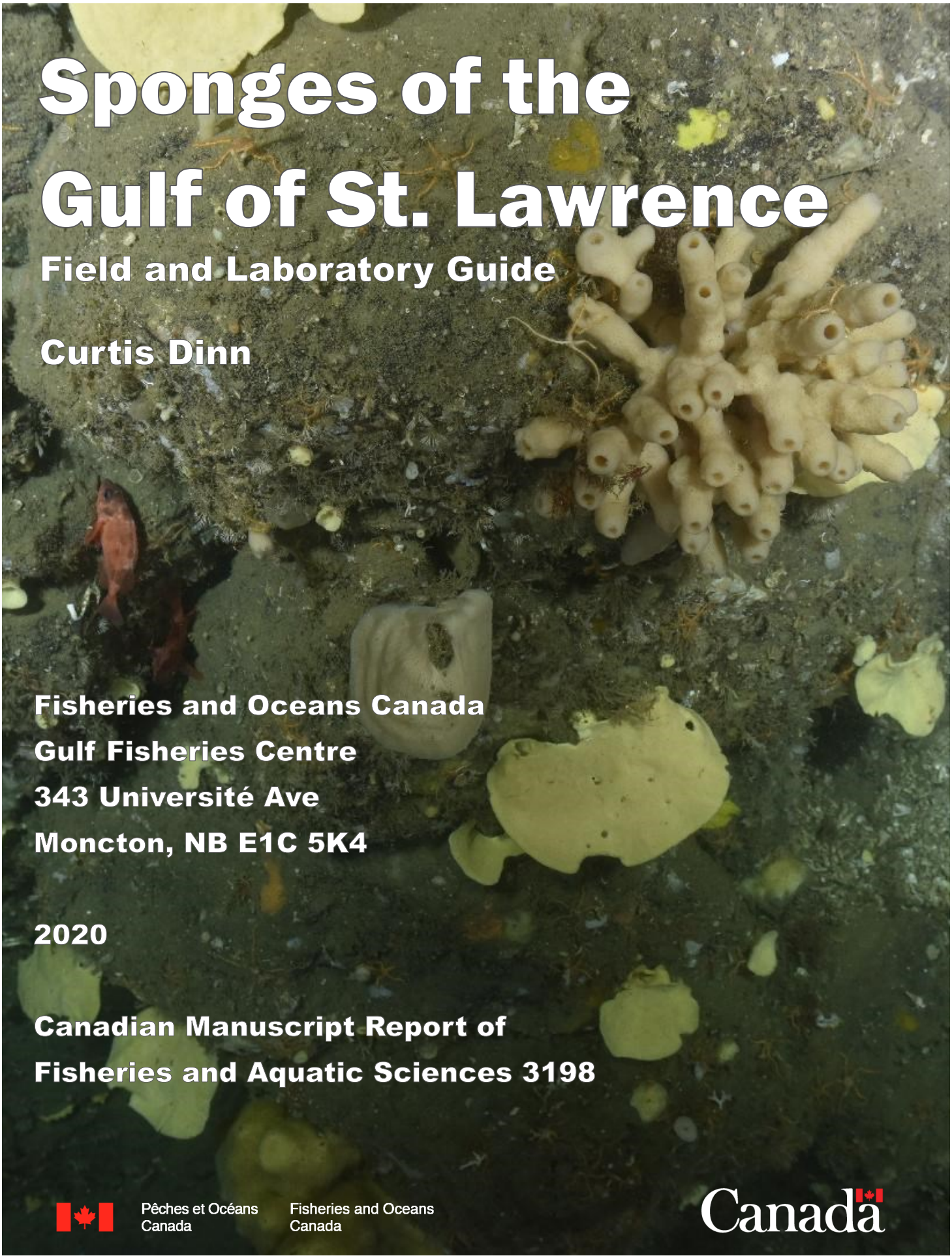


Sponges of the Gulf of St. Lawrence

Field and Laboratory Guide

Curtis Dinn

Fisheries and Oceans Canada
Gulf Fisheries Centre
343 Université Ave
Moncton, NB E1C 5K4

2020

Canadian Manuscript Report of
Fisheries and Aquatic Sciences 3198

Pêches et Océans Canada
Fisheries and Oceans Canada
Canada

Canadian Manuscript Report of Fisheries and Aquatic Sciences

Manuscript reports contain scientific and technical information that contributes to existing knowledge but which deals with national or regional problems. Distribution is restricted to institutions or individuals located in particular regions of Canada. However, no restriction is placed on subject matter, and the series reflects the broad interests and policies of Fisheries and Oceans Canada, namely, fisheries and aquatic sciences.

Manuscript reports may be cited as full publications. The correct citation appears above the abstract of each report. Each report is abstracted in the data base *Aquatic Sciences and Fisheries Abstracts*.

Manuscript reports are produced regionally but are numbered nationally. Requests for individual reports will be filled by the issuing establishment listed on the front cover and title page.

Numbers 1-900 in this series were issued as Manuscript Reports (Biological Series) of the Biological Board of Canada, and subsequent to 1937 when the name of the Board was changed by Act of Parliament, as Manuscript Reports (Biological Series) of the Fisheries Research Board of Canada. Numbers 1426 - 1550 were issued as Department of Fisheries and Environment, Fisheries and Marine Service Manuscript Reports. The current series name was changed with report number 1551.

Rapport manuscrit canadien des sciences halieutiques et aquatiques

Les rapports manuscrits contiennent des renseignements scientifiques et techniques qui constituent une contribution aux connaissances actuelles, mais qui traitent de problèmes nationaux ou régionaux. La distribution en est limitée aux organismes et aux personnes de régions particulières du Canada. II n'y a aucune restriction quant au sujet; de fait, la série reflète la vaste gamme des intérêts et des politiques de Pêches et Océans Canada, c'est-à-dire les sciences halieutiques et aquatiques.

Les rapports manuscrits peuvent être cités comme des publications à part entière. Le titre exact figure au-dessus du résumé de chaque rapport. Les rapports manuscrits sont résumés dans la base de données *Résumés des sciences aquatiques et halieutiques.*

Les rapports manuscrits sont produits à l'échelon régional, mais numérotés à l'échelon national. Les demandes de rapports seront satisfaites par l'établissement auteur dont le nom figure sur la couverture et la page du titre.

Les numéros 1 à 900 de cette série ont été publiés à titre de Manuscrits (série biologique) de l'Office de biologie du Canada, et après le changement de la désignation de cet organisme par décret du Parlement, en 1937, ont été classés comme Manuscrits (série biologique) de l'Office des recherches sur les pêcheries du Canada. Les numéros 901 à 1425 ont été publiés à titre de Rapports manuscrits de l'Office des recherches sur les pêcheries du Canada. Les numéros 1426 à 1550 sont parus à titre de Rapports manuscrits du Service des pêches et de la mer, ministère des Pêches et de l'Environnement. Le nom actuel de la série a été établi lors de la parution du numéro 1551.

Canadian Manuscript Report of
Fisheries and Aquatic Sciences 3198

2020

Sponges of the Gulf of St. Lawrence: Field and Laboratory Guide

by

Curtis Dinn

Aquaculture and Coastal Ecosystems Section
Gulf Region
Fisheries and Oceans Canada
Gulf Fisheries Centre
343 Université Ave
Moncton, NB E1C 5K4

Cat. No. Fs97-4/3198E-PDF ISBN 978-0-660-35374-6 ISSN 1488-5387

Correct citation for this publication:

Dinn, C. 2020. Sponges of the Gulf of St. Lawrence: Field and Laboratory Guide. Can. Manuscr. Rep. Fish. Aquat. Sci. 3198: vi + 118 p.

TABLE OF CONTENTS

ABSTRACT

Dinn, C. 2020. Sponges of the Gulf of St. Lawrence: Field and Laboratory Guide. Can. Manuscr. Rep. Fish. Aquat. Sci. 3198: vi + 118 p.

Sponges collected during annual multispecies surveys in the Gulf of St. Lawrence have not been consistently identified. In 2018, sponge specimens were collected and taxonomically identified from four trawl surveys and additional specimens were collected and identified from opportunistic samples. Using sponge spicules, skeletal arrangement, and on-board photos, a field guide for future sponge collections in the Gulf of St. Lawrence was created, with descriptions of forty-four sponge taxa found in the region and updated taxa codes for use on board survey vessels in the southern Gulf of St. Lawrence. This field guide will be used during future surveys to more reliably identify sponges at sea.

RÉSUMÉ

Dinn, C. 2020. Sponges of the Gulf of St. Lawrence: Field and Laboratory Guide. Can. Manuscr. Rep. Fish. Aquat. Sci. 3198: vi + 118 p.

Toutes les éponges capturées dans les relevés scientifiques du MPO du Golfe du Saint-Laurent n'ont pas été identifiées de façon cohérente au fil du temps. En 2018, les éponges capturées dans quatres relevés scientifiques benthiques, ainsi que des échantillons opportunistes provenant d'autres sources, ont été échantillonnées pour identification taxonomique au laboratoire. En utilisant les spicules, l’arrangement de la squelette, et les photos prise-à-bord, un guide de terrain avec quarante-quatre taxa d’éponges du golfe du Saint-Laurent fut créé, et est maintenant disponible pour les nouvelles collections d’éponges de la région. Ce guide sera dorénavant utilisé dans les relevés scientifiques, et facilitera l’identification d’éponges capturées en mer.

BACKGROUND

The Northwest Atlantic is home to diverse benthic habitats which are often dominated by sessile invertebrates. Sponges and corals in particular can create complex biogenic habitat (Miller et al. 2012; Hawkes et al. 2019), and several species in eastern Canada have recently been identified as vulnerable ecosystem engineers (Beazley et al. 2013; Kenchington et al. 2015). There are more than 9000 species of sponge globally (Van Soest et al. 2020) with varied growth forms and life histories (Hooper and Van Soest 2002). However, the number of sponge species identified from eastern Canadian waters is lower than elsewhere in the Atlantic (Van Soest et al. 2012). Efforts to identify sponge species in Canadian waters and increase the knowledge of benthic diversity are ongoing.

Sponges have been shown to increase habitat heterogeneity, broaden the availability of microhabitats, and elevate local species diversity (Bett and Rice 1992; Klitgaard 1995; Klitgaard and Tendal 2004; Buhl-Mortensen et al. 2010). Beyond altering the physical habitat, sponges affect nutrient cycling and benthic-pelagic coupling by filtering water to feed (Yahel et al. 2007; Kahn et al. 2015; Leys et al. 2018). Removal of sponge biomass in the Flemish Cap region has been likened to the removal of the filtering capacity of a large water treatment plant (based on the filtering capacity of a single species), which is suggested to have a monetary value of hundreds of millions of dollars annually (Pham et al. 2019). As sponge species differ markedly in physiology (Leys and Meech 2006), growth rate (Schippers et al. 2012), and filtering capacity (Weisz et al. 2008; Leys et al. 2011), the importance of understanding where different sponge species are distributed is critical to better understand how to prevent damage to the ecosystem due to fishing and industrial activity.

Annual fisheries-independent surveys carried out by DFO have been occurring in the Gulf of St. Lawrence (GSL) since 1971, but sponges collected during these surveys have largely been recorded at the phylum level. Some sponge species are notoriously difficult to identify in the field (Hooper and Van Soest 2002) and without detailed guides or effort in the lab, it is difficult to identify many trawl collected specimens. As a result, much of the data available for sponge catches in these surveys is reduced to the catch weight of the phylum as a whole. Although sponge biomass is an important indicator to delineate important sponge habitat, a better understanding of species-specific distributions and species associations will be critical to better understand how sponges affect local ecosystem functioning, nutrient turnover, and resilience to disturbance.

Sponges in the GSL have not been consistently identified over time. The first major report of the sponge species in the GSL was compiled by Lambe (1896), and described collections made by Sir William Dawson and J.F. Whiteaves obtained throughout the 1800s. Of the 30 sponge species described in Lambe's 1896 report, 27 species were identified from the GSL. Lambe's work remains the only detailed taxonomic work concerning sponges from the region, as it includes descriptions of outer morphology and spicule measurements for individual specimens. Some sponges

described by Lambe were named as new species but have not been recorded subsequently (Van Soest et al. 2020). Over a century later, Brunel et al. (1998) compiled a list of all invertebrate species in the GSL, St. Lawrence Estuary, and Saguenay Fjord, including 42 sponge taxa in their inventory. Brunel et al. (1998) however questioned several of the sponge species named in their list, where some entries are marked as doubtful, or remarks of particular species suggest that the identity should be re-examined. More recently, an unpublished catalogue of sponges from the southern GSL (sGSL) by Fuller (2004) states that 34 species were reported from the region, with 12 species that could easily be identified from DFO research vessel (RV) trawl surveys. This catalogue has been used since 2004 to identify sponges collected during those surveys, and gives brief descriptions of spicule types, but does not give measurements. Additional sponge taxa were described in two iterations of a species guide for vulnerable taxa in the North Atlantic Fisheries Organization (NAFO) fishing regions (Best et al. 2010; Kenchington et al. 2015). The NAFO guides contain a total of 32 sponge entries, most of which were identified to the genus level, with no spicule measurements given.

This field and laboratory guide attempts to provide a tool for use during at-sea surveys in the GSL region and to aid in the identification of sponges in the lab. Sponges are identified to the lowest taxonomic ranking possible, and species codes for recording catch weights in the Gulf DFO region are provided. The taxa codes presented in this guide are to be used when recording catches during fishing surveys to improve our knowledge of sponge species distributions in the region.

SPONGE COLLECTIONS AND SPECIES IDENTIFICATIONS

Sponges presented in this guide were collected primarily during four DFO trawl surveys in the Gulf of St. Lawrence (Figure 1): the 2018 southern GSL (sGSL) RV survey aboard the *CCGS Teleost* (September 4–October 5, 2018); the 2018 Northumberland Strait (NS) survey aboard the *CCGS M. Perley* (July 10–30, 2018); the 2018 snow crab (SC) survey aboard the *FV Jean Mathieu* (July 19–September 16, 2018); and the 2018 northern GSL (nGSL) survey aboard the *CCGS Teleost* (August 4–September 1, 2018). Sponge specimens were grouped by morphotype and subsampled. Sponge specimens were photographed on board with a ruler for scale. Sponge pieces or whole specimens were frozen or placed in 95% ethanol after collection. Frozen sponges were subsequently transferred to 95% ethanol for long term storage at the Gulf Fisheries Centre (Moncton, NB). Representative sponge morphotypes were subsampled from the 2018 nGSL survey collections and specimens that were not subsampled were identified from photos. A total of 643 specimens from 2018 collections were preserved and identified in the laboratory.

Additional specimens for taxonomic analysis were collected during a 2017 cruise in the GSL using the ROV ROPOS (www.ropos.com) aboard the *CCGS Martha L. Black*

(Faille et al. 2019). Specimens were also identified from the Institut Maurice-Lamontagne (IML) museum collections. Coastal specimens were collected and identified from routine collections by DFO Gulf Region's Aquatic Invasive Species and Aquaculture and Coastal Ecosystems monitoring projects in the sGSL.

Sponge spicules were isolated from all regions of the sponge body. Pieces of sponge were placed in undiluted household bleach overnight to remove tissue, then 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 dried on glass slides, mounted in DPX mounting medium (Sigma-Aldrich, St. Louis, MO) and imaged on a compound microscope. Thick sections of ethanol preserved specimens were made using a razor blade, cleared in clove oil, and mounted in Canada Balsam (Sigma-Aldrich, St. Louis, MO) and viewed on a stereomicroscope. For scanning electron microscopy (SEM), cleaned spicules were placed on metal stubs, coated with gold and viewed with a Hitachi SU3500 SEM at the Digital Microscopy Facility, Mount Allison University (Sackville, NB).

Spicule measurements were made using ImageJ 1.52. Spicules were categorized by type and 30 of each spicule type were measured for each species. The World Porifera Database, which implements the classification system for Demospongiae proposed by Morrow and Cárdenas (2015), was used as the taxonomic authority (Van Soest et al. 2020).

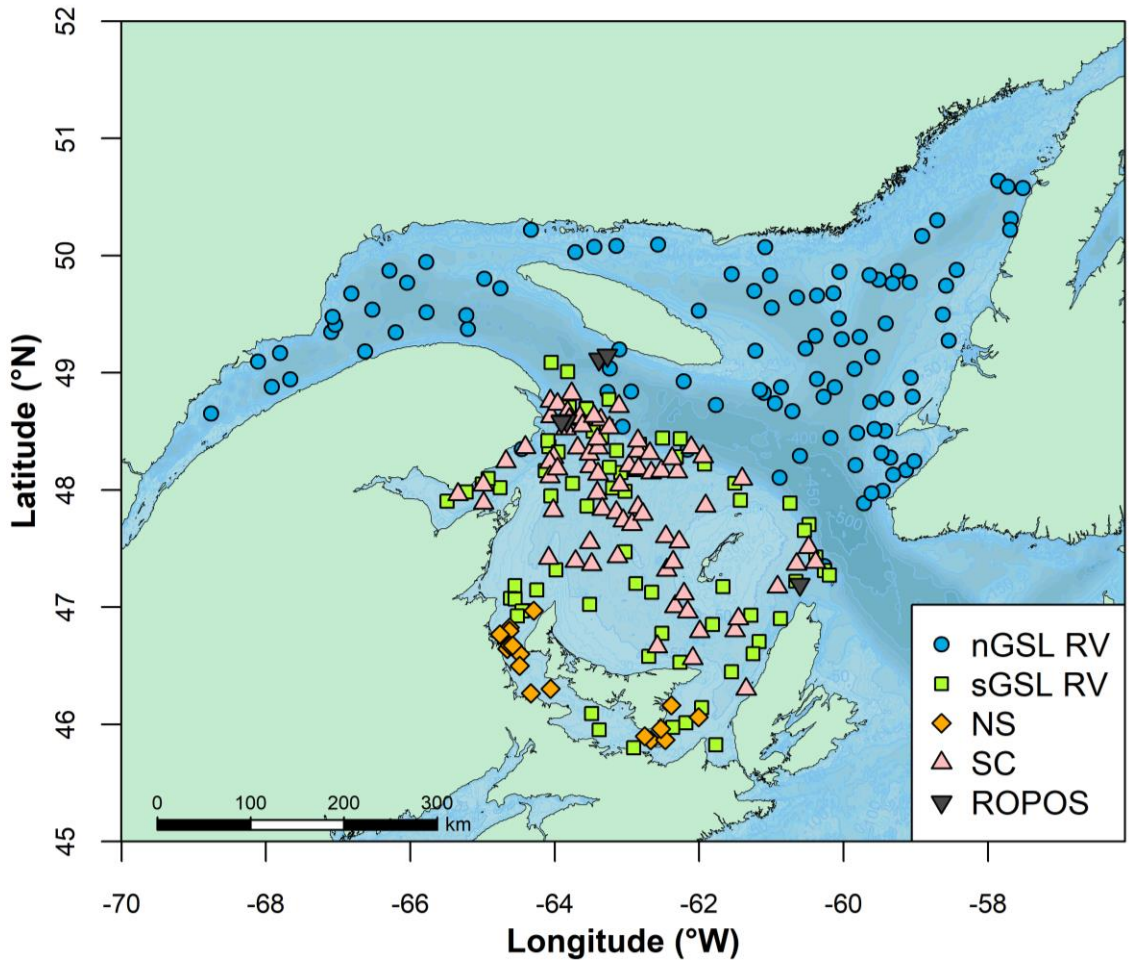


Figure 1. Map of sponge collection locations in the Gulf of St. Lawrence 2017–2018. nGSL RV = Quebec region research vessel survey, sGSL RV = Gulf region research vessel survey, SC = snow crab survey, NS = Northumberland Strait survey. ROPOS = specimens collected by submersible in 2017. Coastal/ opportunistic collections are not shown.

HOW TO USE THIS GUIDE

This guide includes individual species identification pages which provide useful details to identify sponge specimens commonly encountered in fisheries trawls in the GSL. Each entry consists of two pages, the first includes key identifying characters for each species, a short description of the outer morphology, spicule measurements, taxonomic remarks, and on-board photos. Collection locations from 2018 surveys, images of the spicule skeleton, and isolated spicule images are presented on the facing page for each entry.

Sponges in this guide are grouped loosely by morphotype. The morphotype category (see p. 9) is located on the left-hand side of species identification pages. The ease of identification symbols (see p. 10) follow the species name.

Quick reference pages are presented in Appendix 1. These pages group sponges that may be confused based on outer morphology. Less common sponges do not have a quick reference entry to avoid confusion.

Glossary of Terms

Spicule types

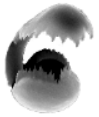
Ala – spatulate structures on the ends of chela — see ansiochela, isochela

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



Centrotylote– a tyle or swelling in a central position of the spicule — see sigmaspire for example

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

Dichotriaene – a triaene where the clads branch into distal rays

Flagellosigma – a deeply curved sigma with an ovoid shape

Isochela – a chela with equal ends

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

Oxea – a spicule with two pointed ends

Protriaene – a triaene with clads facing forwards

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

not shown

Sigma – a C or S shaped microsclere with sharp points

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

Spiraster – a small spicule with rays (actines) extending from a spiral base

not shown

Plesiaster – a spicule with multiple rays (actines) with a very reduced base

See *T. muricata* p. 59

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 megasclere with round or ovoid swellings on each end

General Terms

Axial skeleton – spicule tracts which form the central portion of the skeleton, often with extra-axial branches

Choanocyte – flagellated cell which creates the feeding current in sponges

Choanosome – the body region that contains the choanocyte chambers

Cortex/ Ectosome – the outer body region of a sponge that differs from the choanosome

Megasclere – large spicule, visible to the naked eye

Microsclere – small spicule, only visible using a microscope

Osculum – opening through which water leaves the sponge

Ostium – incurrent opening of the sponge aquiferous system

Plumoreticulate – plumose skeleton with cross-connecting spicules

Plumose – spicules branch out similar to a feather

Reticulation – interlacing spicules arranged like a net

Spicule – skeletal structure in sponges that are either calcareous or siliceous

Spongin – protein which forms sponge skeleton, modified form of collagen

Sponge Morphology Categories

Adapted from Kenchington *et al.* 2015.

The growth form of sponges are often quite variable. Outer sponge morphology is not entirely consistent even between closely related taxa. These morphology categories therefore serve to group similar sponge growth forms found in this guide together for simplicity.

These categories have no taxonomic significance.

Flabellate	Fan, vase, cup, or spatulate shaped specimens.
Stalked	Sponges with an obvious stalk that anchors them to a substrate.
Finger-shaped	Sponges with long, digitate projections. Usually with a central stalk or arising from an encrusting base
Solid/Massive	Large, often dense specimens. Usually irregular in shape, but are sometimes more or less spherical.
Cushion with Projections	Sponges with many papillae on a generally rounded base.
Encrusting	Thin or thick crusts which grow with most of the body attached to a substrate.
Thin-walled/ Glass	White or transparent thin sheets with mesh-like fused skeletons (Hexactinellida)
Calcareous	Small white or transparent cylindrical or barrel shaped sponges (Calcarea)

Ease of Identification Indicator Symbols

Sponges are difficult to identify to species from outer morphology alone. The confidence level of correct identification depends on an individual's familiarity with a particular species. The following symbols are shown on the upper right-hand corner of each species page to indicate the general level of confidence an observer should have when a sponge species from this guide is being considered.

High confidence. One or more unique features which easily distinguish the sponge from other species.

Proceed with caution. This species may look similar to others, but can still be confidently identified. The remarks section on the species page will reference similar looking species.

Low confidence. The species is too difficult to confidently identify in the field in most cases. These species require confirmation of skeletal structure to confirm their identify.

Page left intentionally blank.

Cladocroce spatula (Lundbeck, 1902)

Species Code: 8627 **AphiaID: 370775**

Flabellate

Stalked

Key Identifiers. Soft stalk. Many rounded holes on a flattened fan or multiple flattened lobes. Long skeletal fibres. Holds water.

Description. Stalked, spatulate or with several flat lobes extending out from the central stalk. Specimens can be up to 35 cm in height and more than 20 cm in width. White to light brown in colour. Many round, raised oscula run along the fan and stalk that are quite large, up to 0.3 cm in diameter. The axial skeleton can be removed as dense, stringy fibres. The stalk is more or less cylindrical and flares out at the base to form roots. The periphery of the sponge appears slightly hispid, but remains soft to the touch. The sponge retains water and will drain when touched.

Distribution. Very common throughout the southern Gulf of St. Lawrence and nearshore in the northern Gulf and west coast of Newfoundland. Found in soft bottom environments. 20–366 m depth.

Skeletal Structure. Spicules are oxeas that are slightly bent 197–**227**–261 x 8–**16**–20 µm. Stylote modifications and blunt ends are common. The skeleton has multiple primary axial tracts of 2–3 spicules that run towards the surface in a slightly recurved, rib-like manner. The primary tracts are joined by single spicules.

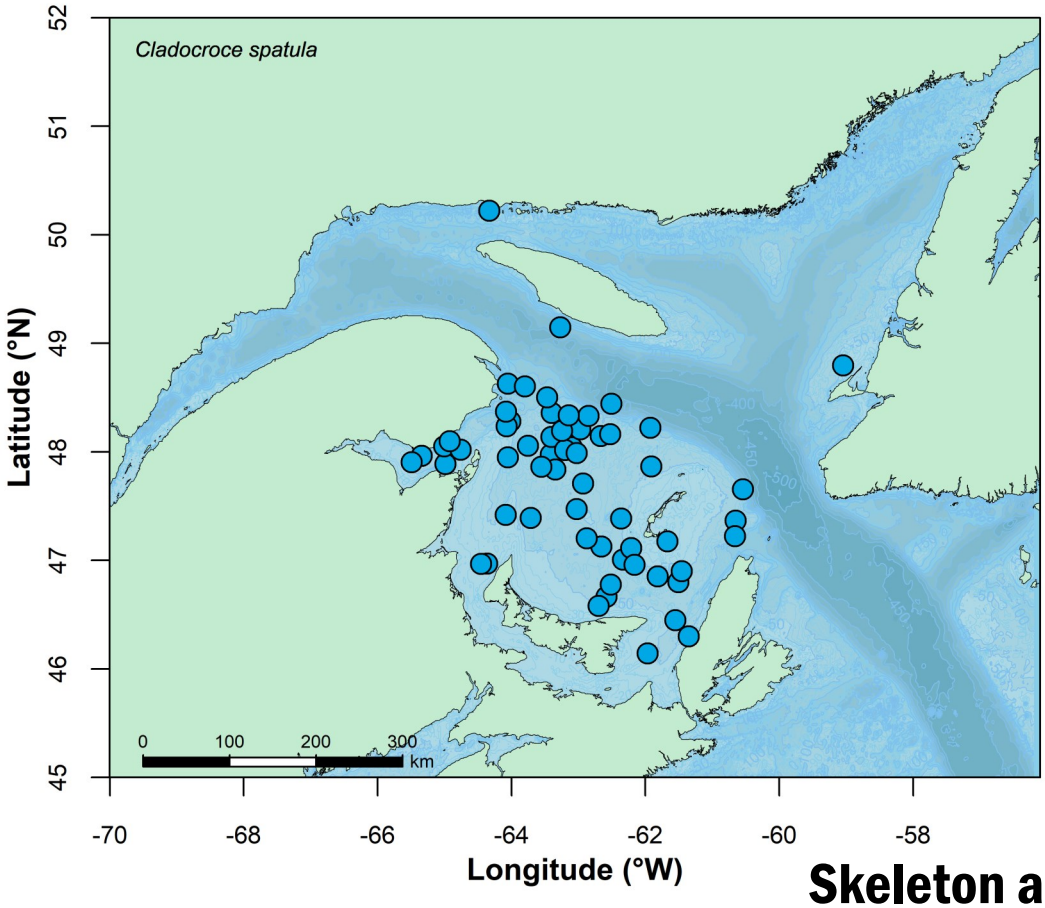
Remarks. Often misidentified as *Isodictya palmata* (Ellis & Solander, 1786), but lacks chelae microscleres, and the lobes are generally thinner in this species. Also similar to *Haliclona (Haliclona) oculata* (Linnaeus, 1759), but that species forms rounded fingers.

Photos. A. Smaller spatulate specimen. B. Fan-shaped specimen. C. Lobed specimen.

Sources: Lundbeck 1902

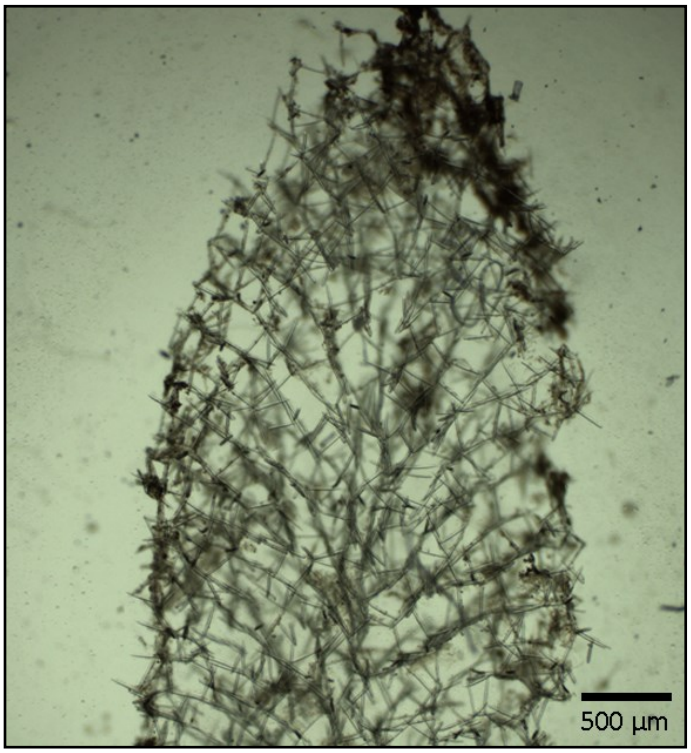
Cladocroce spatula (Lundbeck, 1902)

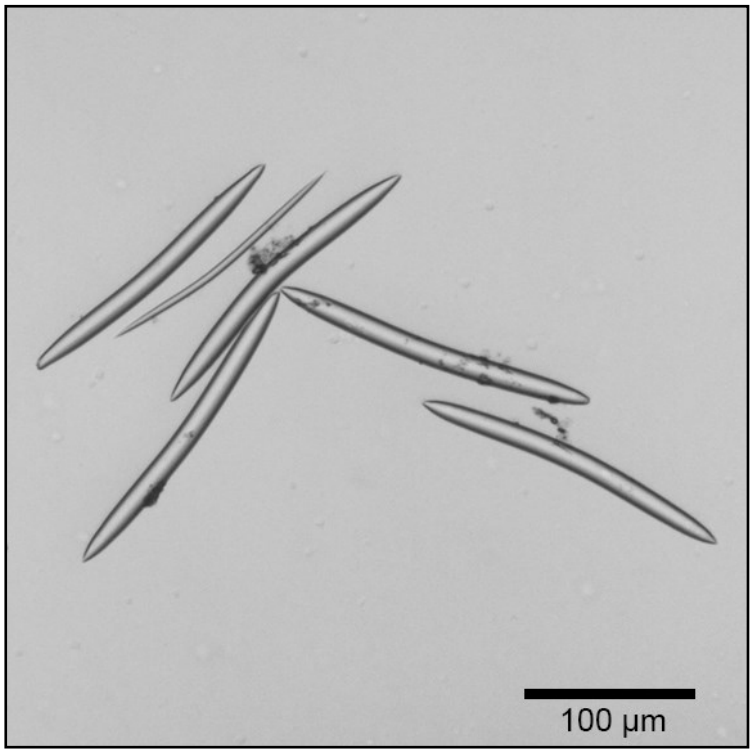
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Semisuberites cribrosa (Miklucho-Maclay, 1870)

Species Code: 8633 **AphiaID: 168379**

Flabellate

Stalked

Key Identifiers. Long, firm stalk. Thin fan with soft, delicate texture. Trumpet shape.

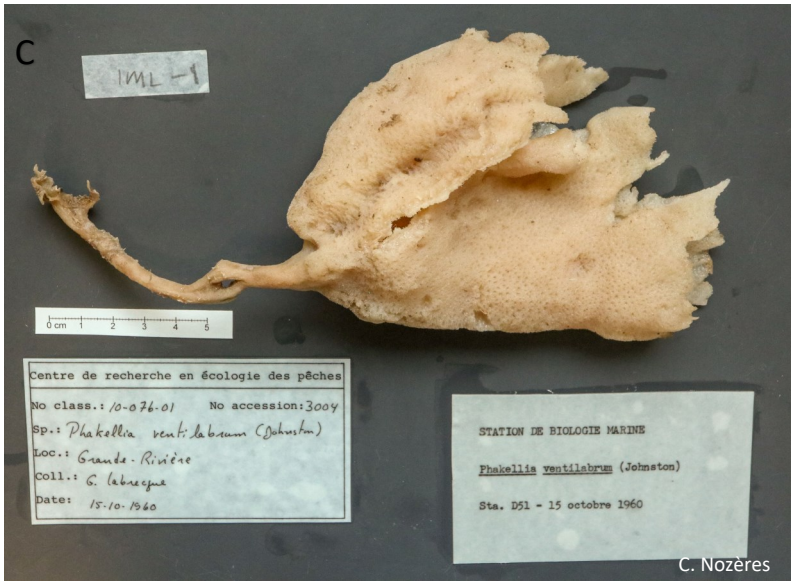
Description. Variable in size, but often a trumpet shaped sponge with a long stalk that forms a holdfast with visible roots. The diameter of the cup can exceed 32 cm and the sponge can be more than 25 cm in height. Surface velvety with a very soft consistency. Larger specimens may have more elaborate forms where more than one stalk may intertwine and give rise to two vases. The distal lip of the sponge is often white to brown or grey in colour. The stalk may have epibionts growing down the length, giving a dark brown or muddy appearance.

Distribution. Southern Gulf in soft bottom environments, but has also been collected in the Baie-des-Chaleurs. 33–289 m depth.

Skeletal Structure. Spicules are exclusively styles that are highly variable in size 186–**390**–540 x 6–**10**–14 µm. Styles from the Gulf of St. Lawrence specimens did not have obvious swollen heads nor did they appear mycalostyle-like, though this is common (Van Soest & Hajdu 2002). Spicules form loose longitudinal tracts in the choanosome. Loose palisade of spicule brushes at the surface.

Remarks. The species has been incorrectly identified as *Phakellia ventilabrum* (Linnaeus, 1767) in eastern Canada and may be confused with members of the Axinellidae.

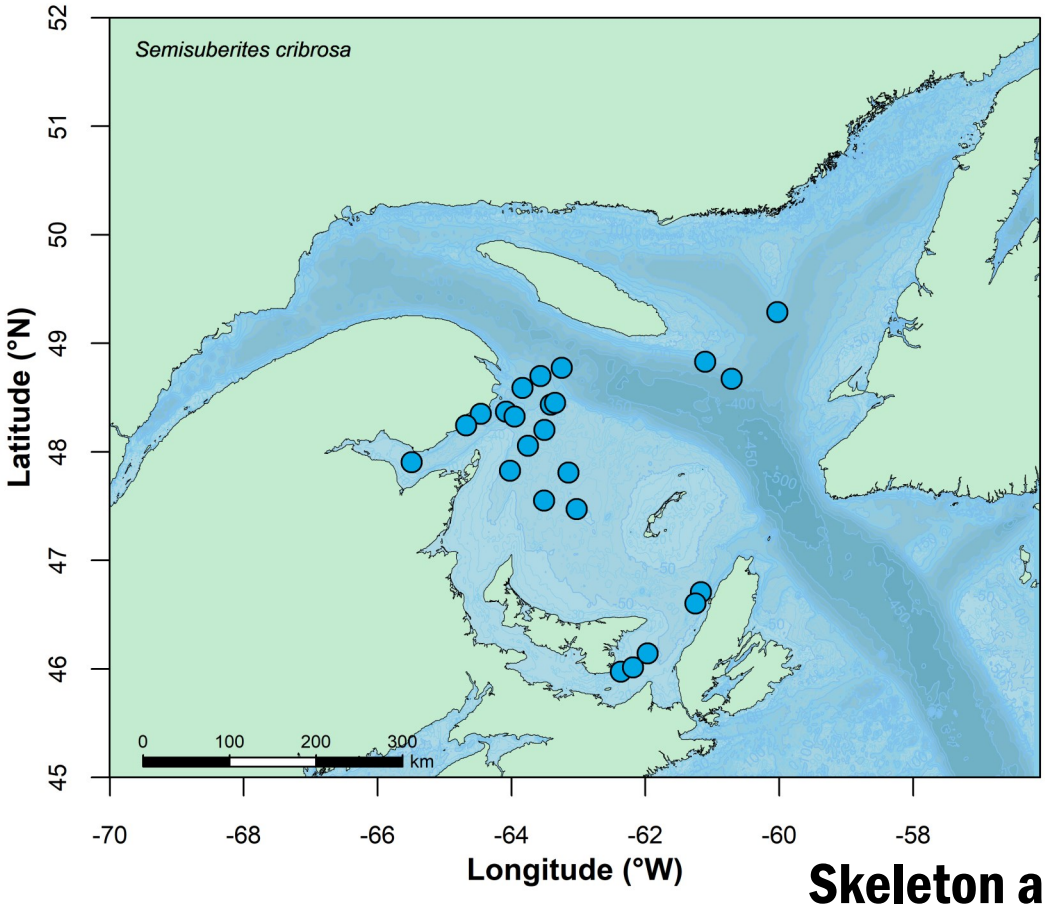
Photos. A. Smaller specimen with clear trumpet shape. B. Specimen with frayed cup. C. Large specimen with thick stalk.



Sources: Van Soest 2016, Van Soest & Hajdu 2002

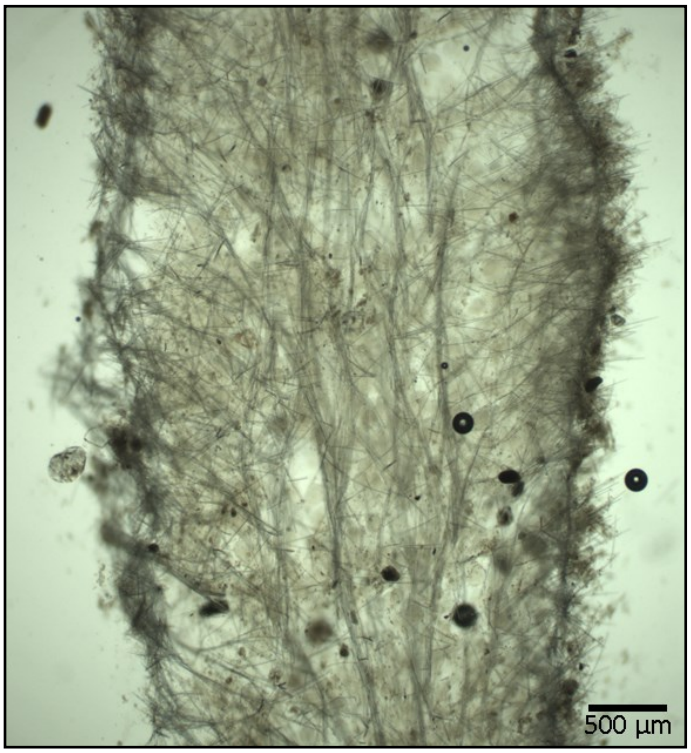
Semisuberites cribrosa (Miklucho-Maclay, 1870)

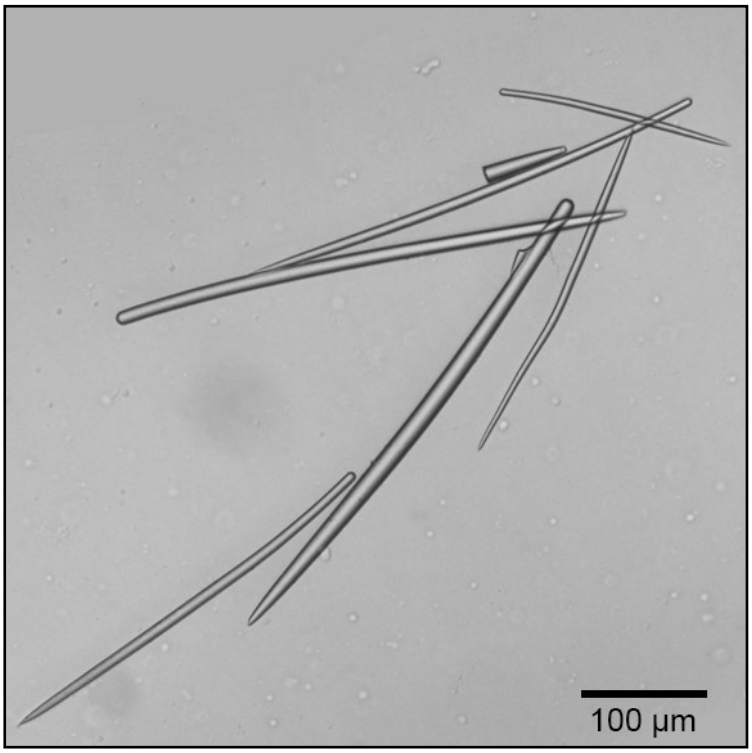
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Plicatellopsis bowerbanki (Vosmaer, 1885)

Species Code: 8648 **AphiaID: 132506**

Flabellate

Stalked

Key Identifiers. Thin but firm tissue. Vase shape. Often with circular apertures .

Description. Large, vase shaped sponge that forms a funnel at the base. In some individuals secondary fans may extend from the distal portions of the primary fan. The inner and outer surface have irregularly spaced pores (<1 mm in diameter) scattered along the surface. The distal lip of the fan is smoothly curved but is often frayed after collection. Most specimens have large circular holes irregularly placed on the sponge body which can include the stem.

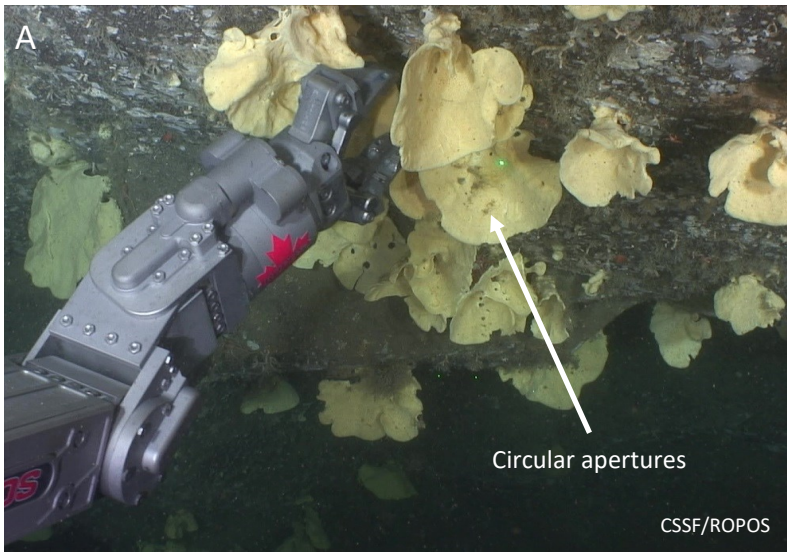
Distribution. Deeper water in the northern Gulf. Found growing on hard substrates, particularly rock walls and boulders. Common along the entire east coast of Canada into the Arctic. 77–878 m depth.

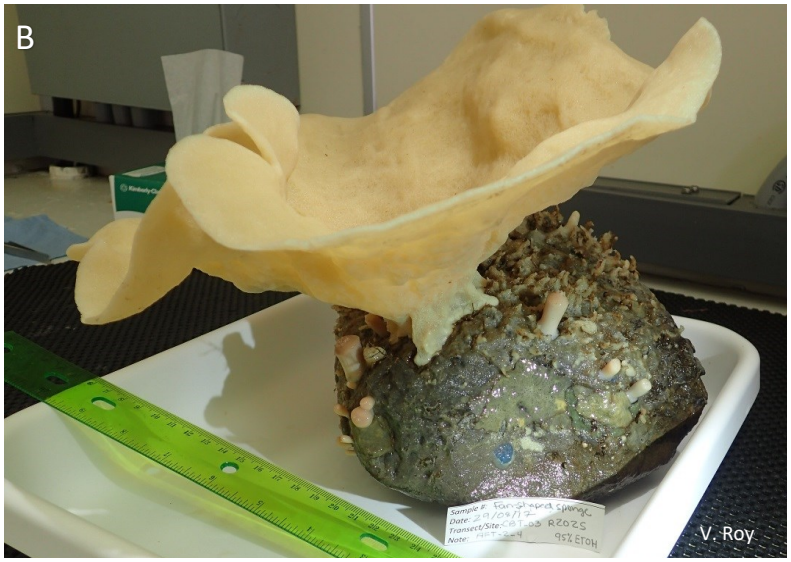
Skeletal Structure. Spicules are stout, slightly bent tylostyles with very slight tyles. Sometimes thin tylostyles are present 213–**273**–326 x 8–**13**–16.5 µm. The skeleton consists of dense spicule tracts forming an axial skeleton, with extra-axial branches fanning out towards the surface. Small spicule brushes are present at the surface, but they do not form a palisade.

Remarks. Easily confused with other fan-shaped sponges like *Semisuberites cribrosa*, though that species has a long stalk and has a softer texture. Recently transferred from the genus *Phakellia* based on genetic data (Dinn *et al.* 2020).

Photos. A. Sponges growing on rock wall, circular apertures are obvious. B. Specimen attached to rock. C. Specimen with secondary fan extending from the base.

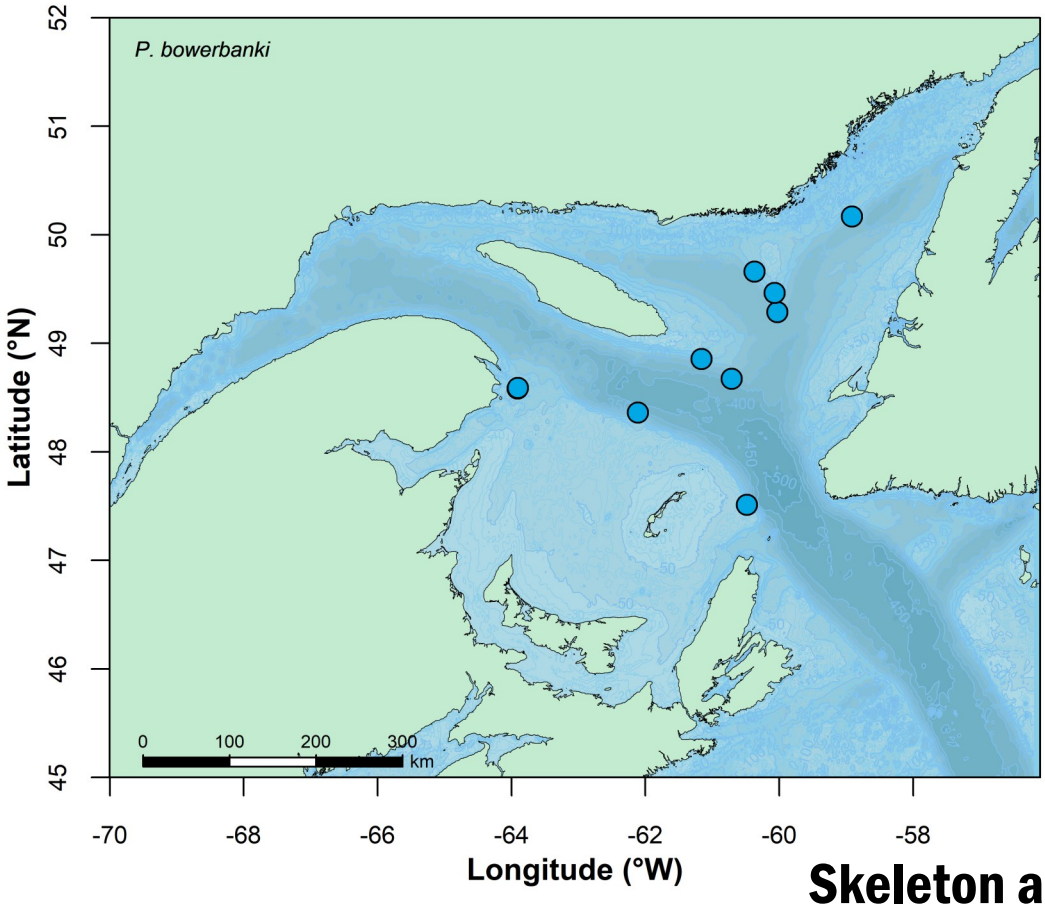
Sources: Vosmaer 1885, Fristedt 1887, Dinn *et al.* 2020.





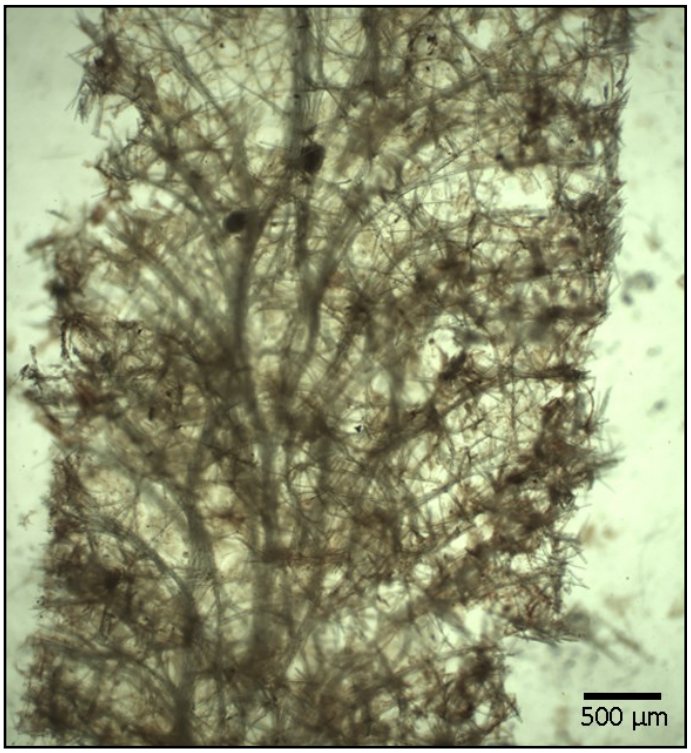
Plicatellopsis bowerbanki (Vosmaer, 1885)

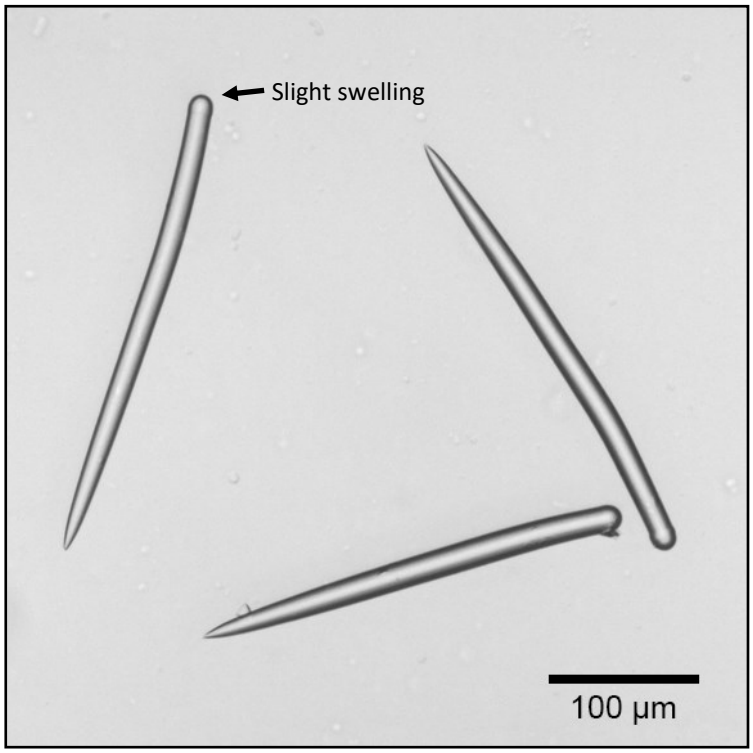
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Hemigellius arcofer (Vosmaer, 1885)

Species Code: 8629 **AphiaID: 166752**

Flabellate

Key Identifiers. Large, thick, sheets with a wide-meshed lattice. Very fibrous.

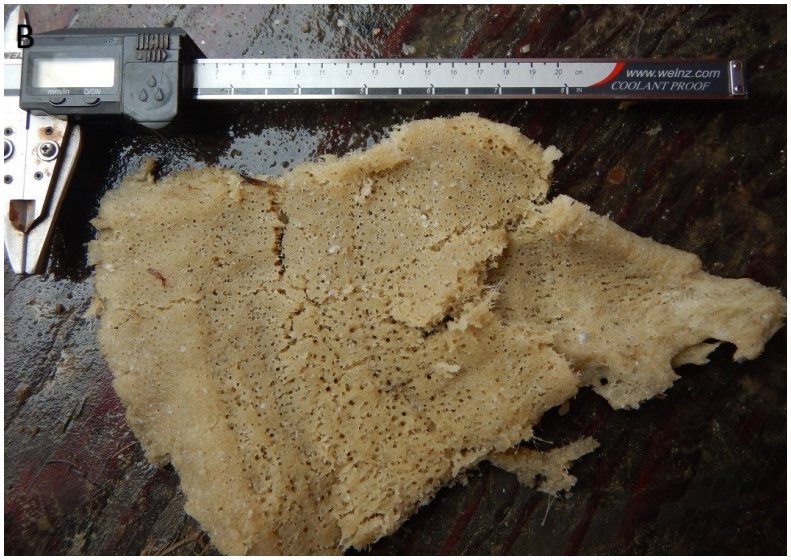
Description. Very thick (up to 3 cm) fan-shaped sponge with large circular openings that appear mesh-like due to the presence of thick fibres. The consistency is firm, but compressible. The sponge can break easily if bent. Colour is variable, and often coated in mud.

Distribution. Wide depth range along the American Bank. Also found nearshore along the inner shelves of western Newfoundland and Quebec. 28–356 m depth.

Skeletal Structure. Spicules are oxeas, sigmas, and bow shaped toxas. Oxea are 370–**435**–472 x 14–**20**–23 µm, sometimes with forked ends. Sigmas 9–**14**–17 µm. Toxas 84–**126**–182 x 5–**6.5**–9.5 µm. Sigmas are very small and thin and may be missed at lower magnifications. Often contaminated with spicules from other species. Skeleton consists of dense polyspicular tracts with irregularly placed interconnecting spicules.

Remarks. Common. Easily identified due to size and appearance. Can be confused with *Haliclona (Flagellia)* xenomorpha, but that species does not have spicule fibres and crumbles very easily. May also be confused with *Mycale* sp., but that species has thicker mesh with much less tissue between the fibres.

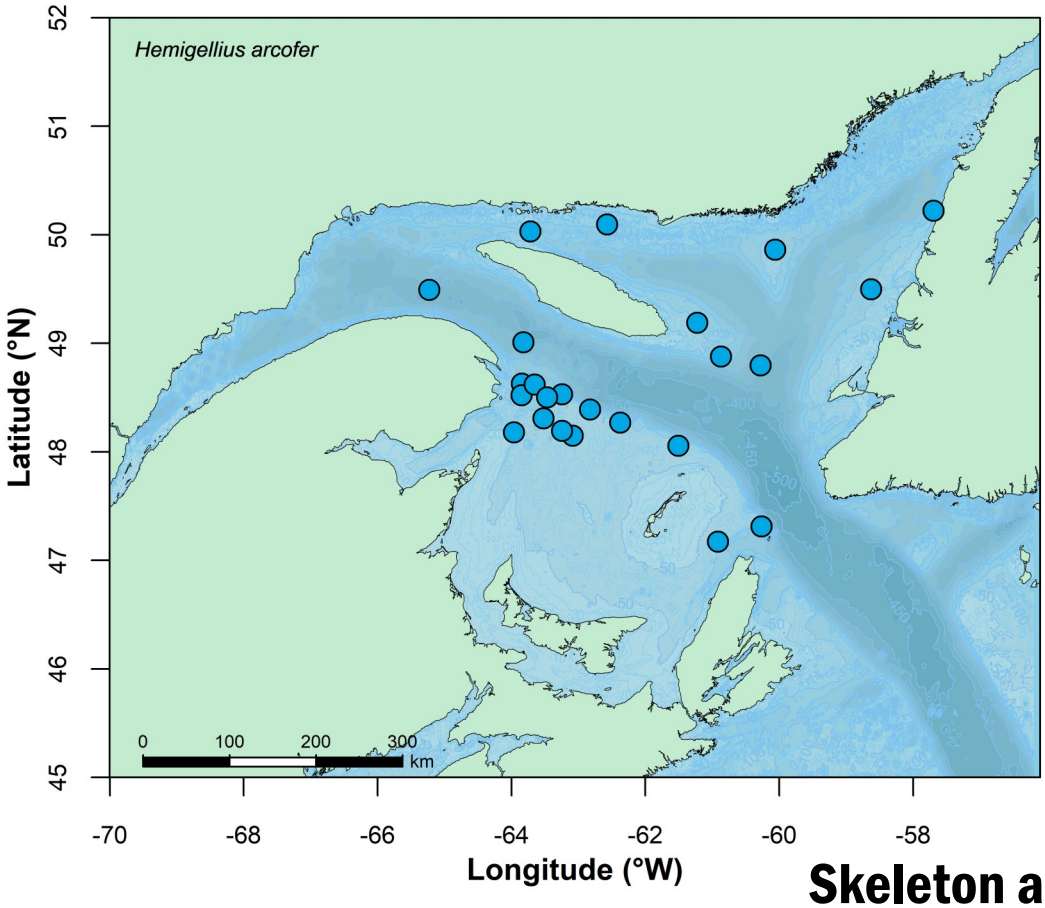
Photos. A. Darker specimen due to mud in the trawl. B, C. Specimens with fibres clearly visible.



Sources: Van Soest et al. 2000, Vosmaer 1885

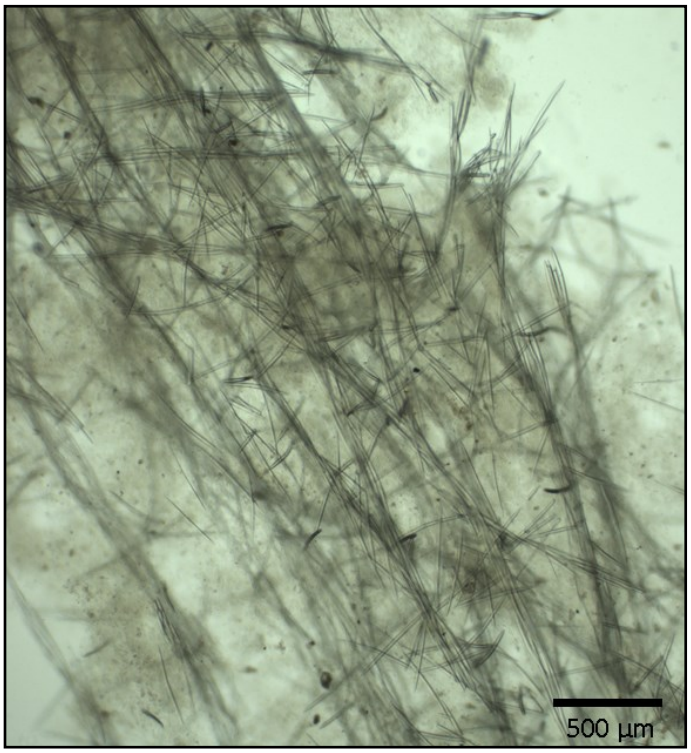
Hemigellius arcofer (Vosmaer, 1885)

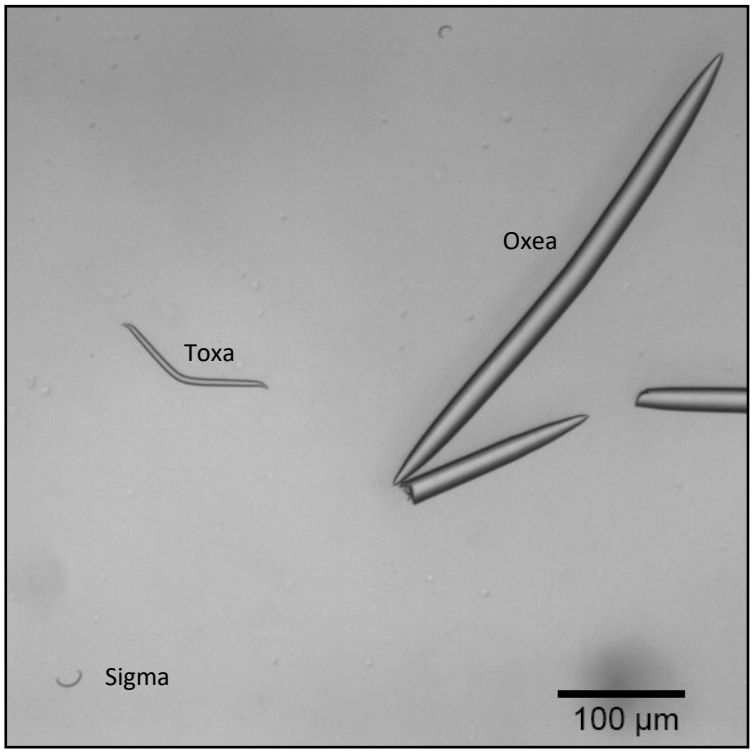
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Mycale sp.

Species Code: 8636 **AphiaID: 131907**

Flabellate

Key Identifiers. Sheets of shaggy yellow mesh.

Description. Collected as a piece, ~23 cm in width. Spicule fibres are thick and visible, but do not form a consistent pattern. Softer tissue fills the spaces between the spicule fibre mesh, but overall the sponge is rough to the touch.

Distribution. A single specimen was analyzed from the Gulf of St. Lawrence, but similar specimens have been reported from nearby waters east and north of Newfoundland. 181 m depth.

Skeletal Structure. Megascleres are styles that are thickest in the middle, tapering towards the ends 342–**408**–446 x 13–**17**–19 µm. There are three sizes of anisochelae 47–**43**–73 µm, 27–**32**–41 µm, and 18–**21**–24 µm. The skeleton is formed by very dense fibres of styles, with small portions of softer tissue that have a somewhat plumoreticulate arrangement of spicules.

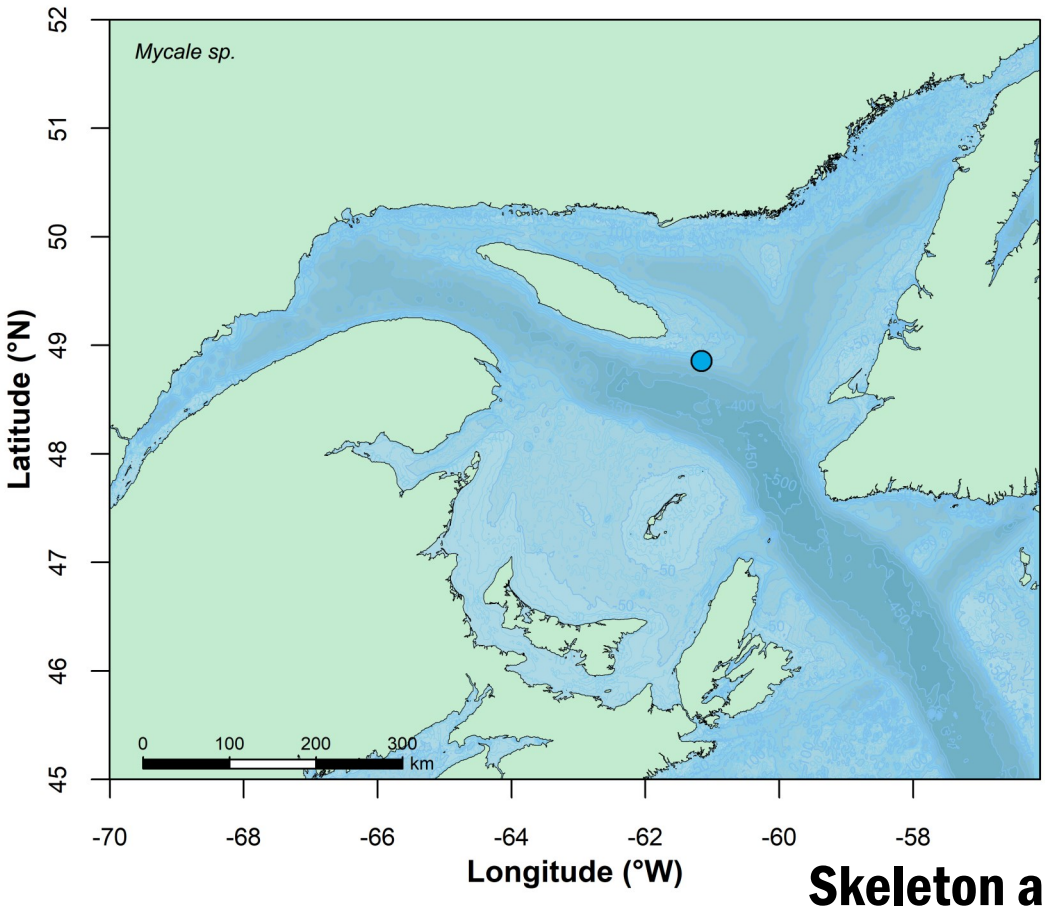
Remarks. Uncommon in the southern Gulf. Has been reported as *M. loveni* elsewhere in eastern Canada, though this identification cannot be confirmed due to differences in spicule shape and size, as well as distribution of that species (the north Pacific). *M. loveni* has styles which swell near the pointed end whereas the mycalostyles are thickest in the middle in eastern Canadian specimens. The anisochelae in these specimens are also distinctive as they have very short shafts. Can appear similar to *M. lingua*, but is not as soft as that species.

Photos. A. Collected piece.

Sources: Stone et al. 2011, Murillo et al. 2018

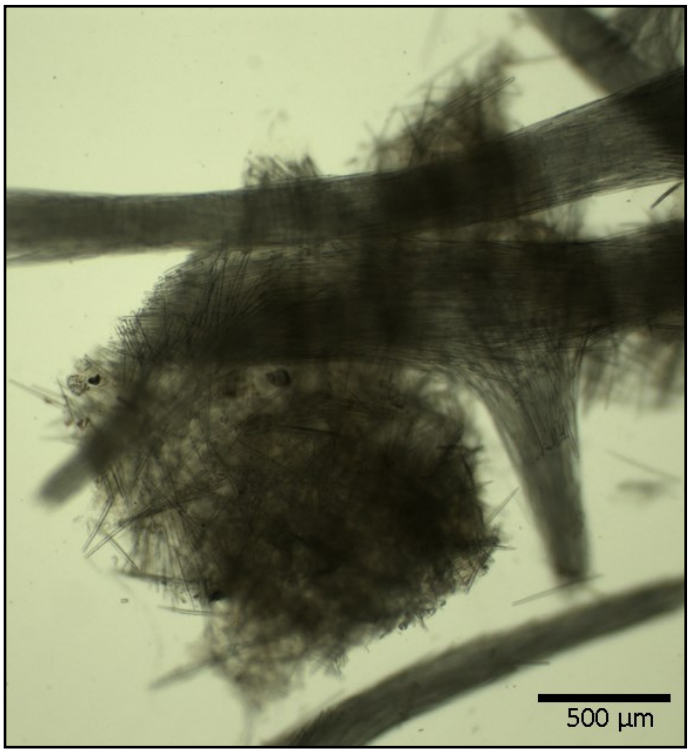
Mycale sp.

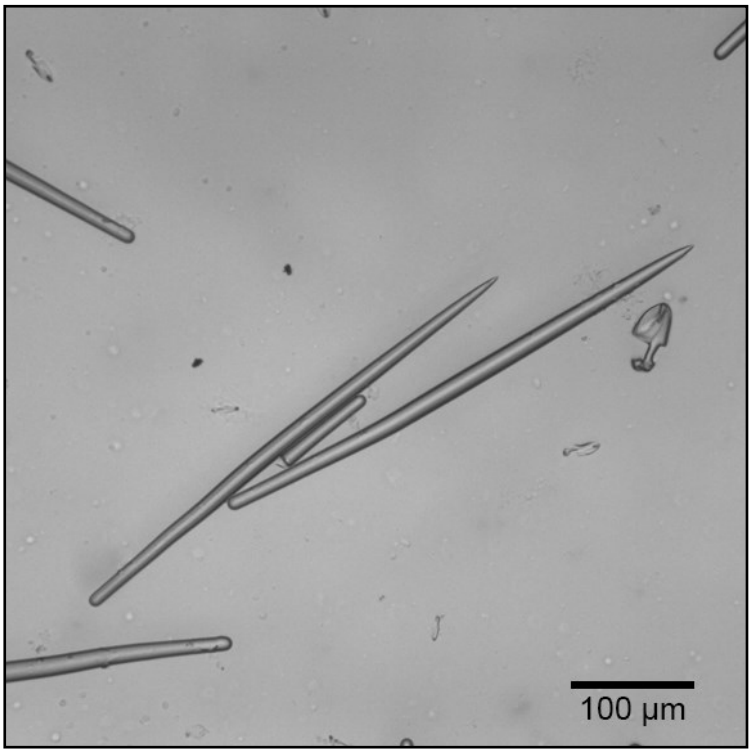
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Haliclona (Haliclona) oculata (Linnaeus, 1759)

Species Code: 8621 **AphiaID: 132833**

Finger-shaped

Stalked

Key Identifiers. Long fingers with many pores along the branches.

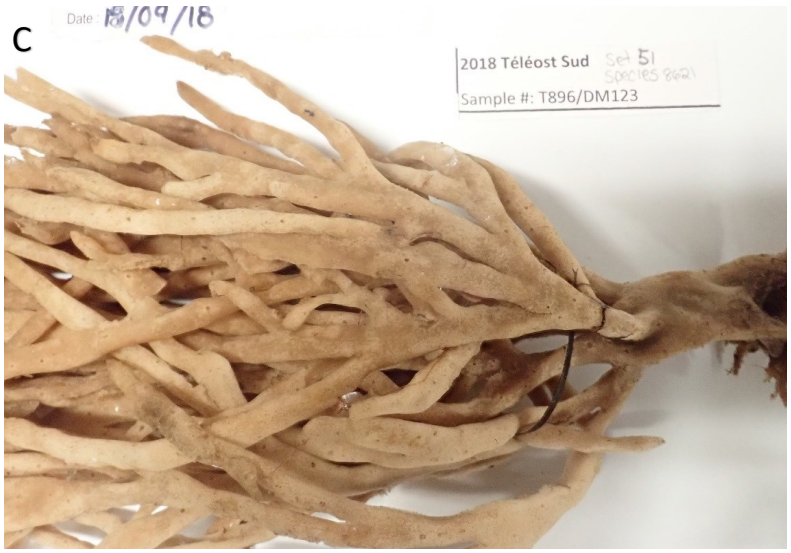
Description. Well known species that is easily identified by the long, branching growth form. There is often a central stalk from which many finger-shaped branches extend. Many oscula can be seen along the branches. It is common to collect single branches detached from the stalk.

Distribution. Common nearshore in the whole north Atlantic ocean. 18–81 m depth.

Skeletal Structure. The spicules are exclusively small oxeas 116–**155**–176 x 7–**11**–13 µm. The skeletal structure is formed by multispicular columns joined by single spicules forming a square mesh.

Remarks. Can be confused with *Cladocroce spatula* as they have a similar texture and oscula occur over the whole body in both species. The branching nature of this species is distinctive and does not form lobes as in *C. spatula*. The sponge is also often confused with *Isodicta* species elsewhere.

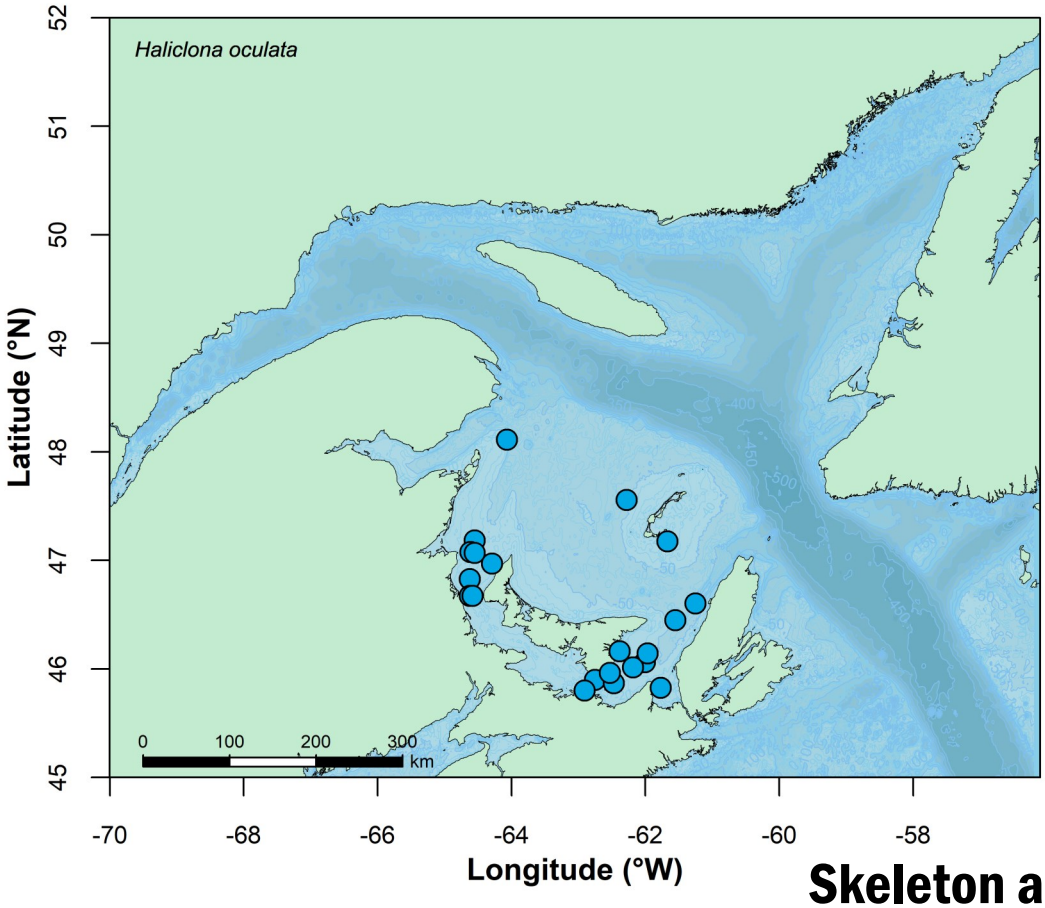
Photos. A. Specimens showing a single stalk and many branches. B. Large catch of multiple individuals. C. Detail of oscula on branches.



Sources: Goodwin 2017, Ackers et al. 2007

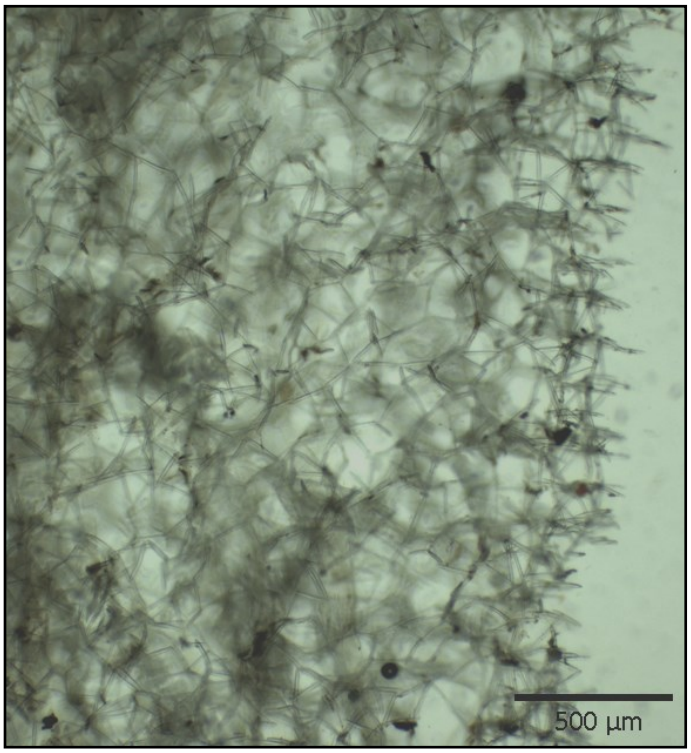
Haliclona (Haliclona) oculata (Linnaeus, 1759)

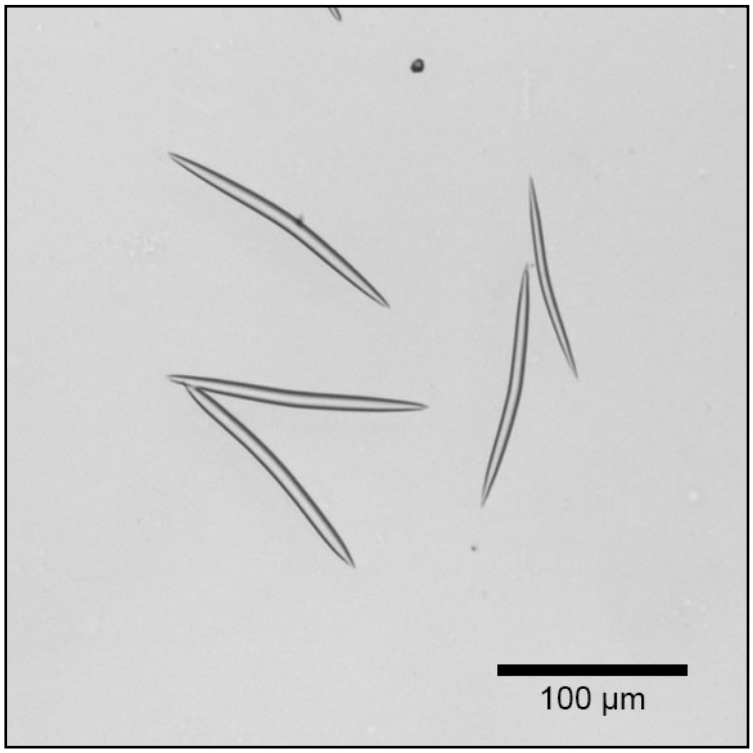
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Haliclona sp.

Species Code: 8618 **AphiaID: 131834**

Finger-shaped

Stalked

Key Identifiers. Thick fingers with large, raised oscula.

Description. Thick branching sponge. Oscula are large and raised along the fingers. Has a stiff holdfast at the base.

Distribution. Collected in two trawls northwest of Prince Edward Island. 43 m depth.

Skeletal Structure. Oxeas only, 180–**203**–219 x 11–**15**–17 µm. The skeleton is formed by spicule columns joined by single spicules.

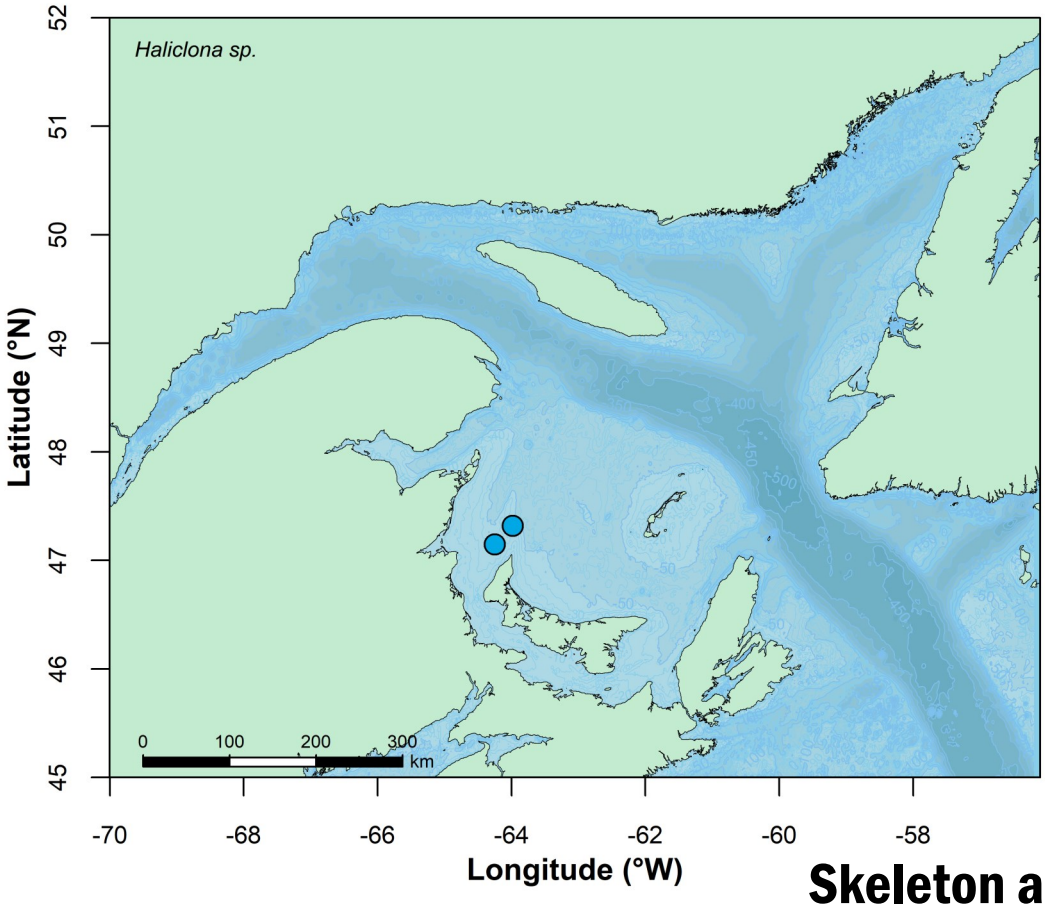
Remarks. Uncommon. Appears similar to *Haliclona oculata* in form, however the branches are much thicker with raised oscula. The spicules are longer and thicker than those of *H. oculata*. Spicules are slightly smaller than *C. spatula*, and the body form does not form lobes. Appears to fit the description of *Haliclona gracilis* (Miklucho-Maclay, 1870), but that species appears to have been synonymized with *H. oculata.* The sponge is very similar to descriptions of *Isodictya palmata* (Ellis and Solander, 1786), but does not have chelae microscleres.

Photos. A. Specimen showing long, thick branches and large oscula.

Sources: Miklucho-Maclay 1870

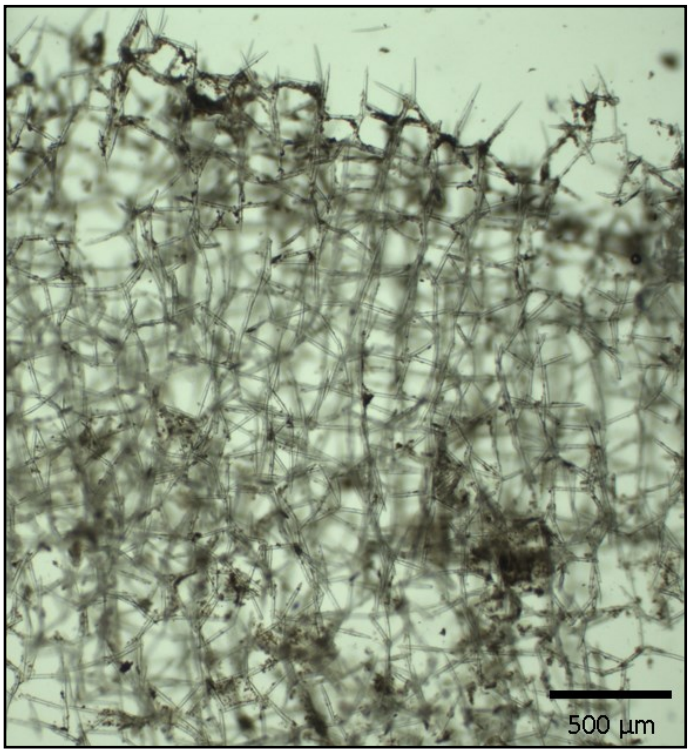
Haliclona sp.

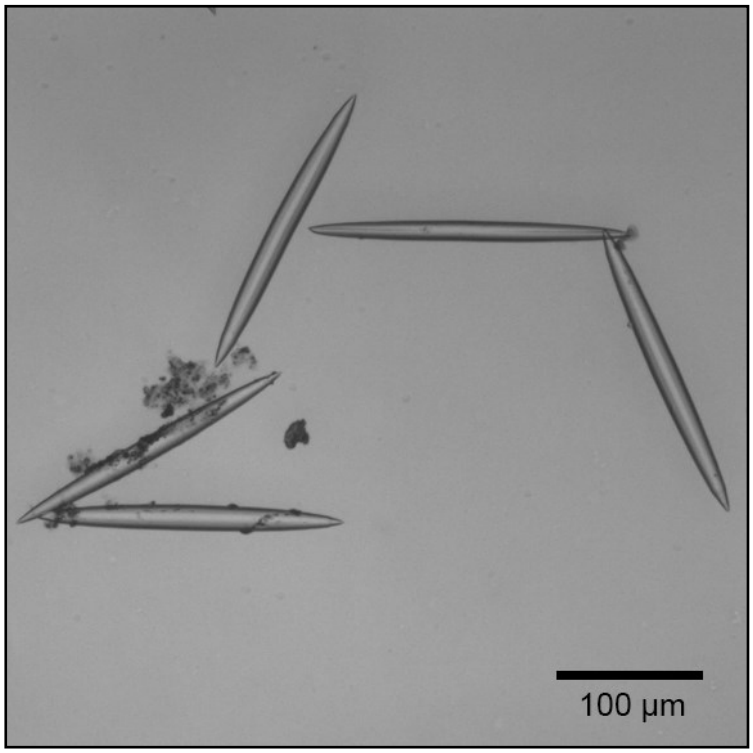
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Clathria (Clathria) prolifera (Ellis & Solander, 1786)

Species Code: 8652 **AphiaID: 167563**

Finger-shaped

Key Identifiers. Bright red or orange fingers, often coated in mud.

Description. Thin fingers issuing from an encrusting base forming a bush. Red colour leeches out easily. This species was not collected during research vessel surveys, and has only been found in shallow coastal water.

Distribution. Common nearshore in the western Atlantic from New Brunswick to South America, but southern forms may be representative of a species complex.

Skeletal Structure. The skeleton is formed by irregular plumose tracts formed by slender styles which meander in a slightly vermiform fashion. Spongin is dense in the skeleton. Protruding spicules form a hispid surface. Slender styles are 150–**221**–323 x 2.5–**3.2**–4.3 µm. Subtylostyles are spined at the head and are 143–**200**–293 x 6.2–**7.8**–10 µm. Fully spined echinating subtylostyles are 62–**86**–123 x 5.3–**6.5**–8.8 µm (N = 11). Toxas (15–50 µm) and chelae (~14 µm) are uncommon.

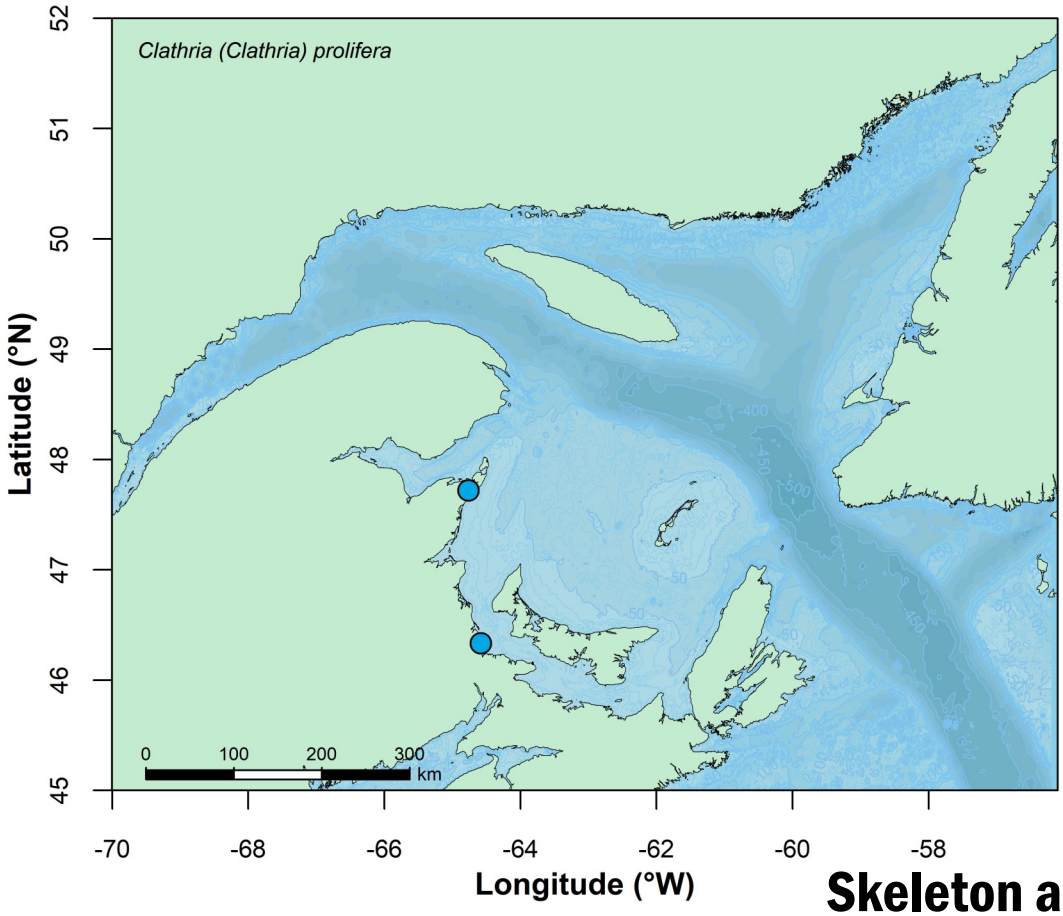
Remarks. Easily recognizable nearshore species. Might be confused with *Amphilectus* sp. due to the colour, but *Amphilectus* specimens do not have small, neat branches like this species. Thin red crusts have also been observed on bivalve shells nearshore which have a similar spicule complement, but may represent a separate encrusting *Clathria* species.

Photos. A–C. Collected specimens.

Sources: Lambe 1896, Pollock 1998.

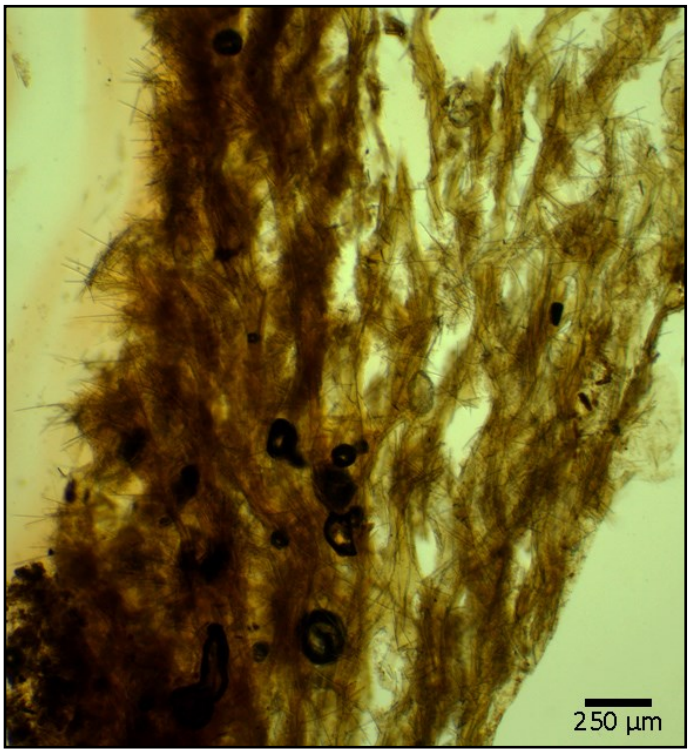
Clathria (Clathria) prolifera (Ellis & Solander, 1786)

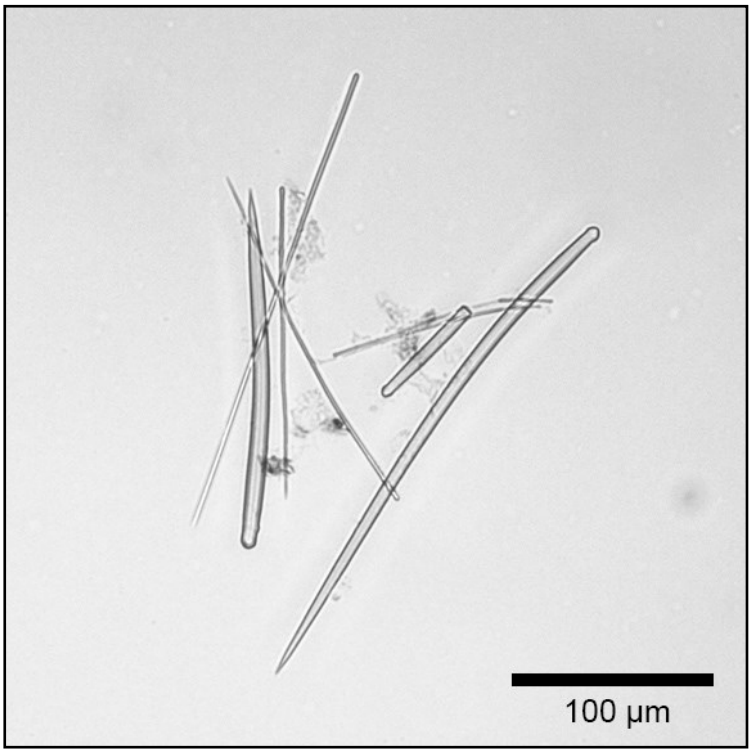
Collection Locations—Gulf of St. Lawrence



Likely present in additional coastal locations.

Skeleton and spicules





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

Species Code: 8619 **AphiaID: 150256**

Finger-shaped

Key Identifiers. Soft tubes with a single terminal opening.

Description. One or more soft cylindrical tubes which extend from a central stalk. The body is flexible and elastic, but may tear easily. The sponge is usually white to pink, but may also be grey-brown. Some tubes may not have an apical opening. Younger specimens may be a single tube only. Single tubes have an obvious stalk, but more mature branching forms may have a reduced stalk.

Distribution. Often encountered in shallow water, but mostly grows attached to rocks. Was collected by ROV in 2017 east of the Gaspé peninsula. Was collected at 84 m depth.

Skeletal Structure. Skeleton formed of oxeas in a unispicular reticulation that is bolstered by dense multi-spicule tracts. Oxeas are small stout oxeas 222–**250**–280 x 14–**17**–20 µm.

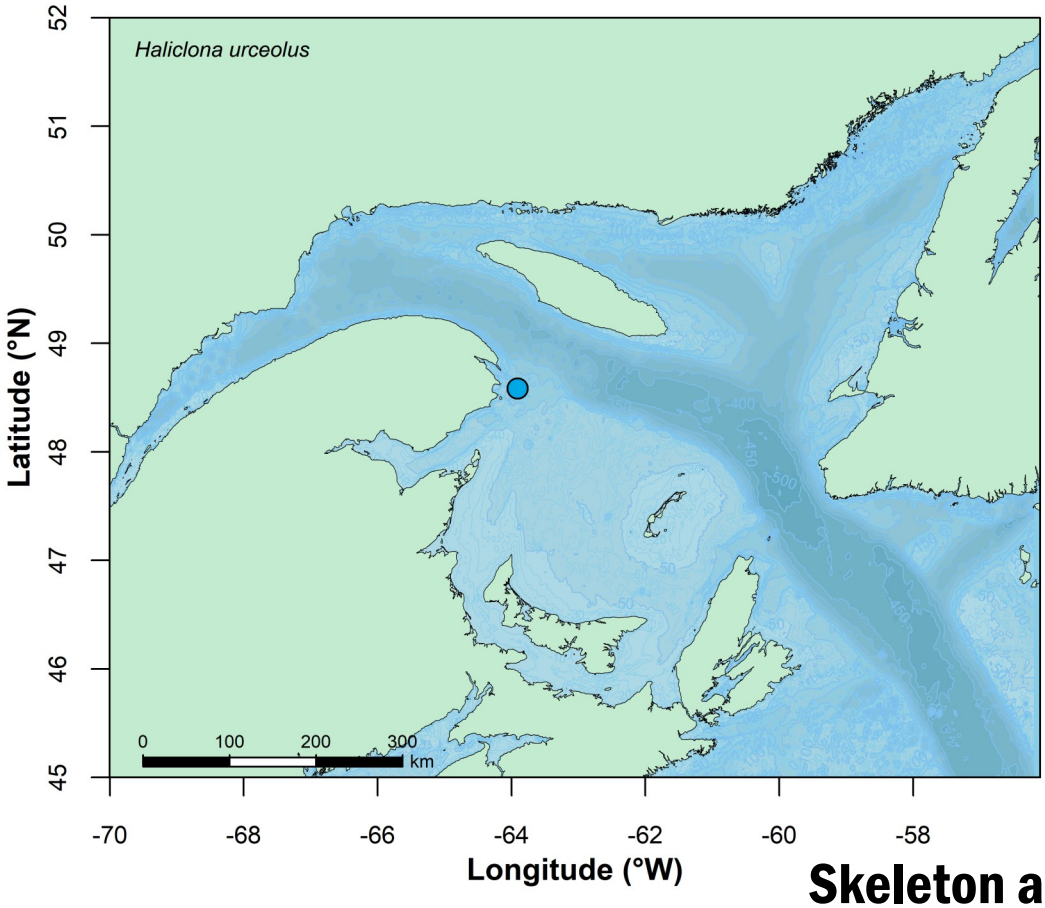
Remarks. Uncommon in trawl surveys, but easily identified if specimen is intact. Does not have oscula down the length as in *H. oculata*.

Photos. A. Specimen on board. B. Specimen *in situ.*

Source: Van Soest et al. 2000.

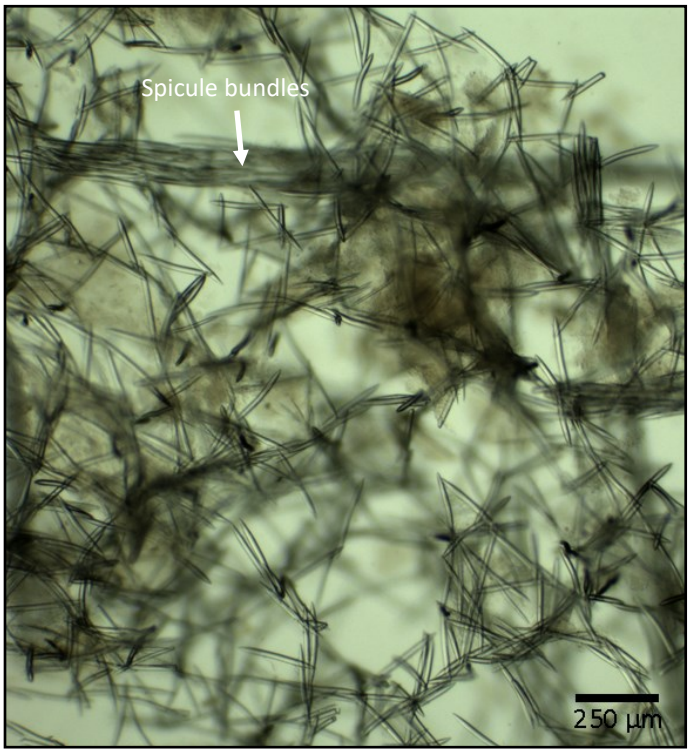
Haliclona (Haliclona) urceolus (Rathke & Vahl, 1806)

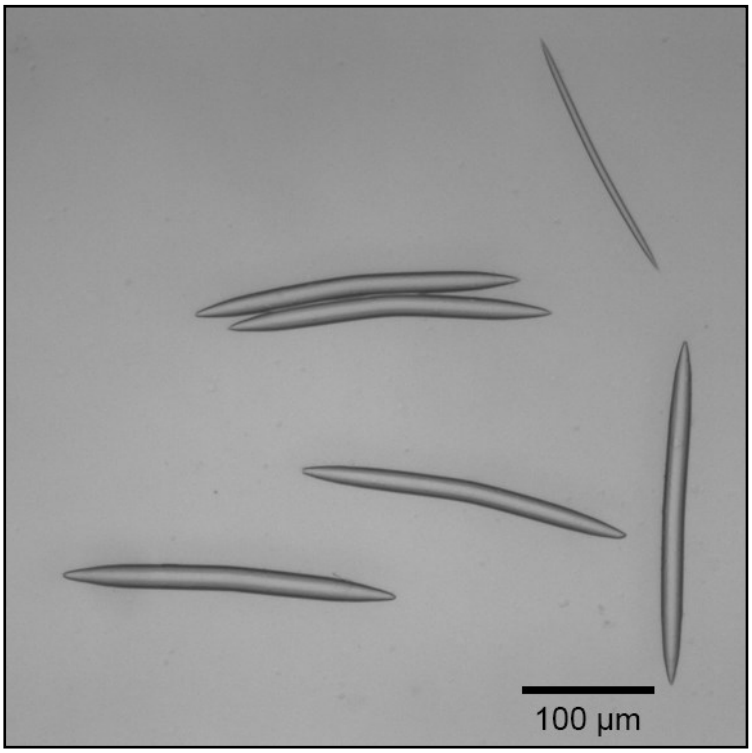
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Suberitida unknown 1

Species Code: 8645 **AphiaID: 845509**

Finger-shaped

Key Identifiers. Fingers with a thick transparent skin.

Description. This sponge grows in large bushes of irregular fingers. The underlying body is soft and yellow, whereas the outer skin is thick and appears bumpy, ranging from clear to white in colour. When encountered the sponge is often collected in large quantities.

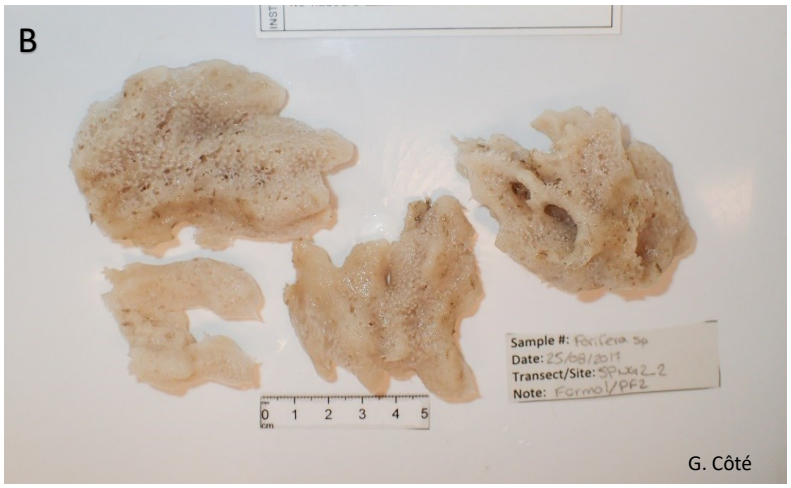
Distribution. Northern Gulf, though was also collected north of Cape Breton Island. Also occurs in the North Labrador Sea. 66–315 m depth.

Skeletal Structure. The spicules are tylostyles ~1000 µm, small tylostyles ~428 µm, and sometimes clavulate tylostyrongyles.

Remarks. The true taxonomic affinity of this species is unknown. DNA loosely places the sponge in the genus *Hymeniacidon*, but the spicules consisting of tylostyles and tylostrongyles is not diagnostic for the genus.

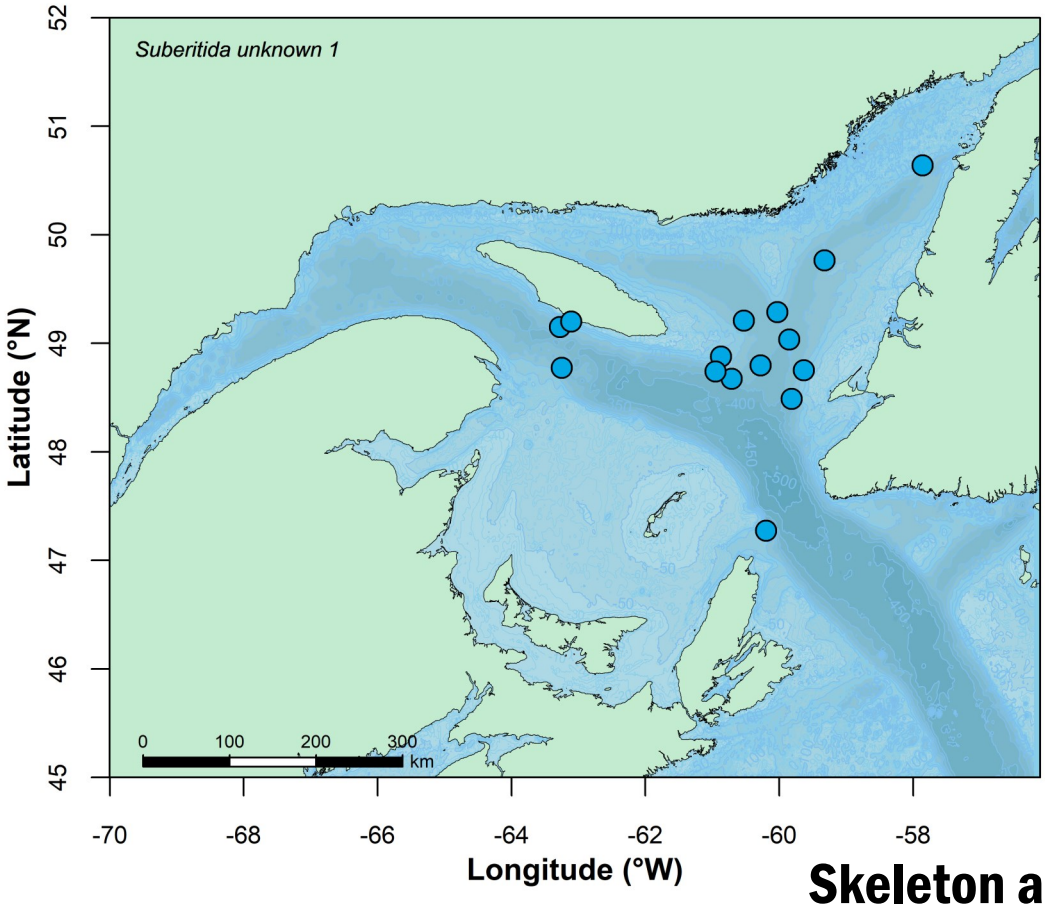
Photos. A. Close-up of dense outer skin and portions of the inner soft body. B. Collected pieces. C. Specimen *in situ.*

Source: Hooper & Van Soest 2002



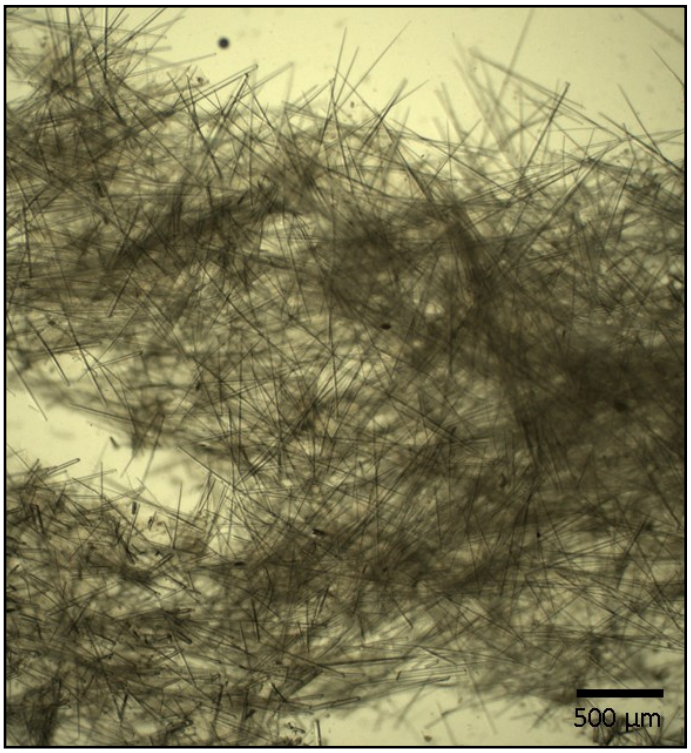
Suberitida unknown 1

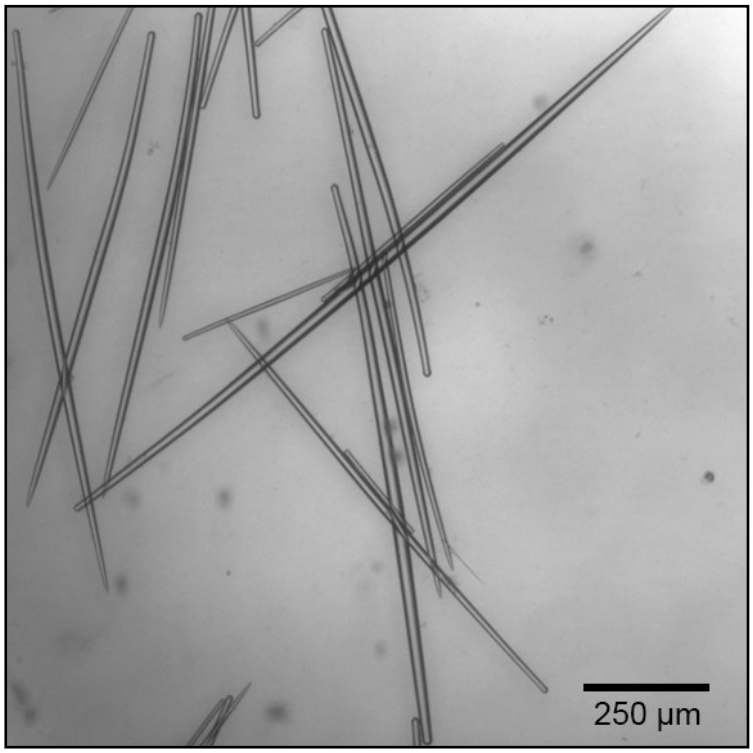
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Iophon cf. *nigricans* (Bowerbank, 1858)

Species Code: 8614 **AphiaID: 132971**

Finger-shaped

Key Identifiers. Difficult to distinguish from other *Iophon* specimens. Often has cephalopod eggs embedded.

Description. Appears to form finger-like growths, but is often collected in pieces or as a more encrusting form on rocks. Primarily identified based on spicule form, though the genus requires extensive revision in eastern Canada. The specimens considered here have two size categories of anisochelae and small bipocilles, but this requires high powered microscopy. Specimens are often collected with *Rossia* sp. eggs embedded, but it is unknown if only this species is targeted.

Distribution. Northern Gulf of St. Lawrence, though *Iophon* is encountered throughout the Gulf and neighbouring waters. 173–313 m depth.

Skeletal Structure. Standard *Iophon* skeleton consisting of tylotes at the surface and a loose reticulation of acanthostyles. Tylotes are 196 –**231**–260 x 5–**7**–9 µm. Acanthostyles are 260–**292** –322 x 8–**11**–13 µm. Anisochelae in two size categories 24–**33**–40 and 14–**17**–20 µm. Bipocilles are 8 –**10**–12 µm. The skeleton is formed by an ectosomal layer of tangential tylotes and a loosely isodictyal reticulation of acanthostyles in the choanosome.

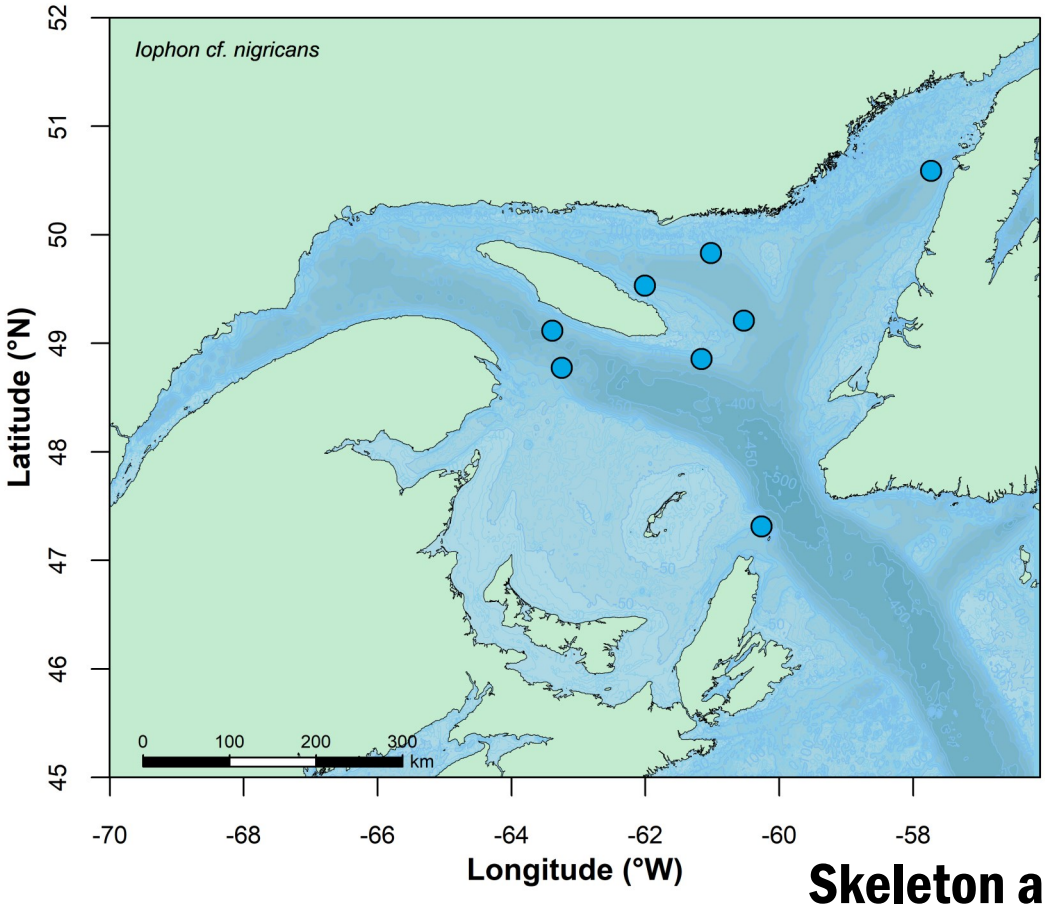
Remarks. Difficult to distinguish from other *Iophon* species in the region without spicule measurements. Until better keys to identification are created, specimens should be considered as *Iophon spp.*

Photos. A. Specimens collected with embedded cephalopod eggs. B. Large catch. C. Emerging juvenile cephalopod.

Sources: Van Soest et al. 2000, Ackers et al. 2007

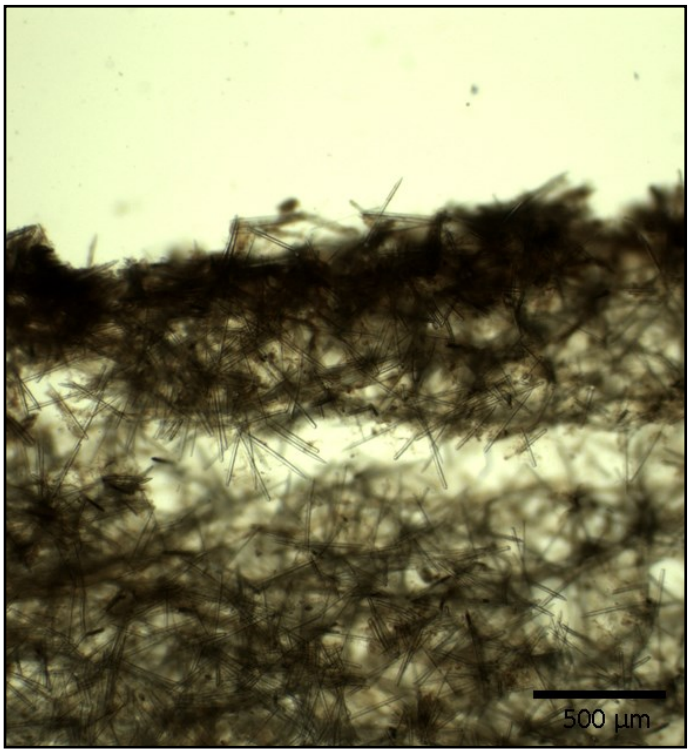
Iophon cf. *nigricans* (Bowerbank, 1858)

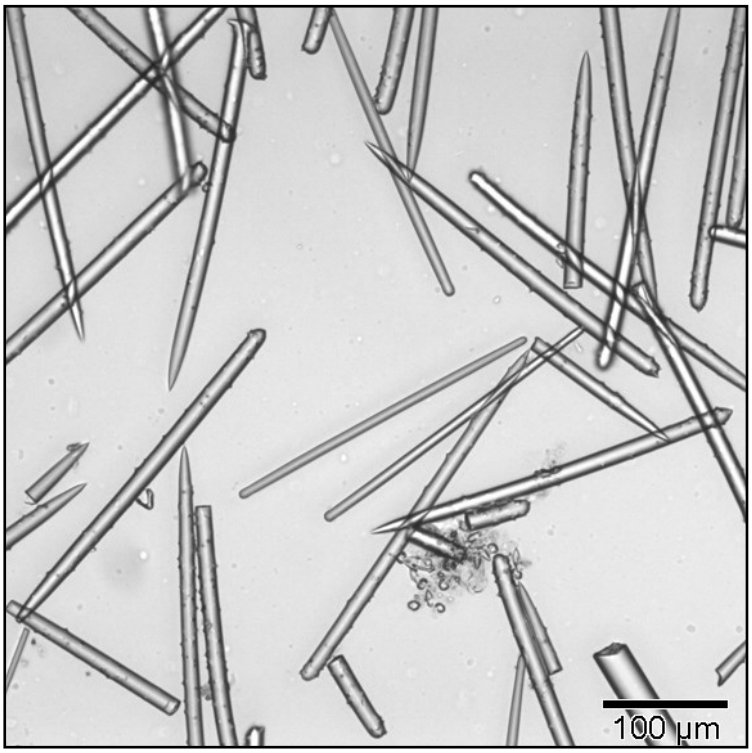
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Iophon spp.

Species Code: 8614 **AphiaID: 131863**

Finger-shaped

Key Identifiers. Firm sponge often collected in small pieces. Colour variable.

Description. Sponges that grow as fingers or dense sheets. Colour varies, and often darkens over time in air. The surface is soft and compressible, but noticeably dense. Several species are likely, but spicule differences are subtle and difficult to distinguish. DNA-based identification measures are being attempted.

Distribution. Northern Gulf of St. Lawrence. 44–356 m depth.

Skeletal Structure. All specimens have the characteristic *Iophon* skeleton consisting of tylotes, acanthostyles, anisochelae, and bipocilles. Some specimens have polytylote tylotes, some have a second size category of longer acanthostyles, and others have small acanthostyles like *I. hyndmani*.

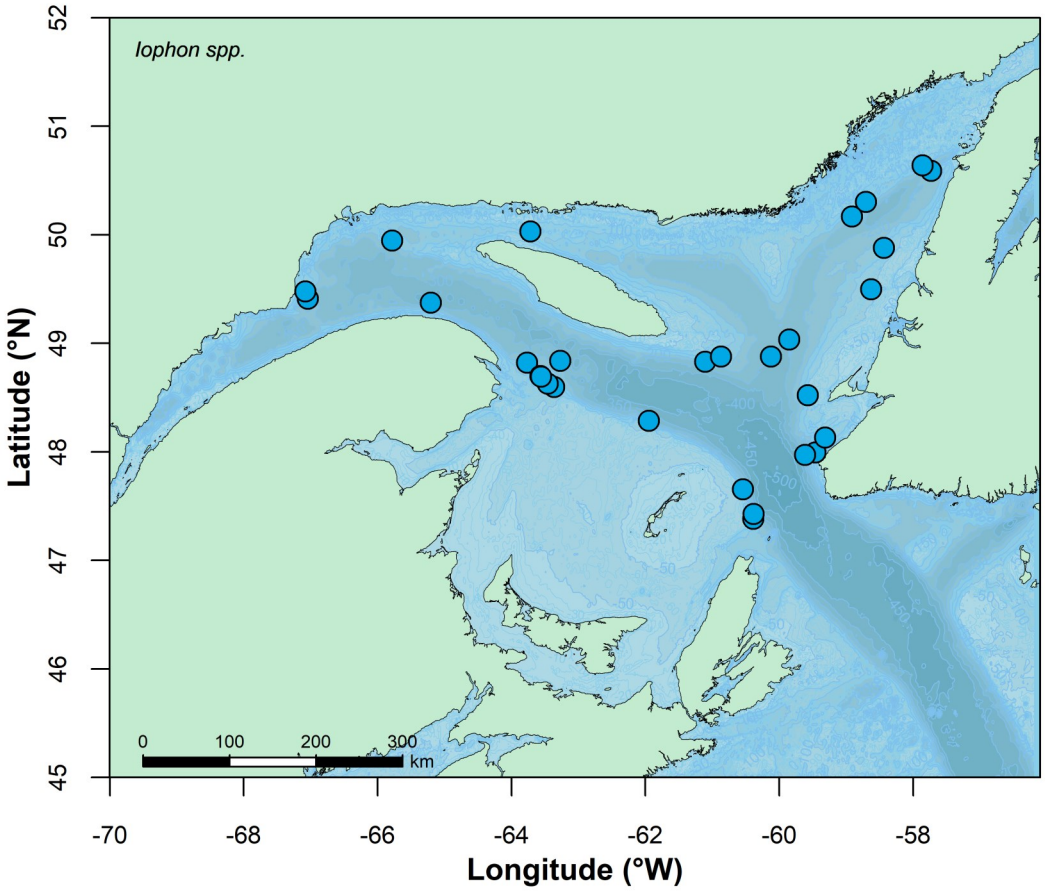
Remarks. Members of the genus are ubiquitous in eastern Canada, but key characters between species have not been established.

Photos. A. Thin, black specimen. B. Thick pieces of another specimen. C. Collected piece.

Source: Hooper & Van Soest 2002

Iophon spp.

Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules vary

Amphilectus sp.

Species Code: 8632 **AphiaID: 131933**

Encrusting

Finger-shaped

Key Identifiers. Rust coloured sponge with finger-like projections.

Description. The sponge is encrusting with long and short finger-like projections covered in oscula. The texture is very soft.

Distribution. Collected nearshore in the Northumberland Strait. 15–20 m depth.

Skeletal Structure. Spicules consist of thick styles 126–**172**–196 x 6.0–**7.8**–11 µm, thin styles 129–**145**–163 x 3.0–**4.4**–5.7 µm, and isochelae 24–**29**–34 µm. The styles are often polytylote.

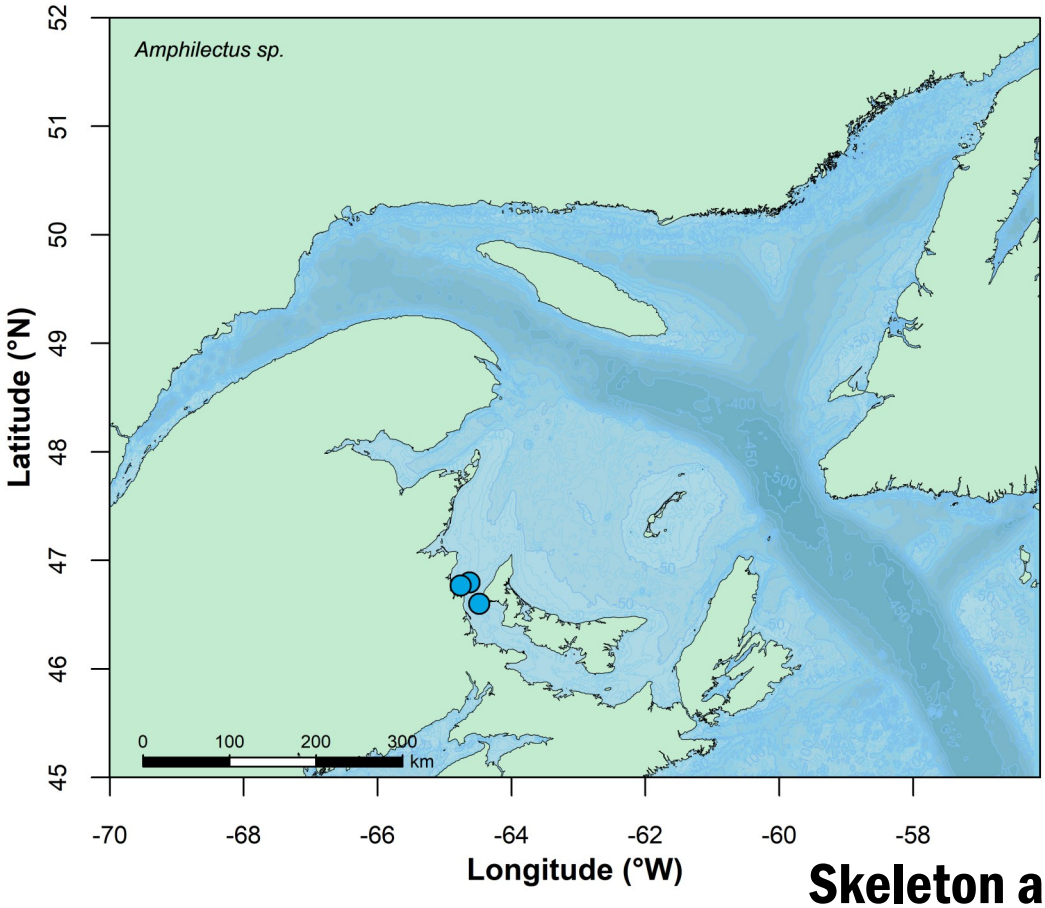
Remarks. The species is currently unknown. The outer morphology is similar to *A. fucorum* (Esper, 1794), however the styles are generally longer in that species and are not polytylote. The isochelae are also smaller in *A. fucorum. A. digitatus digitatus* (Miklucho-Maclay, 1870) does have styles with swellings, but the spicules in that species are thicker and longer. The Gulf of St. Lawrence specimens may represent a different species.

Photos. A,B. Pieces of encrusting specimens with digitate projections.

Source: Ackers et al. 2007

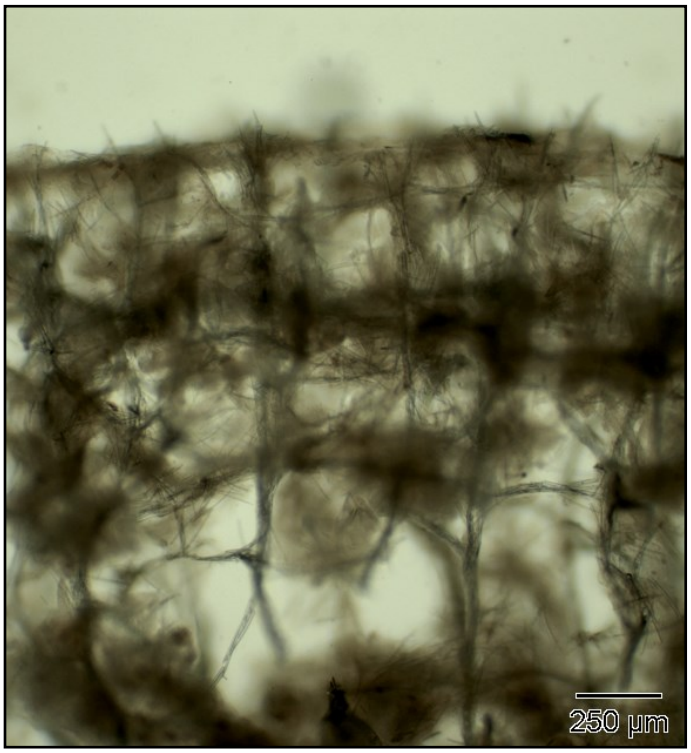
Amphilectus sp.

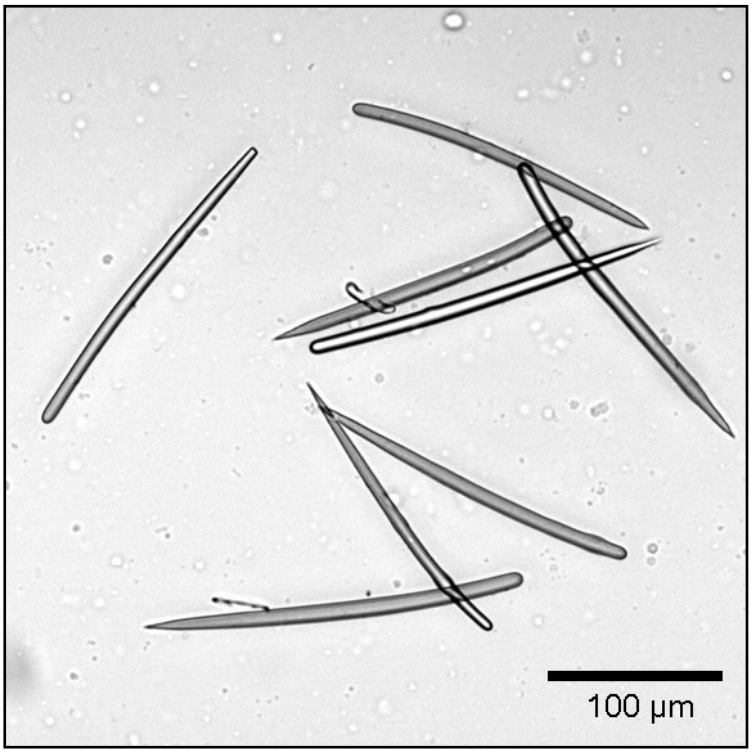
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Haliclona (Flagellia) xenomorpha Dinn, 2020

Species Code: 8628 **AphiaID: TBD**

Solid/Massive

Key Identifiers. No distinct shape. Crumbles very easily. Undamaged specimens have smooth surface.

Description. Massively encrusting with faintly raised oscular lobes. The sponge is very friable and is thus often broken into pieces upon collection. The largest specimens are over 10 cm in diameter, but no consistent growth form is apparent. Larger specimens are often seen fully encrusting small pebbles and may have shell fragments incorporated into the tissue. The colour is pale yellow to buff, with some specimens appearing pinkish.

Distribution. Moderate depth along the American Bank. Also nearshore along the inner shelves of western Newfoundland and Quebec. 41–122 m depth.

Skeletal Structure. Megascleres are oxeas in two size categories, often slightly bent and have sharp tapered points 241–**283**–325 x 10–14–18 µm and 161–**204**–257 x 2.8–**5.3**–7.4 µm. Microscleres are flagellosigmas in two size categories and abundant normal sigmas. Standard flagellosigmas are ovoid with widely curved ends. Length of long endings 35–**47**–71 µm, of short endings 30–**43**–69 µm, width 40–**49**–67 µm, thickness 3–**3.6**–6 µm. The characteristic thick flagellosigmas have long endings 56–**77**–95 µm, short endings 54–**64**–77 µm, width 60–**73**–87 µm, thickness 6.2–**9.3**–12 µm. Regular sigmas are not smoothly curved, and have incurved apices 57–**68**–83 x 3.3–**5.3**–6.7 µm. Skeleton is *Haliclona*-like with a reticulation of polyspicular tracts which are irregularly connected by single spicules.

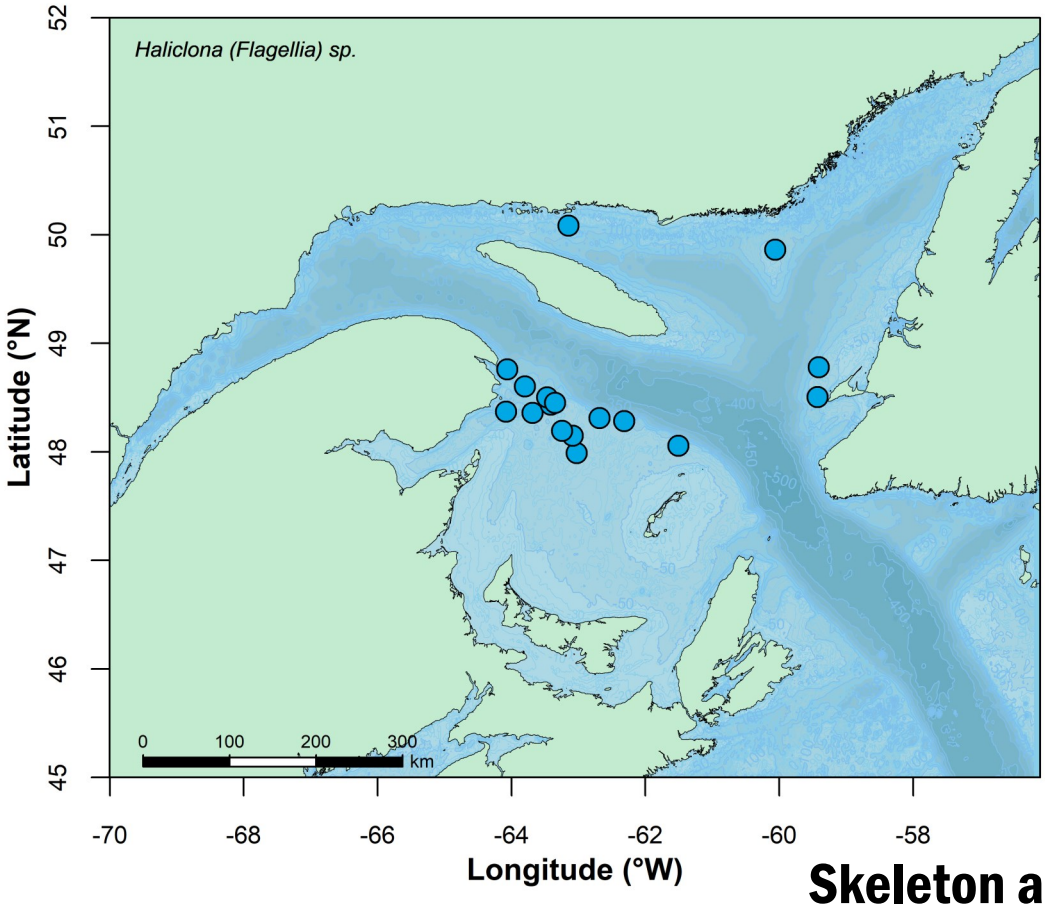
Remarks. Can appear similar to *Hemigellius acrofer*, but that species has a stringy, fibrous texture. Massive habit and thick flagellosigmas are distinctive.

Photos. A. Specimen with smooth, undamaged surface. B. Large catch of damaged specimens. C. Specimens with smooth interior surface.

Source: Van Soest 2017, Dinn 2020

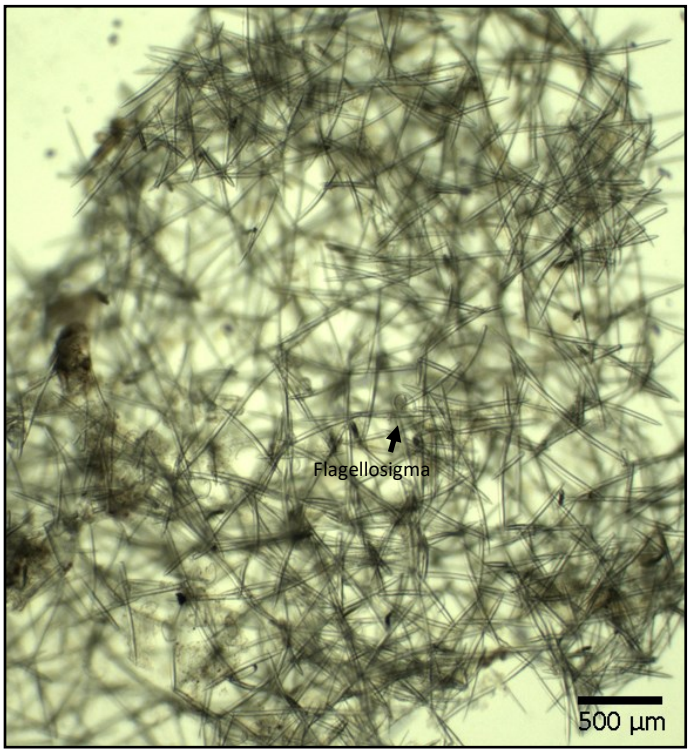
Haliclona (Flagellia) xenomorpha Dinn, 2020

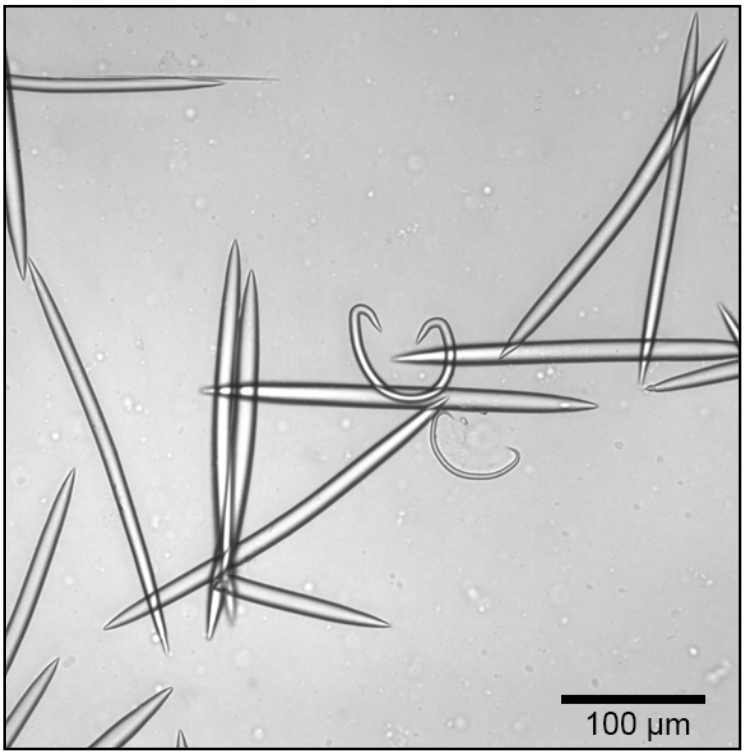
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Mycale (Mycale) lingua (Bowerbank, 1866)

Species Code: 8616 **AphiaID: 168640**

Solid/Massive

Key Identifiers. Bright yellow. Soft upper portion with a dense, fibrous root section. Surface is furrowed.

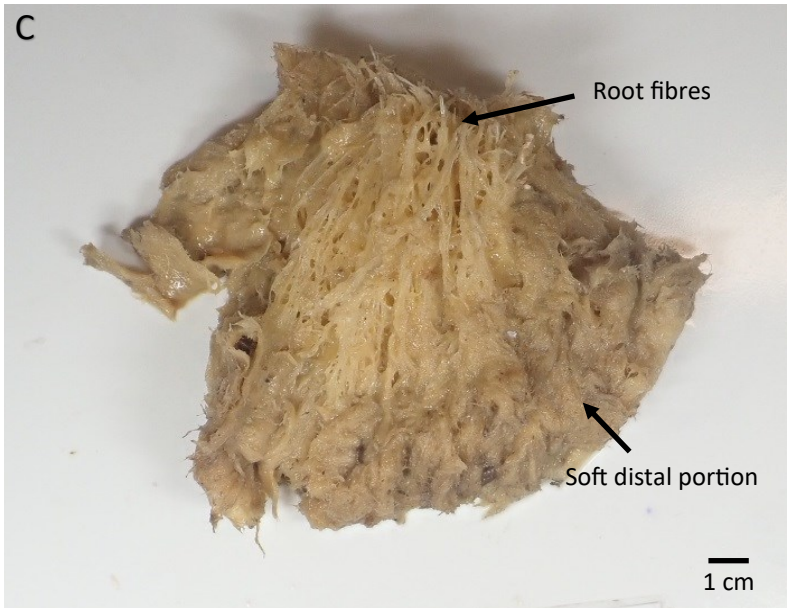
Description. Large sponge with a characteristic furrowed surface. Rather amorphous upon collection. Intact specimens have a dense fibrous stalk below a soft upper portion. The soft portion can feel slimy. Sometimes there are cephalopod eggs embedded.

Distribution. Very common. Whole Gulf and North Atlantic distribution. 24–446 m depth.

Skeletal Structure. Spicules are styles, anisocheale, and sigmas. Styles (mycalostyles) are 410–**573**–683 x 12–**16.5**–21.5 µm. Anisochelae I are 51–**52**–81 µm and Anisochelae II are 32–**37**–40 µm. Sigmas are 15.5–**18**–21 µm. Raphides are rare in eastern Canadian specimens. Skeleton is plumoreticulate.

Remarks. Easily recognised species that is common throughout the North Atlantic. Soft portions may not be present in trawled specimens, but fibres persist.

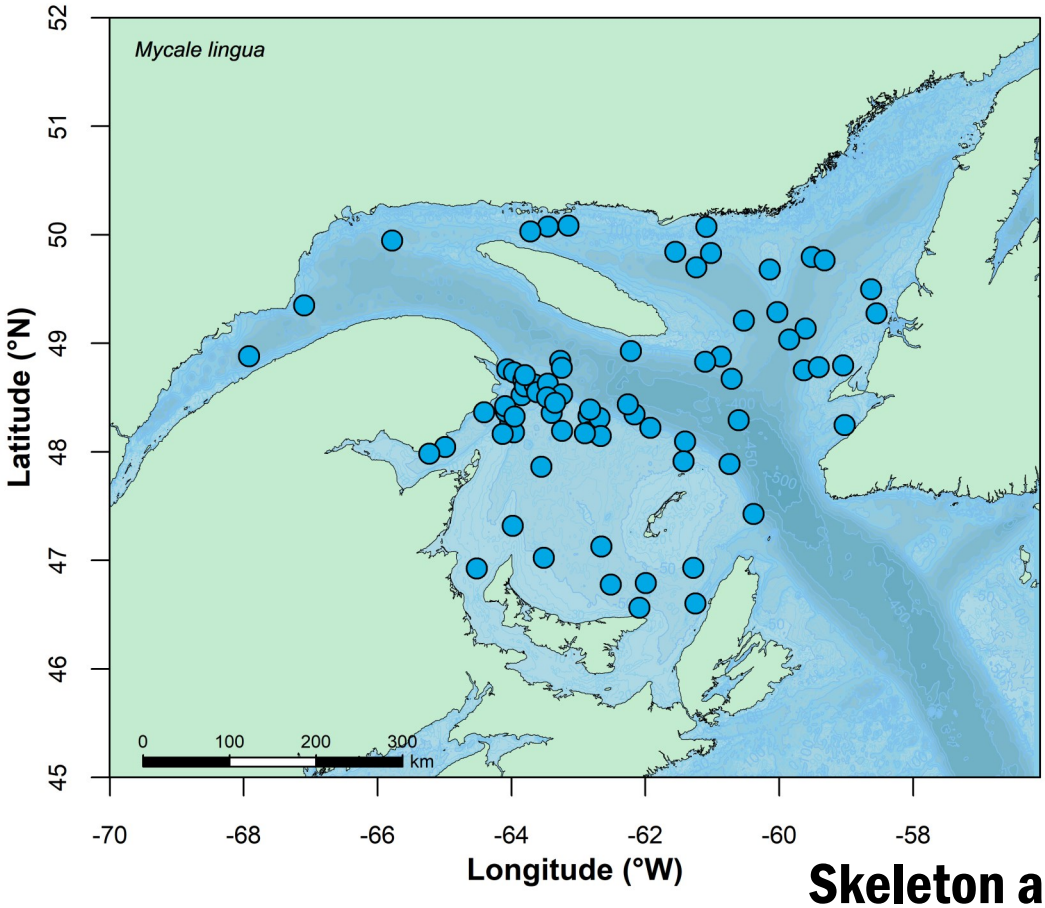
Photos. A–C specimens with soft and fibrous portions clearly visible.



Sources: Ackers et al. 2007, Goodwin 2017

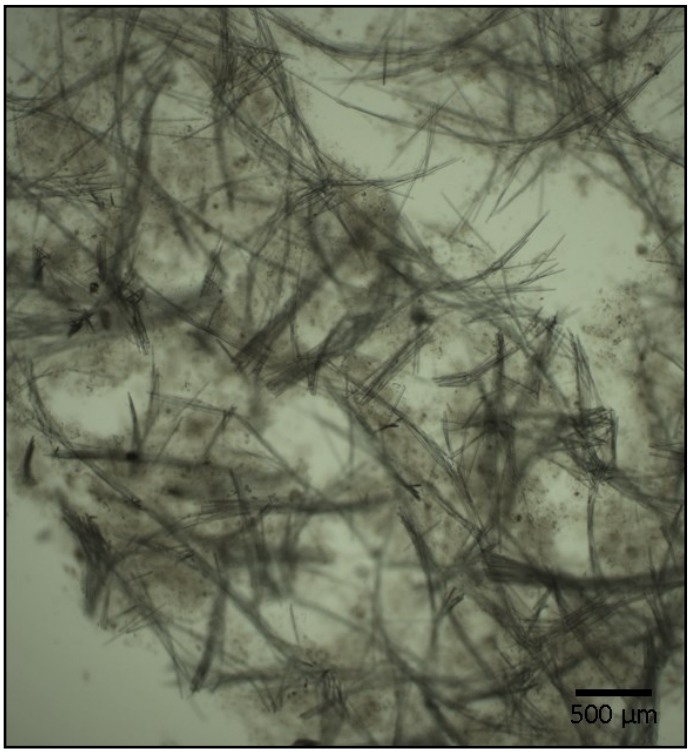
Mycale (Mycale) lingua (Bowerbank, 1866)

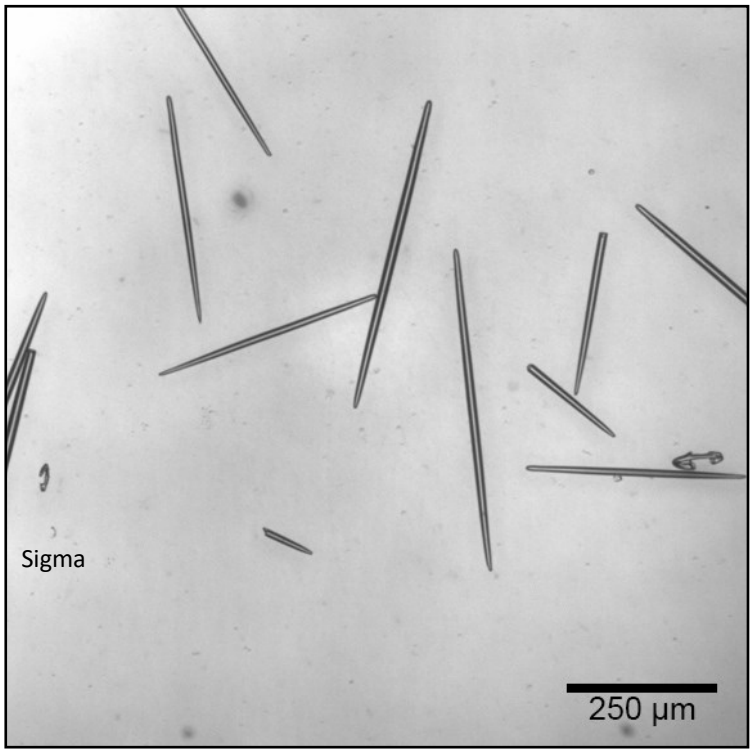
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Craniella polyura (Schmidt, 1870)

Species Code: 8651 **AphiaID: 171347**

Solid/Massive

Key Identifiers. Oval shaped. Long spicules are radially arranged.

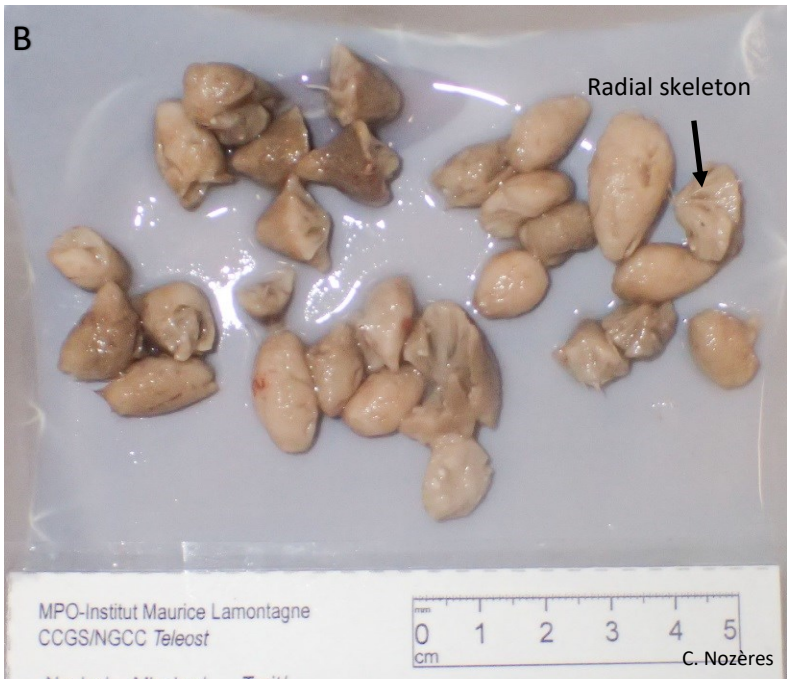
Description. Small, cylindrical sponge. Generally smooth, sometimes with faint depressions on the outer surface. Some specimens will have an intact root tuft of long spicule bundles, but this is often lost during collection. The spicules are radially arranged and can be seen in cross or longitudinal sections of the sponge body. Surface can be hispid due to protruding spicules, but most specimens are smooth. Consistency is firm.

Distribution. Common in the Quebec region. 122–309 m depth.

Skeletal Structure. Radiate skeleton of long oxeas, triaenes, and small oxeas. Microscleres are sigmaspires with a characteristic swelling in the centre are ~13 µm. Megascleres are often broken due to their size, and must be measured with a low magnification microscope.

Remarks. The most obvious identifier of the species is the sigmaspire spicules with swellings, but the small egg-like shape and radiate skeleton differentiate it from other specimens in the Gulf.

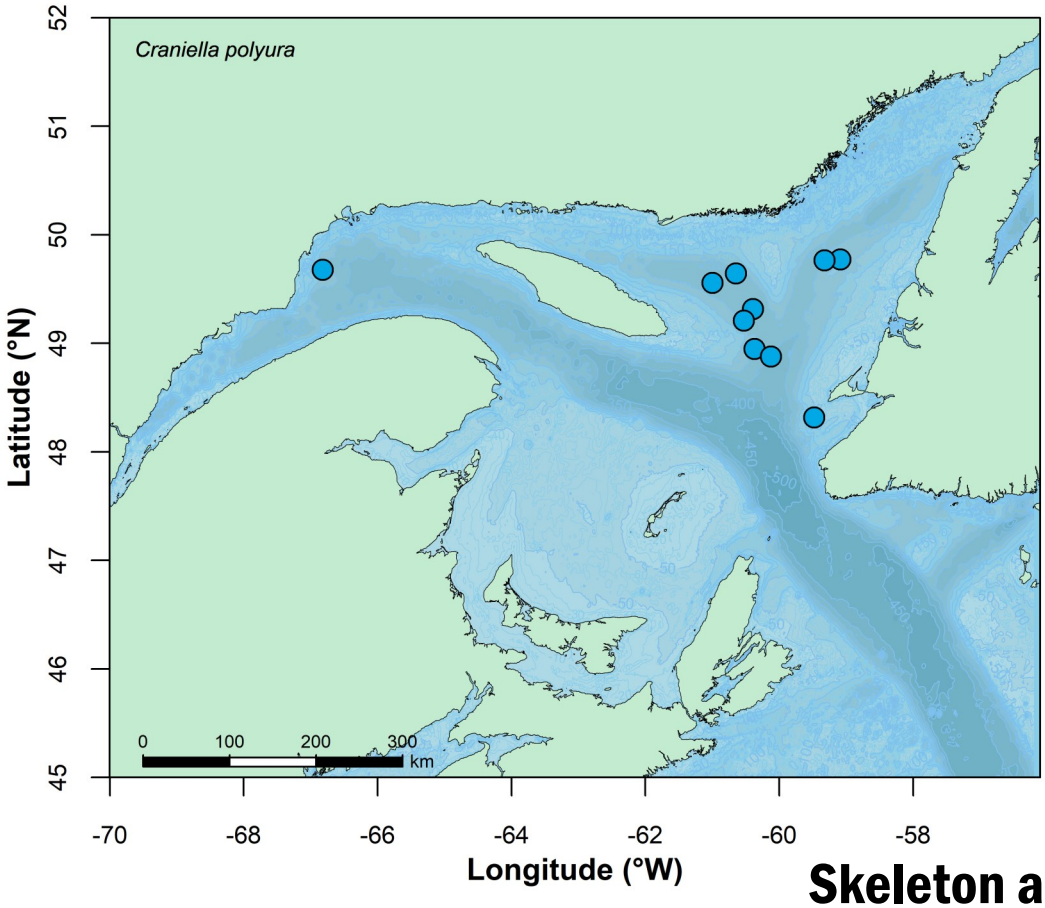
Photos. A–B. Several specimens. Note the skeletal arrangement in damaged specimens.



Sources: Dinn et al. 2019, Van Soest 2016, Vosmaer, 1885

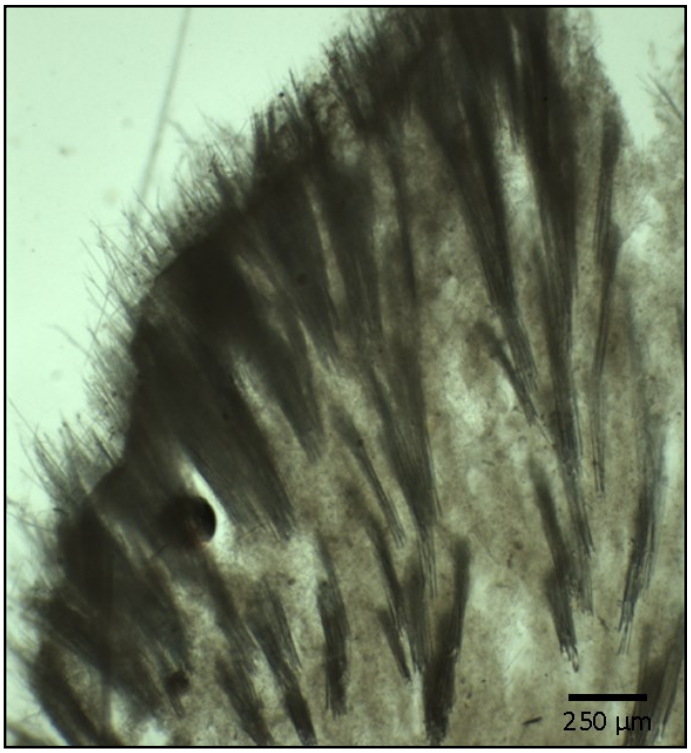
Craniella polyura (Schmidt, 1870)

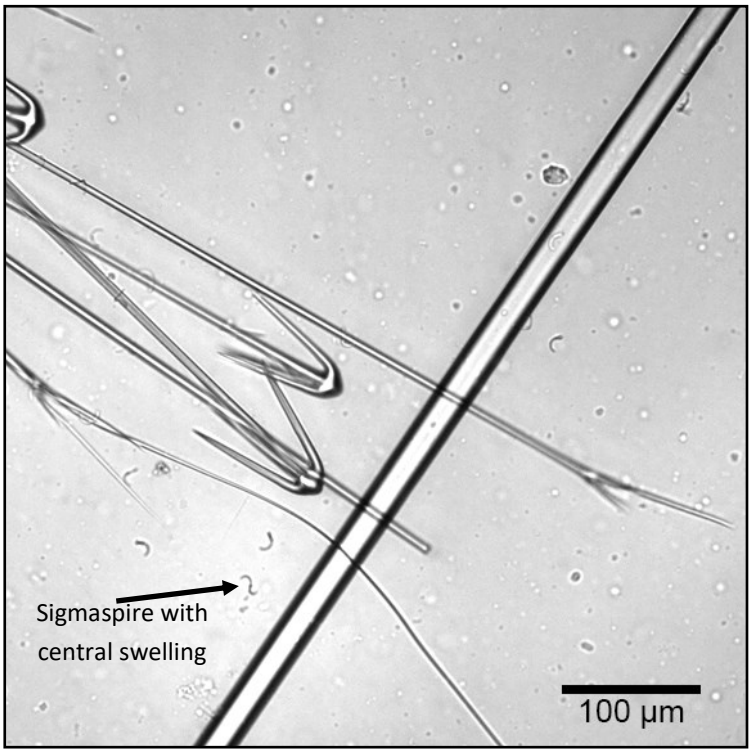
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Suberitida unknown 2

Species Code: 8646 **AphiaID: 845509**

Solid/Massive

Key Identifiers. Dense sponge with a wet paper-like texture. Tissue often full of pebbles.

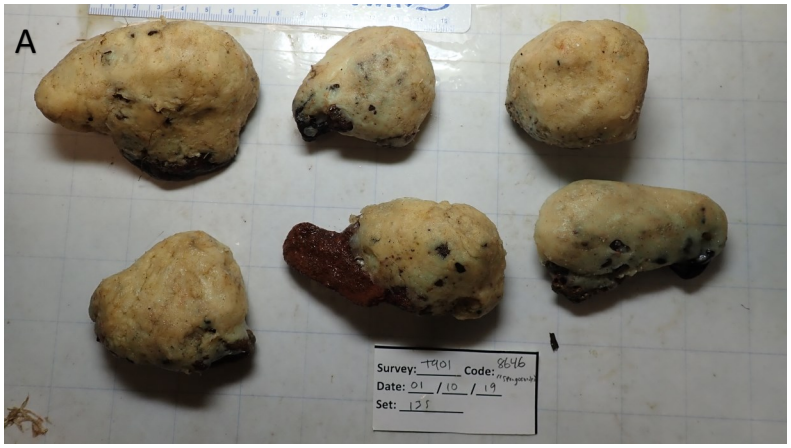
Description. Massive, mostly round sponge. Sometimes with small papillae. Texture is dense but fleshy. Pieces can be pulled away from the body in large flakes. Often found with rocks incorporated in the tissue.

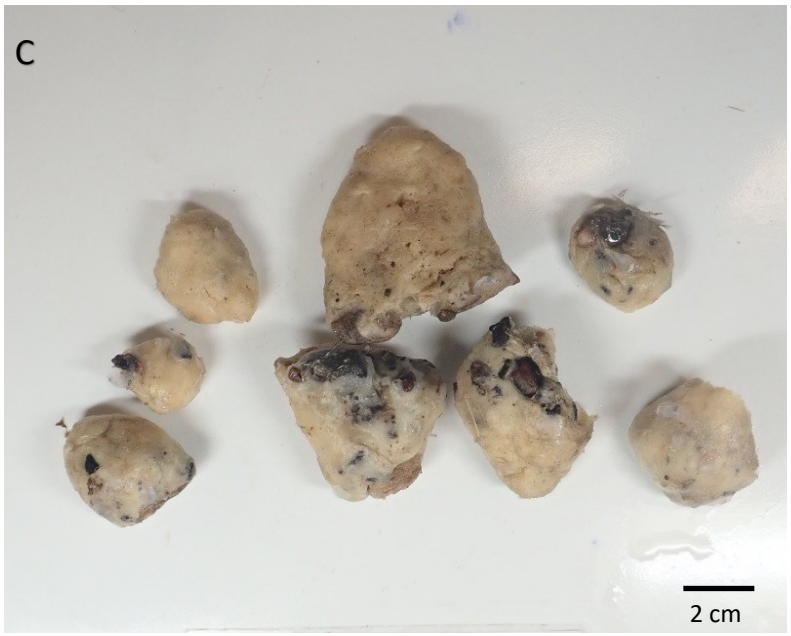
Distribution. Northern Gulf. Possibly into the North Labrador Sea. 66–338 m depth.

Skeletal Structure. Long oxeas, and short spined oxeas. Skeleton is very dense with plentiful spongin. Large oxeas are 737–**926**–1292 x 12–**19**–24 µm, and small completely spined microxeas are 36–**65**–99 x 4.3–**6.2**–7.7 µm.

Remarks. The genus is not currently confirmed. This sponge is difficult to identify due to the unique spicule complement and the very dense tissue. Similar Halichondrid sponges include the genus *Myrmekioderma* which has spined oxea and trichodragmata, and *Spongosorites* which has oxeas of varying lengths.

Photos. A. Specimens with rocks embedded. B. Specimen attached to a rock. C. Specimens with rocks embedded.

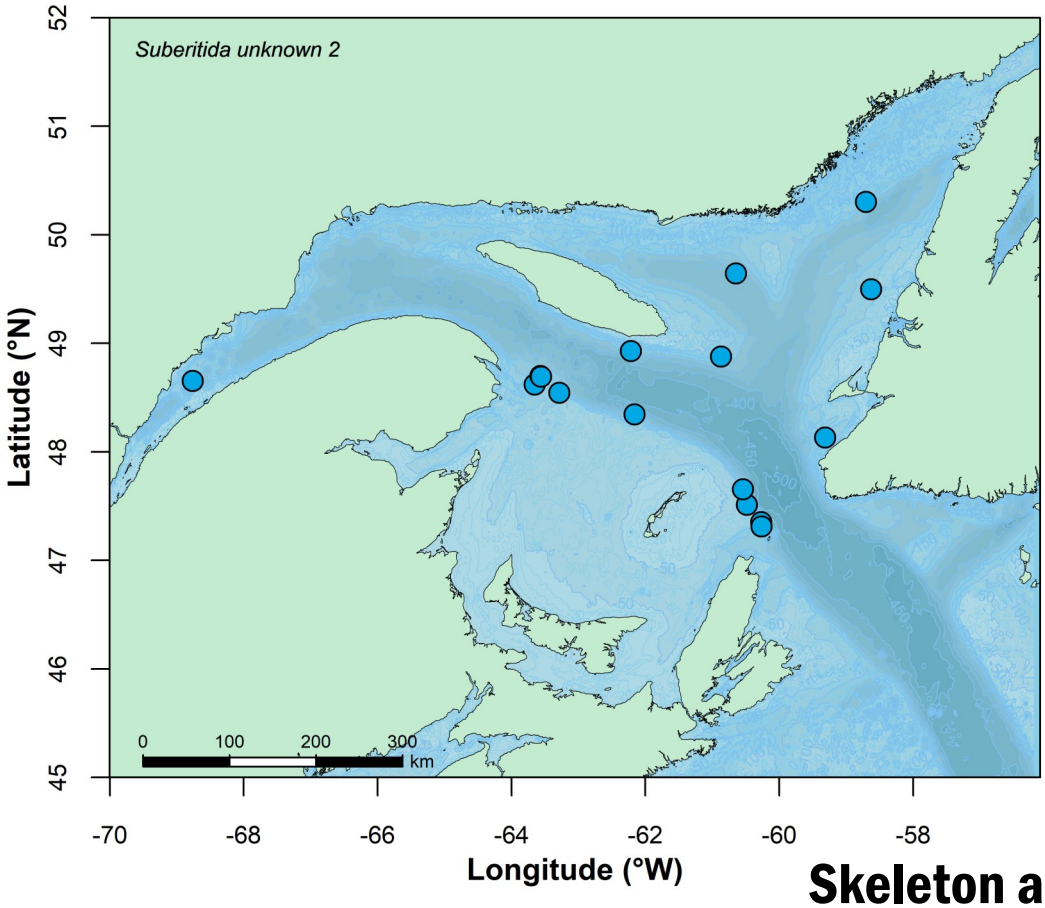




Source: Hooper & Van Soest 2002

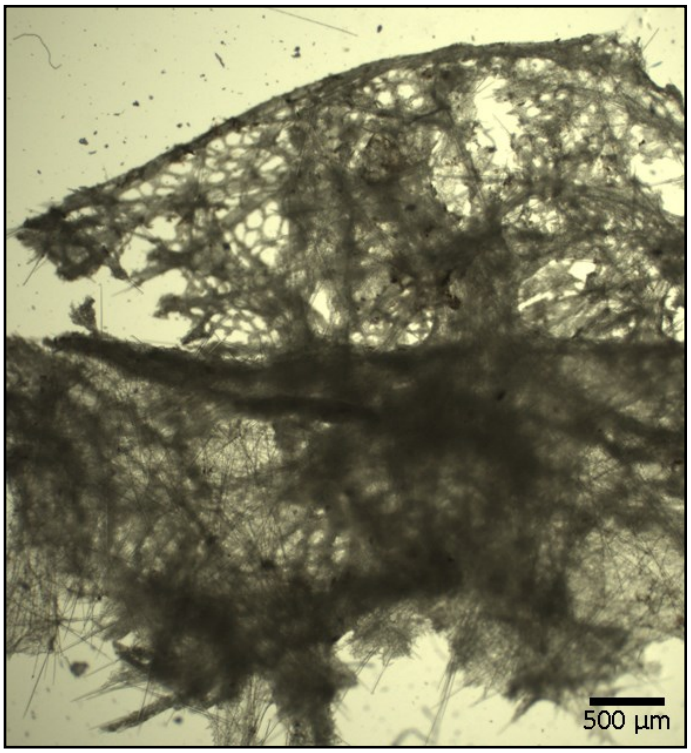
Suberitida unknown 2

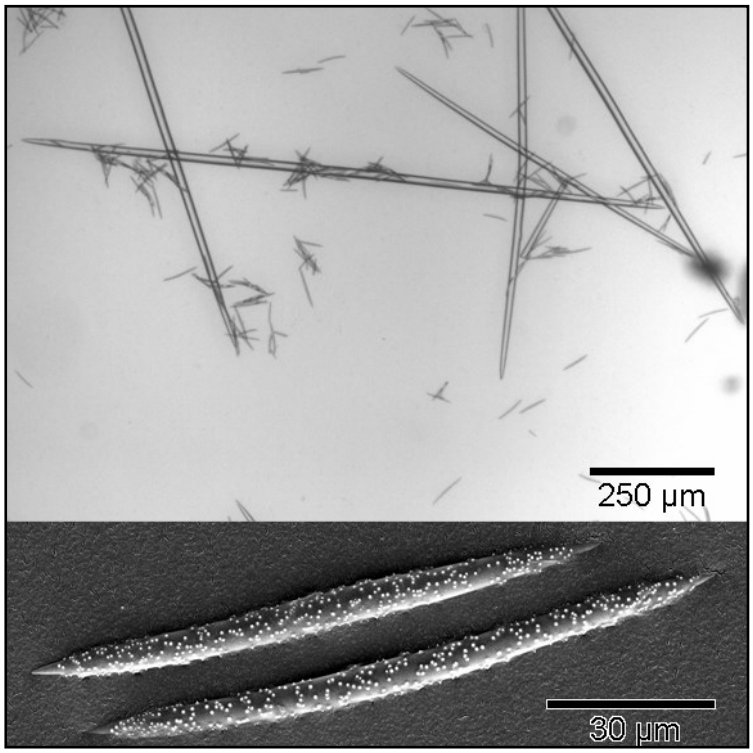
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Pseudosuberites montiniger (Carter, 1880)

Species Code: 8649 **AphiaID: 134257**

Solid/Massive

Key Identifiers. Spherical, smooth surface, cork-like texture.

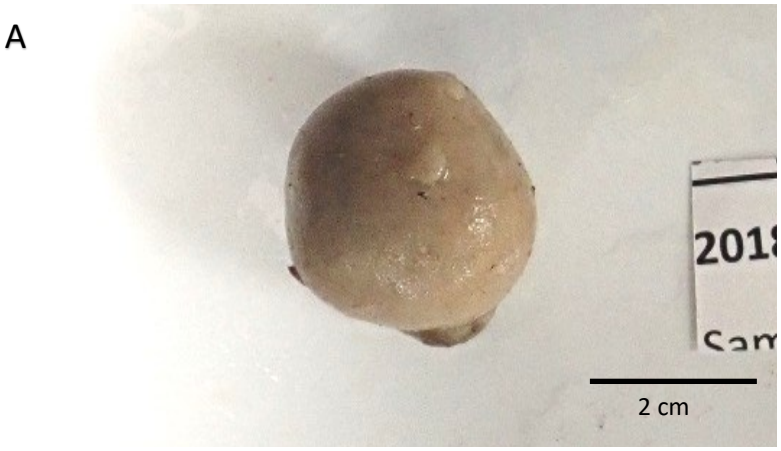
Description. A mostly spherical sponge with a very smooth surface. There are very few oscula which occur on short, single papillae. Smaller specimens may have a visible short stalk.

Distribution. Along the American Bank, 67–175 m depth.

Skeletal Structure. Subtylostyles that taper smoothly to a tear-drop shaped head 220–**250**–272 x 4.8–**6**–6.6 µm. The spicules form radial clusters or brushes at the surface, but the skeleton is highly confused in the choanosome.

Remarks. The sponge may appear similar to *Polymastia* or *Suberites*. The very few papillae and smooth surface are diagnostic. The spicules are distinctive.

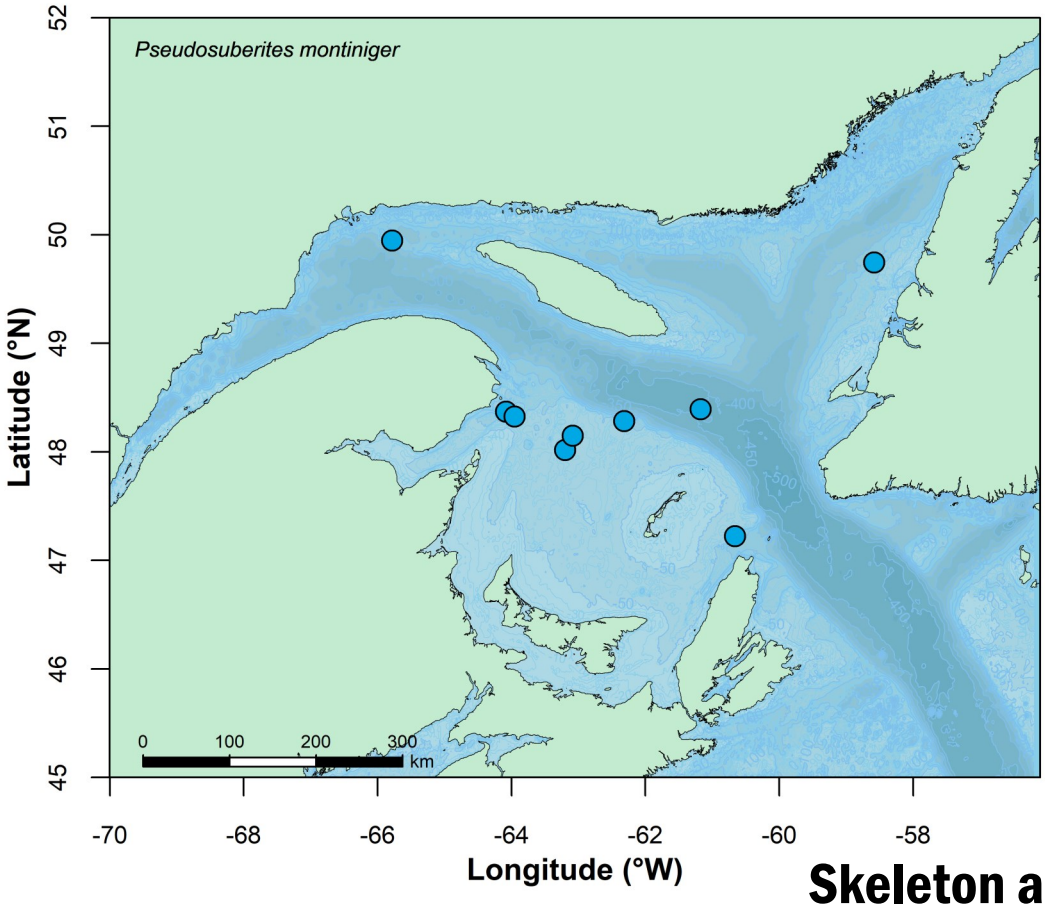
Photos. A. Specimen with single papilla. B. Damaged specimen. C. Small specimen with short stalk. D. Specimen with large central osculum.



Sources: Koltun 1966

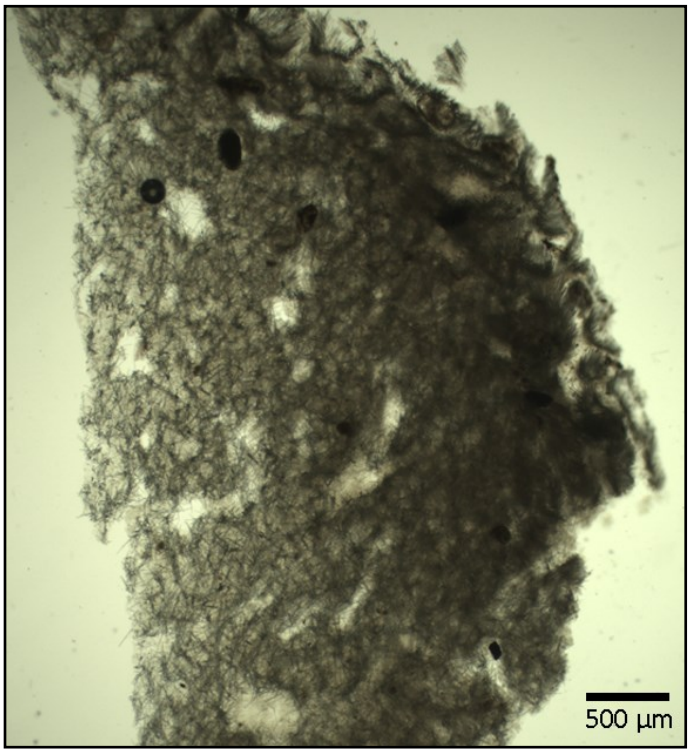
Pseudosuberites montiniger (Carter, 1880)

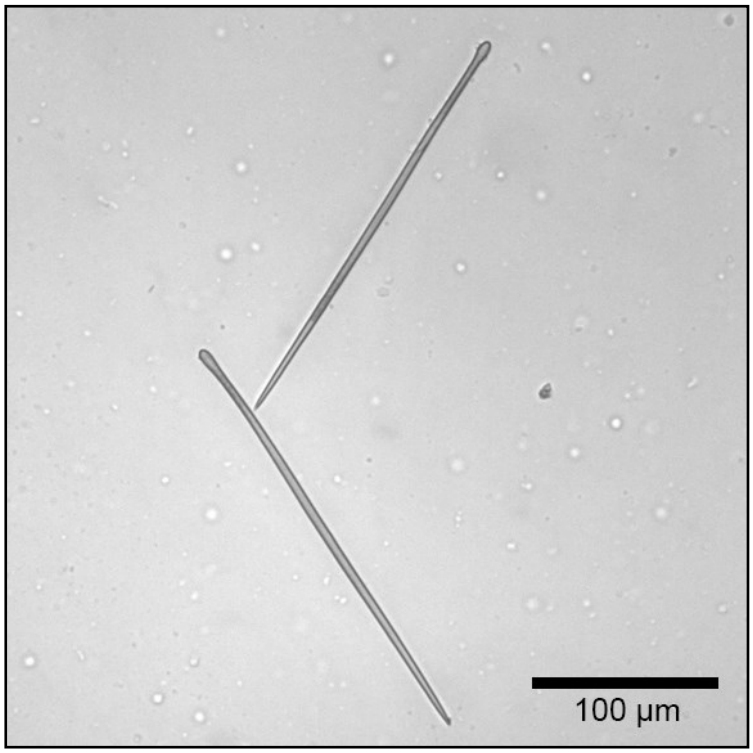
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Suberites ficus (Johnston, 1842)

Species Code: 8613 **AphiaID: 134285**

Solid/Massive

Key Identifiers. Lobate. Velvety surface.

Description. No defined shape. This sponge often forms lobes, and the lobes may twist or fold back upon each other. The surface has a velvety texture and is soft to the touch. The sponge is very dense and somewhat elastic.

Distribution. Throughout the Gulf of St. Lawrence. 27–326 m depth

Skeletal Structure. Spicules are tylostyles and centrotylote microstrongyles. Tylostyles are 272–**438**–540 x 5.6–**7.2**–9 µm. Microstrongyles are 16–**38**–66 µm. Skeleton is mostly confused in the choanoasome, with a subradial arrangement at the surface.

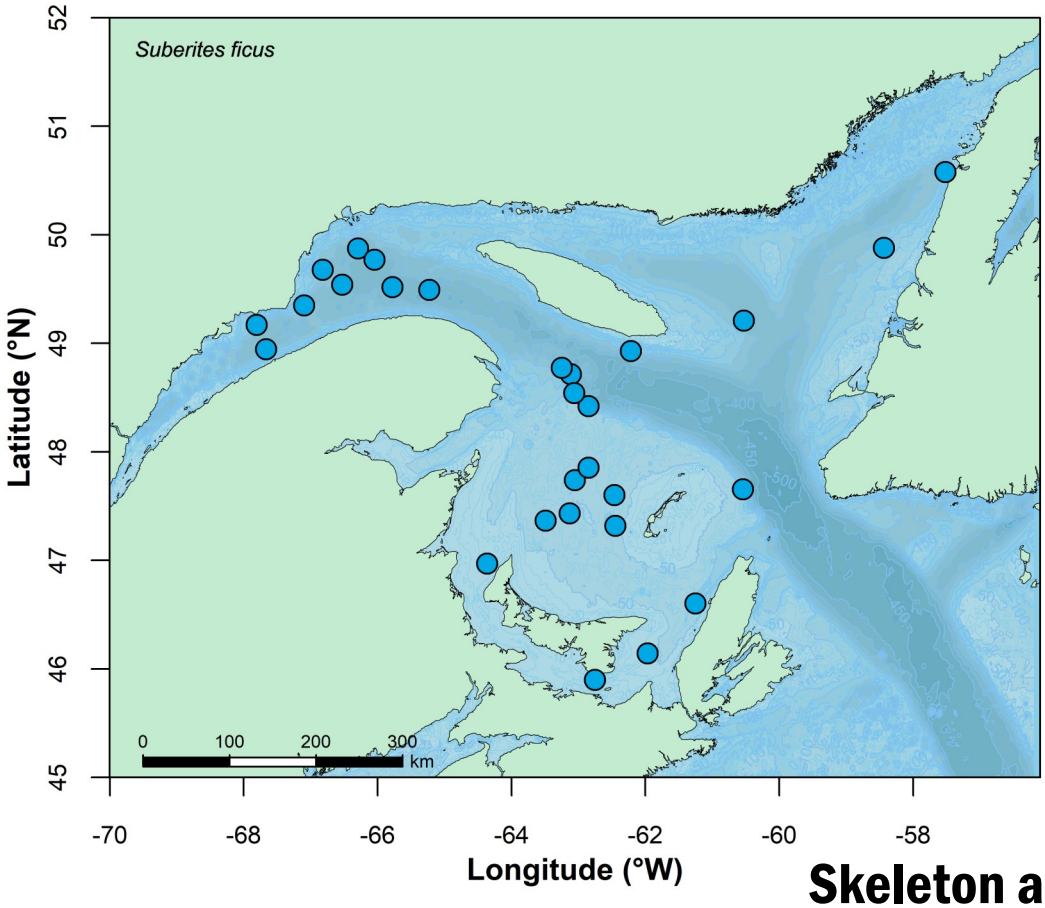
Remarks. Easily identified from the surface texture. Presence of microstrongyle spicules with central swellings is also distinctive of the species.

Photos. A, B. Whole specimens. C. Specimen that has grown in a twisting fashion.

Sources: Ackers et al. 2007, Goodwin 2017

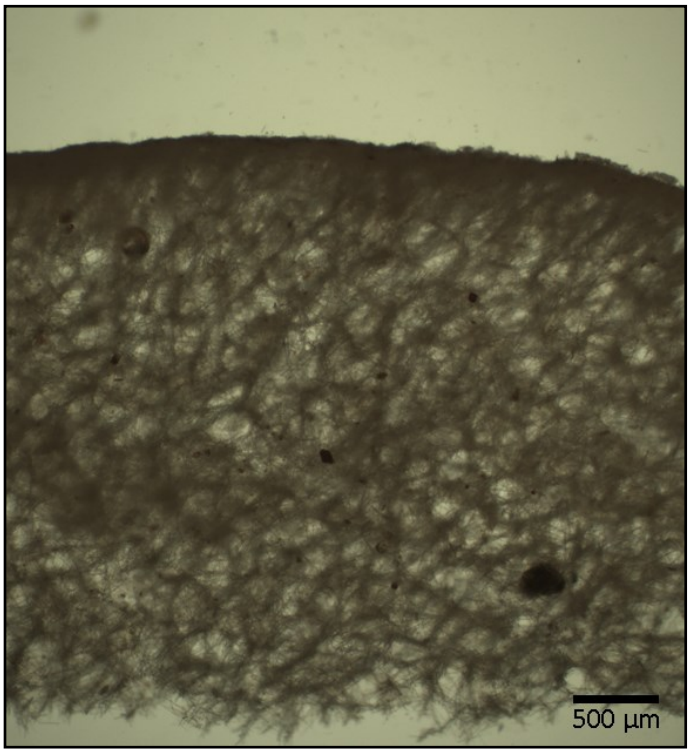
Suberites ficus (Johnston, 1842)

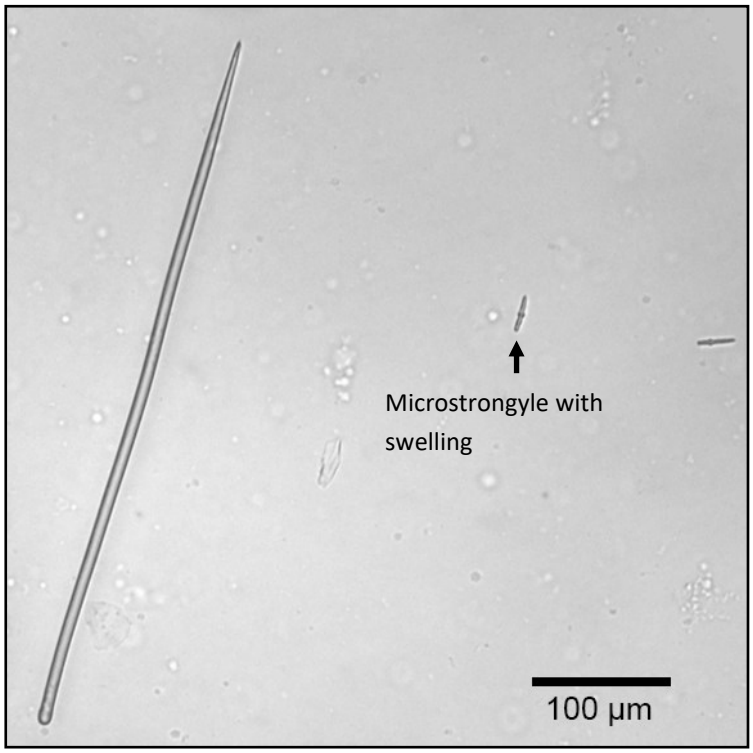
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Artemisina arcigera (Schmidt, 1870)

Species Code: 8635 **AphiaID: 132992**

Solid/Massive

Key Identifiers. Smooth surface, often with collapsed oscula on the upper portion. Requires spicule analysis if large oscula are not easily identified.

Description. A cushion shaped sponge with a smooth surface. The oscula are large, but most are collapsed upon collection.

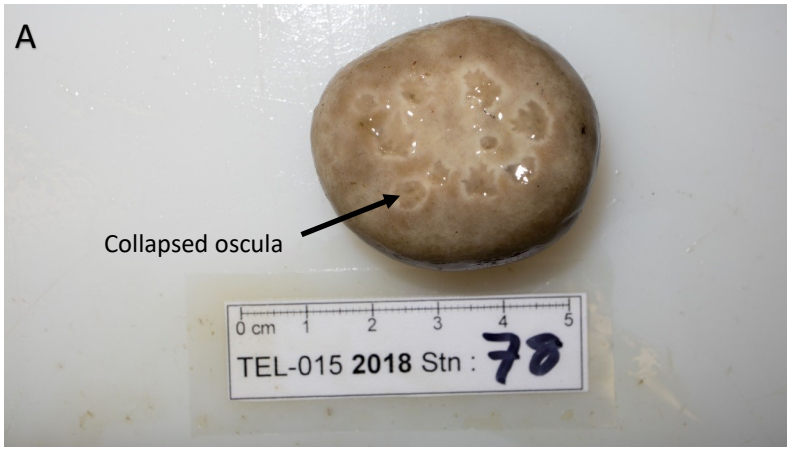
Distribution. Common in the northern Gulf of St. Lawrence. 77–351 m depth.

Skeletal Structure. Subtylostyles in two size categories. Microscleres are toxas and palmate isocheale. The smaller subtylostyles are 266–**324**–363 x 8–**11**–13 µm and the larger are 402 –**518**–590 x 6–**8**–10 µm. Toxas are distinctive and are heavily spined at the ends 87–**222**–322 x 3–**6**–11 µm. Palmate isochelae are 7–**9**–13 µm. There is a palisade of subtylostyle bushes at the surface, with noticeable subdermal spaces. The chonaosomal skeleton is confused.

Remarks. Looks very similar to *Pseudosuberites montiniger* and thus often requires skeletal analysis to be certain of the identification.

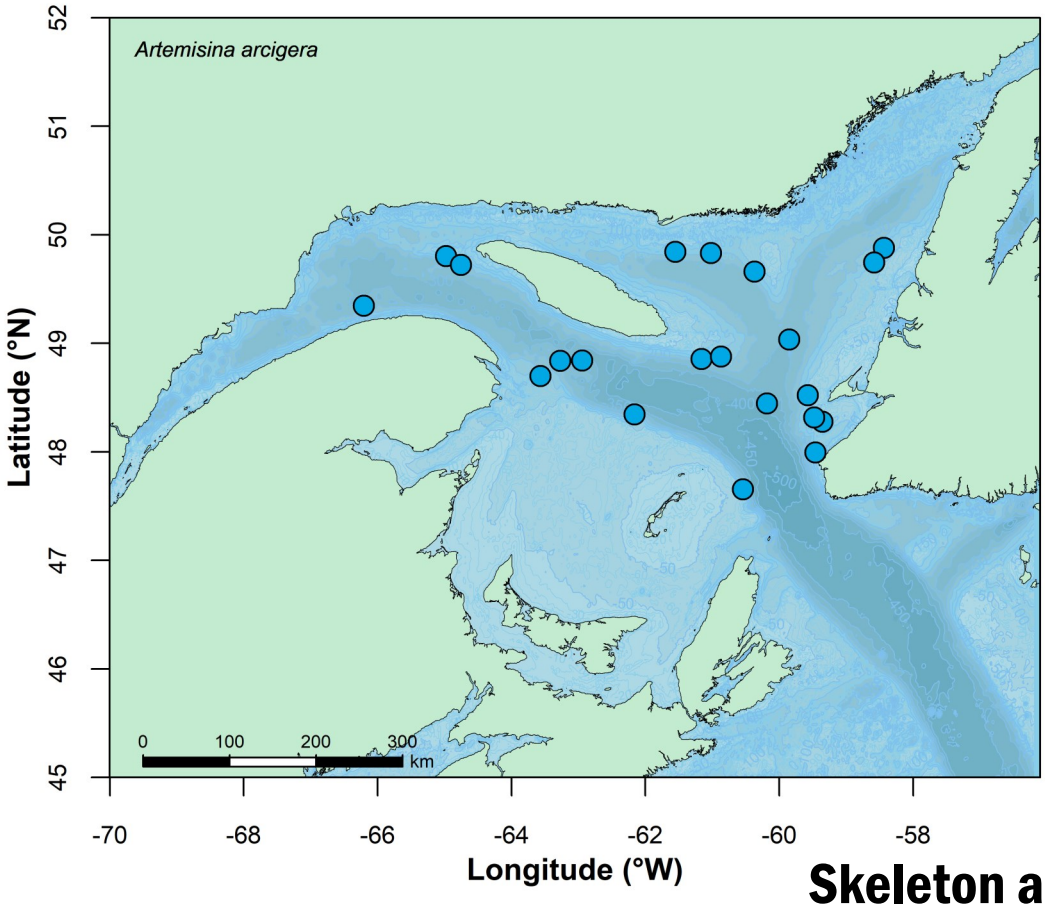
Photos. A. Specimen with clear apical oscula. B. Small oblong specimen. C. Several specimens.

Sources: Van Soest et al. 2000



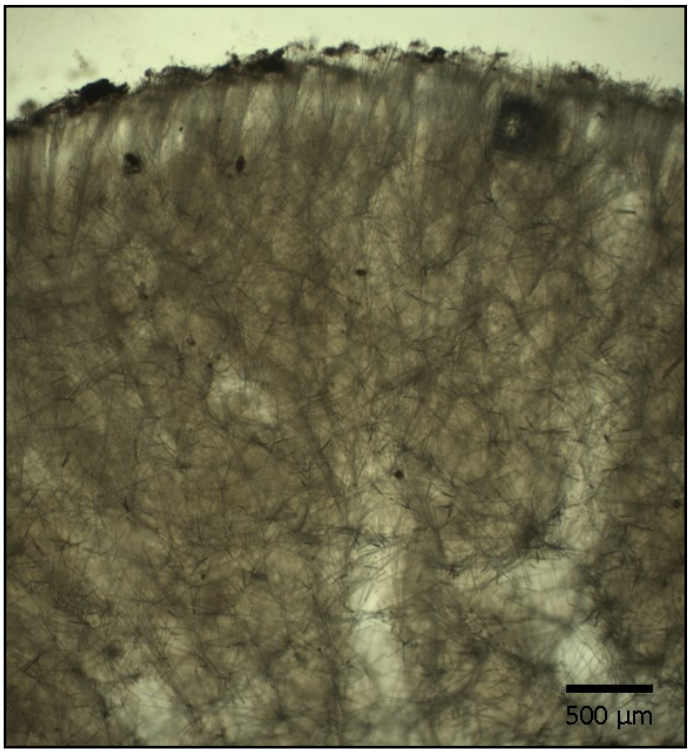
Artemisina arcigera (Schmidt, 1870)

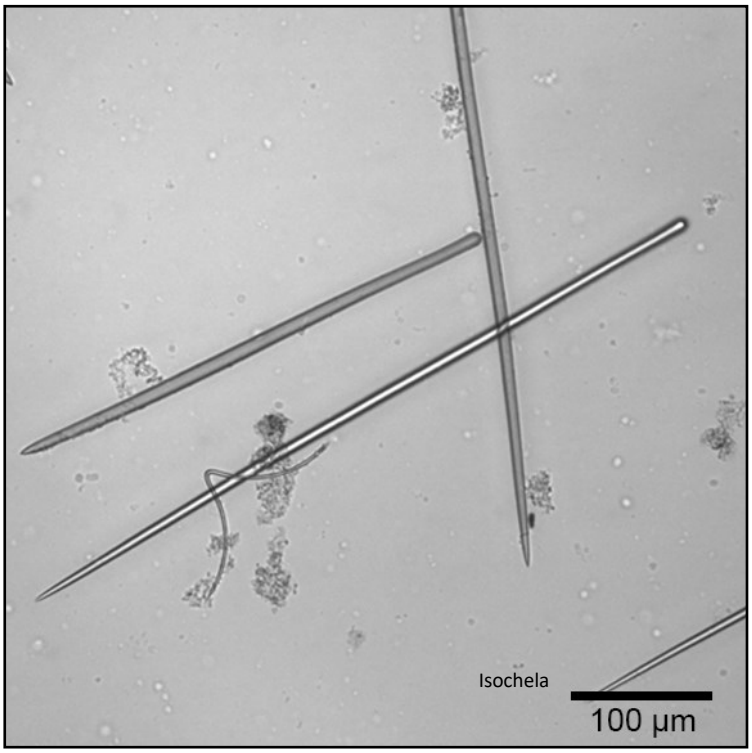
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Tethya norvegica Bowerbank, 1872

Species Code: 8650 **AphiaID: 134314**

Solid/Massive

Key Identifiers. Very small spherical sponge, often with visible buds. Uncommon in trawls.

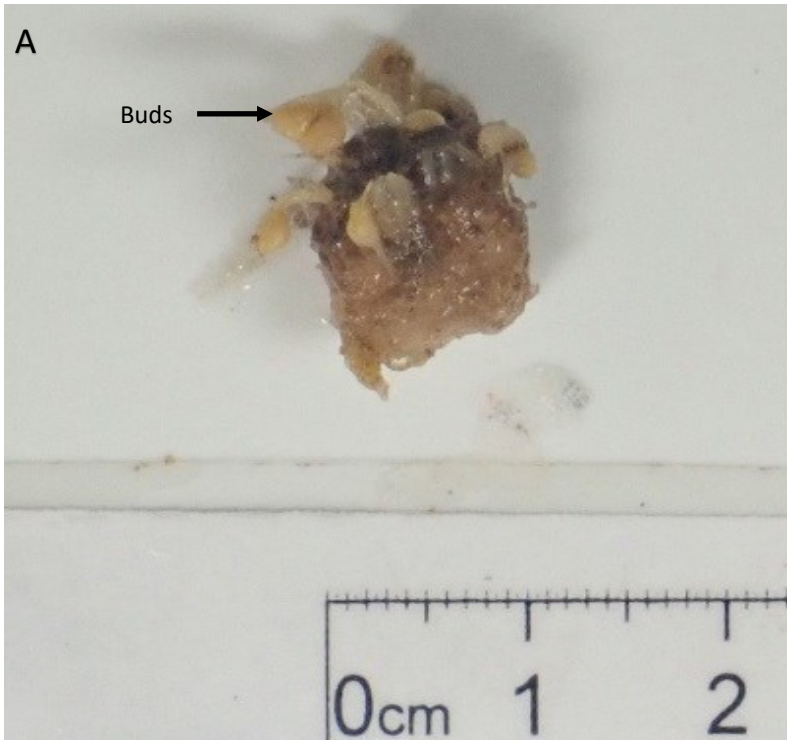
Description. A minute sphere, somewhat warty appearance. May have budding juvenile sponges extending from the surface. These buds are not characteristic of the species, but are common in *Tethya.* As the sponge is often very small (< 1 cm), spicules are most diagnostic of the species.

Distribution. A single specimen was collected north of Cape Breton Island at 240 m depth.

Skeletal Structure. Megascleres are stongyloxeas 974–**1534**–1982 x 17–**28**–36 µm and styles 400–**651**–951 x 7–**13**–18 µm. Microscleres are asters. Megasters are 35–**47**–56 µm and microcrasters are 9–**12**–16 µm. Skeleton is formed by radial spicule bundles.

Remarks. Not often collected in trawls due to the size of an individual. Care should be taken to ensure that sponge is not missed in trawl catches.

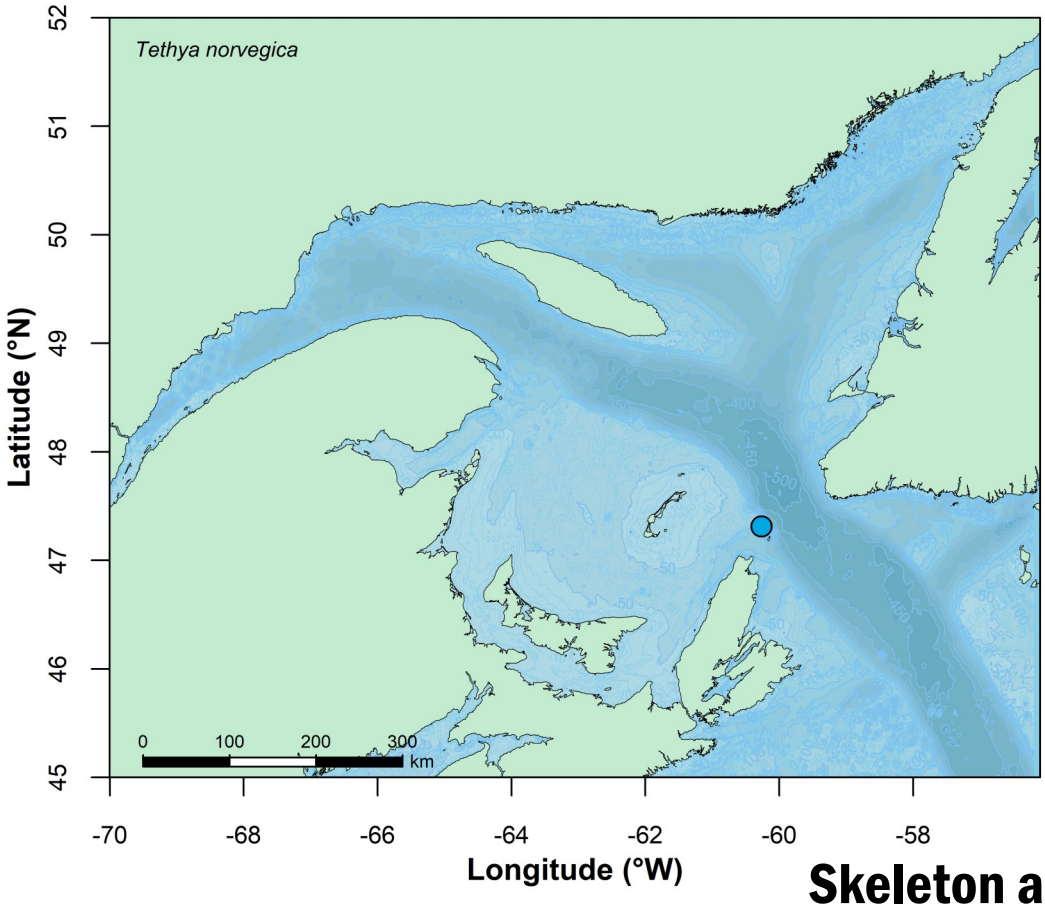
Photos. A. Individual with buds.



Sources: Van Soest et al. 2000, Sarà et al. 1992

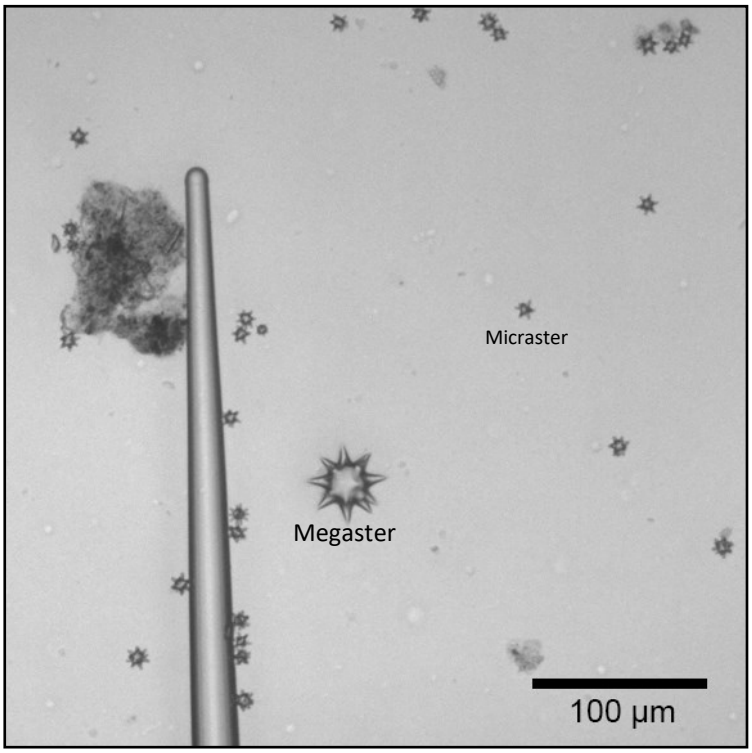
Tethya norvegica Bowerbank, 1872

Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules



Biemna variantia (Bowerbank, 1858)

Species Code: 8617 **AphiaID: 133205**

Solid/Massive

Encrusting

Key Identifiers. Shaggy appearance. Encrusts rocks. Spicule fibres often protrude the surface.

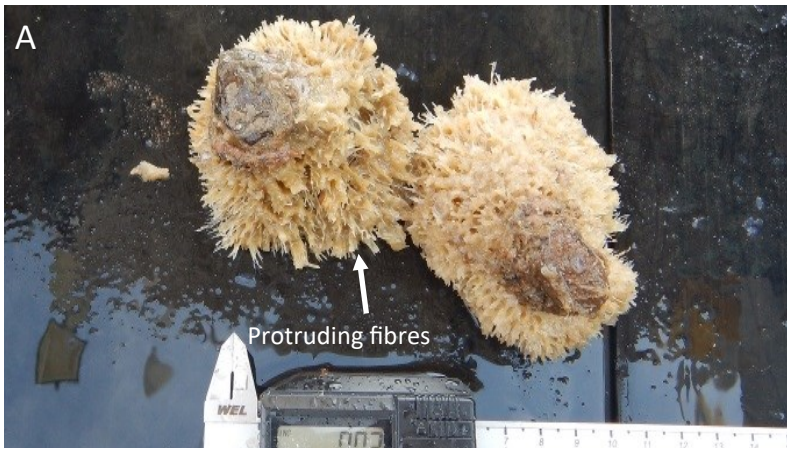
Description. Massively encrusting sponge. Grows with dense spicule tracts that lead to a shaggy appearance. Specimens do not have smooth surfaces.

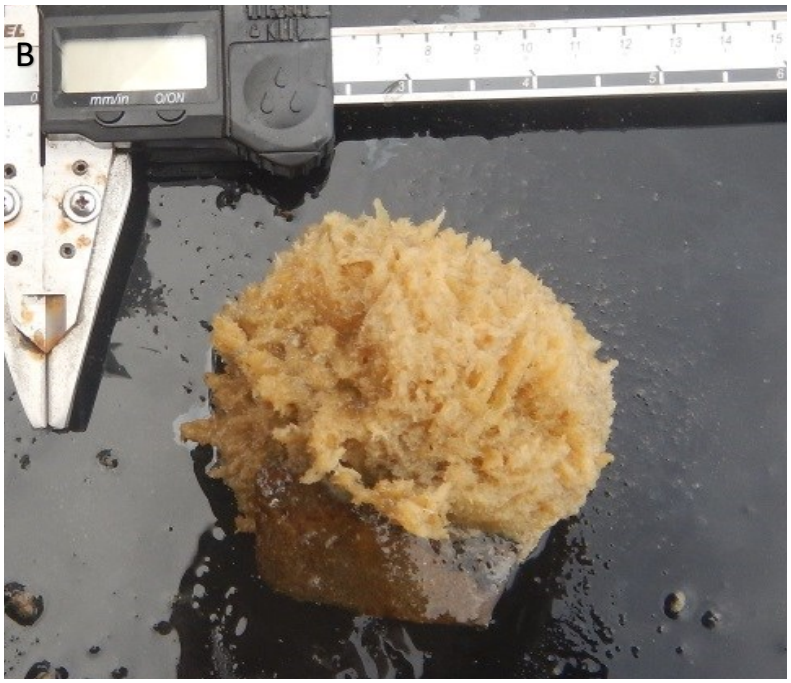
Distribution. Northern Gulf of St. Lawrence. 66–163 m depth.

Skeletal Structure. Megascleres are styles 917–**1120**–1262 x 24–**29**–34 µm. Microscleres are sigmas in two sizes 63–**98**–154 and 22–**33**–43 µm, and raphides 178–**242**–287.

Remarks. Spicules are variable between specimens, however the species name has been used extensively for many variations of sponges with similar spiculation. May be confused with *Hemigellius arcofer*, but that species form sheets of consistent thickness whereas this species is massively encrusting.

Photos. A. Specimens from below showing the distinctive growth form. B. Specimen growing on rock. C. Large catch of several specimens.

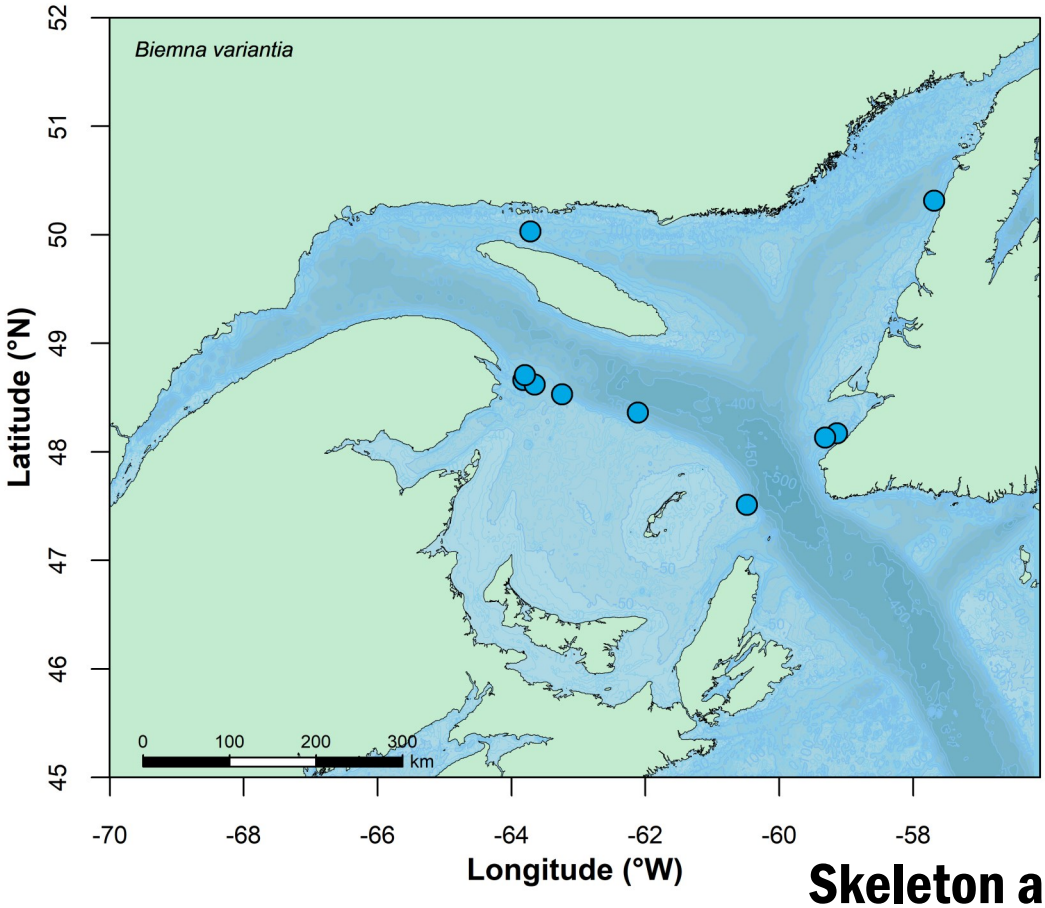




Sources: Ackers et al. 2007, Van Soest et al. 2000

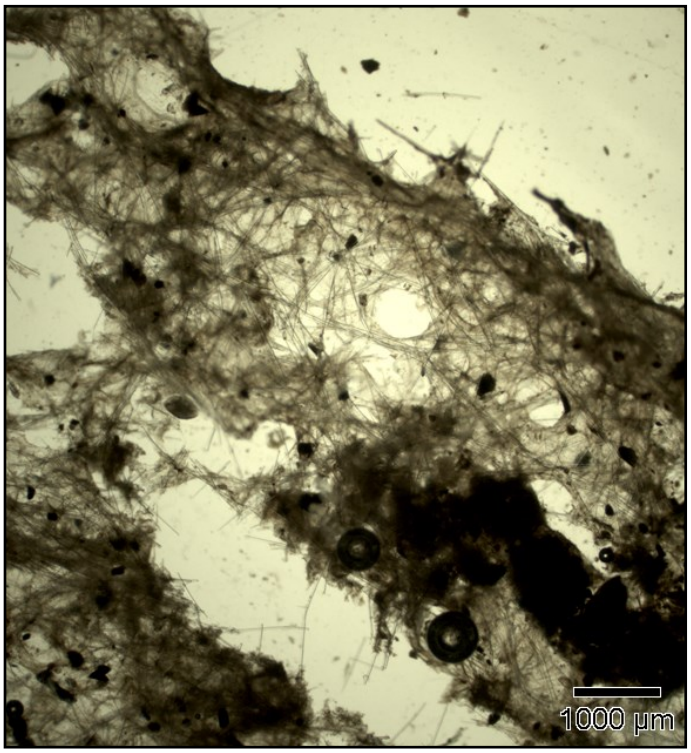
Biemna variantia (Bowerbank, 1858)

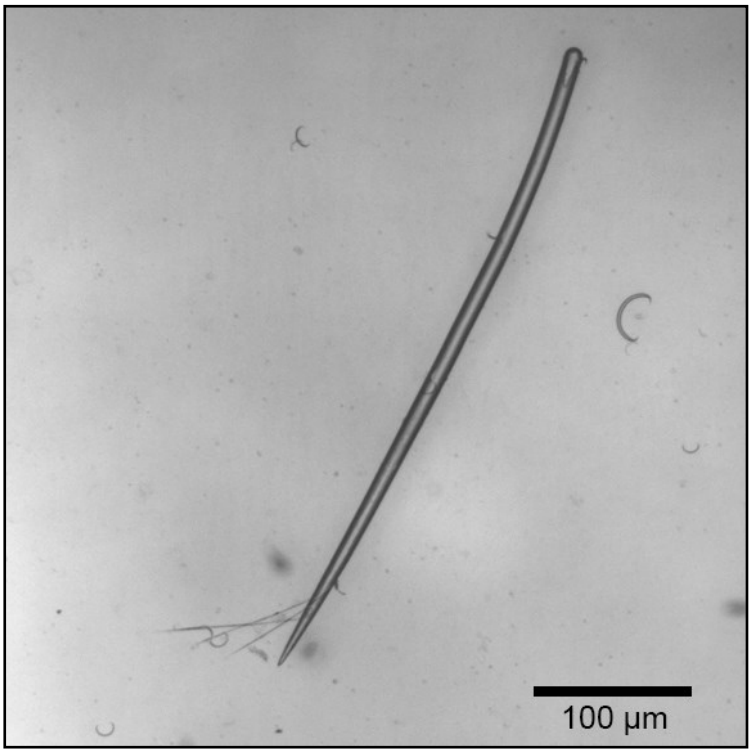
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Myxilla (Myxilla) incrustans (Johnston, 1842)

Species Code: 8637 **AphiaID: 169466**

Solid/Massive

Encrusting

Key Identifiers. Bright yellow, but otherwise indistinguishable from similar species without spicule identification.

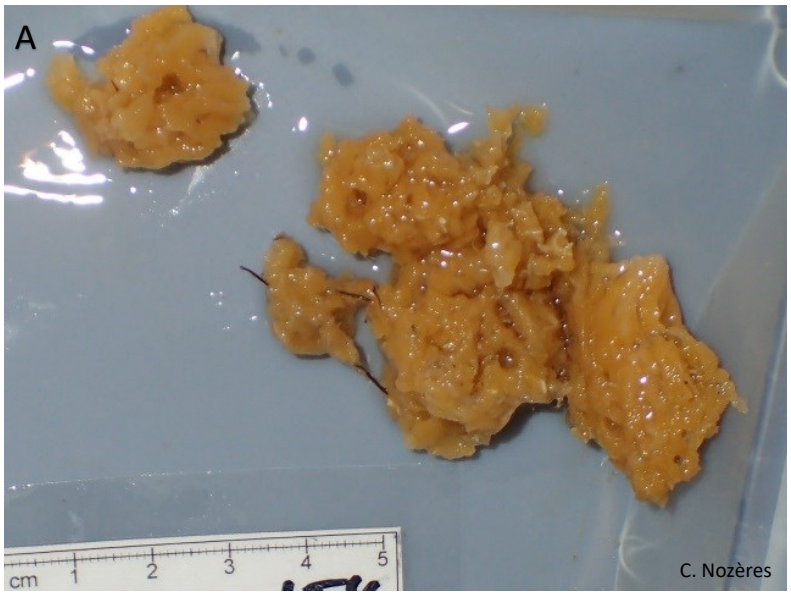
Description. The sponge is thick and can form a large cushion, however is usually collected in trawls as pieces. Most identifiable external features collapse after collection.

Distribution. Only three specimens collected in the northern Gulf. Found in shallow water near the coast. 58–78 m depth.

Skeletal Structure. Megascleres are acanthostyles and tornotes. Acanthostyles are 260–**287**–311 x 10–**12**–14 µm, tornotes with microspined ends are 191–**229**–257 x 6–**8**–9 µm. Microscleres are isochelae in two sizes, 52–**63**–71 and 17–**21**–26 µm and sigmas 20–**38**–64 µm. Skeleton is isodictyal.

Remarks. Spicules are the main distinguishing feature of this species. Can appear similar to other yellow sponges, namely *Mycale lingua* but lacks dense fibres.

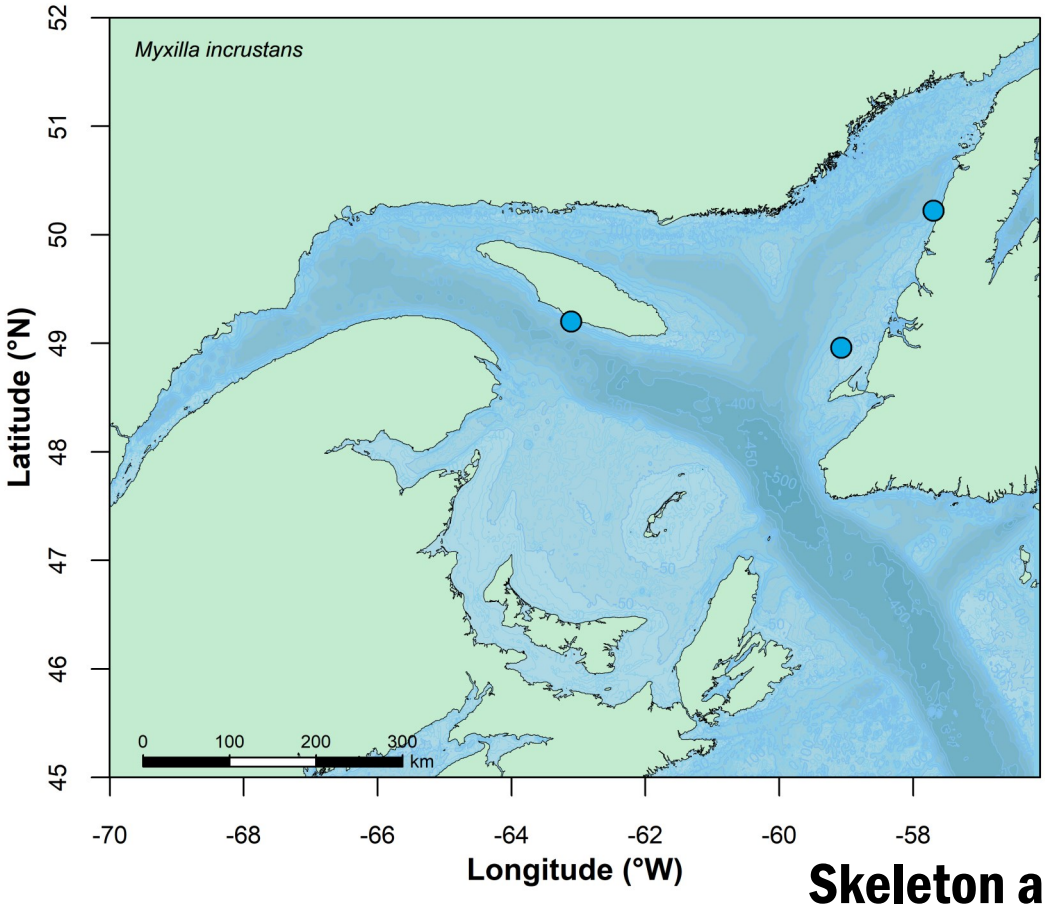
Photos. A, B. Fragments of specimens .



Sources: Ackers et al. 2007

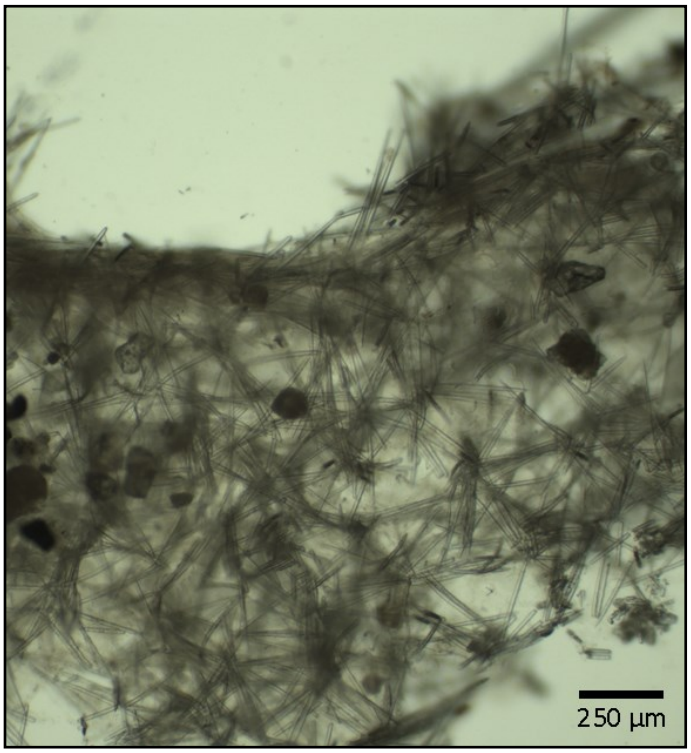
Myxilla (Myxilla) incrustans (Johnston, 1842)

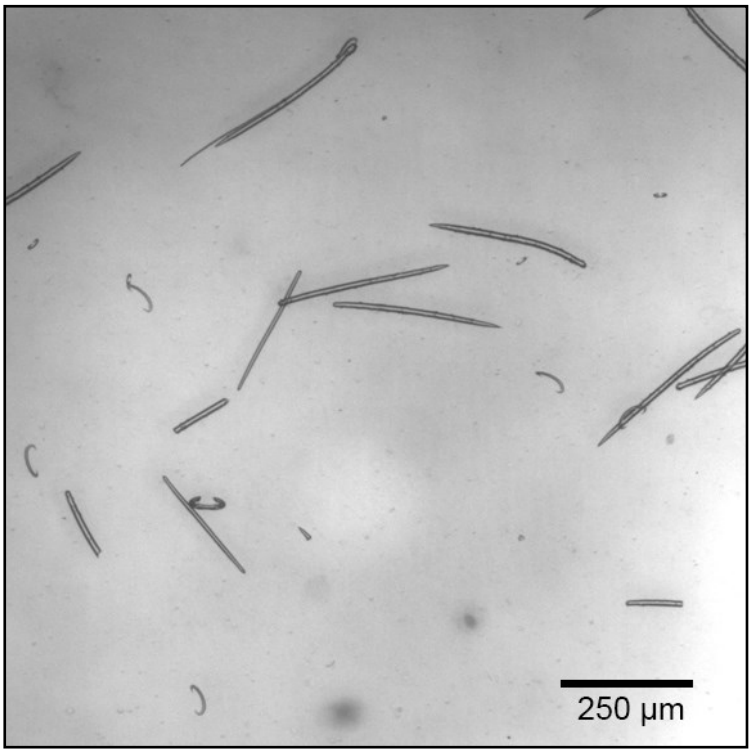
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Thenea cf. *muricata* (Bowerbank, 1858)

Species Code: 8625 **AphiaID: 134106**

Solid/Massive

Key Identifiers. Crunchy, dense skin. Often has roots and a visible equatorial seam.

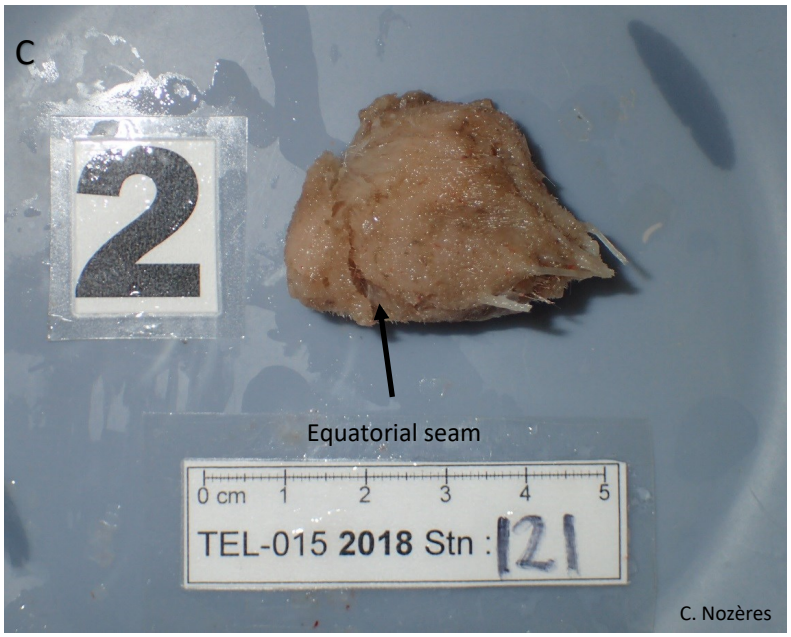
Description. Mostly spherical sponge with a firm consistency. There is often an indented seam which runs around the centre of the sponge body. The sponge will make a crunching noise if pressure is applied.

Distribution. Northern Gulf of St. Lawrence, and elsewhere in eastern Canadian waters. 149–320 m depth.

Skeletal Structure. Spicules consist of oxeas, anatriaenes, dichotrienes, protriaenes, spirasters, and plesiasters. Skeleton is formed by radial bundles of oxeas that protrude the surface. Triaenes are anchored in the surface. Megascleres require a low magnification microscope to measure as they are very long.

Remarks. Difficult group to identify without numerous spicule measurements. Spicules are often large and broken in preparations. Integrity of the osculum is also diagnostic of this species, and as specimens are often collected damaged, it is difficult to give a confident species identity for most specimens. May appear similar to *Craniella polyura,* but that sponge has a much softer texture, where this species is much more firm.

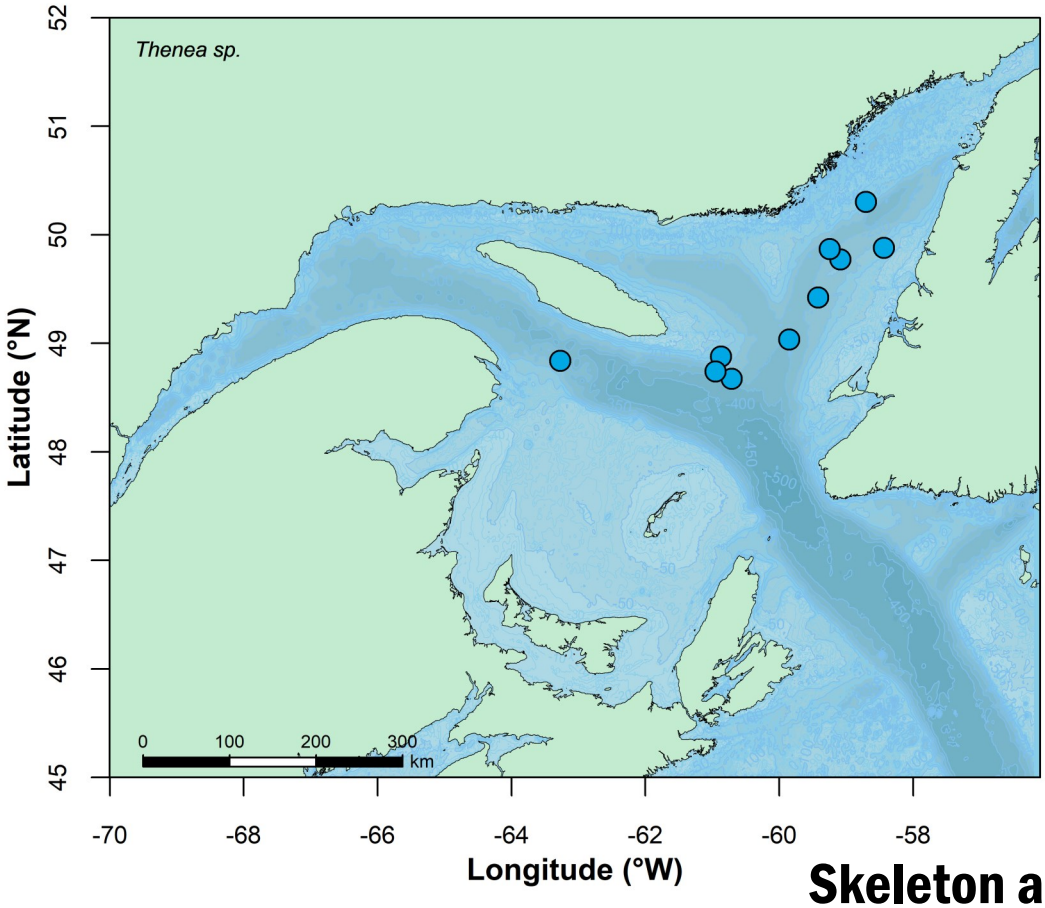
Photos. A. Specimens showing roots. B. Several specimens collected in pieces. C. Single specimen.



Sources: Cárdenas & Rapp 2012

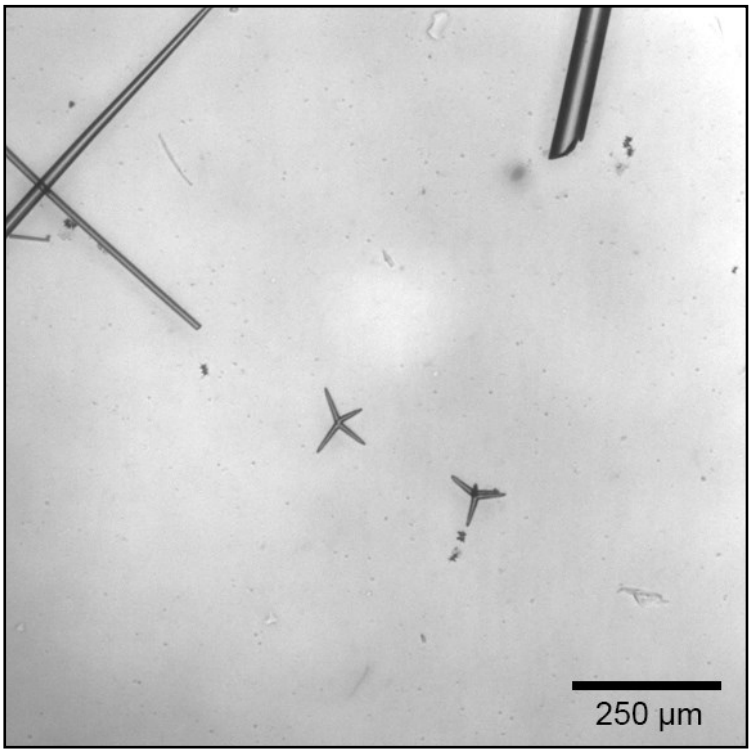
Thenea cf. *muricata* (Bowerbank, 1858)

Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules



Lissodendoryx (Lissodendoryx) cf. *indistincta* (Fristedt, 1887)

Solid/Massive

Species Code: 8630 **AphiaID: 168965**

Key Identifiers. Smooth globular sponges without a cortex.

Description. A yellow to brown irregularly globular sponge with a smooth surface.

Distribution. Only sponges from a single trawl north of Anticosti Island were analyzed here, but the species was also recorded from Frobisher Bay in the North Labrador Sea. 104–122 m depth.

Skeletal Structure. Spicules consist of thin and thick acanthostyles 344–**404**–440 x 12–**16**–19 and 306–**355**–395 x 4–**6**–9 µm respectively, tornotes are 205–**229**–271 x 6–8–11 µm. Microscleres are isochelae in three sizes 34–**39**–44, 27–**23**–26, and 9–**11**–13 µm, and sigmas 34–**44**–50 µm.

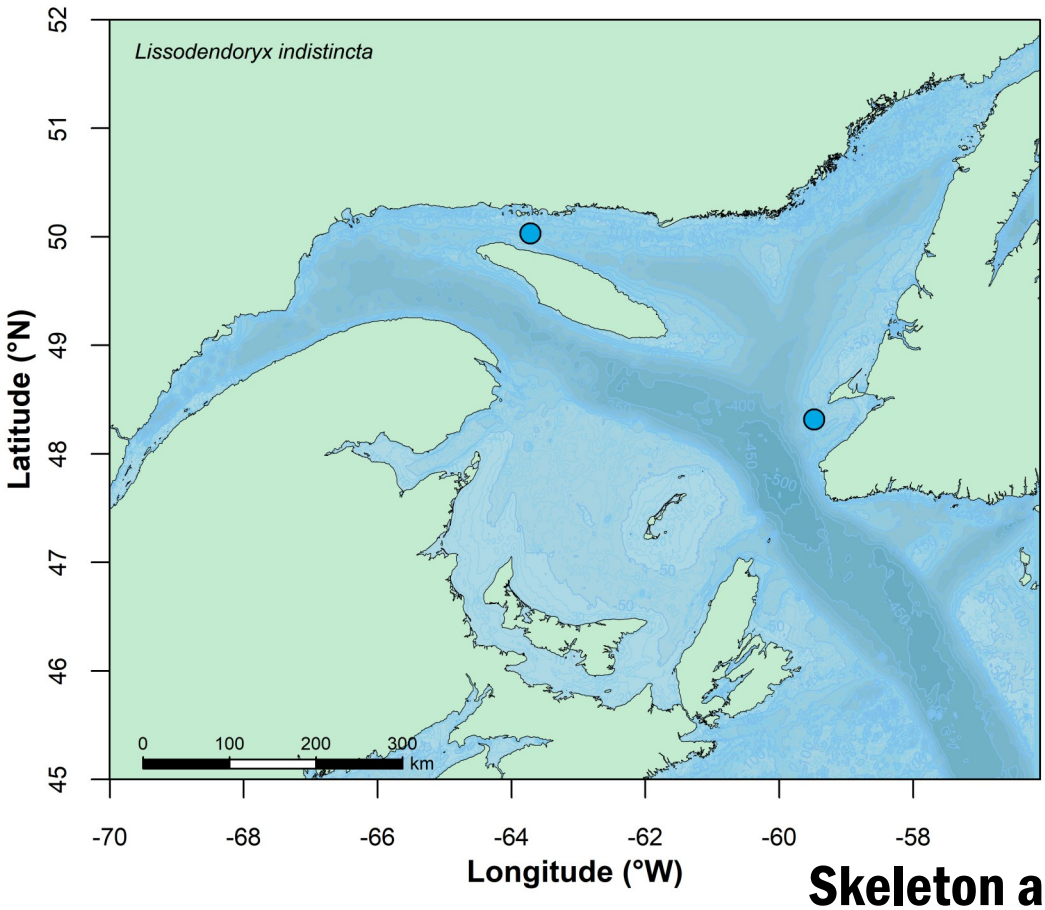
Remarks. Appears similar to *L. indistincta* in external appearance, however the species is not described as having a thin category of acanthostyles and has only two categories of isochelae. Despite these differences, until more specimens are collected, the sponge is best considered as *L. (L.) indistincta.* This species can appear very similar to other globular sponges like *A. arcigera* or *P. montiniger,* but these species are often spherical whereas *L. (L.) indistincta* is irregularly lobose. Spicule analysis is recommended.

Photos. A. several specimens collected in a single trawl.

Sources: Tompkins-Macdonald et al. 2017

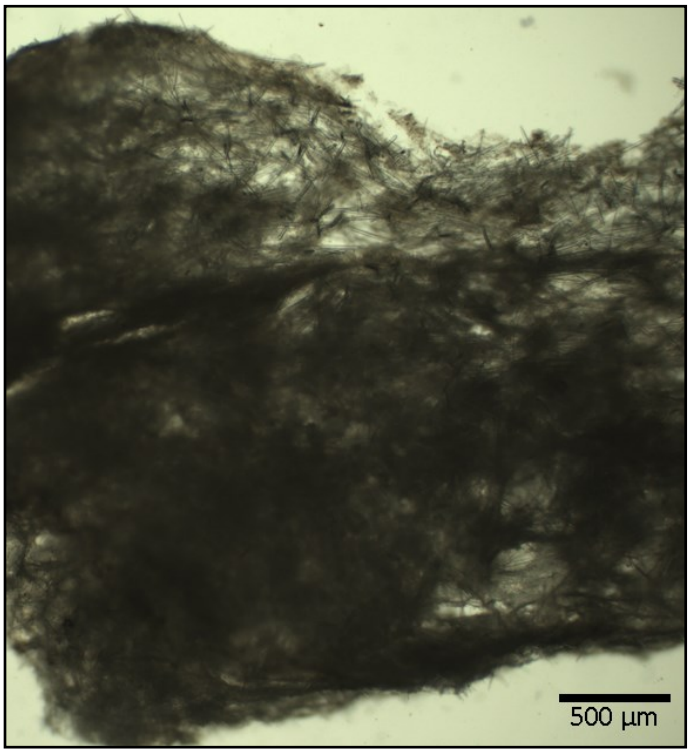
Lissodendoryx (Lissodendoryx) cf. *indistincta* (Fristedt, 1887)

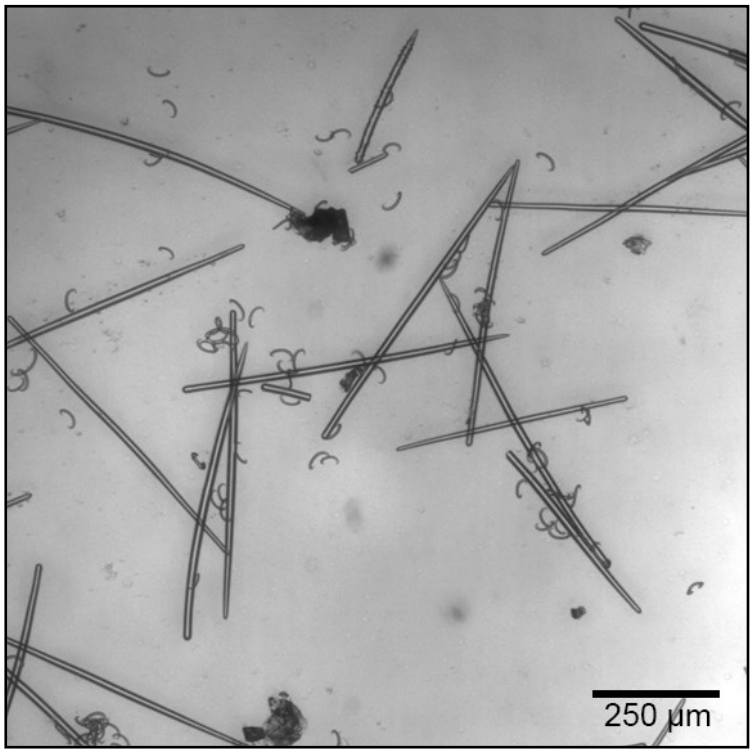
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Halichondria (Halichondria) panicea (Pallas, 1766)

Species Code: 8623 **AphiaID: 165853**

Solid/Massive

Encrusting

Key Identifiers. Common in coastal environments. Polymorphic, difficult to identify from pieces alone.

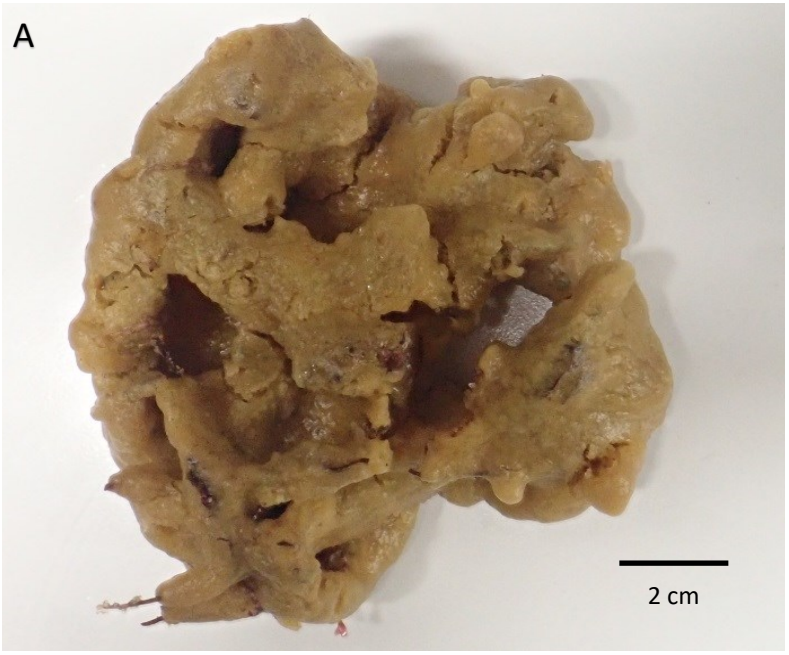
Description. This species is ubiquitous in the North Atlantic and may be encountered in a multitude of growth forms. Most often the sponge is massively encrusting. In shallow water the sponge may be green on the surface due to the presence of photosynthetic algae. The sponge has a strong, unpleasant odor.

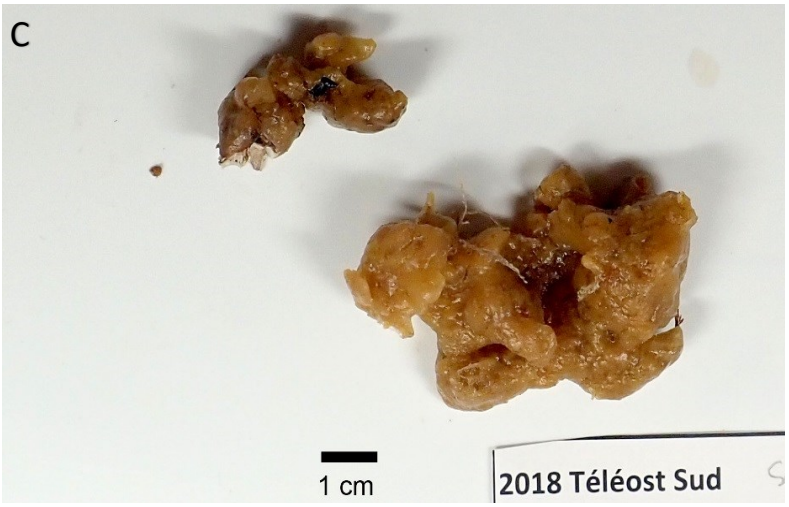
Distribution. Coastal regions throughout the Atlantic. 9–58 m depth.

Skeletal Structure. The spicules are oxeas that vary considerably in size. The oxeas are generally smaller in this species than in *H. bowerbanki,* 168–**253**–380 x 3–**5.5**–10 µm. The skeleton is mostly confused, but with visible columns of spicules.

Remarks. Hard to distinguish from other *Halichondria* specimens. Does not have projections like *H. sitiens* and some *H. bowerbanki* specimens, though *H. bowerbanki* is also highly polymorphic.

Photos. A. Large specimen. B. Specimen showing green surface due to algae. C. Fragments.

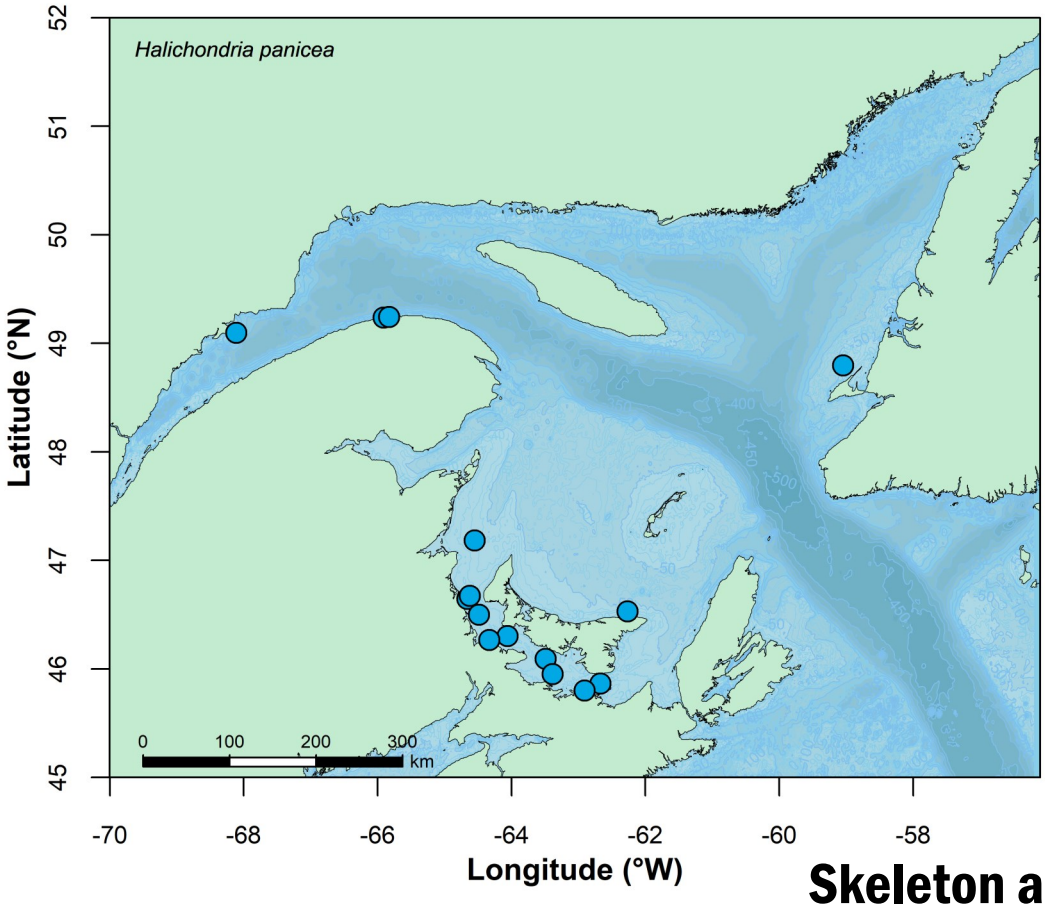




Sources: Goodwin 2017

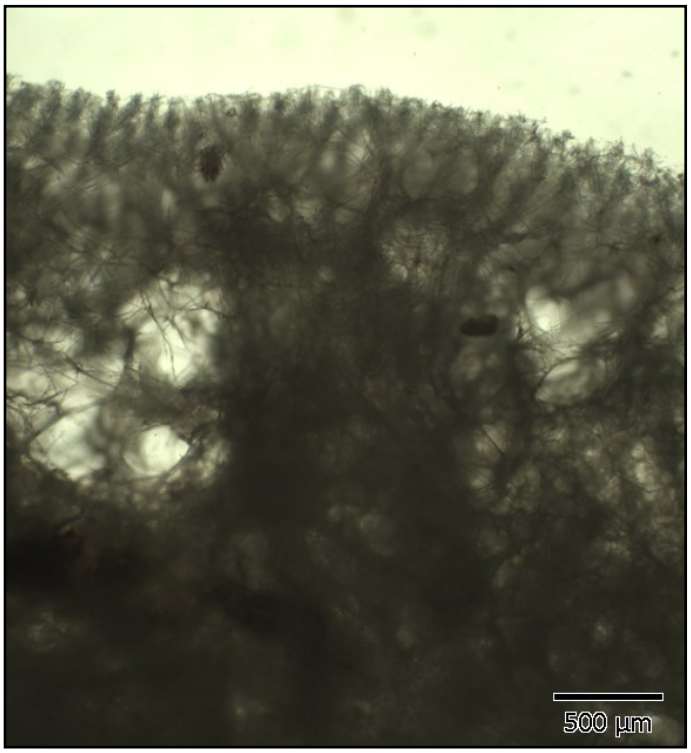
Halichondria (Halichondria) panicea (Pallas, 1766)

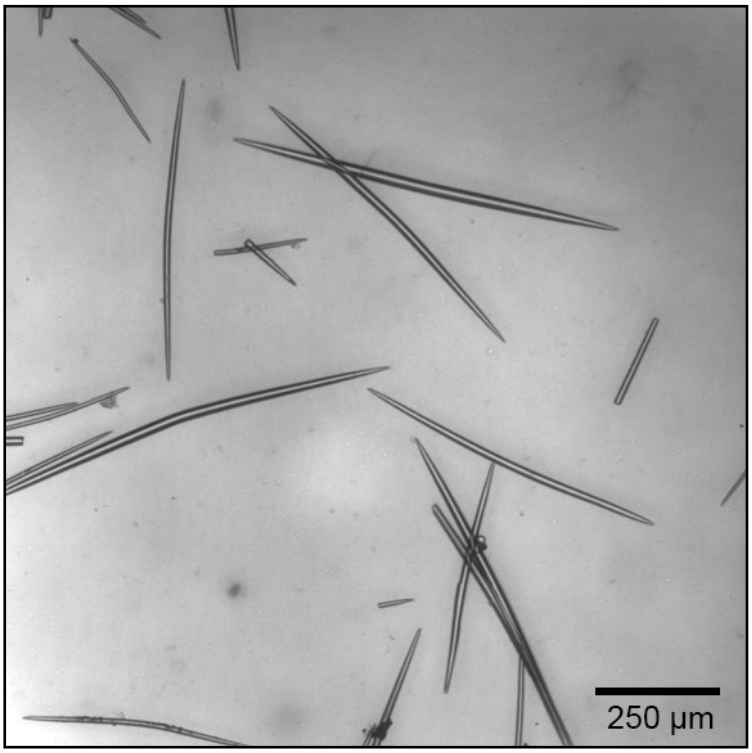
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Halichondria (Halichondria) bowerbanki Burton, 1930

Species Code: 8644 **AphiaID: 165801**

Solid/Massive

Encrusting

Key Identifiers. Polymorphic, often with fleshy projections.

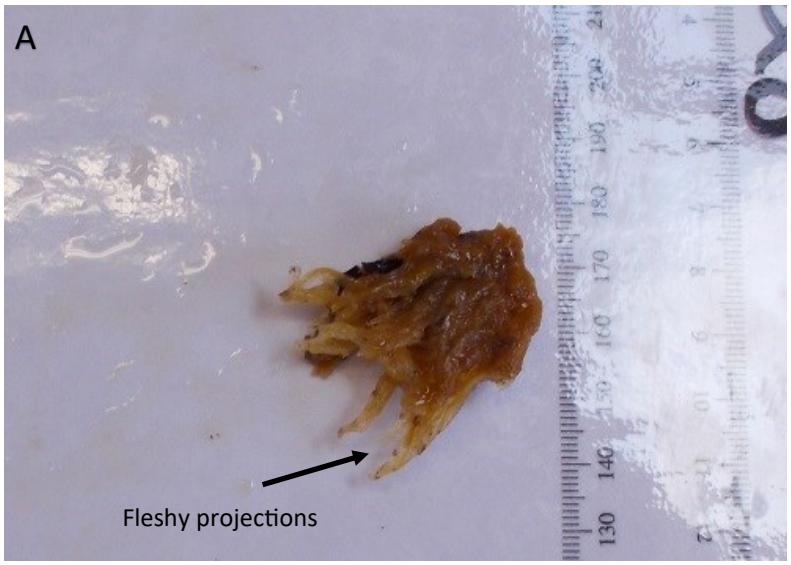
Description. This species is variable in form and is difficult to distinguish without spicule analysis. There are often fleshy projections which may appear similar to *Halichondria sitiens*, but the projections in this species are smaller and often flattened. Can thickly encrust hard objects.

Distribution. Shallow water, whole North Atlantic distribution. 14–161 m depth.

Skeletal Structure. Spicules are oxeas that vary considerably in size. Compared to *H. panicea* the oxeas are generally longer and are often thicker, 249–**380**–453 x 6–**8.5**–11 µm. The skeleton is confused.

Remarks. Hard to distinguish from other *Halichondria* specimens. The surface is not smooth as in *H. panicea*.

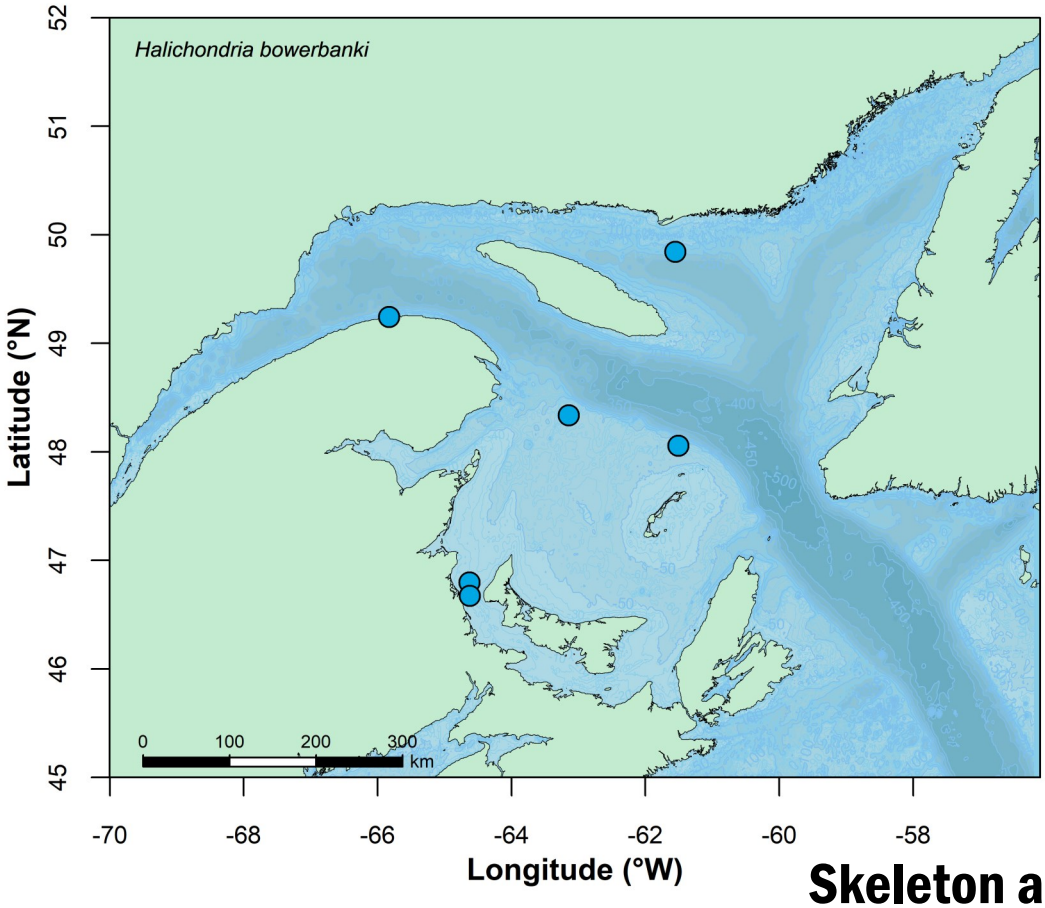
Photos. A, B. Small specimens. C. Specimen growing on a hard substrate.



Sources: Goodwin 2017

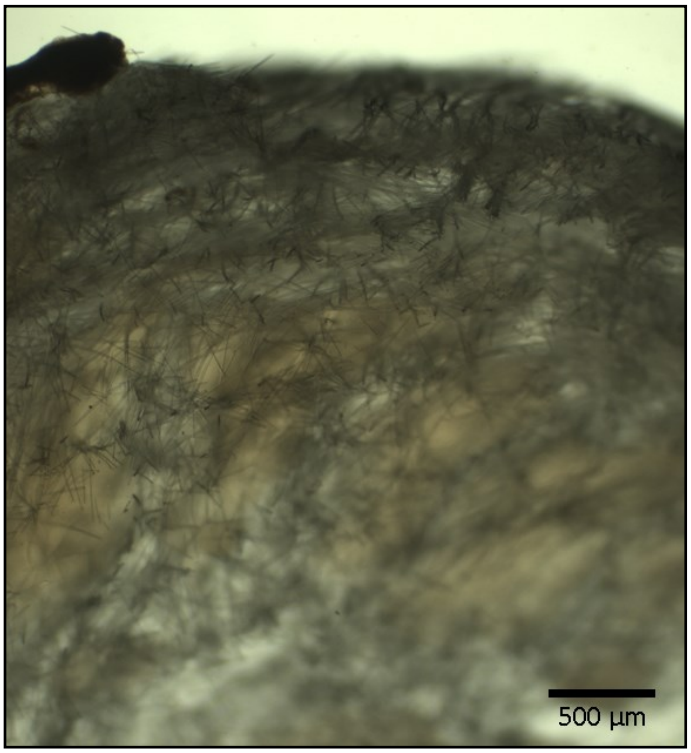
Halichondria (Halichondria) bowerbanki Burton, 1930

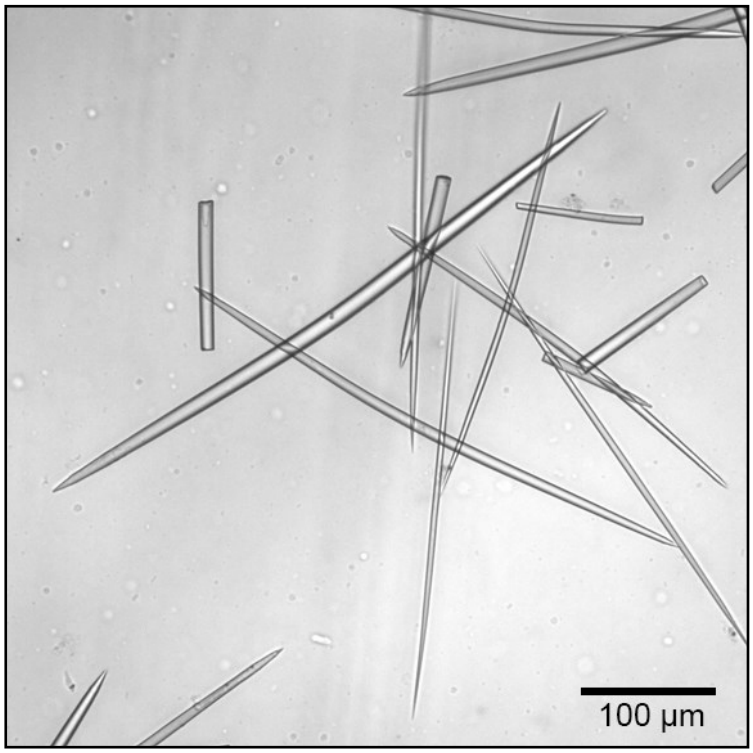
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Hymedesmia (Hymedesmia) cf. *paupertas* (Bowerbank, 1866)

Species Code: 8634 **AphiaID: 133621**

Encrusting

Key Identifiers. Blue crust.

Description. A thin blue to green crust, often growing on rocks in wide patches. Upon close inspection there are raised pore sieves, but these often collapse in collected specimens.

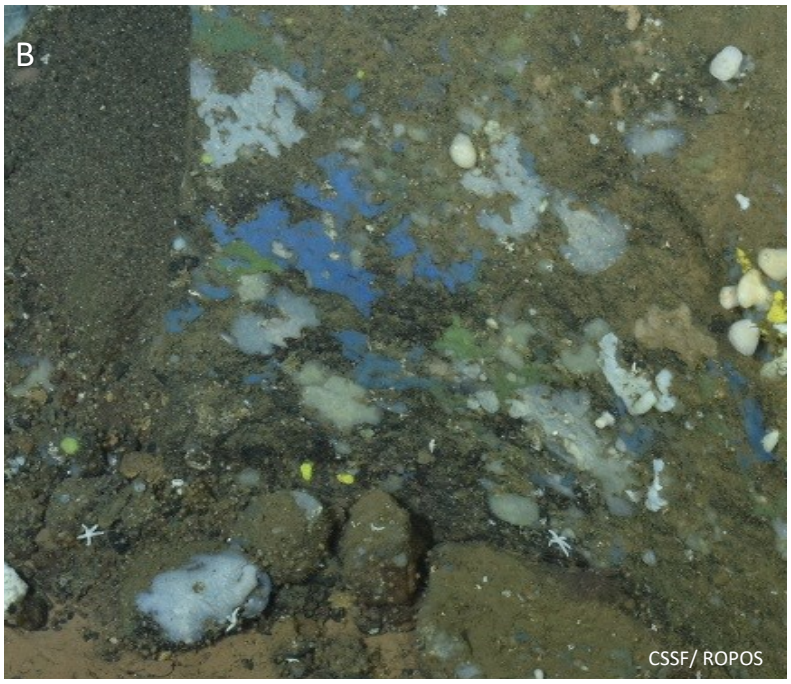
Distribution. Common on rocks throughout eastern Canada. A single sample was collected by ROV in 2018 north of Cape Breton Island as trawl collections of thinly encrusting specimens are rare. Specimen collected at 162 m depth.

Skeletal Structure. Spicules are tornotes 271–**321**–367 x 9–**11**–13 µm, long acanthostyles are 414–**584**–691 x 16–**21**–25 µm, short acanthostyles are 105–**164**–182 x 11–**13**–16 µm. Microscleres are isochelae 31–**36**–40 µm. The skeleton is difficult to discern as the sponge is very thinly encrusting, but acanthostyles form the basal layer with tornotes forming parallel fibres.

Remarks. The spicules from this specimen are longer than those from specimens collected elsewhere, but the shape as well as the overall outer morphology of the sponge are consistent with the species. May be part of a species complex and could require revision. Must be removed from rocks using a blunt probe or scalpel.

Photos. A. Specimen growing on a rock. B. Sponges *in situ*.

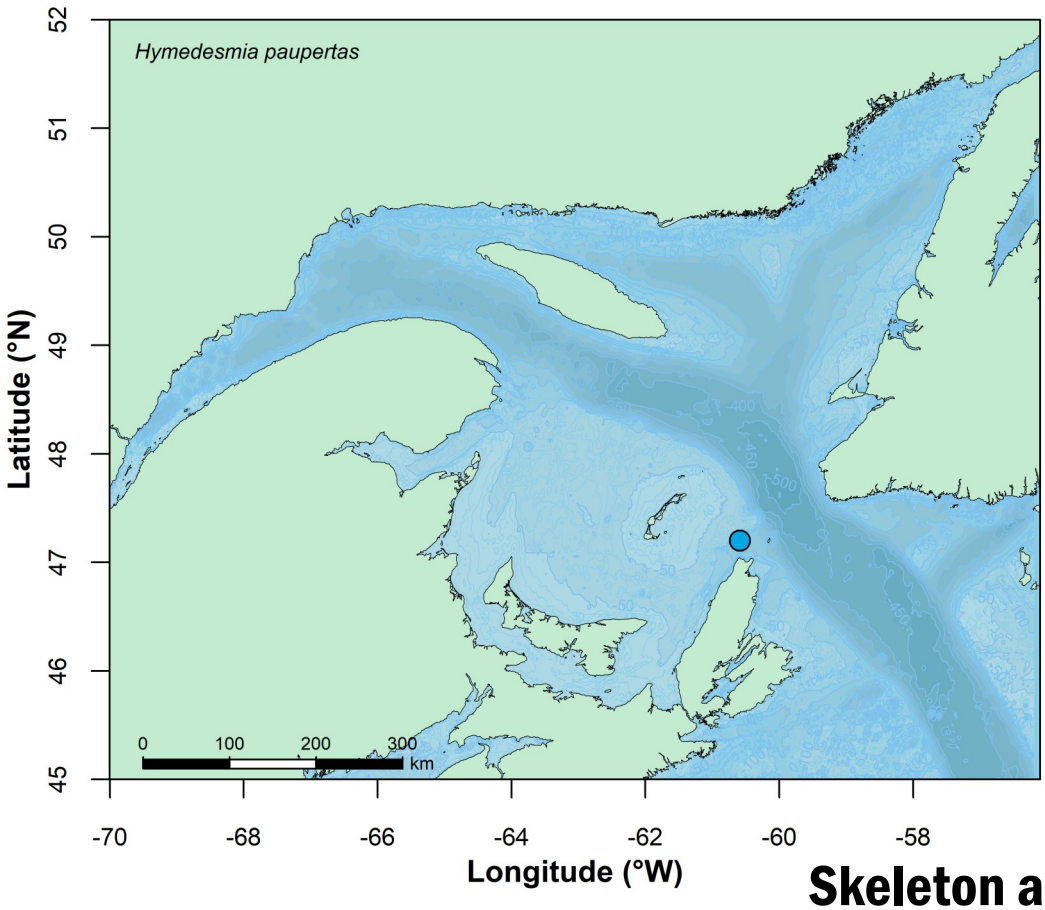
V. Roy



Sources: Ackers et al. 2007.

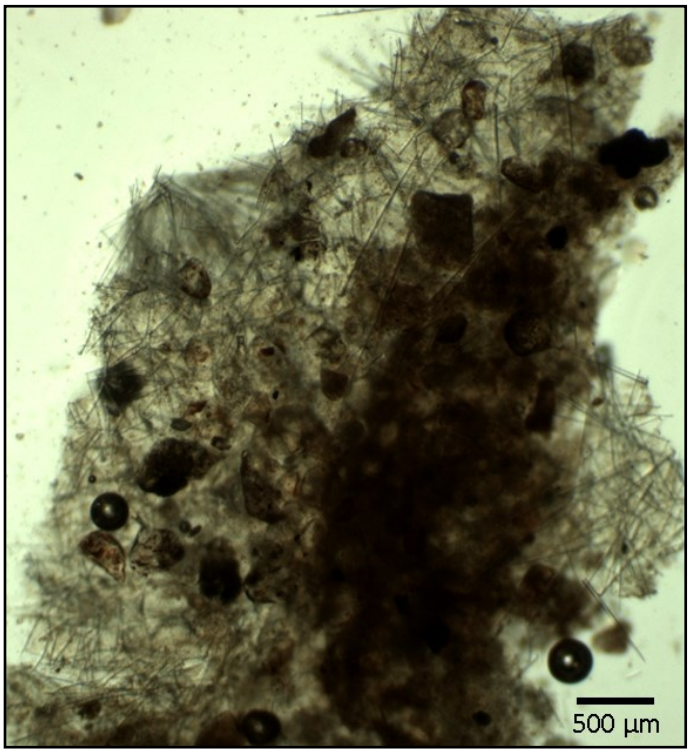
Hymedesmia (Hymedesmia) cf. *paupertas* (Bowerbank, 1866)

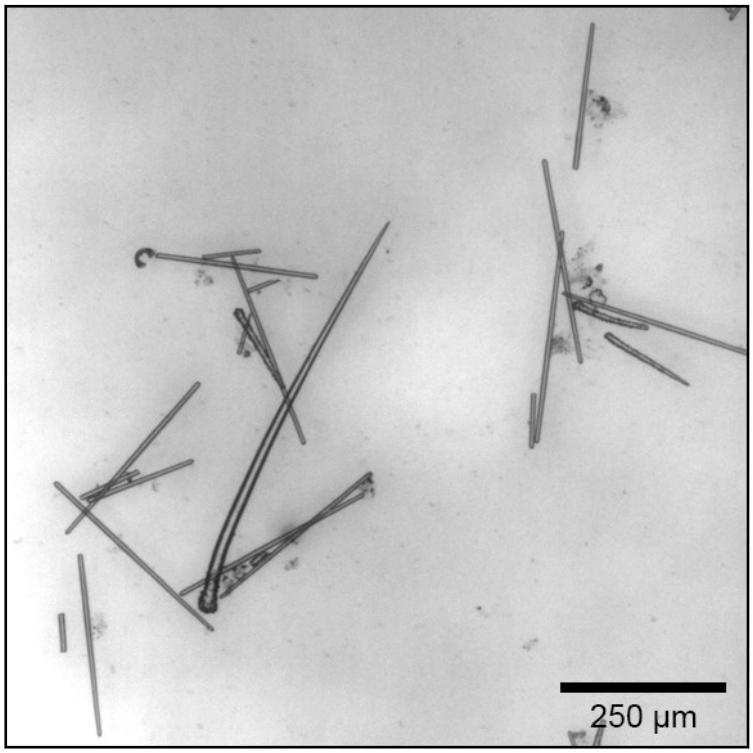
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Aplysilla cf. *sulfurea* Schulze, 1878

Species Code: 8626 **AphiaID: 236120**

Encrusting

Key Identifiers. Bright yellow encrustations with raised projections.

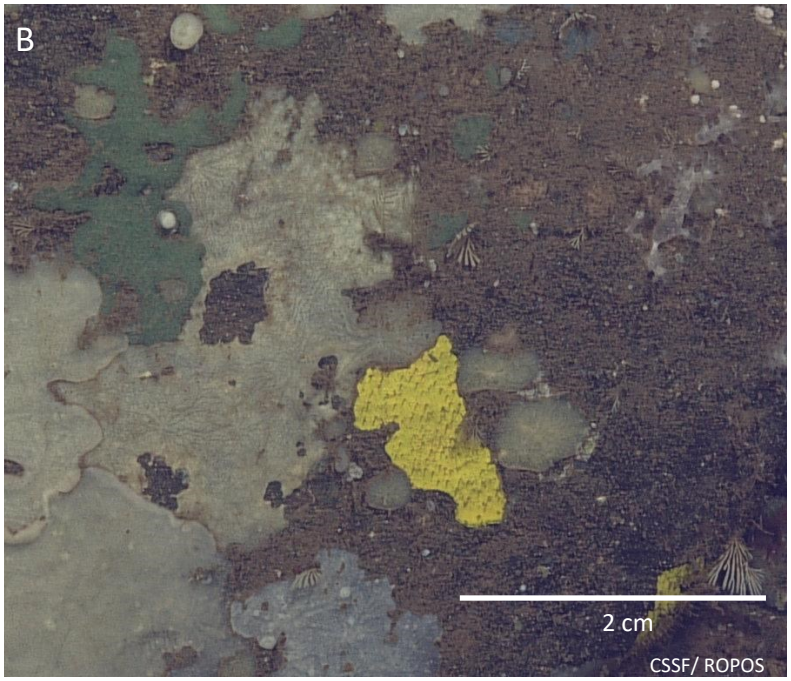
Description. This sponge is a common sulfur yellow sponge which grows on rocks as a thin crust with prominent conules. There is no spicule skeleton, but dense spongin fibres are the cause of the spiked projections.

Distribution. Common on rocks and boulders. Unlikely to be collected in trawl surveys. Specimen collected by ROV in 2017 north of Cape Breton Island. Specimen collected at 166 m depth.

Skeletal Structure. No spicules.

Remarks. Easily identified by the colour and projecting conules. Must be removed from rocks using a blunt probe or scalpel.

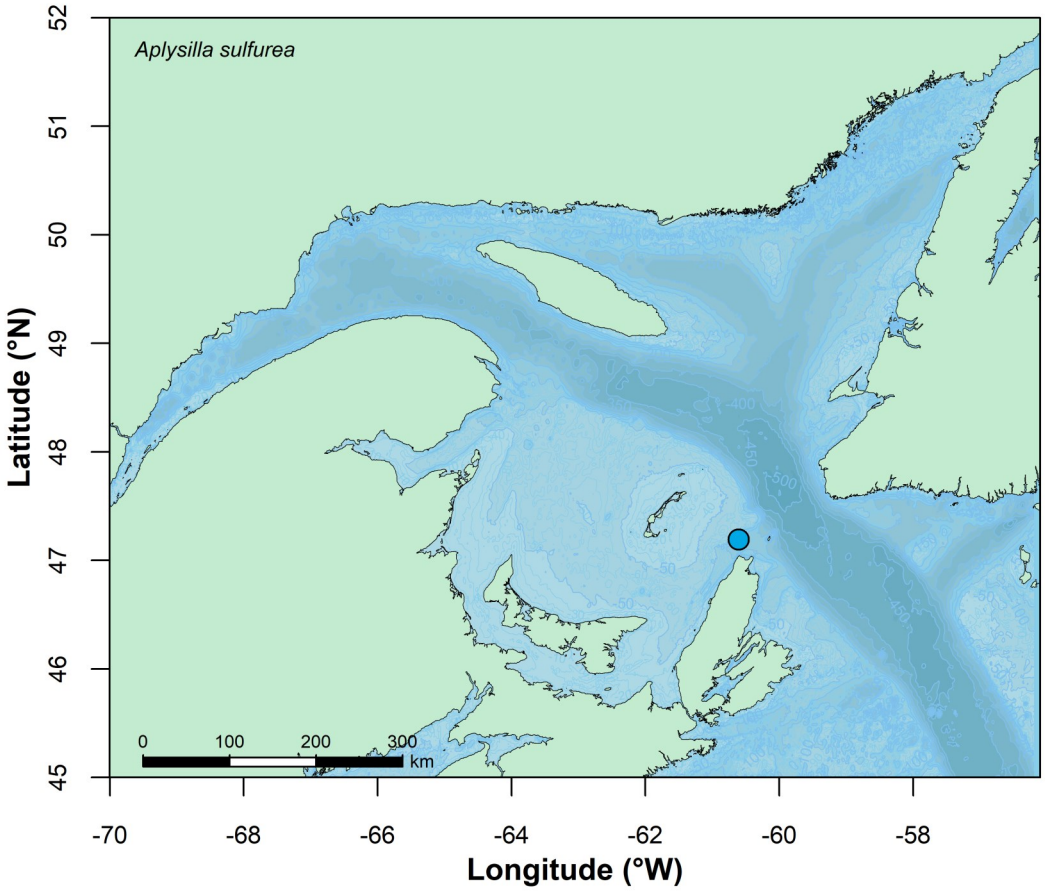
Photos. A. Specimens growing on rock. B. Specimen *in situ.*



Sources: Ackers et al. 2007.

Aplysilla cf. *sulfurea* Schulze, 1878

Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

No spicules

Crella (Pytheas) sp.

Species Code: 8631 **AphiaID: 131936**

Encrusting

Key Identifiers. Transparent skin which is easily removed. Produces copious mucous.

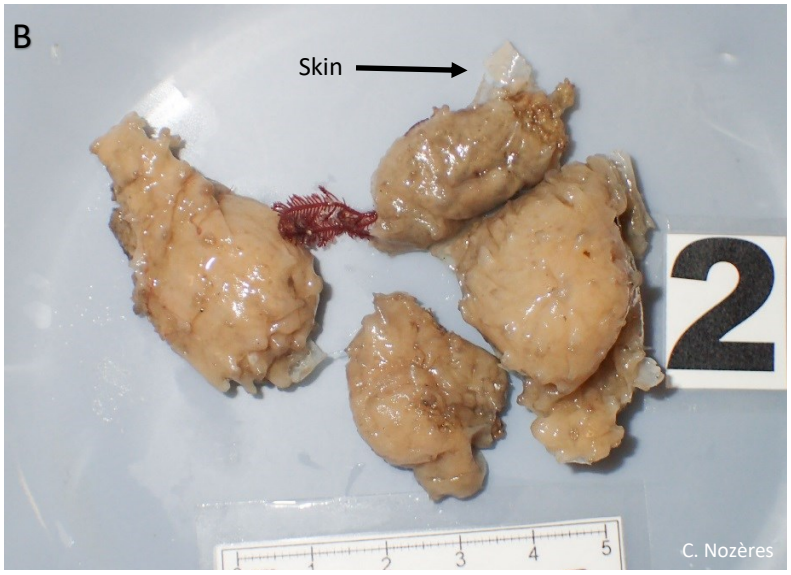
Description. Thickly encrusting species which has a distinctive skin that flares out into multiple oscula. The underlying body is a light cream colour, but turns dark after exposure to air. The sponge is often coated in thick, stringy mucous.

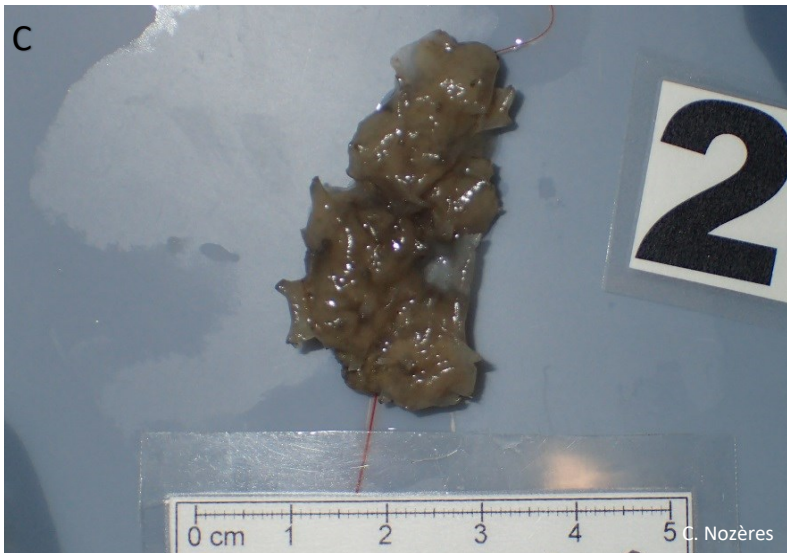
Distribution. Northern Gulf of St. Lawrence. 100–249 m depth.

Skeletal Structure. Skeleton consists of surface and basal layers of tangential acanthostyles and tracts of styles. Tylotes support the papillae. Acanthostyles are in two sizes, large acanthostyles are 191–**289**–338 x 8.4–**11**–15 µm and small acanthostyles are 89–**122**–158 x 8.2–**9.7**–12 µm. Styles are large with a single apical point at the rounded end 434–**472**–505 x 15–**17**–19 µm. Tylotes are 332–**363**–420 x 6.8–**10**–12 µm. Microscleres are sigmas 26–**39**–48 µm and uncommon isochelae 14–**20**–25 µm.

Remarks. This sponge is considered to be an undescribed species as specimens are not similar to other species described from the North Atlantic.

Photos. A. Specimen encrusting rock (left) and light coloured fragments. B. Specimens with light colouration. C. Specimen showing dark colour which occurs after time in air.

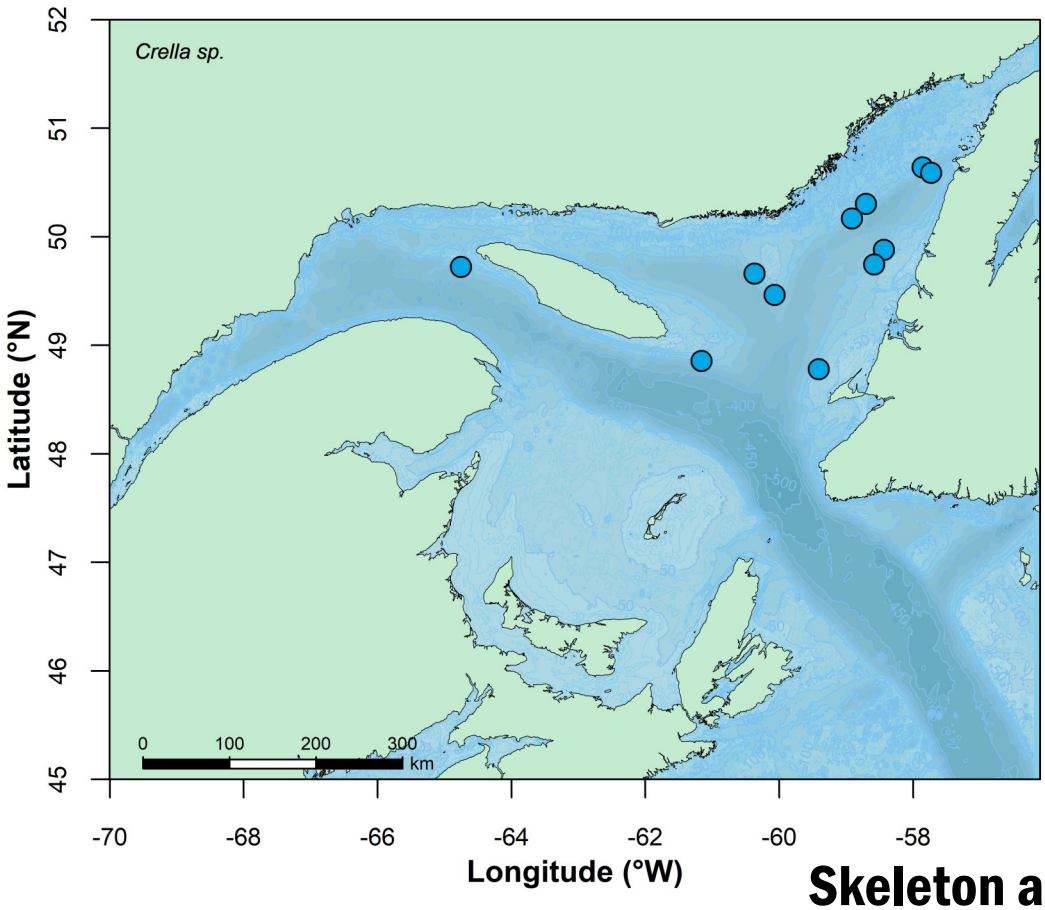




Sources: Boury-Esnault & Lopes 1985, Hooper & Van Soest 2002

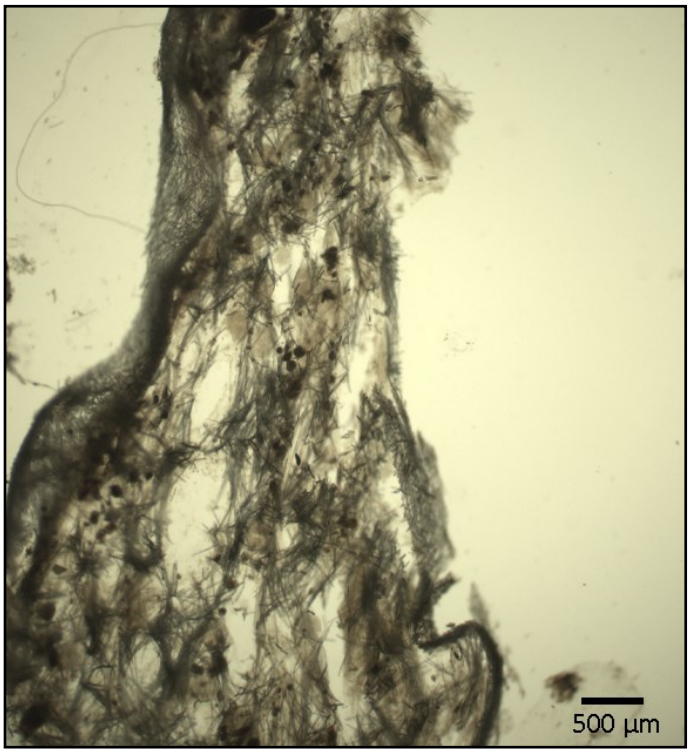
Crella (Pytheas) sp.

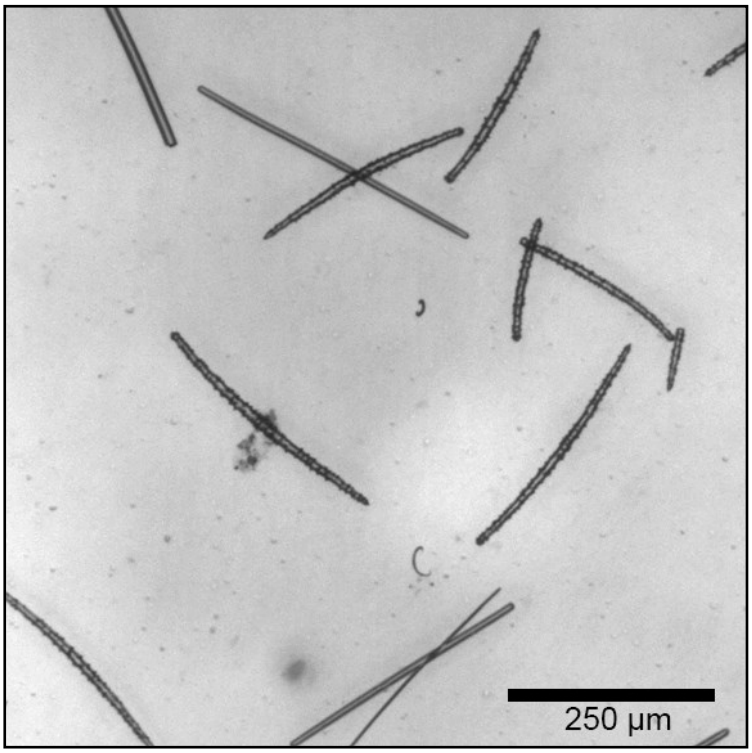
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Cliona celata Grant, 1826

Species Code: 8653 **AphiaID: 134121**

Encrusting

Key Identifiers. Yellow sponge that bores into shells.

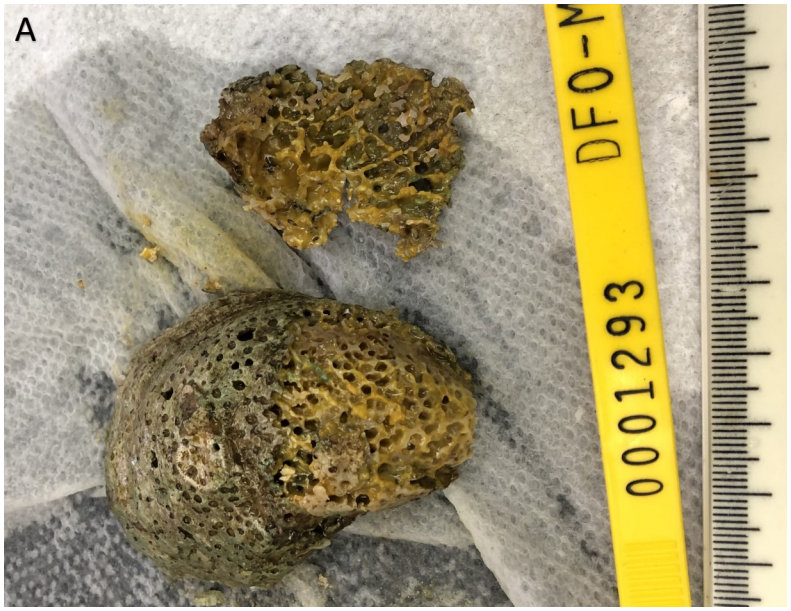
Description. Boring sponge that leaves characteristic pockmarks in bivalve shells, with fleshy sponge tissue visible below the surface. Sponge makes oyster shells very brittle.

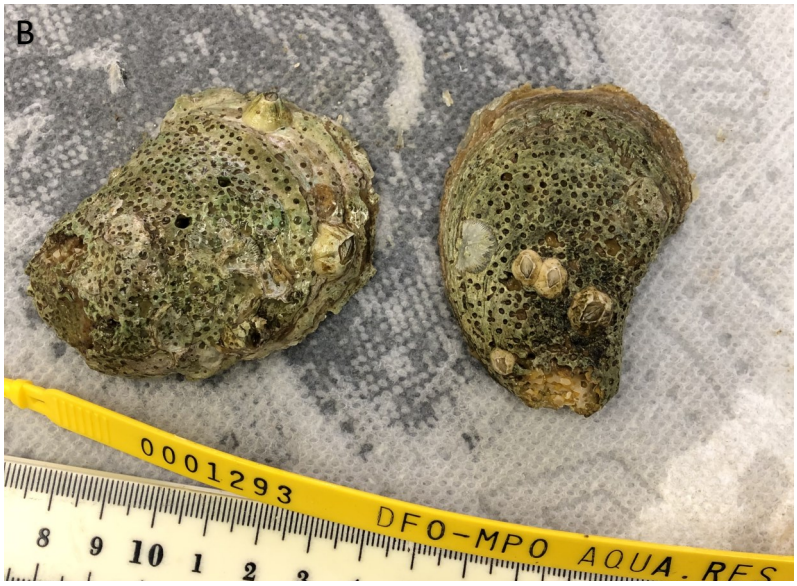
Distribution. Whole North Atlantic distribution. Common oyster pest.

Skeletal Structure. Confused. Largely depends on the substrate the sponge bores into. Spicules are tylostyles with swellings that occur near the tip of the spicule 294–240–325 x 6.2–8.1–10.7 µm.

Remarks. The species is easily recognized as it can cause severe damage to oyster shells. It is difficult to weigh sponge tissue in surveys, so presence/absence measures are most reliable rather than biomass. The species has a wide distribution and is likely part of a large species complex.

Photos. A. Sponge visible after outer portion of oyster shell removed. B. Characteristic pockmarks on outer shell.

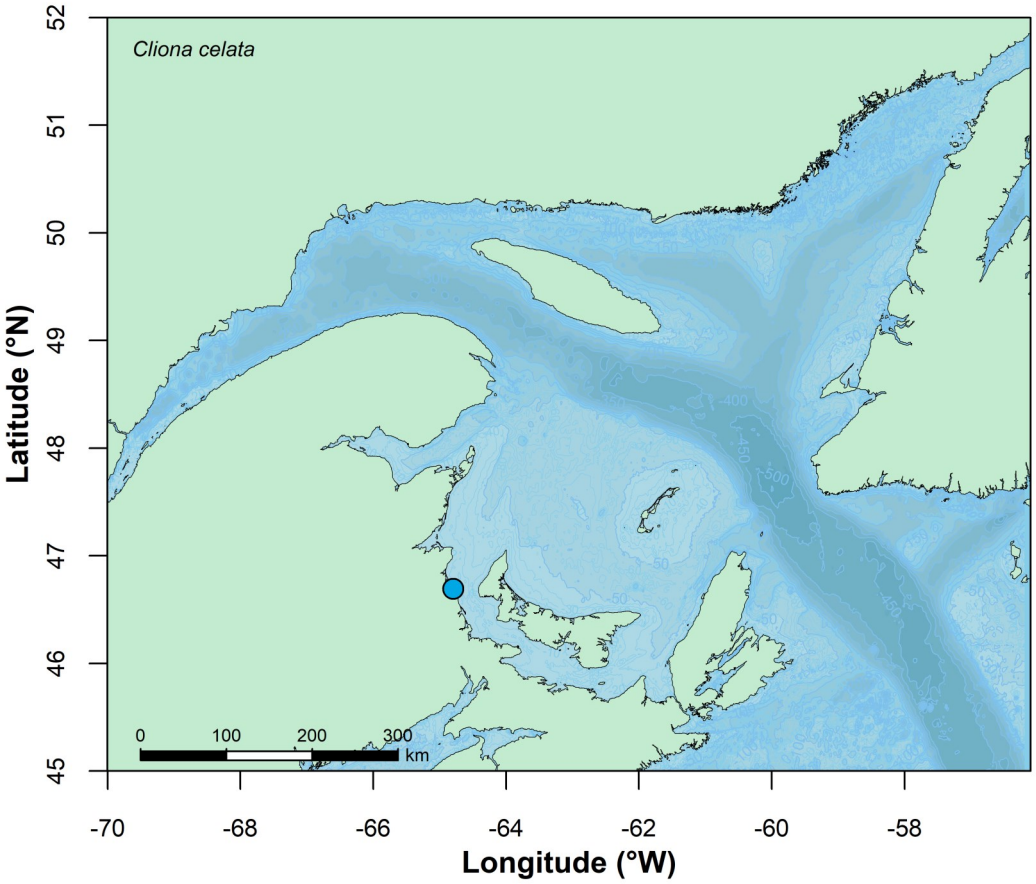




Source: Ackers et al. 2007.

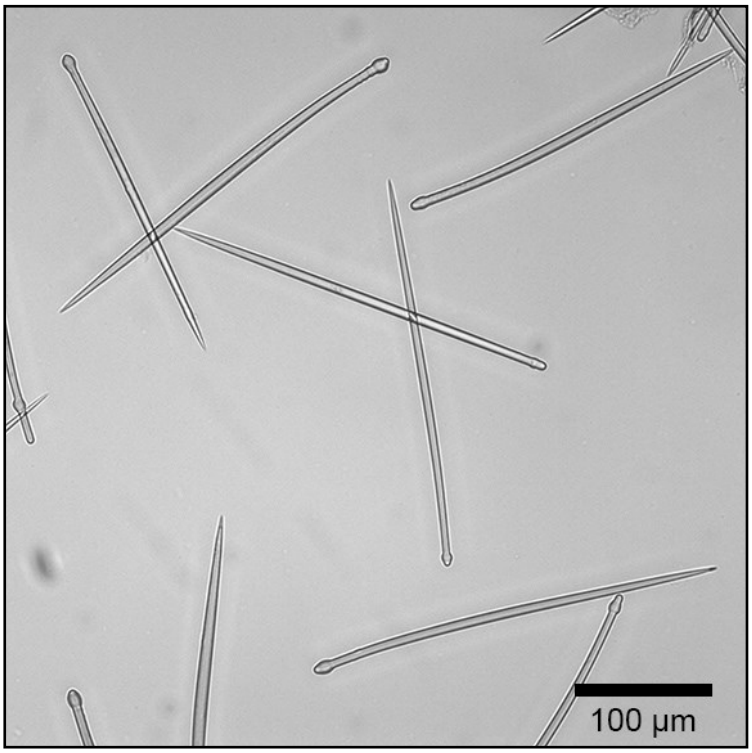
Cliona celata Grant, 1826

Collection Locations—Gulf of St. Lawrence



Likely present in additional coastal locations.

Spicules



Tedania (Tedania) suctoria Schmidt, 1870

Species Code: 8638 **AphiaID: 169587**

Encrusting

Cushion with Projections

Key Identifiers. Brown crust with short white-tipped papillae.

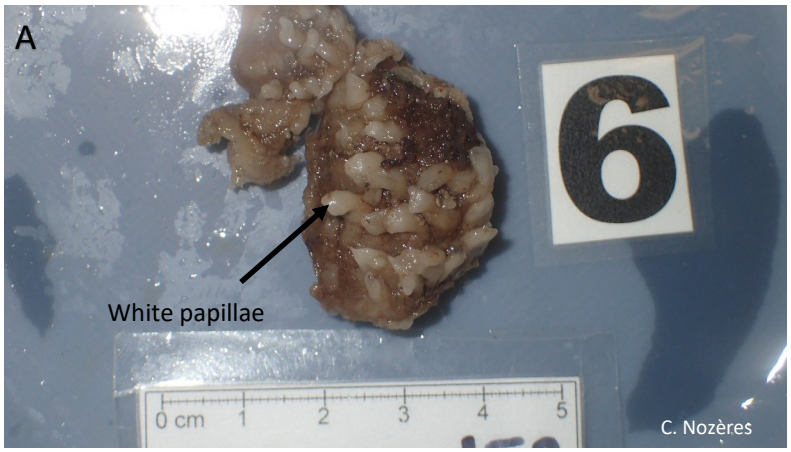
Description. Massively encrusting sponge, often with obvious papillae. There is no defined shape to this species. Spicules are very distinctive.

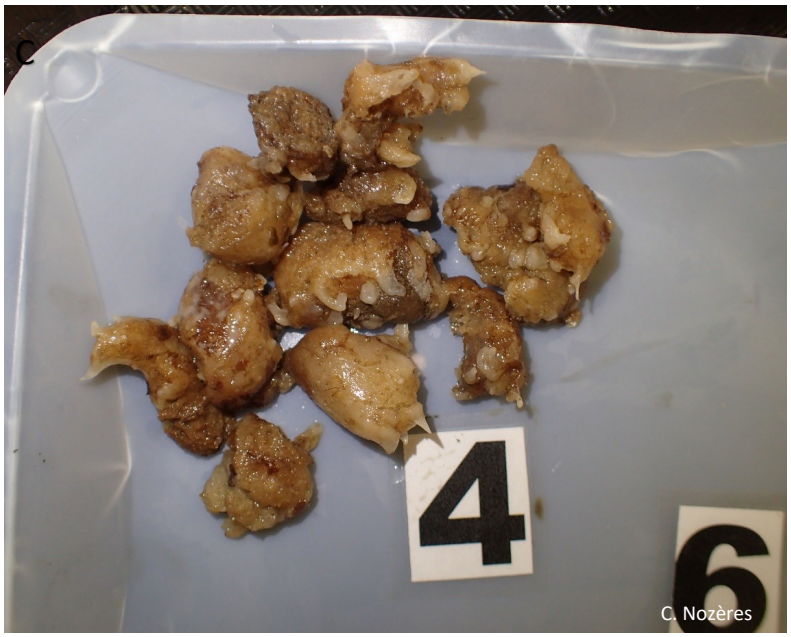
Distribution. North of the American Bank. 77–300 m depth.

Skeletal Structure. Styles, tylotes, onychaetes. Skeleton consists of bundles of tylotes at the surface and styles loosely isotropic in the choanoasome. Tylotes are 312–**348**–389 x 5.5–**6.3**–7.2 µm, styles are 381–**446**–488 x 9.5–**15**–17 µm, and onychaetes are 133–**235**–285 µm and are a few microns thick.

Remarks. This sponge may grow into a cushion shape, and is then easily confused with *Halichondria (Halichondria) sitiens,* but the white tipped papillae are distinctive. The sponge often grows on other species, especially *Iophon* spp. So care must be taken when spicules are isolated as there is often contamination.

Photos. A. Specimen with white papillae. B. Underside of a specimen. C. Multiple specimens.

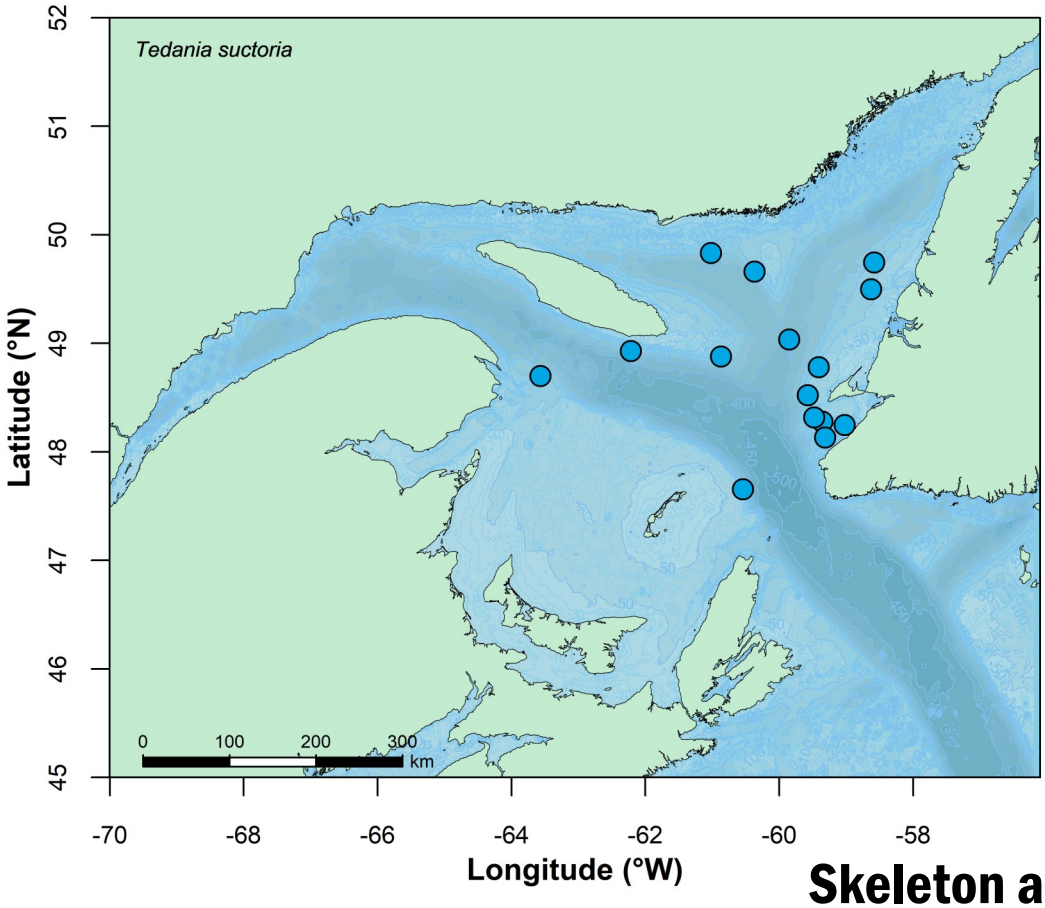




Sources: Van Soest et al. 2000

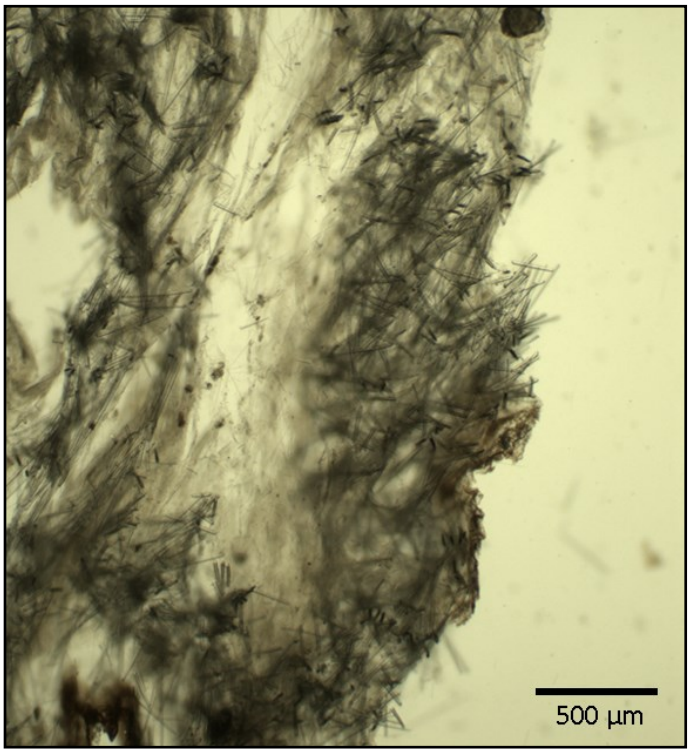
Tedania (Tedania) suctoria Schmidt, 1870

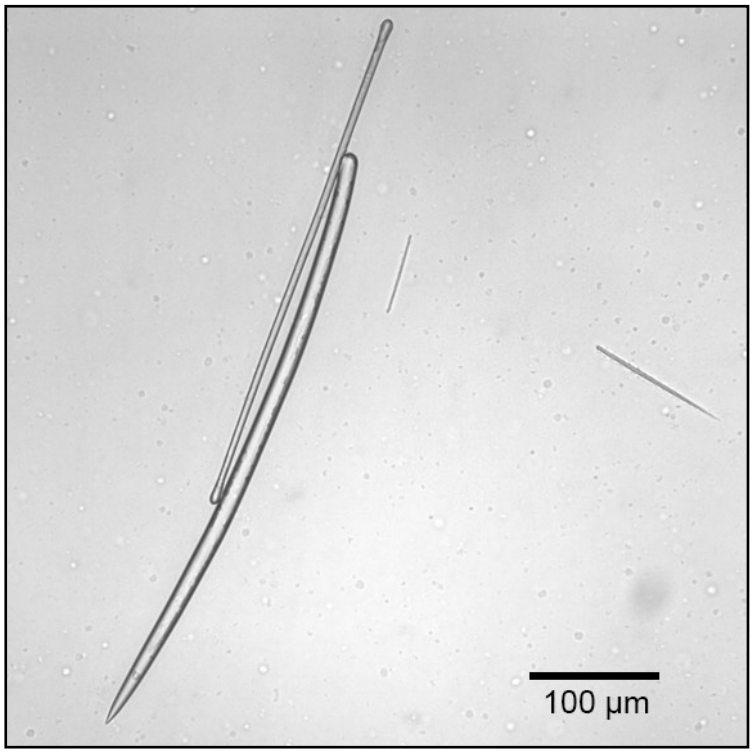
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Halichondria (Eumastia) sitiens (Schmidt, 1870)

Species Code: 8620 **AphiaID: 165789**

Cushion with Projections

Key Identifiers. Many soft, transparent papillae. Very compressible. Not dense like a Polymastid.

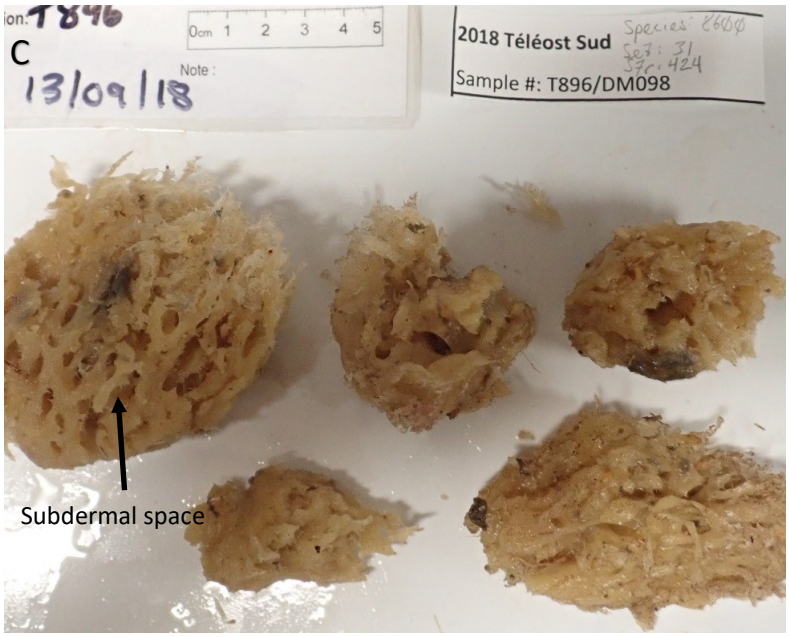
Description. Formed by many individual papillae which extend deep into the sponge body. The papillae are very fleshy and transparent. The sponge body is soft and compressible.

Distribution. Common along the east coat of Canada and the North Atlantic. 35–104 m depth.

Skeletal Structure. Skeleton formed by long, bent oxeas and is largely confused, with spicule bundles in the papillae. Oxeas are 355–**614**–955 x 12–**15**–20 µm.

Remarks. Easily confused with *Polymastia* specimens due to the papillae. However *Polymastia* are very dense and have a thick cortex in cross section. This species has many subdermal spaces below the papillae.

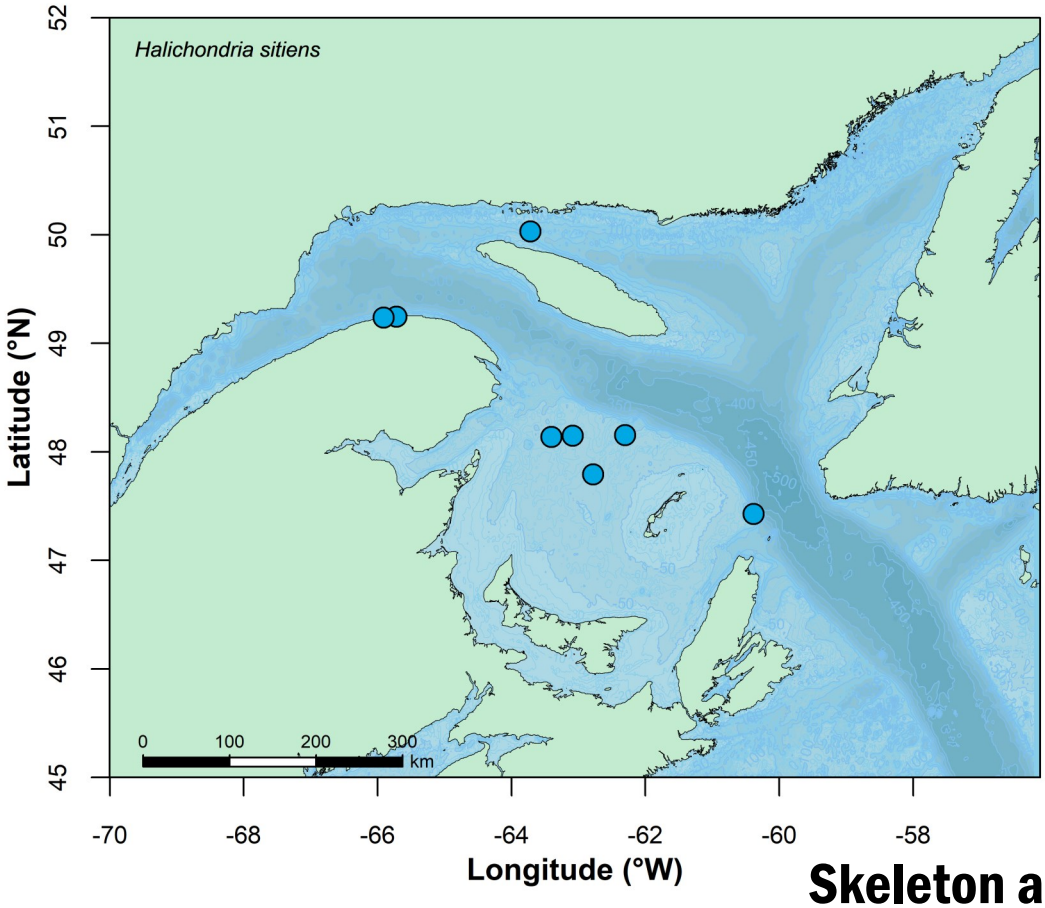
Photos. A–B. Intact specimens showing many papillae. C. Pieces showing the subdermal space.



Sources: Goodwin 2017, Van Soest et al. 2000

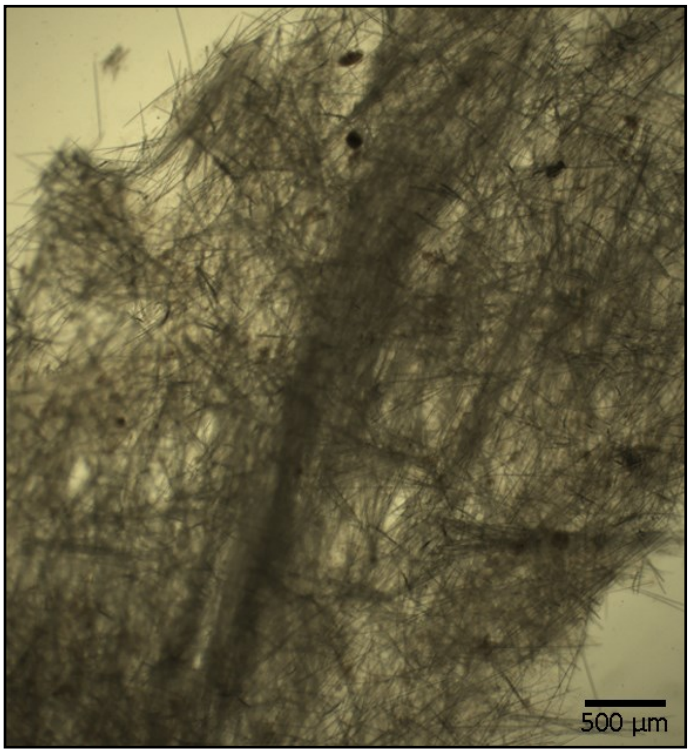
Halichondria (Eumastia) sitiens (Schmidt, 1870)

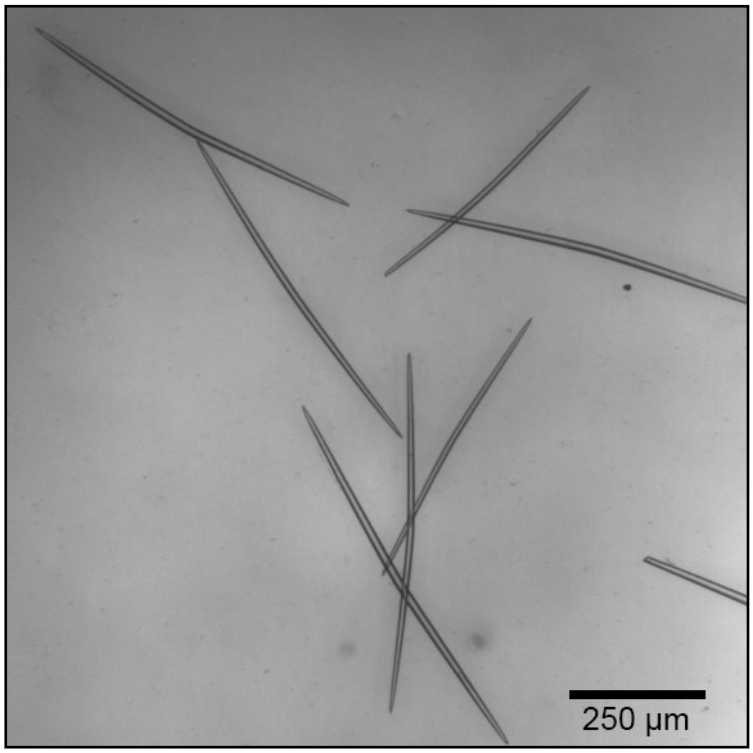
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Tentorium semisuberites (Schmidt, 1870)

Species Code: 8612 **AphiaID: 134224**

Cushion with Projections

Key Identifiers. Toadstool shape, few papillae.

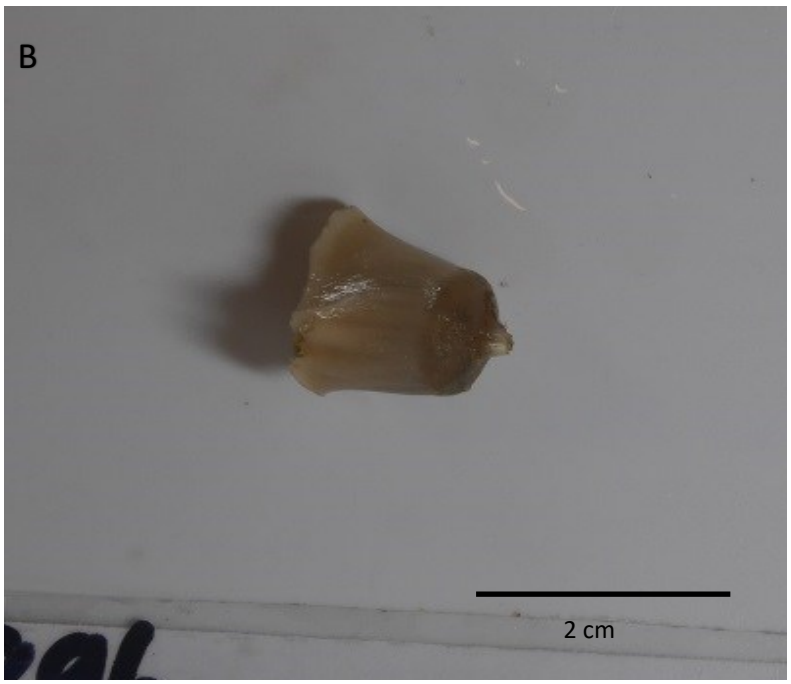
Description. Columnar shape with a dense, rounded upper portion that has one or more papillae. Often growing attached to rocks, thus has a flat base. The walls of the body are firm and difficult to tear.

Distribution. Specimens were not often retained, thus distribution data is not representative. Likely widespread. 109–217 m.

Skeletal Structure. Tylostyles in three categories. Skeleton is formed by dense bundles of large spicules, and small spicules form a palisade at the surface and in the papillae.

Remarks. Easily identified species.

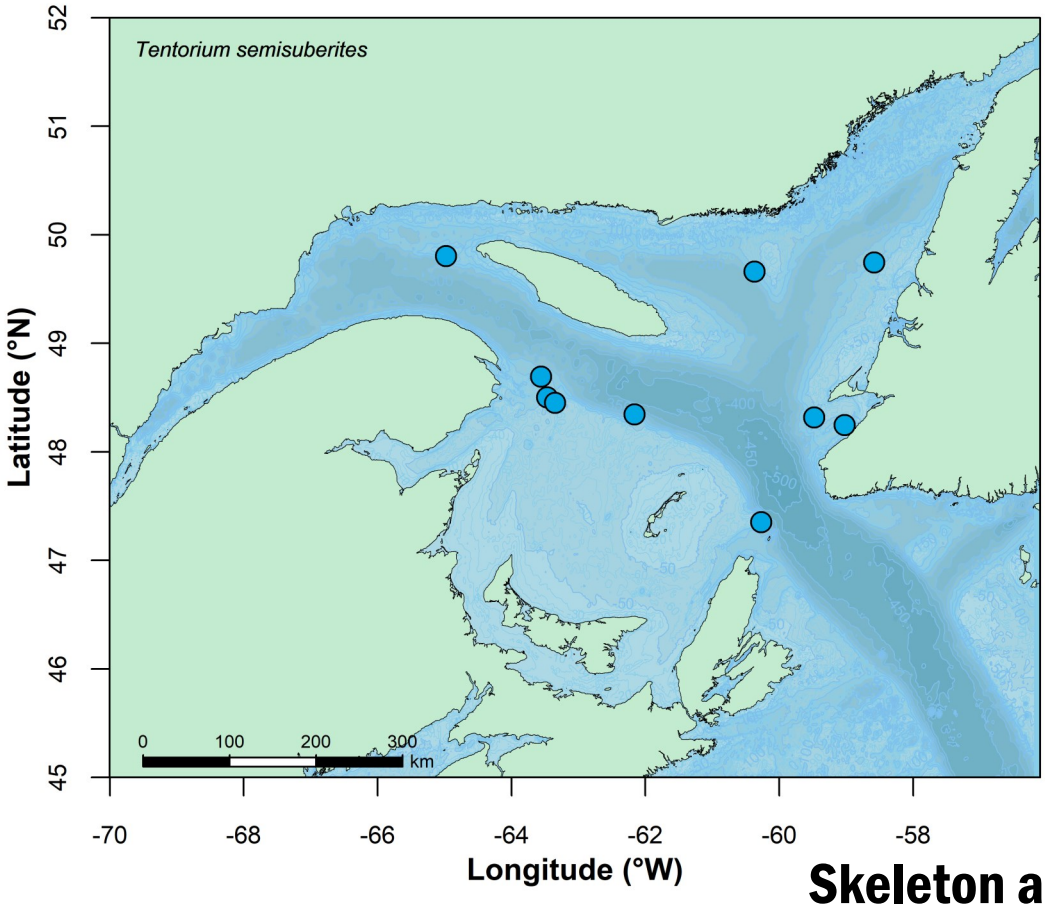
Photos. A,B. Intact specimens.



Sources: Hooper & Van Soest 2002.

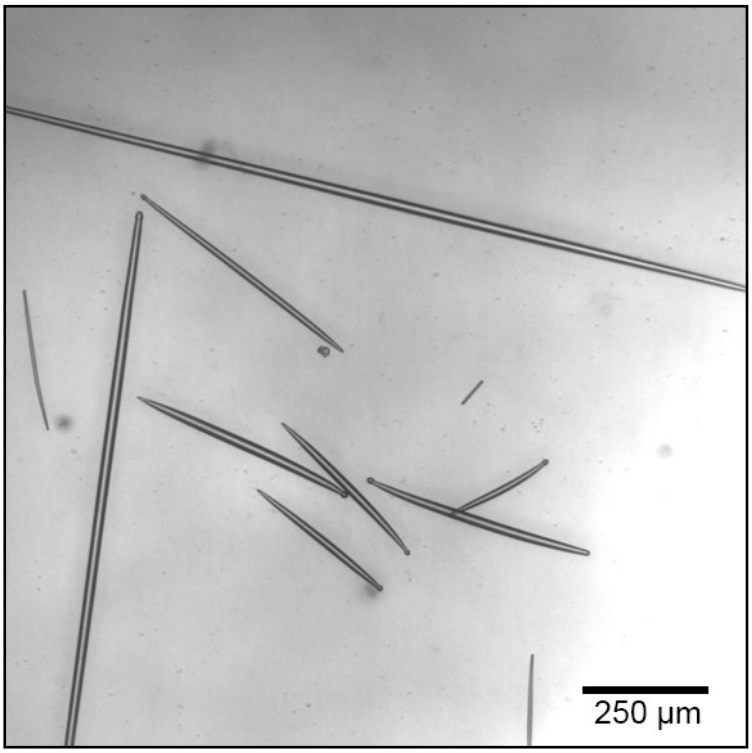
Tentorium semisuberites (Schmidt, 1870)

Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules



Polymastia bartletti de Laubenfels, 1942

Species Code: 8611 **AphiaID: 134193**

Cushion with Projections

Encrusting

Key Identifiers. Thin sheet with long papillae.

Description. Very thin encrusting sponge with many long papillae

Distribution. The sponge was collected nearshore in the Northumberland Strait and near western newfoundland. 14–100 m depth.

Skeletal Structure. Spicules are in three size categories. The largest are styles that do not have an apical swelling 971–**1098**–1263 x 16–**21**–24 µm. The intermediate size have a slight swelling at the rounded end 412–**560**–690 x 12–**15**–19 µm. The small spicules are curved tylostyles with a round or ovoid head 131–**161**–184 x 6.5–**8.3**–10 µm.

Remarks. Easily distinguished from other *Polymastia* specimens by the thin habit with long papillae. Has previously been described as *P. mammilaris* in the region, however DNA confirms the species.

Photos. A. Specimen showing the long papillae. B. Many specimens from a single trawl.

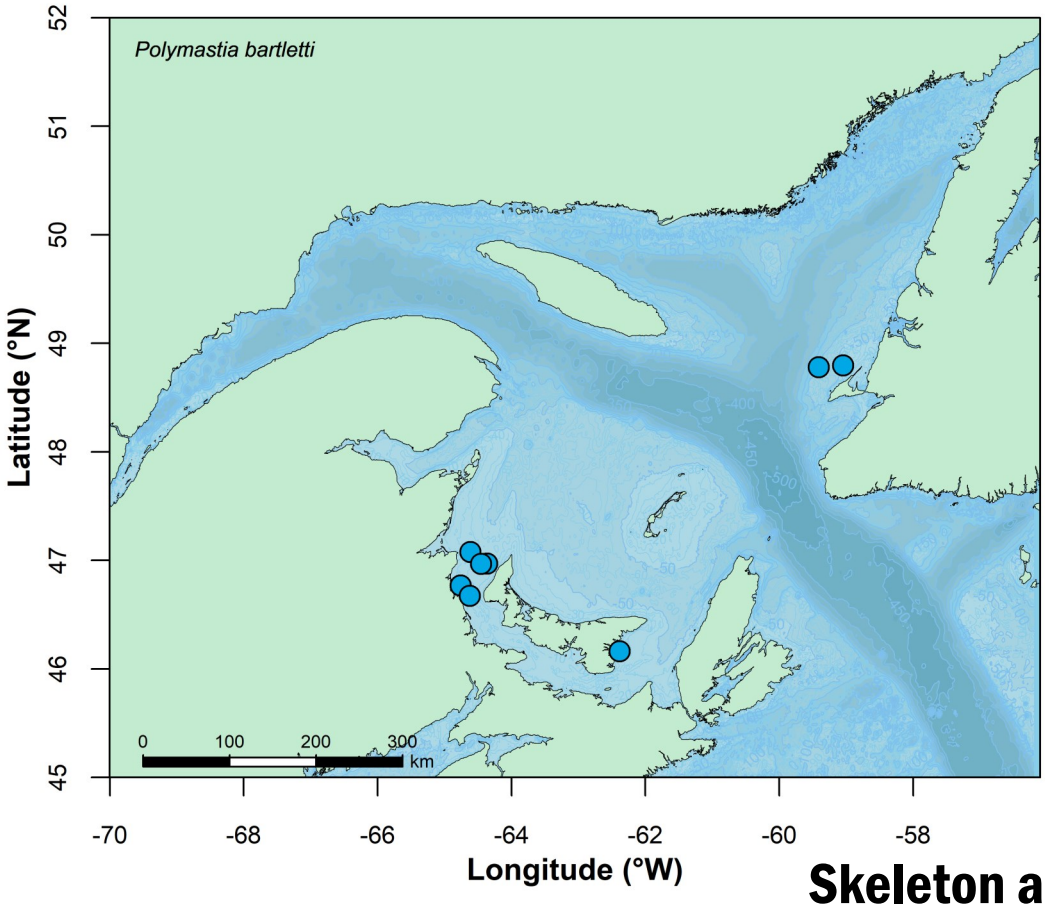
Code **8610** is used for unknown

Polymastid species.

Sources: Fuller 2004, Plotkin et al. 2018.

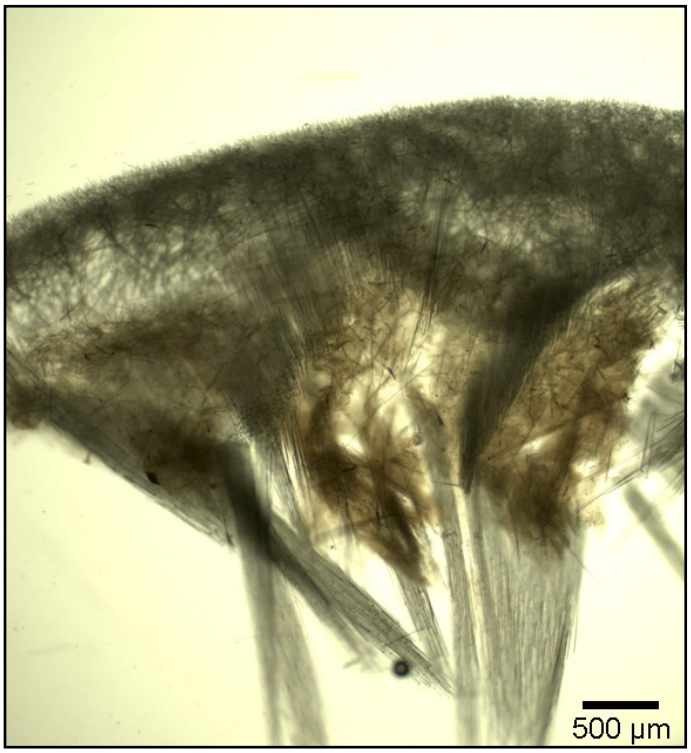
Polymastia bartletti de Laubenfels, 1942

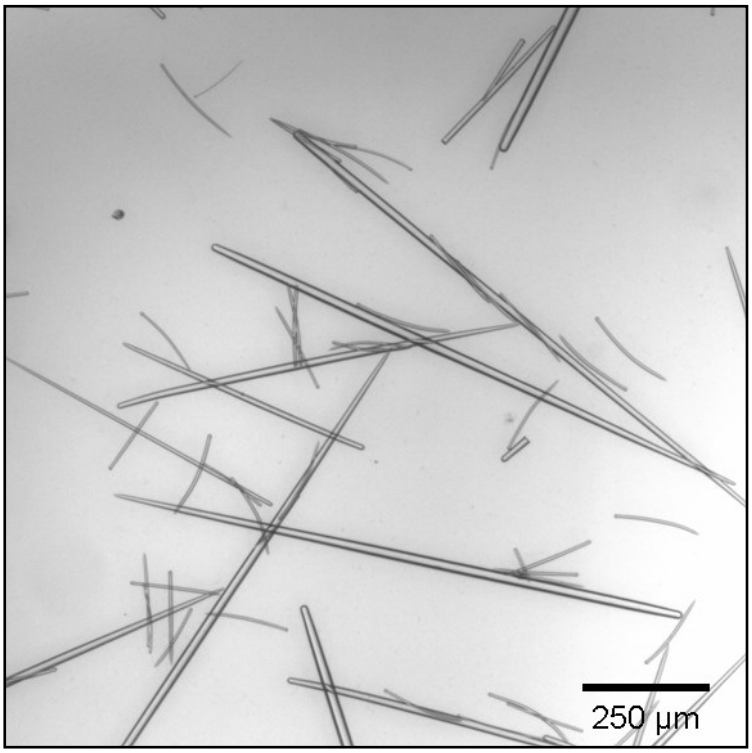
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Polymastia grimaldii (Topsent, 1913)

Species Code: 8639 **AphiaID: 134199**

Cushion with Projections

Key Identifiers. Often with a single large papilla surrounded by many smaller papillae. There is a fringe of long spicules around the periphery.

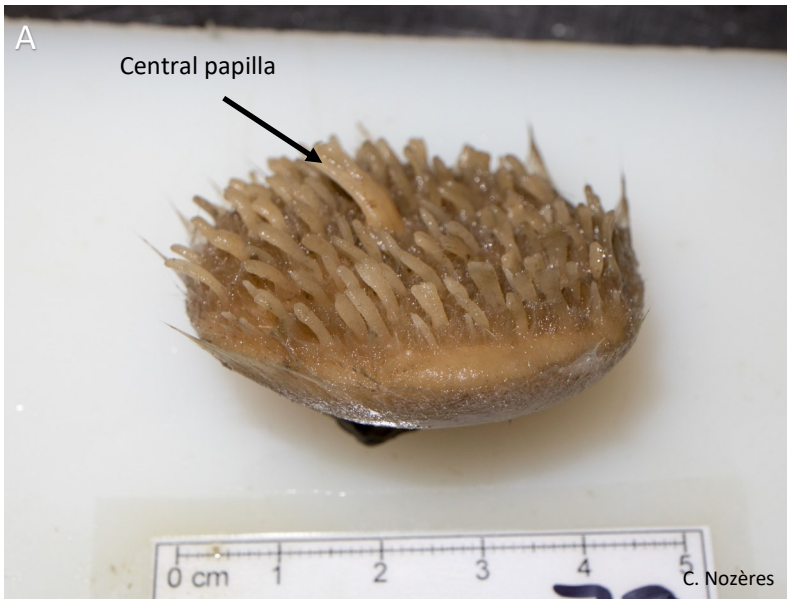
Description. Large cushion shaped sponge with many upward facing papillae. There is often a large central papilla. There is a skirt of spicules which form a fringe around the base of the sponge, this fringe may be upturned or facing outwards after collection. The surface is often covered in sediment.

Distribution. The sponge was collected throughout the Gulf of St. Lawrence, as well as in the estuary. 94–316 m depth.

Skeletal Structure. Spicules are in four sizes. Large strongyloxeas are 922–**1435**–1836 x 20–**25**–31 µm, intermediate tylostyles are 363–**542**–797 x 11–**15**–18 µm, and small tylostyles are 150–**181**–236 x 6.2–**8.3**–12 µm, exotyles are very long styles that extend up to 7000 µm.

Remarks. The single exhalent papilla is distinctive. May appear similar to *P. andrica* but that species has fewer papillae.

Photos. A. Specimen from the southern Gulf with clear fringe of spicules. B–C. Common forms.

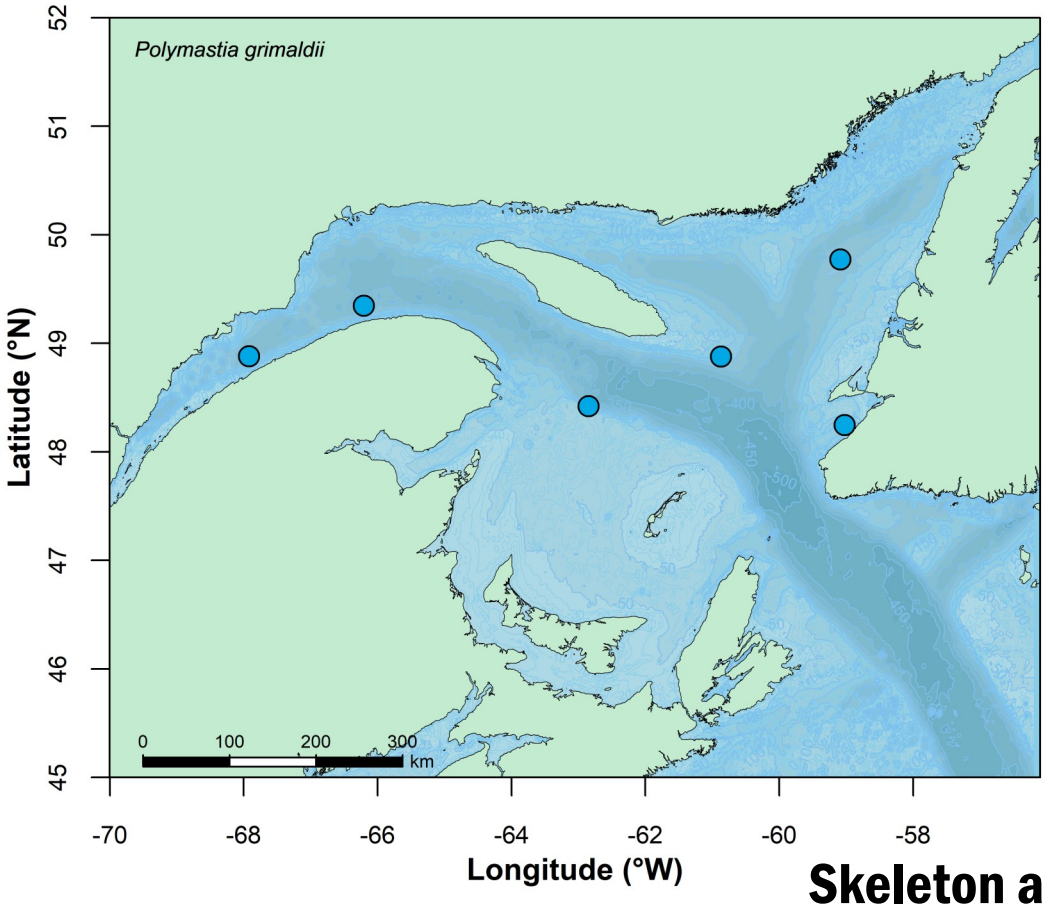


Code **8610** is used for unknown Polymastid species.

Sources: Plotkin 2018.

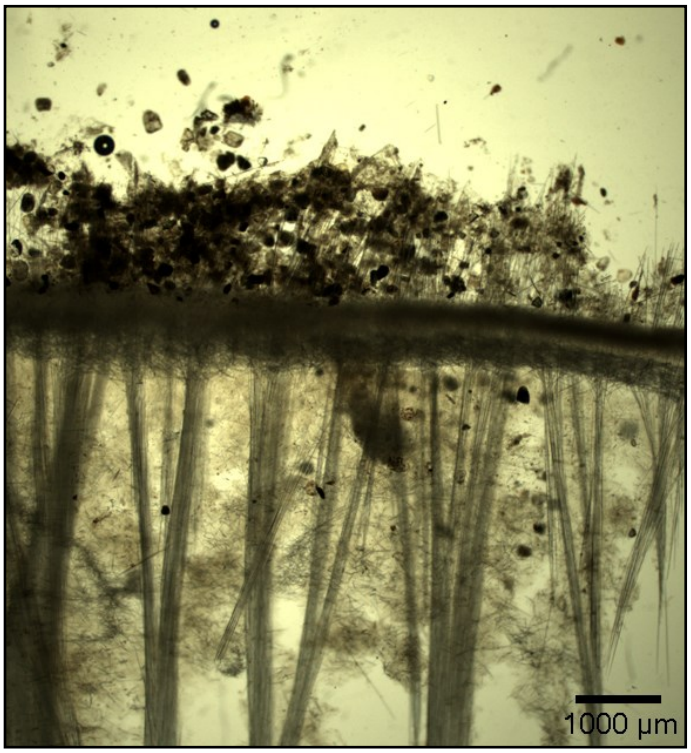
Polymastia grimaldii (Topsent, 1913)

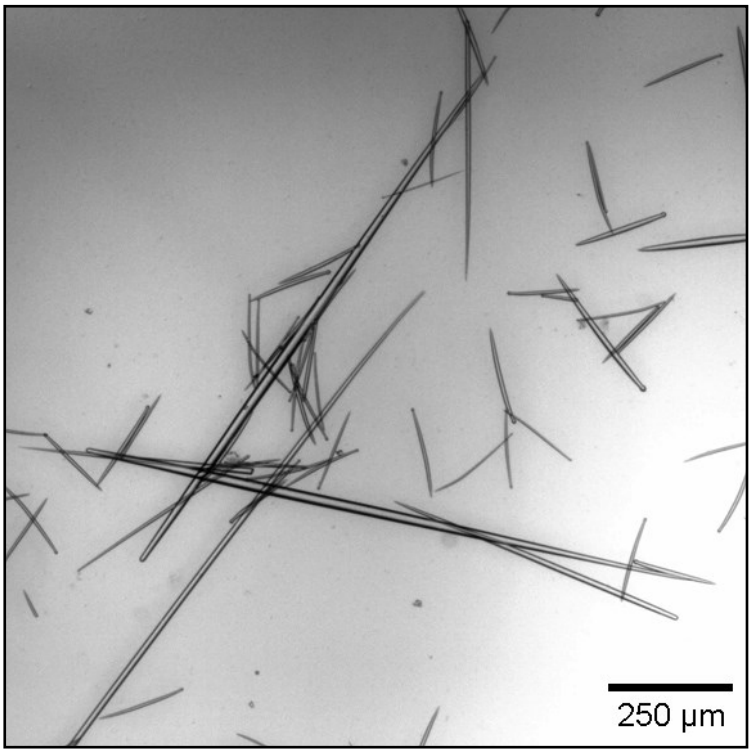
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Sphaerotylus capitatus (Vosmaer, 1885)

Species Code: 8643 **AphiaID: 170682**

Cushion with Projections

Key Identifiers. Large sponges with many wide-based papillae of various sizes. Papillae collapse into tubercles.

Description. Cushion shaped sponge with numerous papillae of various sizes. These papillae often collapse after collection and appear as tubercles after collection or raised ridges after preservation in ethanol.

Distribution. The species is common throughout the Gulf of St. Lawrence, and was seen growing on rock walls during ROV dives in the Cape Breton Trough area. 58–289 m depth.

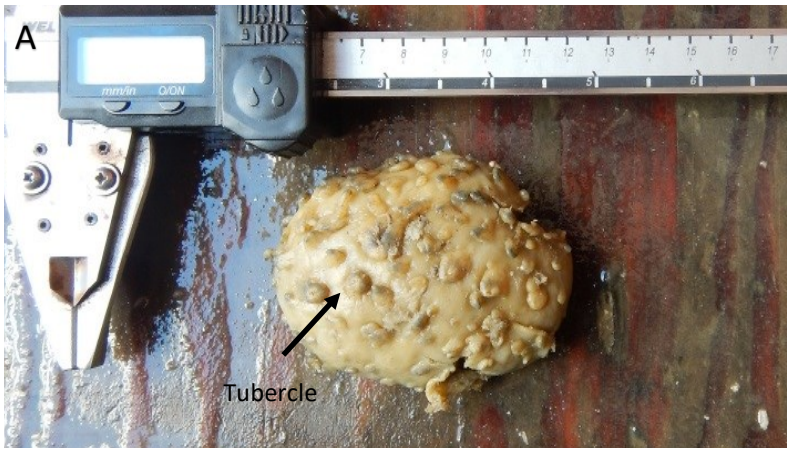
Skeletal Structure. The spicules are in four size categories. Large spicules are clearly polytylote styles/subtylostyles 692–**793**–948 x 11–**15**–948 µm. Intermediate spicules are styles 288–**440**–545 x 6.8–**9.8**–13 µm. Small spicules are tylostyles 139–**168**–209 x 3.4–**4.6**–6.1 µm. Exotyles were rare, but have a clear circular swelling and can be more than 1000 µm long. Tissue is very dense, so analysis of skeletal structure is difficult.

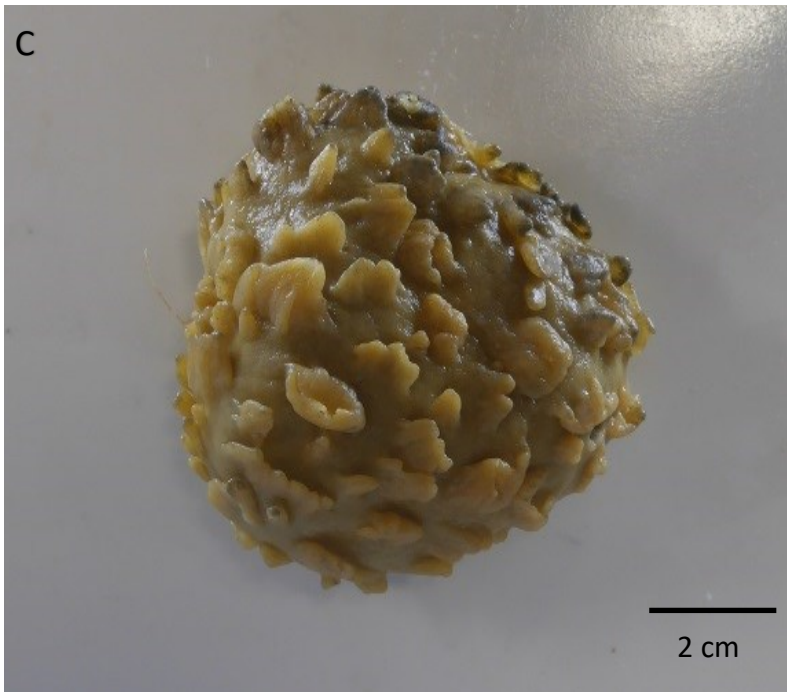
Remarks. The species may look very similar to *P. boletiformis* (Lamarck, 1814), but that species has smaller spicules in two size categories. DNA confirms the species.

Photos. A–C. Whole specimens showing collapsed papillae. A shows the common tubercles clearly.

Code **8610** is used for unknown Polymastid species.

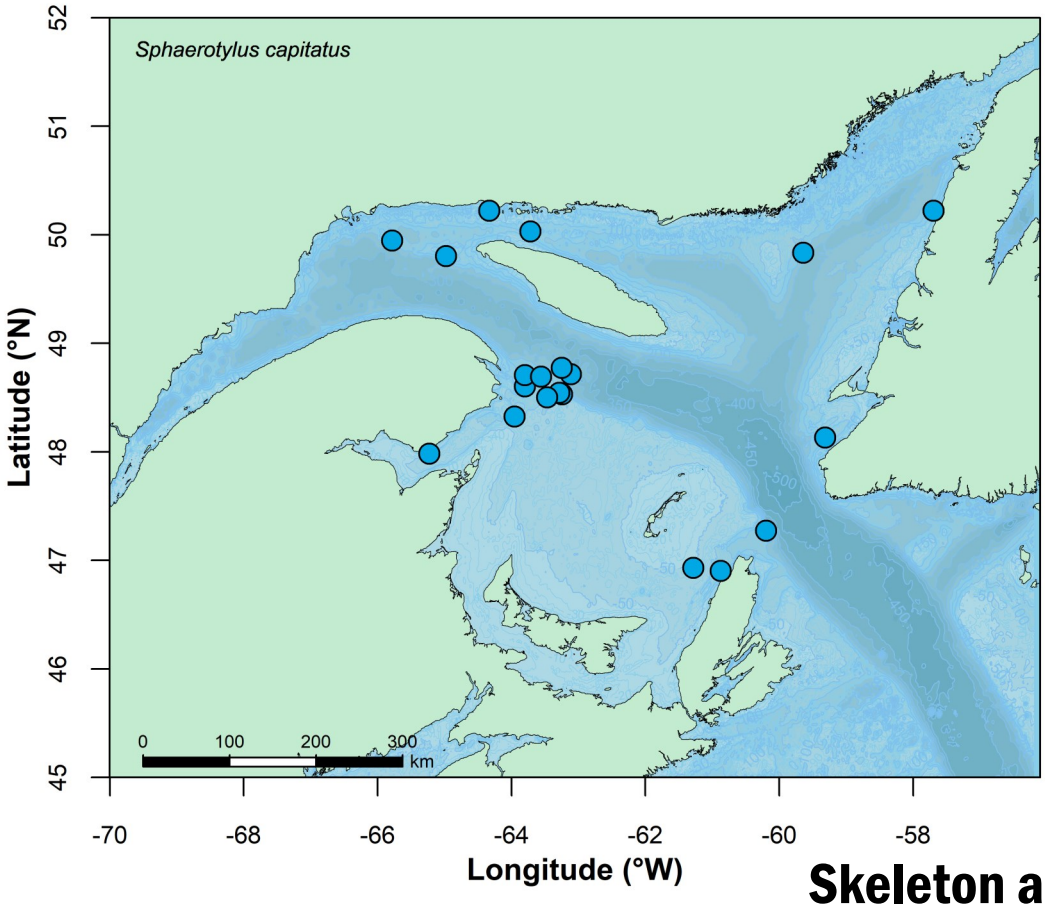
Sources: Plotkin et al. 2018





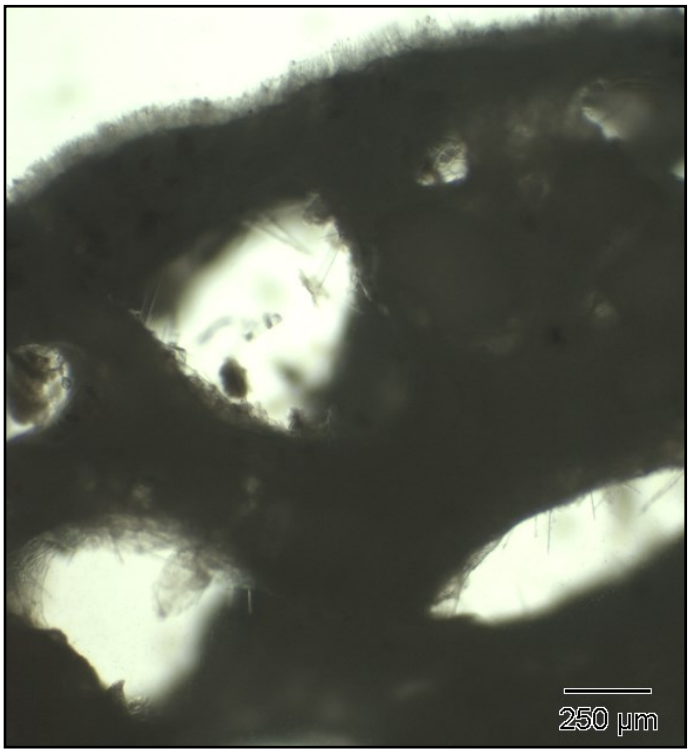
Sphaerotylus capitatus (Vosmaer, 1885)

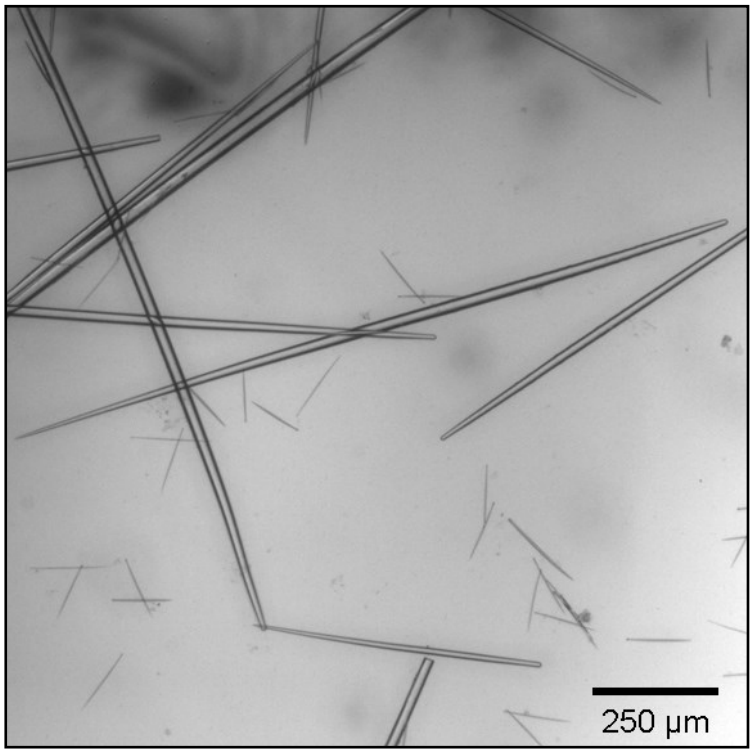
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Weberella bursa (Linnaeus, 1758)

Species Code: 8642 **AphiaID: 134232**

Cushion with Projections

Key Identifiers. Ball-shaped sponge with many conical papillae of the same size that are oriented upwards.

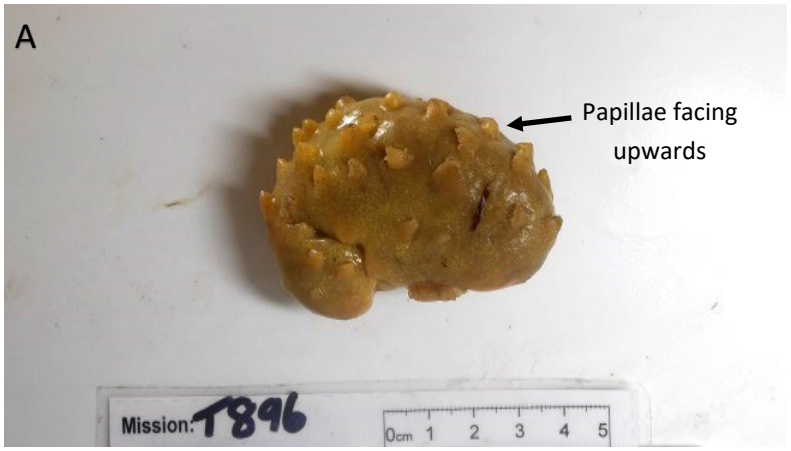
Description. Ovoid sponge that often grows taller than other *Polymastia* specimens in the region. The papillae are uniform and numerous.

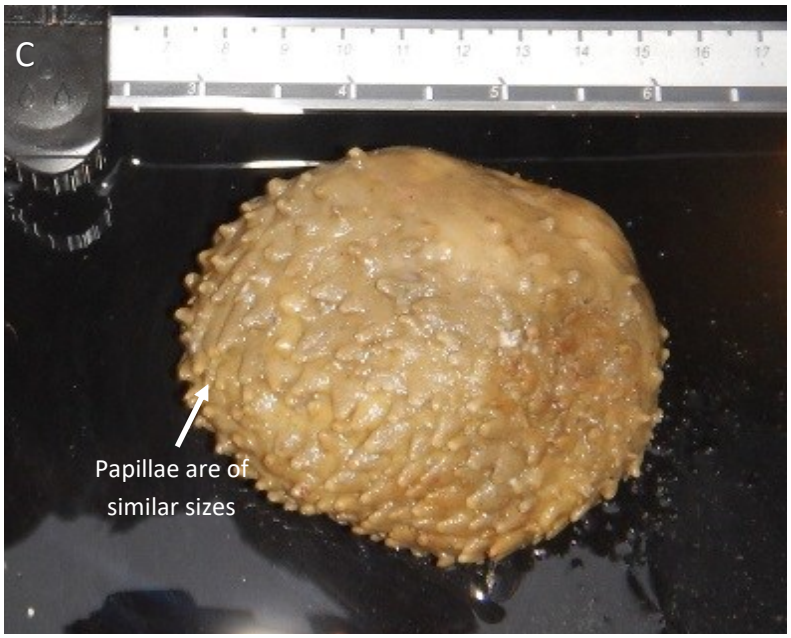
Distribution. Was collected along the slope edge in the central Gulf. 86–419 m depth.

Skeletal Structure. Spicules are subtylostyles 437–**548**–694 x 11–**15**–18 µm and tylostyles 138–**176**–224 x 4.7–**6.2**–8.3 µm. Skeleton in the choanosome is reticulate.

Remarks. Spicules in only two size categories which is similar to *P. boletiformis*, but the papillae in that species are not uniform in size. May also be easily confused with *P. thielei* but that species has fewer papillae.

Photos. A–C. Whole specimens.



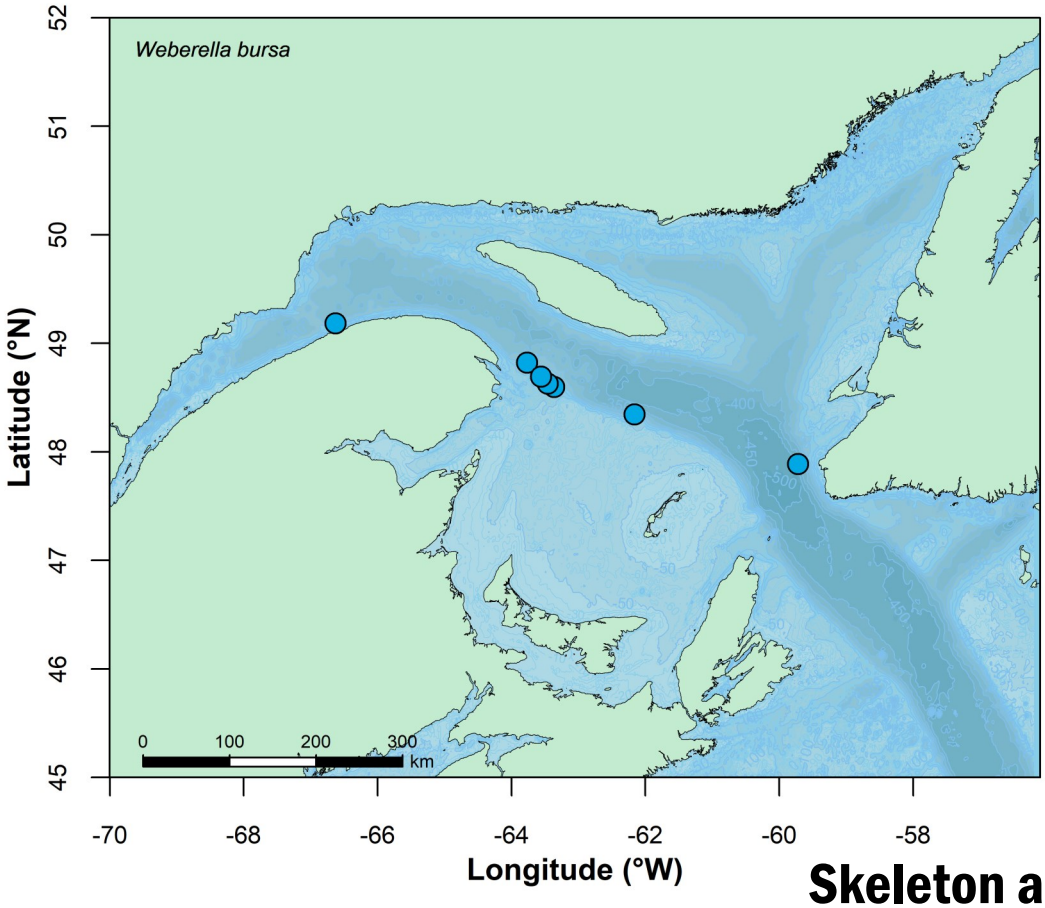


Code **8610** is used for unknown Polymastid species.

Sources: Plotkin et al. 2018

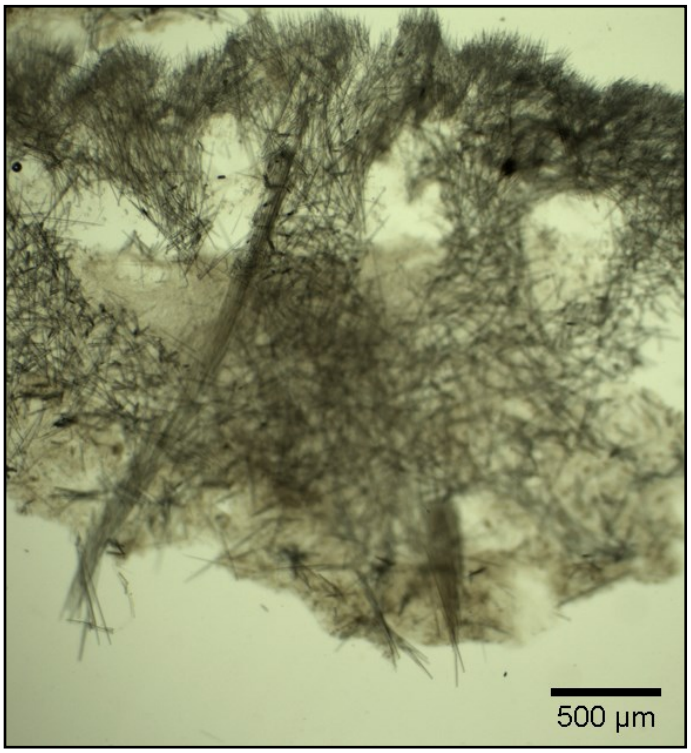
Weberella bursa (Linnaeus, 1758)

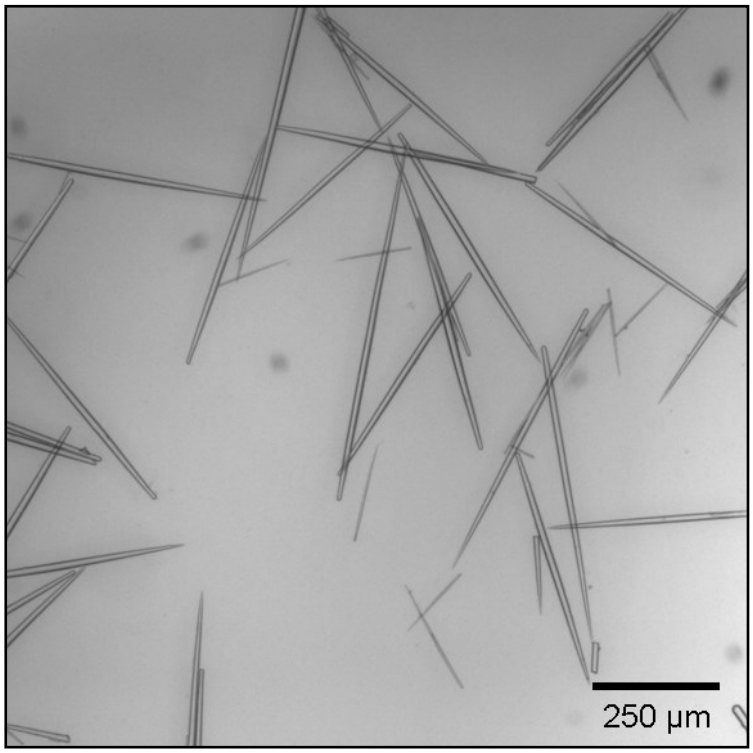
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Polymastia hemisphaerica (Sars, 1872)

Species Code: 8608 **AphiaID: 134200**

Cushion with Projections

Key Identifiers. Disk-shaped sponge with central papillae and a skirt of spicules around the base.

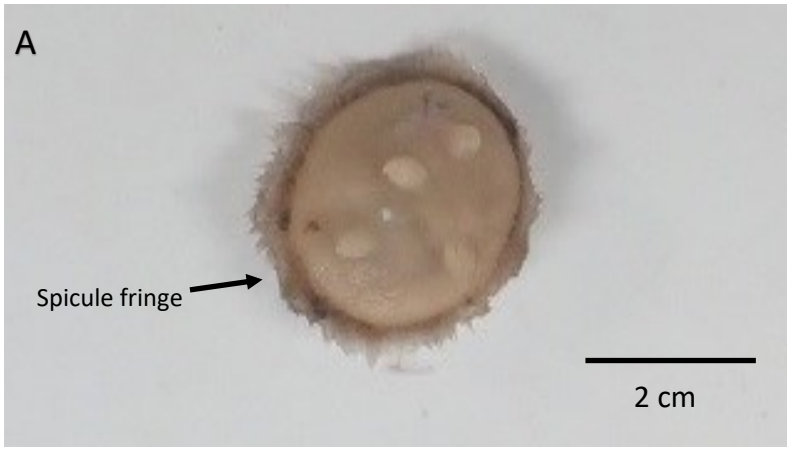
Description. A shallow dome-shaped sponge with an obvious fringe of spicules around the periphery. Papillae vary in number on the surface.

Distribution. Found in deeper water in the northern Gulf. 240–1315 m depth.

Skeletal Structure. Spicules are in four size categories and are very long thus require a low magnification microscope. Species was identified by the arrangement of spicules in the skeleton, therefore spicule measurements were not made.

Remarks. The species may be confused with *P. grimaldii*, however that species generally has a fringe which is oriented upwards and has many small papillae.

Photos. A. Single specimen. B. Several specimens showing variations in morphology.



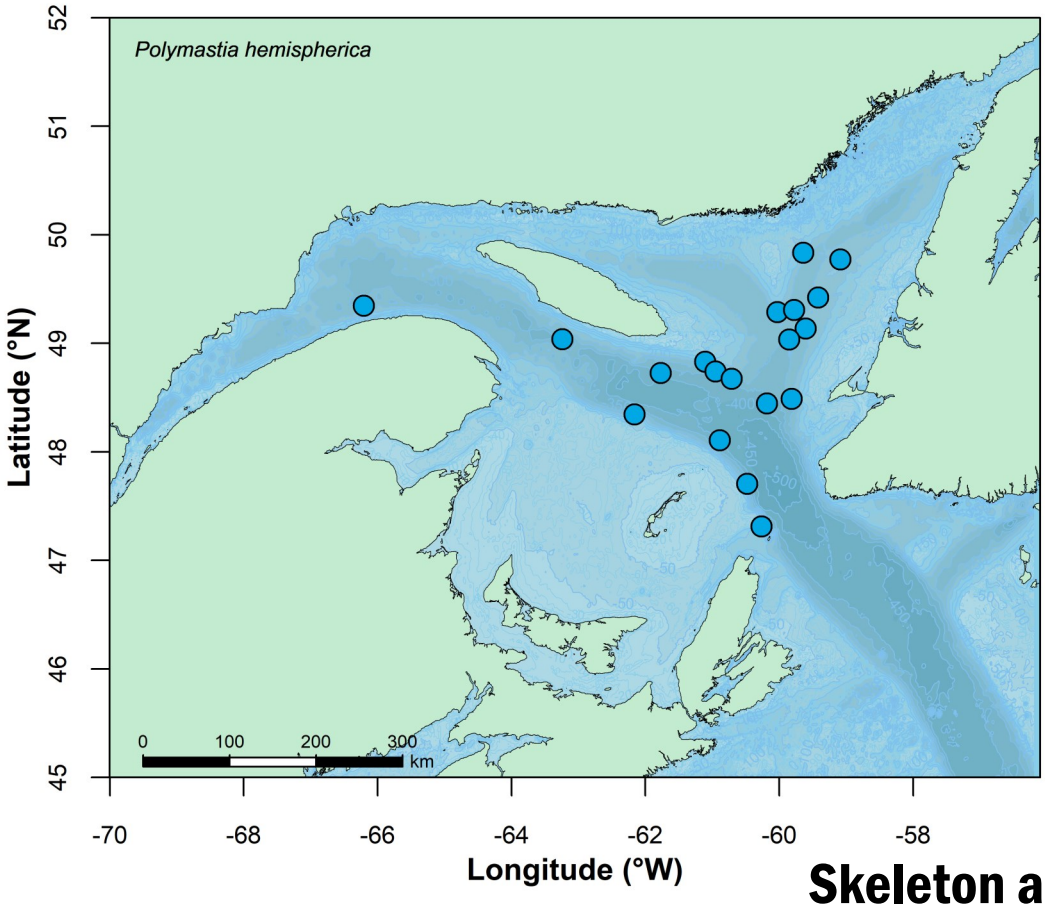
Code **8610** is used for unknown

Polymastid species.

Sources: Plotkin et al. 2018

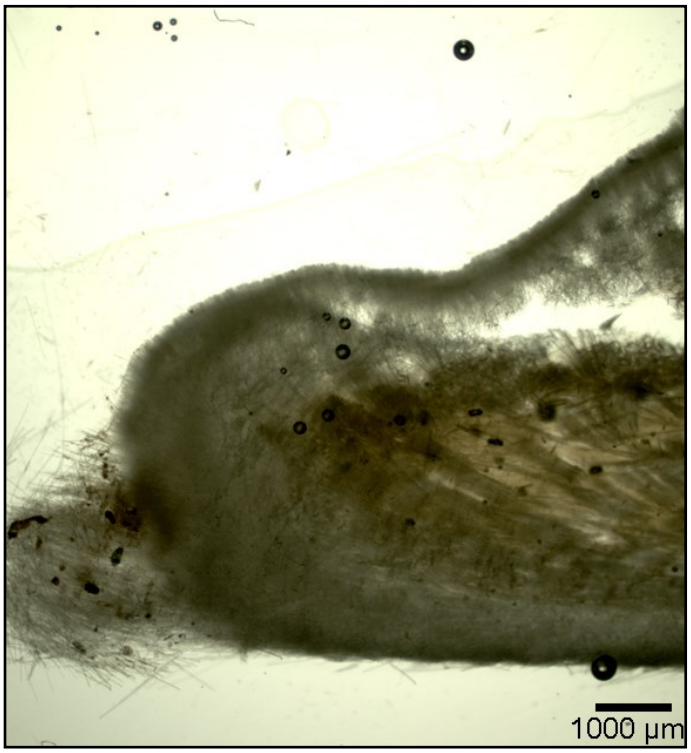
Polymastia hemisphaerica (Sars, 1872)

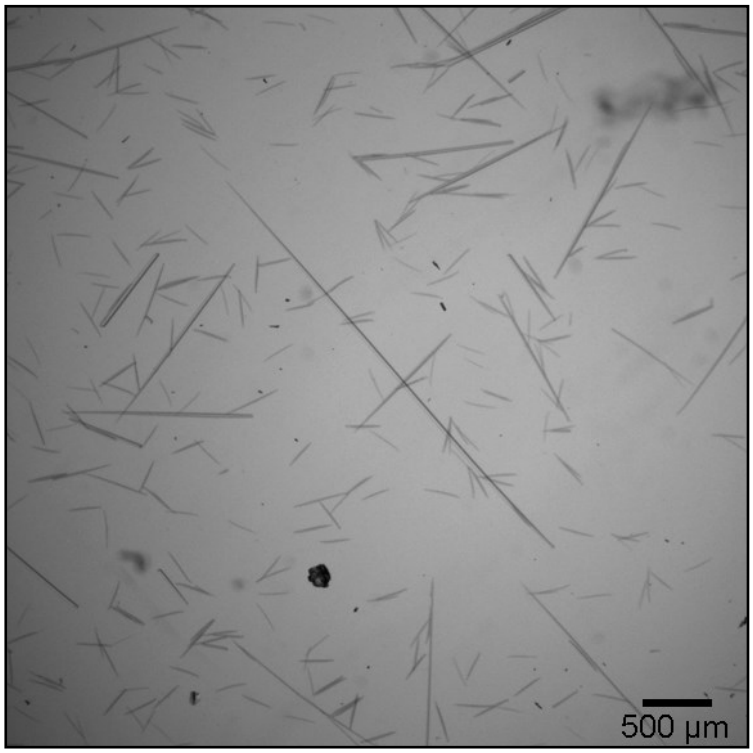
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Polymastia andrica de Laubenfels, 1949

Species Code: 8609 **AphiaID: 157415**

Cushion with Projections

Key Identifiers. Hispid, muddy base with long, light coloured papillae.

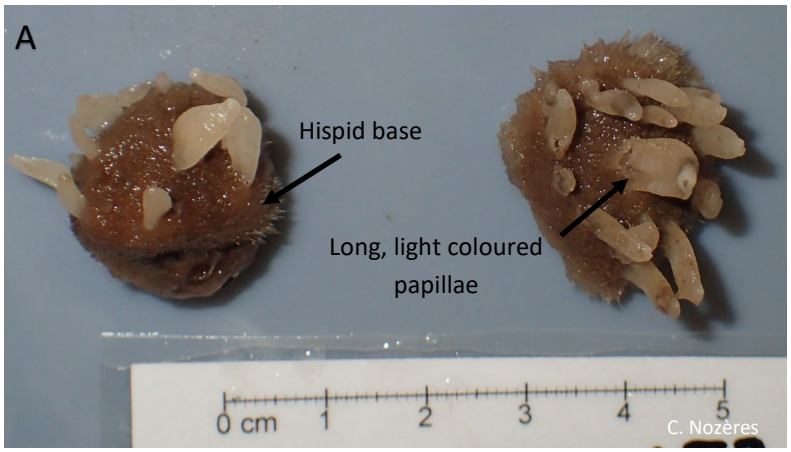
Description. A cushion shaped sponge that is generally flatter and smaller than other members of the genus. The surface is very hispid and often covered with sediment.

Distribution. Was collected in the northern Gulf of St. Lawrence near western Newfoundland. 150–351 m depth.

Skeletal Structure. Large spicules are subtylostyles 851–**1153**–1368 x 19–**26**–31, intermediate spicules are subtylostyles 343–**470**–635 x 13–**15**–19, and small spicules are tylostyles 140–**182**–231 x 6.6–**9.1**–14**.** Exotyles are > 1000 µm.

Remarks. Fits the description by Plotkin, 2017, however the large spicules that were measured are slightly smaller. DNA also confirms the species.

Photos. A. Two specimens. B. Several specimens with a *Weberella bursa* specimen on the far left.



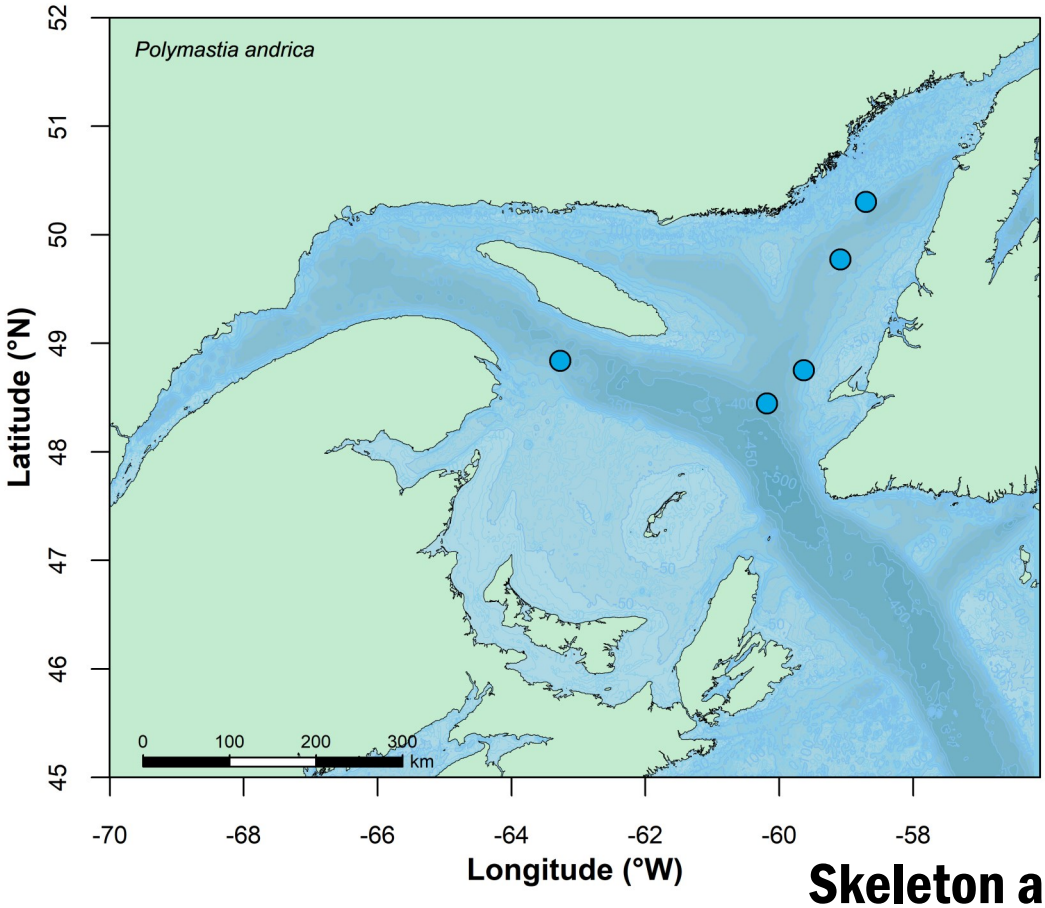
Code **8610** is used for unknown

Polymastid species.

Sources: Plotkin et al. 2018

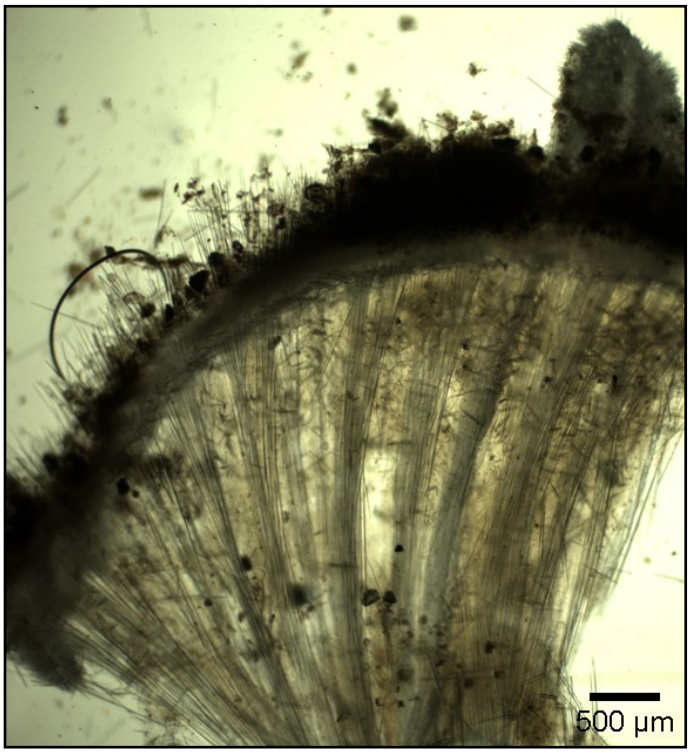
Polymastia andrica de Laubenfels, 1949

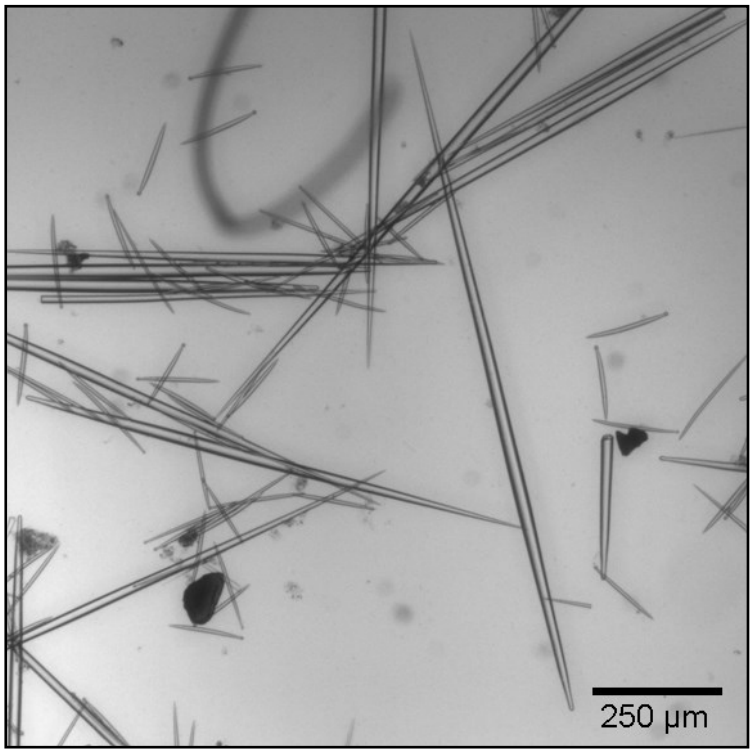
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Polymastia uberrima (Schmidt, 1870)

Species Code: 8641 **AphiaID: 134214**

Cushion with Projections

Key Identifiers. Long, uniform papillae and a dark band (marginal collar) around the base of the sponge.

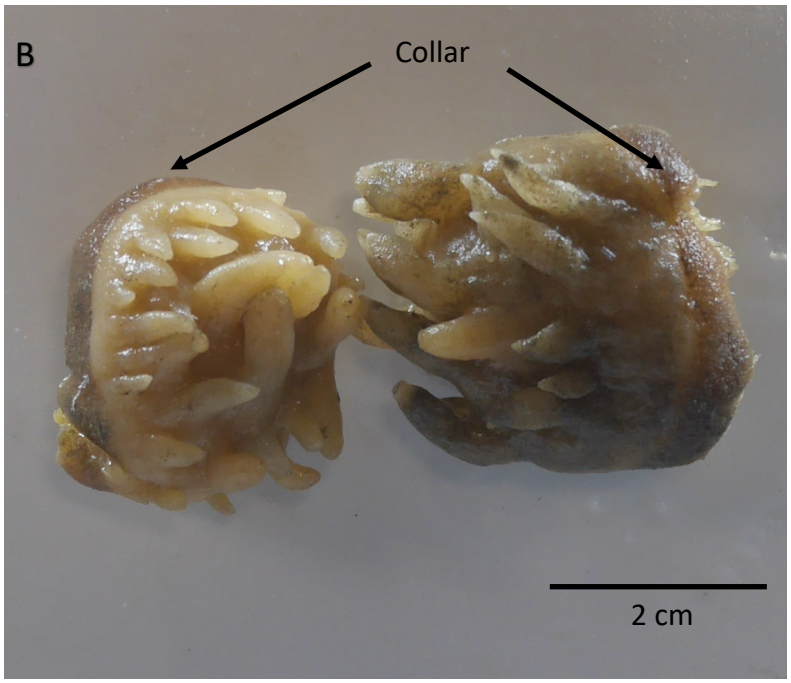
Description. Somewhat polymorphic, with larger specimens that have very thick papillae, and smaller specimens with thin papillae. The key distinguishing feature is the somewhat hispid marginal collar of darker tissue around the base of the sponge.

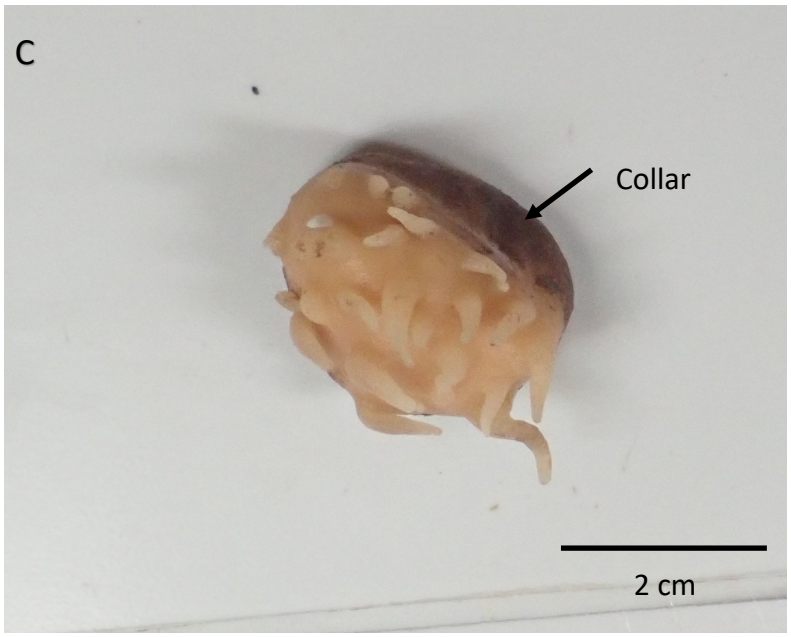
Distribution. Common in the northern Gulf of St. Lawrence. 109–355 m depth.

Skeletal Structure. Spicules are in three size categories. Large subtylostyles 777–**1070**–1292 x 21–**24**–28 µm, intermediate styles are 388–**523**–796 x 11–**14**–19 µm, and small tylostyles are 162–**190**–230 x 6.5–**8.8**–10 µm.

Remarks. Fits the description by Plotkin et al. (2017). The sponge appears to be highly polymorphic, especially in relation the shape, size, and number of papillae. Despite this, any sponge with a similar marginal collar and multiple long papillae should be considered to be *P. uberrima.*

Photos. A. Oblong specimen with long papillae, marginal collar not visible. B. Specimens with thick papillae and obvious collars. C. Small specimen with obvious collar.



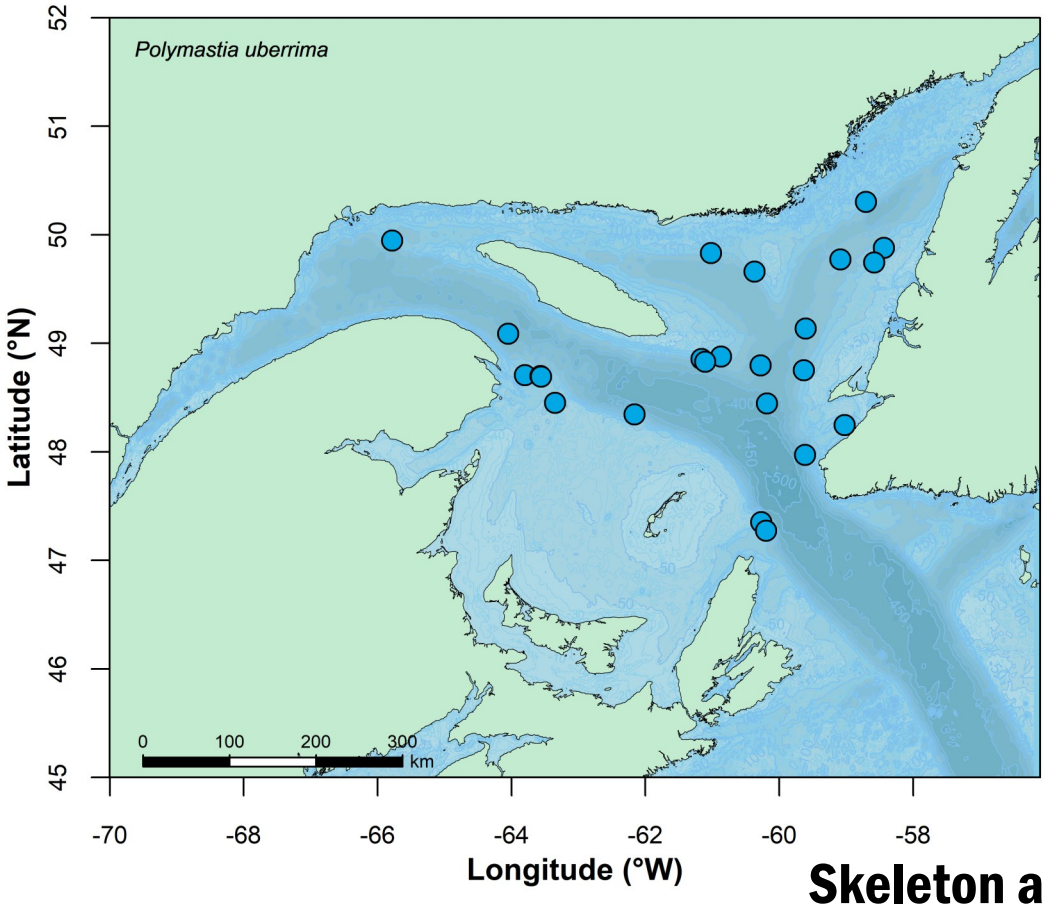


Code **8610** is used for unknown Polymastid species.

Sources: Plotkin et al. 2018

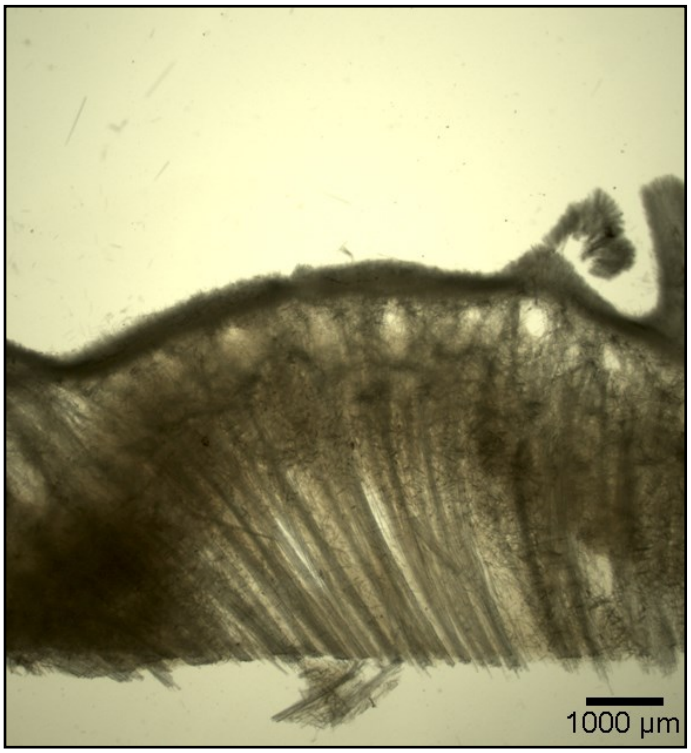
Polymastia uberrima (Schmidt, 1870)

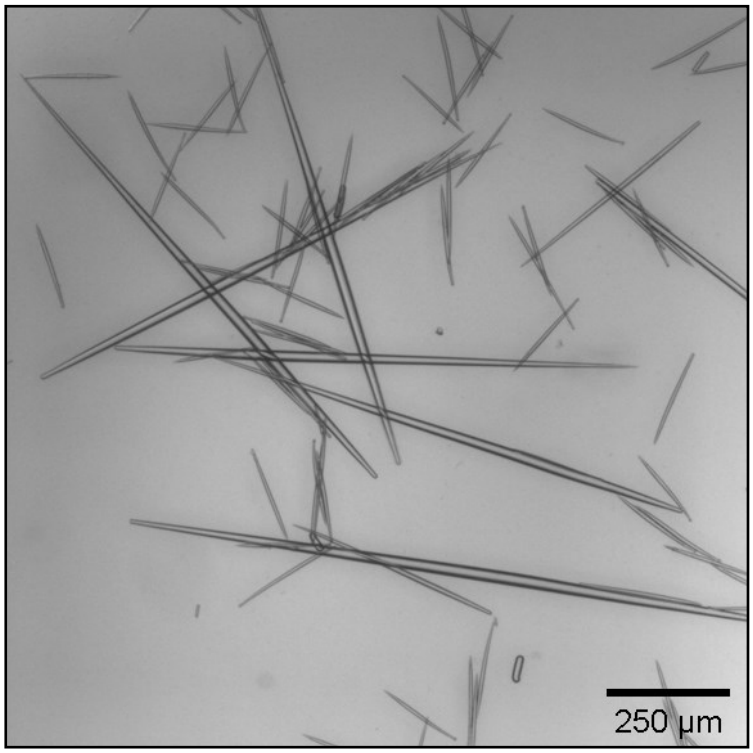
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Polymastia thielei Koltun, 1964

Species Code: 8640 **AphiaID: 170657**

Cushion with Projections

Key Identifiers. Very few papillae on a mostly spherical sponge.

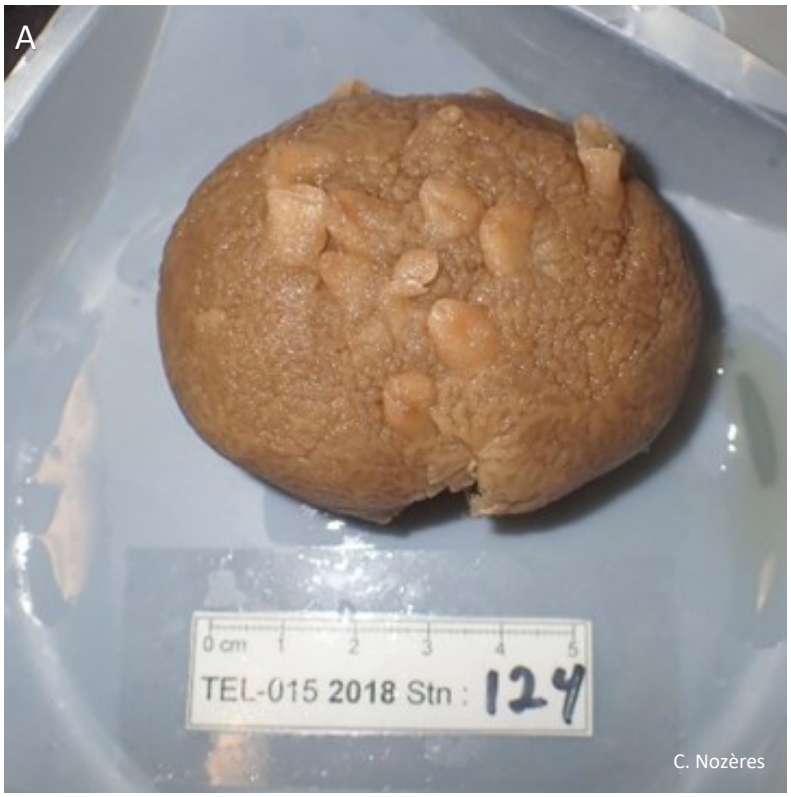
Description. Round sponge which may grow taller than wide. There are very few papillae, and these are found on the apical surface only.

Distribution. Single specimen collected in the northern Gulf. 136 m depth.

Skeletal Structure. The spicules consist of large styles 813–**992**–1136 x 17–**21**–25 µm, intermediate subtylostyles 446–**548**–622 x 11–**13**–15 µm, and small tylostyles 217–**260**–302 x 7.0–**9.6**–12 µm. The skeleton has is distinctive as there are obvious aquiferous cavities bordered by bouquets of spicules.

Remarks. Only a single specimen was collected during the 2018 survey year. The species had very few papillae and is often taller than congeners.

Photo. A. Specimen showing very few apical papillae.



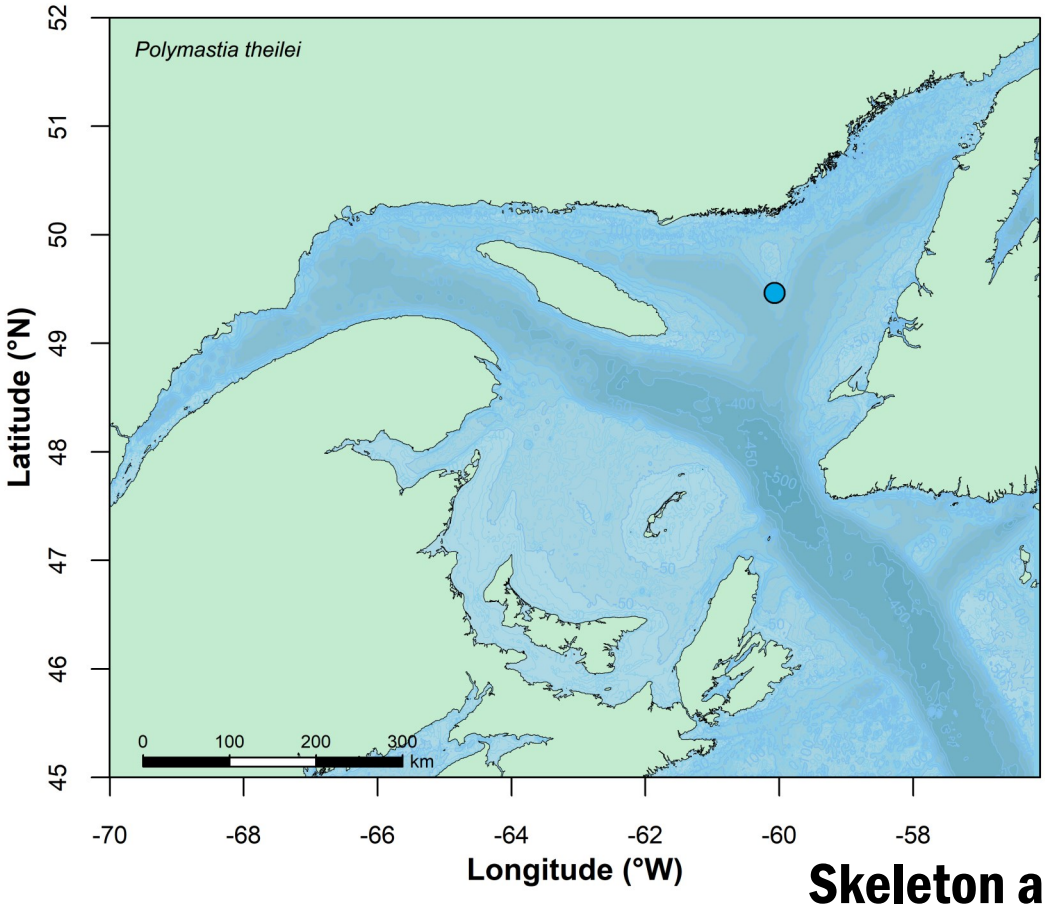
Code **8610** is used for unknown

Polymastid species.

Sources: Plotkin et al. 2018

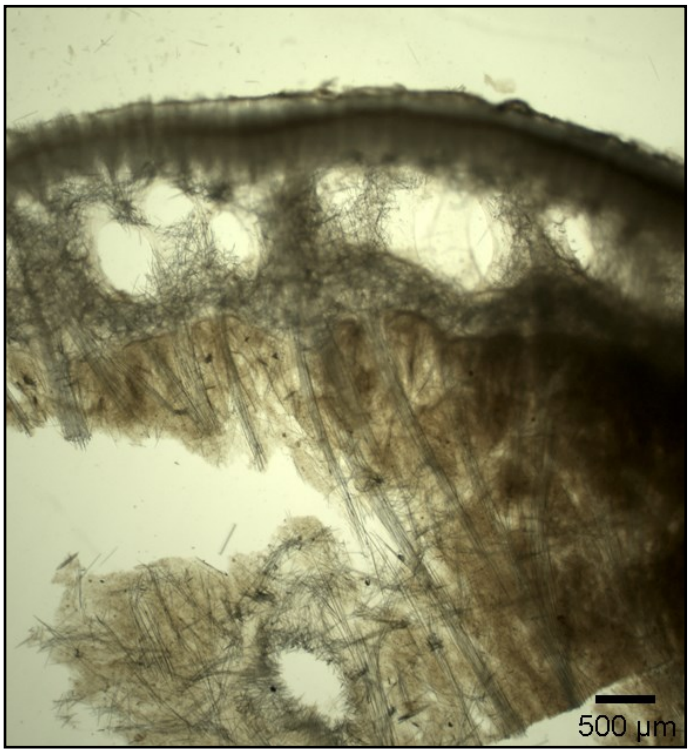
Polymastia thielei Koltun, 1964

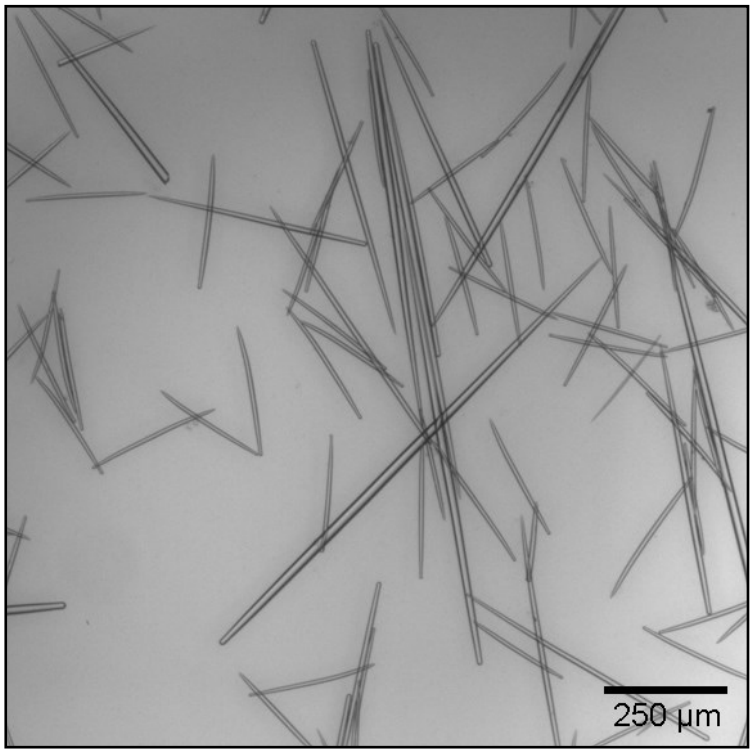
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Polymastia spp. (Code used for all unknown polymastids)

Species Code: 8610 **AphiaID: 132046**

Cushion with Projections

Key Identifiers. Generalized cushion shaped sponge with extended papillae.

Description. Polymastid sponges usually have a unique key identifying feature, however if a specimen is difficult to ID, damaged, or does not fit into a species description in this guide, it is best to use the generic identifier until the specimen is identified in the lab.

Distribution. Throughout the Gulf of St. Lawrence.

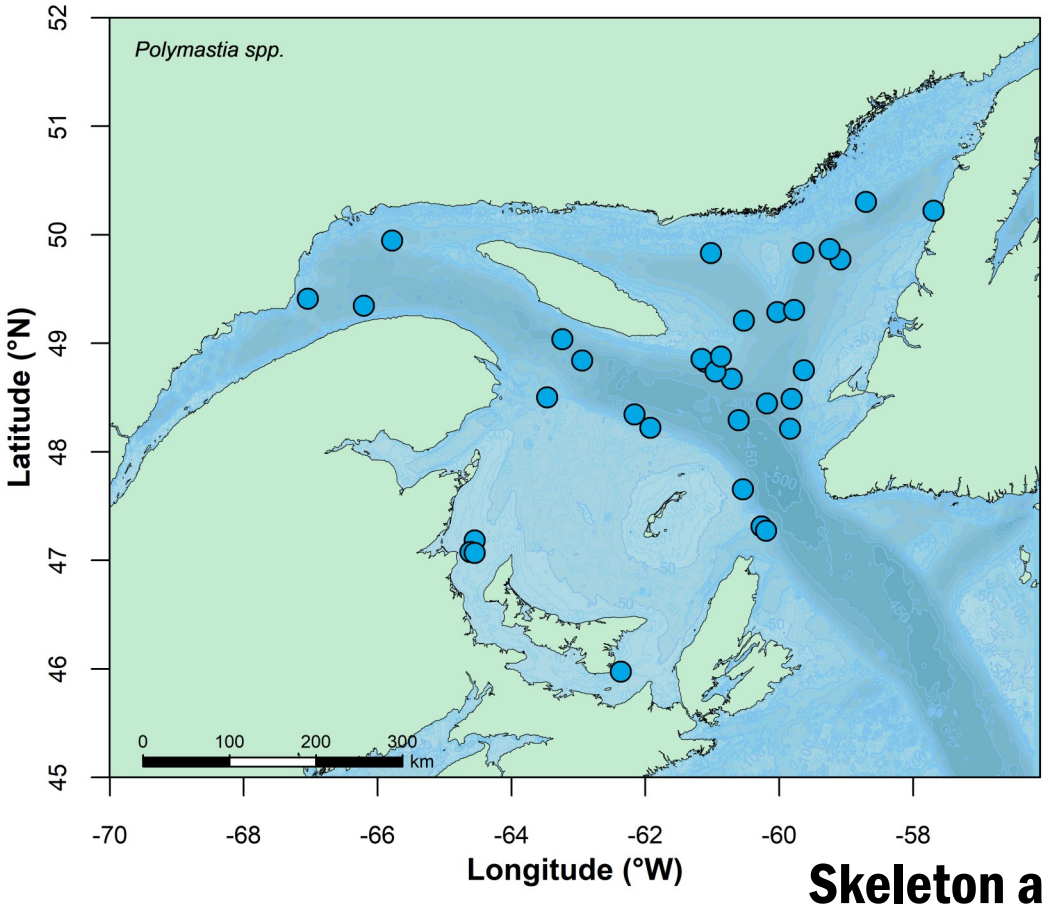
Skeletal Structure. Image of the skeleton on the facing page is from a specimen similar to the sponges shown in photo A.

Photos. A. Several specimens. B. Several taxa.

Sources: Hooper & Van Soest 2002

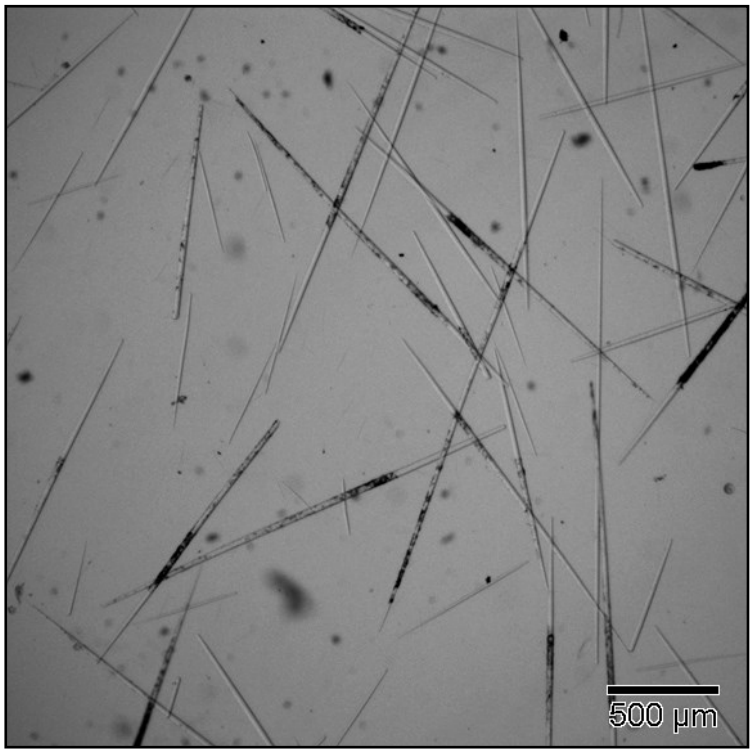
Polymastia spp.

Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules



Stylocordyla borealis (Lovén, 1868)

Species Code: 8647 **AphiaID: 134240**

Stalked

Key Identifiers. Long stalk with club shaped body at the distal end.

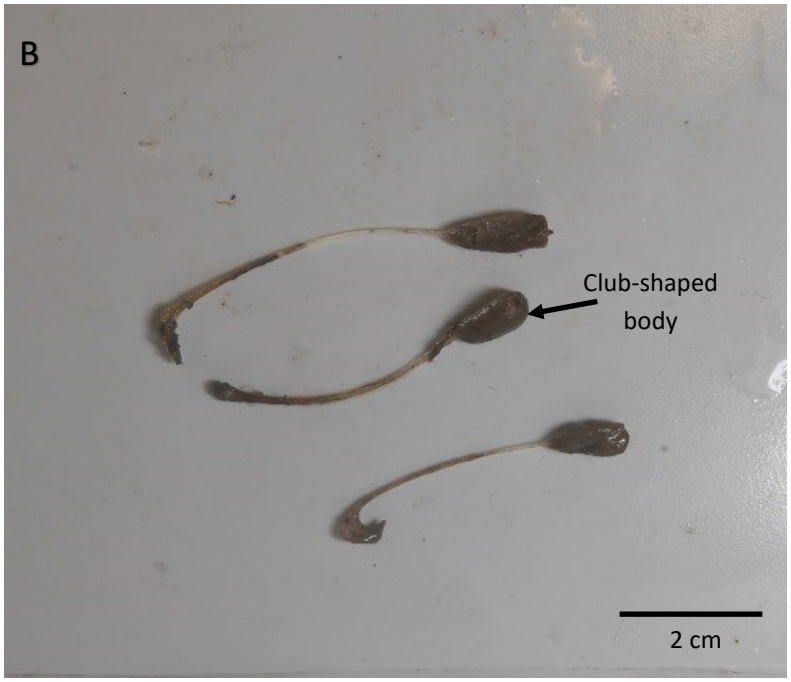
Description. Globular body with a long stalk. The body has a radial arrangement of spicules in cross section.

Distribution. Northern Gulf of St. Lawrence, but common throughout eastern Canada. 45–355 m depth.

Skeletal Structure. Radial skeleton consisting of oxeas with dense crust of small spicules in the ectosome. Oxeas are in three size categories but require low magnification microscopy.

Remarks. Easily recognisable species.

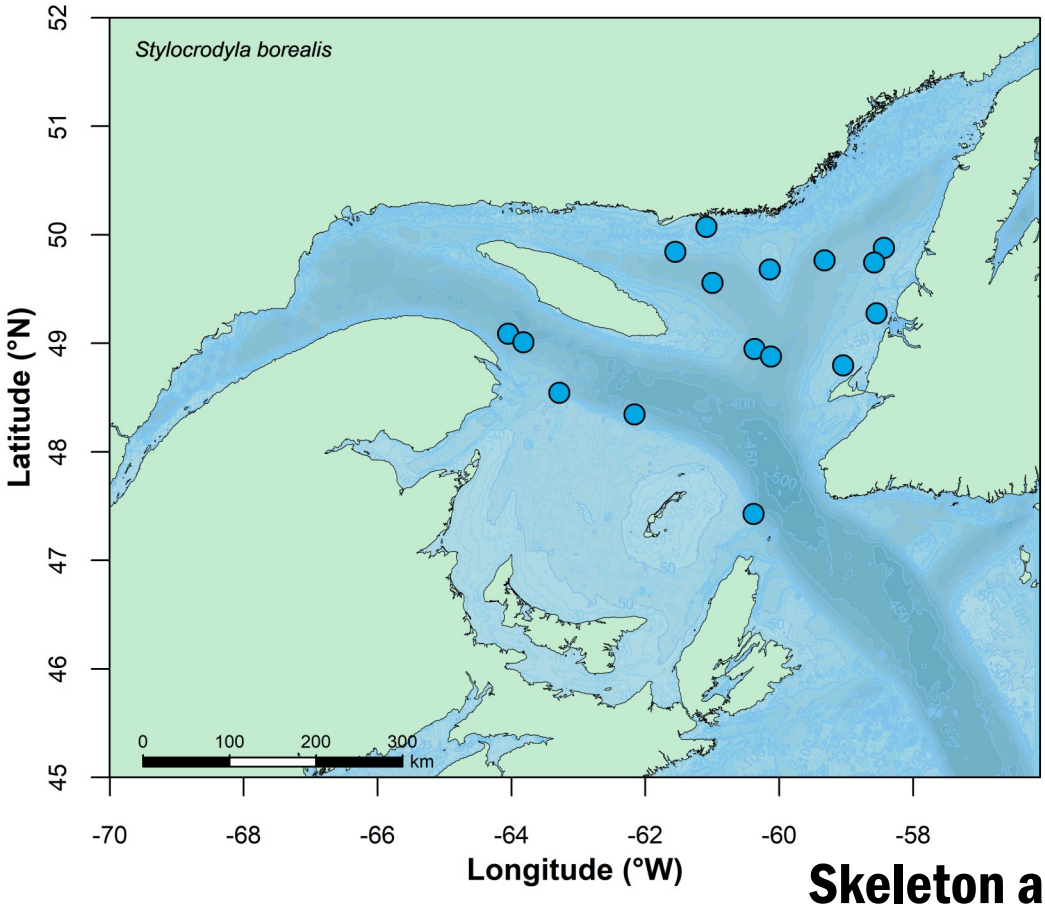
Photos. A. Large catch. B. Few specimens.



Sources: Hooper & Van Soest 2002.

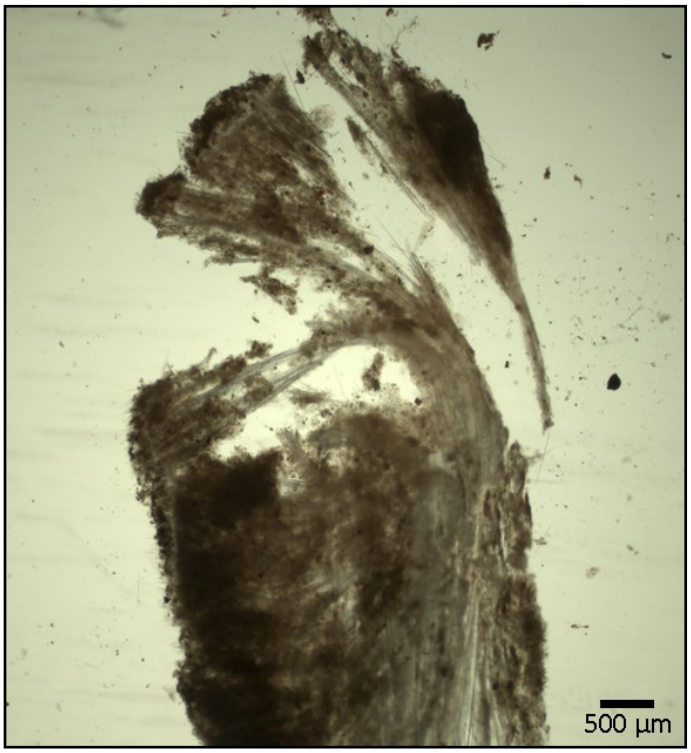
Stylocordyla borealis (Lovén, 1868)

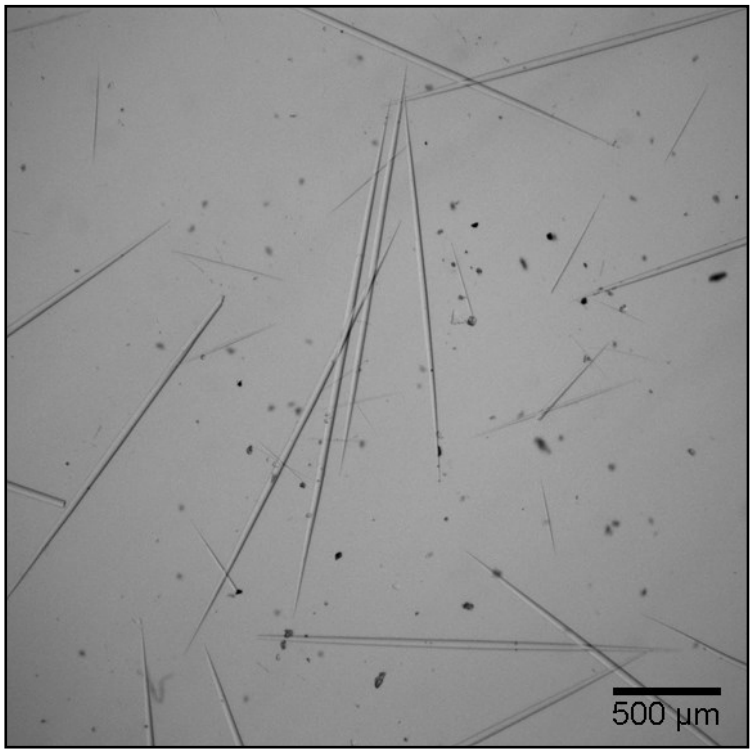
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Asconema spp.

Species Code: 8365 **AphiaID: 132122**

Thin-walled/ Glass

Key Identifiers. Thin, transparent sheets with long spicules.

Description. Large funnel shaped tubes which grow together and form a bush. Species have not been confirmed but likely include *Asconema foliatum* and *Asconema setubalense.* Other glass sponge genera are likely present in the region, and these require special attention.

Distribution. Northern Gulf. Also common in the North Labrador Sea and Baffin Bay. 66–365 m depth.

Skeletal Structure. The skeleton consist of long pentactins, hexactins, diactins, and several types of microscleres.

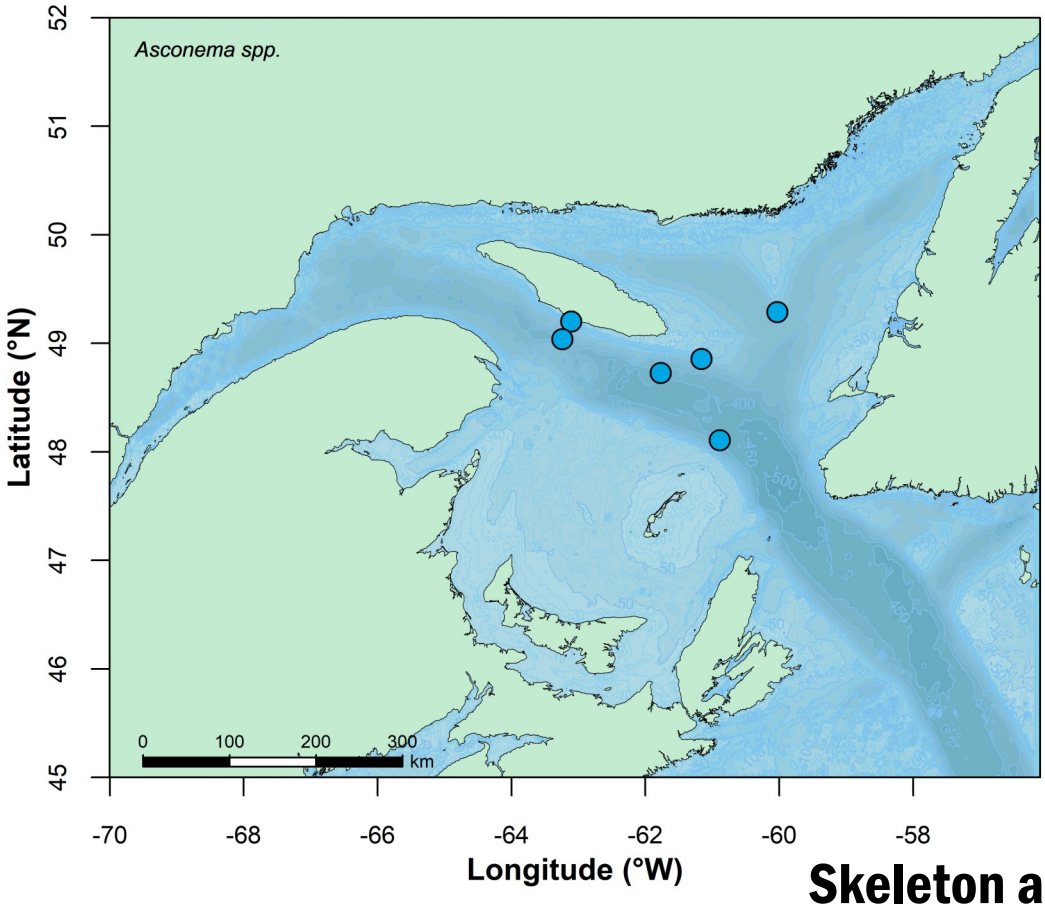
Remarks. The body form is often destroyed in trawls, thus spicule-based identifications are required for most specimens. *Asconema foliatum* is often reported in non-taxonomic literature but diagnostic spicules of that species were not seen in Gulf of St. Lawrence specimens, though high powered microscopy is required. Glass sponges require additional spicule measurements to confirm species level identities.

Photos. A. Specimen with intact oscula. B, C. Fragments.

Sources: Tabachnick & Menshenina 2007

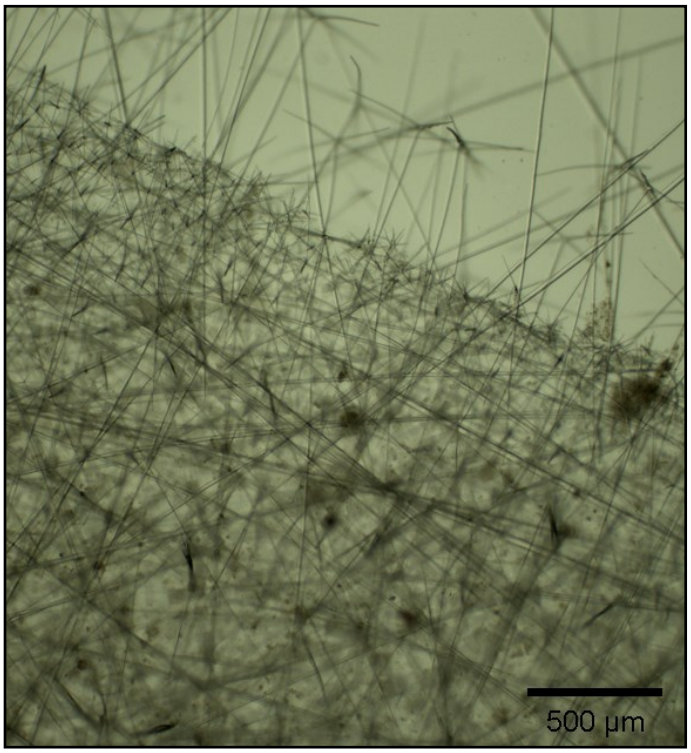
Asconema spp.

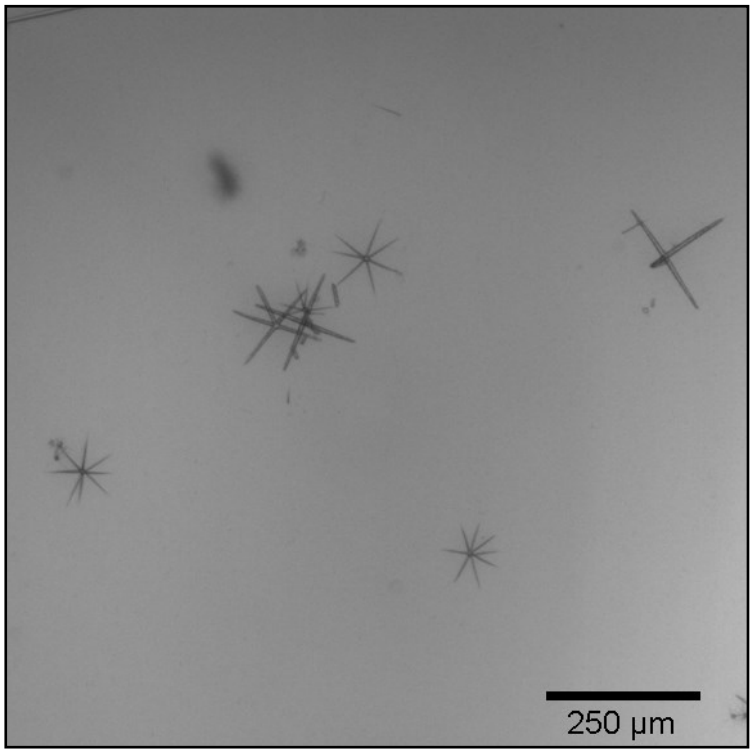
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





Sycon sp.

Species Code: 8602 **AphiaID: 131723**

Key Identifiers. Small tubular sponge with a tuft of long spicules at the apex.

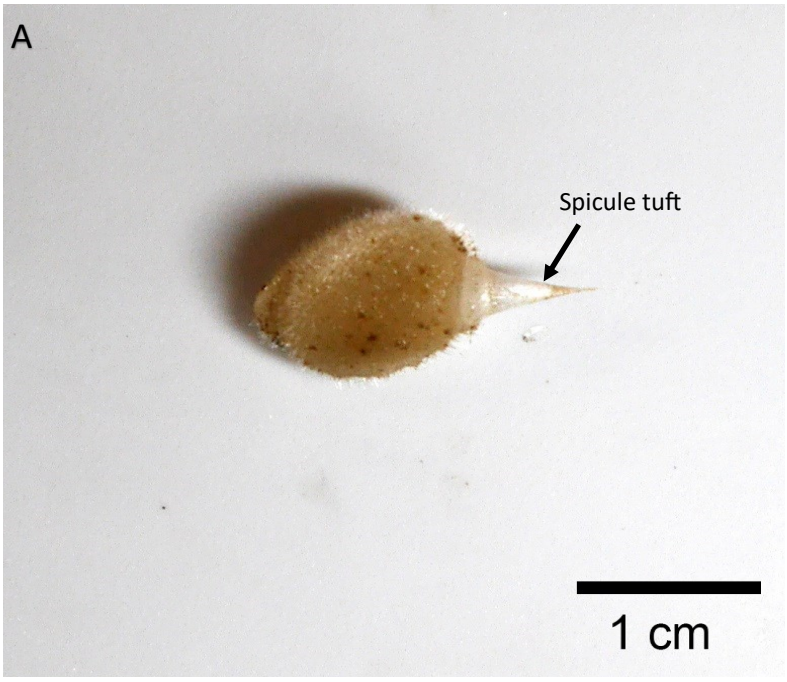
Description. Tubular sponges which have a long fringe of spicules surrounding the osculum. The specimens are usually white to transparent. The sponge is delicate and compressible.

Distribution. A common nearshore species, but is sometimes collected in deeper water. Small species which does not hold up well in most trawl tows. Was collected at 104 and 109 m depth.

Skeletal Structure. Triactines and tetractines. Oxeas form the crown of spicules around the osculum. The skeleton is formed of triactines and tetractines with oxeas protruding from the surface.

Remarks. Calcareous sponges are difficult to identify due to a range of spicule sizes therefore the species is not assured. Additional calcareous sponge genera are also likely present in the region.

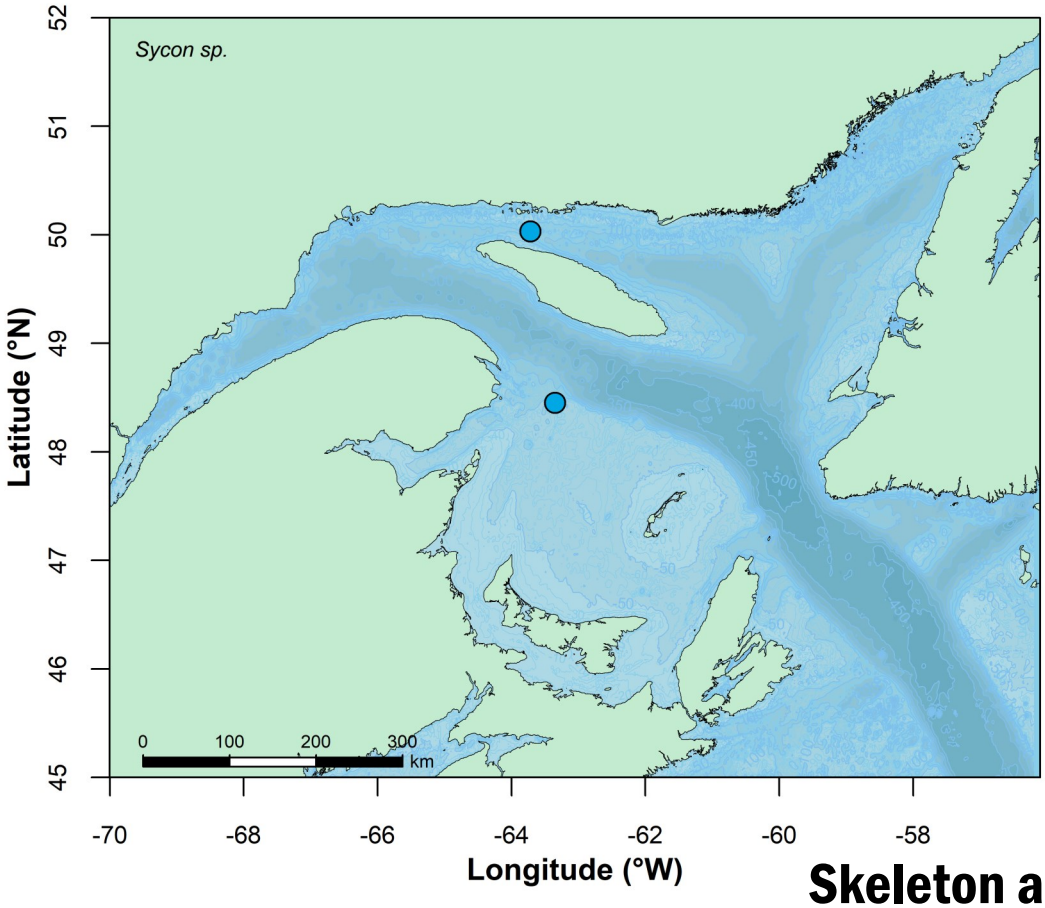
Photos. A. Whole specimen. B. Two specimens, one with long protruding spicules along the sponge body.



Sources: Ackers et al. 2007

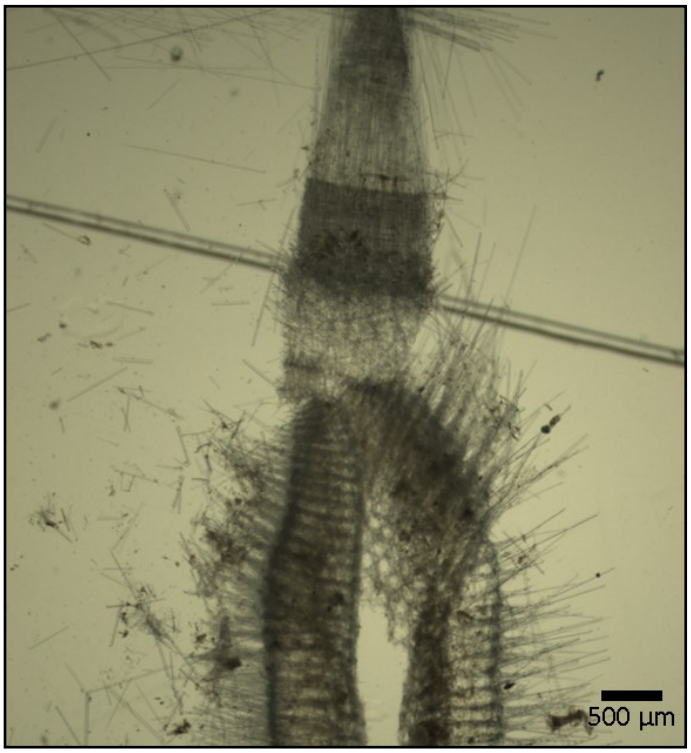
Sycon sp.

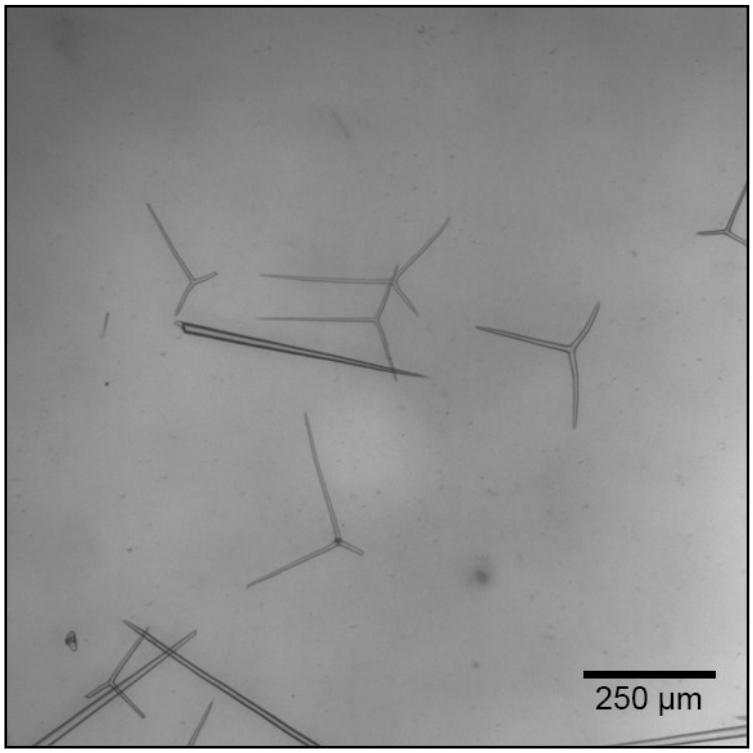
Collection Locations—Gulf of St. Lawrence



Based on 2018 trawl survey collections

Skeleton and spicules





ACKNOWLEDGEMENTS

The author thanks all crew and scientific staff on-board research surveys in 2018, and input from attendees of the 2019 Multi-regional sponge workshop in St. Andrews, NB. Thanks to Denise Méthé for sampling coordination and Mylène Roussel for specimen handling. Thanks to Claude Nozères, Geneviève Côté, Olivia Lacasse, and Virginie Roy for providing samples and photos from the nGSL 2018 collection and providing access to the IML museum collections, as well as providing guidance for layout of the field guide. Thanks to Tobie Surette, Daniel Ricard, and Pablo Vergara for assistance mapping sponge distributions and creating taxa codes. Sincere thank you to Claire Goodwin for taxonomic advice. Generous thanks to James M. Ehrman at the Digital Microscopy Facility, Mount Allison University (Sackville, NB), for SEM expertise and time. Thanks to Oceana Canada for partially funding ROV operations.

REFERENCES

Ackers, R.G., Moss, D., and Picton, B.E. 2007. Sponges of the British Isles ('Sponges V'). A Colour Guide Working Document. Marine Conservation Society. 1–175.

Beazley, L.I., Kenchington, E.L., Murillo, F.J., and Sacau, M. del M. 2013. Deep-sea sponge grounds enhance diversity and abundance of epibenthic megafauna in the Northwest Atlantic. ICES J. Mar. Sci. **70**(7): 1471–1490. doi:10.1093/icesjms/fst124.

Bett, B.J., and Rice, A.L. 1992. The influence of hexactinellid sponge (Pheronema carpenteri) spicules on the patchy distribution of macrobenthos in the porcupine seabight (Bathyal ne atlantic). Ophelia **36**(3): 217–226. doi:10.1080/00785326.1992.10430372.

Best, M., Kenchington, E., Macisaac, K., Wareham Hayes, V., Fuller, S., and Thompson, A. 2010. Sponge Identification Guide NAFO area. In NAFO Scientific Council Studies. doi:10.2960/S.v43.m1.

Boury-Esnault, N., and Lopes, M.T. 1985. Les Démosponges littorales de l'Archipel des Açores. Ann. l'Institut océanographique **61**(2):149-225.

Brunel, P., Bossé, L., and Lamarche, G. 1998. Catalogue des Invertébrés marins de l'estuaire et du golfe du Saint-Laurent / Catalogue of the Marine Invertebrates of the Estuary and Gulf of Saint Lawrence Canadian Special Publication of Fisheries and Aquatic Sciences No. 126. NRC Research Press. doi:10.1139/9780660803661.

Buhl-Mortensen, L., Vanreusel, A., Gooday, A.J., Levin, L.A., Priede, I.G., Buhl-Mortensen, P., Gheerardyn, H., King, N.J., and Raes, M. 2010. Biological structures as a source of habitat heterogeneity and biodiversity on the deep ocean margins. Mar. Ecol. **31**(1): 21–50. doi:10.1111/j.1439-0485.2010.00359.x.

Cárdenas, P., and Rapp, H.T. 2012. A review of Norwegian streptaster-bearing Astrophorida (Porifera: Demospongiae: Tetractinellida), new records and a new species. Zootaxa **3253**(1): 1. doi:10.11646/zootaxa.3253.1.1.

Dinn, C. 2020. A new species of *Haliclona (Flagellia)* Van Soest, 2017 (Porifera, Demospongiae, Heteroscleromorpha) from the Gulf of St. Lawrence, Canada. Zootaxa **4778**(2): 391–395. doi:10.11646/zootaxa.4778.2.10.

Dinn, C., and Leys, S.P. 2018. Field Guide to Sponges of the Eastern Canadian Arctic. University of Alberta Education and Research Archive. doi:https://doi.org/10.7939/R3DF6KJ4G.

Dinn, C., Edinger, E., and Leys, S.P. 2019. Sponge (Porifera) fauna of Frobisher Bay, Baffin Island, Canada with the description of an *Iophon* rich sponge garden. Zootaxa **4576**(2): 301–325. doi:10.11646/zootaxa.4576.2.5.

Dinn, C., Leys, S.P., Roussel, M., and Methe, D. 2020. Geographic range extensions of stalked, flabelliform sponges (Porifera) from eastern Canada with a new

combination of a species of *Plicatellopsis* in the North Atlantic. Zootaxa **4755**(2): 301–321. doi:10.11646/zootaxa.4755.2.6.

Faille, G., Méthé, D., Thériault, M., Thorne, M., Roy, V., Chiasson, M., Benjamin, R., and Rangeley, R. 2019. Cruise Report for the 2017 Fisheries and Oceans Canada and Oceana Canada Mission using the ROPOS in the Gulf of St. Lawrence. Can. Manuscr. Rep. Fish. Aquat. Sci. 3171: v + 22 p.

Fristedt, K. 1887. Sponges from the Atlantic and Arctic Oceans and the Behring Sea. Vega-Expeditionens Vetenskap. Iakttag. 4: 22–31.

Fuller, S.D. 2004. Sponge Catalogue and Visual Guide to the Sponges of the Southern Gulf of St. Lawrence, Northwest Atlantic. (Unpublished)

Goodwin, C. 2017. Field Guide to Sponges of the Bay of Fundy. Atlantic Reference Centre, Huntsman Marine Science Centre.

Hawkes, N., Korabik, M., Beazley, L., Rapp, H.T., Xavier, J.R., and Kenchington, E.L. 2019. Glass sponge grounds on the Scotian Shelf and their associated biodiversity. Mar. Ecol. Prog. Ser. **614**(April): 91–109. doi:10.3354/meps12903.

Hooper J.N.A, Van Soest R.W.M. 2002. Systema Porifera. A Guide to the Classification of Sponges. Springer US, Boston, MA

Kahn, A.S., Yahel, G., Chu, J.W.F., Tunnicliffe, V., and Leys, S.P. 2015. Benthic grazing and carbon sequestration by deep-water glass sponge reefs. Limnol. Oceanogr. **60**(1): 78–88. doi:10.1002/lno.10002.

Kenchington, E.L., Beazley, L., Murillo, F.J., MacDonald, G.T., and Baker, E. 2015. Coral, sponge, and other vulnerable marine ecosystem indicator identification guide, NAFO area. *In* NAFO Scientific Council Studies. doi:10.2960/S.v47.m1.

Klitgaard, A.B. 1995. The fauna associated with outer shelf and upper slope sponges (Porifera, Demospongiae) at the faroe islands, northeastern Atlantic. Sarsia **80**(1): 1–22. doi:10.1080/00364827.1995.10413574.

Klitgaard, A.B., and Tendal, O.S. 2004. Distribution and species composition of mass occurrences of large-sized sponges in the northeast Atlantic. Prog. Oceanogr. **61**(1): 57–98. doi:10.1016/j.pocean.2004.06.002.

Koltun, V.M. 1966. Four-rayed sponges of Northern and Far Eastern seas of the USSR (order Tetraxonida). Opredeliti Faunei SSSR 90. (Zoological Institute of the Academy of Sciences of the USSR: Moscow, Leningrad): 1-112.

Lambe, W.L.M. 1896. Sponges from the Atlantic Coast of Canada. Transactions of the Royal Society of Canada. 2 (2): 181-211

Leys, S.P., and Meech, R.W. 2006. Physiology of coordination in sponges. Can. J. Zool. **84**(2): 288–306. doi:10.1139/z05-171.

Leys, S.P., Kahn, A.S., Fang, J.K.H., Kutti, T., and Bannister, R.J. 2018. Phagocytosis of microbial symbionts balances the carbon and nitrogen budget for the deep-water

boreal sponge Geodia barretti. Limnol. Oceanogr. **63**(1): 187–202. doi:10.1002/lno.10623.

Leys, S.P., Yahel, G., Reidenbach, M.A., Tunnicliffe, V., Shavit, U., and Reiswig, H.M. 2011. The sponge pump: The role of current induced flow in the design of the sponge body plan. PLoS One **6**(12). doi:10.1371/journal.pone.0027787.

Lundbeck, W. 1902. Porifera. (Part I.) Homorrhaphidae and Heterorrhaphidae. *In: The Danish Ingolf-Expedition. 6(1). (Bianco Luno: Copenhagen). Pp. 1-108*).

Miklucho-Maclay, N.N. 1870. Uber einige Schwämme des nördlichen Stillen Oceans und des Eismeeres, welche im Zoologischen Museum der Kaiserlichen Akademie der Wissenschaften in St. Petersburg aufgestellt sind. Ein Beitrag zur Morphologie und Verbreitung der Spongien. Mémoires l'Académie Impériale des Sci. St. Petersbg. **15**(3): 1–24.

Miller, R.J., Hocevar, J., Stone, R.P., and Fedorov, D. V. 2012. Structure-forming corals and sponges and their use as fish habitat in bering sea submarine canyons. PLoS One **7**(3). doi:10.1371/journal.pone.0033885.

Morrow, C.C., and Cárdenas, P. 2015. Proposal for a revised classification of the Demospongiae (Porifera). Front. Zool. 12(1): 1–27. doi:10.1186/s12983-015-0099-8.

Murillo, F.J., Kenchington, E., Gonzalez, C., Sacau, M. 2010. The use of density analyses to delineate significant concentrations of Pennatulaceans from trawl survey data. Ser No N5753. NAFO SCR Doc 10/07, 7 p.

Murillo, F.J., Kenchington, E.L., Tompkins, G., Beazley, L., Baker, E., Knudby, A., and Walkusz, W. 2018. Sponge assemblages and predicted archetypes in the eastern Canadian Arctic. Mar. Ecol. Prog. Ser. **597**: 115–135. doi:10.3354/meps12589.

Pham, C.K., Murillo, F.J., Lirette, C., Maldonado, M., Colaço, A., Ottaviani, D., and Kenchington, E.L. 2019. Removal of deep-sea sponges by bottom trawling in the Flemish Cap area: conservation, ecology and economic assessment. Sci. Rep. **9**(1). doi:10.1038/s41598-019-52250-1.

Plotkin, A., Gerasimova, E., and Rapp, H.T. 2018. Polymastiidae (Porifera: Demospongiae) of the Nordic and Siberian Seas. J. Mar. Biol. Assoc. United Kingdom **98**(6): 1273–1335. doi:10.1017/S0025315417000285.

Pollock, L.W. 1998. A Practical Guide to the Marine Animals of Northeastern North America. Rutgers University Press.

Sarà, M., Giorgio, B., and Mensi, P. 1992. Redescription of Tethya norvegica Bowerbank (Porifera, Demospongiae), with remarks on the genus Tethya in the North East Atlantic. Zool. Scr. **21**(3): 211–216. doi:10.1111/j.1463-6409.1992.tb00323.x.

Schippers, K.J., Sipkema, D., Osinga, R., Smidt, H., Pomponi, S.A., Martens, D.E., and Wijffels, R.H. 2012. Cultivation of Sponges, Sponge Cells and Symbionts. *In* Advances in Sponge Science: Physiology, Chemical and Microbial Diversity,

Biotechnology. *Edited by* M.A. Becerro, M.J. Uriz, M. Maldonado, and X.B.T.-A. in M.B. Turon. Academic Press. pp. 273–337. doi:10.1016/B978-0-12-394283-8.00006-0.

Stone, R.P., Lehnert, H., and Reiswig, H.M. 2011. A guide to the deep-water sponges of the Aleutian Island Archipelago. NOAA Prof. Pap. NMFS 12 (September): 187.

Tabachnick, K.R., and Menshenina, L.L. 2007. Revision of the genus Asconema (Porifera: Hexactinellida: Rossellidae). J. Mar. Biol. Assoc. United Kingdom **87**(6): 1403–1429. doi:10.1017/S0025315407058158.

Tompkins-Macdonald, G., Baker, E., Anstey, L., Walkusz, W., T, S., and Kenchington, E.L. 2017. Sponges from the 2010-2014 Paamiut Multispecies Trawl Surveys, Eastern Arctic and Subarctic: Class Demospongiae, Subclass Heteroscleromorpha, Order Poecilosclerida, Family Coelosphaeridae, Genera Forcepia and Lissodendoryx. *In* Canadian technical report of fisheries and aquatic sciences. doi:10.13140/RG.2.2.15290.49600.

Van Soest, R.W.M. 2016. Sponge-collecting from a drifting ice floe : the Porifera obtained in the Kara Sea by the Dutch Polar Expedition 1882-83. Contributions to Zoology **85**(3): 311–336.

Van Soest, R.W.M. 2017. *Flagellia*, a new subgenus of Haliclona (Porifera, Haplosclerida). Eur. J. Taxon. 2017(351): 1–48. doi:10.5852/ejt.2017.351.

Van Soest R.W.M. 2017. Sponges of the Guyana Shelf. Zootaxa 4217:1. doi:10.11646/zootaxa.4217.1.1

Van Soest, R.W.M., and Hajdu, E. 2002. Family Esperiopsidae Hentschel, 1923. Pp. 656-664. In: Hooper, J.N.A. & Van Soest, R.W.M. (eds) Systema Porifera. A guide to the classification of sponges. 1 (Kluwer Academic/ Plenum Publishers: New York, Boston, Dordrecht, London, Moscow).

Van Soest RWM, Picton BE, 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).

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., Kelly, M., Vacelet, J., Dohrmann, M., Díaz, M.-C., Cárdenas, P., Carballo, J.L., Ríos, P., Downey, R., and Morrow, C.C. 2020. World Porifera Database. Accessed from http://www.marinespecies.org/porifera on 2020-06-04. doi:10.14284/359

Van Soest, R.W.M., Boury-Esnault, N., Vacelet, J., Dohrmann, M., Erpenbeck, D., de Voogd, N.J., Santodomingo, N., Vanhoorne, B., Kelly, M., and Hooper, J.N.A. 2012. Global diversity of sponges (Porifera). PLoS One **7**(4). doi:10.1371/journal.pone.0035105.

Vosmaer, G.C.J. 1885. The Sponges of the ‘Willem Barents’’ Expedition 1880 and 1881. Bijdragen tot de Dierkunde. 12 (3): 1-47

Wassenberg, T.J., Dews, G., and Cook, S.D. 2002. The impact of fish trawls on megabenthos (sponges) on the north-west shelf of Australia. Fish. Res. **58**(2): 141–151. doi:10.1016/S0165-7836(01)00382-4.

Weisz, J.B., Lindquist, N., and Martens, C.S. 2008. Do associated microbial abundances impact marine demosponge pumping rates and tissue densities? Oecologia **155**(2): 367–376. doi:10.1007/s00442-007-0910-0.

Yahel, G., Whitney, F., Reiswig, H.M., Eerkes-Medrano, D.I., and Leys, S.P. 2007. In situ feeding and metabolism of glass sponges (Hexactinellida, Porifera) studied in a deep temperate fjord with a remotely operated submersible. Limnol. Oceanogr. **52**(1): 428–440. doi:10.4319/lo.2007.52.1.0428.

Appendix 1:

Quick Reference Field Guide

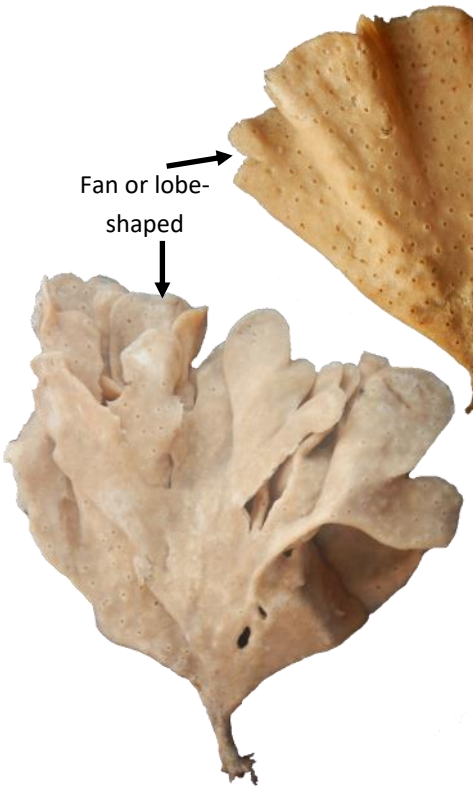
The following quick reference field guide is a useful tool to compare similar specimens. However, the specimen photos used in this section are not to scale. For more detailed descriptions, please refer to the individual species pages in the main text of this guide.

Taxa codes are to be used when recording catches during routine surveys.

Stalked Sponges — Quick Reference

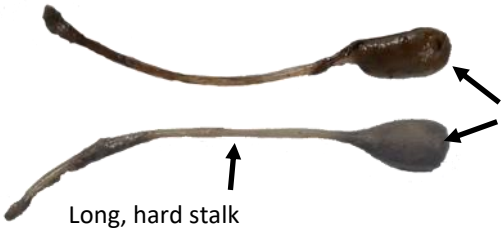
Unknown sponges can be coded as 8600 and retained for identification

Cladocroce spatula 8627

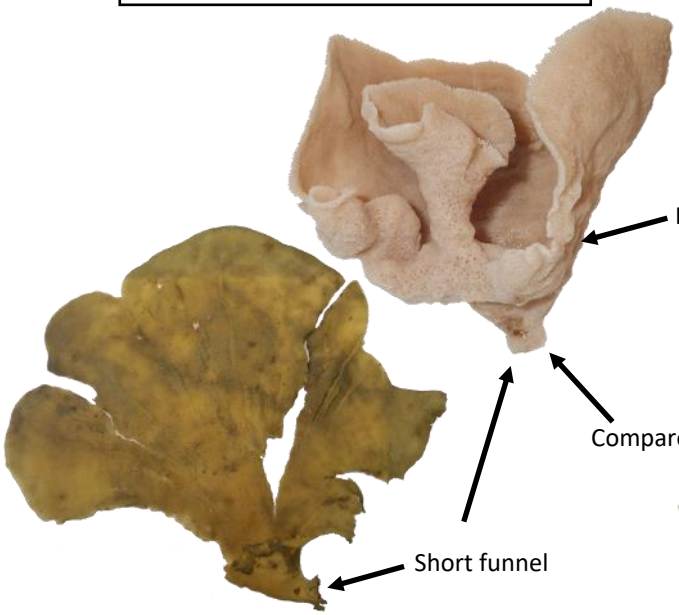


Haliclona oculata 8621

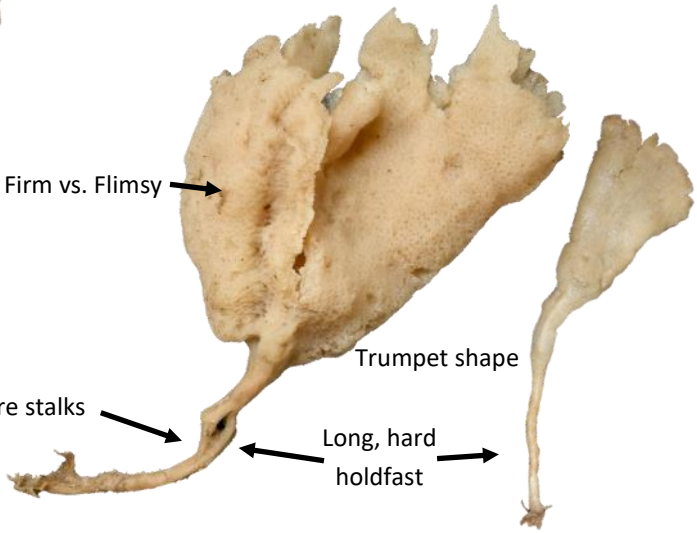
Stylocordyla borealis 8647



Plicatellopsis bowerbanki 8648



Semisuberites cribrosa 8633

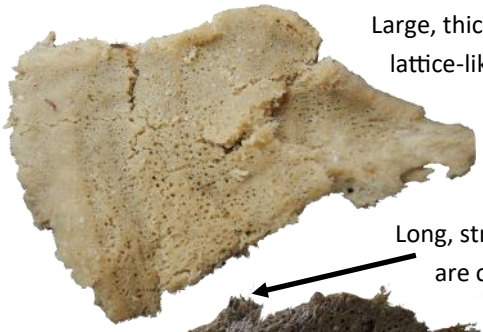


See species pages for scale.

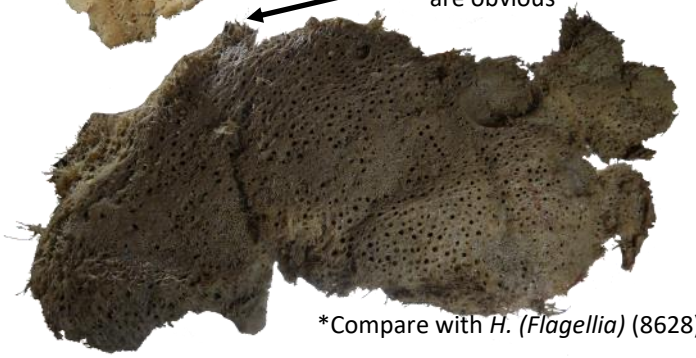
Finger and sheet-like sponges — Quick Reference

Unknown sponges can be coded as 8600 and retained for identification

Hemigellius arcofer 8629



Large, thick sheets with lattice-like structure



Long, stringy fibres are obvious

Mycale lingua 8616

Very hard fibres beneath a soft outer body

Often bright yellow
Very common

*Compare with *H. (Flagellia)* (8628), and *Iophon* spp. (8614)

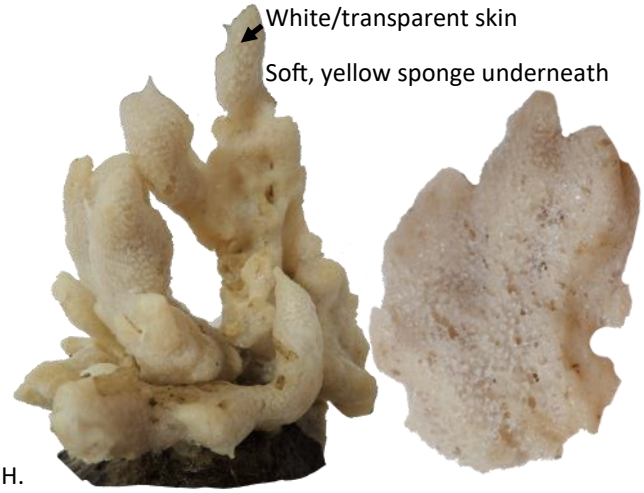
Iophon spp. 8614

Colour variable

Soft, but slightly firm. *Compare with H. arcofer (8629) and *H. (Flagellia)* sp. 8628

Often small, flattened pieces

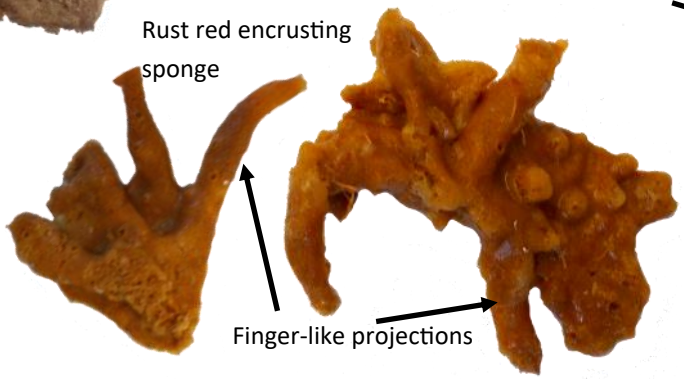
Suberitida unknown 1 8645



White/transparent skin

Soft, yellow sponge underneath

Amphilectus sp. 8632



Rust red encrusting sponge

Finger-like projections

Haliclona urcelous 8619

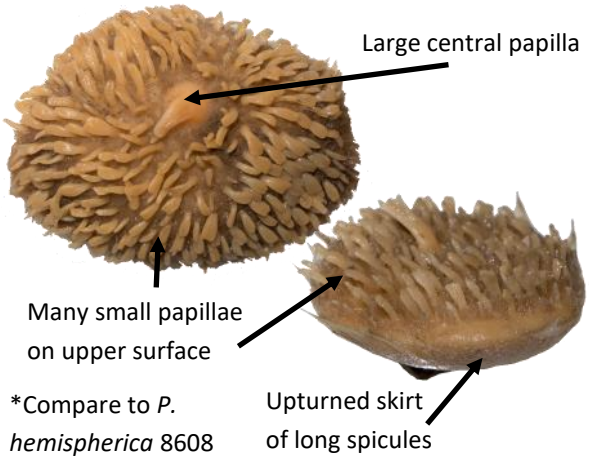
Soft, hollow barrels

See species pages for scale.

Cushion Sponges with Projections — Quick Reference 1 of 2

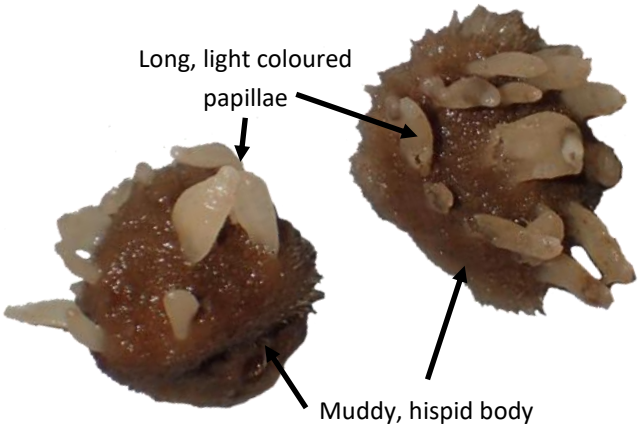
Unknown sponges can be coded as 8600 and retained for identification

Polymastia grimaldii 8639

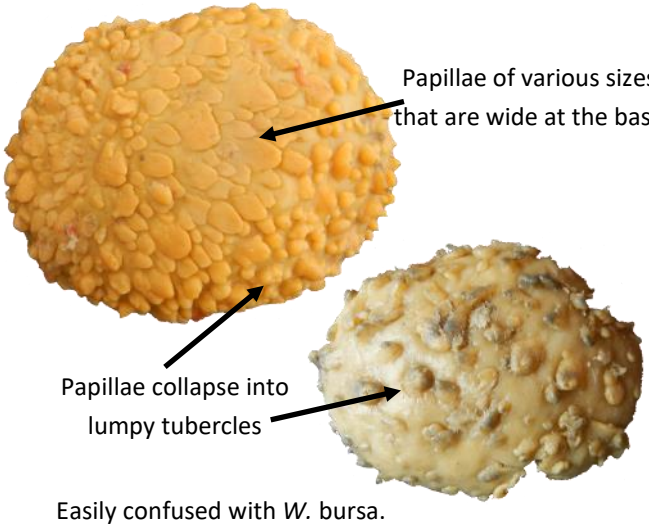


*Compare to *P. hemispherica* 8608

Polymastia andrica 8609

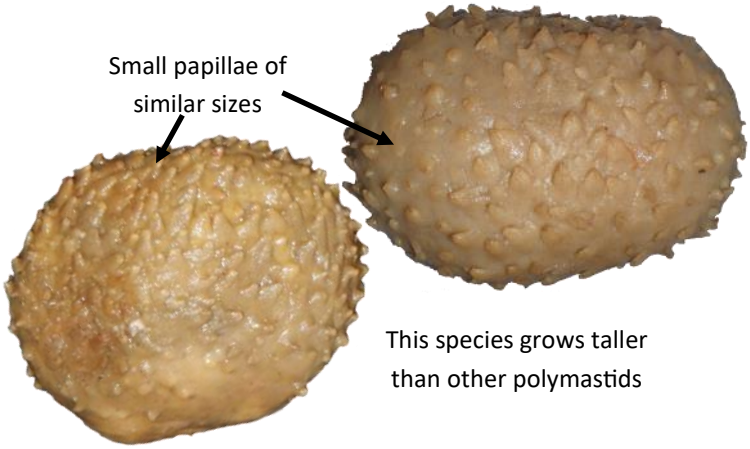


Sphaerotylus capitatus 8643



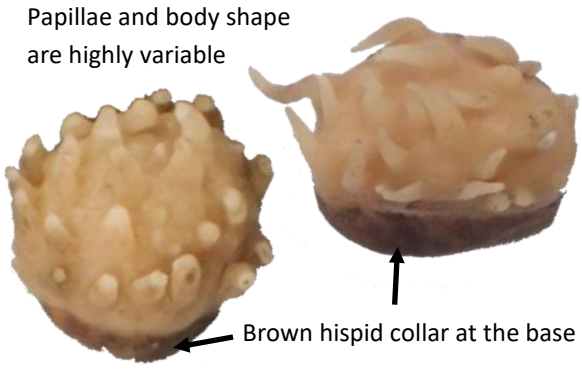
Easily confused with *W. bursa*. Check for tubercles.

Weberella bursa 8642



Polymastia thielei 8640

Polymastia uberrima 8641

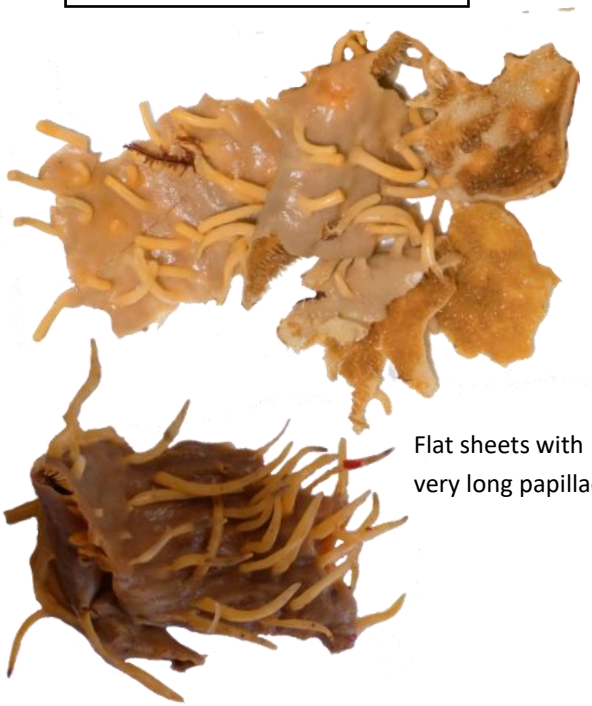


See species pages for scale.

Cushion Sponges with Projections — Quick Reference 2 of 2

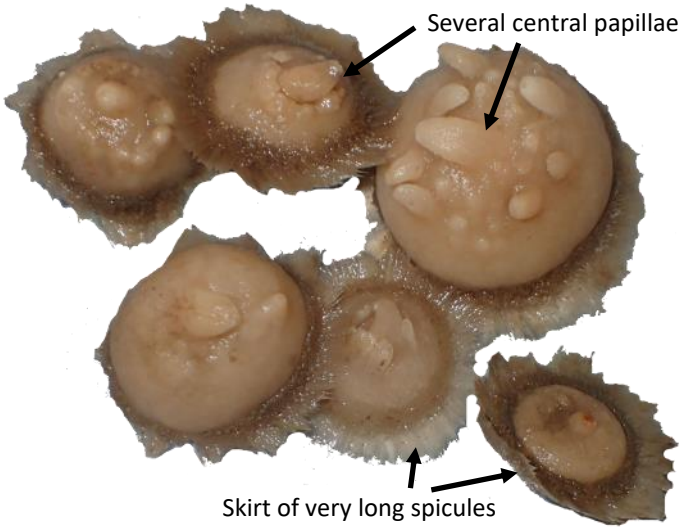
Unknown sponges can be coded as 8600 and retained for identification

Polymastia bartletti 8611



Flat sheets with very long papillae

Polymastia hemisphaerica 8608

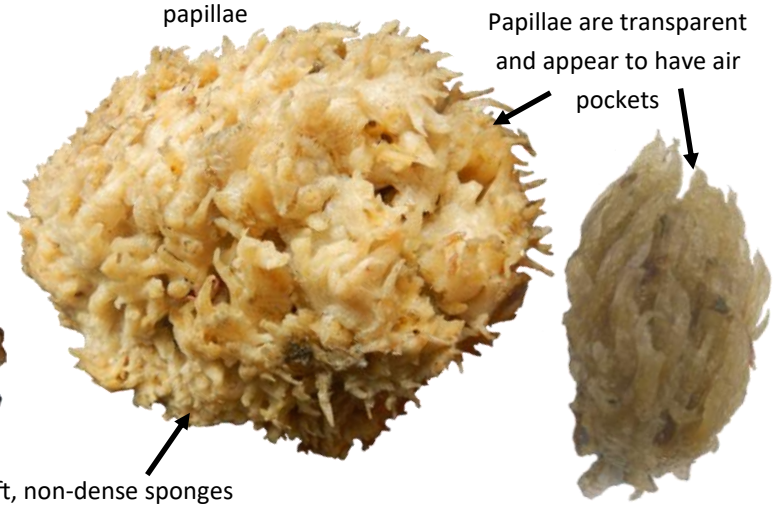


*Compare to *P. grimaldii* (8639)

Halichondria sitiens 8620

Many very soft papillae

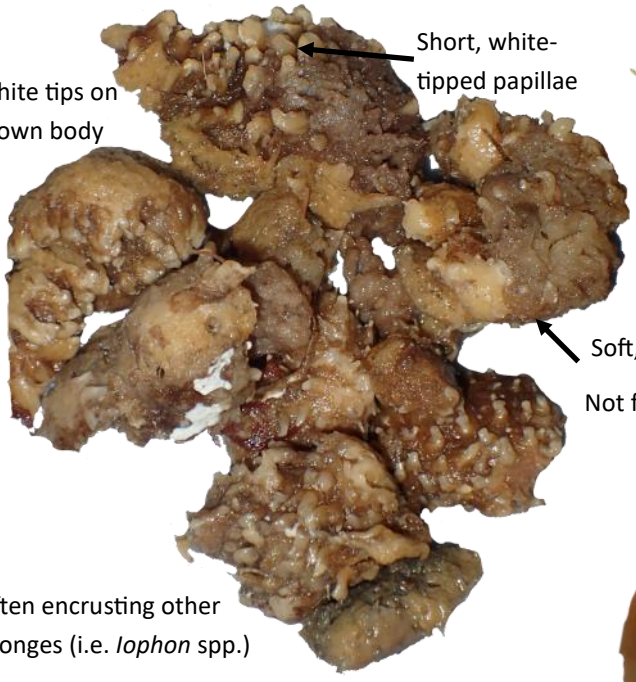
Papillae are transparent and appear to have air pockets



Soft, non-dense sponges

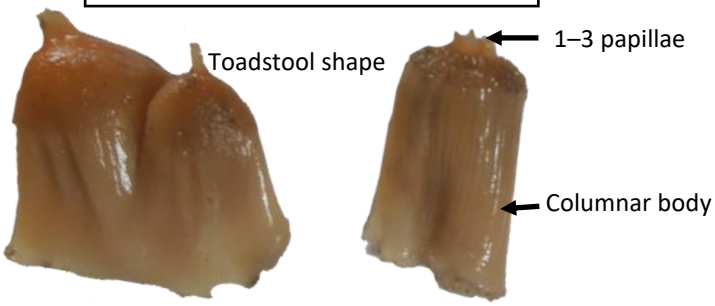
Not firm like a polymastid

Tedania suctoria 8638



Often encrusting other sponges (i.e. *Iophon* spp.)

Tentorium semisuberites 8612

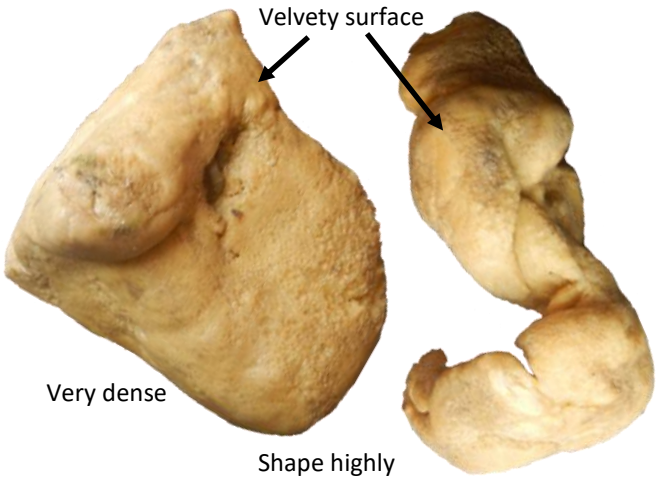


See species pages for scale.

Massive sponges — Quick Reference 1 of 2

Unknown sponges can be coded as 8600 and retained for identification

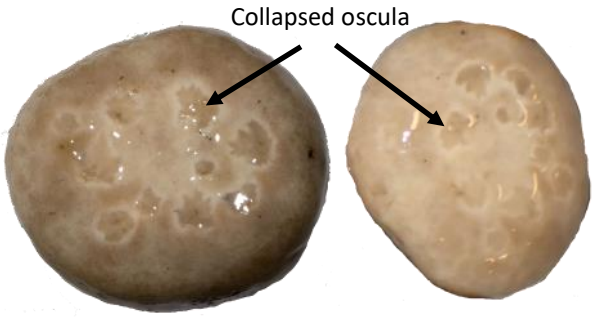
Suberites ficus 8613



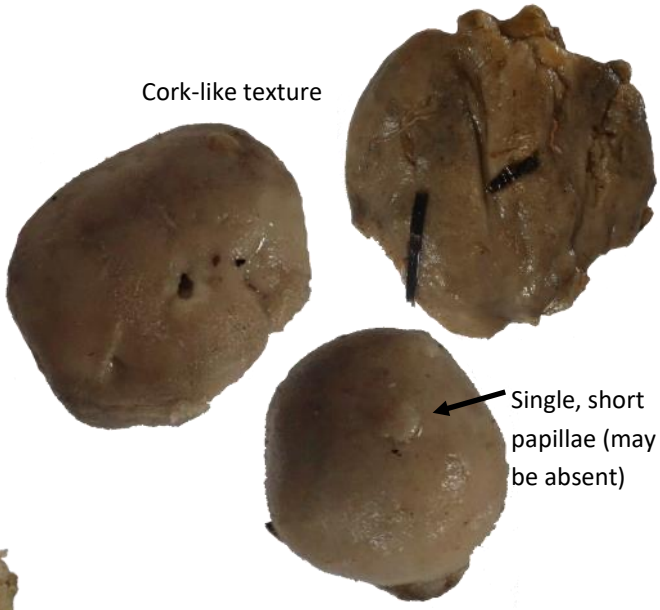
Biemna variantia 8617

*Compare to *M. lingua* (8616)

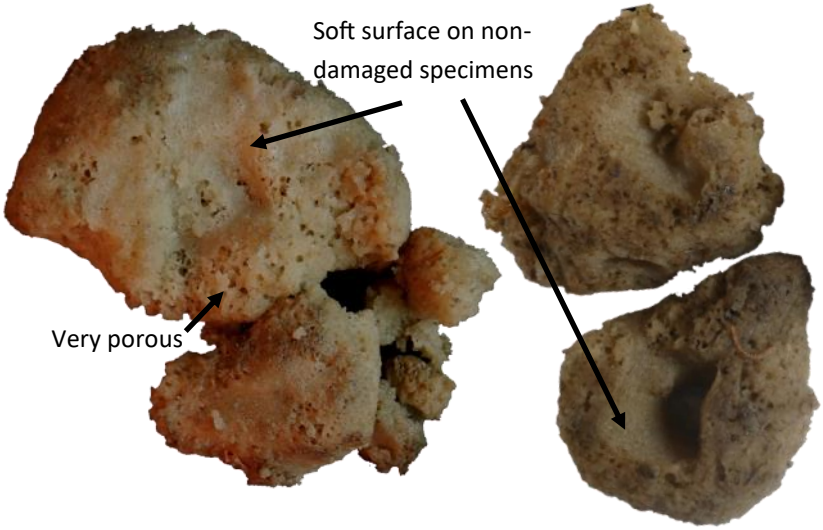
Artemisina arcigera 8635



Pseudosuberites monitiniger 8649



Haliclona (Flagellia) xenomorpha 8628



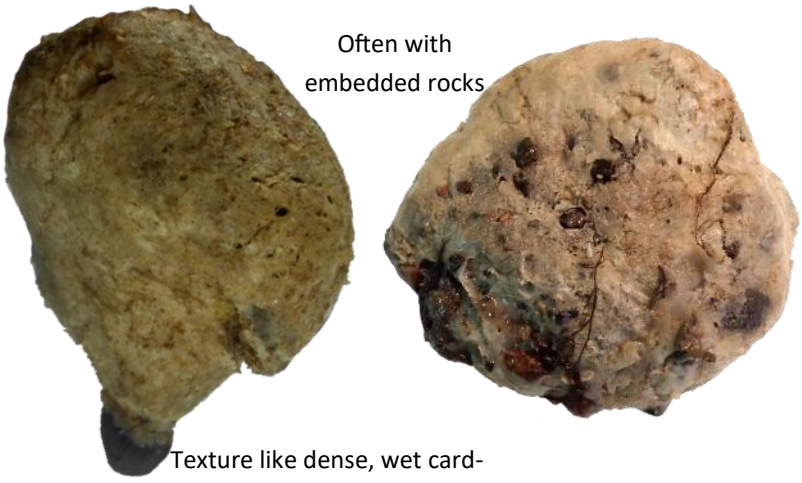
Will crumble when force applied.
*Compare with *H. arcofer* (8629) and *Iophon* spp. 8614

See species pages for scale.

Massive sponges — Quick Reference 2 of 2

Unknown sponges can be coded as 8600 and retained for identification

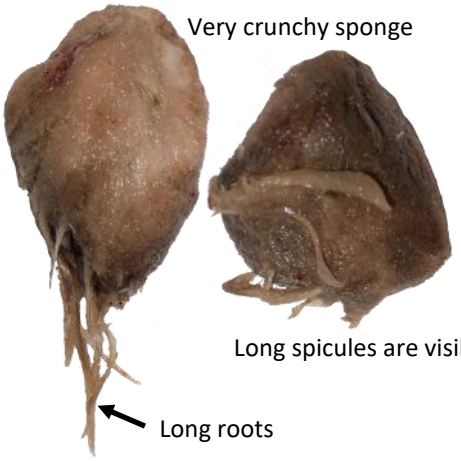
Suberitida unknown 2 8646



Often with embedded rocks

Texture like dense, wet cardboard, breaks off in flakes

Thenea cf. *muricata* 8625

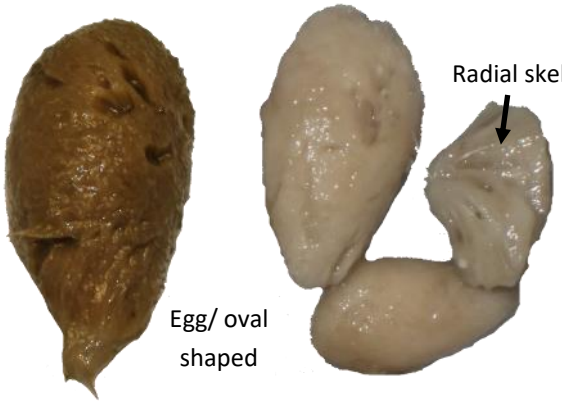


Very crunchy sponge

Long spicules are visible

Long roots

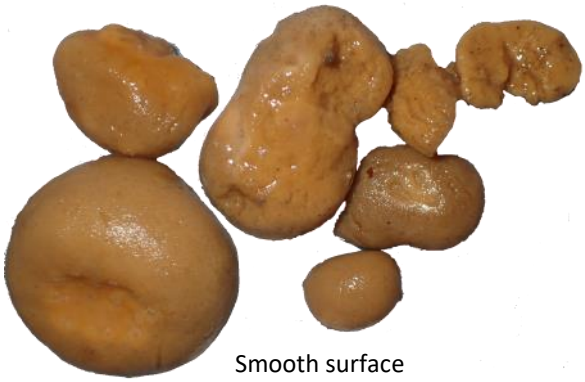
Craniella polyura 8651



Radial skeleton

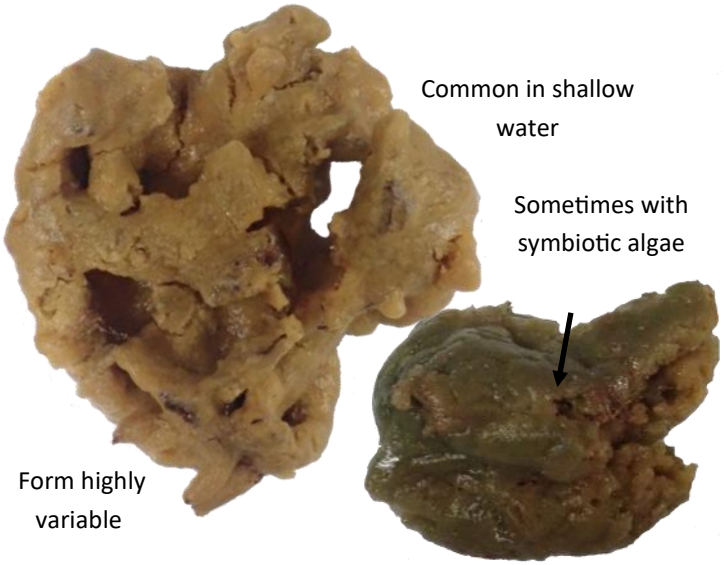
Egg/ oval shaped

Lissodendoryx cf. *indistincta* 8630



Smooth surface

Halichondria panicea 8623



Common in shallow water

Sometimes with symbiotic algae

Form highly variable

Halichondria bowerbanki 8644

Crust, sometimes with small extensions

See species pages for scale.

Other sponges — Quick Reference

Unknown sponges can be coded as 8600 and retained for identification

***Tethya norvegica* 8650**

Very small sphere

Sometimes with buds

***Sycon* sp. 8602**

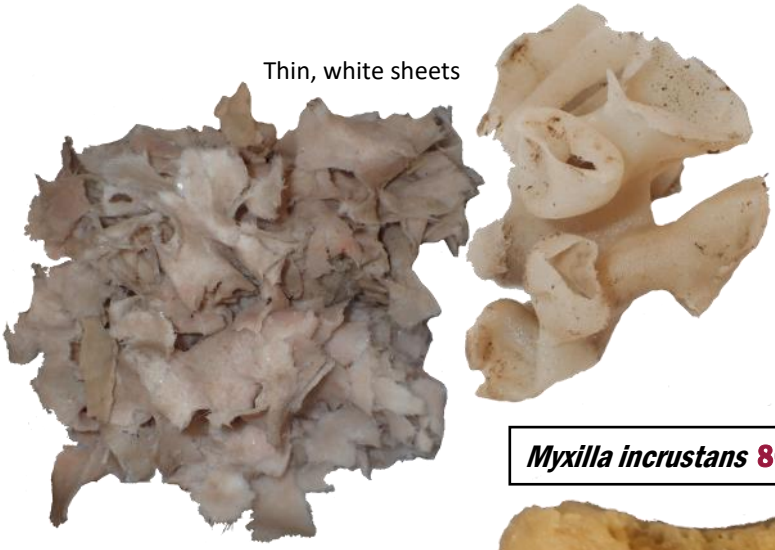
Tuft of straight spicules

Small, transparent, barrel shaped

***Polymastia* spp. 8610**

***Asconema* spp. 8365**

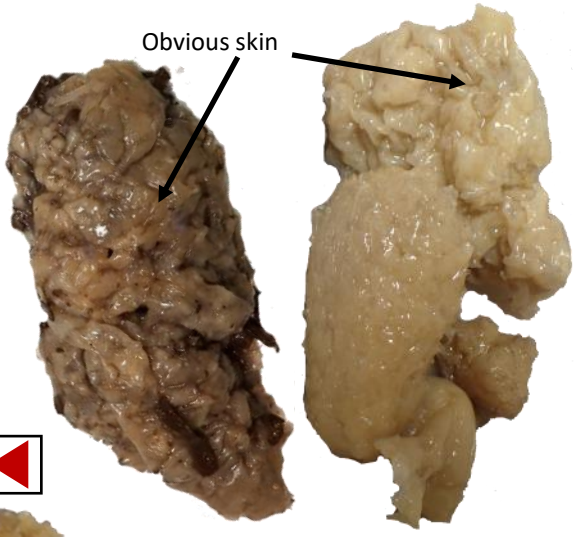
Thin, white sheets



Spicules are very long

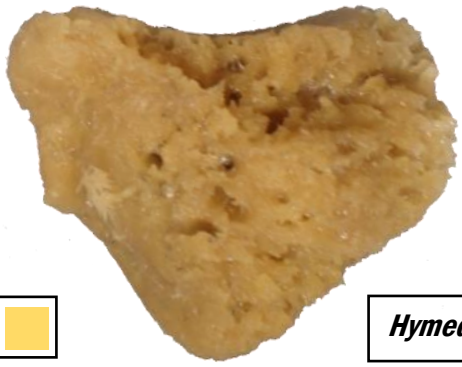
***Crella (Pytheas)* sp. 8631**

Obvious skin



Produces thick mucous

***Myxilla incrustans* 8637**



Yellow, massively encrusting

***Aplysilla* cf. *sulfurea* 8626**

Bright yellow crust with small projections

***Hymedesmia* cf. *paupertas* 8634**

Thin, blue crust

See species pages for scale.

Sponge collection protocol

If sponges are encountered during trawling operations that cannot be identified, or the identity is ambiguous, please document and preserve a piece for lab identification.

Best practices:

1 – If an unknown sponge is encountered please note the date, location, and depth (if possible) on a sample tag to be stored with the specimen. Use a unique sample number for each specimen.

Specimens should be separated by morphotype. If the texture, shape, or colour differs between pieces, then consider the specimens as different samples.

2 – If possible, take photo of specimen with a) ruler, b) collection information tag visible in photo.

If sponge is encrusting rock or settlement plate, take photo of specimen attached to substrate before subsampling.

3 – Subsample specimen.

If sponge has different body regions (stalk, projections, large openings, etc.), try to include pieces of all regions. Place as much tissue as possible in a zip top bag and freeze, or place specimen in a sample vial and fill with ethanol (70% or more, non-denatured). Place tag with the unique sample number in the bag or sample container with the specimen.

4 – If repeat morphotypes are encountered, repeat samples are not required, but please take photo and record location information of any unknown species.