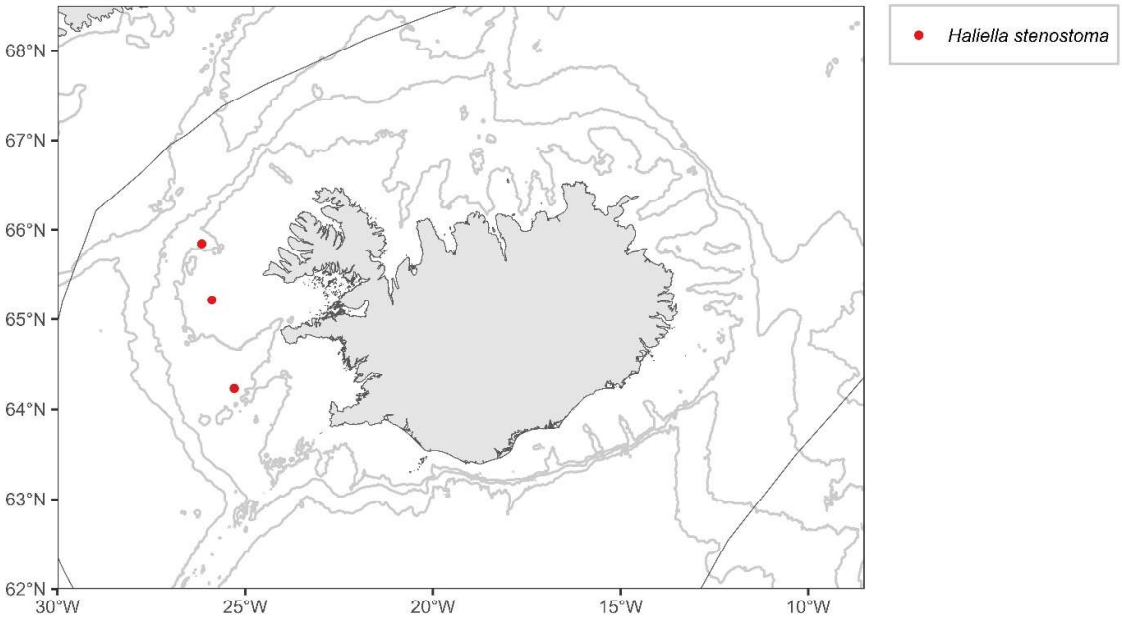
[unassigned] Caenogastropoda - Newtoniellidae



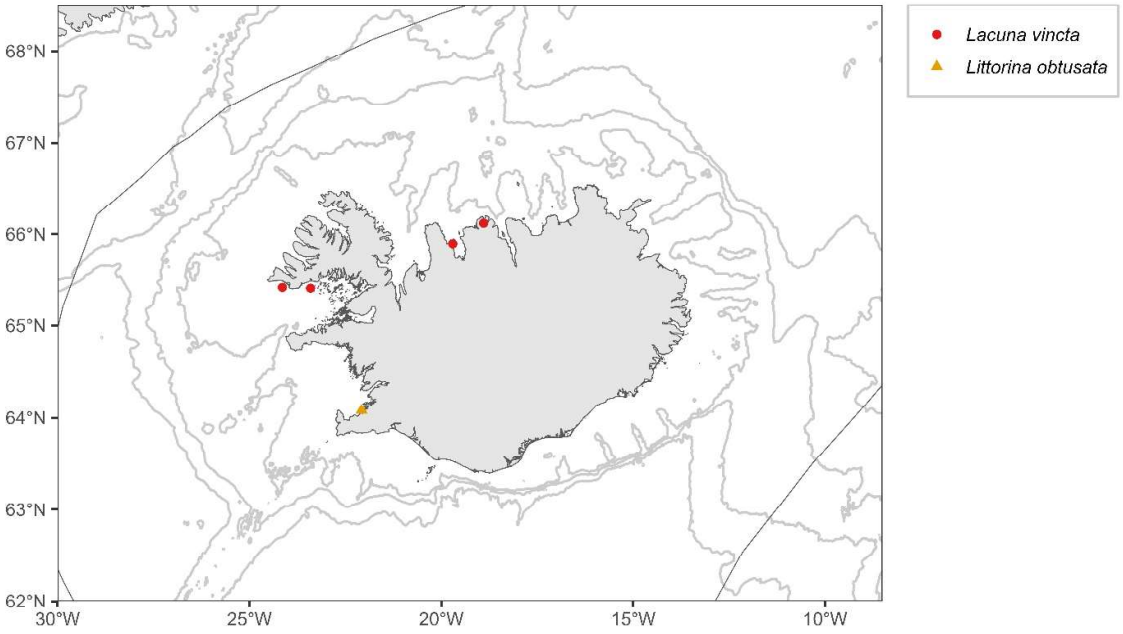
[unassigned] Caenogastropoda - Epitoniidae



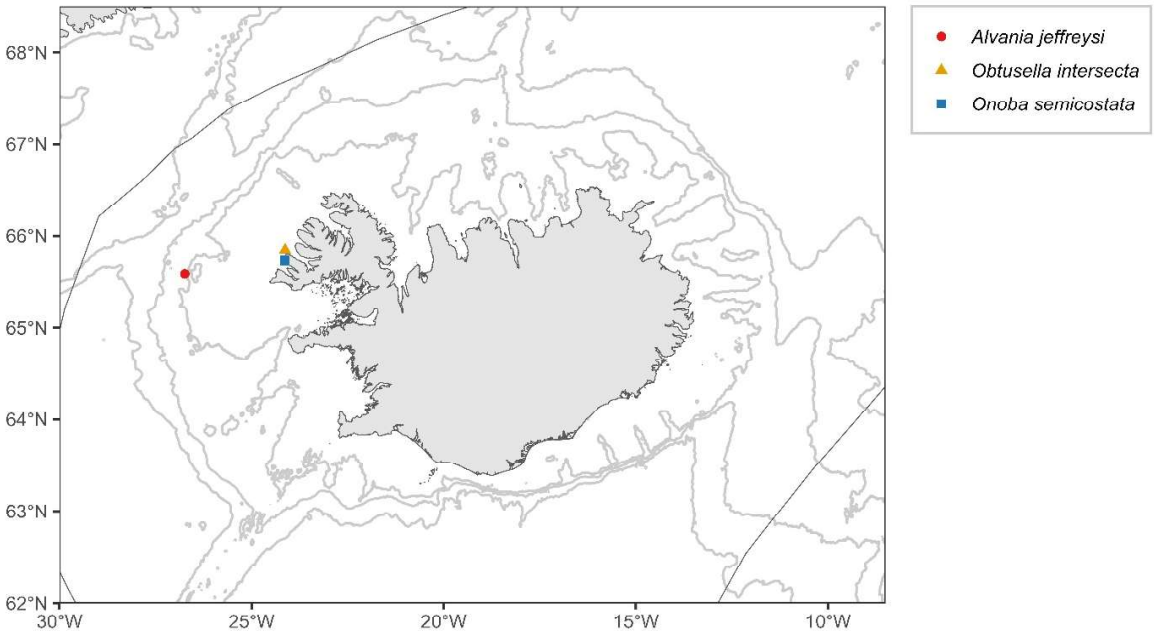
Littorinimorpha - Eulimidae



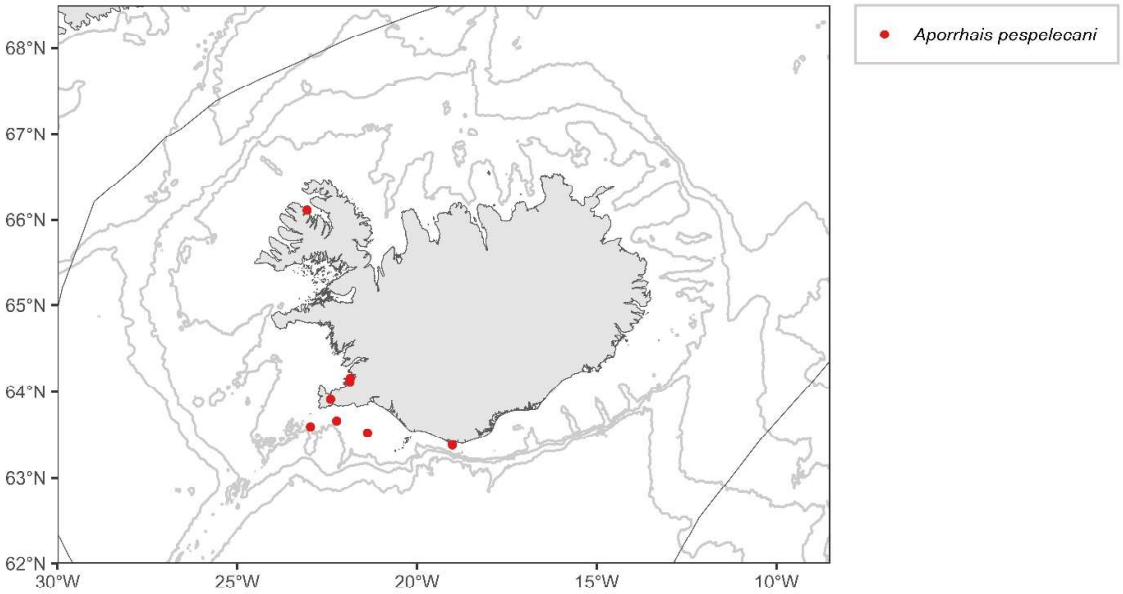
Littorinimorpha - Littorinidae



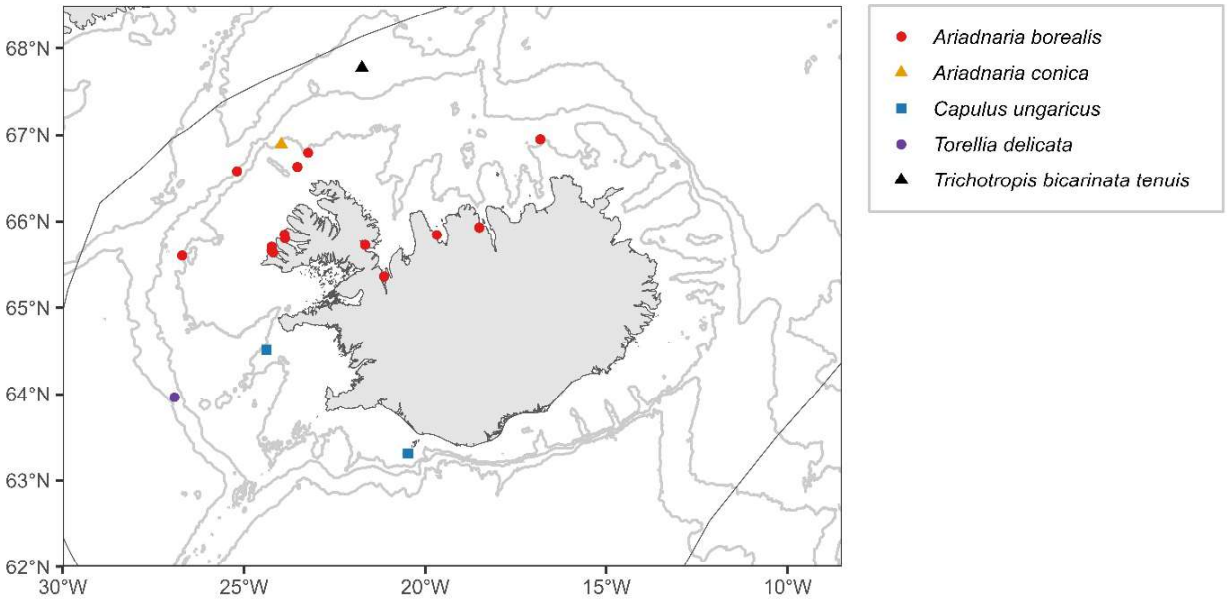
Littorinimorpha - Rissoidae



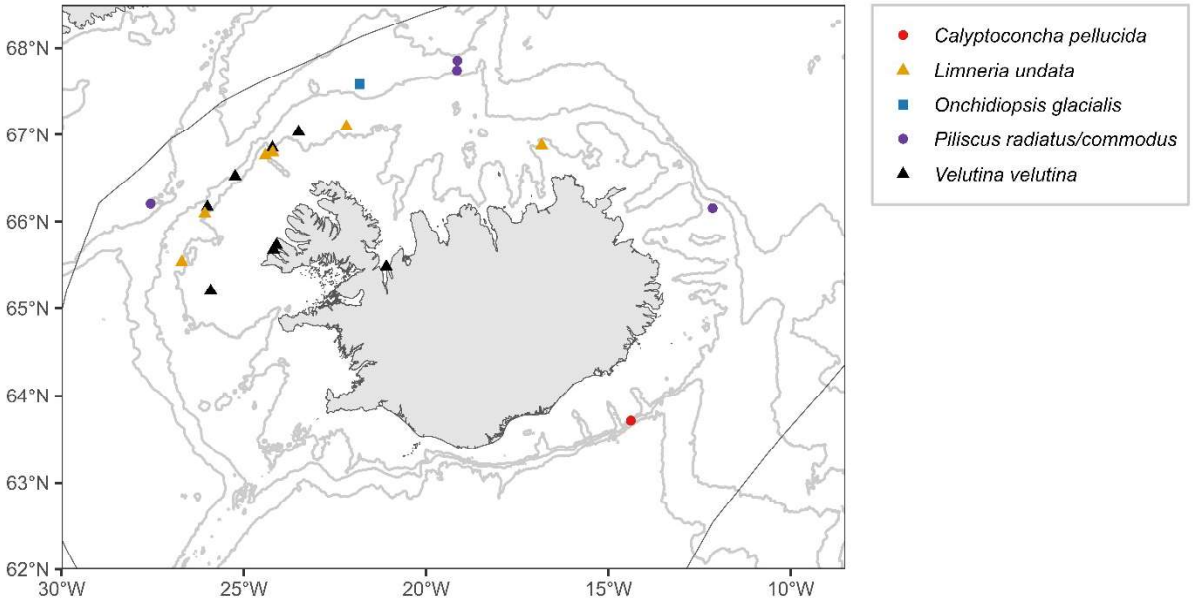
Littorinimorpha - Aporrhaidae



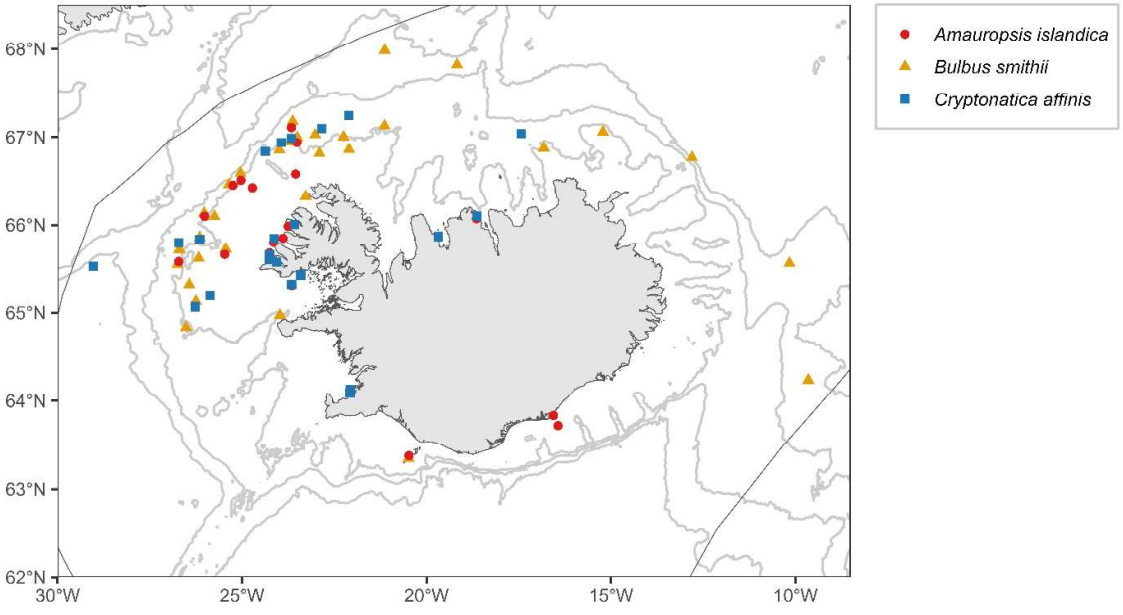
Littorinimorpha - Capulidae



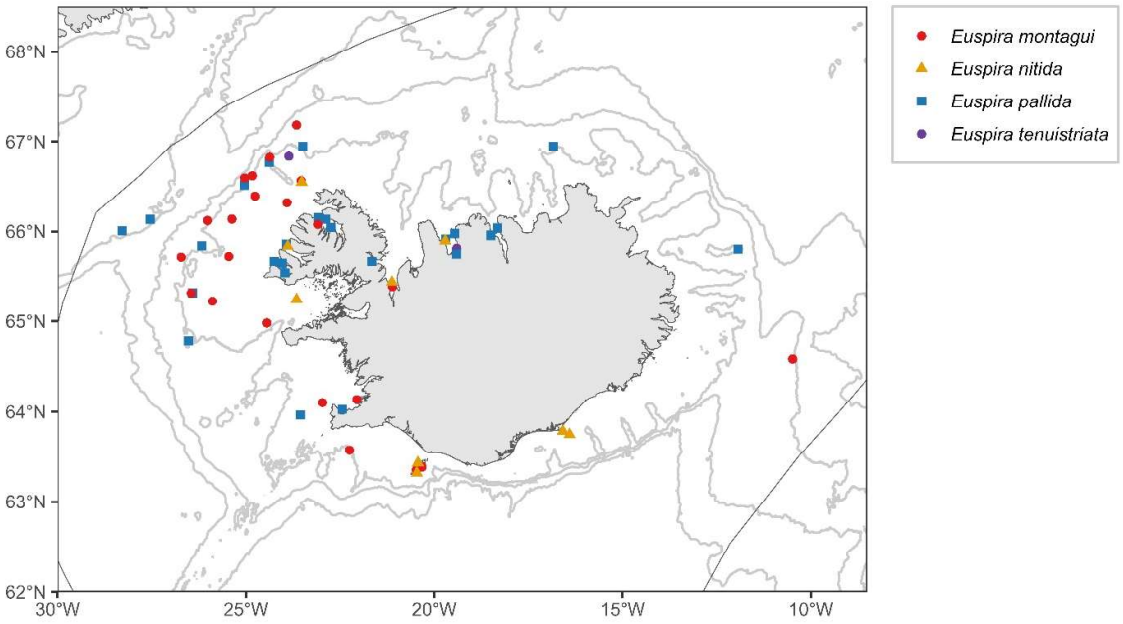
Littorinimorpha - Velutinidae



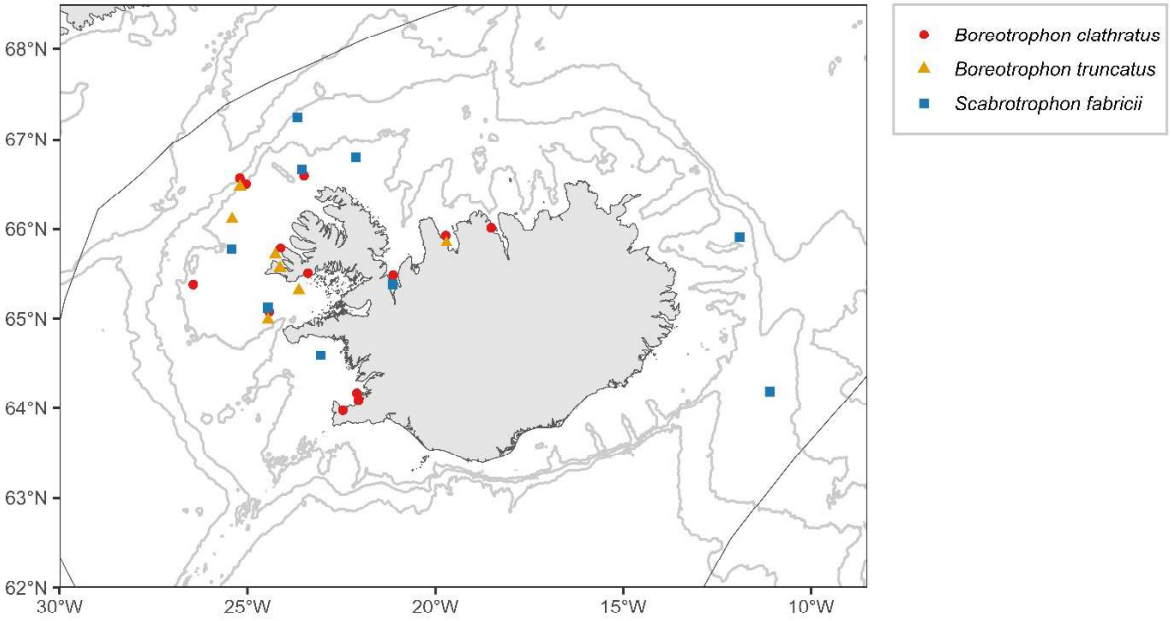
Littorinimorpha - Naticidae



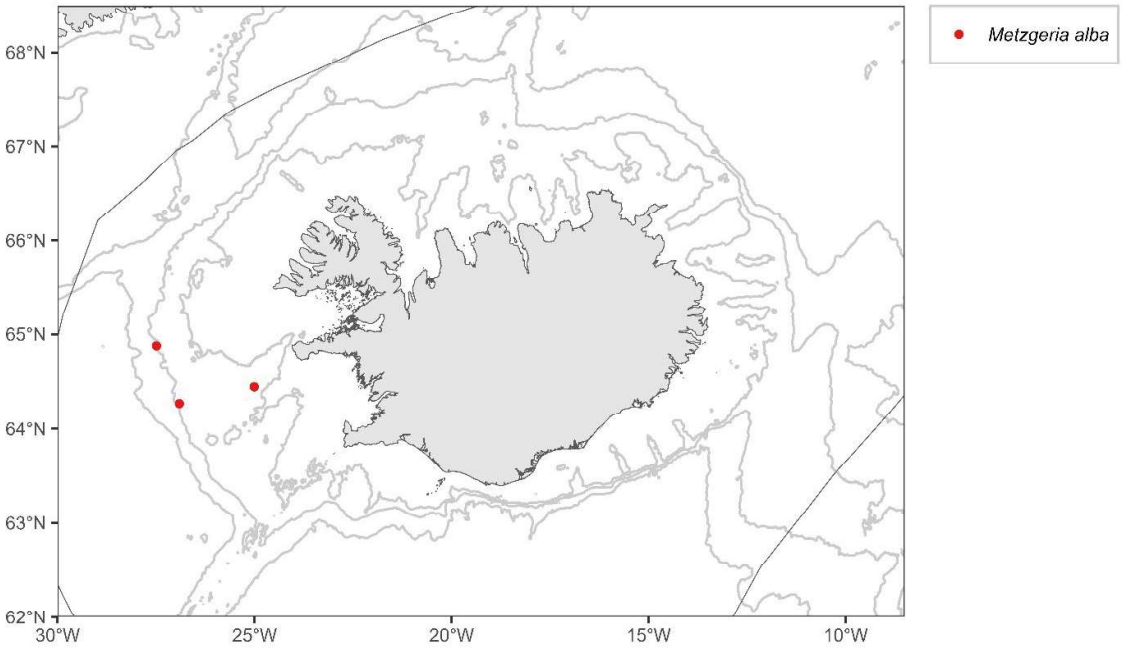
Littorinimorpha - Naticidae



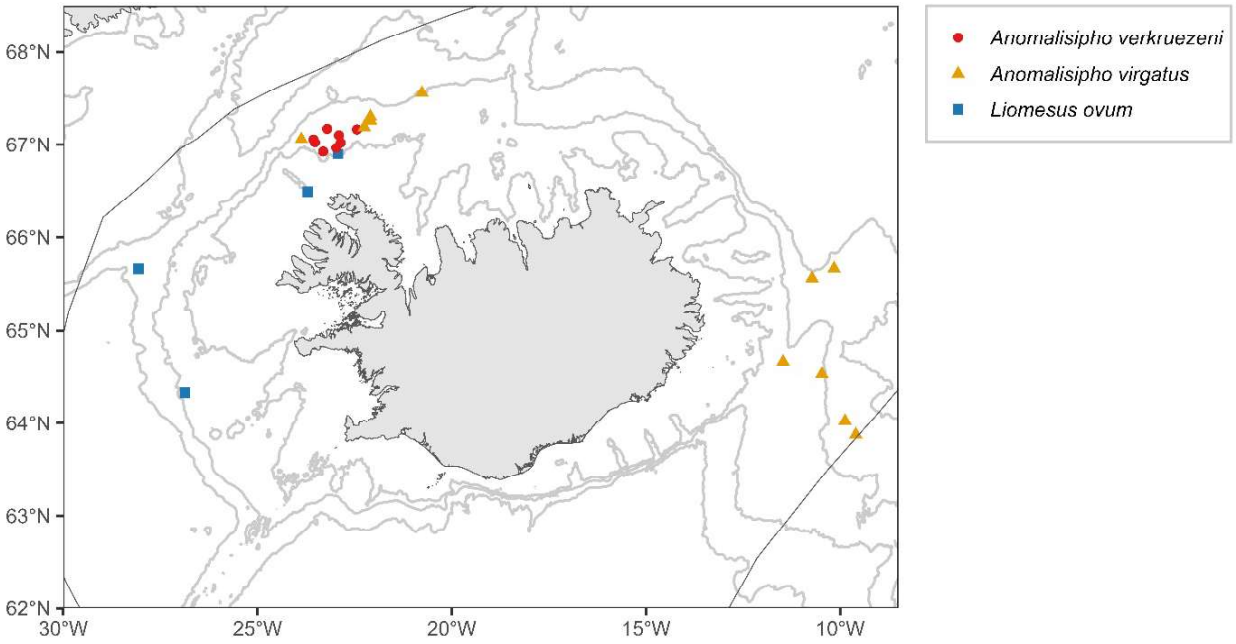
Neogastropoda - Muricidae



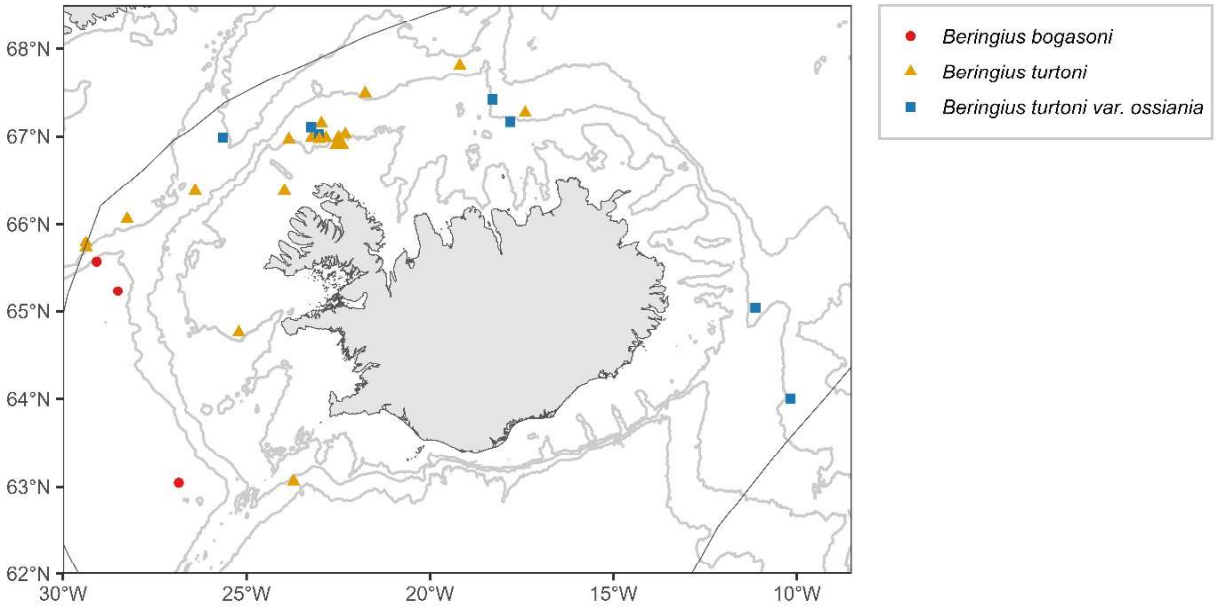
Neogastropoda - Ptychatractidae



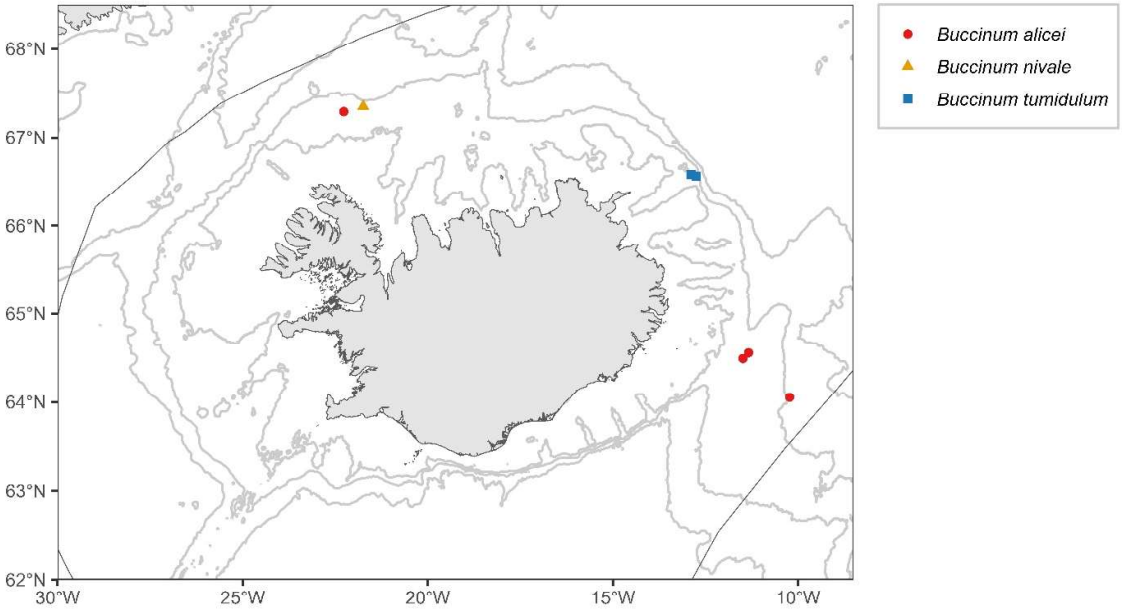
Neogastropoda - Buccinidae



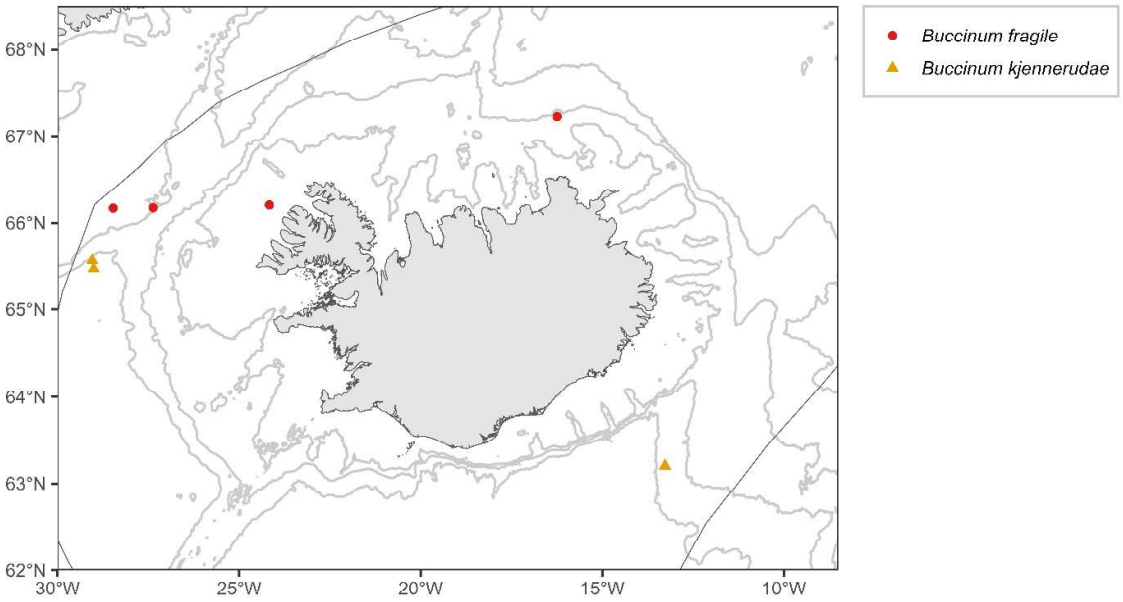
Neogastropoda - Buccinidae



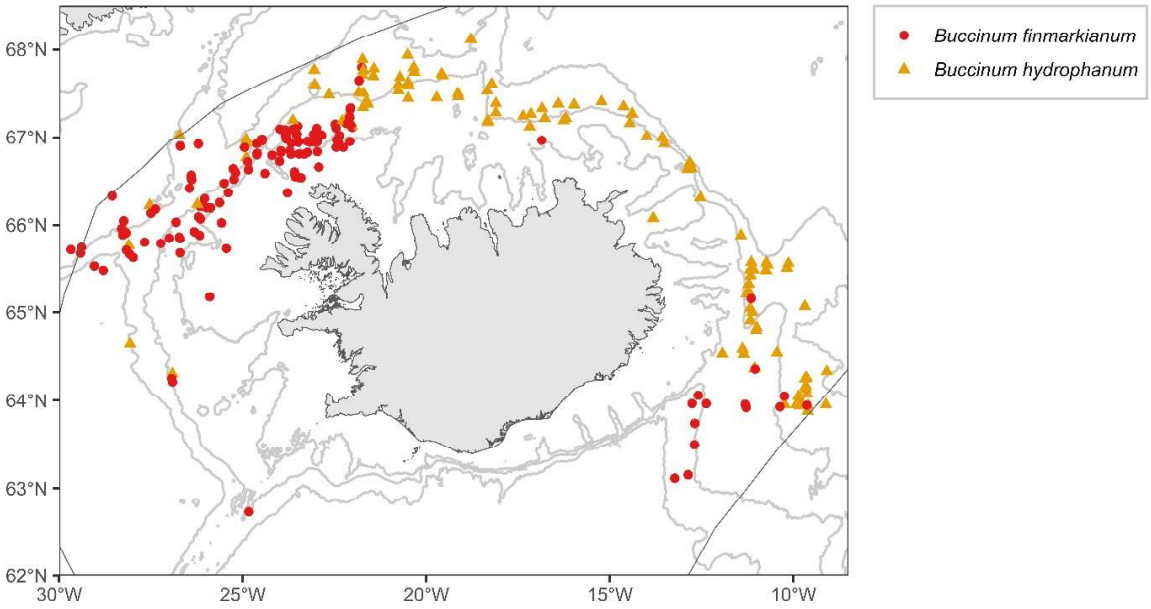
Neogastropoda - Buccinidae



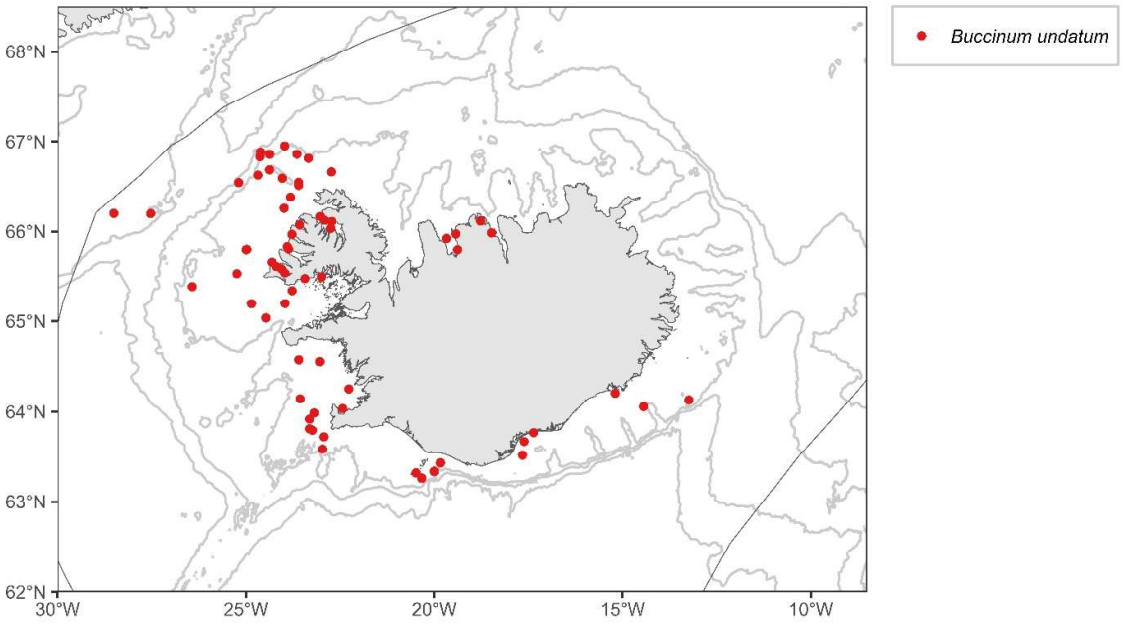
Neogastropoda - Buccinidae



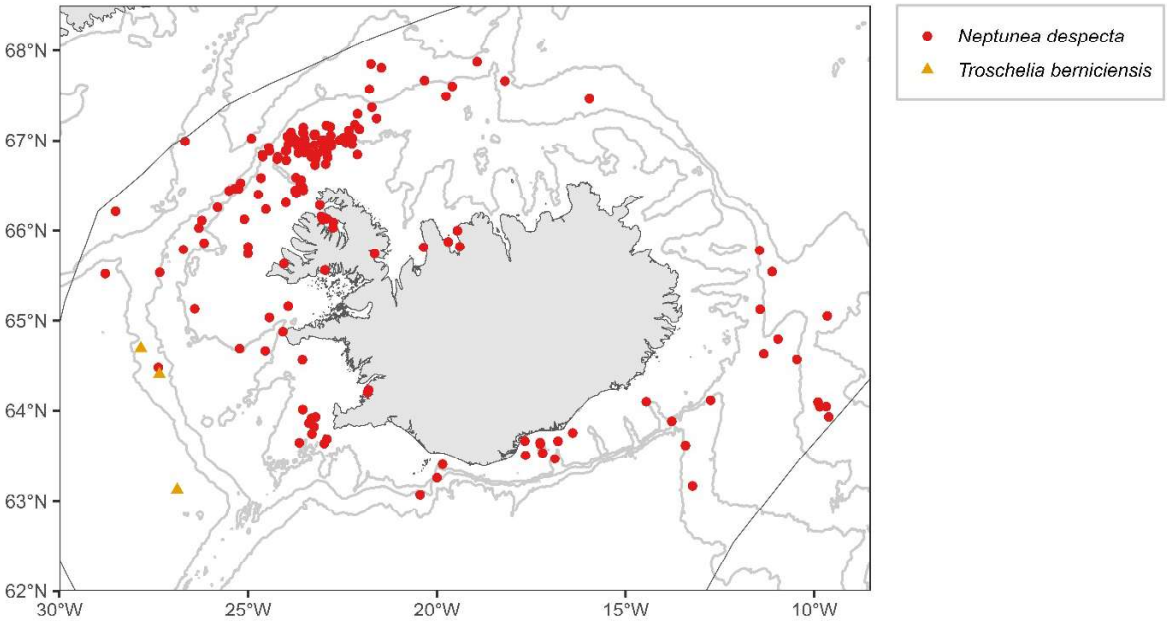
Neogastropoda - Buccinidae



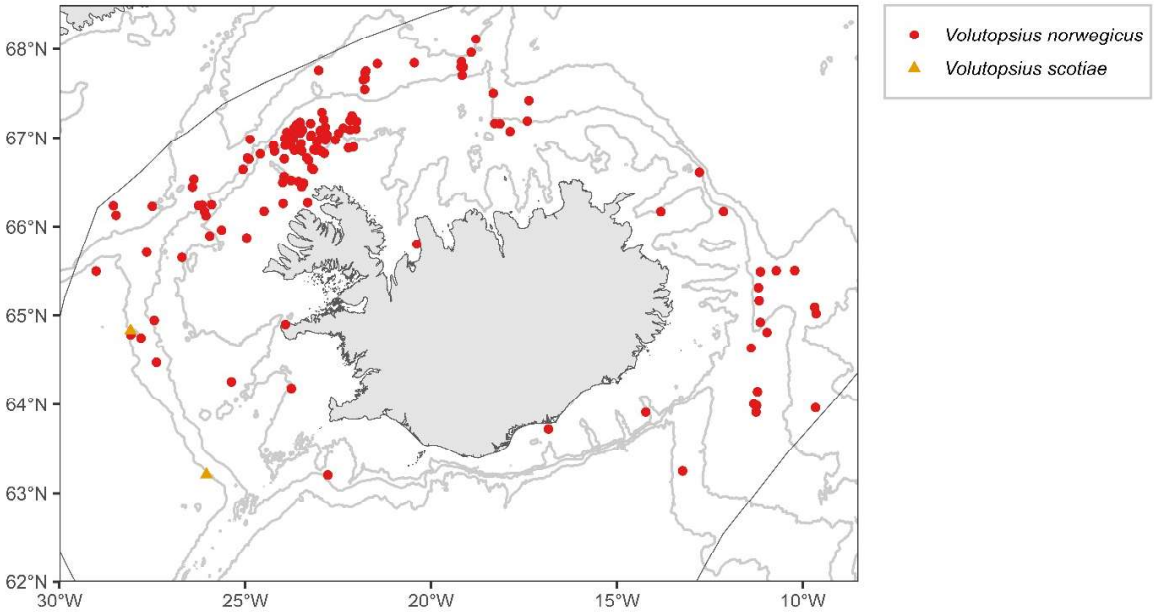
Neogastropoda - Buccinidae



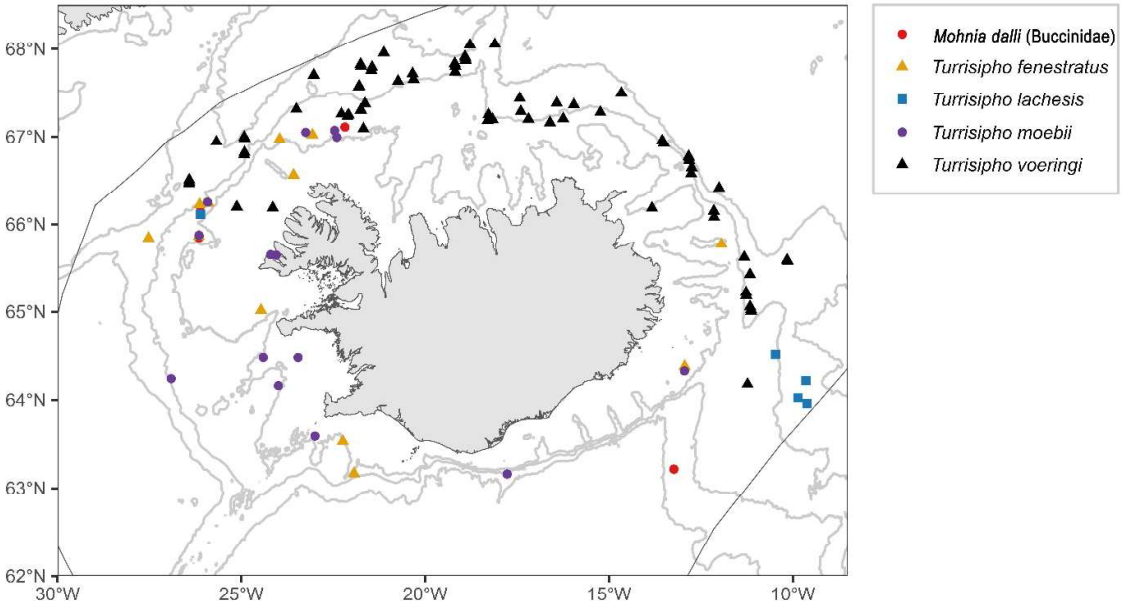
Neogastropoda - Buccinidae



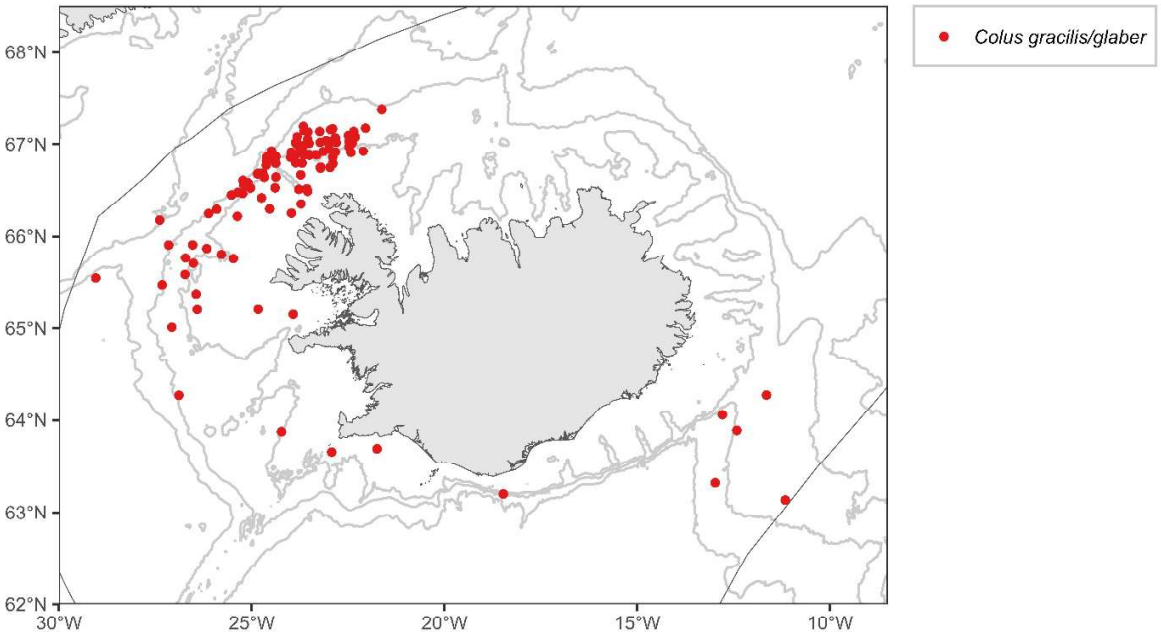
Neogastropoda - Buccinidae



Neogastropoda - Buccinidae- Colidae



Neogastropoda - Colidae



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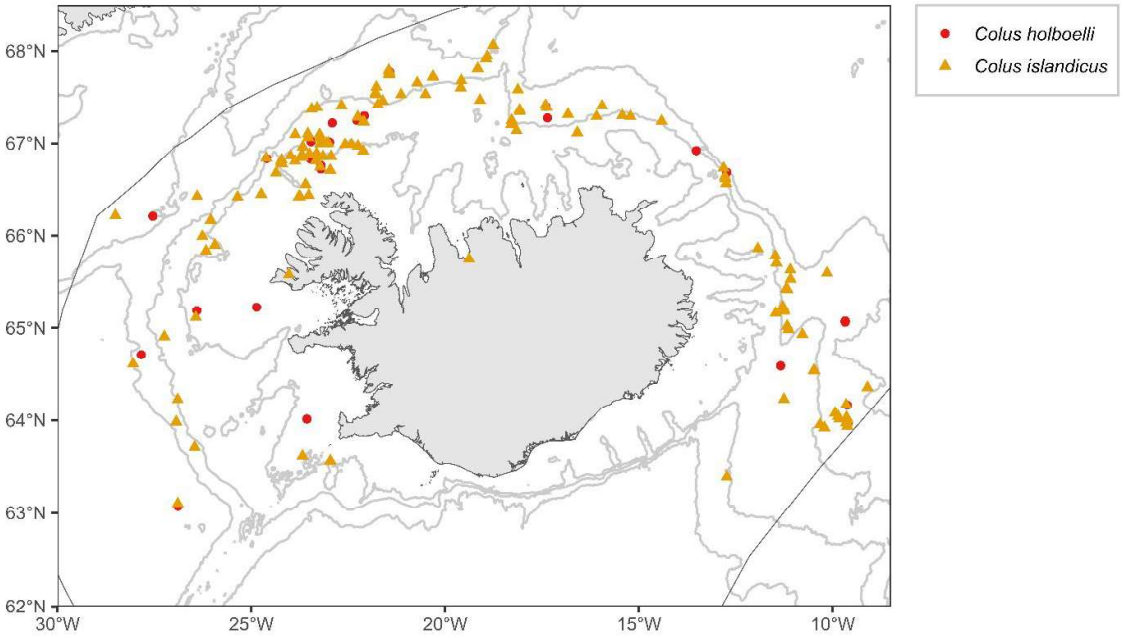
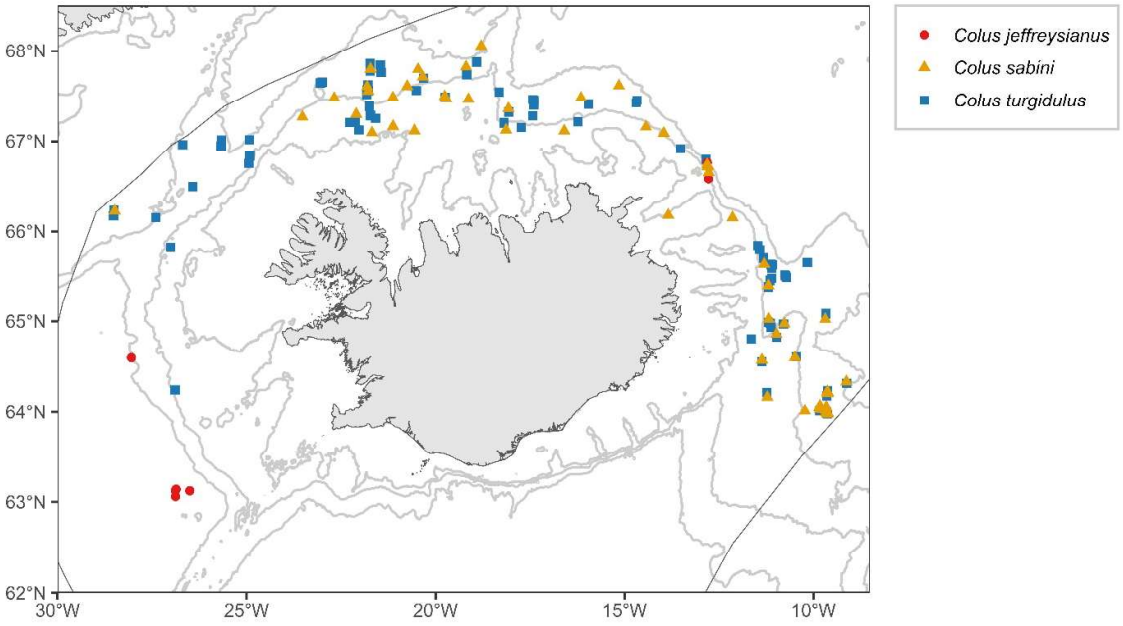
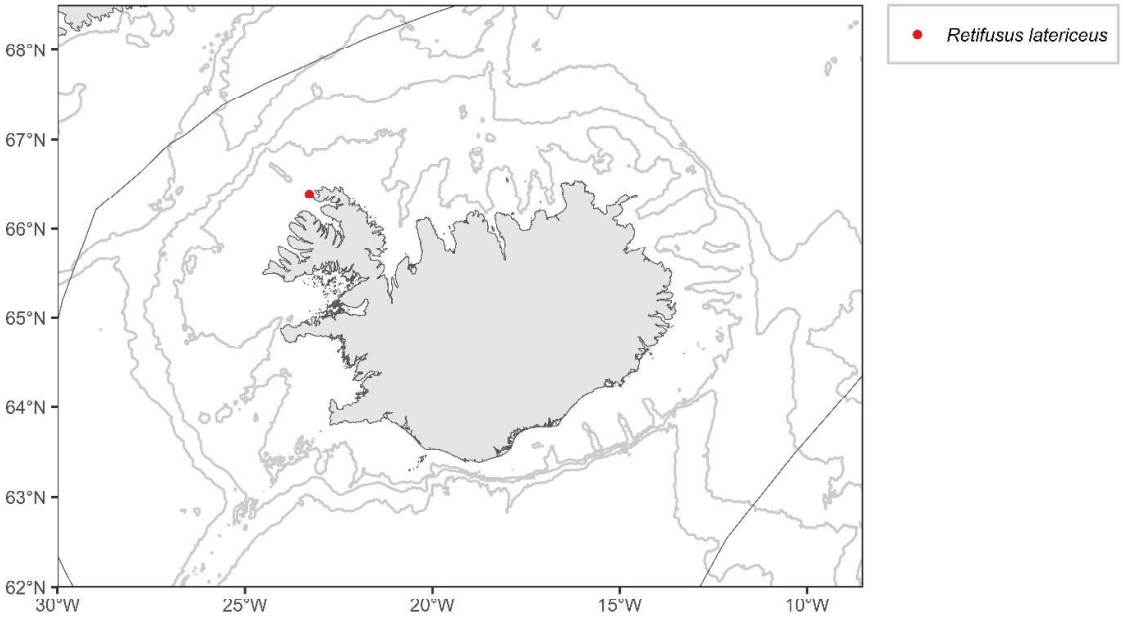


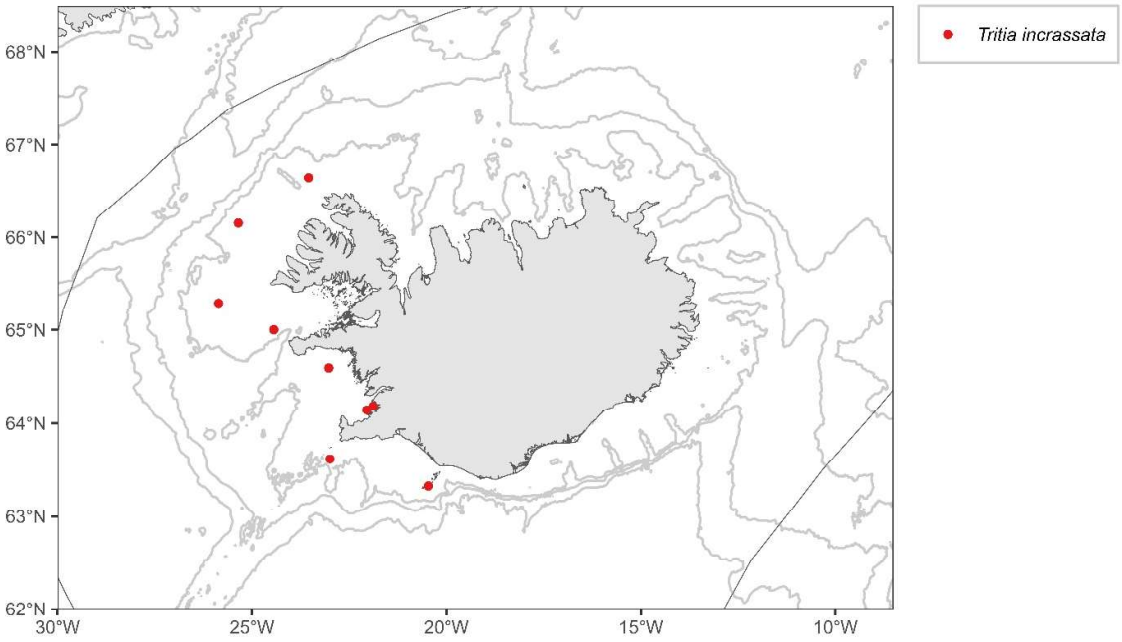
Neogastropoda - Colidae



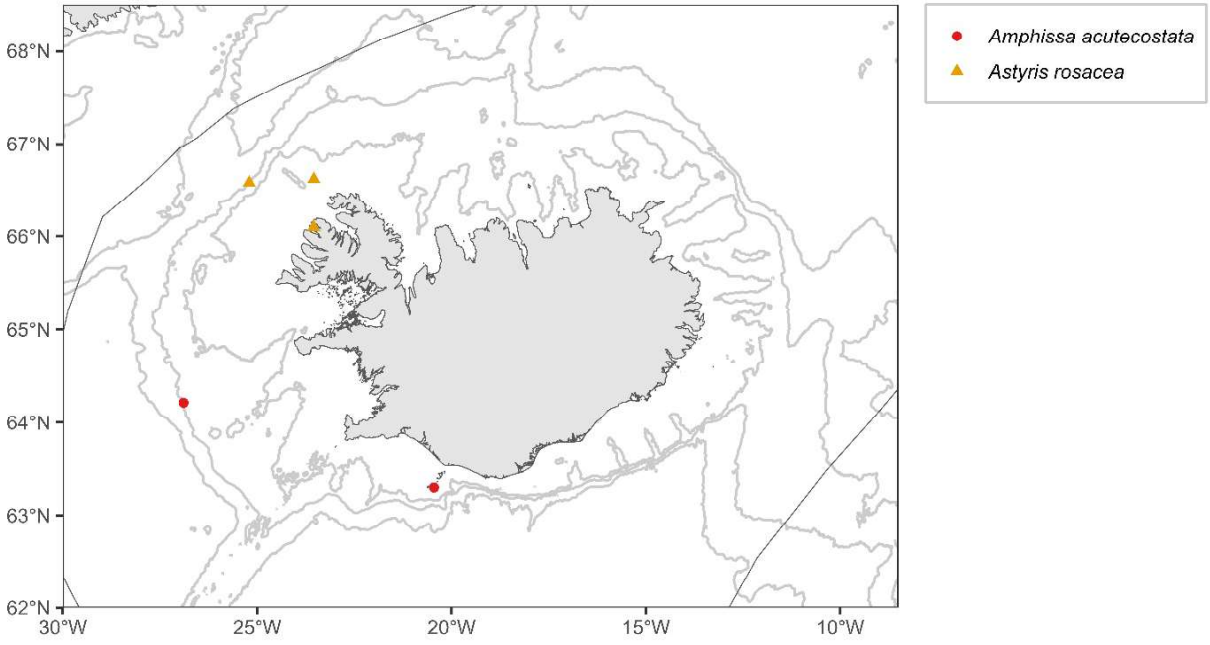
Neogastropoda - Retimohniidae



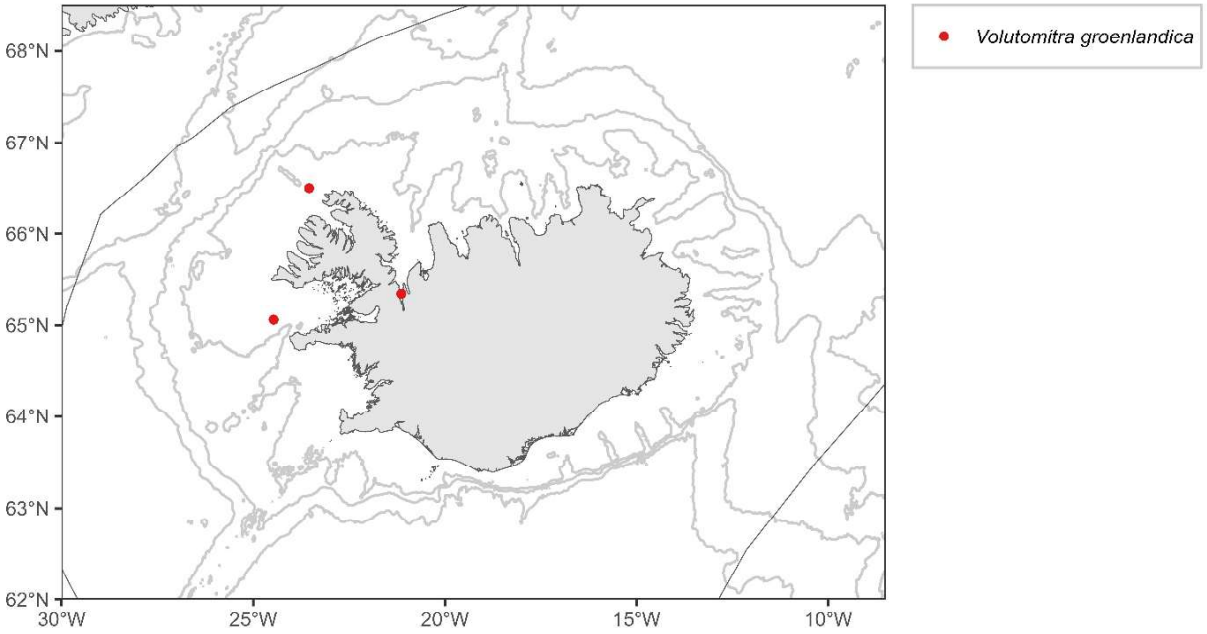
Neogastropoda - Nassariidae



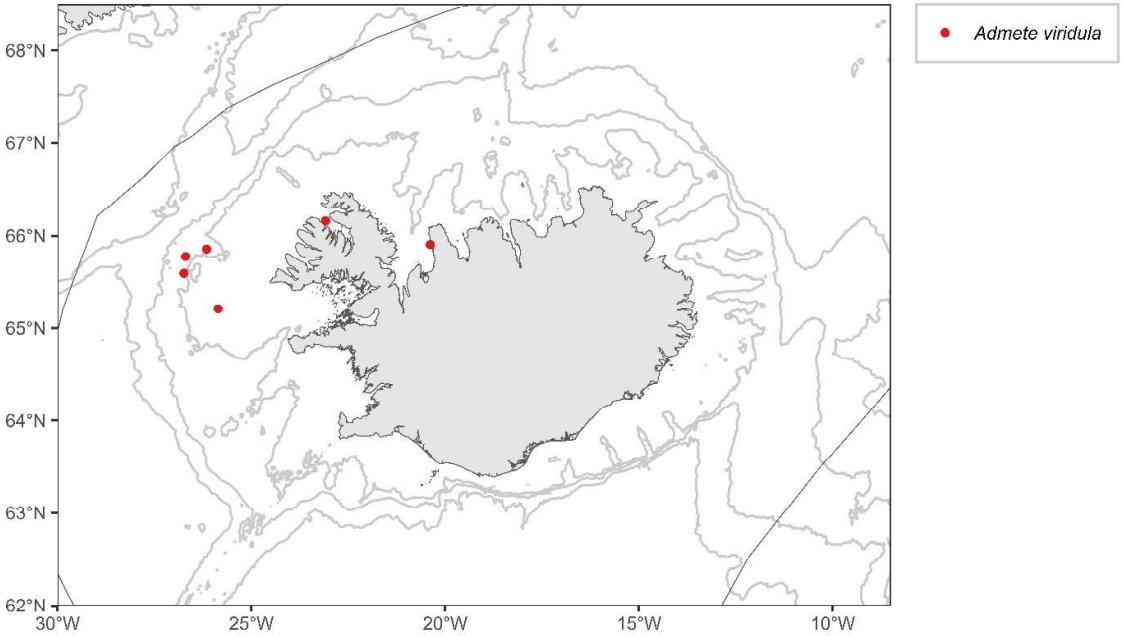
Neogastropoda - Columbellidae



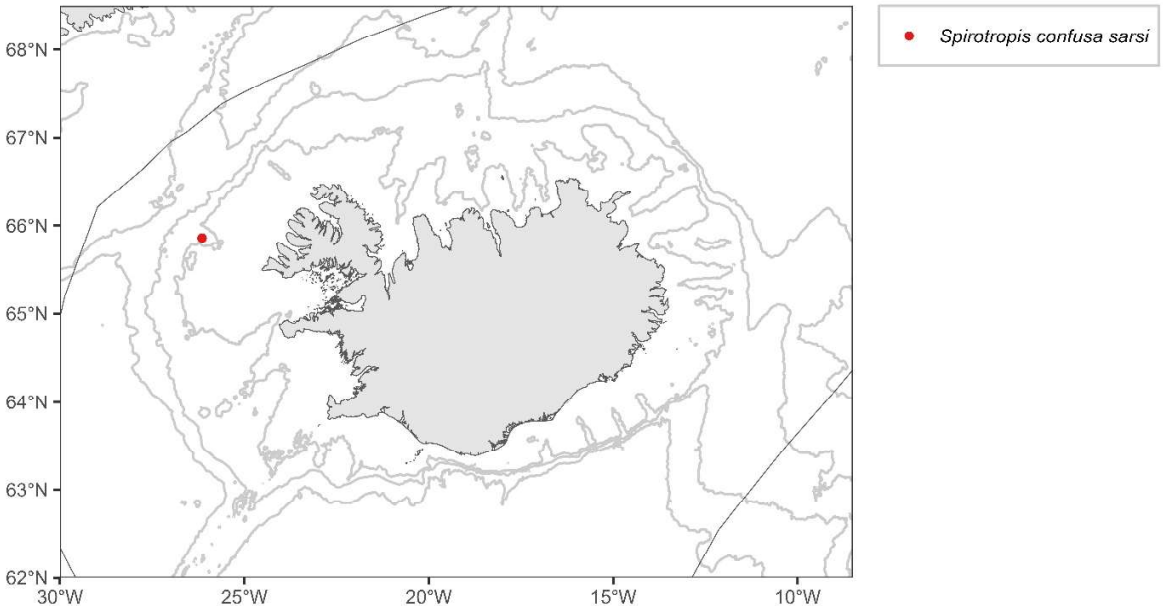
Neogastropoda - Volutomitridae



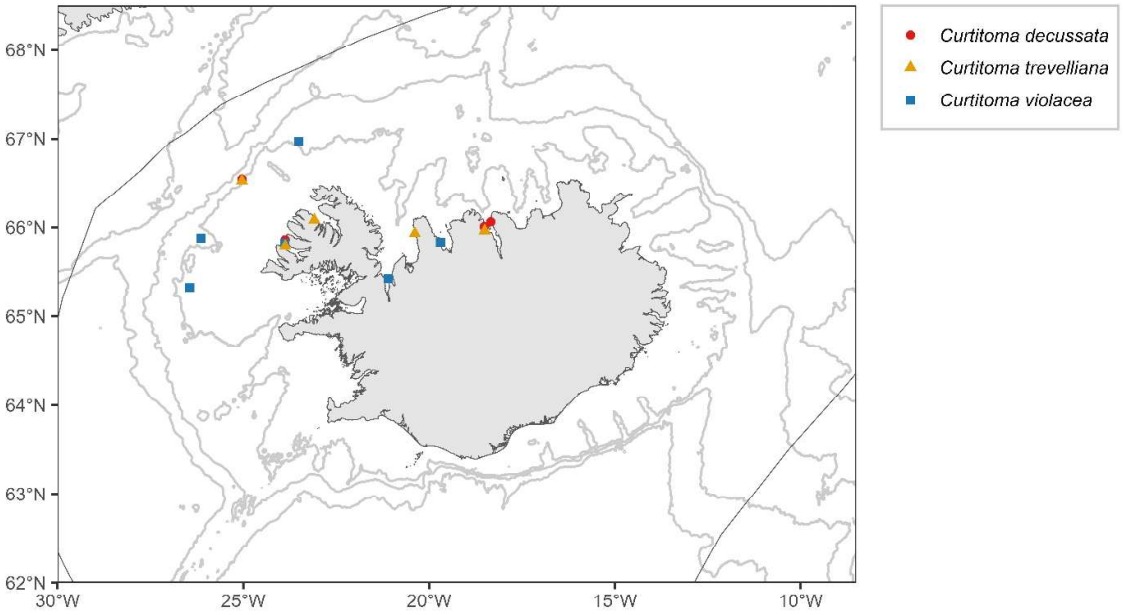
Neogastropoda - Cancellariidae



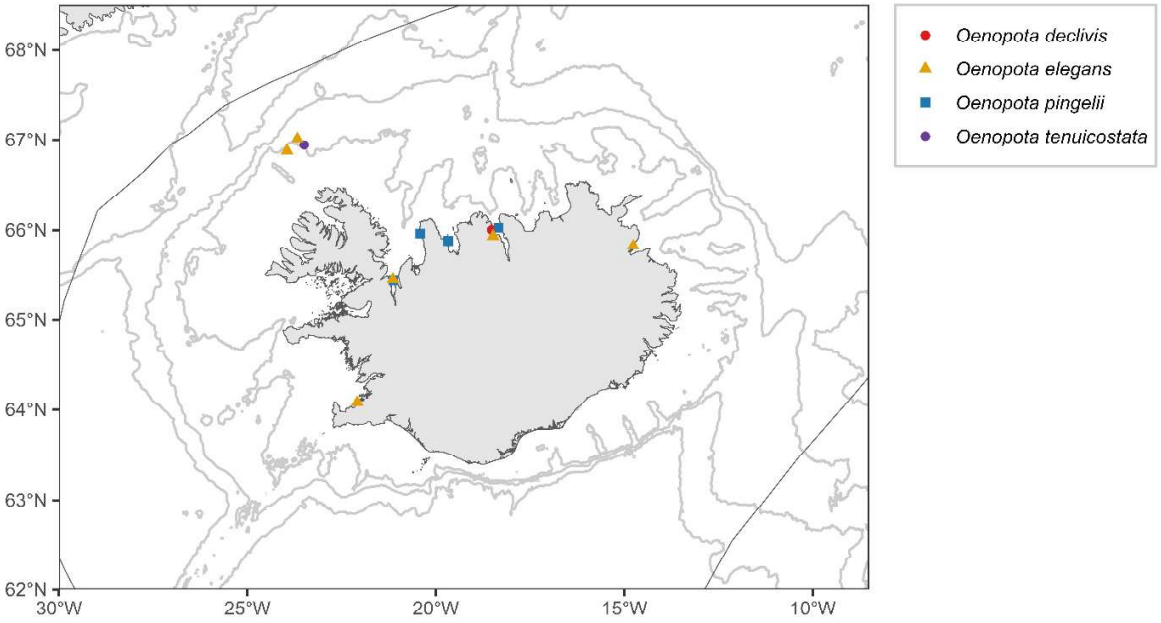
Neogastropoda - Drilliidae



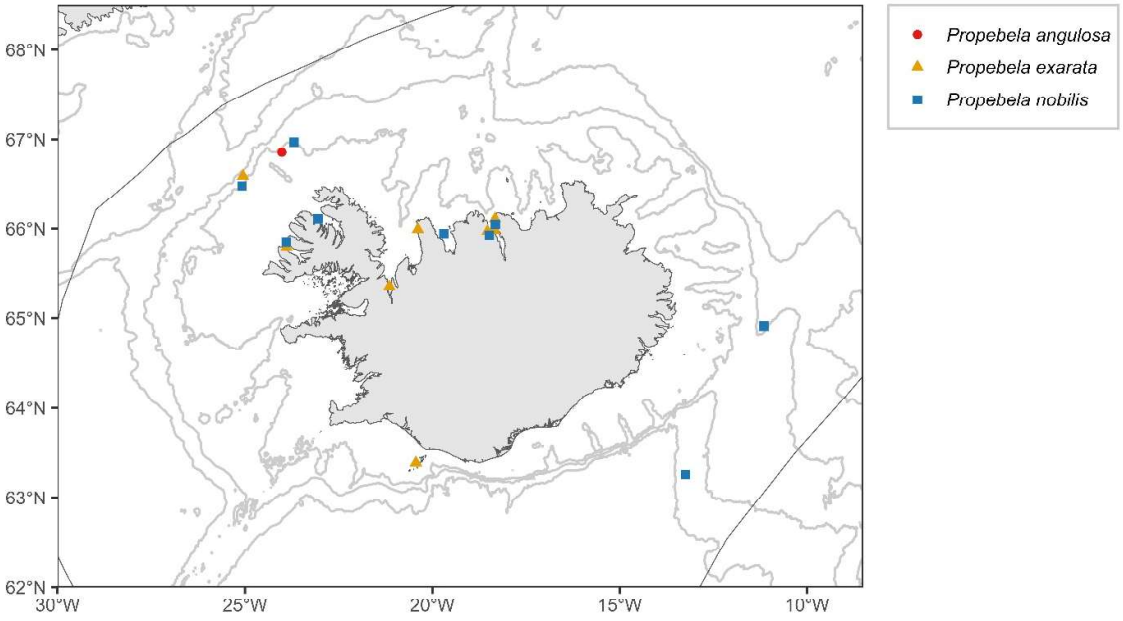
Neogastropoda - Mangeliidae



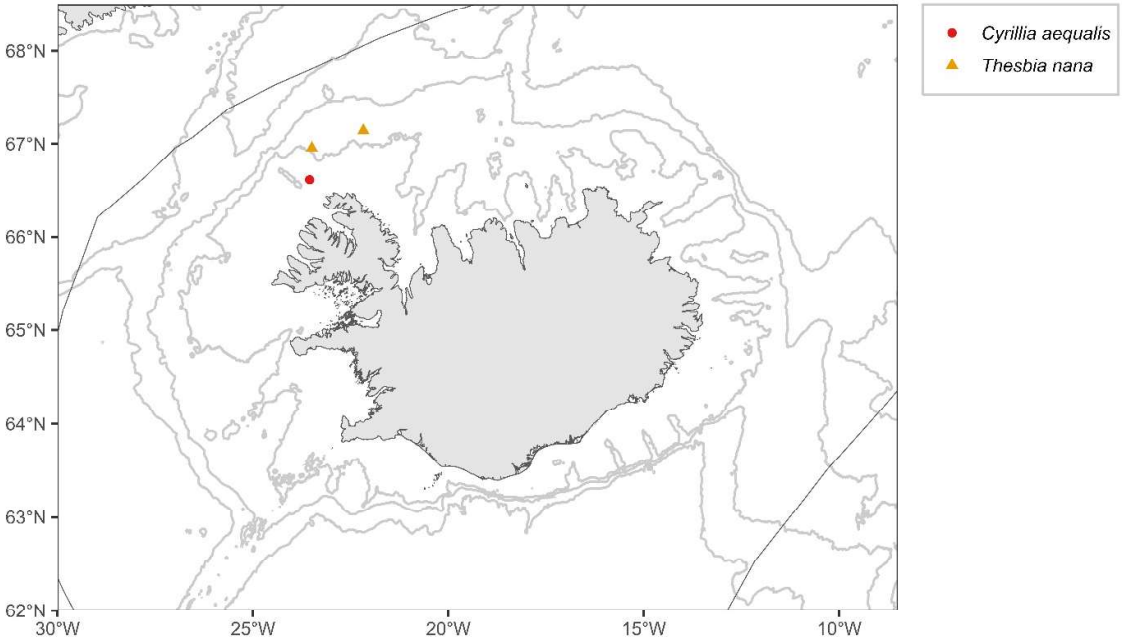
Neogastropoda - Mangeliidae



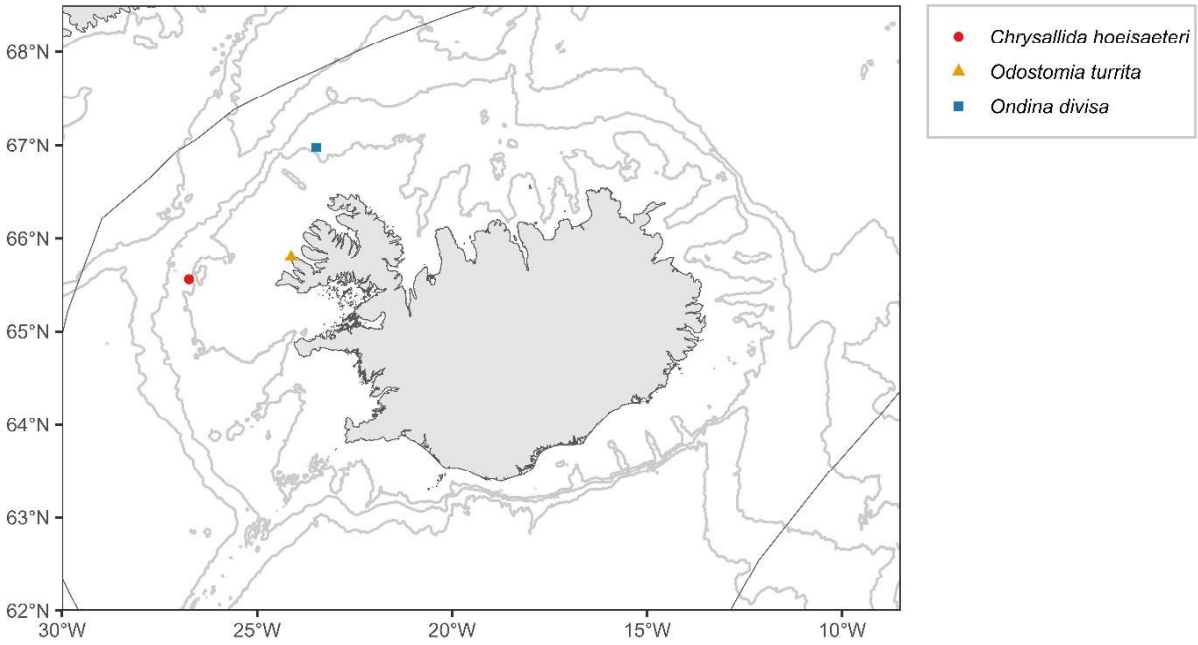
Neogastropoda - Mangeliidae



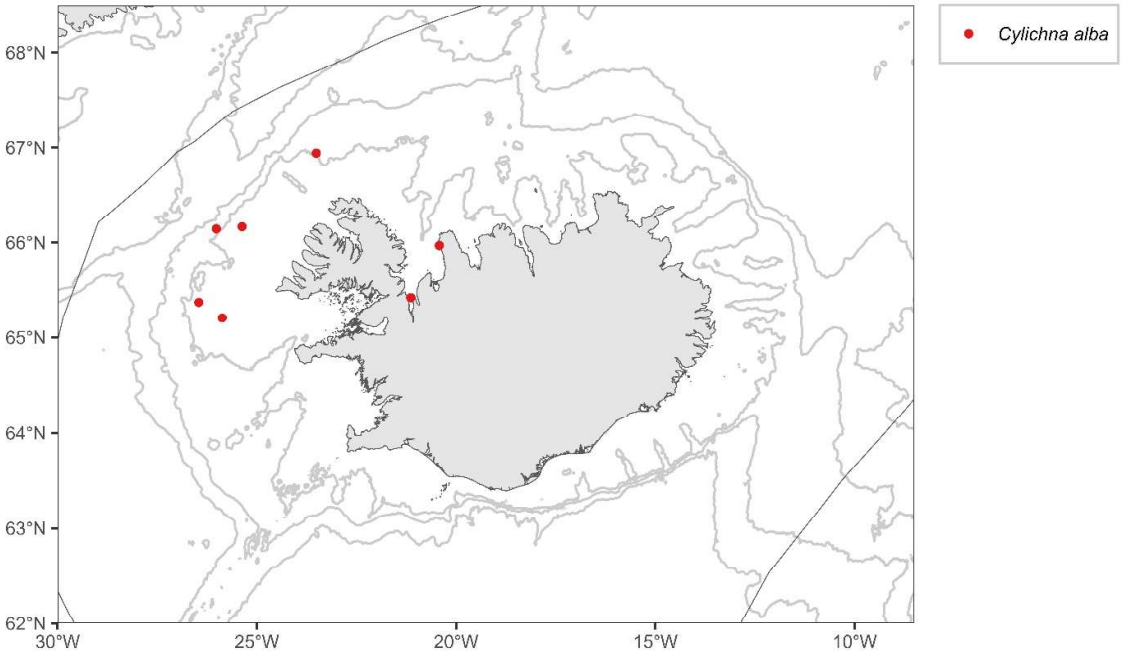
Neogastropoda - Raphitomidae



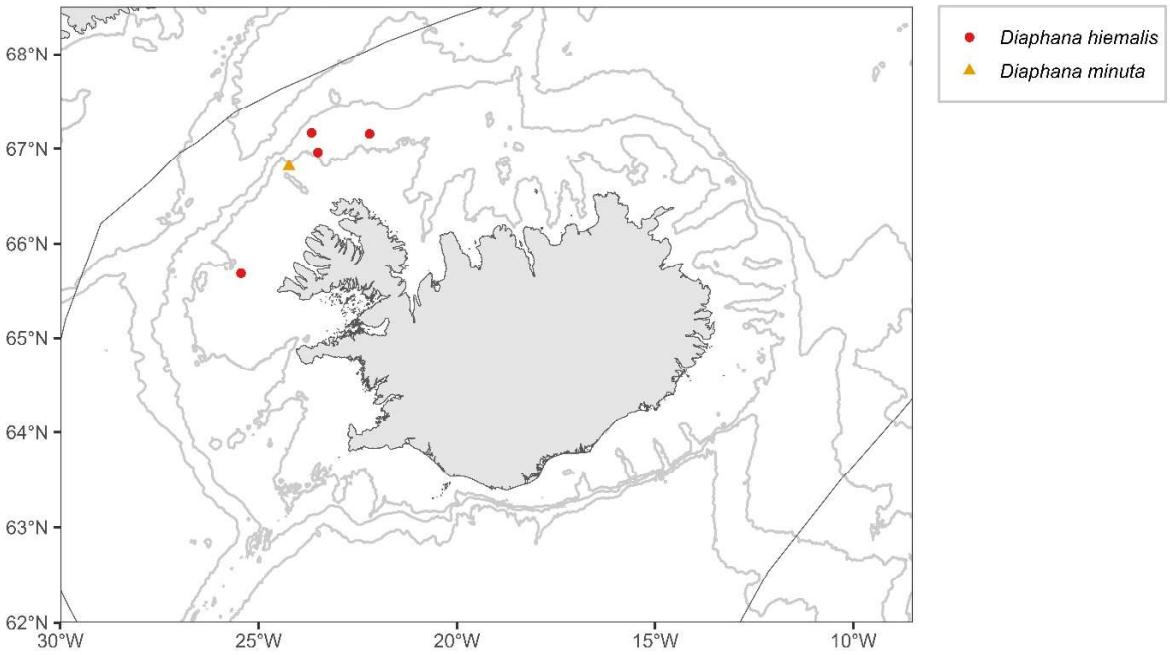
Polypulmonata - Pyramidellidae



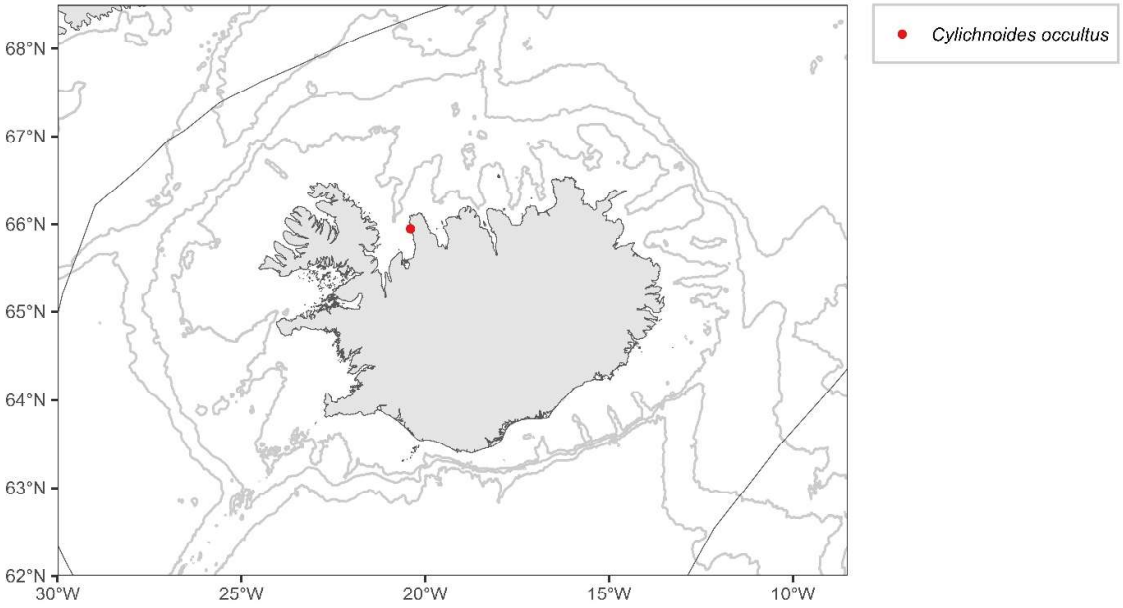
Cephalaspidea - Cylichnidae



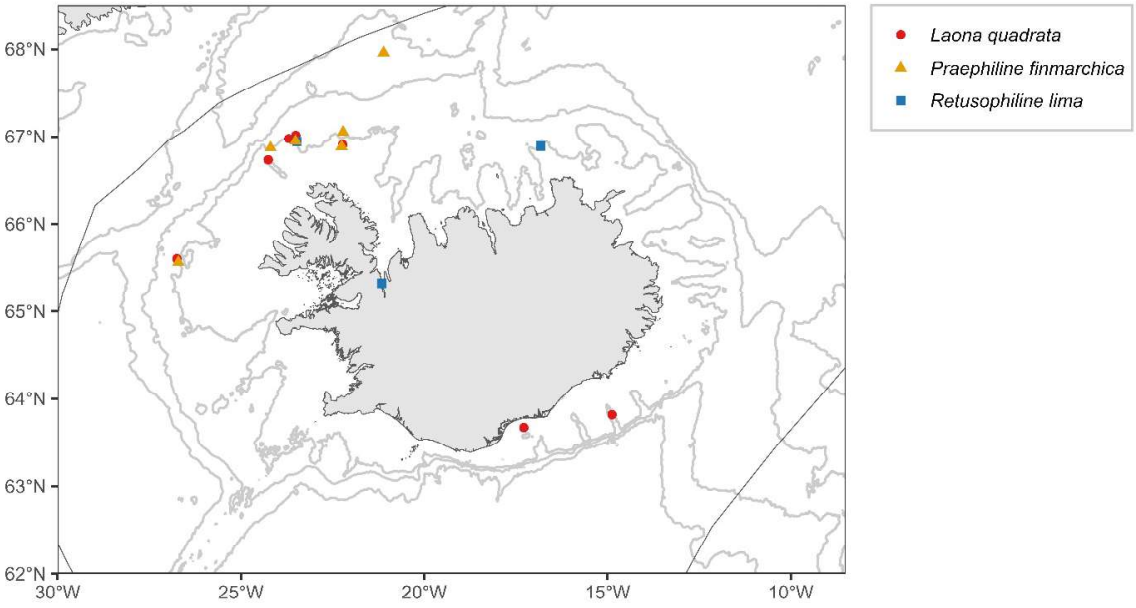
Cephalaspidea - Diaphanidae



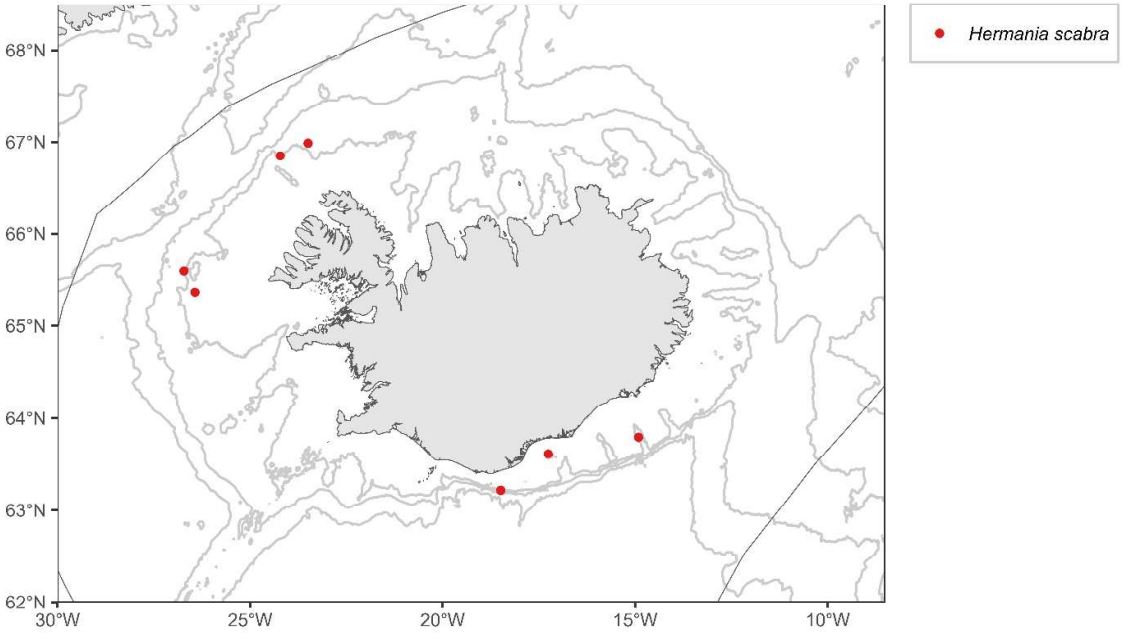
Cephalaspidea - Eoscaphandridae



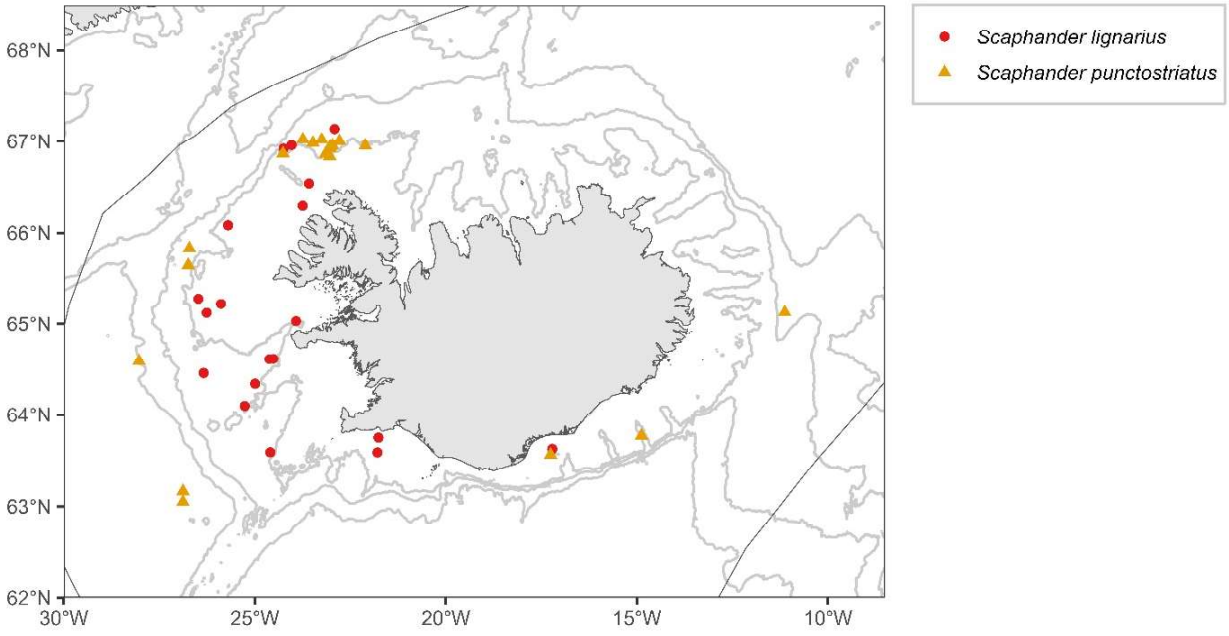
Cephalaspidea - Laonidae



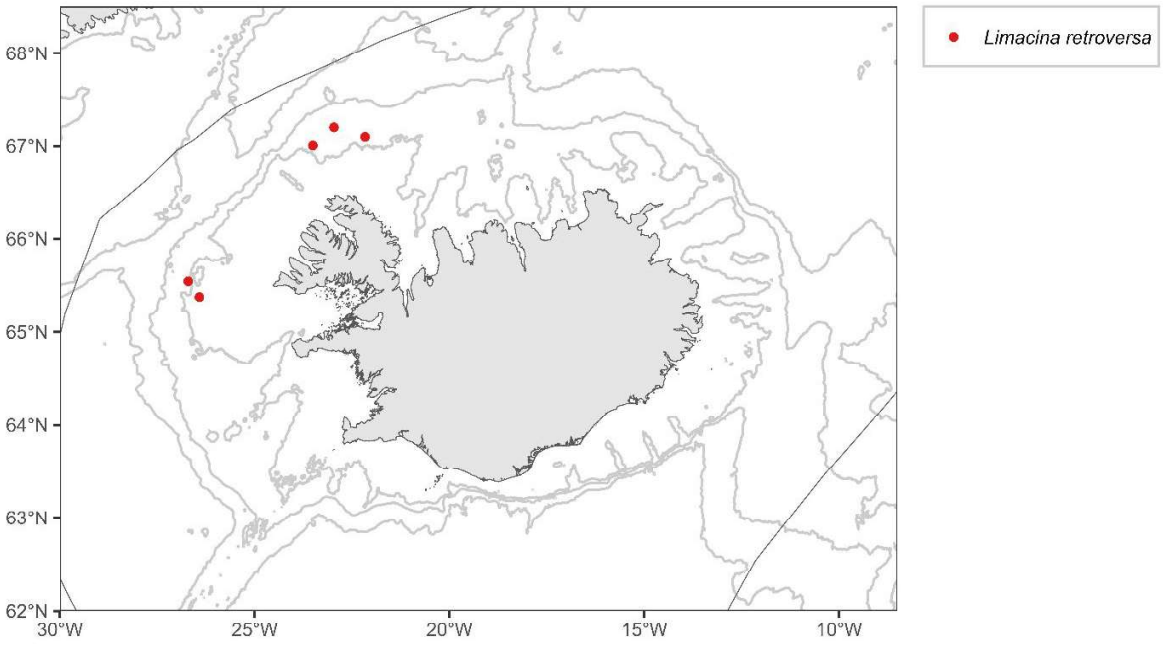
Cephalaspidea - Philinidae



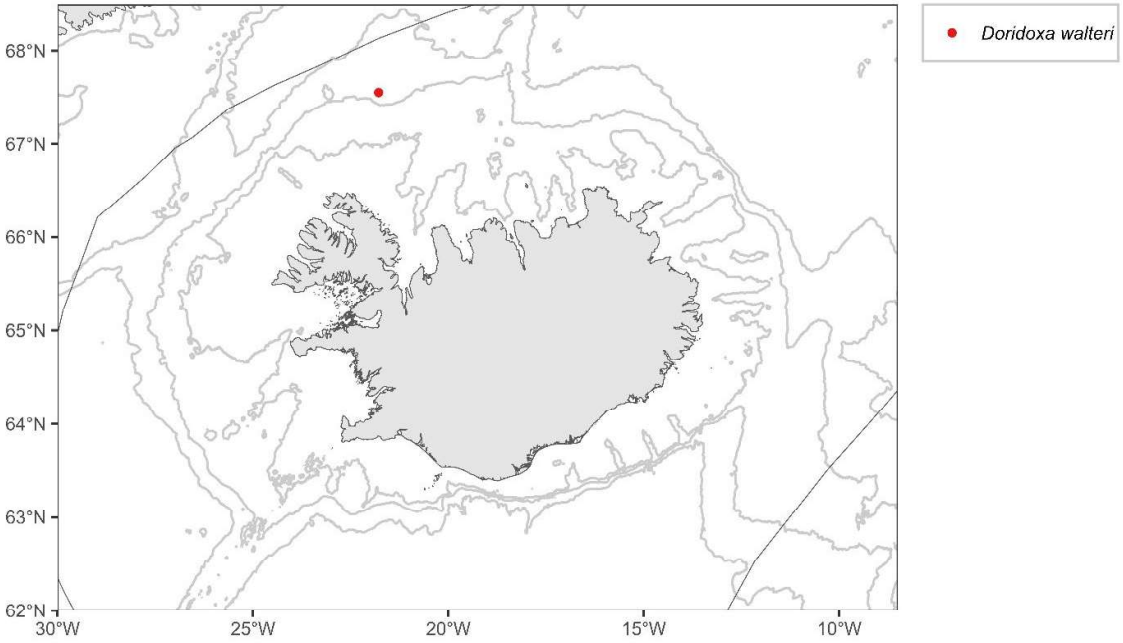
Cephalaspidea - Scaphandridae



Pteropoda - Limacinidae

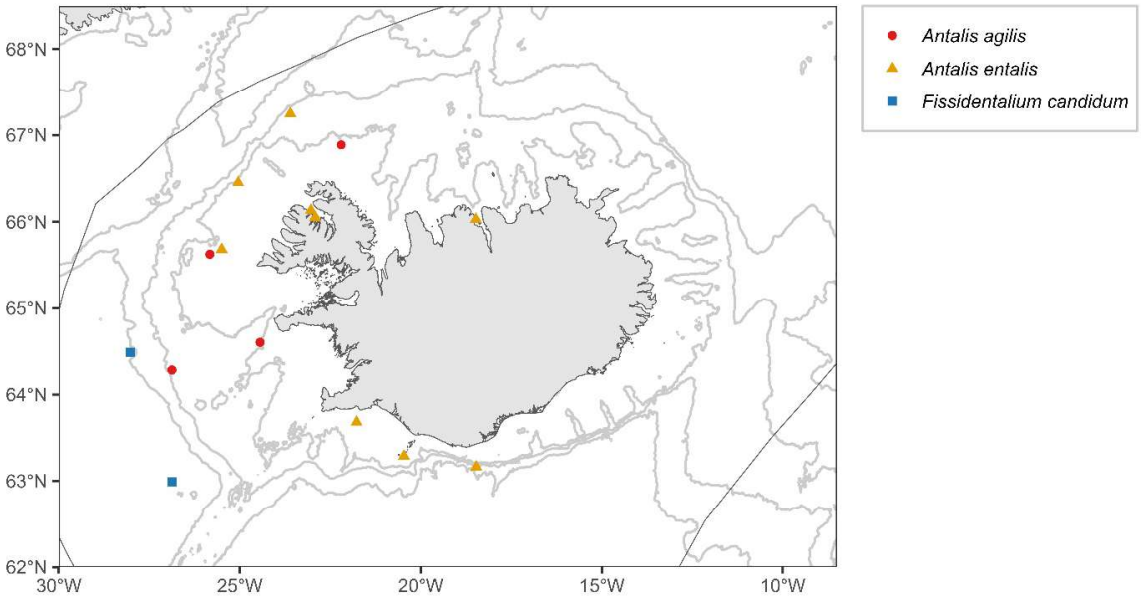


Nudibranchia - Doridoxidae

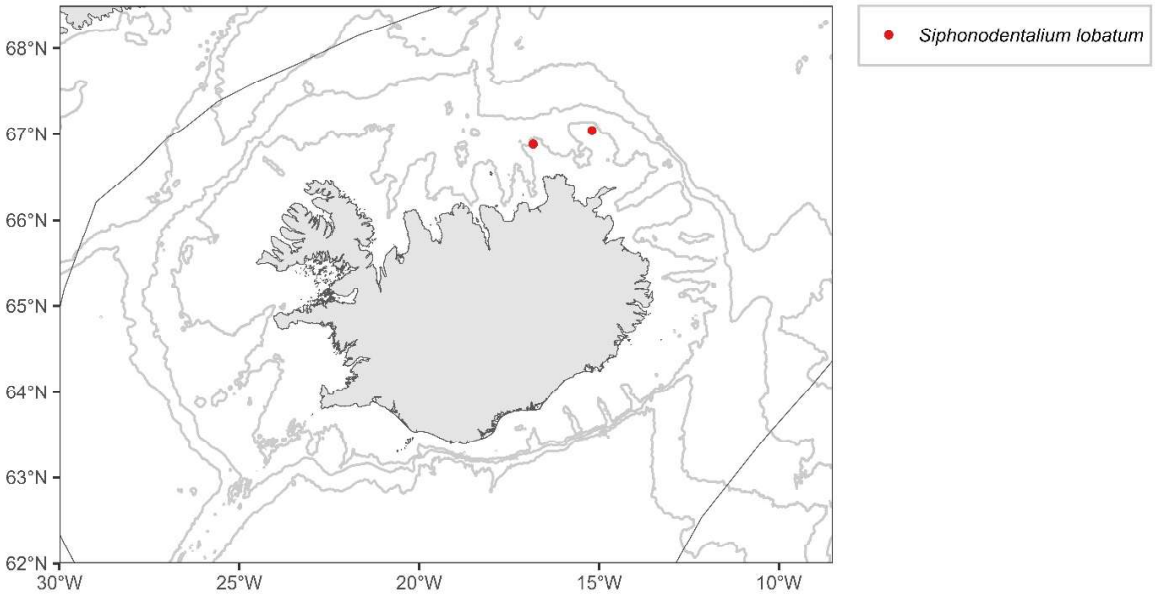


Scaphopoda

Dentaliida - Dentaliidae

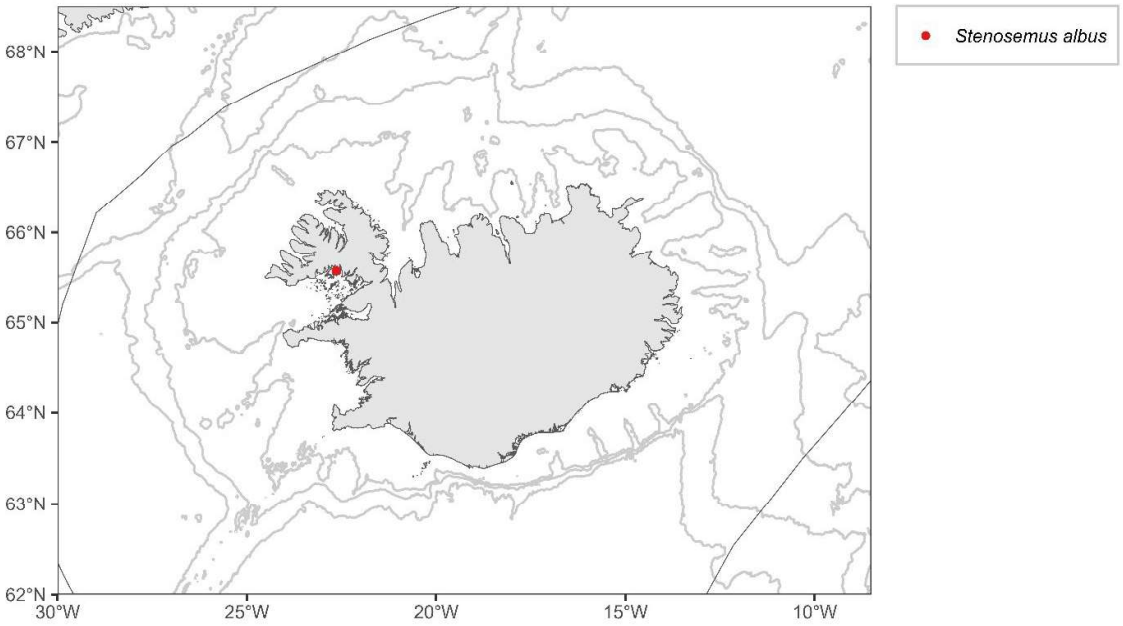


Gadilida - Gadilidae

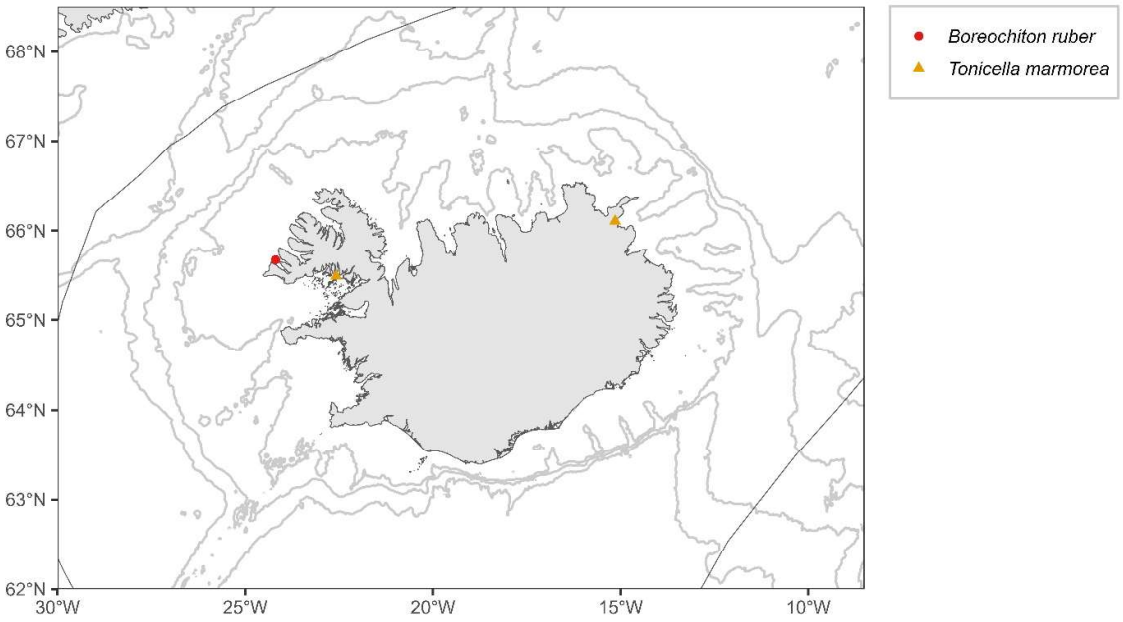


Polyplacophora

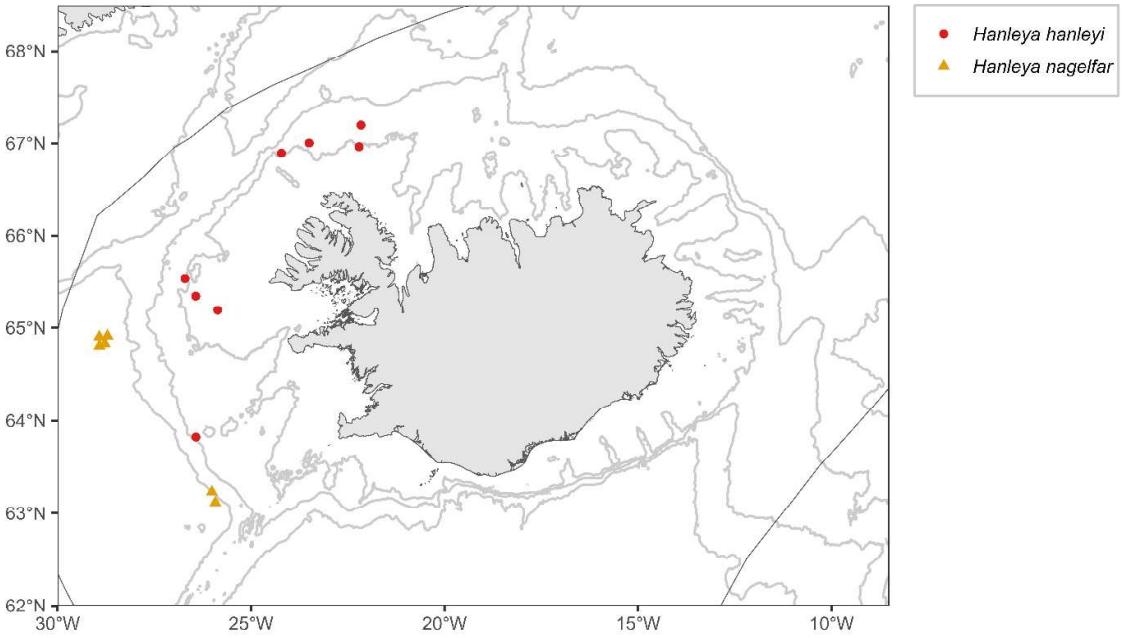
Chitonida - Ischnochitonidae



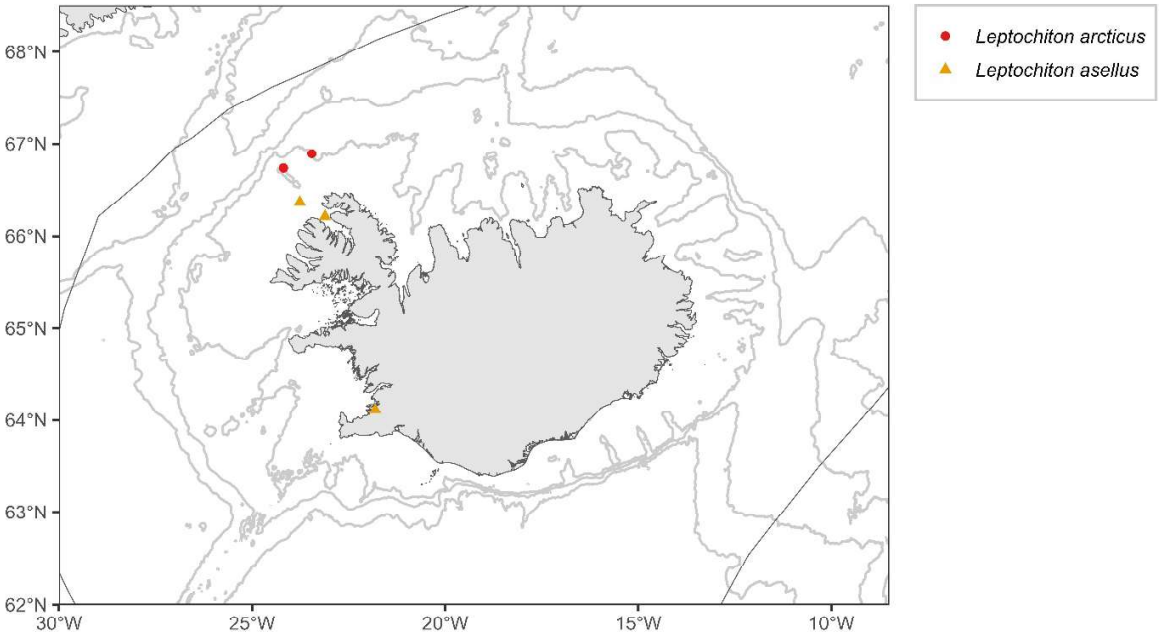
Chitonida - Tonicellidae



Lepidopleurida - Hanleyidae

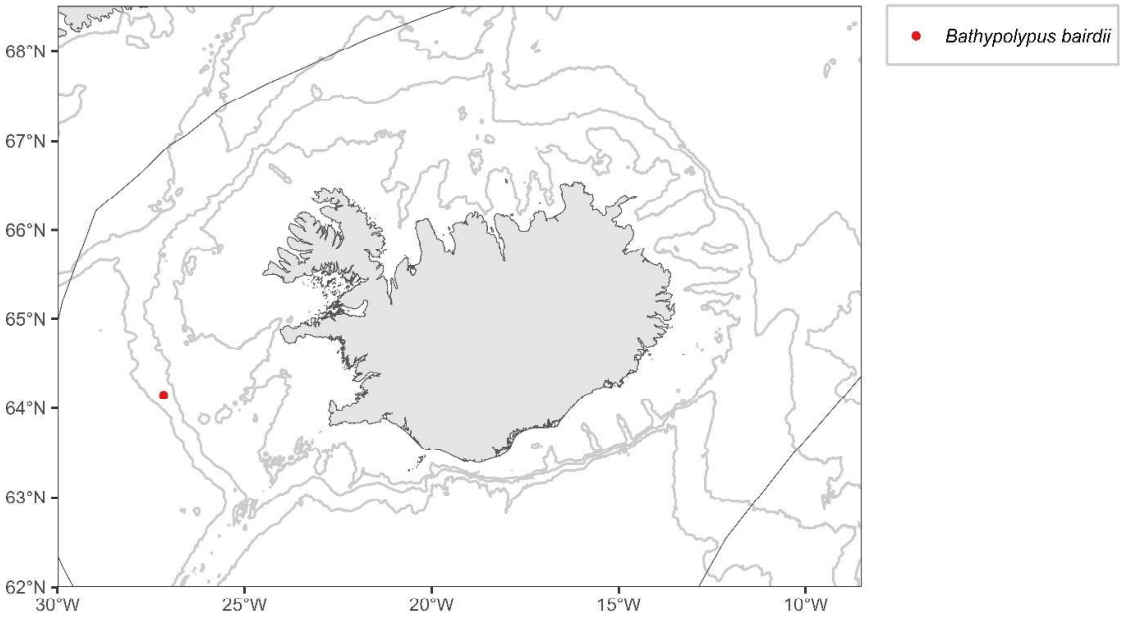


Lepidopleurida - Leptochitonidae

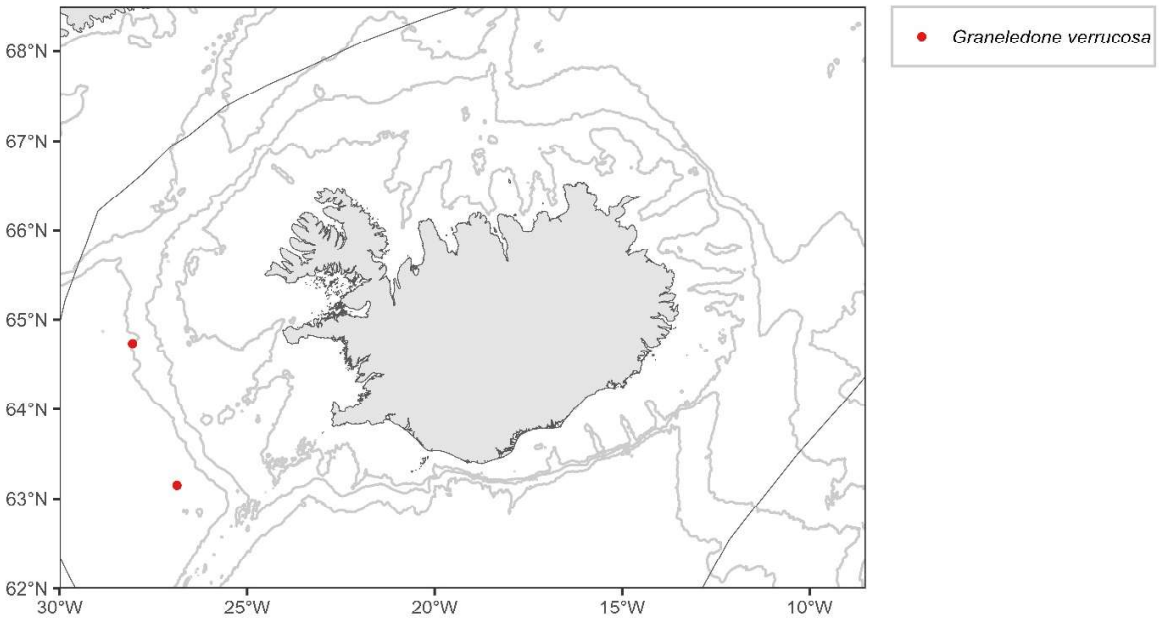


Cephalopoda

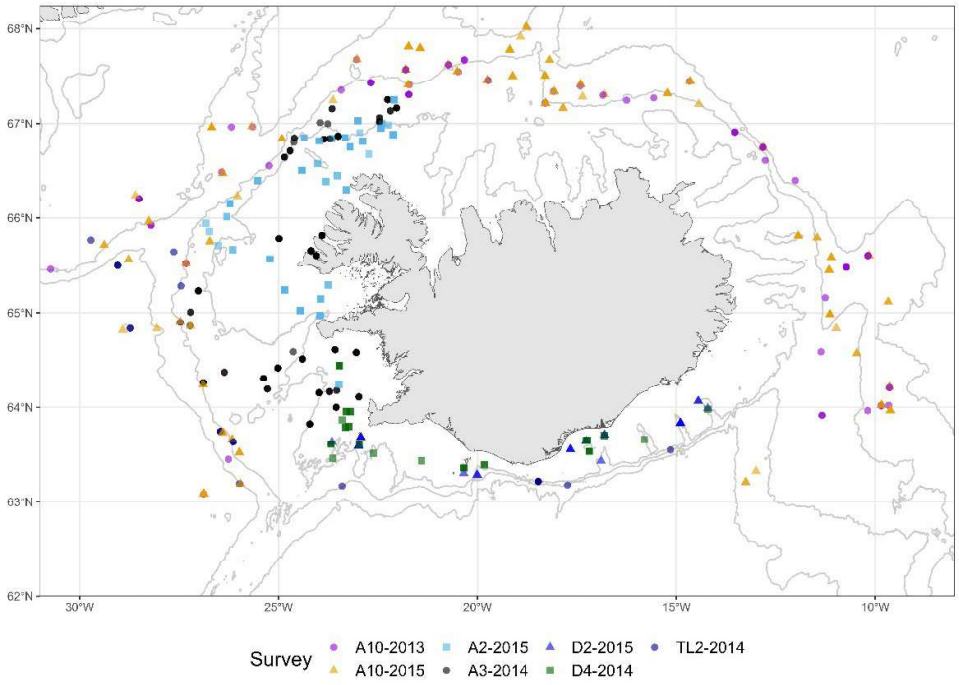
Octopoda - Bathypolypodidae

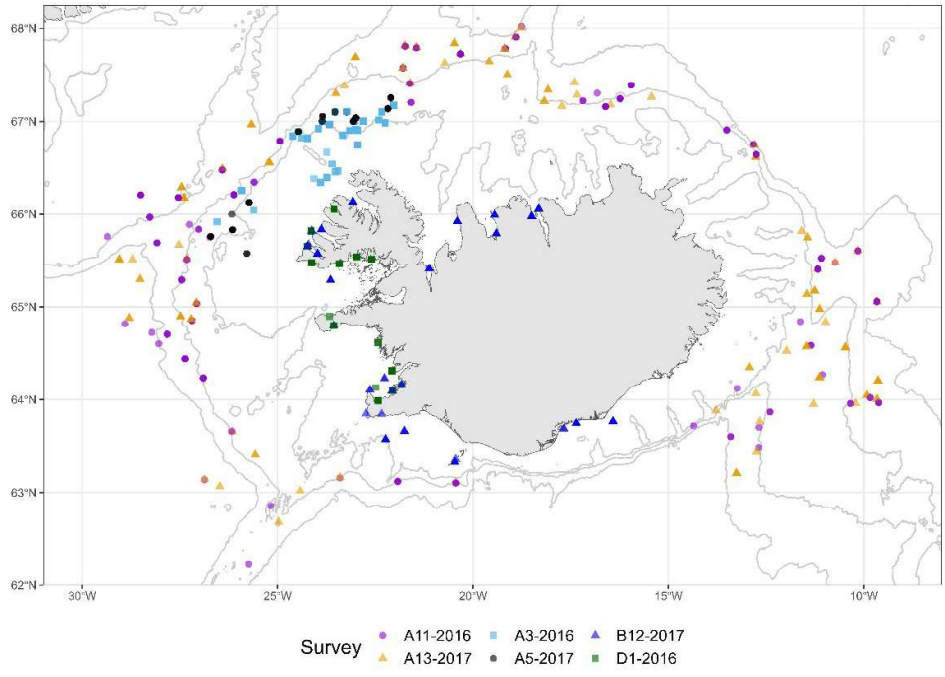


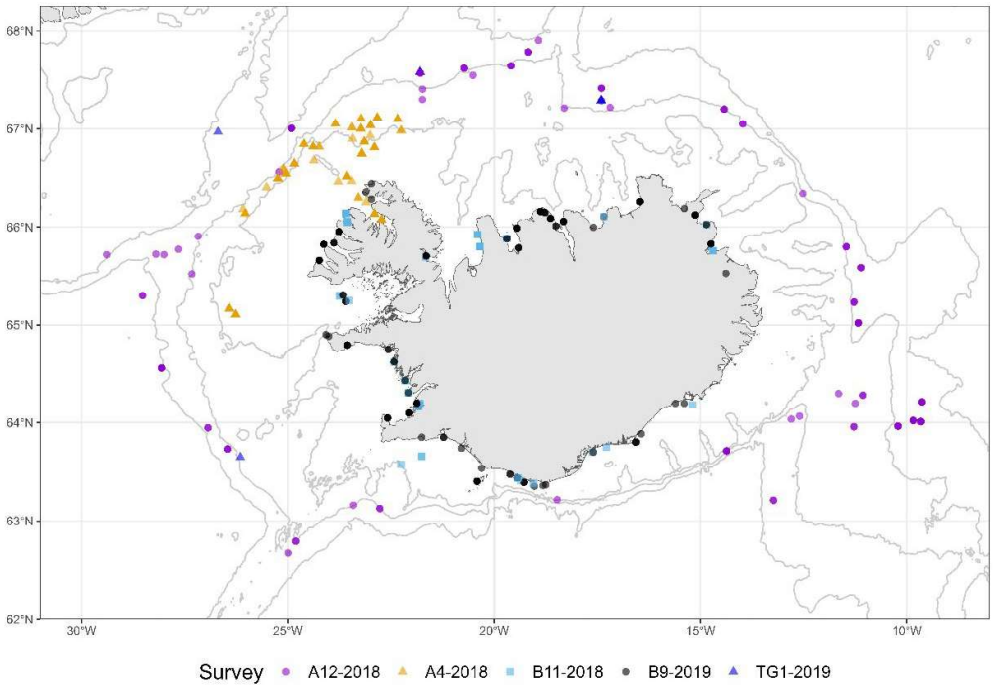
Octopoda - Megaleledonidae

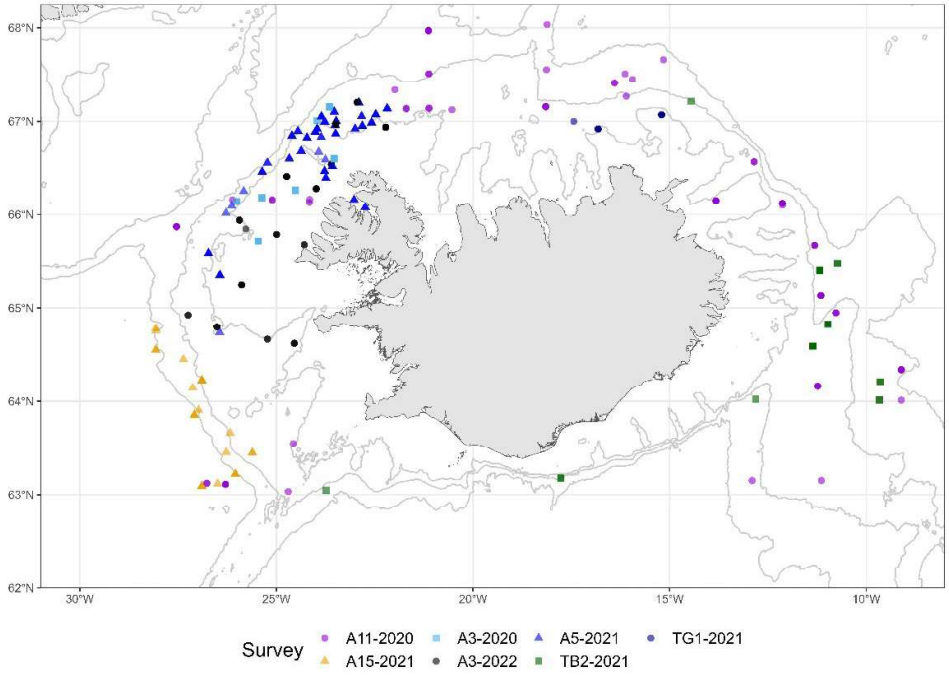


Appendix 4. Surveys and stations where molluscs species were collected in Iceland during 25 groundfish and *Nephrops* surveys in 2013–2022






68°N
67°N
66°N
65°N
64°N
63°N
62°N
30°W
25°W
20°W
15°W
10°W
Survey
A12-2018
A4-2018
B11-2018
B9-2019
TG1-2019


68°N
67°N
66°N
65°N
64°N
63°N
62°N
30°W
25°W
20°W
15°W
10°W
Survey
A11-2020
A3-2020
A5-2021
TG1-2021
A15-2021
A3-2022
TB2-2021

Coordinates of stations for molluscs illustrated

Cruise	Station	Latitude Set N°		Longitude Set W°	Latitude Hauled N°		Longitude Hauled W°	Depth set		Depth hauled
TD1-1985	**91**	651715	-	125090	651708	-	130000	153	-	193
B11-2006	**611**	645701	-	265497	645804	-	265485	278	-	269
A10-2013	**538**	630523	-	265302	630822	-	265251	1330	-	1312
A10-2013	**568**	653124	-	271955	653403	-	271691	489	-	477
A10-2013	**593**	661228	-	283035	661418	-	283604	315	-	304
A10-2013	**601**	665779	-	264115	670079	-	264071	513	-	464
A10-2013	**602**	665800	-	253939	665764	-	253189	901	-	970
A10-2013	**618**	674033	-	201973	674333	-	201921	563	-	671
A10-2013	**646**	665464	-	133194	665464	-	132446	529	-	578
A10-2013	**664**	650961	-	111538	651255	-	111632	575	-	590
A3-2014	**6**	640660	-	225890	640260	-	225960	70	-	80
A3-2014	**11**	640006	-	233314	635908	-	234200	127	-	129
A3-2014	**14**	634947	-	241265	634561	-	241170	161	-	147
A3-2014	**23**	641568	-	265358	641905	-	265818	375	-	405
A3-2014	**27**	640921	-	235886	641260	-	235401	266	-	296
A3-2014	**28**	640994	-	234338	641347	-	233921	118	-	107
A3-2014	**34**	643479	-	230272	643102	-	230590	69	-	95
A3-2014	**35**	643658	-	233480	643514	-	234345	115	-	124
A3-2014	**39**	643063	-	242405	642892	-	243228	205	-	154
A3-2014	**40**	642503	-	250103	642101	-	250149	210	-	215
A3-2014	**47**	641159	-	251688	641546	-	251462	249	-	251
A3-2014	**52**	650050	-	271262	650248	-	270451	311	-	240
A3-2014	**53**	651390	-	270090	651193	-	270166	229	-	234
A3-2014	**67**	671504	-	221547	671498	-	220519	344	-	374
A3-2014	**77**	665198	-	233023	665041	-	233978	184	-	174
A3-2014	**79**	665007	-	235161	665328	-	235746	151	-	165
A3-2014	**90**	654904	-	235445	655225	-	240023	54	-	45
A3-2014	**91**	653623	-	240304	653920	-	240920	48	-	47
A3-2014	**92**	653940	-	241100	654230	-	240750	44	-	17
A3-2014	**95**	654710	-	245937	654310	-	245952	63	-	69
D4-2014	**14**	633957	-	154841	634013	-	154698	194	-	193
D4-2014	**30**	634236	-	164840	633989	-	165926	146	-	152
D4-2014	**33**	632366	-	194975	632138	-	200115	151	-	178
D4-2014	**38**	632619	-	212446	632886	-	213365	126	-	125
D4-2014	**43**	633066	-	223731	633272	-	224624	224	-	198
D4-2014	**46**	634793	-	231432	634622	-	232806	145	-	152
D4-2014	**47**	634735	-	231869	635234	-	231807	148	-	135
D4-2014	**50**	635719	-	231191	635170	-	231723	116	-	136
D4-2014	**52**	633671	-	234084	633257	-	234737	188	-	175
D4-2014	**53**	632756	-	233830	632277	-	234215	188	-	211

TL2-2014	**7**	631306	-	182820	631329	-	183499	196	-	166
TL2-2014	**43**	634477	-	262772	634742	-	263095	676	-	596
TL2-2014	**67**	645007	-	284371	645264	-	284745	1098	-	1046
A2-2015	**53**	650154	-	242681	650233	-	243592	112	-	107
A2-2015	**59**	654004	-	260928	653922	-	261867	155	-	190
A2-2015	**82**	665291	-	220676	665600	-	221310	147	-	160
A2-2015	**90**	671506	-	220554	671503	-	221580	371	-	341
A2-2015	**117**	662326	-	234847	662038	-	235441	112	-	112
A2-2015	**124**	661801	-	231782	661596	-	230942	63	-	69
A10-2015	**550**	630540	-	265270	630840	-	265255	1306	-	1281
A10-2015	**554**	634403	-	262726	634692	-	262909	678	-	520
A10-2015	**566**	644900	-	285495	645086	-	285376	975	-	949
A10-2015	**586**	653366	-	284603	653449	-	285139	1123	-	1099
A10-2015	**588**	654295	-	292306	654584	-	292137	409	-	372
A10-2015	**601**	662860	-	262426	663141	-	262679	595	-	560
A10-2015	**605**	665010	-	245505	664731	-	245615	656	-	608
A10-2015	**619**	674879	-	214389	674901	-	213611	737	-	761
A10-2015	**631**	674026	-	181134	673851	-	180642	857	-	945
A10-2015	**669**	643417	-	102803	643161	-	103161	467	-	440
A10-2015	**671**	635808	-	93721	640075	-	93979	712	-	724
D2-2015	**5**	633557	-	225921	634048	-	225775	170	-	142
D2-2015	**6**	634123	-	225593	634495	-	224880	144	-	151
D2-2015	**15**	633848	-	171633	633541	-	171007	152	-	181
A3-2016	**53**	655505	-	263276	655860	-	262828	268	-	273
A3-2016	**68**	662037	-	235429	662341	-	234794	105	-	102
A3-2016	**106**	670001	-	224852	670005	-	225859	222	-	242
A3-2016	**107**	670000	-	230271	670003	-	231285	248	-	247
A3-2016	**115**	665530	-	235738	665770	-	234943	174	-	177
A3-2016	**116**	665801	-	234041	665796	-	233030	198	-	214
A11-2016	**532**	644236	-	274990	643950	-	275027	880	-	933
A11-2016	**553**	661077	-	273260	661007	-	272536	482	-	479
A11-2016	**554**	661232	-	283080	661477	-	283606	325	-	295
A11-2016	**572**	661255	-	260753	661402	-	260107	440	-	417
A11-2016	**596**	672447	-	213710	672455	-	214480	487	-	492
A11-2016	**602**	674884	-	214420	674907	-	213639	760	-	782
A11-2016	**605**	674386	-	201975	674087	-	201985	704	-	586
A11-2016	**631**	670958	-	163665	671043	-	162920	376	-	392
A11-2016	**632**	671475	-	161420	671600	-	160687	362	-	395
A11-2016	**640**	664504	-	124956	664277	-	124442	945	-	920
A11-2016	**641**	663855	-	124559	663550	-	124579	313	-	304
A11-2016	**681**	635216	-	122411	634943	-	122672	455	-	460
D1-2016	**12**	653076	-	223594	652937	-	223890	13	-	26

D1-2016	**13**	653228	-	225883	653131	-	230288	13	-	26
D1-2016	**15**	654910	-	240869	655119	-	240647	23	-	45
D1-2016	**17**	660315	-	233345	660410	-	233798	20	-	20
D1-2016	**20**	652842	-	240807	652732	-	240413	21	-	21
D1-2016	**21**	652759	-	232547	652791	-	232576	12	-	9
D1-2016	**28**	640605	-	220360	640469	-	220579	16	-	28
A5-2017	**44**	654991	-	260921	654859	-	260011	240	-	212
A5-2017	**71**	671499	-	220623	671498	-	221646	372	-	346
A5-2017	**75**	670214	-	230005	670615	-	230004	239	-	254
A13-2017	**484**	650259	-	270478	650072	-	271030	247	-	292
A13-2017	**493**	645285	-	284788	645030	-	284431	1034	-	1060
A13-2017	**509**	661024	-	272376	661050	-	273094	483	-	483
A13-2017	**514**	653051	-	290303	652794	-	285920	1175	-	1237
A13-2017	**563**	675038	-	202854	674785	-	202469	870	-	817
A13-2017	**578**	672500	-	172429	672795	-	172372	906	-	942
A13-2017	**617**	654917	-	113540	655211	-	113425	301	-	349
A13-2017	**634**	641470	-	110807	641691	-	110356	338	-	330
A13-2017	**657**	640399	-	124591	640134	-	124902	577	-	610
B12-2017	**841**	640988	-	214976	641177	-	215138	11	-	25
B12-2017	**849**	640638	-	223838	640656	-	223887	41	-	42
B12-2017	**852**	635070	-	222027	635001	-	222027	17	-	34
B12-2017	**868**	634479	-	172147	634520	-	171683	51	-	49
B12-2017	**914**	631976	-	202791	632003	-	202779	75	-	74
B12-2017	**942**	641390	-	221600	641399	-	221680	34	-	NA
B12-2017	**953**	644786	-	233364	644723	-	233542	12	-	12
B12-2017	**977**	653431	-	235873	653474	-	240146	50	-	50
B12-2017	**978**	653919	-	241409	654135	-	241499	24	-	28
B12-2017	**982**	655003	-	235279	655199	-	235519	64	-	56
B12-2017	**987**	660753	-	230451	660854	-	230707	46	-	49
B12-2017	**994**	652436	-	210726	652222	-	210695	43	-	39
B12-2017	**995**	655533	-	202399	655750	-	202496	31	-	29
B12-2017	**1003**	655861	-	183005	660057	-	183023	22	-	21
A4-2018	**70**	670602	-	222009	670809	-	221136	230	-	228
A4-2018	**75**	670218	-	225982	670610	-	225997	236	-	243
A4-2018	**76**	670609	-	231363	670409	-	232242	246	-	246
A4-2018	**90**	663083	-	233422	662714	-	233139	116	-	127
A4-2018	**100**	660449	-	224358	660698	-	225120	113	-	118
A4-2018	**117**	665066	-	243662	664748	-	244255	194	-	237
A4-2018	**125**	663270	-	250279	662984	-	250967	222	-	187
A4-2018	**132**	660827	-	260195	660547	-	260871	272	-	276
A12-2018	**515**	635697	-	265592	635423	-	265857	833	-	960
A12-2018	**534**	643362	-	280346	643654	-	280274	987	-	986
A12-2018	**543**	651767	-	283110	651941	-	282873	1150	-	1148

A12-2018	**600**	673436	-	214756	673733	-	214779	618 - 639
A12-2018	**651**	662046	-	123098	661798	-	122704	548 - 500
A12-2018	**708**	641278	-	93833	640988	-	93978	808 - 826
A12-2018	**716**	631272	-	131400	631566	-	131519	756 - 745
A12-2018	**727**	634302	-	142214	634112	-	142728	408 - 415
A12-2018	**752**	630769	-	224621	631021	-	224965	527 - 470
B11-2018	**847**	642587	-	220933	642422	-	221195	17 - 30
B11-2018	**869**	651750	-	234442	651809	-	233976	59 - 55
B11-2018	**877**	660318	-	233366	660418	-	233812	21 - 20
B9-2019	**645**	641197	-	215248	641193	-	214899	28 - 19
B9-2019	**646**	640591	-	220394	640444	-	220579	15 - 28
B9-2019	**705**	655283	-	194131	655093	-	194006	39 - 31
B9-2019	**711**	660065	-	183015	655870	-	183009	21 - 24
B9-2019	**712**	660346	-	181913	660541	-	181980	38 - 29
B9-2019	**715**	661564	-	162823	661757	-	162920	26 - 23
B9-2019	**719**	654958	-	144489	654806	-	144491	35 - 31
B9-2019	**771**	632369	-	191664	632457	-	192063	42 - 43
B9-2019	**785**	632431	-	202499	632457	-	202532	62 - 66
TG1-2019	**70**	673495	-	214789	673789	-	214785	625 - 645
A3-2020	**90**	663569	-	233200	663752	-	232318	75 - 71
A3-2020	**174**	654286	-	252757	654395	-	251833	184 - 133
A11-2020	**651**	665471	-	132959	665464	-	132201	551 - 601
A11-2020	**654**	662033	-	123090	661781	-	122694	523 - 450
A11-2020	**695**	635439	-	123249	635293	-	123825	507 - 528
A5-2021	**28**	653510	-	264356	653873	-	263986	202 - 204
A5-2021	**45**	670803	-	221093	670613	-	221955	233 - 236
A5-2021	**57**	671175	-	225412	671120	-	224909	241 - 267
A5-2021	**63**	670000	-	232880	670000	-	233902	229 - 217
A5-2021	**73**	665329	-	240055	664938	-	235886	166 - 148
A5-2021	**74**	664946	-	241332	664621	-	241909	170 - 192
A5-2021	**89**	662358	-	234451	662064	-	233810	130 - 147
A15-2021	**449**	631329	-	260266	631128	-	255786	1014 - 1051
A15-2021	**452**	632723	-	261647	633016	-	261774	848 - 848
A15-2021	**458**	640854	-	270763	641056	-	271255	768 - 783
A15-2021	**460**	642692	-	272176	642989	-	272245	719 - 697
A15-2021	**467**	643295	-	280393	643584	-	280287	1013 - 981
A15-2021	**469**	644662	-	280389	644861	-	280368	1077 - 1074
A15-2021	**470**	644517	-	280374	644565	-	281028	1039 - 1071
TB2-2021	**86**	643532	-	112163	643440	-	112845	430 - 443
TG1-2021	**129**	670411	-	151231	670006	-	151215	187 - 164

A3-2022	**78**	671192	-	225669	671097	-	224670	250	-	270
A3-2022	**125**	665803	-	232954	665801	-	233962	220	-	202
A3-2022	**189**	651488	-	255286	651261	-	260062	136	-	142
A11-2022	**427**	654662	-	293337	654784	-	293331	306	-	305
A11-2022	**439**	653000	-	290218	652744	-	285851	1205	-	1273
A11-2022	**440**	652044	-	283952	651896	-	283334	1252	-	1176

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