

# NORTHWEST ATLANTIC FISHERIES ORGANIZATION



## Scientific Council Studies Number 47

Coral, Sponge, and Other Vulnerable Marine Ecosystem  
Indicator Identification Guide, NAFO Area



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# **Coral, Sponge, and Other Vulnerable Marine Ecosystem Indicator Identification Guide, NAFO Area**

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## **Abstract**

Reporting of encounters with benthic coral, sponges and other taxa indicative of the presence of vulnerable marine ecosystems (VMEs) is a key component of NAFO's management of fisheries in its regulatory area, in support of its roadmap to an ecosystem approach to fisheries management. Accurate data on the distribution of these species is important for informing decisions on the spatial measures in place to protect these organisms. This identification guide is intended to help those on-board commercial and research fishing vessels to identify the various VME indicator taxa listed in NAFO's Conservation and Enforcement Measures, at time of publication. The photographs are typically of caught specimens taken on the deck, as this gives the best picture of what is actually seen.



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Other Vulnerable  
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Guide, NAFO Area**



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## Photo Credits

On the cover: Various underwater photographs taken from within the NAFO Convention Area. Coral on top (*Paragorgia arborea*); Sponge on bottom: rock wall with several sponge and coral taxa.

A. Altuna, F.J. Murillo. 2012. Diversity and distribution of sea pens (O. Pennatulacea) of the Flemish Cap, Flemish Pass and Grand Banks of Newfoundland (Northwest Atlantic Ocean). XVII Iberian Symposium on Marine Biology Studies. Donostia-San Sebastián (Spain). 11–14 septiembre de 2012. Poster: *D. gracile*.

F.J. Murillo, Instituto Español de Oceanografía (ECOVUL/ARPA project), Vigo, Spain: *G. rubiformis*, bottom; *Ombellula*, top; *B. ovifera*, top; *Pachycerianthus borealis*; *E. loricata*, *Halipteris*.

T. Patrocinio, Instituto Español de Oceanografía (ECOVUL/ARPA project), Vigo, Spain: *L. pertusa*, top.

V. Wareham, Department of Fisheries and Oceans, St. John's, Newfoundland and Labrador, Canada: *Anthomastus*, both; Nephtheidae, bottom; *S. arctica*, top; *Flabellum*, bottom right; *A. armata*, bottom; *S. pulchella*, bottom; *S. fortis*, bottom; *S. ficus*, bottom; *A. foliata*, top; *Asbestopluma*, bottom; *Chondrocladia*, both; and *Haliclona*, bottom.

Tim Siferd, Department of Fisheries and Oceans, Winnipeg, Canada: *Craniella* (bottom).

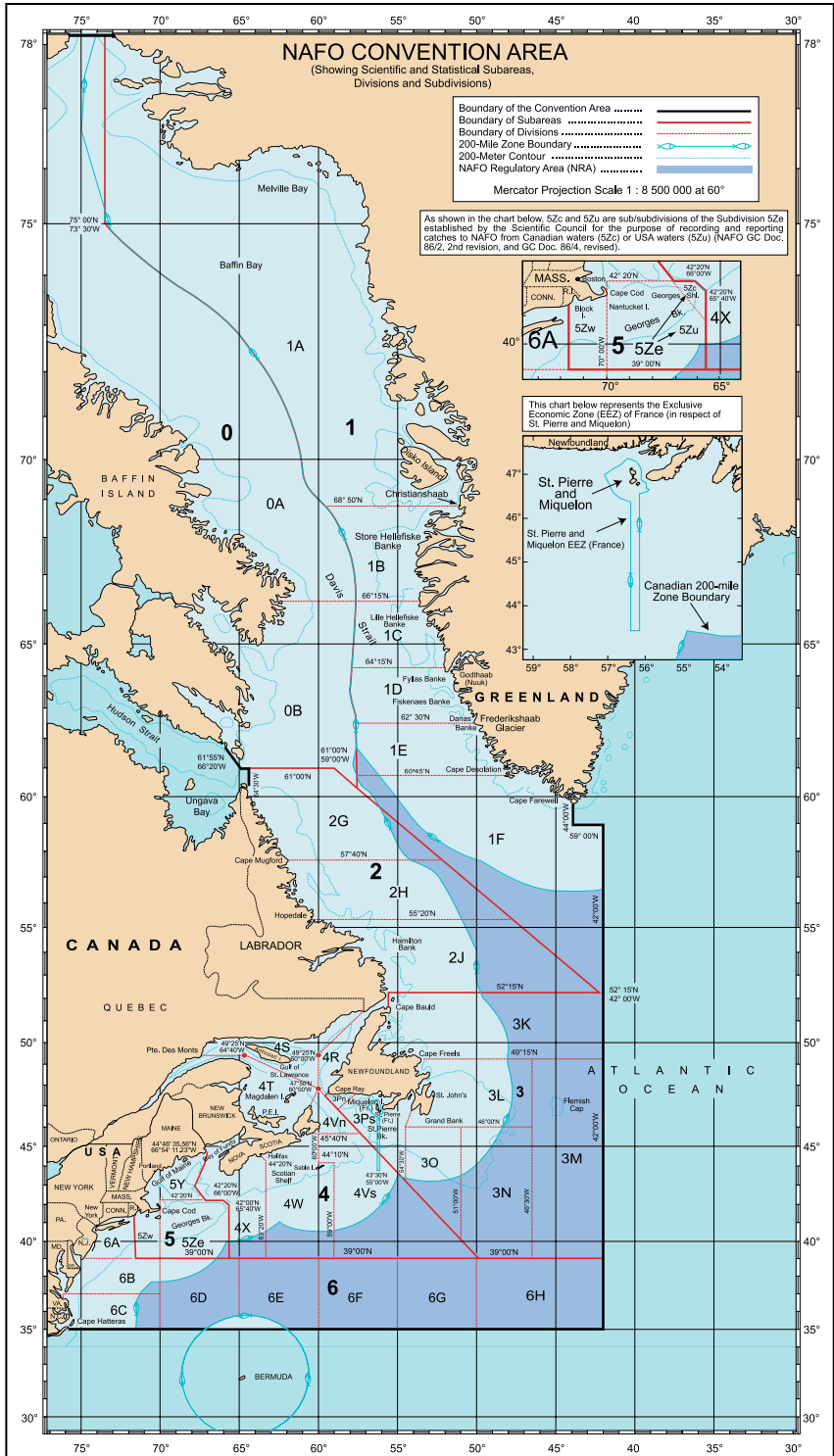
S.C. France, Department of Biology, The University of Louisiana, Lafayette, Louisiana, USA: *Stichopathes*.

M. Butler, Ecology Action Centre, Halifax, Nova Scotia, Canada: *L. pertusa*, bottom.

S.D. Fuller, Dalhousie University, Halifax, Nova Scotia, Canada: *V. pourtalesi*, top.

NEREIDA project, Department of Fisheries and Oceans Canada and Instituto Español de Oceanografía: *Forcepia*, top; *Geodia*, bottom; *H. carteri*, bottom; *S. pulchella*, top; *I. piceum*, bottom; *Dictyaulus*, both; *Asbestopluma*, top; *Cladorhiza*, both; *Rhizaxinella*, top; *S. borealis*, both; and *Sycon*, top.

All other photos courtesy of the Department of Fisheries and Oceans Canada, Bedford Institute of Oceanography, Dartmouth, Nova Scotia, Canada.





## Preface

This guide is intended as a pictorial identification guide for coral, sponge, and other vulnerable marine ecosystem indicator taxa commonly encountered within the NAFO fishing footprint on the Grand Banks of Newfoundland. Some taxa in this guide occur more broadly within the NAFO Regulatory Area (NRA), however, taxa encountered in Divisions 5 and 6 will be under-represented in this guide. Our intent is that this guide should be useful for at-sea identifications by non-specialists. It was written for fishers, fishery observers, scientific technicians and others who may not be familiar with invertebrate identification. It is hoped that this guide will help improve data collection and our knowledge on the distribution of these vulnerable marine species. Should users find specimens that do not fit the guide, or need assistance in identification, please contact:

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## Data Collection

This identification guide can be used with the NAFO Exploratory Fishery Data Collection Form. At present there are no simple species codes for corals, sponges, and other VME taxa, so use the scientific name at the top right corner of the identification page. The corals, sponges, and other VME taxa in this guide can be difficult to weigh. Small samples should be cleared of any larger organisms (e.g. sea stars). All samples must be weighed and all corals and sponges of the same type should be weighed together. Record the weight to the nearest kilogram and use <1 kg for smaller samples. The weight of very large samples (over 100 kg) can be estimated by filling a fish box with the same species and weighing that. The remaining weight can be estimated by multiplying the weight of the coral, sponge, or other VME taxa in the fish box by the estimated unweighed volume. It is also useful to note the number of specimens, if they are broken, and if associated fauna or egg casings are present.

**Scientific Name**  
**Common Name (If any)**

Use when recording

ITIS TSN: XXXXX • ERMS AphiaID: XXXXX

[www.itis.gov](http://www.itis.gov) • [www.marbef.org/data/erms.php](http://www.marbef.org/data/erms.php)

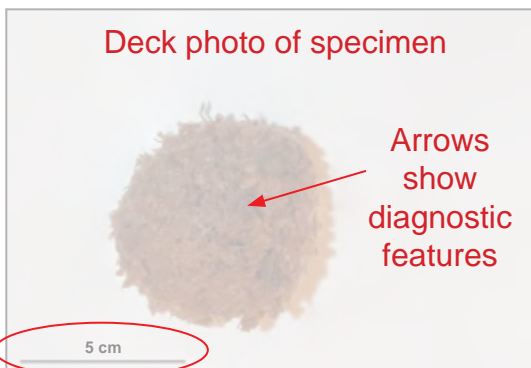


Colour range  
of corals



Relative size  
of sponge,  
coral or other  
species to  
human  
or human hand

**Deck photo of specimen**



Arrows  
show  
diagnostic  
features

Standard 5cm scale bar



**Physical Description**

- 

**Size Information**

- 

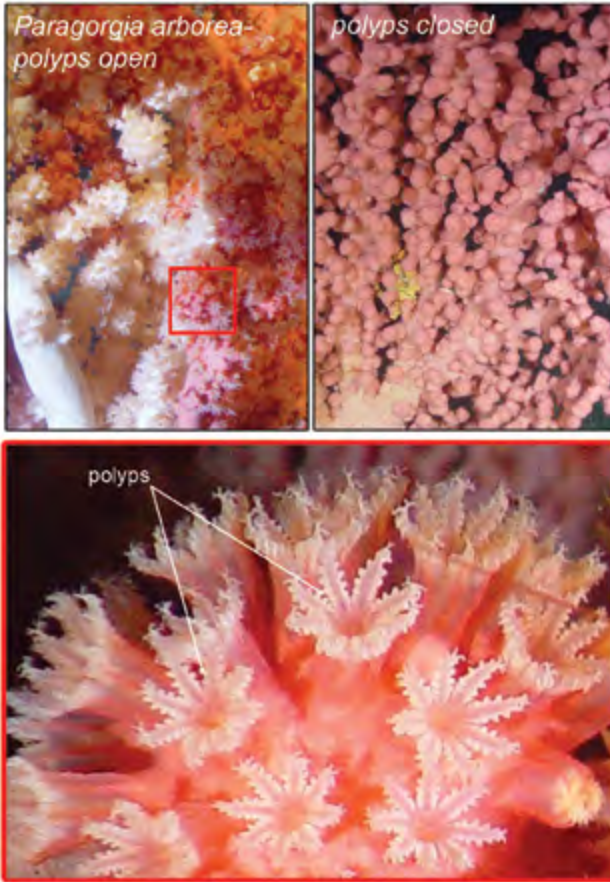
**Colour**

- 

**Habitat Information**

-

# Coral Terminology- Polyps



## Physical Description

- Tubular flower-like structures used for both feeding and reproduction
- Polyps are always closed when specimen caught
- In a variety of forms and can be clustered or solitary depending on the species or size of the individual
- An example of a coral species composed of a single polyp is *Desmophyllum dianthus* (Page 8)
- *Paragorgia arborea* is an example of a species with many hundreds of polyps per individual

# Coral Morphology Categories



## Soft Corals (Alcyonacea)

- Soft-bodied corals that are usually fleshy and flexible. Colonies are either erect or encrusting. Branches of arborescent species may be loose or form tight clusters



## Black Corals (Antipatharia)

- Large branching or whip-like corals with firm small polyps. Skeleton, once exposed, is black or brown and may be covered in thorns



## Hard Corals (Scleractinia)

- Solitary or colonial corals with a hard, calcareous skeleton. Solitary forms may resemble a cup, while colonial species may form a hard, branching network



## Branching Corals (Alcyonacea)

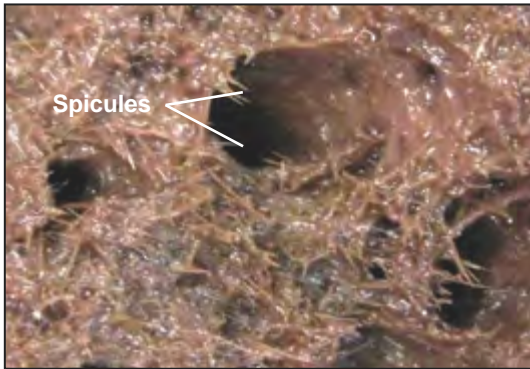
- Large, often brightly-coloured branching or whip-like corals with a firm skeleton. Branching forms may be bushy or fan-shaped



## Sea Pens (Pennatulacea)

- Erect, feather-like corals with growth forms resembling a quill pen. Base of coral appears bulbous and anchors in soft substrate

# Sponge Terminology



## Spicules:

- Skeletal elements that give most sponges their structure
- Generally spicules are microscopic, though large spicules can be seen by the naked eye
- The characteristic shapes of these spicules are used to identify sponge species

## Encrusting:

- A thin, sheet-like coating, generally on a rock or shell

# Sponge Morphology Categories



## Solid/Massive

- Substantial, fairly compact structure; can be round but more often irregular in shape



## Leaf/Vase-Shaped

- Fleshy leaf or vase, with or without a short 'stem' anchored to hard substrate



## Round with Projections

- Distinct projections are present, called 'papillae;' sometimes with visible openings at the ends



## Thin-Walled, Complex

- Spicules are often arranged in intricate, mesh-like patterns visible to the naked eye; also known as 'Glass Sponges'



## Stalked

- Bulk of sponge tissue is centred around a thinner 'stalk' or 'stem'

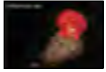
## Other

- A variety of miscellaneous body types: finger-shaped, encrusting, bladder-like, excavating, etc.

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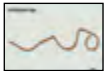


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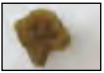
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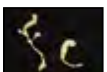
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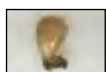
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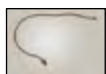
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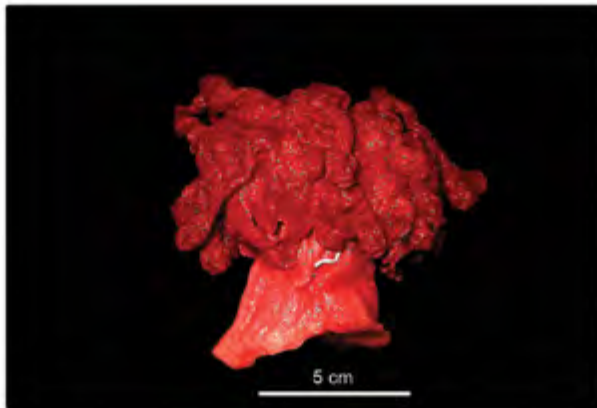
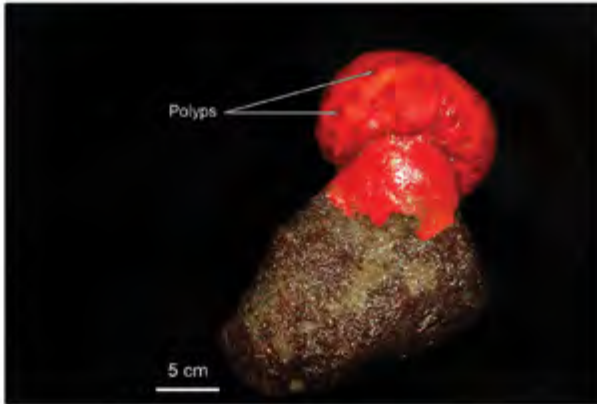
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# Corals



# Anthomastus

ITIS TSN: 52030 • ERMS AphiaID: 125285



## Physical Description

- Soft, mushroom shaped with cap and (usually) stalk, round to flat; large tentacles (if present) attached to cap; dot-like smaller polyps scattered between larger polyps

## Size Information

- Up to 10cm diameter, but typically 5cm or less

## Colour

- Light to dark red

## Habitat Information

- On hard bottom, attached to hard substrate; free on soft bottom; 170–1400m

# Gersemia rubiformis

ITIS TSN 52037 • ERMS AphiaID:156103



## Physical Description

- Soft but firm, branching, cauliflower-like to round, with polyps in tight clusters

## Size Information

- Up to 10cm, but typically less than 5cm

## Colour

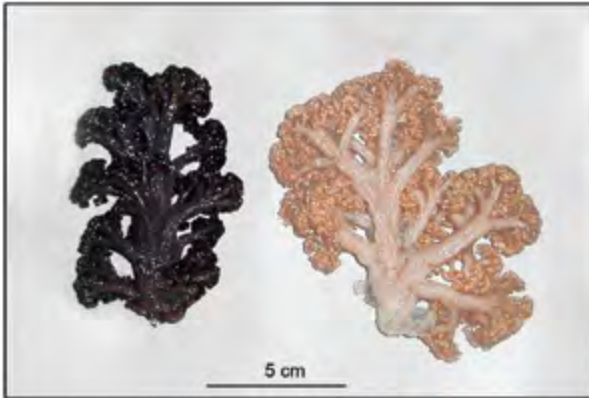
- Tan to pink

## Habitat Information

- Attached to hard substrate on hard and soft bottom; 35–700m (can be common on fishing banks)

# Nephtheidae

ITIS TSN: 52034 • ERMS AphiaID: 146762



## Physical Description

- Soft or firmer, branching with polyps variable but may resemble clusters of grapes, stem rough or smooth to touch

## Size Information

- Typically less than 25cm

## Colour

- White to tan to dark

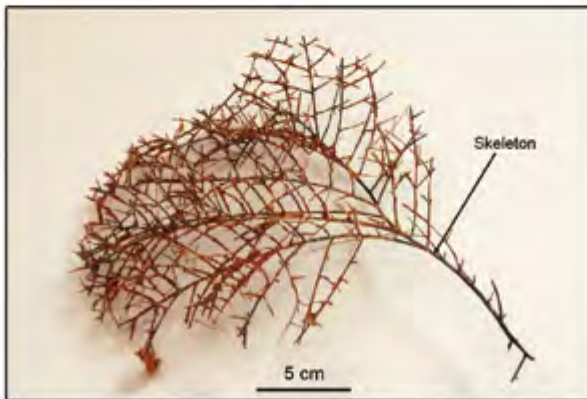
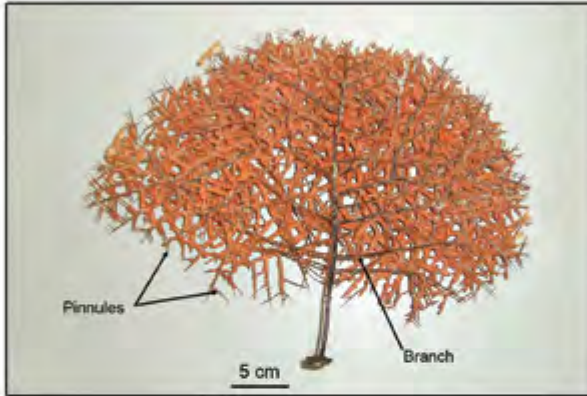
## Habitat Information

- Attached to hard substrate on hard and soft bottom; 200–1500m



# Stauropathes arctica

ITIS TSN (Genus): 719057 • ERMS AphiaID: 291111



## Physical Description

- Bush-like, densely branched on one plane causing flat appearance; two rows of small, unbranched pinnules (needles) on branches, often crossed and fusing with other branches/pinnules

## Size Information

- Up to 80cm

## Colour

- Polyps orange, skeleton black

## Habitat Information

- Hard bottom; 700–1850m

# Stichopathes

ITIS TSN: 51963 • ERMS AphiaID: 103308



Black Corals (Antipatharia)



## Physical Description

- Elongate and whip-like; spiralled

## Size Information

- Up to 80cm

## Colour

- Polyps orange which can be peeled to reveal a black skeleton

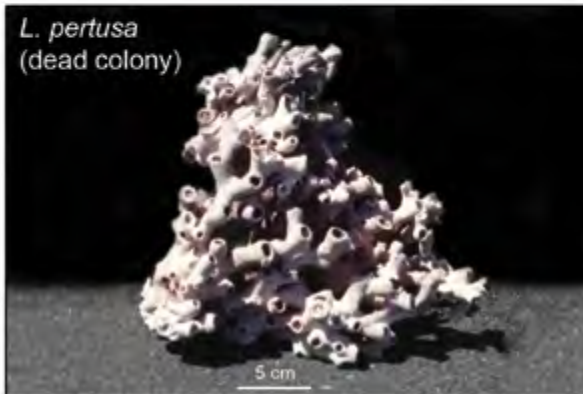
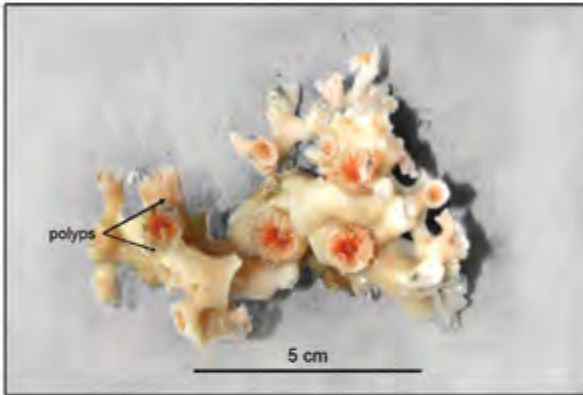
## Habitat Information

- Hard bottom; 700–1300m

# Lophelia pertusa

## Spider Hazards

ITIS TSN: 53706 • ERMS AphiaID: 135161



### Physical Description

- Hard, branching network crossed and fused
- Reef-building

### Size Information

- Individual polyps several cm; colony up to 200cm; typically fragments collected

### Colour

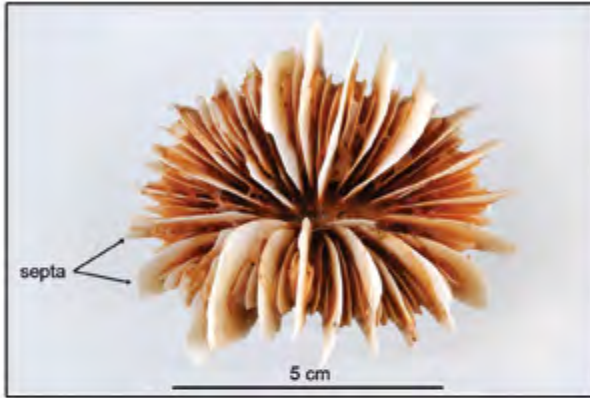
- Tissue transparent white to orange-pink; skeleton white

### Habitat Information

- Hard bottom; 200–1000m

# Desmophyllum dianthus

ITIS TSN: 572071 • ERMS AphiaID: 135159



## Physical Description

- Hard, solitary, stalked, will show sign of breakage where removed from substrate; many blade-like plates (septa) at the top; relatively robust

## Size Information

- Up to 10cm

## Colour

- Polyps transparent pink, yellow, or orange; skeleton white

## Habitat Information

- Hard bottom, attached; 700–1400m

# Flabellum

Flabellum alabastrum (A),

F. angulare (B),

F. macandrewi (C)

ITIS TSN: 572140 (A), 572141 (B), 53731 (C)

ERMS AphiaID: 135194 (A), 135195 (B), 135197 (C)



## Physical Description

- Hard, solitary, conical or cup-like; no stalk, with blade-like septa; skeletons are white
- A – Cup “pinched” in centre; tissue colourless to yellow, orange, pink or red
- B – Oval-shaped cup; tissue colourless to white to yellow
- C – Cup is fragmented; tissue colourless to pink, yellow or orange

## Size Information

- A – Up to 8cm
- B – Up to 8cm
- C – Up to 3cm

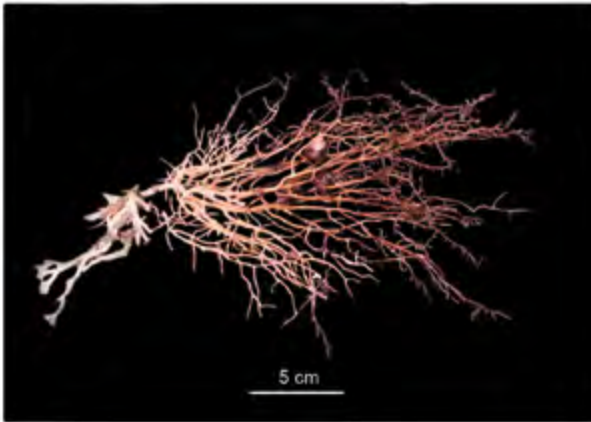
## Habitat Information

- A – Soft bottom; 200–2000m
- B – Soft bottom, 2200–3200m
- C – Soft bottom; 180–650m



# Acanella arbuscula

ITIS TSN: 52338 • ERMS AphiaID: 125371



## Physical Description

- Bush-like; skeleton stiff but delicate, segmented; branching base (sometimes missing)

## Size Information

- Less than 30cm

## Colour

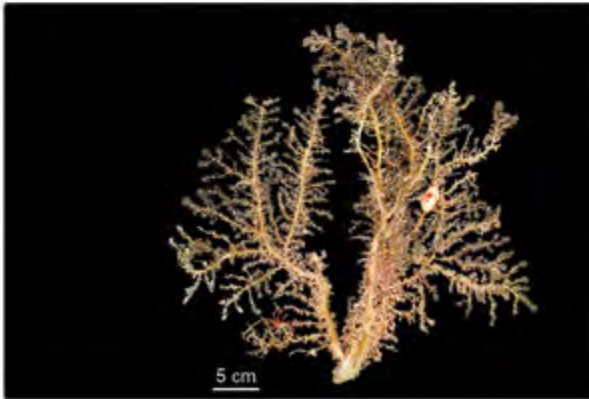
- Polyps pale to dark orange; skeleton white with darker bands

## Habitat Information

- Soft bottom; 150–2300m

# Acanthogorgia armata

ITIS TSN: 52119 • ERMS AphiaID: 125348



## Physical Description

- Bushy, slightly flattened, rough to the touch; skeleton flexible

## Size Information

- Less than 20cm; occasionally up to 50cm

## Colour:

- Polyps yellow (rarely blue), grey when dead; skeleton brown to grey

## Habitat Information

- Attached to hard substrate on hard and soft bottom, 170–1400m



# Keratoisis Bamboo Coral

ITIS TSN: 52330 • ERMS AphiaID: 125306



## Physical Description

- Tree-like; hard and rigid; long, slender, sparse branches

## Size Information

- Up to 150cm

## Colour

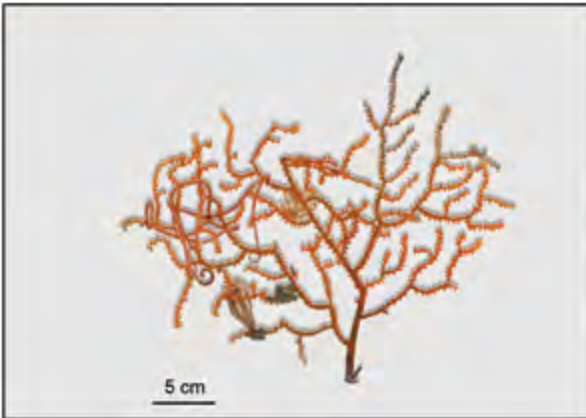
- Polyps pale pink to orange (may phosphoresce); skeleton white with golden-brown joints

## Habitat Information

- Attached to hard substrate on hard and soft bottom; 200–2000m

# Paramuricea

ITIS TSN: 52124 • ERMS AphiaID: 125311



## Physical Description

- Fan-like, curving branches; skeleton flexible, rough to touch

## Size Information

- Up to 80cm

## Colour

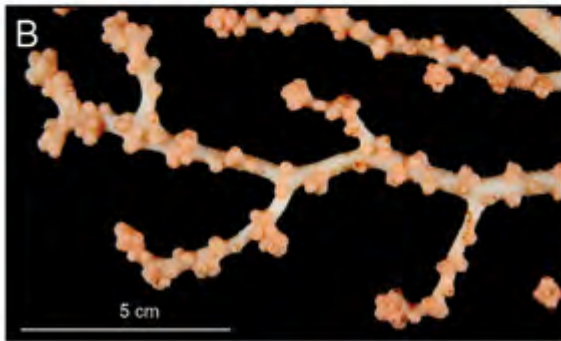
- Polyps yellow to orange; grey to black when dead; skeleton green to brown

## Habitat Information

- Hard bottom; 150–2200m

# Paragorgia arborea (A), P. johnsoni (B) Bubblegum Coral

ITIS TSN: 52108 (A), 52107 (B) (Genus), ERMS AphiaID: 125418 (A), 125419 (B)



## Physical Description

- A – Branches thicker with tips greater than 5mm; association with basket stars common (pictured)
- B – Branches thinner with tips 2–4mm

## Size Information

- A – up to 600cm, typically broken pieces collected
- B – up to 100cm, typically broken pieces collected

## Colour

- A – polyps white to tan, orange, pink and red, dark purple
- B – polyps white to tan, orange, pink and red

## Habitat Information

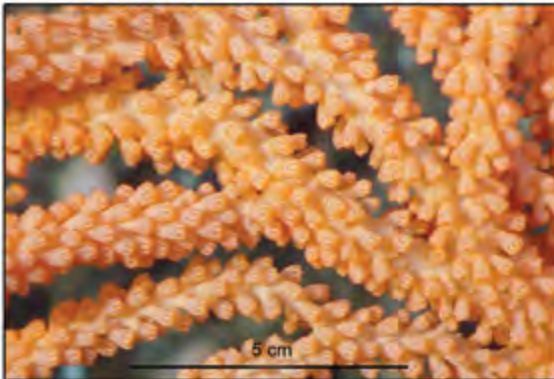
- A – Hard bottom, 200–1300m
- B – Hard bottom, 800–4100m



# Primnoa resedaeformis

## Sea-corn Coral

ITIS TSN: 52307 • ERMS AphiaID: 125411



### Physical Description

- Bush or tree-like; skeleton stiff yet flexible, hard and rigid at the base; conspicuous scale-like polyps

### Size Information

- Up to 120cm

### Colour

- Polyps pink to orange, skeleton brown

### Habitat Information

- Hard bottom, 150–1150m

# Anthothela grandiflora

ITIS TSN: 52095 • ERMS AphiaID: 125414



## Physical Description

- Soft, encrusting or mat-like, with long polyps in loose clusters
- Sometimes upright, irregular branches develop from mat

## Size Information

- Encrusting

## Colour

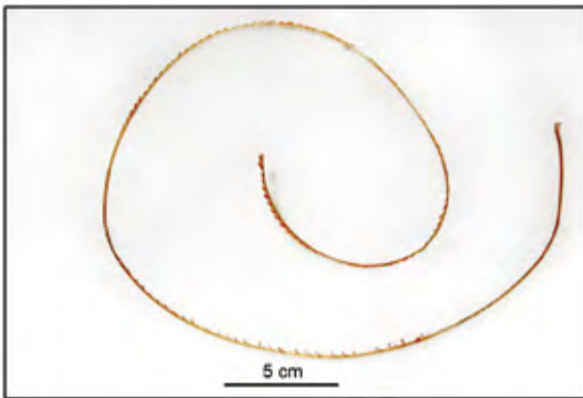
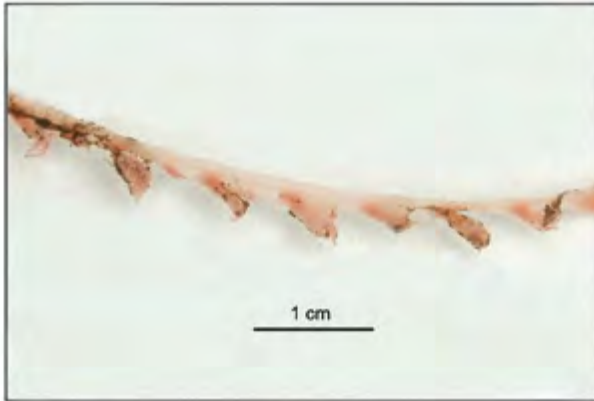
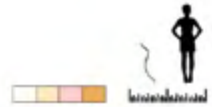
- Coral pink in colour

## Habitat Information

- Grows on corals, shells, and rock

# Radicipes gracilis

ITIS TSN (Genus): 719055 • ERMS AphiaID: 125357



## Physical Description

- Slender, unbranched, whip-like, with slight spiral; skeleton flexible, stiff, with branching, root-like base; polyps located on one side of frond
- Lacks bulbous root

## Size Information

- Up to 90cm, but typically less

## Colour

- White to pink and orange, may be irridescent

## Habitat Information

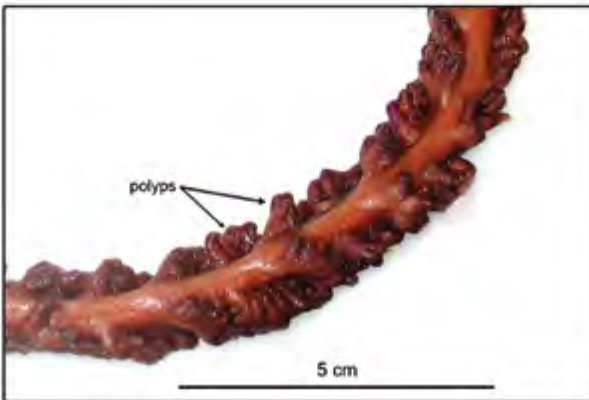
- Soft bottom; 400–1500m





# Anthoptilum grandiflorum

ITIS TSN: 52365 • ERMS AphiaID: 128504



## Physical Description

- Elongate and whip-like, often “?” shaped; polyps at an angle to the main stem in two rows running its length, one side of the stem relatively bare of polyps; smooth to touch
- Bulbous root

## Size Information

- Up to 100cm

## Colour

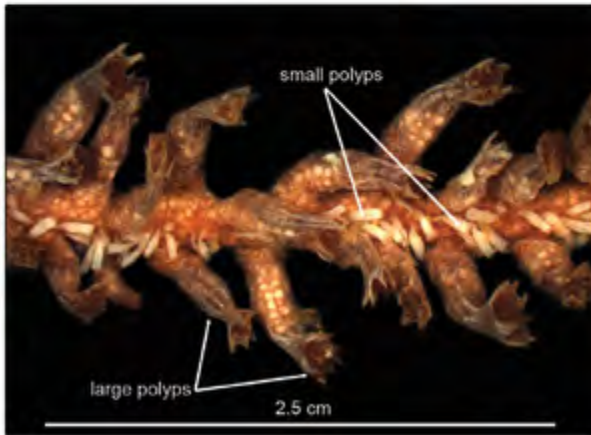
- Polyps brown to red, stalk brown to red or yellow

## Habitat Information

- Soft bottom; 150–2400m

# Funiculina quadrangularis

ITIS TSN: 719232 • ERMS AphiaID: 128506



## Physical Description

- Elongate and whip-like, thin, tip often curled or coiled, two rows of large polyps; smaller polyps conspicuous and scattered sparsely on stalk
- Bulbous root

## Size Information

- Up to 210cm

## Colour

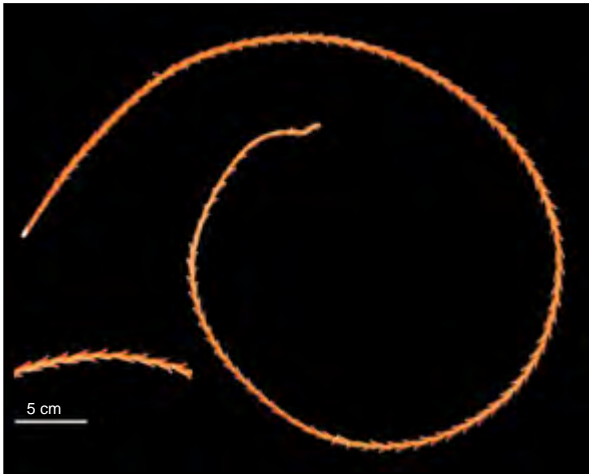
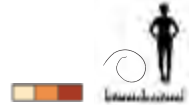
- Polyps yellow, pink to purple with root white to yellow, orange and brown

## Habitat Information

- Soft bottom; 100–2700m

# Distichoptilum gracile

ITIS TSN: 52371 • ERMS AphiaID: 128524



## Physical Description

- Elongate and whip-like, polyps arranged in rows on one side of fleshy stalk

## Size Information

- Up to 100cm in length

## Colours

- Polyps red-orange in colour that is retained after collected; stalk flesh coloured

## Habitat Information

- Soft bottom
- Recorded between 730 and 1170m, but known to occur down to 1700m

# Halipteris finmarchica

ITIS TSN: 719237 • ERMS AphiaID: 128509



## Physical Description

- Elongate and whip-like, polyps in rows at angle to the main stem on raised ridges, rough to touch, tip often bare or with anemones attached
- Bulbous root

## Size Information

- Up to 125cm

## Colour

- Polyps brown to red, stalk white to yellow

## Habitat Information

- Soft bottom; 110–1800m

# Halipteris

ITIS TSN: 719025 • ERMS AphiaID: 128491



## Physical Description

- Elongate and whip-like, polyps arranged in oblique rows
- Thick fleshy root much smaller than the stalk

## Size Information

- Up to 100cm in length

## Colour

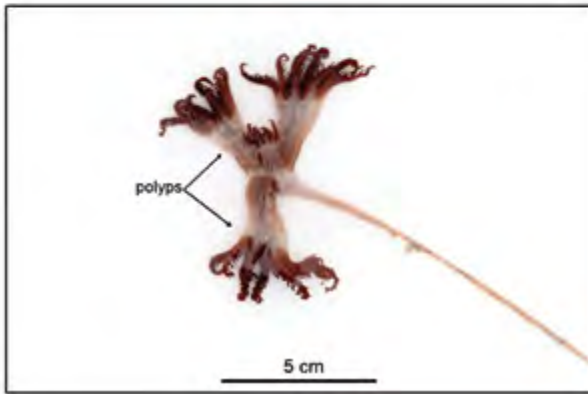
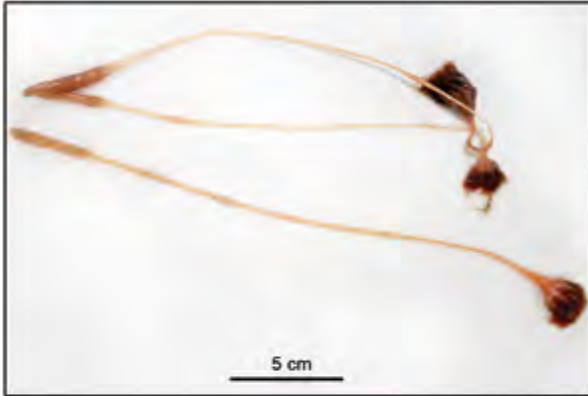
- Both the polyps and stalk are white or cream coloured to pale yellow, distinguishing it from *H. finmarchica* which has red to brown polyps

## Habitat Information

- Soft bottom
- Recorded between 169 and 290m

# Ombellula

ITIS TSN: 719032 • ERMS AphiaID: 128499



## Physical Description

- Elongate, thin, with large polyps in cluster at top of stem

## Size Information

- Up to 50cm

## Colour

- Polyps pink to red to brown, stalk white or pink

## Habitat Information

- Soft bottom; 200–2600m

# Pennatula

ITIS TSN: 52417 • ERMS AphiaID: 128495



## Physical Description

- Feather-like, with polyp leaves and a fleshy, thick stalk
- Leaves; 30 or more/leaf

## Size Information

- Up to 40cm and greater

## Colour

- Typically red to pink, but variable

## Habitat Information

- Soft bottom, 200–2300m

# Kophobelemnon stelliferum

ITIS TSN: 52361 • ERMS AphiaID: 128512



## Physical Description

- Feather-like, with long polyps growing on one side of stalk
- Bulbous root that is slightly curved

## Size Information

- Up to 6cm in height in the NAFO region

## Colour

- Colour can range from white or pale brown to purple, or red

## Habitat Information

- Soft bottom
- Recorded between 660 and 1260m but is known to occur from 40 to 2500m

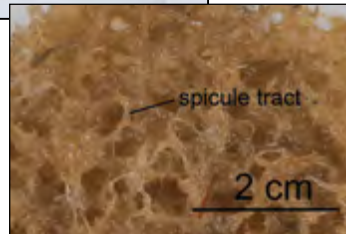


# Sponges



# Biemna variantia

ITIS TSN: 48284 • ERMS AphiaID: 133205



## Physical Description

- Encrusting cushion-shaped sponge that can grow to cup or plate-like forms; thinner at edges
- Dense tracts of spicules form a rigid lattice-like framework; stout tracts pointing out from the surface give the sponge a prickly appearance
- Texture firm but brittle, sometimes slimy

## Size Information

- Up to 15cm

## Colour

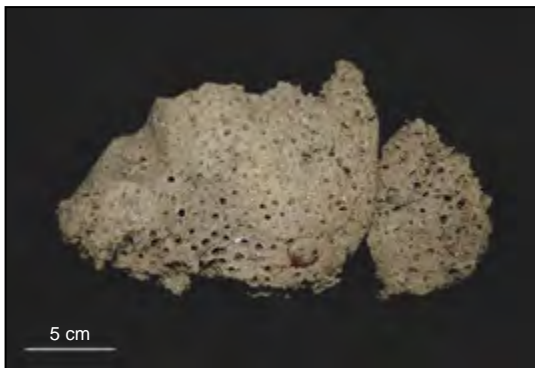
- Yellowish to brown with a pinkish hue

## Habitat Information

- Mud, gravel, rock outcrops

# Forcepia

ITIS TSN: 48049 • ERMS AphiaID: 131921



## Physical Description

- Encrusting to massive growth forms
- Consistency soft, easily broken
- Pores distributed over surface
- Can physically resemble other sponges including *Hamacantha*

## Size Information

- Up to 18cm

## Colour

- White to yellow, brown, grey or pink

## Habitat Information

- Sand, small gravel

# Geodia

ITIS TSN: 48612 • ERMS AphiaID: 132005



## Physical Description

- Massive round/lobed sponges with few or no holes in the surface
- Surface smooth, or rough with encrusting species; hard, sometimes wrinkled in appearance
- Can form “Sponge Grounds” and be found in large quantities

## Size Information

- Largest specimens recorded at 55cm

## Colour

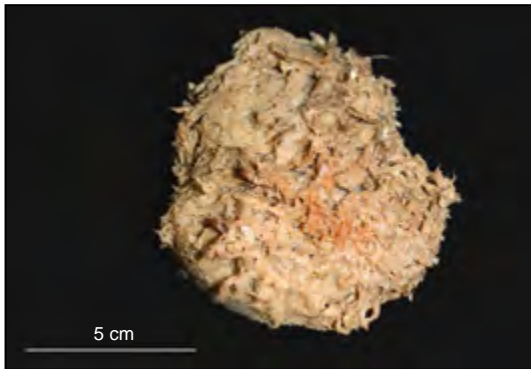
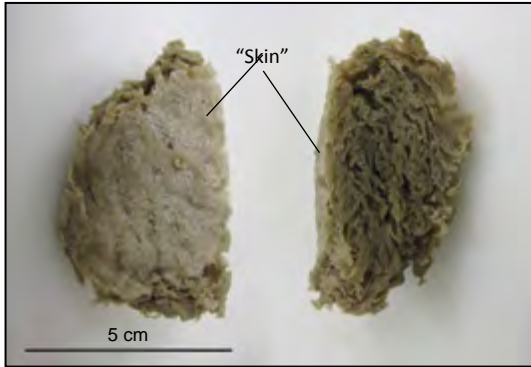
- Cream-yellow, white; pinkish or beige on the inside

## Habitat Information

- Gravel, rock outcrops

# Hamacantha carteri

ITIS TSN: 48299 (Genus) • ERMS AphiaID: 133230



## Physical Description

- Thick, soft, with an irregular but smooth surface and a thin "skin"
- "Skin" is closely-attached, usually intact
- Thickly encrusts on small rocks
- Often confused with *Mycale lingua*, but much less common; presence of "skin" is a diagnostic feature

## Size Information

- Up to 12cm

## Colour

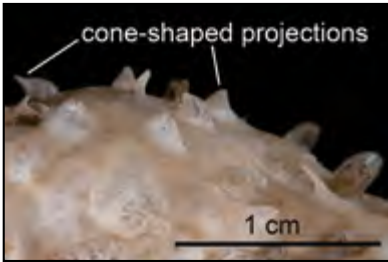
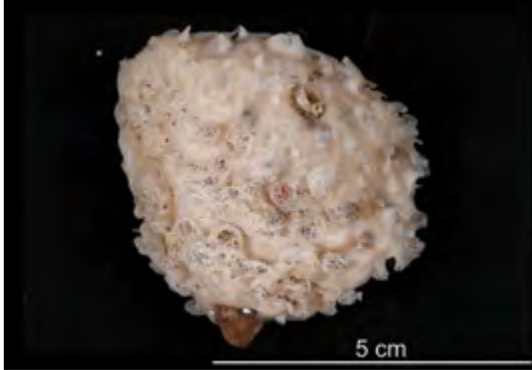
- Light brown, brownish-yellow, possibly grey

## Habitat Information

- Gravel, rock outcrops

# Melonanchora

ITIS TSN: 48079 • ERMS AphiaID: 131969



## Physical Description

- Globular with cone-shaped projections emerging from a parchment-like surface covering
- Sieve-like spicule mesh covers some openings
- Soft interior
- Other organisms or egg cases may be on or within openings

## Size Information

- Up to 10cm in diameter; possibly larger

## Colour

- Yellowish-white or whitish-grey

## Habitat Information

- Gravel, rock outcrops

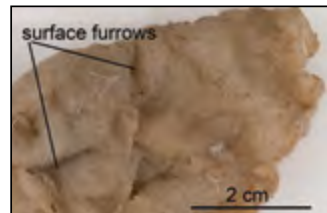
# Mycale lingua

ITIS TSN: 48202 • ERMS AphiaID: 168640



## Physical Description

- Body variable in shape, ranging from globular to pear-shaped
- Velvety surface tissue is furrowed; often easily detached
- Long, stringy root-like tracts extend from main body. Tracts are yellow in colour and are often broken off or collected separately
- Sometimes found with Cephalopod (i.e. octopus, squid, cuttlefish) eggs embedded



## Size Information

- Up to 30cm; possibly larger

## Habitat Information

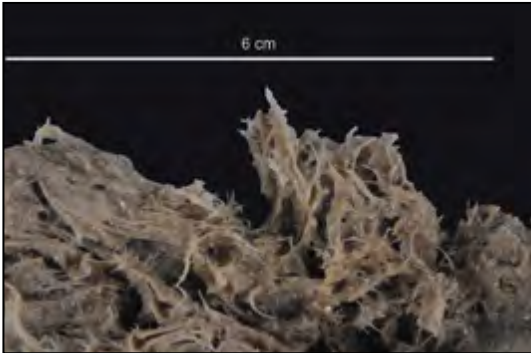
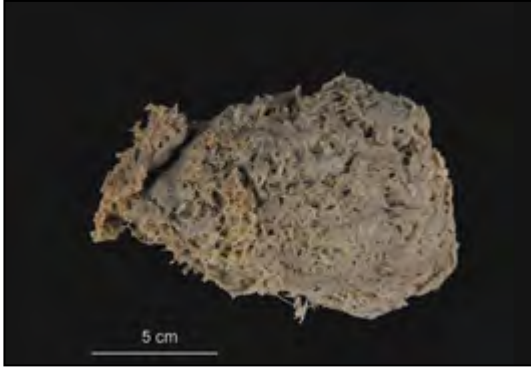
- Sand, gravel

## Colour

- Brown, cream, yellow, white

# Esperiopsis villosa

ITIS TSN: 48240 • ERMS AphiaID: 133272



## Physical Description

- Large lobed sponge with a hairy surface
- Can appear clumped or mat-like
- Dense spicule tracts are visible

## Size Information

- Up to 13cm in length and 3cm in width

## Colour

- Grey to yellow in colour

## Habitat Information

- Recorded between 140 and 1295m depth but known to occur to 2190m



# Spongionella pulchella

ITIS TSN: 47557 • ERMS AphiaID: 132335



## Physical Description

- Plate-shaped, thickly encrusting, or upright with a short stalk
- Very elastic/"spongy," hard to tear; surface smooth and soft; velvety appearance
- Openings set in small depressions, closely-spaced on the outer edge

## Size Information

- 5–10cm

## Colour

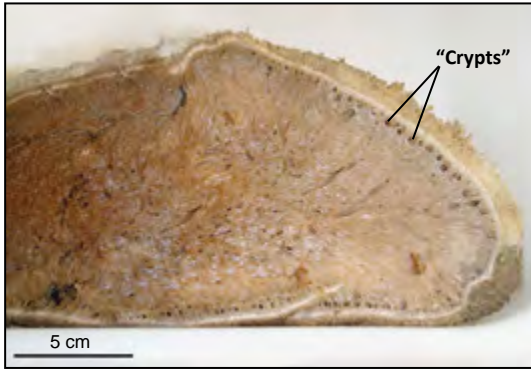
- Brown to brownish-yellow, possibly greenish-grey or cream

## Habitat Information

- Gravel, rock outcrops

# Stelletta

ITIS TSN: 48679 • ERMS AphiaID: 131994



## Physical Description

- More or less spherical, sometimes depressed
- Surface rough due to encrusting sponges; often surface is completely covered
- Similar to *Geodia*, but is more rough and much less common. When cut in cross-section, outer skin appears darker than the inner sponge
- "Crypts" (empty spaces) below surface often very pronounced, much more so than *Geodia*

## Size Information

- Up to 20cm in diameter

## Colour

- Brown, reddish and purplish on the exterior; white, pinkish and light yellow on the inside

## Habitat Information

- Gravel, rock outcrops

# Stryphnus fortis

ITIS TSN: 659254 (Genus) • ERMS AphiaID: 133988



## Physical Description

- Fairly hard, thick, rounded and irregularly-lobed. Sometimes bowl-shaped
- Surface rough, with many encrusting species attached. Spicules often come off when handling (wear gloves!)

## Size Information

- Up to 40cm in diameter

## Colour

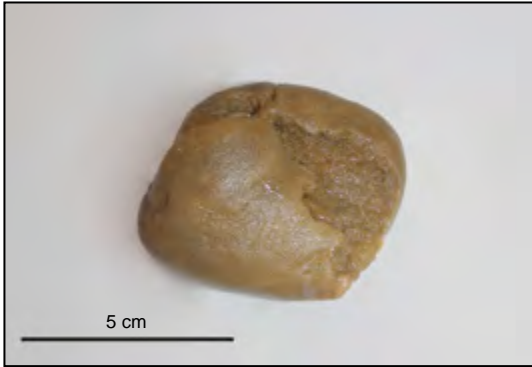
- Pinkish or brown, with encrusting species generally turning a dark purple when out of water

## Habitat Information

- Gravel, rock outcrops

# Suberites ficus

ITIS TSN: 48488 • ERMS AphiaID: 134285



## Physical Description

- Thick, lobed, sometimes cylindrical
- Firm, velvety appearance
- Often smells like garlic!

## Size Information

- Variable; up to 40cm in length

## Colour

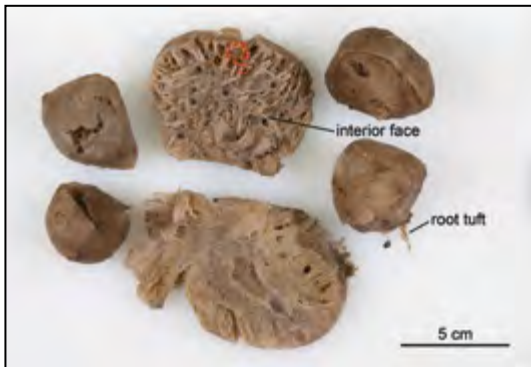
- Yellow to brown, usually yellow on the inside

## Habitat Information

- Gravel, rock outcrops; often found encrusting on shells

# Thenea

ITIS TSN: 48716 • ERMS AphiaID: 132019



## Physical Description

- Ovate or irregular sponge, sometimes with multiple surface openings
- May have a long equatorial furrow which can be covered with a sieve-like spicule mesh
- Root tufts anchor the sponges into substrate
- Surface rough like sandpaper
- Sponges sometimes split open during collection, exposing interior faces

## Colour

- White to brown

## Habitat Information

- Mud, sand

## Size Information

- 1 to 20cm

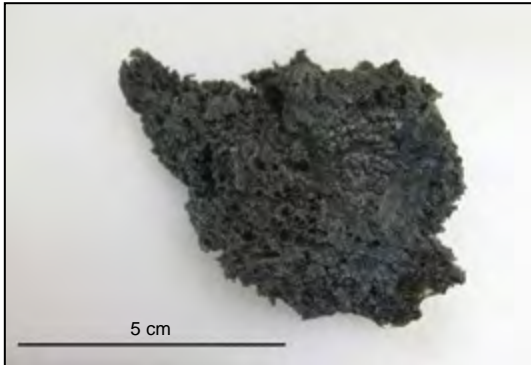
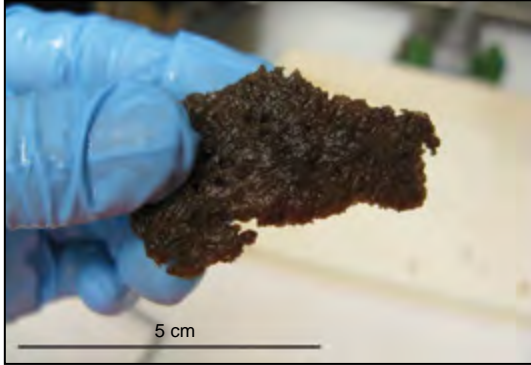


# Iophon piceum

ITIS TSN: 203967 (*I. piceus*) • ERMS AphiaID: 132972



Leaf/Vase-Shaped



## Physical Description

- Cup/leaf-shaped when intact, but most often found in pieces 0.5 to 1.5cm thick; easily broken
- Surface smooth or somewhat grooved
- Many small openings, generally more apparent on one side than the other

## Size Information

- Up to 16.5cm in height

## Colour

- Generally dark brown/black, also light brown

## Habitat Information

- Gravel, rock outcrops

# Axinellidae

ITIS TSN: 48329 • ERMS AphiaID: 131629

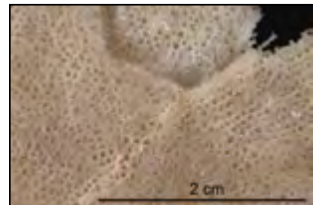


Leaf/Vase-Shaped



## Physical Description

- Cup or fan-shaped, or branching sponge attached by a stalk
- Can sometimes see a pattern of ribbed veins fanning out from stem
- Honey-combed surface appearance
- Surface smooth, velvety, or slightly rough



## Size Information

- Up to 30cm in height and 2mm–5cm thick

## Colour

- White to yellow

## Habitat Information

- Attached to gravel or rock



# Vazella pourtalesi

## Russian Hat

ITIS TSN: 659662 (Genus) • ERMS AphiaID: 172120 (Genus)



Leaf/Vase-Shaped



### Physical Description

- Thick (1–2cm), vase-shaped, with spicules projecting out from the outer surface, giving it a spikey appearance
- Many small holes; extend through entire wall

### Size Information

- Up to 30cm in height

### Colour

- White, grey, brown

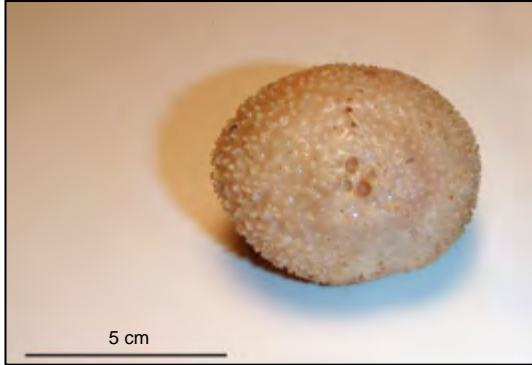
### Habitat Information

- Mud



# Craniella

ITIS TSN: 48627 • ERMS AphiaID: 132093



## Physical Description

- Ball-shaped, covered in small projections (“spikey”)
- Can sometimes see opening at the top, usually this is closed
- Has a tuft at the base, often not attached
- Cross-sections show the skeleton is spirally radiate



## Size Information

- 2-10cm in diameter

## Colour

- Varies between white, yellow, red, and beige

## Habitat Information

- Gravel, sometimes found attached to other sponges

# Polymastia/Weberella

ITIS TSN: 48506 • ERMS AphiaID: 132046 (POLYMASTIA)

ITIS TSN: 659295 • ERMS AphiaID: 132059 (WEBERELLA)



## Physical Description

- Dense globular or cushion-shaped sponges representing two different genera, with characteristic nipple-like projections known as papillae. The length, number and shape of papillae can be used to identify species.
- Attach to rock or other hard substrate; sometimes encrusting

## Size Information

- Usually small, with some up to 15cm, possibly larger

## Colour

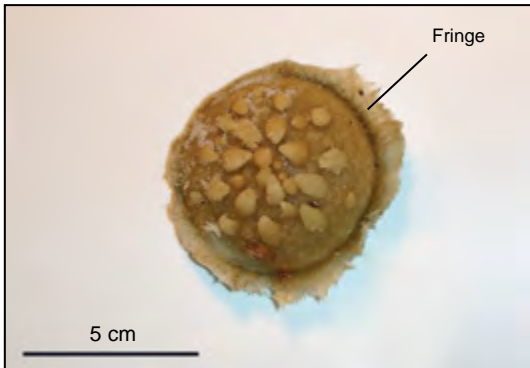
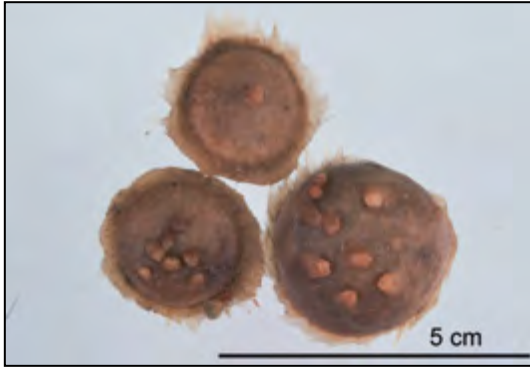
- Brown, reddish, yellow, white

## Habitat Information

- Gravel, rock outcrops

# Radiella hemisphaerica

ITIS TSN: 659290 (Genus) • ERMS AphiaID: 170674



Round with Projections

## Physical Description

- Hemispherical or disc-like in shape, with a crown-like fringe of spicules around the edge
- Up to 20 short cone-shaped papillae on the upper convex surface
- Firm consistency
- Smooth convex upper surface and fewer papillae distinguish this species from *Polymastia grimaldii*

## Size Information

- Up to 5cm in diameter

## Habitat Information

- Mud, gravel

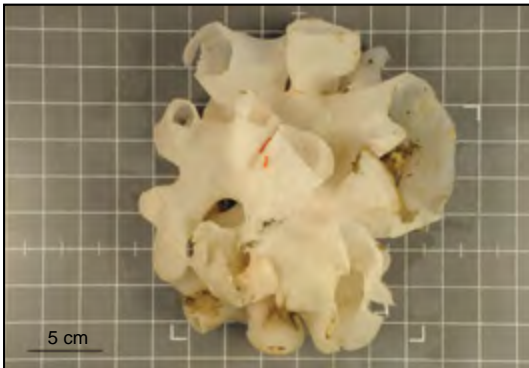
## Colour

- Light to dark brown



# Asconema foliata

ITIS TSN: 659654 (Genus) • ERMS AphiaID: 132122 (Genus)



Thin-Walled, Complex

## Physical Description

- Found in thin (1–2mm) fibreglass-like sheets with long linear fibres; fused tubes when intact
- Surface smooth, no holes, pulls apart very easily
- Sometimes associated brittle stars or crinoids attached

## Size Information

- Entire sponge up to 40cm across

## Colour

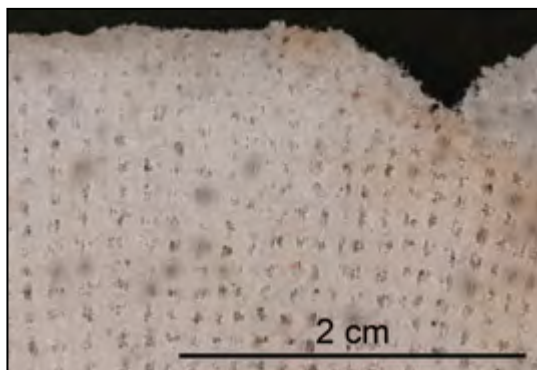
- White or grey, sometimes brown from sediment

## Habitat Information

- Gravel, rock outcrops

# Chonelasma choanoides

ITIS TSN: 47355 (Genus) • ERMS AphialD:132102 (Genus)



Thin-Walled, Complex

## Physical Description

- Thin (2–5mm), hard, and very brittle
- Distinct mesh-like pattern throughout
- Vase-shaped with flared edges when intact, but almost always found in small fragments

## Size Information

- Large intact specimens can approach 1m in width; typically less than 50cm

## Colour

- White, greyish, or brown from sediment (usually dead); often dead specimens have encrusting sponges which gives a hue of yellow, blue, or purple

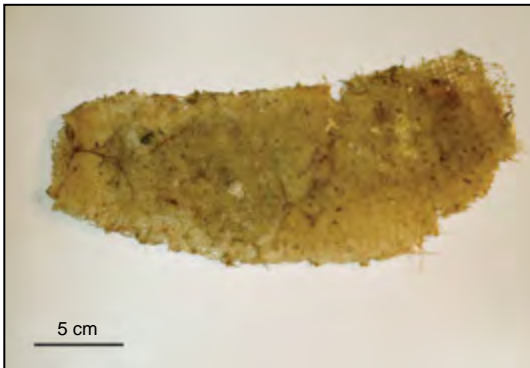
## Habitat Information

- Gravel, rock outcrops



# Dictyaulus

ITIS TSN: 659641 • ERMS AphiaID: N/A



Thin-Walled, Complex

## Physical Description

- Thin, tube-shaped sponge with complex, mesh-like surface; tube covered with larger mesh at one end, often torn at basal end
- Comes up flattened in trawls but relatively intact
- Sometimes two associated shrimp are found inside

## Size Information

- Up to 30cm in height, 15cm in diameter

## Colour

- White, greyish, or brown from sediment

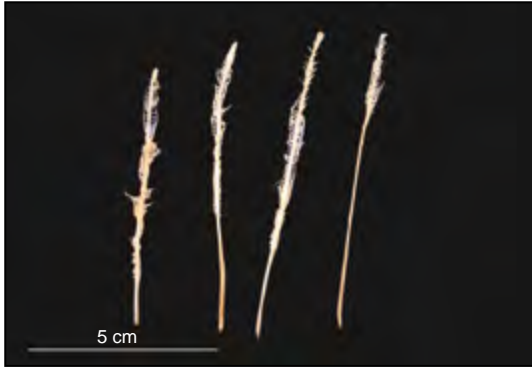
## Habitat Information

- Mud, gravel, rock outcrops



# Asbestopluma

ITIS TSN: 48263 • ERMS AphiaID: 131893



Stalked

## Physical Description

- Thin, pen/feather-shaped, one end with small branches and the other smooth and slightly widened

## Size Information

- Up to 10cm long

## Colour

- White to yellow

## Habitat Information

- Gravel, rock outcrops

# Chondrocladia

ITIS TSN: 48278 • ERMS AphiaID: 131894



Stalked

## Physical Description

- Long, thin arms with bulbous ends attached to a tough, straight stalk/ stem made of spiral (or slightly twisted) fibres
- Some referred to as “pine cones of the sea”

## Size Information

- Up to 30cm long, 10cm wide

## Colour

- Yellow, brown, orange, pink

## Habitat Information

- Mud, coral rubble

# Cladorhiza

ITIS TSN: 48274 • ERMS AphiaID: 131895



Stalked

## Physical Description

- Tree-like shape, often confused with coral
- Thin (generally less than 1cm), smooth, and straight, with alternating branches and root-like structures
- Branches bulbed at ends or pointed

## Size Information

- Can approach 1m in length, typically less than 20cm

## Colour

- Yellow, cream, pinkish, brown

## Habitat Information

- Mud

# Rhizaxinella

ITIS TSN: 659300 • ERMS AphiaID: 132071



Stalked

## Physical Description

- Long, thin, branching stalk, with a root-like support system
- Sponge body somewhat oval; distinguished from *Stylochordyla borealis* by its 'hairy' appearance

## Size Information

- Body up to 6cm long, 1cm wide; stalk up to 30cm long, 0.5cm wide

## Colour

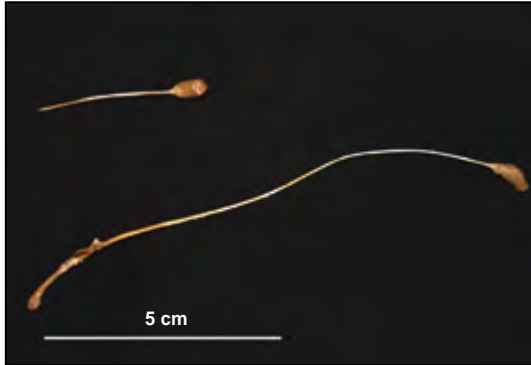
- Yellow, yellowish-grey

## Habitat Information

- Mud, gravel

# Stylocordyla borealis

ITIS TSN: N/A • ERMS AphiaID: 134240



Stalked

## Physical Description

- Club-shaped on a long, thin, unbranched stalk, with a root-like support system
- Sponge body is oval, somewhat flattened at the top, and smooth in appearance

## Size Information

- Up to 10cm long

## Colour

- White, greyish, brown

## Habitat Information

- Mud, sparse gravel





# Haliclona Dead Man's Fingers

ITIS TSN: 47771 • ERMS AphiaID: 131834



## Physical Description

- Finger-like projections, arising from a short stalk or base
- Velvety surface, with holes arranged in rows along branches

## Size Information

- Commonly between 10 and 30cm

## Colour

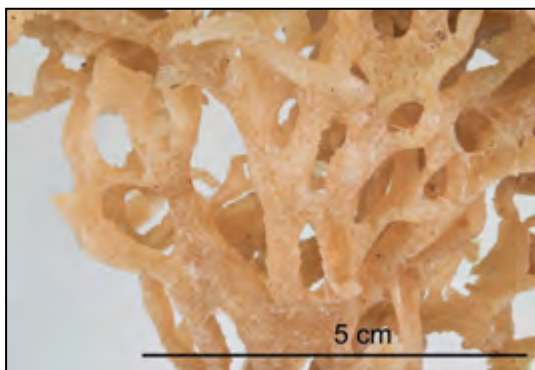
- Yellow, light brown, sometimes with a greenish or reddish tinge

## Habitat Information

- Gravel, rock outcrops, corals, other sponges

# Lissodendoryx complicata

ITIS TSN: 48067 (Genus) • ERMS AphiaID: 133430



Other

## Physical Description

- Bush-like sponge with branches that separate and rejoin in a net-like pattern
- Branches are flexible and elastic; surface slightly rough

## Size Information

- Up to 30cm in height, with branch widths up to 1cm

## Colour

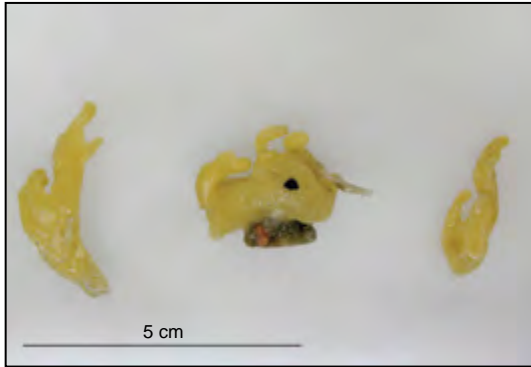
- White, yellow, orange, light brown

## Habitat Information

- Sand, gravel, or rock outcrops; recorded up to 2000m

# Homaxinella

ITIS TSN: 48340 • ERMS AphiaID: 131777



## Physical Description

- Small, tough, finger-like projections, sometimes branching

## Size Information

- Clumps can be 10–15cm, projections rarely more than 0.5cm wide

## Colour

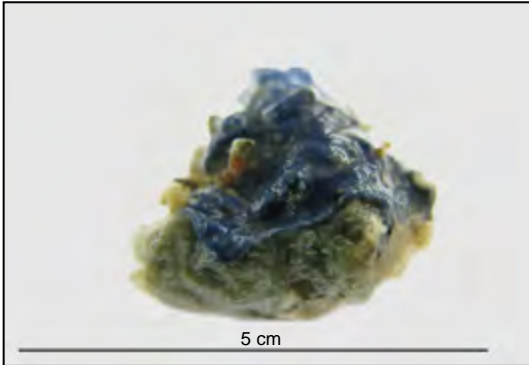
- Bright yellow, light brown

## Habitat Information

- Gravel, rock outcrops

# Hymedesmiidae

ITIS TSN: 48301 • ERMS AphiaID: 131655



## Physical Description

- Extremely thin (1-2mm) encrusting sponge, sometimes with projections or depressions/holes
- Sometimes a vein-like pattern can be seen
- Soft, sometimes slimy

## Size Information

- Patches up to 30cm wide

## Colour

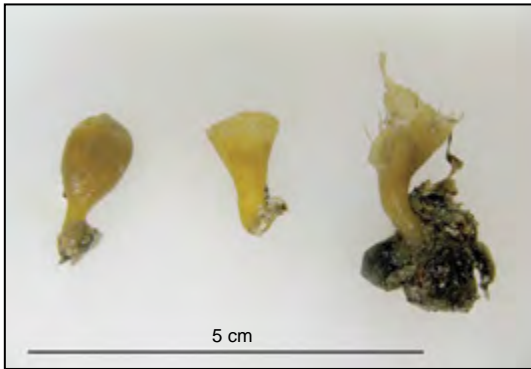
- Typically very bright colouration; blue, yellow, orange, green

## Habitat Information

- Gravel, rock outcrops

# Quasillina brevis

ITIS TSN: 659289 (Genus) • ERMS AphiaID: 134215



## Physical Description:

- Small, bladder-like, very thin, and often stalked; attached to pebbles and small stones
- Often found broken open
- Distinguished from *Tentorium semisuberites* by its thin walls and hollow body

## Size Information

- 2–4cm

## Colour

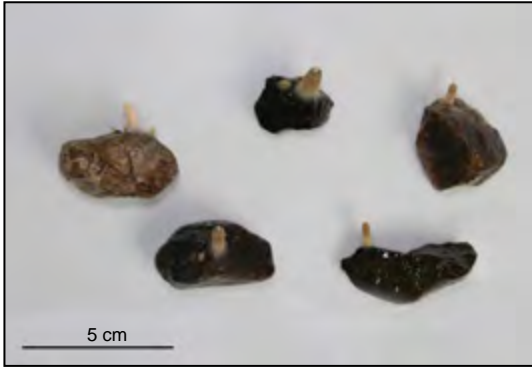
- Bright yellow; also dark yellow to brown

## Habitat Information

- Gravel, rock outcrops

# Tentorium semisuberites

ITIS TSN: 48497 • ERMS AphiaID: 134224



## Physical Description

- Toadstool-like, with a cylindrical body and a rounded top; one or more small projections arise from top, distinguishing it from *Quasillina brevis*
- Surface smooth or slippery
- Often smells like garlic when pinched

## Size Information

- Up to 4cm high, 3cm in diameter; often find several small individuals (<1cm) together

## Colour

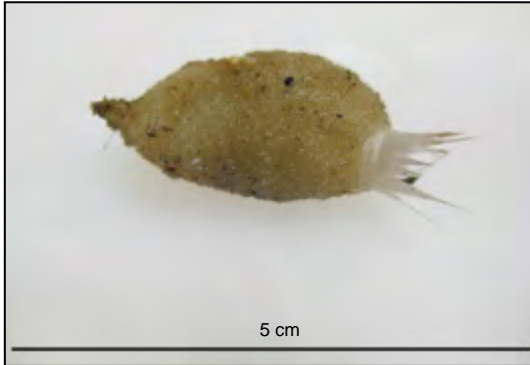
- Light pink, pinkish-brown, yellowish-grey

## Habitat Information

- Mud, gravel, rock outcrops

# Sycon

ITIS TSN: 47050 • ERMS AphiaID: 131723



## Physical Description

- Tube-shaped, with a tuft of stiff spicules at opening
- “Hairy” surface, sometimes smooth
- Most often found as individuals, sometimes clustered

## Size Information

- Up to 9cm long, though usually 1–3cm

## Colour

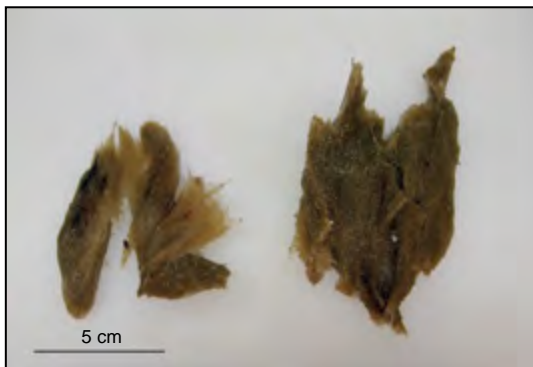
- Off-white, grey, brown

## Habitat Information

- Gravel, rock outcrops

# Spicule clumps

ITIS TSN: 46861 (Porifera) • ERMS AphiaID: 558 (Porifera)



## Physical Description

- Mass of sponge spicules with no discernable structure, often embedded with sediment
- Can occur in large mats on the sea floor

## Size Information

- Small 1cm balls to 20cm clumps

## Colour

- Whitish, grey, and brown

## Habitat Information

- Mud



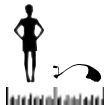
# Other VME Indicator Taxa



# Boltenia ovifera

## Sea Squirt

ITIS TSN: 159485 • ERMS AphiaID: 103815



### Physical Description

- A pale-coloured bulb with two openings that is attached to a stalk with a root-like base
- The stalk is usually two to three times the length of the bulb
- Commonly called “sea potato” or “sea onion”

### Size Information

- Up to 150cm long including the stalk

### Colour

- Colour light brown to orange-red

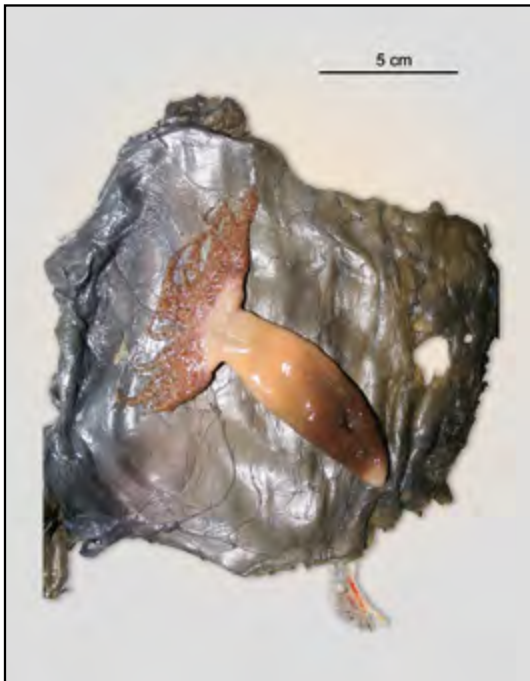
### Habitat Information

- Recorded between 40 and 570m depth but known to occur from 10 to 1800m
- Attached to rock

# Pachycerianthus borealis

## Tube-Dwelling Anemone

ITIS TSN: 51988 (Cerianthus borealis) • (WoRMS AphialID): 283816



### Physical Description

- A large thick pale tube with two rings of tentacles with the tube covered by a thick coat
- The inner ring of tentacles is usually shorter than the outer ring
- The tube coat can be slimy and covered with sand grains

### Size Information

- Up to 45cm long with the tentacle rings 22cm wide

### Colour

- Can be a different colour (red, purple, yellow, white)

### Habitat Information

- Recorded between 140 and 150m depth but known to occur to 1500m
- Found on sand or mud

# Eucratea loricata

## Erect Bryozoan

ITIS TSN: 155809 • ERMS AphiaID: 111361



### Physical Description

- A clump of soft branching stalks
- Often whitish or light-brown in colour

### Size Information

- Clumps often 10cm high, but can reach up to 25cm

### Colour

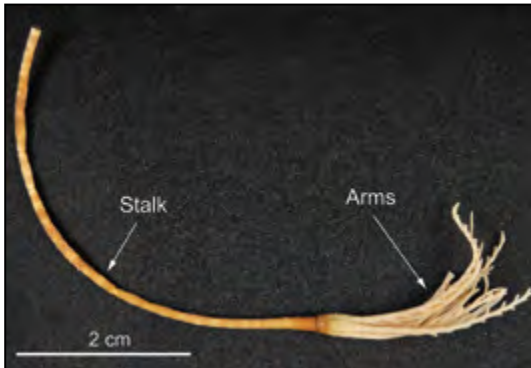
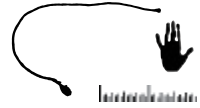
- Often whitish or light-brown in colour

### Habitat Information

- Recorded at depths up to 100m
- Attached to rock

# Conocrinus lofotensis Sea Lily (Crinoid)

ITIS TSN: 158615 (Rhizocrinus lofotensis) • ERMS AphiaID: 562035



## Physical Description

- Thin, segmented stalk, sometimes with attached head that resembles a flower. Head usually contains 5, feathery arms
- Commonly called a “sea lily”

## Size Information

- Stalk is up to 7.5cm in length, head an additional 2cm

## Colour

- Yellow or grey

## Habitat Information

- Soft bottom
- Has been recorded between 140 and 3475m depth

# Notes

# NAFO Scientific Council Studies

- No. 1. Miscellaneous Selected Papers (101 pages, published March 1981)
- No. 2. Manual on Groundfish Surveys in the Northwest Atlantic. W. G. Doubleday, Editor (55 pages, published December 1981)
- No. 3. Miscellaneous Selected Papers (82 pages, published April 1982)
- No. 4. Special Session on Remote Sensing, September 1981 (98 pages, published September 1982)
- No. 5. Symposium on Environmental Conditions in the Northwest Atlantic During 1970–79, September 1981 (113 pages, published December 1982)
- No. 6. Miscellaneous Selected Papers (103 pages, published December 1983)
- No. 7. Miscellaneous Selected Papers (97 pages, published August 1984)
- No. 8. Miscellaneous Selected Papers (95 pages, published April 1985)
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- No. 10. Miscellaneous Selected Papers (112 pages, published August 1986)
- No. 11. Miscellaneous Selected Papers (128 pages, published March 1987)
- No. 12. Miscellaneous Selected Papers (90 pages, published March 1988)
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- No. 14. Miscellaneous Selected Papers (82 pages, published November 1989)
- No. 15. Miscellaneous Selected Papers (68 pages, published May 1991)
- No. 16. Special Session on Management Under Uncertainties, September 1990 (189 pages, published November 1991)
- No. 17. Workbook – Introduction to Sequential Population Analysis (98 pages, published February 1993)
- No. 18. Symposium on Changes in Abundance and Biology of Cod Stocks and Their Possible Causes (110 pages, published July 1993)
- No. 19. Miscellaneous Selected Papers (98 pages, published October 1993)
- No. 20. Miscellaneous Selected Papers (113 pages, published February 1994)
- No. 21. Collection of Papers Related to Northern Cod and Seals in NAFO Divisions 2J and 3KL, Papers from June 1993 (165 pages, published December 1994)
- No. 22. Miscellaneous Selected Papers (95 pages, published May 1995)
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- No. 27. Miscellaneous Selected Papers (81 pages, published December 1996)
- No. 28. Assessment of Groundfish Stocks Based on Bottom Trawl Survey Results (105 pages, published December 1996)
- No. 29. Selected Studies Related to Assessment of Cod in NAFO Divisions 2J+3KL (125 pages, published May 1997)

- No. 30. Miscellaneous Selected Papers (117 pages, published December 1997)
- No. 31. Miscellaneous Papers (165 pages, published December 1998)
- No. 32. Miscellaneous Papers (133 pages, published April 1999)
- No. 33. Miscellaneous Papers (135 pages, published May 2000)
- No. 34. Miscellaneous Papers (91 pages, published October 2001)
- No. 35. Workshop: The Canada-United States Yellowtail Flounder Age Reading (68 pages, published December 2002).
- No. 36. Workshop on Assessment Methods (320 pages, published May, 2003)
- No. 37. Working Group on Reproductive Potential (378 pages, published August, 2003)
- No. 38. Yellowtail Flounder Ageing Manual (54 pages, published May, 2005)
- No. 39. Workshop on Mapping and Geostatistical Methods for Fisheries Stock Assessment (50 pages, published May, 2005)
- No. 40. Identification of Wolffish, Hake and rockling in the Northwest Atlantic (7 pages, published 2007)
- No. 41. Report of the Greenland Halibut (*Reinhardtius hippoglossoides*) Age Determination Workshop (96 pages, published 2008)
- No. 42. Coral Identification Guide NAFO Area (35 pages, published 2009)
- No. 43. Sponge Identification Guide NAFO Area (52 pages, published 2010)
- No. 44. Report of the Workshop on Implementation of Stock Reproductive Potential into Assessment and Management Advice for Harvested Marine Species (75 pages, published 2012)
- No. 45. NAFO Research Vessel Stock-by-Stock Surveys Summary 2000–2010 (91 pages, published 2013)
- No. 46. Protocols of the EU bottom trawl survey of Flemish Cap (41 pages, published 2014)
- No. 47. Coral, Sponge, and Other Vulnerable Marine Ecosystem Indicator Identification Guide, NAFO Area (74 pages, 2015)



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No. 47 (2015) Kenchington, E., L. Beazley, F. J. Murillo, G. Tompkins MacDonald and E. Baker. 2015. Coral, Sponge, and Other Vulnerable Marine Ecosystem Indicator Identification Guide, NAFO Area.....		Online
No. 46 (2014) Vázquez A., J. M.I Casas and R. Alpoim. Protocols of the EU bottom trawl survey of Flemish Cap.....		Online only
No. 45 (2013) NAFO Secretariat. NAFO Research Vessel Stock-by-Stock Surveys Summary 2000–2010.....		Online only
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The Journal is for the primary publication of original practical and theoretical research that is unpublished and is not being submitted for publication elsewhere. While it is intended to be regional in scope, papers of general applicability and methodology may be considered. Space is also provided for notes, letters to the editor and notices. Each paper is assigned to an Associate Editor of the Journal's Editorial Board, and is normally reviewed by two referees regarding suitability as a primary publication.

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The Studies publishes papers which are of topical interest and importance to the current and future activities of the Scientific Council, but which do not meet the high standards or general applicability required by the Journal. Such papers have usually been presented as research documents at Scientific Council meetings and nominated for publication by the Standing Committee on Publications. Studies papers are not peer reviewed.

### Content of Paper

The paper should be in English. The sequence should be: Title, Abstract, Text, References, Tables and Figures.

#### Title

The paper should start with the title, followed by the name(s), address(es) and emails of the author(s) including professional affiliation, and any related footnotes.

#### Abstract

An informative concise abstract should be provided along with key words listed alphabetically.

#### Text

In general, the text should be organized into Introduction, Materials and Methods, Results, Discussion, and Acknowledgements. Authors should be guided by the organization of papers that have been published in the NAFO Journal or Studies.

**Introduction** should be limited to the purpose and rationale of the study.

**Materials and Methods** should describe in sufficient detail the materials and methods used, so as to enable other scientists to evaluate or replicate the work.

**Results** should answer the questions evolving from the purpose of the study in a comprehensive manner and in an orderly and coherent sequence, with supporting tables and figures.

**Discussion** should explain the main contributions from the study, with appropriate interpretation of the results focusing on the problem or hypothesis. Comparisons with other studies should be included here.

**Acknowledgements** should be limited to the names of individuals who provided significant scientific and technical support, including reviewers, during the preparation of the paper, and the names of agencies which provided financial support.

#### References

The references cited in the text should be listed alphabetically. References should be mainly restricted to significant published literature. Unpublished documents and data, papers in preparation, and papers awaiting acceptance to other journals, may be cited with full contact addresses as unpublished or personal communications.

#### Examples:

KING, M. 1995. Fisheries biology, assessment and management. Fishing News Books, UK, 341 p.

CROWDER, L. B., and S. A. MURAWSKI. 1998. Fisheries by-catch: implications for management. *Fisheries*, **23**: 8–16. doi:10.1577/1548-8446(1998)023<0008:FBIFM>2.0.CO;2

ÁVILA DE MELO, A. M., D. POWER, and R. ALPOIM. MS 2005. An assessment of the status of the redfish in NAFO Division 3LN, *NAFO SCR Doc.*, No. 52, Serial No. 5138, 19 p.

Text citations of the above would be (King, 1995; Crowder and Murawski, 1998; Ávila de Melo *et al.*, MS 2005). The surnames of two authors may be used in a citation, but *et al.* should be used for more than two authors. The citation of mimeographed reports and meeting documents should contain the abbreviation "MS". Abbreviations of periodicals can be found [ftp://ftp.fao.org/fi/asfa/Monitoring\\_List/MASTER.txt](ftp://ftp.fao.org/fi/asfa/Monitoring_List/MASTER.txt). The Digital Object Identifier (doi) should be included if available. <http://www.crossref.org/freeTextQuery/> can be used to check this.

#### Tables and Figures

All Tables and Figures must be cited in the text. Tables and Figures must be numbered consecutively and correspond with the order of presentation in the text. Figure captions should be included as a separate page. Each table and figure should have a complete concise descriptive caption. Figures should always be submitted in black and white. Colour plots and photographs are acceptable only if colour is essential to the content. Preferably, all figures should be submitted as separate files in .eps or .ps format. Photographs, maps and contour plots can also be submitted in high quality .jpg format.

If using excel, open the files in R and save the graphs by right clicking and saving as metafiles or postscript files.

If using SlideWrite copy the files as Metafiles (WMF). Do not save them as bitmap files. They are not editable.

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