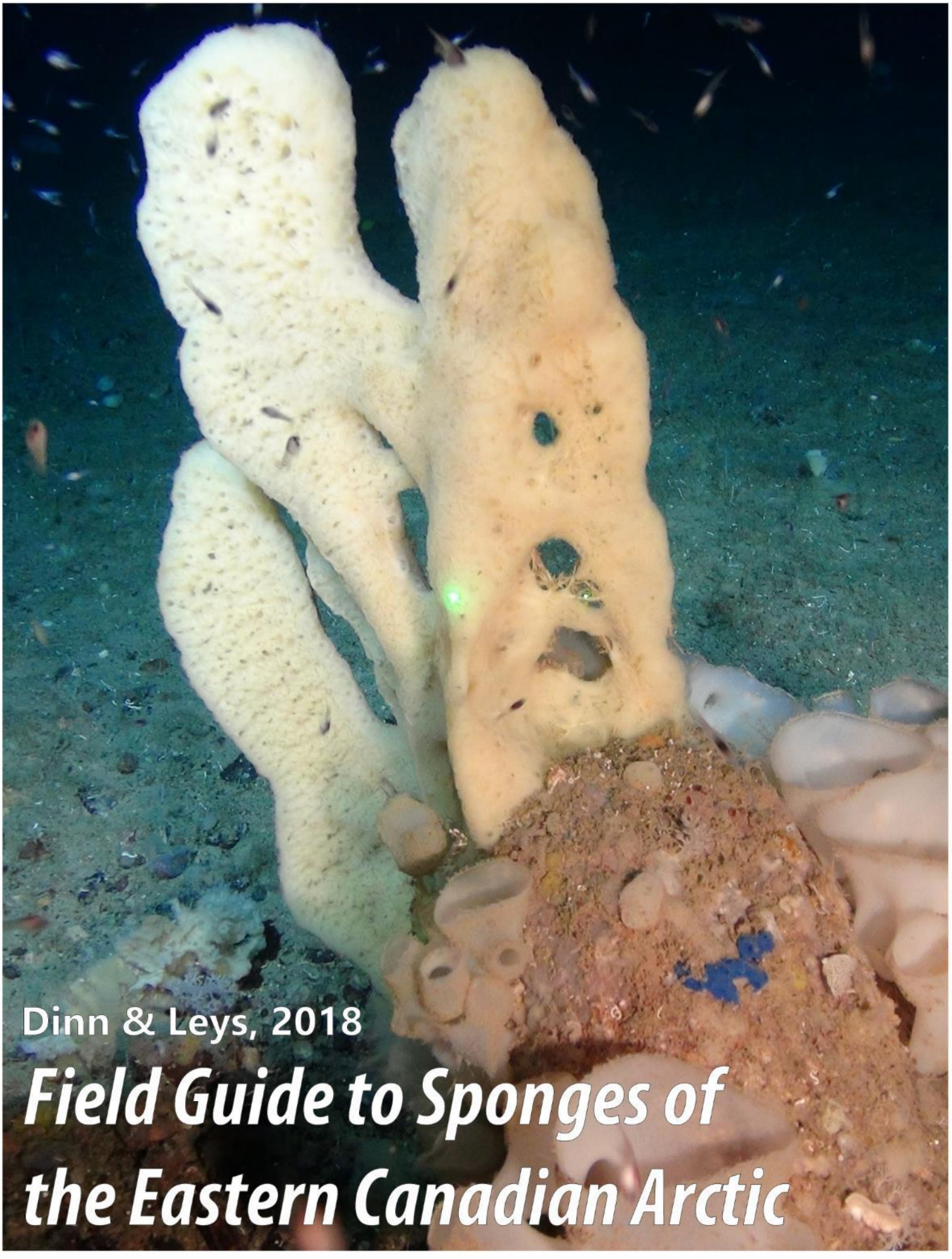

Dinn & Leys, 2018

Field Guide to Sponges of the Eastern Canadian Arctic

Field Guide to Sponges of the Eastern Canadian Arctic.

A field and laboratory identification guide

Ver. 1.0

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UNIVERSITY OF ALBERTA

ArcticNet

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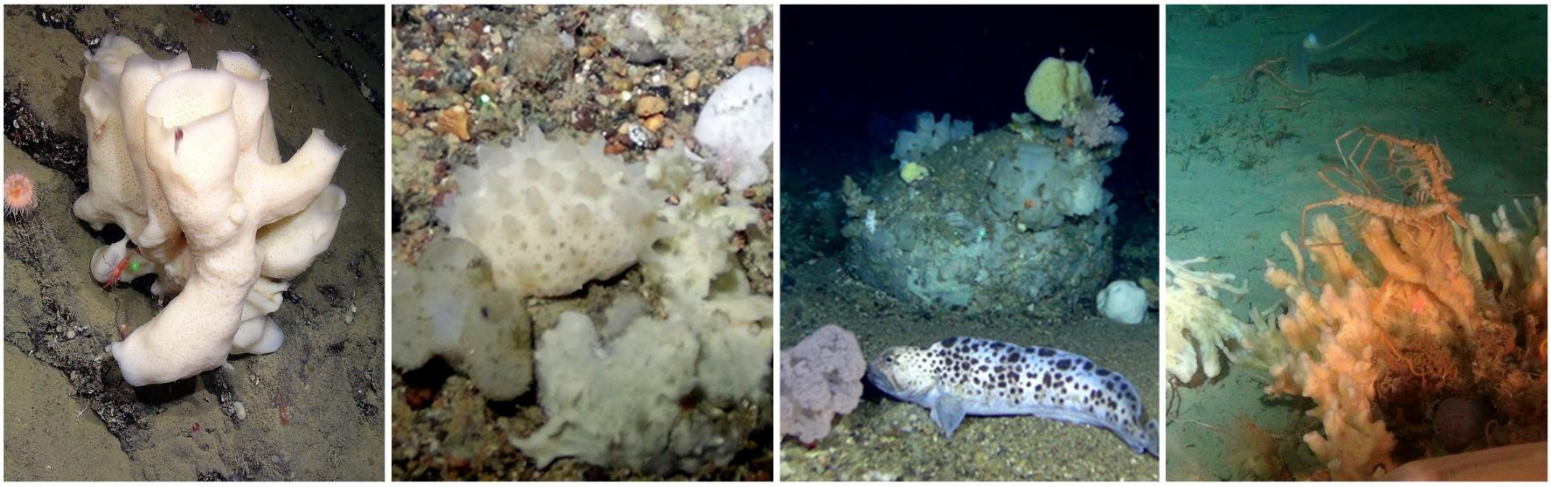
Preface

It is **essential** to employ microscopy to identify sponges.
Failure to assess the spicule complement of a specimen can lead to the misidentification of species that are often cryptic.
Do not rely on gross morphology alone to assign lower taxonomic rankings as sponge body form may vary even within a species.

This guide is a working document. The identifications and descriptions were made to the best of the ability of the authors, using both morphology and molecular analyses. The information herein should therefore be considered provisional and may be subject to correction.



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Introduction

There is generally an inverse relationship between our knowledge of the diversity of marine species and the depth and remoteness of a region (Archambault *et al.*, 2010). The vast Canadian Arctic is extremely remote. The deep basins and extent of the continental shelf in the Arctic and Subarctic harbour a wide range of plankton, fish, mammal, and bird species which are important economic resources, particularly for inhabitants of northern regions (Darnis *et al.*, 2012), but the true biodiversity of the Canadian Arctic waters remains relatively unknown. Many benthic species are overlooked in biodiversity studies (Archambault *et al.*, 2010; Piepenburg *et al.*, 2010; Darnis *et al.*, 2012; Roy *et al.*, 2015) and sponges (phylum Porifera) in particular are poorly known in the Canadian North. The number of sponge species known from eastern Canadian waters is an order of magnitude lower than species known from similar latitudes globally (Ackers *et al.*, 1992; Sara *et al.*, 1992; Picton & Goodwin, 2007; Downey *et al.*, 2012; Van Soest *et al.*, 2012; Lehnert & Stone, 2016).

Canadian oceans contain approximately 7% of the world's 232 global marine ecoregions (Spalding *et al.*, 2007; Archambault *et al.*, 2010). Of the 17 marine ecoregions surrounding Canada, three occur in the eastern Canadian Arctic and Subarctic: Northern Labrador, Baffin Bay/Davis Strait and Lancaster Sound (Spalding *et al.*, 2007). These ecoregions represent a considerable portion of the Canadian continental shelf, thus knowledge of the marine fauna inhabiting the area is important for managing human activities in the north.

The goal of this guide is to derive a better understanding of the biodiversity of sponges across the eastern Canadian Arctic. Specimens were collected during research cruises aboard the Canadian Coast Guard Ship (*CCGS*) *Amundsen* in October 2015, July 2016 and July 2017. Collection sites were selected based on reported areas of high sponge abundance (Kenchington *et al.*, 2010; Kenchington *et al.*, 2011; Knudby *et al.*, 2013) and particular emphasis was given to deep, hard-bottom habitats where collection of benthic organisms is not possible using traditional sampling methods such as sediment grabs and cores.

Using this guide

Sponges in this guide are arranged by taxonomic group. Upon collection, sponges may be sorted first, generally, by overall morphology, e.g. massive, encrusting, cushion-shaped, fan-shaped, etc., and also by texture since texture reflects a character of the underlying tissue (the choanosome) and the spicule skeleton. Sometimes colour is important, especially if colour changes in air which it often does because the colour of the sponge reflects its chemistry and chemicals present in sponges are also characteristic of a particular taxon.

Care must be taken not to assign a species name to a sponge based on outer morphology alone. Many sponges are cryptic and may have a gross morphology similar to another species. For example, *Polymastia* specimens are often cushion shaped with many papillae, but the outer morphology and spicule sizes differ slightly between species. It is necessary to study the spicules to determine exact species affinities.

In order to quickly look at spicules in the field, a small (2-5 mm^2) portion of the sponge can be placed on a microscope slide in 1-2 drops of household bleach. After about 5 minutes a glass coverslip can be placed on top to look at the spicules with a compound microscope. These slides are not permanent, but they can be used in conjunction with this guide to help place the more common species into groups. How to prepare a permanent slide is outlined in the methods section of the guide. For the smallest spicules - microscleres - a high-power objective is required (200-400x magnification).

Users of this guide should scan through the pages of descriptions to see if the specimen they have found, in addition to having similar gross morphological features, shares similar spicules with any that are described herein. It may finally be important to study the range of sizes, shapes, and positions in the tissue of similar spicules in order to narrow the specimen to genus and species.

Care must be taken when collecting specimens. Many sponges are small and encrusting and may easily be overlooked in large trawl catches. Where possible photographs of each specimen should be taken, and a piece preserved in ethanol or frozen for identification in the lab.

Methods

Collections were made using a remotely operated submersible (ROV; Sub-Atlantic SuperMohawk) equipped with SubC Imaging 1Cam Alpha HD Colour Zoom camera and two sampling arms, an Agassiz trawl (1.5 m opening, 40 mm net mesh size, with a 5 mm cod end liner towed for 3 minutes at 1.5 knots), and a box core (BX 650 MK III 50 cm x 50 cm, maximum penetration depth 60 cm). Sponges were photographed on-board using a Lumix GF7 camera using a ruler for scale. Sponges collected by ROV were photographed *in situ*. An initial description of each specimen included body form, size, colour, consistency, surface texture, and where possible the habitat it was collected in and its distribution as described in the World Porifera Database were noted.

Specimens were either preserved in 95% ethanol or frozen and in both cases then transported to the University of Alberta. Collection information was recorded in the Polar Data Catalogue (https://www.polardata.ca/ CCIN: 12754). At the University of Alberta, sponge spicules were isolated from 1 cm^2 pieces that included outer and inner regions of the sponge body, called the cortex and choanosome respectively. Pieces of sponge were placed in undiluted household bleach in a Petri or multiwell dish overnight to remove tissue, rinsed four times in distilled water allowing spicules to settle for 15 minutes between rinses, and cleaned in two washes of 95% ethanol. Cleaned spicules were pipetted out from the bottom of the dish with a wide-bore pipette and dried on glass slides, mounted in DPX mounting medium (Sigma-Aldrich, St. Louis, MO) with a coverslip, and imaged with a Zeiss Axioskop2 Plus compound microscope and an Olympus SZX12 stereomicroscope with a QImaging QiCam or Retiga 2000R camera using EMPIX Northern Eclipse v8 software. Thick sections 100-200µm thick that included the cortex or outer surface of the sponge were made using a razor blade. Sections were cleared in toluene for at least 24 hours and mounted in DPX or Canada Balsam (Sigma-Aldrich, St. Louis, USA). For scanning electron microscopy (SEM), cleaned spicules were placed on metal stubs with carbon tape, coated with a gold/palladium mix and viewed with a Phillips XL30 SEM, Zeiss Sigma 300 VP, or Hitachi TM3000 SEM. Spicule measurements (N=30, unless otherwise noted) were made with ImageJ 1.51 and are reported as mean and range.

Voucher specimens were deposited at the Canadian Museum of Nature (CMN) Ottawa, Canada. The World Porifera Database was used as the taxonomic authority and for reference of species distributions (Van Soest *et al.*, 2018).

Spicule forms

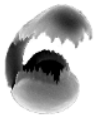
Ala – spatulate structures on the ends of chela — see ansiochela, isochela

Anatriaene – a triaene with recurved clads pointing backwards

Anisochela – a chela with unequal ends

Aster – a star-shaped spicule

Bipocillum – modified anisochela with fused ala



Centrotylotic – a tyle or swelling in a central position of the spicule — see sigmaspire

Chela – a microsclere with a recurved shaft and ala at both ends — see anisochela, isochela

Clad – short ray of a triaene — see atriaene, protriaene, dichotriaene

Diact – a spicule with two rays that extend from a central point — see oxea

Dichotriaene – a triaene where the clads branch into distal rays

Forcep – a spicule which forms a U shape

Isochela – a chela with equal ends

Mycalostyle – a modified style with a narrowing near the rounded end of the spicule

Monact – a spicule consisting of a single ray — see style, tylostyle

Oxea – a spicule with two pointed ends

Oxyaster – an aster microsclere with a small central portion compared to the rays

Protriaene – a triaene with clads facing forwards

Raphide – A thin microsclere that looks like a very small oxea, can form bundles called trichodragmata — see oxea

Rhabd – long ray of a triaene — see anatriaene, protiaene, dichotriaene

Sigma – a C or S shaped microsclere with sharp points

Sigmaspire – a C or S shaped microsclere with spines along the shaft

Sphaerancora – a donut shaped spicule

Sterraster – an aster microsclere where the rays are fused and form rosettes

Strongylaster – an aster microsclere with blunt rays

Strongyle – a spicule with two rounded ends (acanthostyongyle shown)

Style – a megasclere with one round end and one pointed end

Tetractine – a calcareous spicule with four rays

Tornote – a spicule with conical ends

Toxa – a bow shaped spicule

Triactine – a calcareous spicule with three rays

Triaene – a spicule with four rays, one ray (the rhabd) is much longer than the others

see anatriaene, protieaene, dichotiraene

Tylostyle – a style with a swelling at the rounded end

Tylote – a diactinal megasclere with round or ovoid swellings on each end

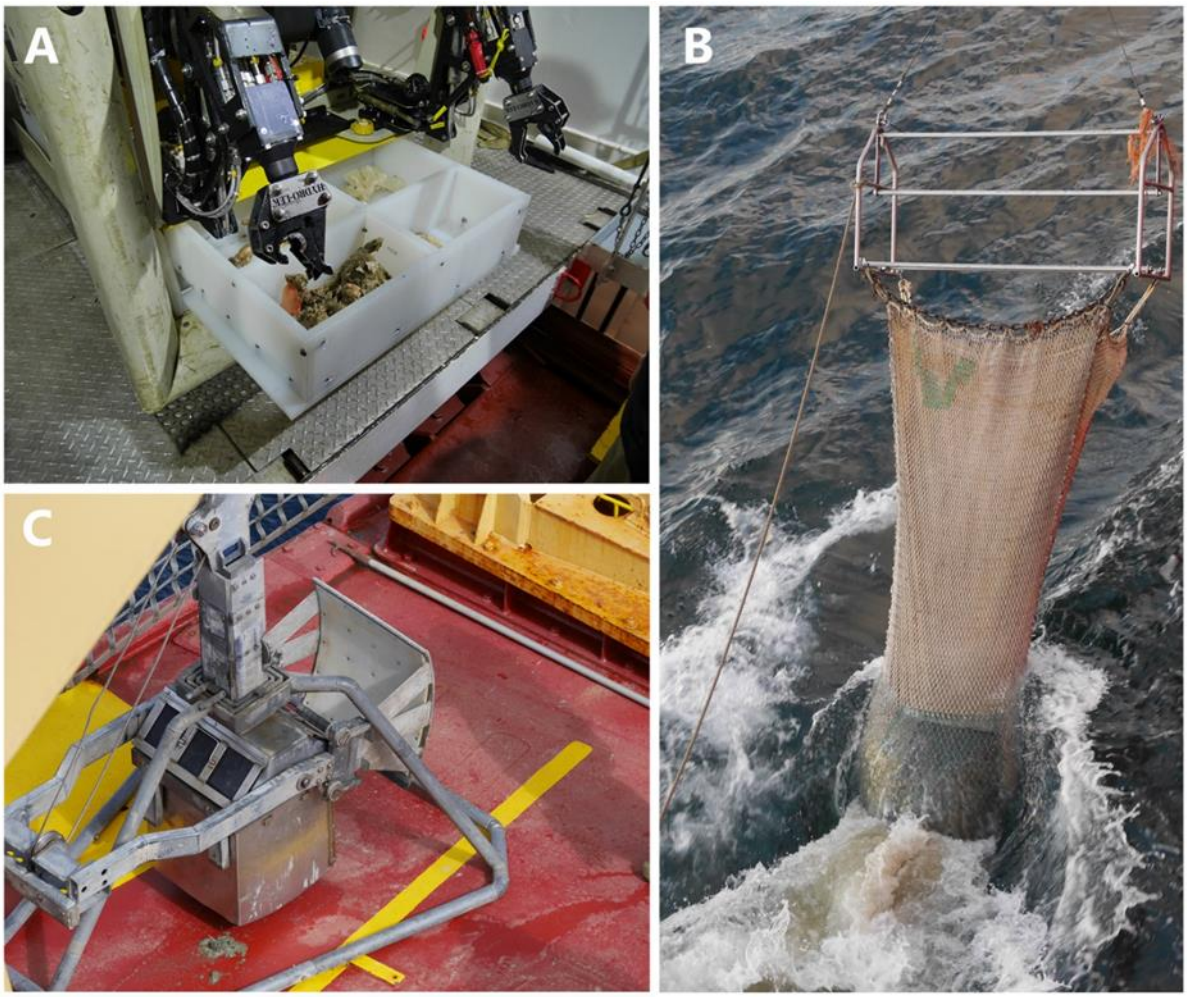
Sponge species described from collections in the Eastern Canadian Arctic on ship cruises in 2015-2017

The study material includes 162 sponge specimens comprising 61 separate species, 19 of which could only be identified to the genus level. In the Northern Labrador marine ecoregion, a total of 32 individual species were identified, and 14 additional sponges were identified to the genus level. In the Baffin Bay/Davis Strait marine ecoregion, a total of 15 species were identified (six of which also occurred in Northern Labrador) and eight additional sponges were narrowed to genus (four of which also occurred in Northern Labrador). In the Lancaster Sound marine ecoregion, two species were collected, one of which was also collected in the Baffin Bay marine ecoregion. Forty-three specimens could not be identified, either because of spicule contamination, the specimen was too damaged, or the specimen's identity was taxonomically ambiguous and was not resolved by DNA analysis.

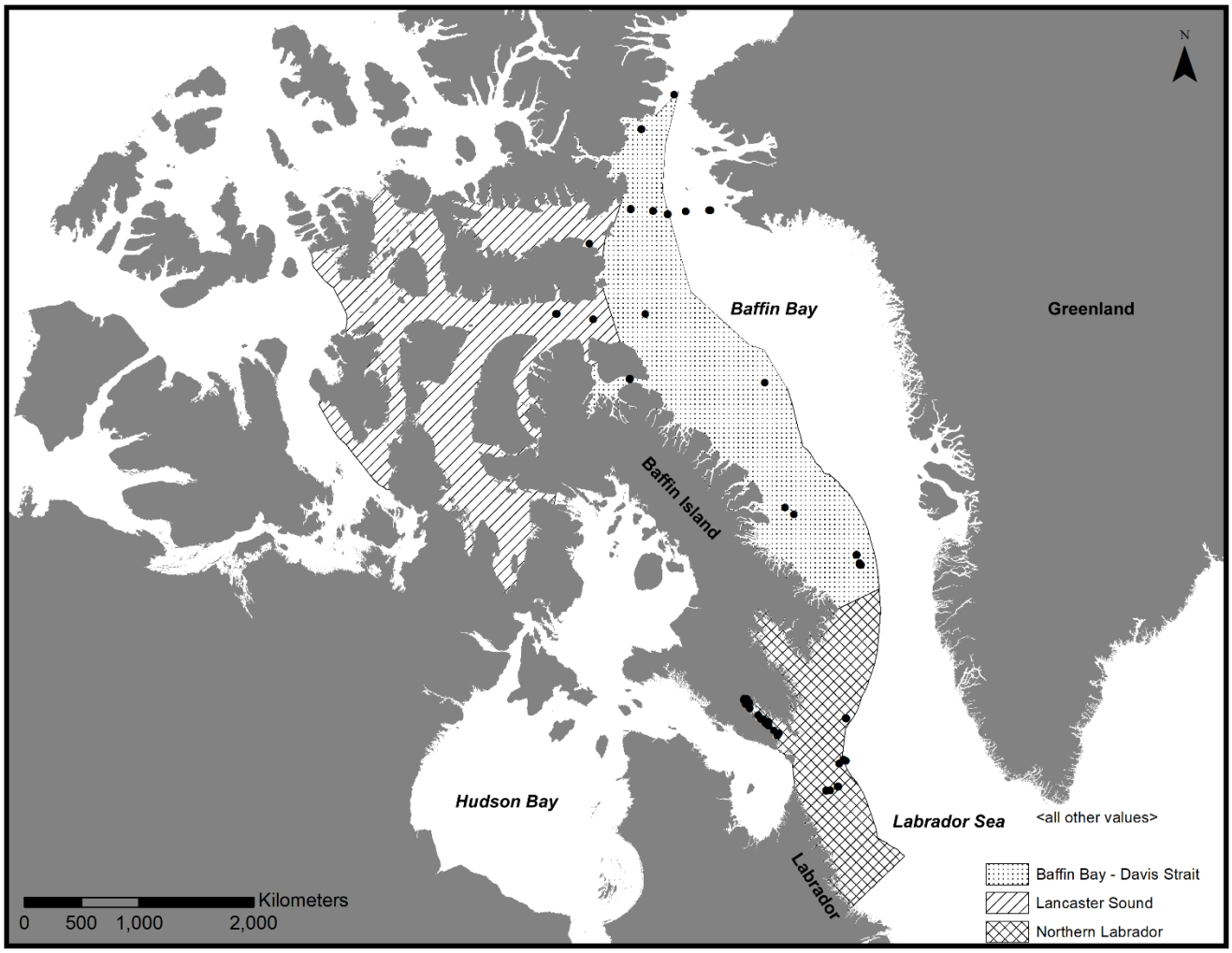
Since body form and spicule complements vary considerably within orders, it is difficult to define key characters to separate individual sponges. Therefore, instead of developing a dichotomous key, this guide is organized by sponge Order, and within Orders, alphabetically.

Summary of collections

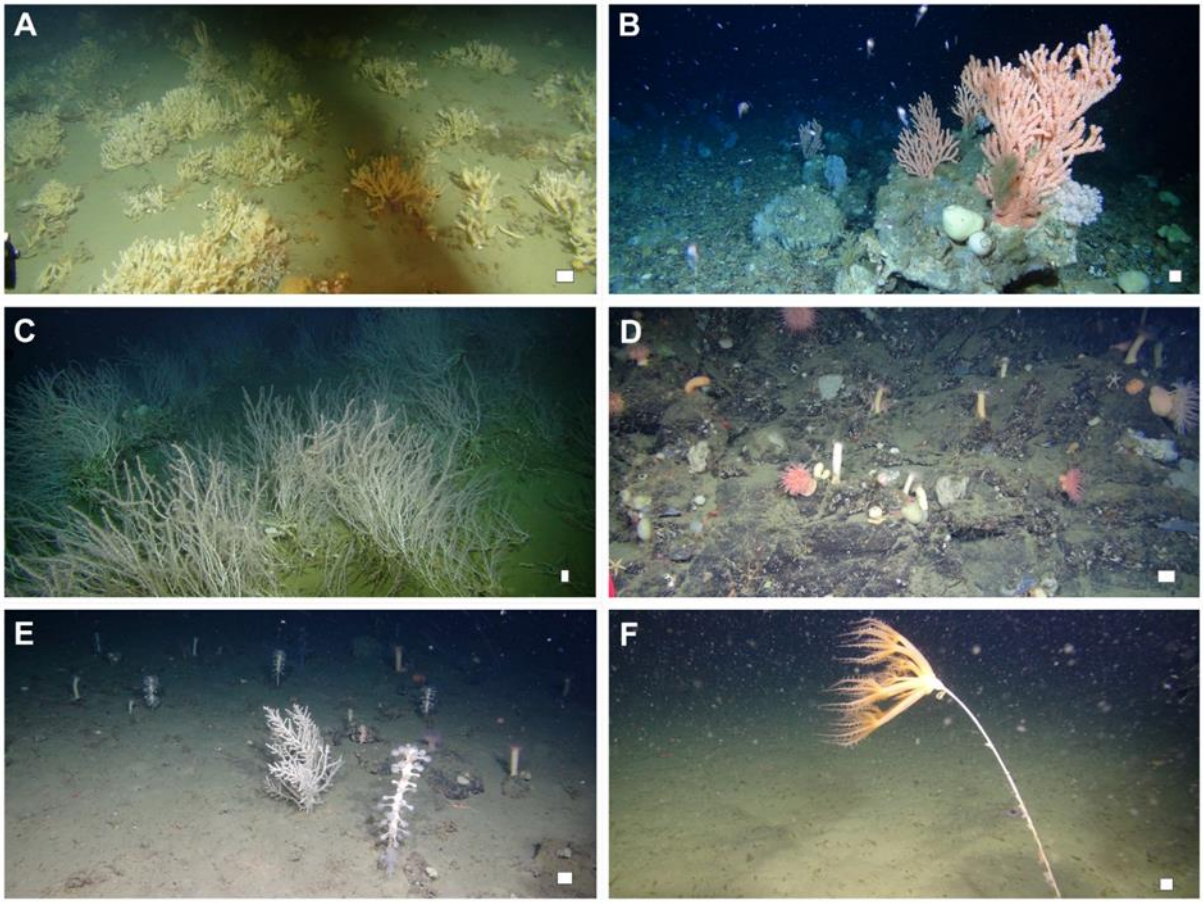
Marine Ecoregion of the World (MEOW)	Number of sponges collected	Number identified to species	Number identified to genus
Northern Labrador	116	32	14
Baffin Bay/Davis Strait	43	15 (6)	8 (3)
Lancaster Sound	3	2 (1)	-
Total (excluding repeat taxa)	162	42	19



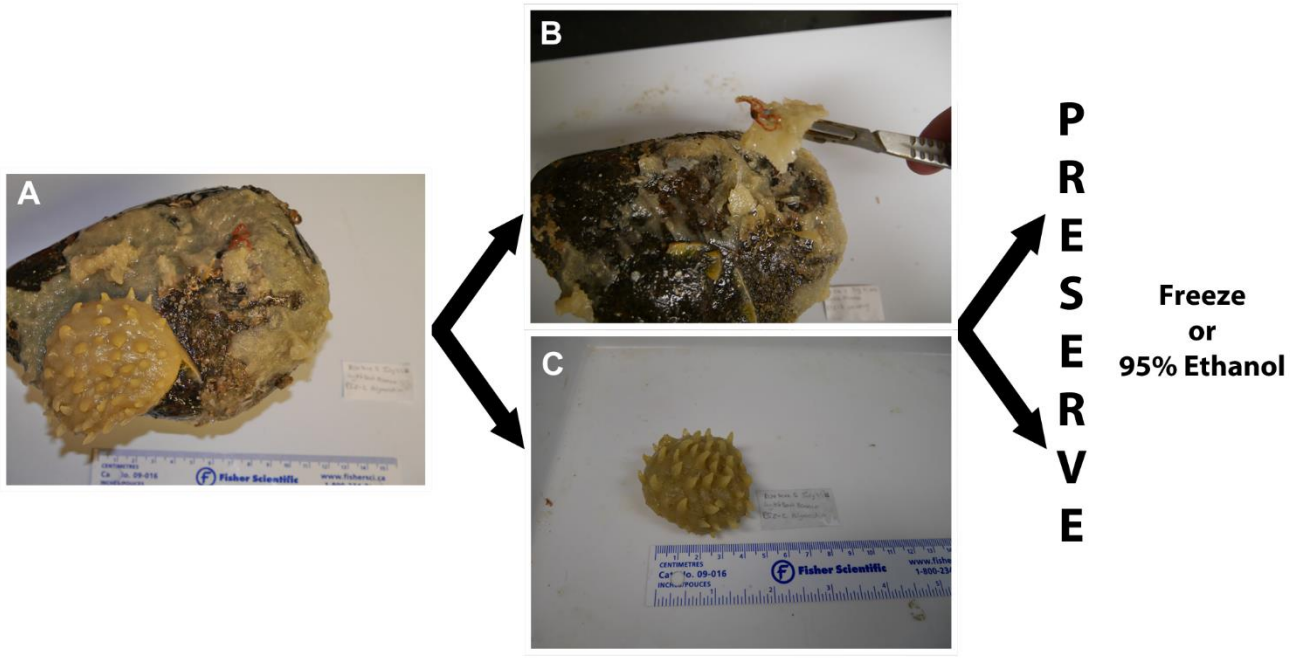
Collection methods used aboard the CCGS Amundsen. A. SuMO ROV showing hydraulic sampling arms and sampling skid. B. Agassiz Trawl. C. Box Core.



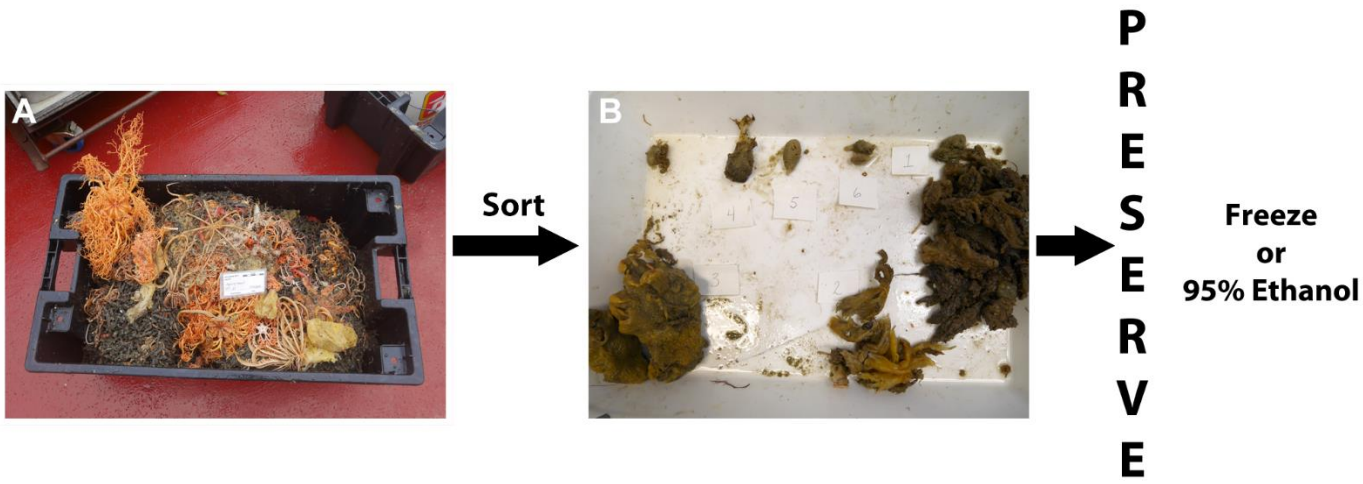
Study region in the eastern Canadian Arctic and Subarctic showing marine ecoregions of the world. Sampling locations shown by black dots. Sponges were not collected at all sites.



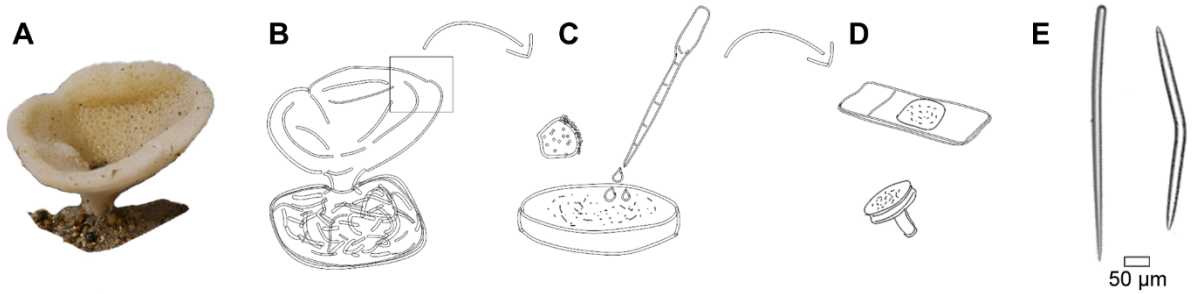
Characteristic seafloor types at dive sites.A. Soft sediment and *Iophon* sponge gardens of inner Frobisher Bay. B. Rocky substrate in the North Labrador Sea. C. Sandy/muddy bottom with dense *Keratoisis* coral forests on the Western Greenland shelf. D. Steep bedrock cliff of Pond Inlet. E. Sand flat in Pond Inlet. F. Sandy/muddy substrate with *Umbellula* sea pen. Scale bars are 6 cm.



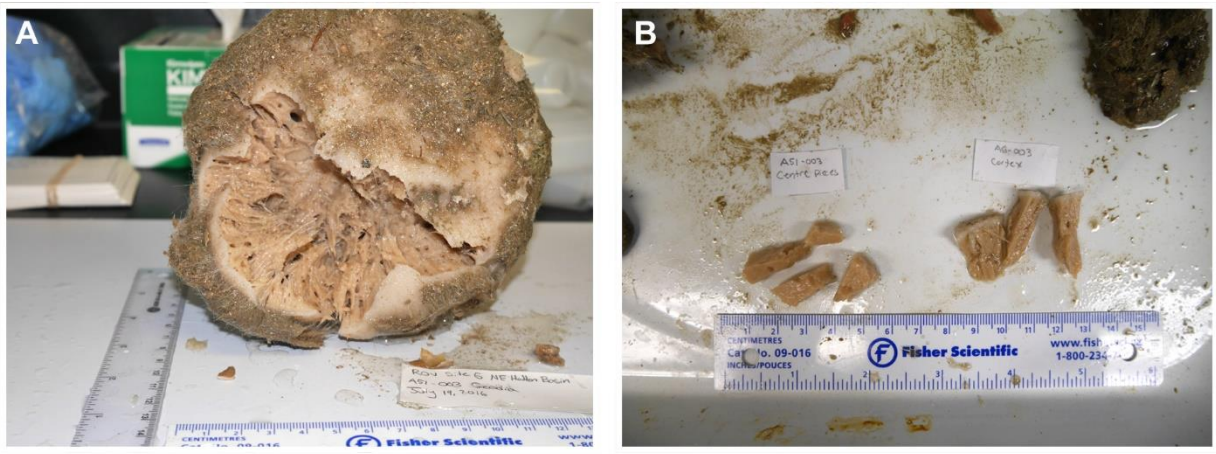
Sponges collected by box core.Care must be taken to remove encrusting sponges from rocks using a scalpel or blunt probe. Pieces or whole specimens should be preserved in ethanol or frozen for molecular identifications



Sponges collected by Agassiz trawl.Sponges must be sorted by appearance and texture immediately after collection. Preserved specimens can then be identified by spicules and by using molecular methods.



Methodology to make permanent spicule preparation.If the sponge has distinct body regions (stalk, papillae, cortex, etc.) portions of each region of the sponge body should be prepared separately as spicules may vary in different body regions. A. A sponge is photographed either *in situ* or after collection on deck; it is then either preserved in 95% ethanol, or frozen. B. Portions of preserved specimens are cut from the specimen. C. The sponge tissue is placed in bleach until the tissue is dissolved. Bleach is removed through rinses with distilled water and ethanol. D. Cleaned spicules are mounted on microscope slides or SEM stubs for viewing by light or electron microscopy. E. Spicules can be photographed, identified to type, and measured.



Collected Geodia macandrewii A. whole specimen photo showing the choanosome and cortex. B. portions of the choanosome and cortex removed using a scalpel to be preserved in 95% ethanol.

Sponge identification resources used

The following list contains works that are indispensable for identifying sponges in the North Atlantic.

Hooper, J. & Van Soest, R. W. (2002) **Systema Porifera: A Guide to the Classification of Sponges**.

This is a first stop resource when attempting to identify an unknown sponge based on spicule morphology.

Boury-Esnault, N. & Rützler, K. (1997) **Thesaurus of Sponge Morphology**.

In order to understand the language of sponges, this illustrated guide is an asset for any aspiring sponge taxonomist.

Hooper, J. (2000) **Sponguide: Guide to Sponge Collection and Identification.**

This guide describes how to identify a sponge, from laboratory methods to "mud-map" depictions of major sponge groups.

Ackers, R. G., Moss, D. & Picton, B. E. (1992) **Sponges of the British Isles ("Sponge V"): A Colour Guide and Working Document, 1992 Edition: Marine Conservation Society.**

Many sponges found in the NE Atlantic are also found in Canadian Waters. This guide provides many useful descriptions and was the inspiration for this work.

Van Soest, R.W.M.; Picton, B.E.; Morrow, C. (2000). **Sponges of the North East Atlantic.** In: World Biodiversity Database CD-ROM Series, Windows/Mac version 1.0. (ETI, University of Amsterdam, Amsterdam), available from http://species-identification.org/species.php?species_group=sponges&id=104&menuentry=soorten.

This website provides a key to sponge species of the NE Atlantic, as well as a glossary of sponge terminology. The rich multimedia portions of this source are incredibly useful when faced with an unknown sponge.

Van Soest, R.W.M; Boury-Esnault, N.; Hooper, J.N.A.; Rützler, K.; de Voogd, N.J.; Alvarez, B.; Hajdu, E.; Pisera, A.B.; Manconi, R.; Schönberg, C.; Klautau, M.; Picton, B.; Kelly, M.; Vacelet, J.; Dohrmann, M.; Díaz, M.-C.; Cárdenas, P.; Carballo, J. L.; Ríos, P.; Downey, R. (2018). **World Porifera database**. Accessed at http://www.marinespecies.org/porifera

The ultimate source of sponge distributions, literature, and news on new sponge discoveries. This guide would not have been possible without the WPD.

Species collected as part of the ArcticNet HiBIO project 2015-2017

Class Demospongiae

Subclass Heteroscleromorpha

Order Axinellida

Family Axinellidae

Genus *Axinella*	*Axinella arctica* (Vosmaer, 1885)

Family Raspailiidae

Subfamily Plocamioninae

Genus *Janulum*	*Janulum spinispiculum* (Carter, 1876)

Order Biemnida

Family Biemnidae

Genus *Biemna*	*Biemna variantia* (Bowerbank, 1858)

Order Haplosclerida

Family Chalinidae

Genus *Haliclona*	*Haliclona (Flagellia) porosa* (Fristedt, 1887)
	Haliclona (Reniera) sp. *1* Schmidt, 1862
	Haliclona (Reniera) sp. *2* Schmidt, 1862
	Haliclona (Haliclona) urceolus (Rathke & Vahl, 1806)

Order Poecilosclerida

Family Acarnidae

Genus *Iophon*	*Iophon piceum* (Vosmaer, 1882)
	Iophon spp. (Gray, 1867)

Family Cladorhizidae

Genus *Cladorhiza*	*Cladorhiza oxeata* Lundbeck, 1905
Genus *Lycopodina*	*Lycopodina lycopodium* (Levinsen, 1887)
	Lycopodina cupressiformis (Carter, 1874)
	Lycopodina sp. *1* Lundbeck, 1905
	Lycopodina sp. *2* Lundbeck, 1905
Genus *Chondrocladia*	*Chondrocladia (Chondrocladia) grandis* (Verrill, 1879)

Family Crellidae

Genus *Crella*	*Crella (Yvesia) pyrula* (Carter, 1876)

Family Coelosphaeridae

Genus *Lissodendoryx*	*Lissodendoryx (Lissodendoryx) complicata* (Hansen, 1885)
	Lissodendoryx (Lissodendoryx) indistincta (Fristedt, 1887)
	Lissodendoryx (Lissodendoryx) lundbecki Topsent, 1913
	Lissodendoryx sp. Topsent, 1892
Genus *Forcepia*	*Forcepia (Forcepia) fabricans* (Schmidt, 1874)

Family Hymedesmiidae		
	Genus *Hymedesmia*	*Hymedesmia (Hymedesmia) paupertas* (Bowerbank, 1866)
		Hymedesmia sp. Bowerbank, 1864
	Genus *Phorbas*	*Phorbas* sp. Duchassaing & Michelotti, 1864
		Phorbas microchelifer (Cabioch, 1968)
	Genus *Plocamionida*	*Plocamionida ambigua* (Bowerbank, 1866)
		Plocamionida sp. Topsent, 1927
Family Iotrchotidae		
	Genus *Iotroata*	*Iotroata affinis* (Lundbeck, 1905)
Family Microcionidae		
Subfamily Ophlitaspongiinae		
	Genus *Antho*	*Antho (Acarnia) signata* (Topsent, 1904)
Family Mycalidae		
	Genus *Mycale*	*Mycale (Anomomycale)* Topsent, 1924
		Mycale (Mycale) lingua (Bowerbank, 1866)
Family Myxillidae		
	Genus *Melonanchora*	*Melonanchora elliptica* Carter, 1874
Family Tedaniidae		
	Genus *Tedania*	*Tedania (Tedania) suctoria* (Schmidt, 1870)
Order Polymastiida		
Family Polymastiidae		
	Genus *Polymastia*	*Polymastia uberrima* (Schmidt, 1870)
		Polymastia thielei Koltun, 1964
		Polymastia grimaldii (Topsent, 1913)
		Polymastia andrica de Laubenfels, 1949
	Genus *Tentorium*	*Tentorium semisuberites* (Schmidt, 1870)
	Genus *Spinularia*	*Spinularia sarsii* (Ridley & Dendy, 1886)
	Genus *Quasillina*	*Quasillina brevis* (Bowerbank, 1861)
Order Suberitida		
Family Suberitidae		
	Genus *Plicatellopsis*	*Plicatellopsis* sp. Burton, 1932
	Genus *Pseudosuberites*	*Pseudosuberites* sp. Topsent, 1896
Family Halichondriidae		
	Genus *Halichondria*	*Halichondria (Eumastia) sitiens* (Schmidt, 1870)
		Halichondria (Halichondria) panicea (Pallas, 1766)
		Halichondria sp. Fleming, 1828
	Genus Hymenicidon	*Hymeniacidon* sp. Bowerbank, 1858

Order Tethyida
Family Tethyidae
Genus *Tethya* — *Tethya* cf. *norvegica* Bowerbank, 1872

Order Tetractinellida

Suborder Astrophorina
Family Geodiidae
Subfamily Geodiinae
Genus *Geodia* — *Geodia barretti* Bowerbank, 1858
Geodia macandrewii Bowerbank, 1858

Family Theneidae
Genus *Thenea* — *Thenea* cf. *muricata* (Bowerbank, 1858)
Thenea sp. *1* Gray, 1867
Thenea sp. *2* Gray, 1867

Family Tetillidae
Genus *Tetilla* — *Tetilla sibirica* (Fristedt, 1887)
Genus *Craniella* — *Craniella* cf. *polyura* (Schmidt, 1870)
Craniella cf. *cranium* (Müller, 1776)
Craniella sp. Schmidt, 1870

Class Calcarea

Calcarea unknown

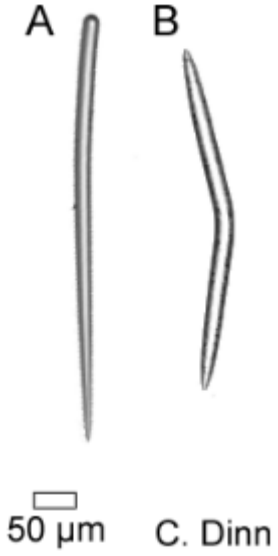
Subclass Calcaronea
Order Leucosolenida
Family Sycettidae
Genus *Sycon* — *Sycon* cf. *lambei* Dendy & Row, 1913
Sycon sp.*1* Risso, 1827

Class Hexactinellida
Subclass Hexasterophora
Order Lyssacinosida
Family Rossellidae
Subfamily Rossellinae
Genus *Asconema* — *Asconema* spp. Kent, 1870

Axinella arctica (Vosmaer, 1885)

Sample	CMNI 2018-0094, CMNI 2018-0099, CMNI 2018-0146, CMNI 2018-0150
Family	AXINELLIDAE
Synonyms	*Axinella calyciformis* (Lamarck, 1814), *Phakellia arctica* Vosmaer, 1885, *Spongia calyciformis* Lamarck, 1814, *Spongia pocillum* Lamouroux, 1816 *Tragosia arctica* (Vosmaer, 1885), *Tragosia calyciformis* (Lamarck, 1814)
Collection Details	North Labrador Sea 60.468° N, -61.287° W, Depth 412 m 60.466° N, -61.278° W, Depth 452 m Greenland shelf 67.967° N, -59.484° W, Depth 877 m
Form	Cup-like or flabellate. Often an inverted, hollow cone with a solid stalk.
Size	5-25 cm in diameter.
Colour	Pale yellow or buff to white.
Consistency	Firm. Pieces will break off when bent more than 45°.
Surface	Surface of the inner portions has many pin-hole sized exhalent openings. The outside surface has inhalant openings which appear to be facing upward. Dense longitudinal ribs extend from the stalk to the distal portions on the outside surface.
Spicules	Megascleres are styles 470 (400-561) x 17.5 (12.8-24.5) µm, and oxeas 385 (330-443) x 18 (12.8-23.6) µm. No microscleres are present.
Habitat	Rocky bottoms.
Distribution (WPD)	Northern Norway and Finnmark, Barents Sea, North Sea, Celtic Seas, Southern Norway, European Waters.
Remarks	This sponge is similar in form to *Axinella infundibuliformis (Linnaeus, 1759)*, though it lacks trichodragmas. *A. infundibuliformis* was not found during *CCGS Amundsen* collections. Only the base potion of the specimen from the

Top: on-board. Bottom: *in situ*

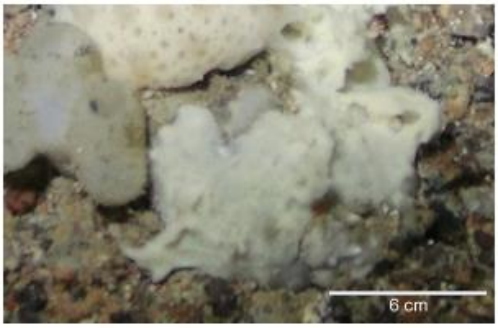


Greenland shelf was collected, so outer morphology cannot be confirmed for deeper water specimens.

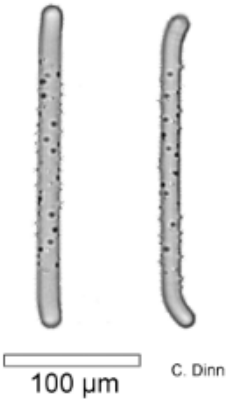
References Stephens (1921), Vosmaer (1885)

Janulum spinispiculum (Carter, 1876)

Sample	CMNI 2018-0095
Family	RASPAILIIDAE
Synonyms	*Isodictya spinispiculum* Carter, 1876 *Lithoplocamia spinispiculum* (Carter, 1876) *Metschnikowia spinispiculum* (Carter, 1876)
Collection Details	North Labrador Sea (Saglek Bank) 60.468° N, -61.287° W, Depth 412 m
Form	Encrusting. Oscula protrude from crust on raised, nearly cylindrical portions.
Size	Irregular crust 15 cm wide. May grow much larger.
Colour	White *in situ*, buff to yellow upon collection.
Consistency	Firm. Very sticky mucous.
Surface	Soft, except for raised portions which are irregular.
Spicules	Strongyles with sharp spines on the central portion, but smooth at the extremities. The tips of the spicules are often bent.
Habitat	Rocky substrates. Seen encrusting pebbles and boulders.
Distribution (WPD)	South European shelf, Celtic Seas, Northern Norway and Finnmark, South and West Iceland, Western Mediterranean.
Remarks	Fits the description in Kelly *et al.*, 2015. Bone-white encrusting sponges with irregular borders in the North Labrador Sea are assumed to be *J. spinispiculum.* Appears to be very common in the region.
References	Kelly *et al.* (2015)



Top: *in situ*. Bottom: on board.

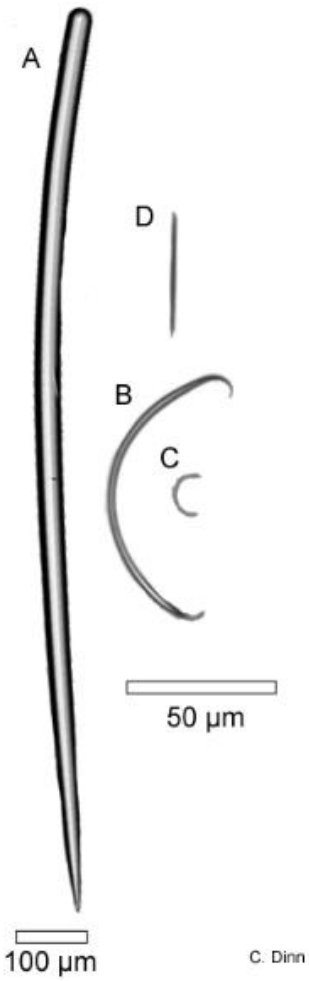


Biemna variantia (Bowerbank, 1858)

Sample	CMNI 2018-0110, CMNI 2018-0115, CMNI 2018-0133
Family	BIEMNIDAE
Synonyms	*Asychis variantia* (Bowerbank, 1858) *Biemna capillifera* (Levinsen, 1887) *Biemna gemmulifera* (Breitfuss, 1912) *Biemna groenlandica* (Fristedt, 1887) *Biemna hamifera* (Lundbeck, 1902) *Biemna peachii* (Bowerbank, 1866) *Biemna variantia hamifera* (Lundbeck, 1902) *Desmacella capillifera* (Levinsen, 1887) *Desmacella groenlandica* Fristedt, 1887 *Desmacella hamifera* Lundbeck, 1902 *Desmacella peachii* (Bowerbank, 1866) *Desmacella peachii var. groenlandica* Fristedt, 1887 *Desmacella peachii var. stellifera* Fristedt, 1885 *Desmacella variantia* (Bowerbank, 1858) *Desmacidon korenii* Schmidt, 1875 *Desmacidon peachii* Bowerbank, 1866 *Gellius capillifer* Levinsen, 1887 *Gellius gemmuliferus* Breitfuss, 1912 *Halichondria variantia* Bowerbank, 1858 *Hymeniacidon varians* Bowerbank, 1882 *Hymeniacidon variantia* (Bowerbank, 1858) *Raphiodesma aculeatum* Topsent, 1888
Collection Details	North Labrador Sea (Saglek Bank) 60.468° N, -61.288° W, Depth 401 m North Labrador Sea (SE Baffin shelf) 63.004° N, -60.642° W, Depth 457 m
Form	Cushion shaped, encrusting.
Size	Variable – up to 15 cm in height and breadth.
Colour	Yellow, beige
Consistency	Friable, rough to the touch
Surface	Spicules project from the surface. Many large exhalent openings on outer surface.

Top: on board whole. Bottom: on board in pieces.

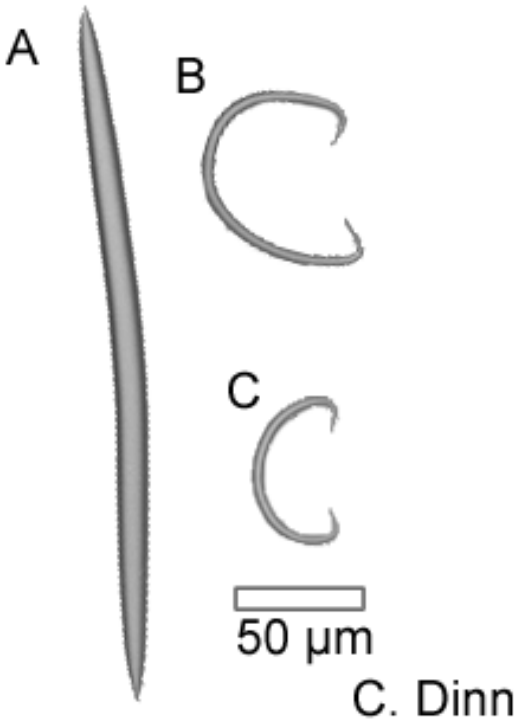
Spicules	Megascleres are styles that can be slightly bent (A) 1128 (834-1397) x 30.8 (22.5-39) µm. Microscleres are sigmas (B) 90.5 (78.5-108) µm in length, small sigmas (C) ~18 µm in length N=2, and raphides (D) 55 (33-165) µm in length. Commata were not measured.
Habitat	Encrusting rocks.
Distribution (WPD)	Whole North Atlantic distribution
Remarks	Similar spicule measurements to those in Ackers (1992), though megascleres much smaller in that description (max. 700µm). Two small specimens were dome shaped with large spicule projections. Several synonymized species may indicate that several species are sharing the same taxon. Revision may be necessary.
References	Ackers *et al.* (1992)



Haliclona (Flagellia) porosa (Fristedt, 1887)

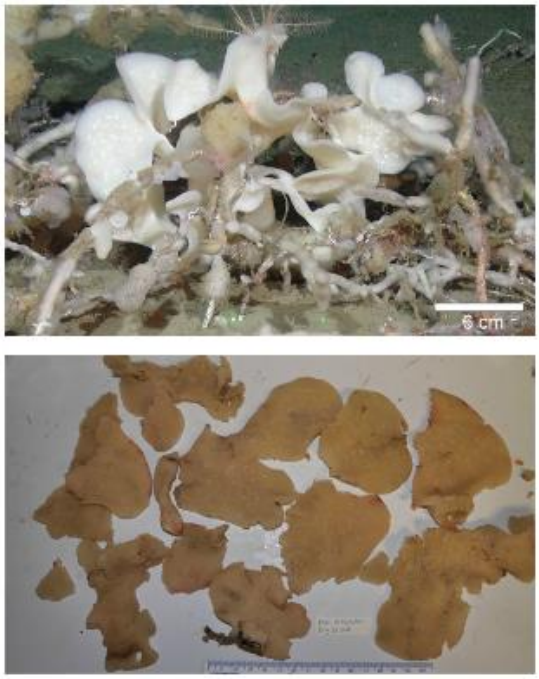
Sample	CMNI 2018-0197
Family	CHALINIDAE
Synonyms	*Desmacella porosa* Fristedt, 1887 *Gellius porosus* (Fristedt, 1887) *Haliclona porosus* (Fristedt, 1887) *Hemigellius porosus* (Fristedt, 1887)
Collection Details	Northern Baffin Bay 76.317° N, -75.770° W, Depth 333 m
Form	Massive, cushion shaped.
Size	2 cm wide by 2 cm tall.
Colour	Buff to white, oscular portion are transparent.
Consistency	Soft.
Surface	The specimen appears to have a thin skin with noticeable openings under the surface. The oscula are large in relation to specimen size.
Spicules	Megascleres are slightly bent oxeas (A) 282 (250-314) x 13.5 (11.3-15.5) µm. Microscleres are flagellosigmas with long ending length (B) ~62 µm, short ending ~49 µm, width ~61 µm, and thickness ~5 µm N=7, and regular sigmas (C) ~61 µm N=1.
Habitat	Unknown.
Distribution (WPD)	Whole North Atlantic and Arctic
Remarks	Fits the description in Van Soest, 2017. Regular sigmas were less common than flagellosigmas, which is typical for the species.
References	Van Soest (2017)

Shown whole.



Haliclona (Reniera) sp. 1 Schmidt, 1862

Sample	CMNI 2018-0142
Family	CHALINIDAE
Synonyms	*Haliclona (Reniclona)* De Laubenfels, 1954 *Kallypilidion* de Laubenfels, 1954 *Philotia* Gray, 1867 *Prianos* Gray, 1867 *Reniclona* de Laubenfels, 1954 *Reniera* Schmidt, 1862 *Toxadocia* Laubenfels, 1936
Collection Details	Western Greenland shelf (Disko Fan) 67.967° N, -59.484° W, Depth 877 m
Form	Flabellate. Very slight transverse ribbing along the plates is noticeable upon close examination.
Size	Plates are about 5 cm in breadth.
Colour	Bone white *in situ* with noticeable bright white spots. The sponge becomes off-white upon collection. After contact with air the sponge becomes bright pink. This pink colour remains after preservation in ethanol.
Consistency	Soft and flexible.
Surface	Smooth, covered in noticeable pin-hole apertures.
Skeleton	Anisotropic reticulation forming a square-like lattice. This reticulation is mostly formed by unispicular tracts.
Spicules	Short, stout oxeas 325 (288-378) x 18.3 (14-24) µm.
Habitat	Was found growing on dead *Keratoisis* coral skeleton along with other sponges.
Distribution (WPD)	Unknown.
Remarks	The peculiar pink colouration after death is distinctive. COI sequences were not of high read quality but suggest the specimen belongs to the genus *Haliclona.* Anisotropic reticulation of oxeas suggests subgenus *Haliclona (Reniera).* It does not appear to fit any known species descriptions and was only found at this site.
References	Ackers *et al.* (1992)



Top: *in situ*. Bottom: pieces on board.

Haliclona (Reniera) sp. 2 Schmidt, 1862

Sample	CMNI 2018-0176
Family	CHALINIDAE
Synonyms	*Haliclona (Reniclona)* De Laubenfels, 1954 *Kallypilidion* de Laubenfels, 1954 *Philotia* Gray, 1867 *Prianos* Gray, 1867 *Reniclona* de Laubenfels, 1954 *Reniera* Schmidt, 1862 *Toxadocia* Laubenfels, 1936
Collection Details	Frobisher Bay 62.953° N, -67.139° W, Depth 402 m
Form	Chimney shaped with an obvious terminal osculum. Tissue appears fibrous and stringy.
Size	4 cm in breadth, true height is unknown as specimen was damaged.
Colour	Yellow.
Consistency	Soft and fibrous.
Surface	Smooth.
Spicules	Oxeas that are short and sharply pointed 280 (243-307) x 23 (15.5-29) µm.
Habitat	Unknown.
Remarks	The spicules and skeleton suggest *Halicona (Reniera).* COI sequence aligns most closely with *Haliclona (Reniera) cinerea* (Grant, 1826), however the spicules are much longer in this specimen. This specimen was also collected much deeper than is documented for *H. cinera.* Further work is needed to determine the species of this specimen.
References	Ackers *et al.* (1992)

Collected as a piece.

Haliclona (Haliclona) urceolus (Rathke & Vahl, 1806)

Sample	CMNI 2018-0065, CMNI 2018-0139
Family	FAMILY
Synonyms	*Adocia urceolus* (Rathke & Vahl, 1806) *Chalina pulcherrima* Fristedt, 1885 *Haliclona (Haliclona) urceola* (Rathke & Vahl, 1806) *Haliclona clava* (Bowerbank, 1866) *Haliclona clavata* (Levinsen, 1887) *Haliclona pulcherrima* (Fristedt, 1885) *Haliclona urceolus* (Rathe & Vahl, 1806) *Isodictya clava* Bowerbank, 1866 *Polysiphonia mucronalis* Levinsen, 1893 *Reniera clavata* Levinsen, 1887 *Reniera simplex* Hansen, 1885 *Reniera urceolus* (Rathke & Vahl, 1806) *Siphonochalina pulcherrima* (Fristedt, 1885) *Spongia urceola* Rathke & Vahl, 1806 *Spongia urceolus* Rathke & Vahl, 1806
Collection Details	North Labrador Sea (NE Hatton Basin) 61.341° N, -61.1600° W, Depth 562 m western Greenland shelf 67.967° N, -59.484° W, Depth 877 m
Form	Tubular to chimney shaped. A thin flexible stalk attaches the sponge to the substrate.
Size	Less than 10 cm in length.
Colour	Grey to light yellow.
Consistency	Soft and flexible.
Surface	Smooth.
Spicules	North Labrador Sea specimen: Oxeas 235 (206-252) x 12 (10-15) µm Western Greenland shelf specimen: Oxeas 275 (240-308) x 18.4 (12-21) µm
Habitat	Unknown. Attached to hard substrate.
Distribution (WPD)	Whole North Atlantic (only once recorded on the western Greenland shelf)

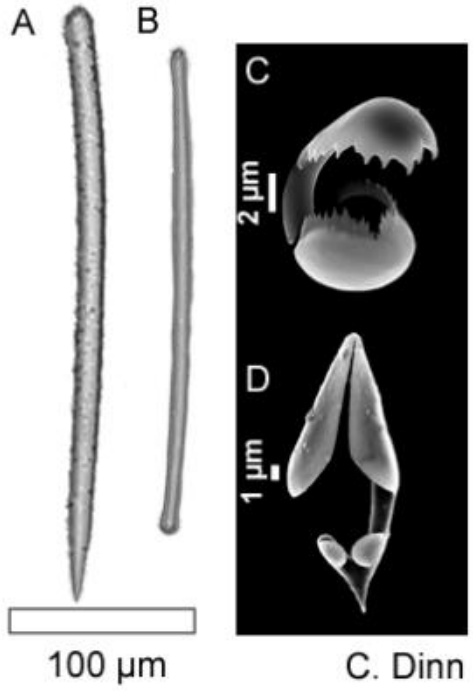
Top: whole. Bottom: piece with shrimp inside.

Remarks	Spicules and body form of North Labrador Sea specimen agree with the description in Ackers, 1992. The spicules of the western Greenland shelf specimen are just slightly longer than that in Ackers 1992. The Western Greenland specimen was much thinner and there was no obvious base, though this may have been damaged upon collection. However, there was no osculum on this sponge, and a single amphipod was completely enclosed in the specimen. These sponges may be separate species but are treated as one here.
References	Ackers *et al.* (1992)

Iophon piceum (Vosmaer, 1882)

Sample	CMNI 2018-0177
Family	ACARNIDAE
Synonyms	*Alebion piceum* Vosmaer, 1882 *Esperella picea* (Vosmaer, 1882) *Esperia pattersoni* sensu Fristedt, 1887 *Iophon piceus* (Vosmaer, 1882)
Collection Details	Frobisher Bay 62.819° N, -67.139° W, Depth 507 m
Form	Cup-shaped.
Size	10-20 cm in diameter.
Colour	Black.
Consistency	Firm, stringy.
Surface	Rough due to the lattice form of the spongin fibres.
Spicules	The spicules consist of acanthostyles (A) 320 (275-349) x 16 (12-19) µm, tylotes (B) with spined heads 260 (237-278) x 12 (9-16) µm, spurred anisochelae (C) 18.5 (13-32) µm, and bipocilles (D) with fine teeth 11.8 (8.7-16.5) µm.
Habitat	Unknown substrate in deeper water.
Distribution (WPD)	Arctic Ocean, Faroe Plateau, European Waters, Barents Sea, South and West Iceland, White Sea, West Greenland shelf.
Remarks	This is an easily identified species due to the colour and lattice-like growth form. The general body form is a cup-shape.
References	Lundbeck (1905), Vosmaer (1882)

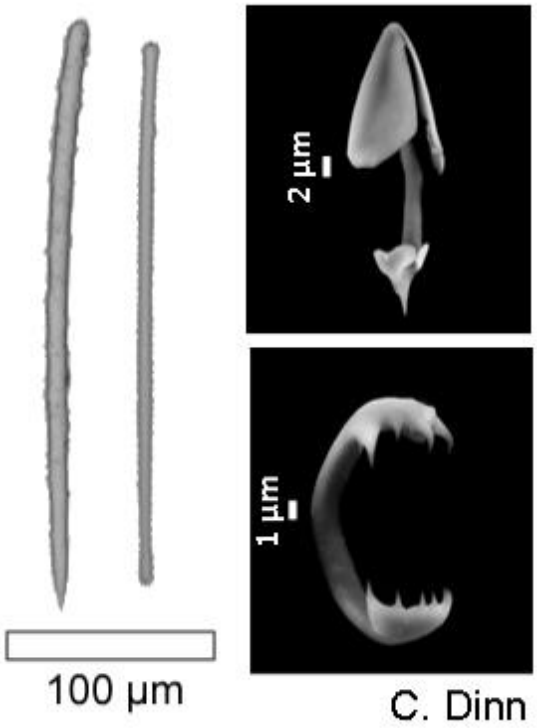
Shown in pieces.



Iophon cf. *nigricans* (Bowerbank, 1858)

Sample	CMNI 2018-0180, CMNI 2018-0166
Family	ACARNIDAE
Synonyms	*Alebion* Gray, 1867 *Burtonella* de Laubenfels, 1928 *Dendoryx* (Iophon) Gray, 1867 *Hymedesanisochela* Bakus, 1966 *Ingallia* Gray, 1867 *Iophonopsis* Dendy, 1924 *Iophonota* Laubenfels, 1936 *Menyllus* Gray, 1867 *Myxilla* (*Pocillon*) Topsent, 1891 *Pocillon* Topsent, 1891
Collection Details	Frobisher Bay 63.640° N, -68.627° W, Depth 141 m 63.639° N, -68.629° W, Depth 95.5 m
Form	Finger-like projections.
Size	Forms very large bushes *in situ*, up to a metre wide. Individual finger-like projections can be up to 10 cm long.
Colour	Yellow to tan *in situ*, becomes dark brown on contact with air.
Consistency	Firm.
Surface	Soft. Furrowed texture. A transparent dermal membrane is seen covering the tissue *in situ*, but this collapses after collection.
Spicules	There are two types of megascleres, acanthostyles which are often swollen at the head resembling a spined tylostyle, variably spined, often with long spines on the head, rarely these spicules are thin and elongate 277 (245-308) x 9.7 (8-12) µm, and smooth ectosomal tylotes with swollen microspined heads are 247(199-266) x 7.6(6-9) µm. Microscleres are spurred anisochelae 19 (16.5-22) µm, and large bipocilles with reduced, single, equal-sized alae and elongated teeth. Bipocilles are isochelae-like with long, smooth, arcuate shafts with a bend in the centre of the shaft 15.4 (12.5-19.5) µm.

Top: collected in pieces. Bottom: *in situ.*

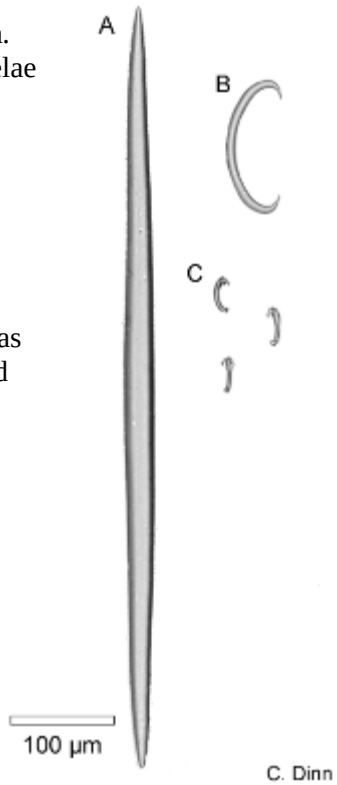


Habitat	Seen only in inner Frobisher Bay on sand or bedrock outcrops.
Distribution (WPD)	European waters
Remarks	This species is most similar to *Iophon nigricans* (Bowerbank 1858) in body form and darkening upon death, but it has much larger bipocilles that are not of the same form and lacks a small ~10 µm size category of anisochelae. The bipocilles are similar to those found in *I. dogieli* Koltun, 1955, but this species has styles rather than acanthostyles.
References	Bowerbank (1866), Koltun (1955)

Cladorhiza oxeata Lundbeck, 1905

Sample	CMNI 2018-0171, CMNI 2018-0201
Family	CLADORHIZIDAE
Synonyms	*Exaxinata oxeata* (Lundbeck, 1905)
Collection Details	Frobisher Bay 62.953° N, -67.139° W, Depth 402 m Pond Inlet 72.827° N, 77.609° W, Depth 875 m
Form	Branching, erect. The main stem is thick with many side branches.
Size	Variable but often large, can be over 30 cm tall.
Colour	White to pinkish. The stem is darker than the branches.
Consistency	Hard. Stem is particularly hard and requires a very sharp razor blade to cut.
Surface	Filamentous along the branches.
Spicules	Megascleres are oxeas, rarely styles (A) 707 (617-765) x 29 (16-36) µm. Microscleres are sigmas (B) 131.5 (112-144) µm in length and anisochelae (C) 35.5 (30.5-41) µm in length.
Habitat	Soft sediments
Distribution (WPD)	Baffin Bay, Davis Strait, European Waters, Barents Sea, South and West Iceland.
Remarks	Easily identified by the presence of oxeas. Specimen from Pond Inlet was collected by ROV and had *Themisto abyssorum* amphipods attached and partially digested on the terminal branches. This specimen is like that described by Hestetun e*t al.* (2017) in not having sigmancistras.
References	Hestetun *et al.* (2017)

Top: *in situ.* Bottom: on-board.



Lycopodina lycopodium (Levinsen, 1887)

Sample	CMNI 2018-0139
Family	CLADORHIZIDAE
Synonyms	Asbestopluma (*Asbestopluma*) *lycopodium* (Levinsen, 1887) *Asbestopluma* (*Lycopodina*) *lycopodium* (Levinsen, 1887) *Esperella cupressiformis* var. *lycopodium* Levinsen, 1887 *Esperella lycopodium* Levinsen, 1887
Collection Details	Frobisher Bay 62.979° N, -67.272° W, Depth 443 m
Form	Pinnate. Peduncle attaches to substrate.
Size	Minute, < 2 cm tall and 1 mm wide.
Colour	White
Consistency	Stiff.
Surface	Hispid.
Spicules	Megascleres are styles/mycalostyles that are highly variable in size 1093 (640.5-1443) x 15 (12-21) µm. Microscleres are palmate anisochelae 11.3 (9-13.5) µm long. See Hestetun *et al.*, 2017 for spicule images.
Habitat	Rocky bottoms, attached to a large rock.
Distribution (WPD)	Amphi-Atlantic, Northern Russian waters.
Remarks	Fits the description provided for this specimen by Hestutun *et al.* (2017). Although small styles were not seen in this specimen, those spicules may occur in a portion that was not examined due to the size of the specimen. Forceps spicules are absent but are noted as only being associated with spermatic cysts (Riesgo *et al.*, 2007), and spermatic cysts were not found in this specimen. Found with *L. cupressiformis*, though the external morphology is distinctive.
References	Hestetun *et al.* (2017), Riesgo *et al.* (2007).

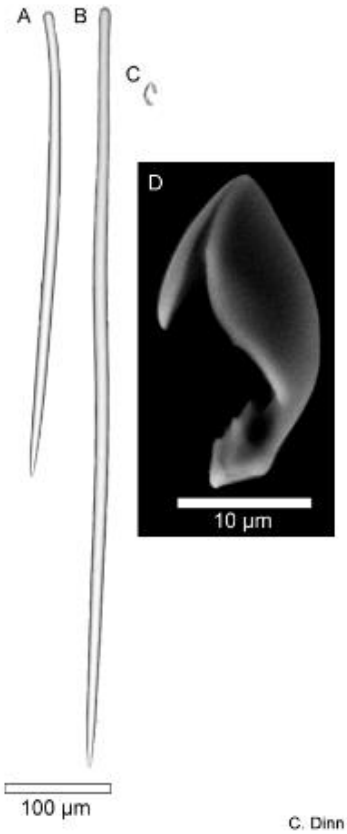
Shown whole.

Lycopodina cupressiformis (Carter, 1874)

Sample	CMNI 2018-0061
Family	CLADORHIZIDAE
Synonyms	*Asbestopluma (Asbestopluma) cupressiformis* (Carter, 1874) *Asbestopluma (Lycopodina) cupressiformis* (Carter, 1874) *Cladorhiza cupressiformis* (Carter, 1874) *Esperella cupressiformis* (Carter, 1874) *Esperia cupressiformis* Carter, 1874
Collection Details	Frobisher Bay 62.979° N, -67.272° W, Depth 443 m

Shown whole.

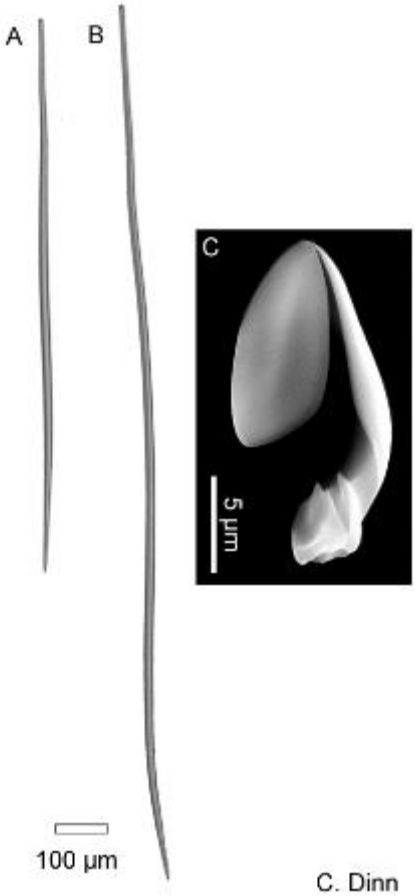
Form	Pedunculate with small knobby projections along the body.
Size	3 cm tall and about 3-4 mm wide.
Colour	Pinkish white.
Consistency	Soft and fleshy.
Surface	Smooth along the body and shaft.
Spicules	Megascleres are styles/mycalostyles that range in size, the smaller of which are (A) 413 (293-540) x 11 (7.8-15) µm, and the larger are (B) 689 (585-772) x 14 (11.3-17) µm. These were not split into two size categories by Hestetun (2017) but are rather described as being highly variable. Microscleres are palmate anisochelae (C, D) 22 (19-25) µm in length.
Habitat	Rocky bottoms, attached to a large rock.
Distribution (WPD)	Amphi-Atlantic and the Kara Sea/Northern Russia.
Remarks	Fits the description given in Hestutun *et al.* (2017). Forceps spicules are absent but are noted as only being associated with spermatic cysts (Riesgo *et al.*, 2007). Found with *L. lycopodium*, although the external morphology between these species are distinctive.
References	Hestetun *et al.* (2017), Riesgo *et al.* (2007).



Lycopodina sp. 1 Lundbeck, 1905

Sample	CMNI 2018-0157
Family	CLADORHIZIDAE
Synonyms	*Asbestopluma (Lycopodina)* Lundbeck, 1905
Collection Details	Baffin Bay 68.259° N, -59.823° W, Depth 1148 m
Form	Pinnate.
Size	Less than 10 cm long and 5 mm thick
Colour	Beige to brown.
Consistency	Bristly, somewhat stiff.
Surface	Moderately hispid
Spicules	Megascleres are mycalostyles I (A) 972 (719-1293) x 19 (12-25) µm, mycalostyles II are long and veriform (B) 1934 (1525-2322) x 21 (13-27) µm. Microscleres are palmate anisochelae (C) 17 (11-21) µm. No forceps spicules were seen.
Habitat	Unknown.
Distribution (WPD)	Unknown.
Remarks	Since the mycalostyles were longer than 1500 µm, this species could be *L. tendali* (Hestetun, 2017), however small tylostyles and forceps spicules were not seen in this specimen. Therefore, the assignment to species is not certain.
References	Hestetun *et al.* (2017).

Shown whole.

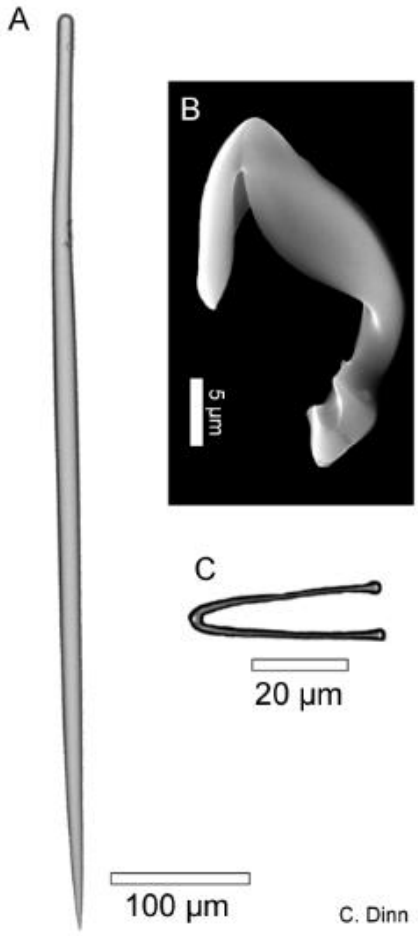


C. Dinn

Lycopodina sp. 2 Lundbeck, 1905

Sample	CMNI 2018-0161
Family	CLADORHIZIDAE
Synonyms	*Asbestopluma (Lycopodina)* Lundbeck, 1905
Collection Details	Baffin Bay 68.259° N, -59.823° W, Depth 1148 m
Form	Potentially pedunculate. Specimen was damaged.
Size	Approximately 10 cm long.
Colour	Beige to brown.
Consistency	Firm and stiff.
Surface	Silt covered and rough.
Spicules	Megascleres are mycalostyles with some modified to strongyles (A) 734 (643-810) x 17 (13-20) µm. Microscleres are palmate anisochelae (B) 25 (22-28) µm in length, and forceps (C) ~38 µm N=4.
Habitat	Unknown.
Distribution (WPD)	Unknown.
Remarks	Body form and spicules do not fit descriptions of other North Atlantic *Lycopodina* species. Since forceps spicules were found, this strongly suggests assignment to this genus.
References	(Hestetun *et al.*, 2017).

Collected as a piece.



Chondrocladia (Chondrocladia) grandis (Verrill, 1879)

Sample	CMNI 2018-0209, CMNI 2018-0210, CMNI 2018-0211
Family	CLADORHIZIDAE
Synonyms	*Chondrocladia (Chondrocladia) arctica* (Hansen, 1885) *Chondrocladia (Chondrocladia) gigantea* (Hansen, 1885) *Chondrocladia (Chondrocladia) nucleus* (Hansen, 1885) *Chondrocladia gigantea* (Hansen, 1885)· *Chondrocladia grandis* (Verrill, 1879)· *Chondrocladia nucleus* (Hansen, 1885) *Cladorhiza grandis* Verrill, 1879 *Cladorhiza nobilis* Fristedt, 1887 *Desmacidon arctica* Hansen, 1885 *Desmacidon clavatum* Hansen, 1885 *Desmacidon giganteum* Hansen, 1885 *Desmacidon nucleus* Hansen, 1885
Collection Details	Pond Inlet 72.836° N, -77.594° W, Depth 416 m Lancaster Sound 74.276° N, -83.364° W, Depth 719 m

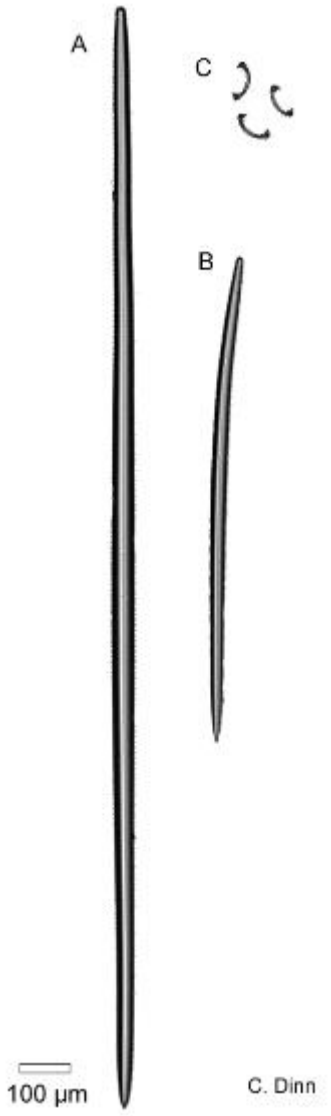
Top: *in situ.* Middle/bottom: whole on-board.

Form	Pedunculate with large fleshy lobed projections. Has large basal root portion to anchor the sponge into soft sediments.
Size	Can be >30 cm tall
Colour	Beige to pink.
Consistency	Firm, slightly flexible.
Surface	Rough, spicules from the surface can shed easily.
Spicules	Megascleres are mycalostyles in two size categories. Mycalostyles I (A) are 2009 (1644-2229) x 45-40-49) µm N =8, Mycalostyles II (B) are 895 (692-1118) x 25 (20-30) µm. Microscleres are anchorate isochelae (C) 68 (60-74) µm in length. Very few small sigmancistras were seen but not measured.
Habitat	Sandy substrates.
Distribution (WPD)	Amphi-Atlantic
Remarks	This specimen fits the description of the outer morphology of *C. grandis* in Hestetun *et al.* (2017).

Megascleres and anchorate isochelae fit the description, but smaller anchorate isochelae (~21µm) were not seen, though in Hestutun *et al.*, (2017) these spicules are noted as not being as common. These spicules may be localized in different portions of the sponge that were not dissolved. This sponge was only seen in soft sediments and is one of the two species of sponge found in Lancaster Sound, where it lives amongst fields of *Umbellula* sea pens.

References

Hestetun *et al.* (2017)



Crella (Yvesia) pyrula (Carter, 1876)

Sample	CMNI 2018-0149
Family	CRELLIDAE
Synonyms	*Cometella pyrula* Carter, 1876 *Crella lobata* (Arnesen, 1903) *Crella pedunculata* (Topsent, 1890) *Crella pyrula* (Carter, 1876) *Grayella pyrula* (Carter, 1876) *Reniera membranacea* Hansen, 1885 *Sclerilla arctica* Hansen, 1885 *Sclerilla dura* Hansen, 1885 *Yvesia lobata* Arnesen, 1903 *Yvesia pedunculata* Topsent, 1890 *Yvesia pyrula* (Carter, 1876) *Yvesiella pyrula* (Carter, 1876)
Collection Details	Western Greenland shelf 67.967° N, -59.484° W, Depth 877 m
Form	Stalked. The distal portion was mostly dislodged after collection.
Size	9 cm long.
Colour	Yellow.
Consistency	Firm.
Surface	Smooth.
Spicules	The megascleres are long, smooth tornotes (A) 440 (394-485) x 11.7 (10-13) µm, and entirely spined acanthostyles (B, C) 140 (115-190) x 12 (8-18) µm. Microscleres are isochelae (D) 23 (18-28) µm in length N=27.
Habitat	Found growing on *Keratoisis* coral skeletons.
Distribution (WPD)	Amphi-Atlantic.
Remarks	Arndt (1935) suggests that the form can have a more lobate body with many porefields. This specimen was small however, thus the lobed form may be more indicative of older sponges. Porefields were not obvious in this specimen. Boury-Esnault *et al.*, (1994) state that the inhalant pores form sieves, but this was not seen in this specimen either.
References	Arndt (1935), Boury-Esnault *et al.* (1994).

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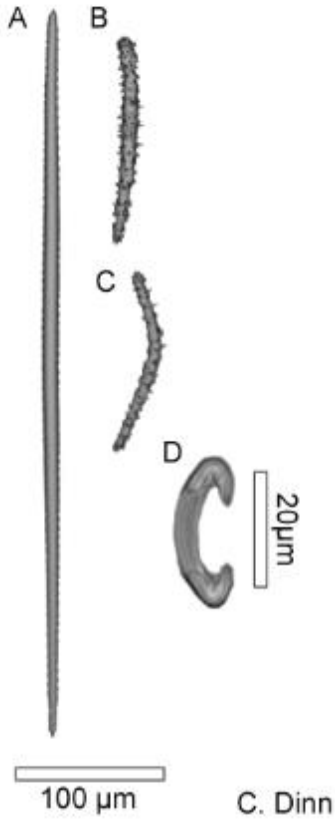

Lissodendoryx (Lissodendoryx) complicata (Hansen, 1885)

Sample	CMNI 2018-0140
Family	COELOSPHAERIDAE
Synonyms	*Clathria corallorhizoides* Fristedt, 1887 *Lissodendoryx complicata* (Hansen, 1885) *Lissodendoryx corallorhizoides* (Fristedt, 1887) *Reniera complicata* Hansen, 1885
Collection Details	western Greenland shelf 67.967° N, -59.484° W, Depth 877 m
Form	Compressed branches that arise from a single basal stalk.
Size	Branches are about 5 cm long.
Colour	Yellow to beige.
Consistency	Flexible.
Surface	Slightly hispid, with small depressions.
Spicules	Megascleres are large, smooth, slightly bent styles (A) 581 (515-686) x 24 (18-28) µm, and smooth tylotes (B) 289 (233-363) 6 (3.5-8.6) µm. Smooth strongyles were uncommon 279 (120-397) x 33 (27-46) µm N=6. Microscleres are isochelae (C) 49 (41-56) µm in length, small sigmas (D) 19 (15-23.5) µm in length, and uncommon large sigmas (E) 50 (45-57) µm in length N=4.
Habitat	Found growing amongst dead *Keratoisis* coral skeletons.
Distribution (WPD)	Amphi-Atlantic as well as Northern Russia.
Remarks	The specimen was very small. This species can grow in large bushes and have an elaborately branched form.
References	Boury-Esnault *et al.* (1982), Tompkins *et al.* (2017).

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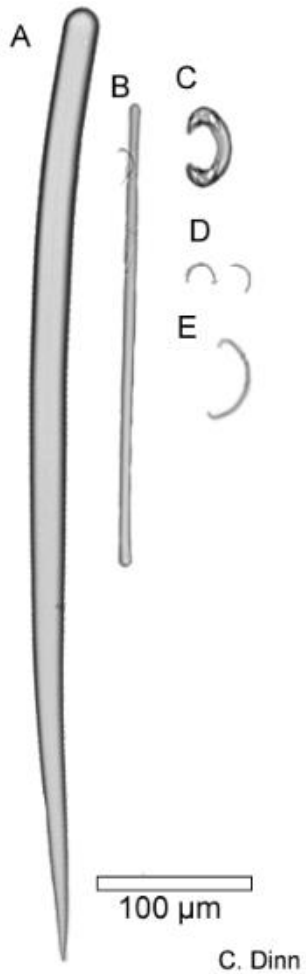
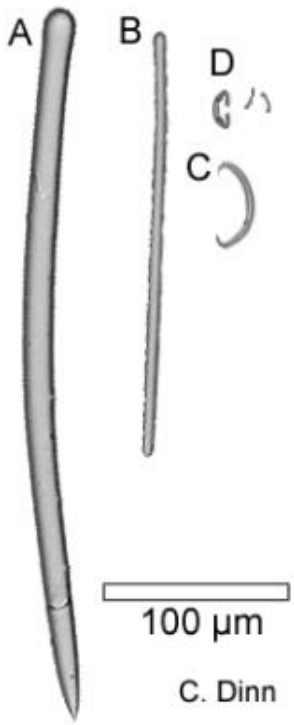


Lissodendoryx (Lissodendoryx) indistincta (Fristedt, 1887)

Sample	CMNI 2018-0182, CMNI 2018-0192
Family	COELOSPHAERIDAE
Synonyms	*Ectyodoryx indistincta* (Fristedt, 1887) *Hastatus indistincta* Fristedt, 1887 *Hastatus indistinctus* Fristedt, 1887 *Lissodendoryx indistincta* (Fristedt, 1887) *Zetekopsis indistinctus* (Fristedt, 1887)
Collection Details	Frobisher Bay 63.639° N, -68.627° W, Depth 141 m 62.868° N, -66.746° W, Depth 288 m
Form	Massive, lobed, many large oscula.
Size	10 cm by 10 cm but could grow larger as only fragments were collected.
Colour	Yellow to brown.
Consistency	Soft, slimy.
Surface	Has many depressions. Large oscula are present at the distal portions but collapse after collection.
Spicules	Megascleres are large and smooth styles (A) 338 (341-412) x 15 (8.5-19.5) 230 µm, tornotes (B) are 229 (201-249) x 7.7 (5.7-9.6) µm. Microscleres are sigmas (C) 44 (38-52) µm in length, large isochelae are in two size categories, the larger (D) are 24 (19-38) µm in length, and the smaller are 11.6 (9-16) µm in length.
Habitat	Unknown.
Distribution (WPD)	Amphi-Atlantic.
Remarks	Fits the description in Tompkins *et al.*, (2017).
References	(Tompkins *et al.*, 2017).

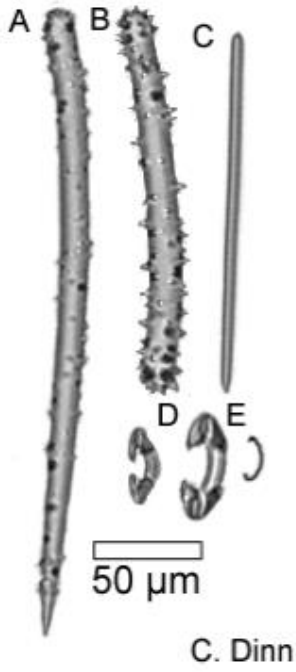
Top: whole. Bottom: in pieces.



Lissodendoryx (Lissodendoryx) lundbecki Topsent, 1913

Sample	CMNI 2018-0207
Family	COELOSPHAERIDAE
Synonyms	*Lissodendoryx lundbecki* Topsent, 1913
Collection Details	Pond Inlet 72.832° N, -77.602° W, Depth 767 m
Form	Branching, multilobate.
Size	Small, only a fragment was collected 3 x 3 cm.
Colour	Beige to light grey.
Consistency	Soft but incompressible.
Surface	The surface is covered in many depressions and is slightly hispid.
Spicules	The megascleres are acanthostyles (A) 297 (265-320) x 15.4 (13-17) µm, acanthostrongyles (B) 207 (186-229) x 19 (15-24) µm N = 18, and tornotes (C) 190 (156-208) x 7.5 (5-9.5) µm N=21. Microscleres are isochelae in two size categories (D) 51 (30-63) µm and 28 (22-40) µm in length, and sigmas (E) that are 25 (21-29.5) µm in length N =27.
Habitat	This sponge was found growing on a sandy bottom.
Distribution (WPD)	NW Atlantic and Arctic, Northern Russia, Alboran Sea, Northern Norway and Finnmark.
Remarks	Branches may arise from a more leaf-shaped base as described by Tompkins *et al.* (2017). Acanthostyles are sometimes modified into acanthostrongyles, which were not described previously, however the presence of two categories of anisochelae and only one size category of sigma, as well as the outer morphology do appear to fit the description of *L. lundbecki.*
References	Tompkins *et al.* (2017).

Top: *in situ*. Bottom: collected as a piece.

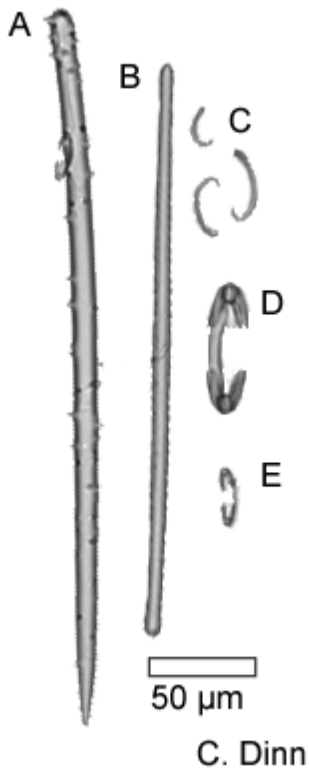


Lissodendoryx sp. Topsent, 1892

Sample	CMNI 2018-0186
Family	COELOSPHAERIDAE
Collection Details	Frobisher Bay 63.639° N, -68.627° W, Depth 141 m
Form	Bundles of spongin radiating outwards from the point of attachment.
Size	Specimen is about 6 cm in breadth, though may be a portion of a larger sponge.
Colour	Brown.
Consistency	Soft, fibrous.

Collected as a piece.

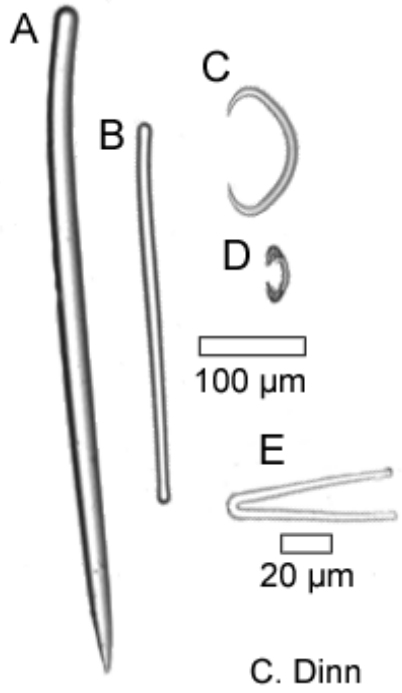
Surface	Has a thin translucent membrane covering fibourous tracts.
Spicules	Megascleres are acanthostyles (A) 325 (237-387) x 12 (7-14) µm, and tylotes (B) 275 (245-361) x 8 (6-11) µm. Microscleres are sigmas in two sizes (C) 67 (39-77) µm and 27 (20-34) µm in length, and isochelae in two sizes 64 (55-71) µm (D) and 27 (17-29) µm (E) in length.
Habitat	Unknown.
Distribution (from Tompkins *et al.* 2017)	Northern Hudson Strait/Ungava Bay.
Remarks	Fits the description of a similar sponge described in Tompkins *et al.* (2017) where tylotes and acanthostyles are distinctive characteristics though was not formally described as a species. This sponge was found with mollusc eggs embedded in the tissue.
References	Tompkins *et al.* (2017)



Forcepia (Forcepia) fabricans (Schmidt, 1874)

Shown whole.

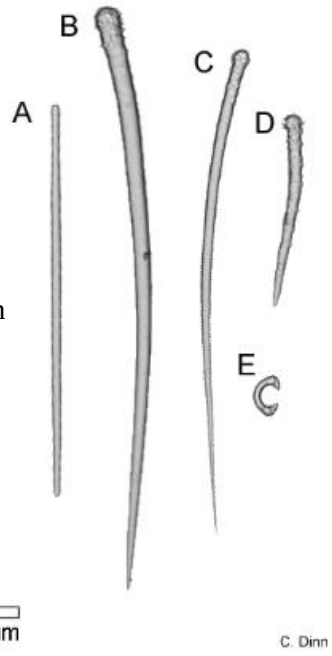
Sample	CMNI 2018-0174
Family	COELOSPHAERIDAE
Synonyms	*Esperia fabricans* Schmidt, 1874 *Forcepia fabricans* (Schmidt, 1874) *Forcipina bulbosa* Vosmaer, 1885 *Hamigera (Forcipina) fabricans* (Schmidt, 1874)
Collection Details	Frobisher Bay 62.954° N, -67.139° W, Depth 402 m
Form	Cushion shaped.
Size	About 6 cm in diameter.
Colour	Yellow.
Consistency	Firm. Thick mucous.
Surface	Several large oscula (<5mm) on the upper portion. Very small papillae are noticeable on the upper portion.
Spicules	Megascleres are styles (A) 610 (544-667) x 25 (22-29) µm, and tylotes (B) 367 (312-408) x 14 (11-18) µm. Microscleres are sigmas (C) 239 (111-158) µm in length, isochelae (D) 48 (40-54) µm in length, and forceps (E) with a length of ~53 µm and width at the top of the arch of ~3.8µm. Smaller forceps were present, but not common.
Habitat	Rocky bottoms.
Distribution (WPD)	Amphi-Atlantic.
Remarks	Fits the description in Tompkins *et al.* (2017), though is more yellow in colour.
References	Tompkins *et al.* (2017).



Hymedesmia (Hymedesmia) paupertas (Bowerbank, 1866)

Sample	CMNI 2018-0086
Family	HYMEDESMIIDAE
Synonyms	*Anchinoe paupertas* (Bowerbank, 1866) *Ectyodoryx paupertas* (Bowerbank, 1866) *Hymedesmia paupertas* (Bowerbank, 1866) *Hymeniacidon paupertas* Bowerbank, 1866 *Myxilla paupertas* (Bowerbank, 1866)
Collection Details	North Labrador Sea 60.315° N, -61.880° W, Depth 286 m
Form	Encrusting, very small.
Size	~5mm, but was seen to encrust large portions of boulders in ROV video.
Colour	Blue to greenish.
Consistency	Firm.
Surface	See Ackers, 1992.
Spicules	Megascleres are tornotes (A) 310 (282-342) x 8.3 (6.3-10.7), long acanthostyles (B, C) (less common) 453 (403-558) x 14.8 (7.5-18.5) µm N = 6, short acanthostyles are fully spined (D) 171 (152-190) x 11 (7.5-14.1) µm. Microscleres are isochelae (E) 35 (32.7-38.2) µm N = 7.
Habitat	Rocky bottom. Was collected encrusting on a rock.
Distribution (WPD)	Azores, Cape Verde, Celtic Seas, European Waters, South European Atlantic shelf
Remarks	Fits the description in Ackers, 1992. Specimen was very small, therefore few spicules could be measured.
References	Ackers *et al.* (1992)

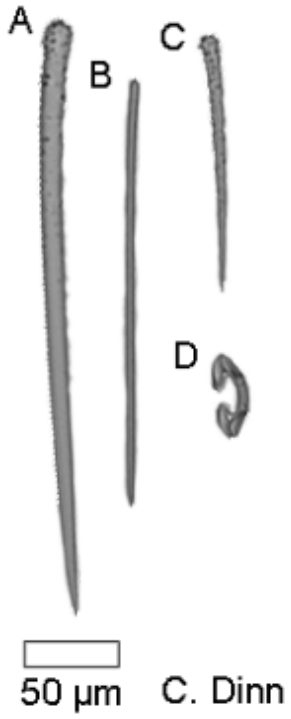
Top: *in situ*. Bottom: collected in pieces.



Hymedesmia sp. Bowerbank, 1864

Sample	CMNI 2018-0193
Family	HYMEDESMIIDAE
Collection Details	Frobisher Bay 62.868° N, -66.746° W, Depth 288 m
Form	Massive, lobate, and slightly branching.
Size	Individuals are about 4 cm in breadth and up to 3 cm in height.
Colour	Beige to yellow.
Consistency	Soft.
Surface	Pore fields cover the outer surfaces.
Spicules	Megascleres are acanthostyles in two sizes 292 (248-325) x 12.6 (9-17) µm, and 131 (97-156) x 8.3 (6-10.7) µm, and tornotes with one end thicker than the other 214 (186-247) x 5.8 (4.3-8) µm. Microscleres are isochelae 39 (28.5-51) µm.
Habitat	Unknown.
Distribution (WPD)	Unknown.
Remarks	Since *Hymedesmia* and *Phorbas* share similar spicule characters, this sponge may actually be *Phorbas* sp.
References	Hooper and Van Soest (2002)

Collected in pieces.



Phorbas sp. Duchassaing & Michelotti, 1864

Sample	CMNI 2018-0131
Family	HYMEDESMIIDAE
Synonyms	*Anchinoe* Gray, 1867 *Bipocillopsis* Koltun, 1964 *Clathrissa* Lendenfeld, 1888 *Grayax* Laubenfels, 1936 *Lissopocillon* Ferrer-Hernandez, 1916 *Merriamium* Laubenfels, 1936 *Plumohalichondria* Carter, 1876 *Podotuberculum* Bakus, 1966 *Pronax* sensu Gray, 1867: 536 *Pronaxella* Burton, 1931 *Stylostichon* Topsent, 1892 *Suberotelites* Schmidt, 1868
Collection Details	North Labrador Sea (SE Baffin shelf) 63.004° N, -60.642° W, Depth 457 m

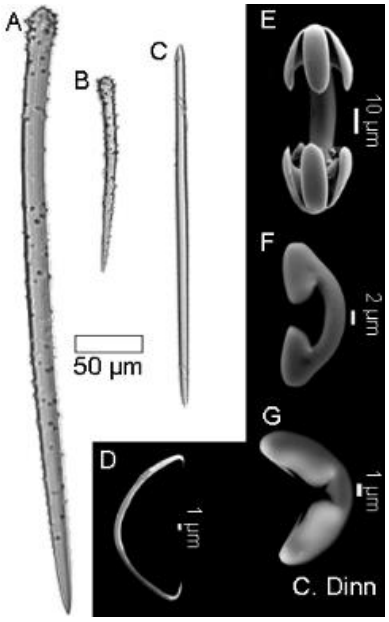
Shown whole.

Form	Thickly encrusting. Collected growin on gastropod shell.
Size	About 10 cm long, over 1 cm thick in portions.
Colour	Yellow
Consistency	Firm.
Surface	Irregular, with many ridges and folds.
Skeleton	Tornotes are more common at the surface, often perpendicular to it but generally scattered. The chelae are concentrated at the surface, with stigmata found throughout the choanosome. The acanthostyles form plumose bundles and are echinated by smaller acanthostyles.
Spicules	Megascleres are acanthostyles 405 (357-470) µm x 19 (16-25) µm, echinating entirely spined acanthostyles are 149 (110-249) x 12 (8-14) µm, and smooth tornotes 265 (231-467) µm. Microscleres are sigmas 48 (28-76) µm in length, and arcuate isochelae in three size categories 55 (24-74) µm, 27 (18-42) µm, and 13 (10.5-20) µm. The smallest isochelae have a very short shaft.
Habitat	Rocky bottoms. Found encrusting a gastropod shell.
Distribution	Unknown.

(WPD)

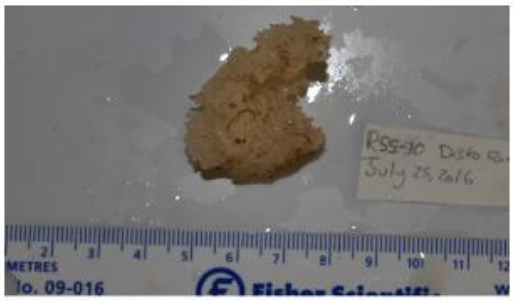
Remarks — This species is most similar to the three Phorbas species described with sigmas, *P. dives*, *P. bihamiger*, and *P. microchelifer*, however it has a third category of isochelae. The largest isochelae in this specimen are almost twice the size of the largest isochelae in these known species.
The described species are noted as living in shallow water, whereas this specimen was found in deep water. The skeleton with echinating acanthostyles within plumose bundles assures the placement in the genus *Phorbas.*

References — Ackers *et al.* (1992), Hooper and Van Soest (2002), Waller (1878)

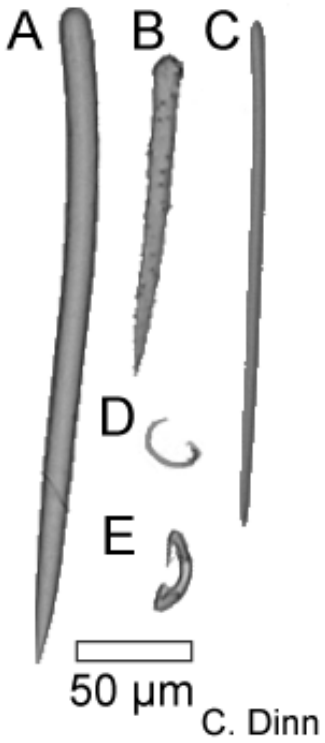


Phorbas microchelifer (Cabioch, 1968)

Sample	CMNI 2018-0138
Family	HYMEDESMIIDAE
Synonyms	*Pronax microchelifer* (Cabioch, 1968) *Stylostichon microcheliferum* Cabioch, 1968
Collection Details	Western Greenland shelf (Disko Fan) 67.967° N, -59.485° W, Depth 878 m
Form	Likely massively encrusting. Found growing on dead *Keratoisis* coral skeletons.
Size	A portion about 3 cm wide was collected.
Colour	Off-white
Consistency	Soft, friable.
Surface	Irregular. Pore fields are not consistent along the body.
Spicules	Megascleres are very faintly spined acanthostyles (A) 288 (245-315) x 14 (11-16) µm, echinating acanthostyles (B) are entirely spined and are less common 151 (136-181) x 9.6 (5-12) µm N = 11, and tornotes (C) 199 (134-222) x 703 (5.7-10.7) µm. Microscleres are sigmas (D) 26.6 (22-31) µm in length, and arcuate isochelae (E) 36 (27-50) µm in length.
Habitat	Was found growing on dead *Keratoisis* coral skeleton.
Distribution (WPD)	European waters.
Remarks	This specimen was collected growing on dead coral skeleton, and there was a crinoid attached to the sponge, therefore only a portion was collected. The size of the lightly spined acanthostyles, echinating acanthostyles, tornotes, and stigmata fit the original description. The size of the arcuate isochelae are larger in this specimen, however. The spines on the acanthostyles in this specimen are much more finely spined and most appear to be styles.



Collected as a piece held by a crinoid.



The species is known from shallow water ~ 30 m, however this specimen was found in very deep water on the Western Greenland shelf. Further DNA work on the genus is required to distinguish it from sigma bearing *Phorbas* species.

References Cabioch (1968)

Plocamionida ambigua (Bowerbank, 1866)

Sample	CMNI 2018-0090
Family	HYMEDESMIIDAE
Synonyms	*Antho lundbecki* (Breitfuss, 1912) *Hastatus ambiguus* (Bowerbank, 1866) *Hymedesmia indistincta* Bowerbank, 1874 *Microciona ambigua* Bowerbank, 1866 *Myxilla lundbecki* Breitfuss, 1912 *Placomia ambigua* (Bowerbank, 1866) *Plocamia ambigua* (Bowerbank, 1866) *Plocamia lundbecki* (Breitfuss, 1912)
Collection Details	Northern Labrador Sea (Saglek Bank) 60.313° N, -61.880° W, Depth 279 m
Form	Encrusting.
Size	Very thinly encrusting but covered a 10 cm wide portion of rock.
Colour	Pink.
Consistency	Appears soft, slightly hispid.
Surface	Mostly even, but portions are lumpy after collection.
Spicules	Megascleres are acanthostyles in two size categories (A) 706 (524-923) x 24 (19-31) µm N =15, and (B) 297 (168-481) x 13.7 (9-22.5) µm, acanthostrongyles (C) that are entirely spined 144 (123-160) x 10.6 (6-12.5) µm, and tornotes (D) 352 (289 -595) x 8.5 (6.5-10.6) µm. Microscleres are palmate isochelae (E) 30.6 (27-36) µm long.
Habitat	Encrusting on rocks.
Distribution (WPD)	Amphi-Atlantic.
Remarks	Descriptions of this species show high variability of spicule sizes. However, the spicule complement, colour, and habit of the sponge are similar to the description in Ackers *et al.* (1992)
References	Ackers *et al.* (1992)

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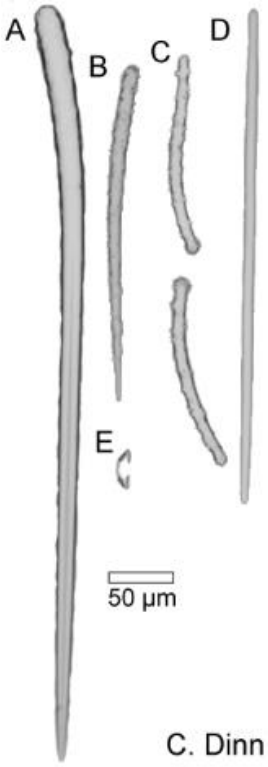

Plocamionida sp. Topsent, 1927

Sample	CMNI 2018-0088
Family	HYMEDESMIIDAE
Synonyms	*Hymendectyon* Bakus, 1966
Collection Details	Northern Labrador Sea (Saglek Bank) 60.313° N, -61.880° W, Depth 279 m
Form	Encrusting, irregular.
Size	1 x 1 cm.
Colour	Yellow.
Consistency	Slightly hispid.
Surface	Irregular.
Spicules	Megascleres are styles (A) with a faintly spined head that may be tylote 508 (446-567) x 11.5 (8.7-13) µm and inequiended tornotes (B) 314 (279-339) x 6.6 (4.8-7.8) µm. Microscleres were not seen in spicule preparations though outer surface of sponge may have been lost upon collection.
Habitat	Encrusting on rocks.
Distribution (WPD)	Unknown.
Remarks	The lack of microscleres casts doubt on the identification of this specimen, however, COI sequences suggest the genus. This sponge was growing sympatrically with *P. ambigua*, though the colour and form of the sponge is clearly different from that species.
References	Hooper and Van Soest (2002)

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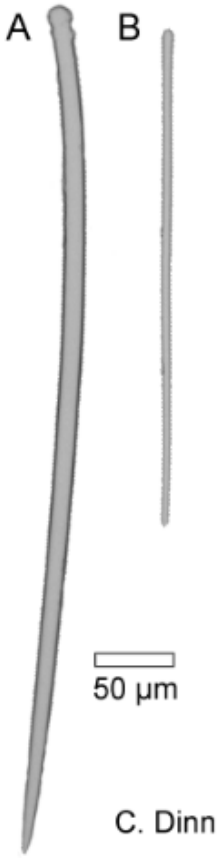
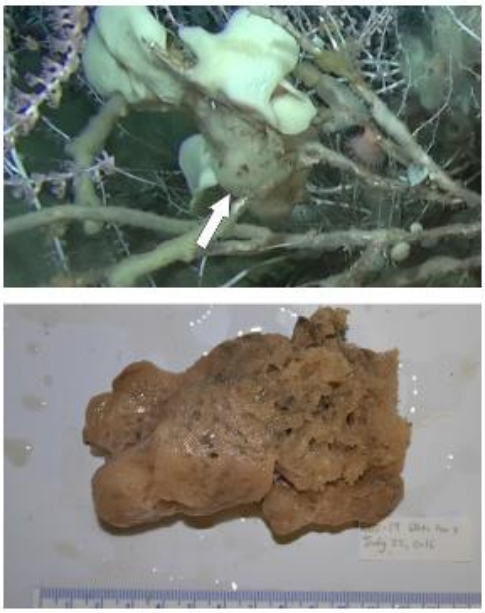
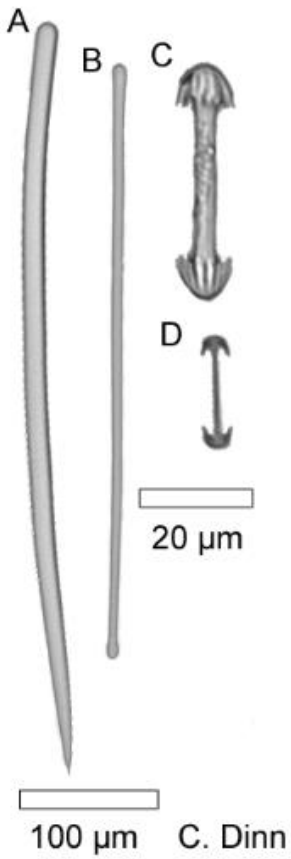


Iotroata affinis (Lundbeck, 1905)

Sample	CMNI 2018-0147, CMNI 2018-0151
Family	IOTROCHOTIDAE
Synonyms	*Iotrochota affinis* Lundbeck, 1905
Collection Details	Western Greenland shelf (Disko Fan) 67.967° N, -59.484° W, Depth 877 m
Form	Massive.
Size	About 10 cm wide.
Colour	Buff to beige.
Consistency	Smooth, slippery.
Surface	Smooth appearance.
Spicules	Megascleres are styles, often curved and sometimes flexus (A) 544 (503-603) x15.5 (13-19.5) µm, tylotes (B) 389 (325 -441) x 7.7 (6-9.8) µm, and uncommon thick strongyles 362 (326-399) x 20 (17-22.5) µm N = 3. Microscleres are birotulae in two size categories 43 (34-52) µm in length (C), and 1.95 (16.5-24) µm in length (D).
Habitat	The sponge was found growing on dead coral skeleton. *Haliclona (Reniera)* sp. *1* was found growing inside the osculum of one specimen.
Distribution (WPD)	East Greenland shelf.
Remarks	Lundbeck (1905) suggests there are three species of *Iotroata* (previously *Iotrochota*) with two size categories of birotulae. This specimen does not have acanthostyles, and therefore does not fit the description of *I. spinosa*, and the large birotules in this specimen are much larger than those in *I. polydentata.* This therefore strongly suggests that this specimen is *I. affinis*. The uncommon strongyles may just be ill-formed styles, but are noticeably thicker than any measured styli, therefore they may have been missed in previous descriptions, or may simply be a spicule variation on the Western Greenland shelf compared to the type specimen which was collected in the east.



Top: arrow shows specimen *in situ.*
Bottom: shown whole.



Lundbeck (1905) considered the number of teeth on the birotulae to be a diagnostic character, and there appear to be 12 or more teeth on the larger size, but the teeth on the smaller size spicules were not easily counted.

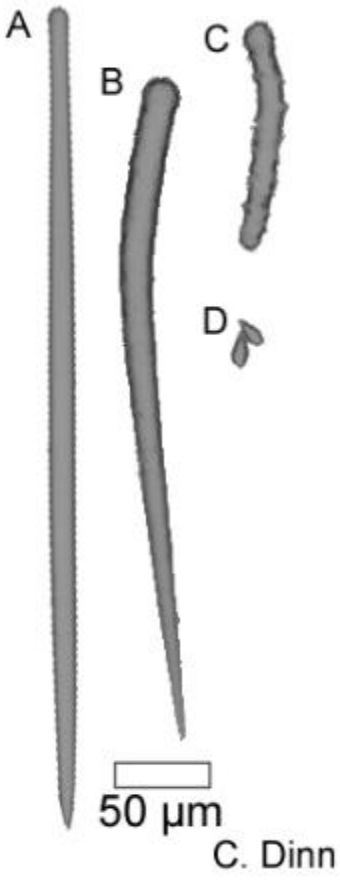
References (Lundbeck, 1905)

Antho (Acarnia) signata (Topsent, 1904)

Sample	CMNI 2018-0079
Family	MICROCIONIDAE Subfamily OPHLITASPONGIINAE
Collection Details	Northern Labrador Sea (NE Hatton Basin) 61.489° N, -60.839° W, Depth 615 m
Form	Encrusting.
Size	2 cm wide crust.
Colour	Off-white.
Consistency	Hard.
Surface	Hispid.

Shown whole.

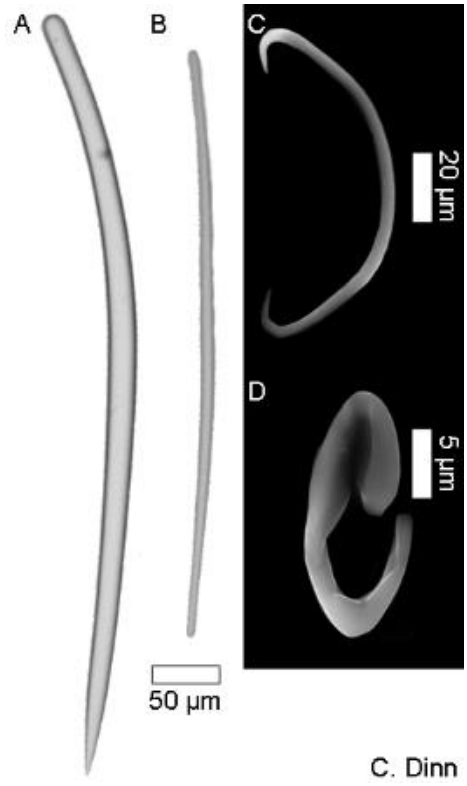
Spicules	Megascleres are styles, uncommonly very long 1081 (691-1472) x 26 µm N = 2, and most commonly smooth with microspined heads 402 (355-446) x 14.7 (12-18) µm, acanthostyles are fully spined and are 357 (273-419) x 17 (12-19.5) µm N = 8, and entirely spined acanthostrongyles 126 (108-157) x 14 (10.5-20) µm. Microscleres are toxas 94 (70-130) µm in length N= 7 (not shown) and anisocleistochelae 14.6 (12.2-18) µm long.
Habitat	Encrusting on rocky bottoms.
Distribution (WPD)	South European Atlantic shelf, Saharan upwelling, Ionian Sea, Azores.
Remarks	The anisocleistochelae are diagnostic in this species, however in this specimen they appear completely fused into teardrop shaped spicules. Scanning electron microscopy is needed to identify these microscleres. Van Soest *et al.* (2013) suggest that spicules in this species are quite variable in size, so despite the fact that this species has only been found further south in the Atlantic, it fits the species description.
References	Van Soest *et al.* (2013), Topsent (1904)



Mycale (Anomomycale) titubans (Schmidt, 1870)

Sample	CMNI 2018-0109
Family	MYCALIDAE
Synonyms	*Anomomycale titubans* (Schmidt, 1870) *Desmacidon titubans* Schmidt, 1870 *Mycale titubans* (Schmidt, 1870)
Collection Details	Northern Labrador Sea (Saglek Bank) 60.469° N, -61.289° W, Depth 401 m
Form	Encrusting, irregular.
Size	4 cm wide by 1-2 cm high
Colour	Bright yellow
Consistency	Firm.
Surface	Hispid.
Skeleton	Large styles form the primary skeleton forming a polyspicular reticulation. The smaller styles either echinate these tracts or are bundled at the surface. Microscleres are scattered throughout the sponge but concentrated at the surface.
Spicules	Megascleres are styles in two categories, (A) 565 (484-646) x 19.6 (16-24) µm and (B) 425 (350-595) x 9.6 (7.5-16) µm. The microscleres are sigmas (C) 70 (55-97) µm in length and anomochelae (D) – also described as "cleistochelate" anisochelae (Van Soest *et al*., 2014*)* 28 (26-30) µm in length. Sometimes these anomochelae are more anisochelae-like.
Habitat	Was found associated with *Biemna variantia* on a rocky bottom habitat.
Distribution (WPD)	Azores, South European shelf, South and West Iceland, Off the coast of Florida.
Remarks	Sigmas are not as long (up to 262µm) as those in the description by Boury-Esnault & Van Beveren (1982) but are more similar to those described by Van Soest *et al.* 2014) (50-130 µm) and Topsent (1928) (70-115 µm). The

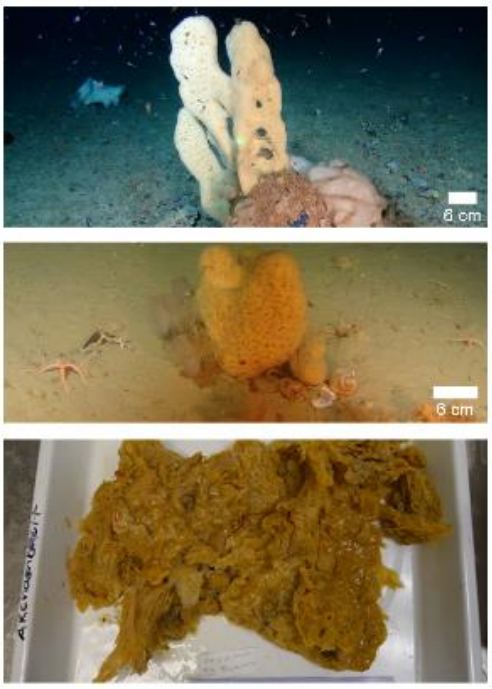
Top: shown whole. Bottom: arrow shows sponge growing on *Biemna*.



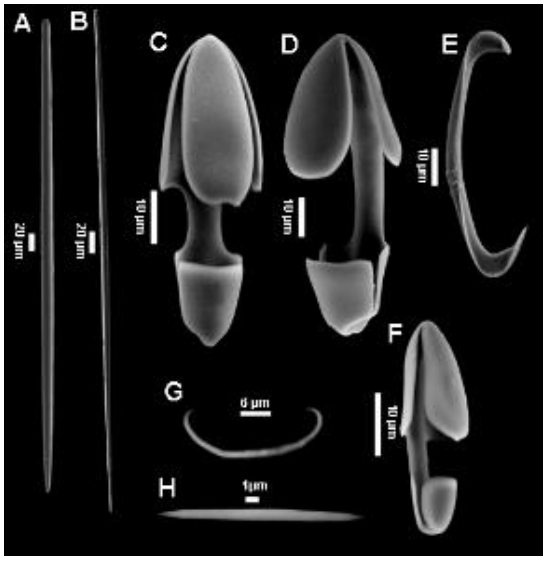
	presence of anisochelae as well as anomochelae is not described elsewhere, but this specimen may show how these spicules transition from the standard form to the more derived anomochelae.
References	Boury-Esnault *et al.* (1982), Van Soest *et al.* (2014)

Mycale lingua (Bowerbank, 1866)

Sample	CMNI 2018-0053, CMNI 2018-0071, CMNI 2018-0152, CMNI 2018-0167, CMNI 2018-0196
Family	MYCALIDAE
Synonyms	*Desmacidon constrictus* Bowerbank, 1866 *Esperella lingua* (Bowerbank, 1866) *Esperella placoides* (Carter, 1876) *Esperella vosmaeri* Levinsen, 1887 *Esperia constricta* (Bowerbank, 1866) *Esperia lingua* (Bowerbank, 1866) *Esperia lucifera* Schmidt, 1873 *Esperia placoides* Carter, 1876 *Hymeniacidon lingua* Bowerbank, 1866 *Mycale (Mycale) vosmaeri* (Levinsen, 1887) *Mycale lingua* (Bowerbank, 1866) *Mycale placoides* (Carter, 1876) *Mycale vosmaeri* (Levinsen, 1887) *Raphioderma coacervata* Bowerbank in Norman, 1869 *Raphiodesma lingua* (Bowerbank, 1866)
Collection Details	Frobisher Bay 63.111° N, -67.518° W, Depth 459 m 62.954° N, -67.139° W, Depth 402 m 62.868° N, -66.746° W, Depth 288 m Northern Labrador Sea (NE Hatton Basin) 61.440° N, -60.665° W, Depth 631 m Northern Baffin Bay /Nares Strait 76.317° N, -75.771° W, Depth 333 m western Greenland shelf (Disko Fan) 67.967° N, -59.484° W, Depth 877 m
Form	Massive, lobed, sometimes erect.
Size	Variable. Can be quite large up to 30 cm in diameter.
Colour	Yellow to light orange.
Consistency	Soft, with firm roots near the base.
Surface	Distinguished by conspicuous surface furrows *in situ*, these collapse after collection and appear like a soft mass near the distal portions.



Top/middle: *in situ.* Bottom: piece on-board.

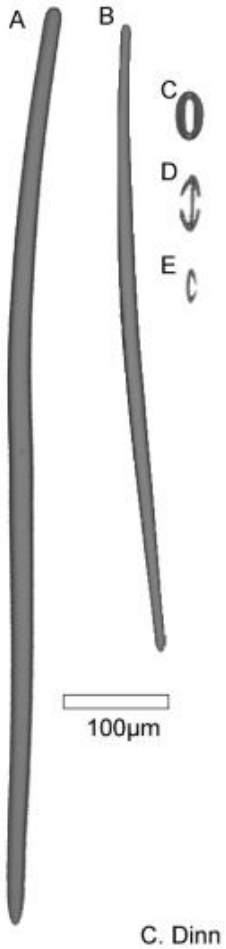


Spicules	Spicules consist of styles/mycalostyles (A) 514 (400-590) x 16 (12-20) µm, anisochelae I (C-E) 73(52-88) µm, anisochelae II (F) 37.5(28.5-50) µm, sigmas (G) 20(14.5-26) µm, and raphides (H) which were rare and did not form conspicuous trichodragmas in the Frobisher Bay specimen 43 (30-53) µm n=16.
Habitat	Rocky bottoms.
Distribution (WPD)	Amphi-Atlantic.
Remarks	This species is large and conspicuous *in situ* and after collection. *(Mycale) loveni* (Fristedt, 1887) has been suggested to occur in this region but has not been collected nor confirmed in the WPD. In the eastern Canadian specimens, only two size categories of anisochelae were found. Some descriptions of this species state that there may be three sizes of anisochelae (Boury-Esnault, 1994).
References	Ackers *et al.* (1992), Boury-Esnault *et al.* (1994)

Melonanchora elliptica Carter, 1874

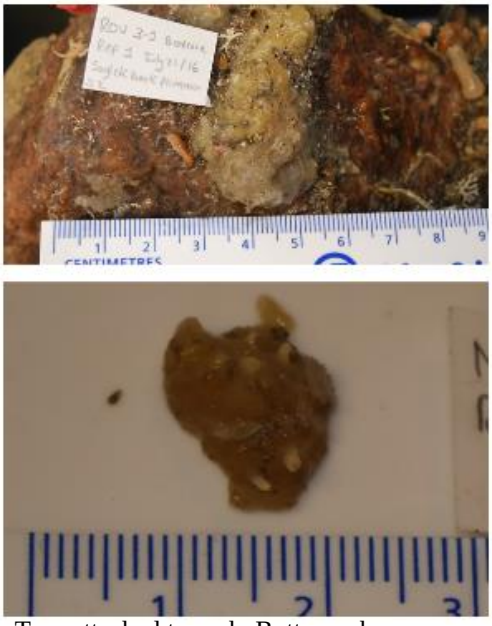
Sample	CMNI 2018-0107
Family	MYXILLIDAE
Collection Details	Northern Labrador Sea (Saglek Bank) 60.463° N, -61.280° W, Depth 427 m
Form	Encrusting with tubercles.
Size	Crusts are about 3 cm wide.
Colour	Dermal membrane is more or less clear, and the underlying choanosome is yellow.
Consistency	Soft and compressible.
Surface	The dermal membrane is smooth, with large ~2mm oscula. The oscula look like extended tubercles after collapse.
Spicules	Megascleres are styles, though only bluntly pointed (A) 833 (749-923) x 23 (18.5-26) µm N=13, and tylotes (B) 623 (554-693) x 15.5 (12.6-18.6) µm. Microscleres are sphaerancoras (C) 50 (43-53) µm in length N = 28, and anchorate isochelae in two sizes (D) 55 (35-64) µm in length N=28 and (E) 22 (18-27.6) µm in length.
Habitat	Rocky bottoms
Distribution (WPD)	European waters, western Mediterranean, northern Norway and Finnmark, South and west Iceland, eastern Greenland.
Remarks	The "bladder-like" body form described by Van Soest (2002) is not noticeable in these specimens as they were encrusting rocks. This species can look superficially similar to *Tedania (Tedania) suctoria* (Schmidt, 1870), though the spicules are distinctive between the two species.
References	Hooper and Van Soest (2002)

Top: attached to rock. Bottom: shown whole.

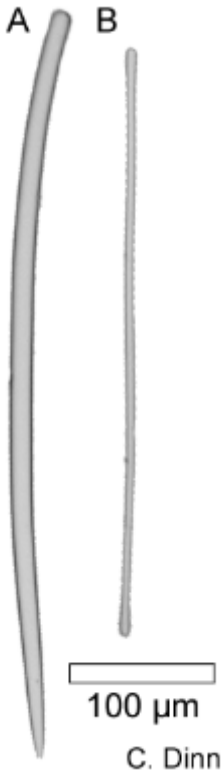


Tedania (Tedania) suctoria (Schmidt, 1870)

Sample	CMNI 2018-0097, CMNI 2018-0084, CMNI 2018-0085
Family	TEDANIIDAE
Synonyms	*Tedania conuligera* Topsent, 1892 *Tedania increscens* Schmidt, 1875 *Tedania suctoria* Schmidt, 1870
Collection Details	Northern Labrador Sea (Saglek Bank) 60.315° N, -61.880° W, Depth 286 m 60.466° N, -61.278° W, Depth 452 m
Form	Encrusting with small erect papillae.
Size	Up to 5 cm wide.
Colour	Off-white to yellow-orange.
Consistency	Soft.
Surface	Papillated.
Spicules	Megascleres are styles (A) 477 (355-428) x 13.4 (9-15) µm, and tylotes (B) 387 (347-481) x 6.7 (4.4-12) µm. Microscleres are onychaetes (not shown) that often appear like very thin oxeas though are finely spined 270 (197-296) x 3.8 (2.7-5.2) µm.
Habitat	Encrusting on rocks and boulders.
Distribution (WPD)	Amphi-Atlantic.
Remarks	Fits the descriptions by Lundbeck (1910) and Topsent (1928). This sponge can look very similar to *Melonanchora elliptica* Carter, 1874, but the spicule complements are distinctive. Oscula at the distal end of the papillae are not as large in this species as in *Melonanchora*.
References	Lundbeck (1910), Topsent (1928)



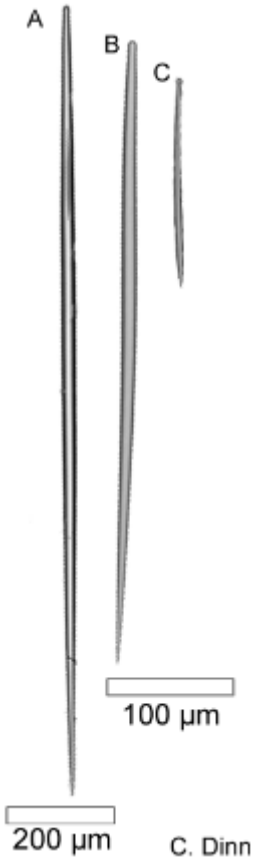
Top: attached to rock. Bottom: shown whole.



Polymastia uberrima (Schmidt, 1870)

Sample	CMNI 2018-0093, CMNI 2018-0103, CMNI 2018-0096
Family	POLYMASTIIDAE
Synonyms	*Polymastia infrapilosa* Topsent, 1927 *Rinalda uberrima* Schmidt, 1870
Collection Details	Northern Labrador Sea (Saglek Bank) 60.468° N, -61.287° W, Depth 412 m 60.466° N, -61.278° W, Depth 452 m
Form	Cushion shaped, ovoid to spherical.
Size	Up to 5 cm in diameter.
Colour	Yellow, brown choanosome.
Consistency	Firm with soft papillae.
Surface	Smooth with several large papillae on the upper surface.
Spicules	Megascleres are primary strongyloxea (A) 1399 (885-1682) x 28 (23-33) µm, intermediary tylostyles (B) 542 (409-762) x 15 (11-26) µm, and ecotosomal tylostyles (C) which are often curved 178 (127-216) x 13 (9.4-15) µm.
Habitat	Growing on boulders and rocks.
Distribution (WPD)	European waters, northern Norway and Finnmark, north and east Barents Sea, and South and west Iceland. Described as Amphi-Atlantic by Plotkin *et al.* (2017).
Remarks	Primary spicules are slightly longer and thicker and ectosomal tylostyles are slightly shorter than described in Boury-Esnault (1987), but COI sequences strongly suggest *P. uberrima*. Spicules are noted by Plotkin *et al.*, 2017 as being quite variable in size, and fit the measurements for specimens collected on the Grand Banks of Newfoundland.
References	Vacelet and Boury-Esnault (1987), Plotkin *et al.* (2017).

Top: *in situ*. Bottom: shown whole



Polymastia thielei Koltun, 1964

Sample	CMNI 2018-0121, CMNI 2018-0125, CMNI 2018-0154, CMNI 2018-0169, CMNI 2018-0194
Family	POLYMASTIIDAE
Collection Details	Frobisher Bay 62.953° N, -67.139° W, Depth 402 m 62.567° N, -66.282° W, Depth 377 m North Labrador Sea (SE Baffin shelf) 62.987° N, -60.629° W, Depth 500 m 63.004° N, -60.643° W, Depth 457 m western Greenland shelf 68.260° N, -59.823° W, Depth 1148 m
Form	Cushion shaped.
Size	Up to 7 cm in diameter.
Colour	Beige to light brown, with a dark brown choanosome.
Consistency	Firm.
Surface	Smooth with papillae scattered over body.
Spicules	The principal styles (A) are 964 (712-1181) µm x 22 (16-28) µm N=120, intermediary tylostyles (B) are 546 (409-750) µm x 15 (8.5-21.5) µm N=120, and small, often curved tylostyles (C) are 250 (160-312) µm x 12 (5.5-22) µm, N=120
Habitat	Hard bottom habitats.
Distribution (WPD)	North East Greenland shelf, Northern Norway and Finnmark, North and East Barents Sea, Southern Norway. Described as having a whole NE Atlantic Distribution by Plotkin *et al.* (2017), with one record on the Eastern Grand Banks.
Remarks	From specimens and ROV video collected in the eastern Canadian Arctic, this species is likely distributed throughout the whole eastern Canadian Arctic, as far north as Pond Inlet and potentially to Lancaster Sound. This species is clearly distinguished from congeneric species by having papillae on the whole spherical surface. COI sequences can also distinguish this species from *P. uberrima* quite clearly.
References	Koltun (1966), Plotkin *et al.* (2017)

Shown whole.

Polymastia grimaldii (Topsent, 1913)

Sample	CMNI 2018-0178
Family	POLYMASTIIDAE
Synonyms	*Polymastia mamillaris var. grimaldii* (Topsent, 1913) *Polymastia mamillaris var. hyperborea* Hentschel, 1916 *Radiella grimaldii* (Topsent, 1913) *Trichostemma grimaldii* Topsent, 1913
Collection Details	Frobisher Bay 63.663° N, -68.420° W, Depth 84 m
Form	Large, semicircular cushion with many papillae and wide tuft of spicules around the periphery.

Shown whole.

Size	Greater than 15 cm in diameter.
Colour	Yellow, with brown spicule tufts due to entrapped mud.
Consistency	Firm, with soft papillae.
Surface	Completely covered in long papillae, but hispid around the spicule tufts.
Spicules	Primary spicules are strongyloxeas 1523 (1043-2239) x 26 (12-34) µm, intermediate tylostyles are 501 (245-819) x 14 (10-29) µm, and small tylostyles are 206 (148-281) x 11.4 (7.3-15.6) µm. Exotyles from the spicule tuft are quite long and often broken but can be >6000 µm. See Plotkin *et al.* (2017) for spicule images.
Habitat	Unknown.
Distribution (WPD)	Eastern Greenland, Northeast Ireland, North and East Barents Sea. Reported from Newfoundland waters and Northwest Iceland by Plotkin *et al.*, (2017)
Remarks	The body form and extent of the exotyle tuft are distinctive of this species. Care should be taken not to confuse this species with *Polymastia hemisphaerica* (Sars, 1872), but the spicules are much longer in that species.
References	Plotkin *et al.* (2017)

Polymastia andrica de Laubenfels, 1949

Sample	CMNI 2018-0200
Family	POLYMASTIIDAE
Collection Details	Lancaster Sound 74.157° N, -80.468° W, Depth 786 m
Form	Cushion shaped, very long papillae (up to 1 cm long) and a tuft of spicules along the periphery.
Size	About 2 cm in diameter.
Colour	Brown.
Consistency	Firm.
Surface	Hispid, with trapped mud.
Spicules	Principal styles/subtylostyles are 1062 (647-1987) x 21 (14.7-33.8) µm, intermediate tylostyles are 521 (334-780) x 13.2 (10.4-16.7) µm, and small tylostyles 176 (154-204) µm. Exotyles are often broken 1898 (1552-2337) x 16.4 (13-19) µm N=3, though exotyles likely attain longer lengths.
Habitat	Sandy bottoms.
Distribution (WPD)	Gulf of St. Lawrence, Northern Norway and Finnmark, Southern Norway.
Remarks	Matches the description in Plotkin *et al.*, (2017). Long papillae are distinctive. This is one of only two sponges collected or seen in Lancaster Sound.
References	Plotkin *et al.* (2017)

Whole individuals.

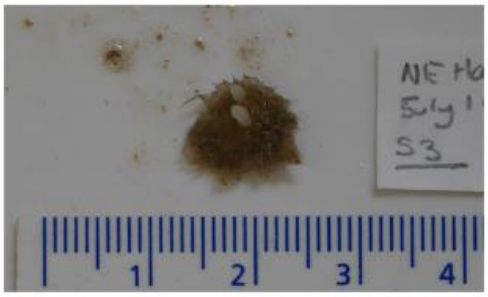
Tentorium semisuberites (Schmidt, 1870)

Top: attached to rock. Bottom: individual which was attached to *Keratoisis* coral.

Sample	CMNI 2018-0072, CMNI 2018-0083, CMNI 2018-0101, CMNI 2018-0104, CMNI 2018-0144, CMNI 2018-0163, CMNI 2018-0195, CMNI 2018-0199
Family	POLYMASTIIDAE
Synonyms	*Thecophora elongata* Marenzeller, 1877 *Thecophora ibla* Thomson, 1873 *Thecophora semisuberites* Schmidt, 1870
Collection Details	Frobisher Bay 62.954° N, -67.140° W, Depth 402 m 62.567° N, -66.172° W, Depth 377 m Northern Labrador Sea (NE Hatton Basin) 61.440° N, -60.664° W, Depth 620 m Northern Labrador Sea (Saglek Bank) 60.315° N, -61.881° W, Depth 286 m 60.466° N, -61.278° W, Depth 452 m 60.463° N, -61.280° W, Depth 427 m western Greenland shelf (Disko Fan) 67.967° N, -59.484° W, Depth 877 m western Greenland shelf 68.260° N, -59.823° W, Depth 1148 m Northern Baffin Bay/Nare's Strait 77.756° N, -76.650° W, Depth 400 m
Form	Toadstool shaped, columnar sponge with a convex upper portion scattered with papillae.
Size	Up to 3 cm tall.
Colour	Beige to grey, the upper portion is usually darker than the columnar body.
Consistency	Firm, bladder-like.
Surface	Smooth.
Spicules	Principal tylostyles are 1447 (1012-1713) x 20 (18-22) µm N=12, intermediate tylostyles are 1025 (855-1217) x 28 (23-33) N = 5, and small stout tylostyles are 417 (307-543) x 19 (13.6-24.5) µm. See Plotkin *et al.* (2017) for spicule images.
Habitat	Attached to hard surfaces including boulders, dead coral skeletons, and small pebbles.
Distribution (WPD)	Cosmopolitan.
Remarks	This is an easily identified species visually. The columnar body and round distal portion are distinctive.
References	Arndt (1935), Plotkin *et al.* (2017)

Spinularia cf. *sarsii* (Ridley & Dendy, 1886)

Sample	CMNI 2018-0078
Family	POLYMASTIIDAE
Synonyms	*Radiella sarsii* (Ridley & Dendy, 1886) *Trichostemma sarsii* Ridley & Dendy, 1886
Collection Details	Northern Labrador Sea (NE Hatton Basin) 61.489° N, -60.839° W, Depth 615 m
Form	Flat, discoid, with a fringe of spicules along the periphery. Few tiny papillae appear on the upper portion in the centre of the sponge.
Size	1 cm in diameter.
Colour	Brown, lighter towards the centre of the sponge.
Consistency	Firm.
Surface	Hispid.
Spicules	Principal styles to tylostyles (A) are 911 (632-1122) x 16.5 (11-19) µm, intermediate tylostyles (B) are 385-402 x 11-12 µm N = 2, small tylostyles (C) are 145 (122-181) x 7.2 (3.6-10.3) µm. Exotyles were not measured.
Habitat	Hard bottom.
Distribution (WPD)	Atlantic Ocean south of the Grand Banks.
Remarks	The spicules described in Plotkin *et al.* (2017) are longer than in this specimen, however the general body form appears to fit this species. The genus *Spinularia* is problematic, and thus more work is required to identify specimens to species.
References	Plotkin *et al.* (2017)



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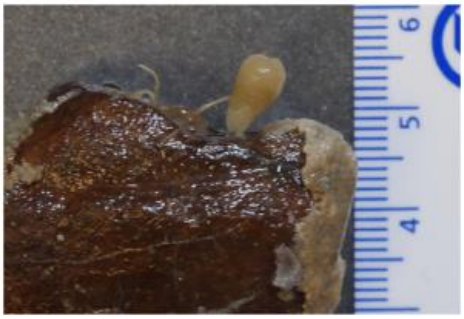
Quasillina brevis (Bowerbank, 1861)

Sample	CMNI 2018-0076
Family	POLYMASTIIDAE
Synonyms	*Bursalina muta* Schmidt, 1875 *Euplectella brevis* Bowerbank, 1861 *Polymastia brevis* (Bowerbank, 1861)
Collection Details	Northern Labrador Sea (NE Hatton Basin) 61.490° N, 60.839° W, Depth 615 m
Form	Bladder-like, club shaped sponge.
Size	Less than 1cm in height.
Colour	Pale yellow.
Consistency	Firm.
Surface	Smooth.
Spicules	The principal spicules are subtylostyles to styles (A) 785 (560-996) x 22 (14-28.5) µm. Small tylostyles are divisible in two categories: the thicker ones (B) are 184 (153-210) x 9 (7.5-11.7) µm; and the thinner ones (C) are 185 (154-216) x 6 (3.4-8.5) µm. The thinner tylostyles are often bent near the pointed end.
Habitat	Was found in a rocky bottom habitat.
Distribution (WPD)	Amphi-Atlantic. Not previously recorded from the North Labrador Sea.
Remarks	The thin, bent small tylostyles are characteristic of *Q. richardi* Topsent, 1913, however Plotkin *et al.* (2017) suggest that this description by Topsent was based on the idea that northern Norwegian specimens only had these slightly bent spicules, however this is not the case. Therefore, until genetic material becomes available, *Q. richardi* should be considered a junior synonym of *Q. brevis*.
References	Plotkin *et al.* (2017)



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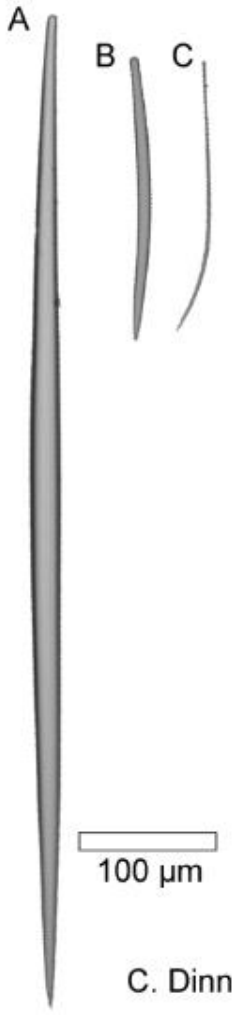


Plicatellopsis sp. Burton, 1932 (W. Greenland shelf morph)

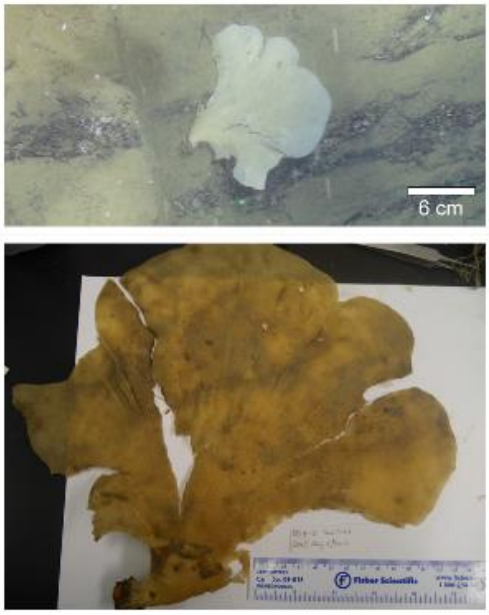
Sample	CMNI 2018-0135, CMNI 2018-0136, CMNI 2018-0145
Family	SUBERITIDAE
Collection Details	western Greenland shelf (Disko Fan) 67.967° N, -59.484° W, Depth 877.6 m
Form	Fan shaped, larger specimens have a characteristic “swiss-cheese” growth form with large holes in the fan.
Size	Up to 15 cm in diameter.
Colour	White *in situ*, off-white to light yellow after collection.
Consistency	Moderately firm and difficult to tear.
Surface	Minute indentations are scattered over outer surface.
Skeleton	Appears to have bundles of styles at the surface, though more sections are likely needed.
Spicules	The spicules are only styles 333 (284-389) x 19.8 (14.7-25.8) µm. These styles are sometimes faintly tylote with a characteristic bend near the head.
Habitat	Growing amongst dead *Keratoisis* coral skeletons. This species was a common and noticeable sponge throughout the coral-dominated habitat.
Distribution (WPD)	Unknown.
Remarks	The fan shape of these specimens and the skeleton formed of styles cause difficulty in identifying the genus. *Plicatellopsis* is a genus of sometimes-flabellate sponge with spicule bundles in the extra axial skeleton, but most species have tylostyles. *Homaxinella* contains sponges with more branching, arborescent forms and have styles as spicules, but the skeleton does not have spicule bundles near the surface.

Top: *in situ.* Bottom: Shown whole.

	However, a new species of *Plicatellopsis* from the Bering Sea shows a similar growth form to this specimen, a fan with a clear stalk. However, *Plicatellopsis borealis* Lehnert & Stone, 2017 has two size categories of tylostyles (though many appear to be styles). COI sequences of these sponges are similar to both *Plicatellopsis* and *Homaxinella.* Further work to identify this species is required. This smaller specimen of this species was found on the Western Greenland shelf, but a larger morph was found at the Pond Inlet site.
References	Hooper and Van Soest (2002), Lehnert and Stone (2017)

Plicatellopsis sp. Burton, 1932 (Pond Inlet Morph)

Sample	CMNI 2018-0202
Family	SUBERITIDAE
Collection Details	Pond Inlet 72.829° N, -77.609° W, Depth 856 m
Form	Large, fan shaped sponge that forms a funnel at the base. The single stalk attaches to a hard substrate.
Size	The sponge is > 30 cm in height and width.
Colour	Buff to light yellow. Appears bone white *in situ.*
Consistency	Very soft and thin. The sponge is easily damaged.
Surface	Indentations are aligned in longitudinal tracts along the outer surface of the sponge.
Spicules	Only styles 317 (258-359) x 18 (14-21) µm. These spicules often appear more tylostyle-like with irregular heads.
Habitat	This specimen was found growing on a bedrock wall. Previous descriptions of the species are described in shallower water up to 325 m.
Distribution (WPD)	Unknown.
Remarks	Further work to identify this species is required. COI sequences are identical for both the Pond Inlet morph and the western Greenland shelf specimen, so this species is quite variable in body morphology, though the two morphs were not found outside of their respective collections sites. This specimen appeared to fit the description of *Semisuberites cribosa* (Miklucho-Maclay, 1870), which is reported from the area. However, spicules were less variable in size and DNA confirms that this sponge is not related to the genus *Semisuberites*.
References	Hooper and Van Soest (2002), Lehnert and Stone (2017)



Top: *in situ.* Bottom: Shown whole.

Pseudosuberites sp. Topsent, 1896

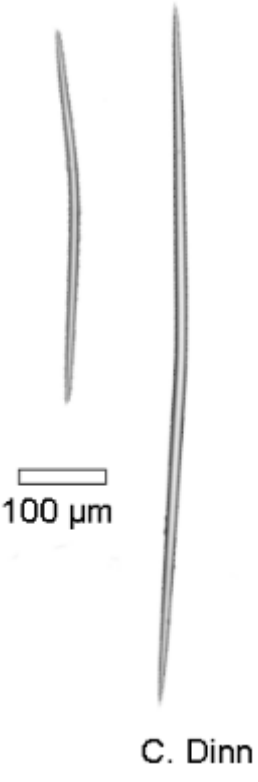
Sample	CMNI 2018-0143
Family	SUBERITIDAE
Collection Details	Western Greenland shelf (Disko Fan) 67.967° N, -59.484° W, Depth 877.6 m
Form	Encrusting.
Size	Can encrust entire dead *Keratoisis* coral skeletons.
Colour	White *in situ*, off-white after collection.
Consistency	Firm.
Surface	Slightly hispid.
Spicules	Spicules are tylostyles which may be separated in two size categories based on thickness. The larger tylostyles (A) are 1060 (823-1279) x 33.5 (20.7-42.3) µm, and the thinner tylostyles (B) are more variable in size 595 (346-852) x 16.5 (12.6-23) µm. These size categories may not be true, and tylostyles may just be highly variable.
Habitat	Found encrusting on dead *Keratoisis* coral skeletons.
Distribution (WPD)	Unknown.
Remarks	Spicules are similar to those found in *Pseudosuberites hyalinus* (Ridley & Dendy, 1887), although this species is more massively encrusting. The global distribution of *P. hyalinus* is also disputed in the WPD and Systema Porifera, so until more work is done on the genus this sponge can only be placed in the genus *Pseudosuberites*. It should also be noted that *P. hyalinus* was only collected at depths less than 200 m whereas this specimen was collected at nearly 900 m depth.
References	Hooper and Van Soest (2002)

Top: shown encrusting *Keratoisis* coral.
Bottom: *in situ*.

Halichondria (Eumastia) sitiens (Schmidt, 1870)

Sample	CMNI 2018-0055, CMNI 2018-0066, CMNI 2018-0181, CMNI 2018-0188
Family	HALICHONDRIIDAE
Synonyms	*Amorphina nodosa* Fristedt, 1887 *Cioxeamastia polycalypta* de Laubenfels, 1942 *Eumastia sitiens* Schmidt, 1870 *Halichondria borealis* (Miklucho-Maclay, 1870) *Halichondria borealis* var. papillosa (Miklucho-Maclay, 1870) *Halichondria nodosa* (Fristedt, 1887) *Halichondria sitiens* (Schmidt, 1870) *Pellina sitiens* (Schmidt, 1870) *Spuma borealis* Miklucho-Maclay, 1870 *Spuma borealis var. papillosa* Miklucho-Maclay, 1870
Collection Details	Frobisher Bay 63.557° N, -68.247° W, Depth 104 m 63.664° N, -68.421° W, Depth 87 m 63.639° N, -68.627° W, Depth 141 m 63.359° N, -68.182° W, Depth 119 m
Form	Cushion shaped with large papillae or finger-like with less of a cushion base growing on tube worms.
Size	Up to 7 cm in length.
Colour	Yellow.
Consistency	Very soft.
Surface	Smooth, thin dermal membrane covers the entire surface.
Spicules	The only spicules are oxeas in a single variable size category 635 (287-1003) x 15 (11-19) µm.
Habitat	Attached to polychaete tubes or other hard substrates.
Distribution (WPD)	Whole Northern Hemisphere.
Remarks	The finger-like growth forms are not consistent with previous descriptions of the species, but due to the similar spicule complement and form of the papillae, this specimen is treated as the same species here.
References	(Hooper & Van Soest, 2002)

Top: pieces showing choanosome.
Bottom: pieces growing on worm tubes.



Halichondria (Halichondria) panicea (Pallas, 1766)

Sample	CMNI 2018-0091
Family	HALICHONDRIIDAE
Synonyms	Many, listed in WPD.
Collection Details	Northern Labrador Sea 60.313° N, -61.880° W, Depth 279 m
Form	Encrusting.
Size	1 cm.
Colour	Yellow.
Consistency	Soft.
Surface	Smooth.
Spicules	The only spicules are smooth fusiform oxeas 346 (283-416) µm.
Habitat	Encrusting on rocks.
Distribution (WPD)	Cosmopolitan.
Remarks	Many synonymized species and a global distribution with a similar size of oxea strongly suggest this species.
References	Hooper and Van Soest (2002)

Shown whole.

Halichondria sp. Fleming, 1828

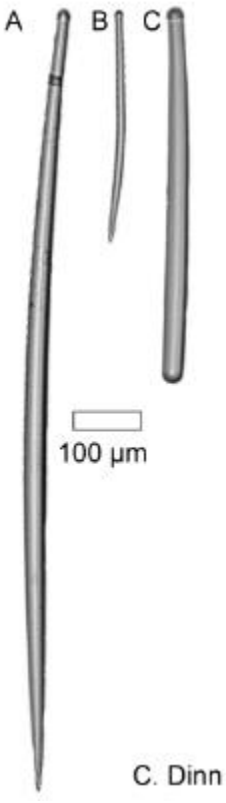
Sample	CMNI 2018-0191
Family	HALICHONDRIIDAE
Collection Details	Frobisher Bay 62.868° N, -66.746° W, Depth 288 m
Form	Tracts of spongin appear confused underneath a clear membrane.
Size	15 cm wide.
Colour	Yellow, with a clear transparent membrane on the outer surface.
Consistency	Soft.
Surface	Uneven membrane covers conspicuous spongin fibres.
Spicules	Only oxeas that are bent 613 (363-900) 18.7 (13.9-26.2) µm.
Habitat	Unknown.
Distribution (WPD)	Unknown.
Remarks	The species of this specimen is unknown. The growth form is quite different than *H. sitiens*, therefore they are unlikely the same species. This specimen does not appear to be *Halichondria genitrix* (Schmidt, 1870) based on the distinct bend of the spicules in that species, however due to the shiny skin and sandy nature of the specimen it may indeed be *H. agglomerans* (Cabioch, 1968). Until the specimen is reliably photographed *in situ*, or DNA sequencing attempted, it is unlikely to be properly identified.
References	Boury-Esnault and Lopes (1985), Hooper and Van Soest (2002)

Collected as a piece.

Hymeniacidon sp. Bowerbank, 1858

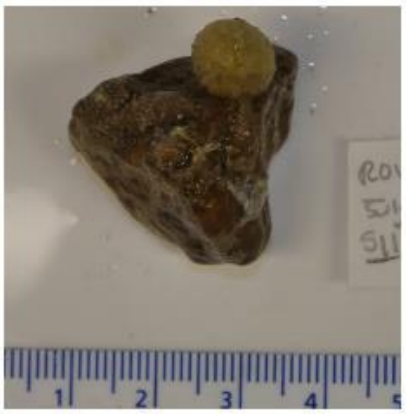
Sample	CMNI 2018-0123, CMNI 2018-0127, CMNI 2018-0164
Family	HALICHONDRIIDAE
Synonyms	*Amorphilla* Thiele, 1898 *Laxosuberites* Topsent, 1896 *Rhaphidostyla* Burton, 1935 *Rhaphoxiella* Burton, 1934 *Stylinos* Topsent, 1891 *Stylohalina* Kirk, 1909 *Stylotella* Lendenfeld, 1888 *Thieleia* Burton, 1932
Collection Details	Northern Labrador Sea (SE Baffin shelf) 63.002° N, -60.645° W, Depth 456 m 63.004° N, -60.643° W, Depth 457 m 63.003° N, --60.640° W, Depth 458 m
Form	Finger-like growth forms.
Size	Less than 10 cm tall.
Colour	Yellow.
Consistency	Soft.
Surface	The surface is soft and smooth surface with a raised dermal membrane over visible canals.
Spicules	These specimens only have megascleres, there are large tylostyles/styles (A) 1000 (638-1620) x 24.8 (16.7-38.5) µm and short tylostyles (B) 428 (307-613) x 15.9 (10.5-21.7) µm. There are uncommon clavulate (club-shaped) tylostrongyles (C) 578 (212-1118) x 38.5 (24.7-52.2) µm N = 10.
Habitat	Rocky bottoms.
Distribution (WPD)	Unknown
Remarks	This sponge can occur in large aggregations as many fragments were collected in single Agassiz trawls. The COI sequence of this specimen strongly suggests the genus, though the species is unknown.
References	Hooper and Van Soest (2002)

Top: pieces. Bottom: many pieces collected in trawl.



Tethya cf. *norvegica* Bowerbank, 1872

Sample	CMNI 2018-0119
Family	TETHYIDAE
Synonyms	*Tethya lyncurium var. obtusum* Vosmaer, 1882.
Collection Details	Northern Labrador Sea (Saglek Bank) 60.469° N, -61.289° W, Depth 401 m
Form	Spherical.
Size	Less than 1 cm.
Colour	Yellow cortex, brown choanosome.
Consistency	Firm.
Surface	Lightly hispid, appears slightly uneven/furrowed.
Spicules	The spicules are strogyloxeas (A) which are rounded at both ends, but one end is slightly narrower 1298 (960-1601) x 23.5 (16-29) µm, styles (B) 734 (498-893) x 15 (10-21.6) µm and short tylostyles (C) 139 (120 -162) x 10 (7.7-13.4) µm. The microscleres are asters, megasters are sperasters (D, E) 56 (46-69) µm, and microasters are small oxyasters (F) 9.9 (5.1-15.8) µm. The microasters are often fused into the larger megasters.
Habitat	Attached to a pebble in a rocky bottom habitat.
Distribution (WPD)	Ireland, European waters, the North Sea, Barents Sea, northern Norway and Finnmark.
Remarks	The COI sequence of this specimen is only 1 bp different from *T. norvegica*, therefore it is currently assumed to be this species. However, the presence of small tylostyles which are not noted in any description of *T. norvegica*, and fusion of round megasters and microasters casts doubt on the species affinity of this specimen.
References	Sarà *et al.* (1992)



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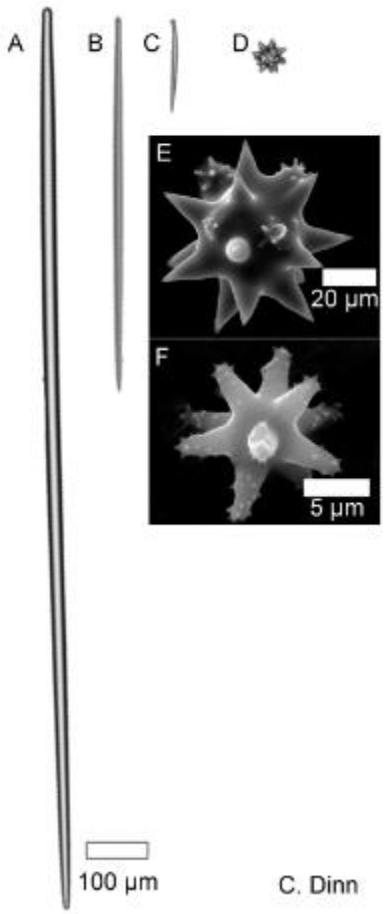
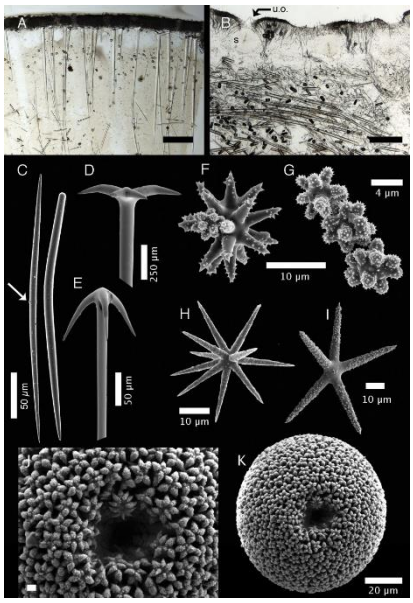


Geodia barretti Bowerbank, 1858

Sample	CMNI 2018-0070, CMNI 2018-0126
Family	GEODIIDAE
Synonyms	*Cydonium barretti* (Bowerbank, 1858) *Geodia simplicissima* Burton, 1931
Collection Details	Northern Labrador Sea (NE Hatton Basin) 61.440° N, -60.665° W, Depth 615 m Northern Labrador Sea (SE Baffin shelf) 63.004° N, -60.643° W, Depth 457 m
Form	Massive, spherical with large oscula.
Size	Variable, often greater than 10 cm in diameter.
Colour	White to grey.
Consistency	Hard.
Surface	Hispid.
Spicules	Spicules include anatriaenes, long oxeas, dichotriaenes, microxeas, sterrasters, oxyasters, and strongylasters. See Cárdenas *et al.*, (2013) for measurements.
Habitat	Rocky bottoms.
Distribution (WPD)	Amphi-Atlantic.
Remarks	The lack of speroxyasters, size of the sterrasters (65-130µm), and presence of microxeas assures the assignment of these specimens to this species.
References	Cárdenas *et al.* (2013)

Top: collected pieces Bottom: *in situ.*

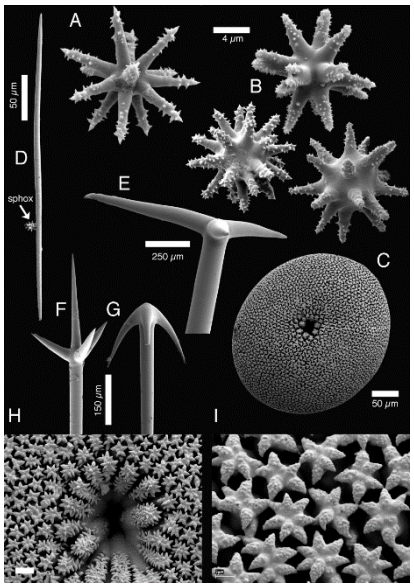


From Cárdenas *et al.* (2013)

Geodia macandrewii Bowerbank, 1858

Sample	CMNI 2018-0067
Family	GEODIIDAE
Synonyms	*Cydonium normani* Sollas, 1888 *Geodia normani* (Sollas, 1888)
Collection Details	Northern Labrador Sea (NE Hatton Basin) 61.341° N, -61.160° W, Depth 632 m
Form	Massive, spherical, very hispid.
Size	15 cm in diameter.
Colour	The surface looks brown due to mud trapped in the surface spicules. The cortex is off-white to beige and the cortex is pinkish.
Consistency	Hard.
Surface	Very hispid. Other encrusting organisms (bryozoans) are found on the surface spicules.
Spicules	Spicules include anatrianes, oxeas, microxeas, protriaenes, dichotrianes, spheroxyasters, sterrasters, and oxyasters. See Cárdenas *et al.*, (2013) for measurements.
Habitat	Rocky bottoms.
Distribution (WPD)	Amphi-Atlantic.
Remarks	Notably, the sterrasters are ~315 µm long, which distinguishes this species from other *Geodia* species. Upon collection, the dermal spicules may break off and the sponge will appear smooth, like congeneric species. However, the thick cortex formed by large sterrasters is distinctive.
References	Cárdenas *et al.* (2013)

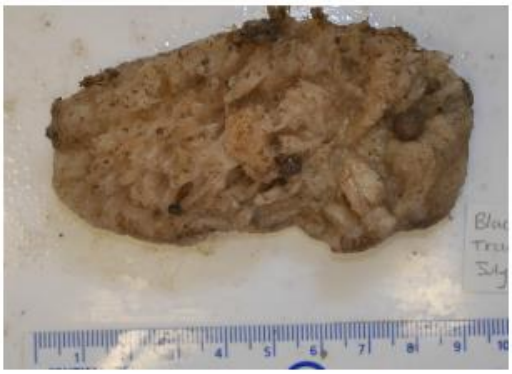
Top: *in situ.* Bottom: whole showing choanosome.



From Cárdenas *et al.* (2013)

Thenea cf. *muricata* (Bowerbank, 1858)

Sample	CMNI 2018-0160, CMNI 2018-0162
Family	THENEIDAE
Synonyms	*Clavellomorpha minima* Hansen, 1885 *Dorvillia agariciformis* Kent, 1870 *Stelletta echinoides* Schmidt, 1877 *Stelletta profunditatis* Schmidt, 1880 *Tethea muricata* Bowerbank, 1858 *Tethya muricata* (Bowerbank, 1858) *Thenea intermedia* Sollas, 1888 *Thenea wallichii* (Wright, 1870) *Tisiphonia agariciformis* (Kent, 1870) *Wyvillethomsonia wallichii* Wright, 1870
Collection Details	Western Greenland shelf 68.259° N, -59.823° W, Depth 1148 m
Form	Massive, sub-spherical.
Size	Up to 10 cm long.
Colour	Brown.
Consistency	Firm.
Surface	Hispid.
Spicules	Spicules are protriaenes, length ~3600 x 72 µm with clads ~521 µm. Dichotrianes are ~3800 x ~84 µm, with protoclads ~200 µm and deuteroclads ~481 µm. Oxeas are ~4650 x 77µm. Anatrianes are ~7000 x 39 µm with clads ~130 µm. Microscleres are plesiasters ~102 µm and ~23 µm and streptasters (spirasters) ~15 µm.
Habitat	Unknown.
Remarks	This genus is very difficult to identify without an intact specimen with a visible osculum, spicules are also in many categories and require extensive measurements. These specimens are tentatively grouped into *T. muricata* based solely on the size of the plesiasters which are slightly larger than those reported in *T. valdiviae.* However, it is unclear whether these specimens are in fact different from the other *Thenea* specimens collected in the same locality.
References	Cardenas and Rapp (2012)



Collected as a piece.

Thenea sp. 1 Gray, 1867

Sample	CMNI 2018-0058
Family	THENEIDAE
Synonyms	*Ancorina* (*Thenea*) Lendenfeld, 1903 *Clavellomorpha* Hansen, 1885 *Dorvillia* Kent, 1870 *Tisiphonia* Thomson, 1869 *Wyvillethomsonia* Wright, 1870
Collection Details	Frobisher Bay 63.663° N, -68.422° W, Depth 80 m
Form	Sub-spherical, the base is an inch-thick layer of mud.
Size	10 cm long.
Colour	White surface, orange choanosome.
Consistency	Firm.
Surface	Hispid.
Spicules	Spicules are protriaenes 6350 (4648-8302) x 53 (38-58) µm N = 17, dichotrianes in two size categories, the longer being 5514 (4541-6598) x 74 (55-88) µm N = 9 with protoclads 345 (184-580) µm and deuteroclads being 500 (227-823) µm. Short dichotrianes are 3925x 65 µm with protoclads 390 µm and deuteroclads 221 µm N= 2. Anatrianes were uncommon and had a width of 38 µm N = 1 and clads 126 µm long N = 5. Oxeas are 5618 (4078-7143) 53 (33-109) µm N = 10. Microscleres are plesiasters ~76.5 µm N = 2 and spirasters ~23 µm long N = 7.
Habitat	Soft sediments.
Distribution (WPD)	Unknown.
Remarks	This sponge is considered a different species than the deep-water specimens collected mainly due to the colour of the choanosome. No noticeable sieve was present in the osculum, therefore identification based on outer morphology is difficult.
References	Cardenas and Rapp (2012)

Shown whole.

Thenea sp. 2 Gray, 1867

Sample	CMNI 2018-0155, CMNI 2018-0156, CMNI 2018-0158, CMNI 2018-0159
Family	THENEIDAE
Synonyms	*Ancorina* (*Thenea*) Lendenfeld, 1903 *Clavellomorpha* Hansen, 1885 *Dorvillia* Kent, 1870 *Tisiphonia* Thomson, 1869 *Wyvillethomsonia* Wright, 1870
Collection Details	Western Greenland shelf 68.259° N, -59.823° W, Depth 1148 m
Form	Sub-spherical.
Size	About 5 cm in diameter.
Colour	Dark brown.
Consistency	Firm.
Surface	Hispid.
Spicules	Spicules are dichotrianes that are sometimes flexus with a slight thickening under the clads and sometimes the deuteroclad has an axial bend 7035 (5751-7693) x 106 (76-130) µm N = 12, protoclads are 307 (210-392) and deuteroclads 811 (484-1083) µm. Oxeas were very thin, and none were unbroken. Microscleres are plesiasters 35 (22-68) µm tip-to-tip and spirasters 25 (16-37) µm tip-to-tip.
Habitat	Unknown.
Distribution (WPD)	Unknown.
Remarks	The external morphology and presence of large, thin oxeas and smaller microscleres distinguish these specimens from the suspected *T. muricata* specimens collected in the same locality. Further work needs to be done on these specimens to assure correct species assignment.
References	Cardenas and Rapp (2012)

Collected as a piece.

Tetilla sibirica (Fristedt, 1887)

Sample	CMNI 2018-0165, CMNI 2018-0183
Family	TETILLIDAE
Synonyms	*Tethya sibirica* Fristedt, 1887
Collection Details	Frobisher Bay 63.643° N, -68.609° W, Depth 65 m 63.639° N, -68.627° W, Depth 141 m
Form	Massive, spherical.
Size	Up to 20 cm in diameter.
Colour	Grey.
Consistency	Firm.
Surface	Hispid.
Spicules	The spicules consist of large oxeas 2811 (1784-4080) x 37 (28-54) µm, short oxeas are 1026 (754-1290) x 40 (26-52) µm, anatriaenes are 3030 (1992-4378) x 21 (9-35) µm, protriaenes, sometimes with one whip-like clad are 2219 (1150-3452) x 21 (6-29) µm, clads are 57 (29-83) µm, whip-like clads, when present are 91 (64-113) µm, and sigmaspires are 17 (11-20) µm in length.
Habitat	Soft bottoms.
Distribution (WPD)	High Arctic, Barents Sea, Northern Russia
Remarks	A common sponge in inner Frobisher Bay on sandy substrates.
References	Koltun (1966)

Top: whole on-board. Bottom: *in situ.*

Craniella cf. *polyura* (Schmidt, 1870)

Sample	CMNI 2018-0184
Family	TETILLIDAE
Synonyms	*Lophurella lophura* Gray, 1872 *Polyurella schmidtii* (Gray, 1870) *Tetilla polyura* Schmidt, 1870
Collection Details	Frobisher Bay 63.639° N, -68.627° W, Depth 141 m
Form	Massive, ovoid.
Size	3cm tall by 1.5 cm wide.
Colour	Brown.
Consistency	Firm.
Surface	Hispid.
Spicules	The spicules consist of large oxeas that are often thicker on one end 2206 (1610-3453) x 28 (15-41) µm, short, very thin oxeas 441 (251-1199) x 9 (4-17) µm, protriaenes with one whip-like clad have a shaft length of 1905 (888-5879) x 16 (8-29) µm with clads 105 (36-183) µm which includes both short and long whip-like clads. Anatriaenes were uncommon and only one was found fully intact with a length of 7017µm, the shaft width is 14 (8-20) µm n=20, and the clads were 77 (57-94) µm, sigmaspires with a centrotylotic swelling were 13 (10-18) µm in length.
Habitat	Soft bottoms.
Distribution (WPD)	Barents Sea, the Kara Sea, the Laptev Sea, Greenland waters, Norway, the Azores, and Baffin Bay
Remarks	This sponge is distinguished from the sympatric *T. sibirica* by having sigmaspires with a centrotylotic swelling and by having an ovoid shape rather than being spherical. This sponge is likely very closely realted to *Tetilla sibirica* due to the similarities in spicule complements and body form, therefore the genus is in need of revision.
References	Van Soest (2016), Vosmaer (1885)

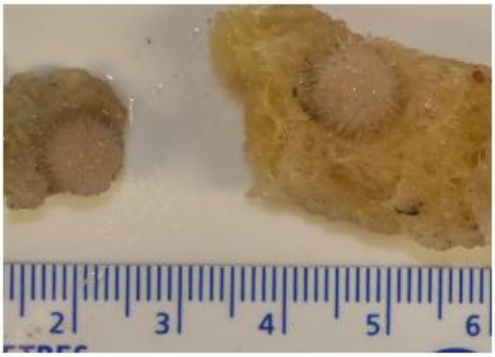
Collected as a piece.

Craniella cf. *cranium* (Müller, 1776)

Shown whole.

Sample	CMNI 2018-0168, CMNI 2018-0170, CMNI 2018-0173, CMNI 2018-0175
Family	TETILLIDAE
Synonyms	*Alcyonium cranium* Müller, 1776 *Craniella muelleri* Vosmaer, 1885 *Spongia pilosa* Montagu, 1814 *Tethya abyssorum* Carter, 1876 *Tethya cranium* (Müller, 1776) *Tethya cranium* abyssorum Carter, 1876 *Tethya cranium* infrequens Carter, 1876 *Tethya gravata* Hyatt, 1878 *Tethya infrequens* Carter, 1876 *Tethya pilosa* (Montagu, 1814) *Tethya unca* Bowerbank, 1872 *Tethyopsilla infrequens* (Carter, 1876) *Tetilla abyssorum* (Carter, 1876) *Tetilla cranium* (Müller, 1776) *Tetilla gravata* (Hyatt, 1878) *Tetilla infrequens* (Carter, 1876)
Collection Details	Frobisher Bay 62.954° N, -67.139° W, Depth 402 m
Form	Spherical with a distinctly papillated surface.
Size	Up to 5 cm in diameter.
Colour	Beige to pinkish.
Consistency	Firm.
Surface	Connulose, warty papillae are spread along the whole surface. Spicules are often protruding giving a hispid appearance.
Spicules	Spicules are stout oxeas 362 (267-442) x 28 (21-34) µm, long oxeas tapered at one end 1485 (943-2079) x 29 (21-37) µm N = 19, and protriaenes that were not seen unbroken, with a width of 22 (18-29) µm N = 7 and a clad length of 159 (143-175) µm N =12 and sigmaspires ~15 µm in length.
Habitat	Often growing on *Mycale lingua.*
Distribution (WPD)	Amphi-Atlantic.
Remarks	The true placement of some synonyms of this species is debated. *C. cranium* may contain genetically distinct species that are in need of revision.
References	Arndt (1935)

Craniella sp. Schmidt, 1870

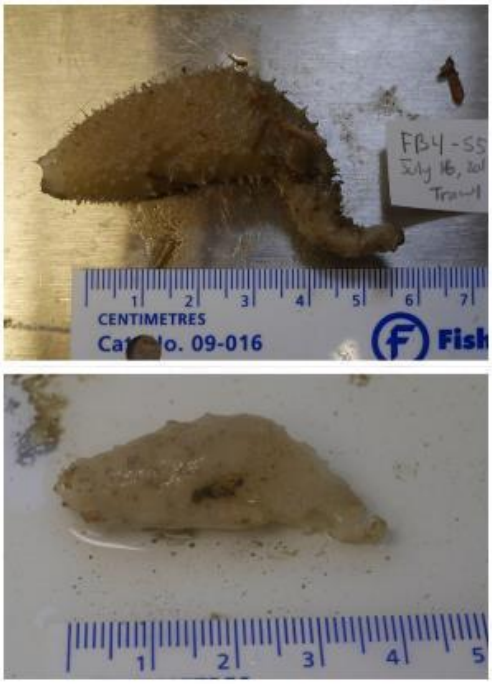


Shown whole growing on *Mycale lingua.*

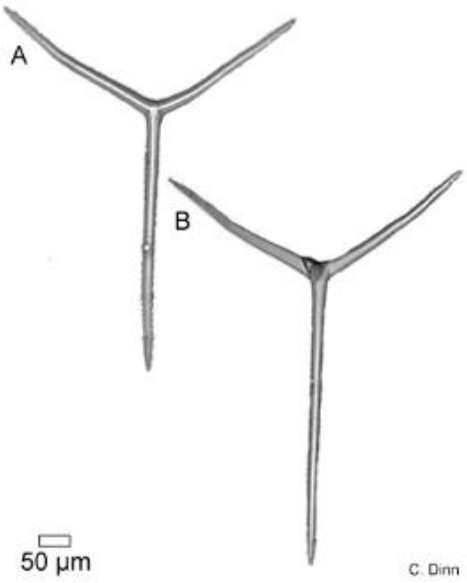
Sample	CMNI 2018-0129
Family	TETILLIDAE
Synonyms	*Craniellopsis* Topsent, 1913 *Polyurella* Gray, 1870 *Tethyopsilla* Lendenfeld, 1888
Collection Details	Northern Labrador Sea (SE Baffin shelf) 63.004° N, -60.643° W, Depth 457 m
Form	Small, round, with long protruding spicules.
Size	1 cm in dimeter.
Colour	Pink.
Consistency	Firm.
Surface	Very hispid.
Spicules	Spicules are protriaenes 1932 (1478-2318) x 18.6 (15.8-22.2) µm N=7 with clads 125 (108-144) µm in length N=19, long oxeas which are narrower on one end 1515 (865-1930) x 29 (17-38.3) µm N = 14, and stout oxeas which are quite variable in size 426 (269-520) x 28 (19.6-32.8) µm. Sigmaspire spicules were not measured as they were very rare, their rarity may be a distinguishing character.
Habitat	Unknown. Found growing on *Mycale lingua*.
Remarks	This sponge is genetically distinct from other *Craniella* specimens collected. The only discernable morphological difference is the long spicules projecting from the surface appear more pronounced in this specimen.
References	Arndt (1935)

Sycon cf. *lambei* Dendy & Row, 1913

Sample	CMNI 2018-0054, CMNI 2018-0057
Family	SYCETTIDAE
Synonyms	*Sycon asperum* Lambe, 1896
Collection Details	Frobisher Bay 63.558° N, -68.249° W, Depth 118 m 63.557° N, -68.247° W, Depth 104 m
Form	Tubular or barrel shaped.
Size	Up tp 8 cm long
Colour	Grey to off white
Consistency	Firm.
Surface	Large papillae along the outer surface.
Spicules	Calcareous. Triactines (A) with apical rays 211 (95-337) x 15.6 (6.5-25) µm, basal ray length 308 (158-487) µm. Tetractines (B) with apical ray length 219 (128-293) x 18 (13-24) µm, basal ray length 347 (189-460) x 19.7 (13-26) µm. Oxeas were not seen as apical tufts were not present.
Habitat	Unknown.
Distribution (WPD)	Canadian Exclusive Economic Zone, Gulf of St. Lawrence, North Labrador Sea.
Remarks	A taxonomically difficult family of sponges. Both specimens lacked a tuft of spicules surrounding the osculum. This was likely due to damage from collection as these specimens were collected using an Agassiz trawl. No oxeas were seen in spicule preparations which raises doubt about the species assignment. However, *Sycon lambei* has a well established Canadian distribution, therefore assignment to this species is suggested.
References	Lambe (1896)



Top: shown whole. Bottom: collected as a piece.



Sycon sp.1 Risso, 1827

Sample	CMNI 2018-0185
Family	SYCETTIDAE
Synonyms	*Dunstervillia* Bowerbank, 1845 *Homoderma* Lendenfeld, 1885 *Leuckartea* Haeckel, 1872 *Scypha* Gray, 1821 *Streptoconus* Jenkin, 1908 *Sycarium* Haeckel, 1869 *Sycocystis* Haeckel, 1870 *Sycodendron* Haeckel, 1870 *Sycodendrum* Haeckel, 1869 *Syconella* Schmidt, 1868 *Sycortis* Haeckel, 1872 *Sycum* Agassiz, 1846 *Tenthrenodes* Jenkin, 1908

Shown whole.

Collection Details	Frobisher Bay 63.639° N, -68.627° W, Depth 141 m
Form	Barrel shaped with a long tuft of spicules at the apex.
Size	3-4 cm long, 1 cm wide.
Colour	Grey to off-white. Covered in a layer of sediment.
Consistency	Slightly firm.
Surface	Hispid.
Spicules	Triactines, tetractines, and very long oxeas. Measurements are highly variable, and spicules were often broken.
Habitat	Unknown.
Distribution (WPD)	Unknown
Remarks	Due to the variable nature of the spicules, this species could not reasonably be identified. Triactines have a similar form to descriptions of *S. ciliatum*, though the apical oxeas are very long in this specimen.
References	Ackers *et al.* (1992)

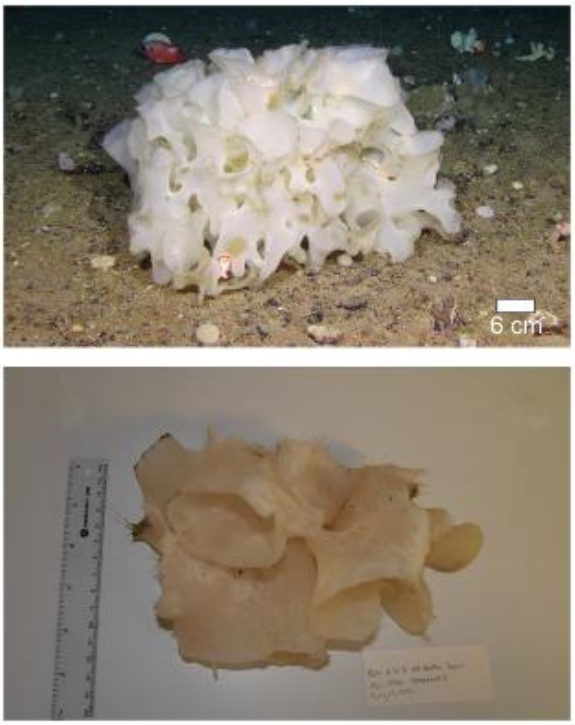
Calcarea unknown

Sample	CMNI 2018-0187, CMNI 2018-0198
Collection Details	Frobisher Bay 63.359° N, -68.182° W, Depth 119m Northern Baffin Bay 76.317° N, -75.770, ° W, Depth 333m
Form	Tubular.
Size	Less than 2 cm
Colour	White.
Consistency	Firm.
Surface	Hispid due to protruding spicules.
Spicules	Triactines, tetractines, oxeas.
Habitat	Hard substrates.
Distribution (WPD)	Unknown.
Remarks	Specimens were very tiny, and spicules were difficult to isolate without destroying whole specimen. It is unknown whether these are juvenile *Sycon* spp. or another genus of calcareous sponge. The northern Baffin Bay specimen appears similar to Frobisher Bay specimen, but after preservation, spicules were impossible to isolate. Since this specimen appears to be more encrusting than stalked and upright, it is difficult to tell if they are the same species, therefore the distribution remains unclear.

Shown whole.

Asconema spp. Kent, 1870

Sample	CMNI 2018-0069, CMNI 2018-0106, CMNI 2018-0113, CMNI 2018-0120, CMNI 2018-0137
Family	ROSSELLIDAE
Collection Details	North Labrador Sea (NE Hatton Basin) 61.440° N, -60.665° W, Depth 632 m North Labrador Sea (Saglek Bank) 60.463° N, -61.280° W, Depth 427 m 60.469° N, -61.289° W, Depth 401 m North Labrador Sea (SE Baffin shelf) 62.987° N, -60.629° W, Depth 500 m western Greenland shelf (Disko Fan) 67.967° N, -59.484° W, Depth 877 m
Form	Large, ill-defined funnel shaped with individual tubes forming a large bush-like structure.
Size	Variable, bushes can be greater than30 cm in diameter.
Colour	White.
Consistency	Soft, easily torn.
Surface	Smooth.
Spicules	More measurements are required
Habitat	Hard substrates.
Distribution (WPD)	Amphi-Atlantic.
Remarks	Large, bush-like glass sponges are assumed to be *A. foliatum* (Fristedt, 1887), though species affinities cannot easily be confirmed by DNA as amplification of COI did not amplify. Multiple species in the region may be assumed to be *Asconema*, but more work is required.
References	Tabachnick and Menshenina (2007)



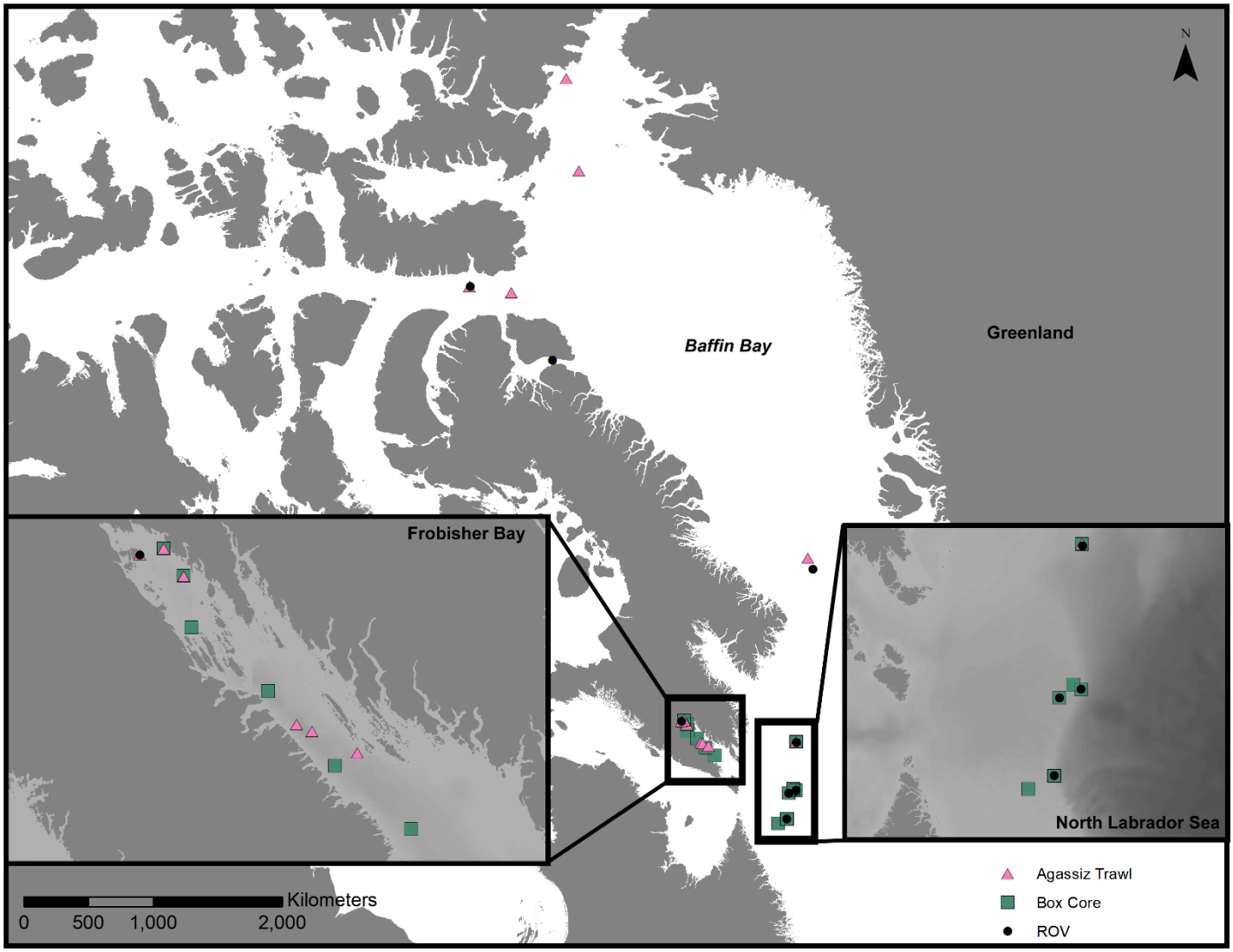
Top: *in situ.* Bottom: collected as pieces.

Collection information

Locations of ROV dives 2015-2017. Dives 49 and 56-58 were cancelled due to weather, and dive 60 was a repeat dive in the W Greenland shelf site and is not included.

Dive number and location	Date	Start Latitude, Longitude	End Latitude, Longitude	Bottom Time	Distance Covered (m)[i]	Depth Range (m)
48 – Inner Frobisher Bay	October 25, 2015	63.6392°, -68.6253°	63.6348°, -68.6303°	4:10	2,463	55-147
50 – NE Hatton Basin	July 19, 2016	61.3415°, -61.1571°	61.3401°, -61.1445°	1:48	4,541	523-574
51 – NE Hatton Basin *Primnoa* rich	July 19, 2016	61.4401°, -60.6645°	61.4402°, -60.6650°	0:59	787	592-632
52 – Saglek Bank	July 21, 2016	61.4672°, -61.2781°	60.4670°, -61.2763°	3:13	3,910	361-473
53 – SE Baffin shelf	July 22, 2016	62.9836°, -60.6287°	62.9869°, -60.6290°	0:26	575	495-499
54 – W Greenland shelf Disko Fan I	July 24, 2016	67.9688°, -59.5040°	67.9701°, -59.5044°	2:08	1,698	894-940
55 – W Greenland shelf Disko Fan II	July 25, 2016	67.9688°, -59.5032°	67.9675°, -59.4839°	2:35	1,588	853-934
59 – Pond Inlet	August 1, 2017	72.8274°, -77.6099°	72.8368°, -77.5940°	4:52	3,449	410-876
61 – Lancaster Sound	August 3, 2017	74.2778°, -83.3121°	74.2767°, -83.3500°	3:42	2,670	713-748

[i] The distance covered is based on a 10 m Polynomial Approximation with Exponential Kernel (PAEK) smoother.



Sponge collection locations by sampling method.

Number of box core deployments and sponges collected by site.

Site	Number of box core deployments	Number of sponges collected	Catalogue number
FB6-1	3	1	CMNI 2018-0053
Bell 1	1	0	
Bell 2	1	0	
Bell 3	1	0	
Bell 4	1	0	
FB3	1	0	
FB4	1	1	CMNI 2018-0054
Bell 5	1	0	
Bell 6	1	0	
FB1-1	1	0	
FB 2-2	3	0	
FB2-1	3	2	CMNI 2018-0059, CMNI 2018-0060
FB7-1	1	0	
FB8	1	0	
NE Hatton Basin Dive 50	1	6	CMNI 2018-0062 - CMNI 2018-0066
NE Hatton Basin Primnoa Rich Dive 51	2	11	CMNI 2018-0072 - CMNI 2018-0082
NE Saglek Bank Cold Seep	6	10	CMNI 2018-0083 - CMNI 2018-0092
Saglek Bank Primnoa Rich Dive 52	4	24	CMNI 2018-0096 - CMNI 2018-0119
SE Baffin Shelf Dive 53	4	2	CMNI 2018-0123, CMNI 2018-0164
Disko Fan Dive 54	4	0	
Black Coral Site	1	0	
OF-S-25 (OF B2)	3	1	CMNI 2018-0177
OF-B6	1	0	CMNI 2018-0178
FB 2-2 5G	3	1	
FB 2-2 5D	3	0	
Bell 12	1	0	
A16	4	0	
Bell 11	1	4	CMNI 2018-0187 - CMNI 2018-0188
OF-S-22	1	0	
OF - B9	1	2	CMNI 2018-0194, CMNI 2018-0195
OF -B14	2	0	
Disko Fan 2017	6	0	

Number of box core deployments and sponges collected by site continued

Site	Number of box core deployments	Number of sponges collected	Catalogue number
Coring Stn. 8.1	1	0	
Stn. 176	1	0	
BB 2	1	0	
Stn. 101	1	0	
Stn. 105	1	0	
Stn. 115	1	0	
Stn. 129	1	0	
Trinity Glacier TS 233	1	0	
Stn. 111	1	0	
Stn. 108	2	0	
Belcher Glacier	1	0	
Stn. 323	1	0	
Stn. 301	4	0	

Number of Agassiz trawl deployments and sponges collected by site.

Site	Number of Agassiz trawl deployments	Number of sponges collected	Catalogue number
FB4	1	3	CMNI 2018-0055 - CMNI 2018-0057
FB7-1	1	2	CMNI 2018-0060, CMNI 2018-0061
SE Baffin Shelf Dive 53	1	10	CMNI 2018-0124 - CMNI 2018-0128, CMNI 2018-0139 - CMNI 2018-0143
Black Coral Site	1	11	CMNI 2018-0153 - CMNI 2018-0163
OF-S-25 (OF B2)	1	12	CMNI 2018-0167 - CMNI 2018-0176
OF-B6	1	0	
FB 2-2 5G	1	1	CMNI 2018-0179
A16	1	7	CMNI 2018-0180 - CMNI 2018-0186
OF-S-22	1	6	CMNI 2018-0189 - CMNI 2018-0193
Stn. 101	1	0	
Stn. 105	1	3	CMNI 2018-0196, CMNI 2018-0197, CMNI 2018-0198
Stn. 115	1	0	
Stn. 129	1	0	
Trinity Glacier TS 233	1	1	CMNI 2018-0199
Stn. 111	1	0	
Stn. 108	1	0	
Stn. 323	1	1	CMNI 2018-0200
Stn. 301	1	2	CMNI 2018-0210, CMNI 2018-0211

Sponges collected by ROV at each dive site.

Site	**Number of sponges collected**	**Catalogue number**
Frobisher Bay Dive 48	2	CMNI 2018-0165, CMNI 2018-0166
NE Hatton Basin Dive 50	0	
NE Hatton Basin Primnoa Rich Dive 51	5	CMNI 2018-0067 - CMNI 2018-0071
NE Saglek Bank Cold Seep	0	
Saglek Bank Primnoa Rich Dive 52	3	CMNI 2018-0093 - CMNI 2018-0095
SE Baffin Shelf Dive 53	3	CMNI 2018-0120 - CMNI 2018-0122
Disko Fan Dive 54	1	CMNI 2018-0134
Disko Fan Dive 55	18	CMNI 2018-0135 - CMNI 2018-0152
Pond Inlet Dive 59	9	CMNI 2018-0201 - CMNI 2018-0209
Lancaster Sound Dive 61	0	

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