

Deep-water Pennatulacea

A guide

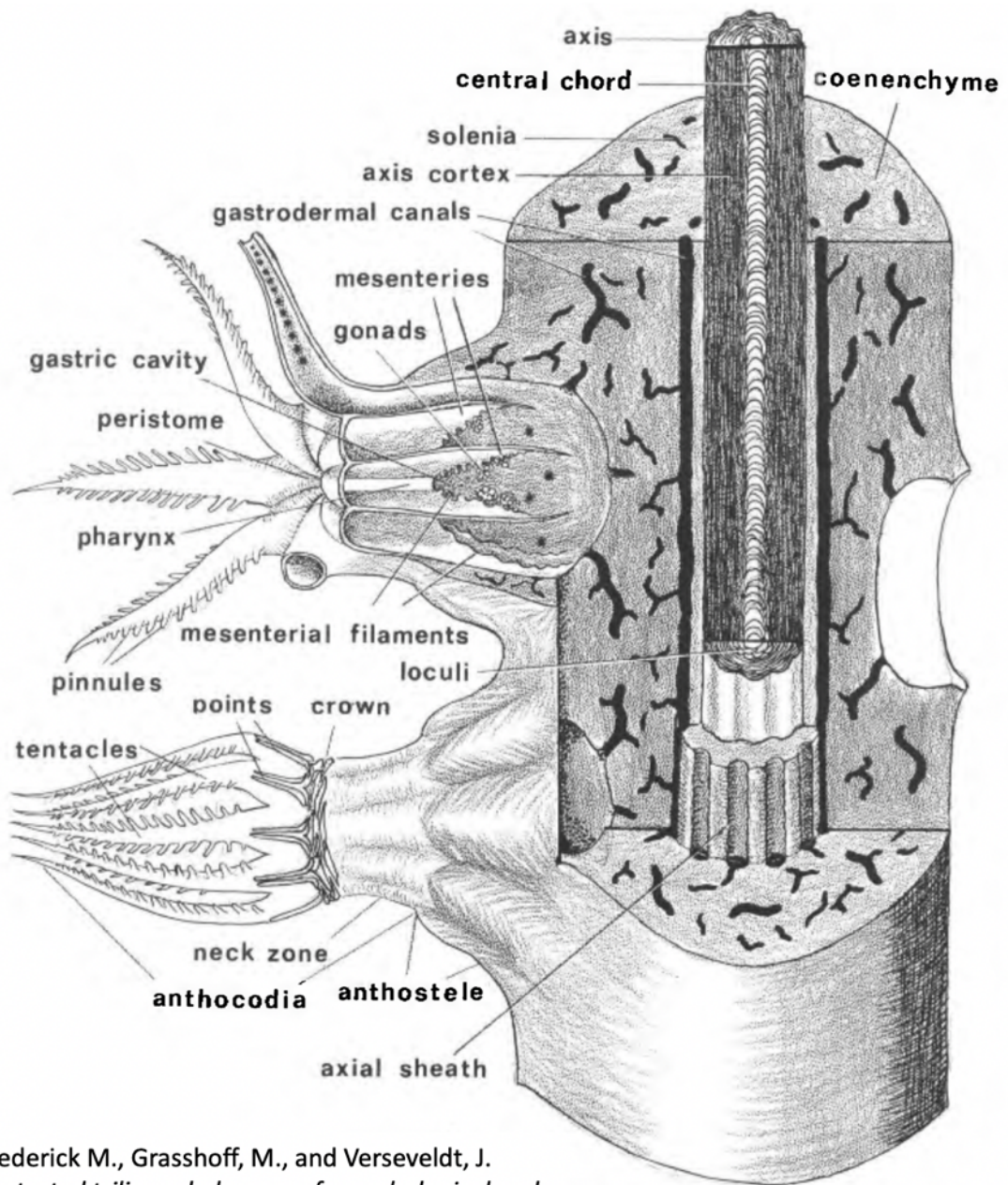


Credit: NOAA/OAR/OER, 2016 Deepwater Exploration of the Marianas, Leg 1.

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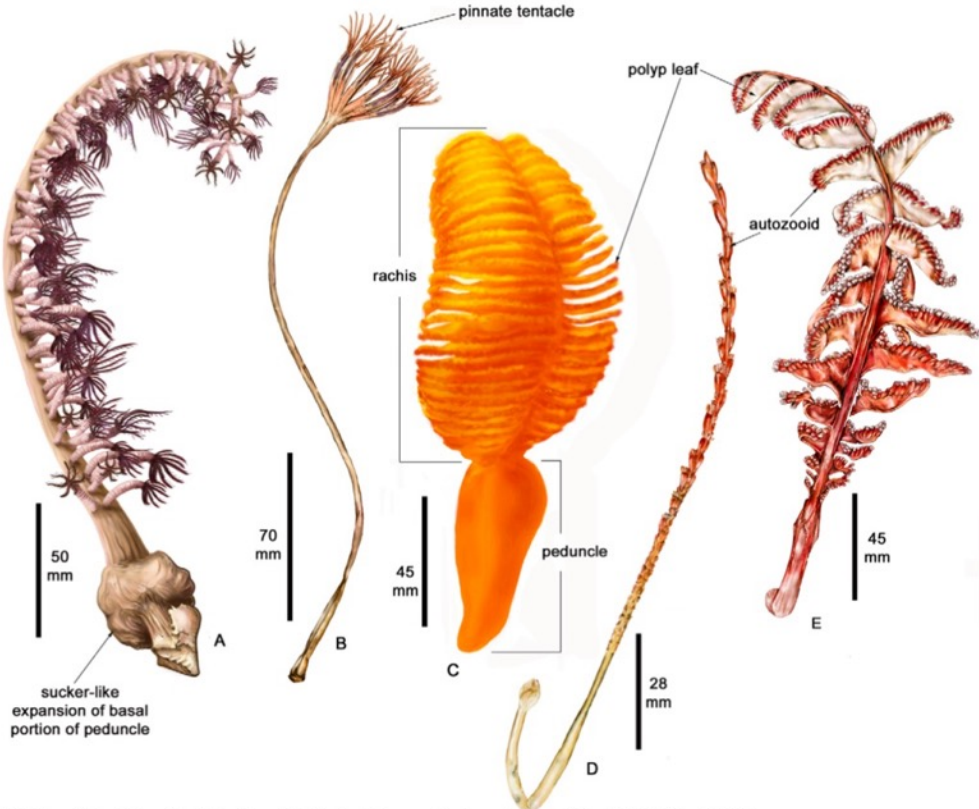
Terminology

An alyconacean polyp

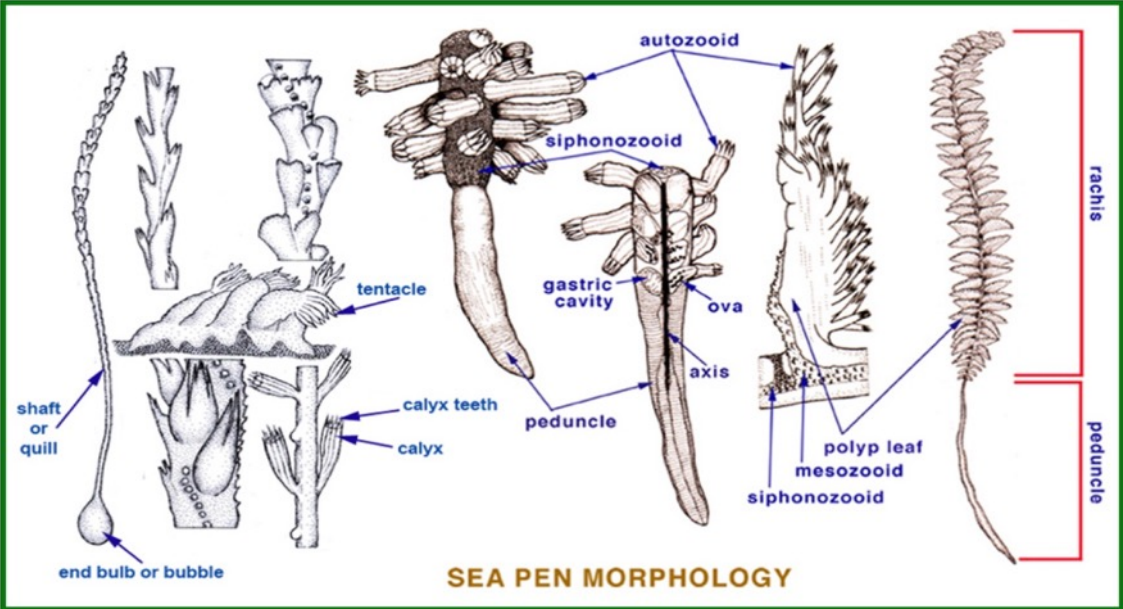


Bayer, Frederick M., Grasshoff, M., and Verseveldt, J. 1983. *Illustrated trilingual glossary of morphological and anatomical terms applied to Octocorallia*. E.J. Brill.

Specific sea pen terminology



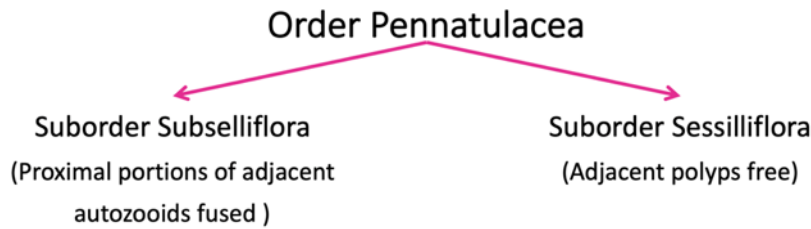
Williams GC (2011) The Global Diversity of Sea Pens (Cnidaria: Octocorallia: Pennatulacea). PLoS ONE 6(7): e22747



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Classification

Higher-level

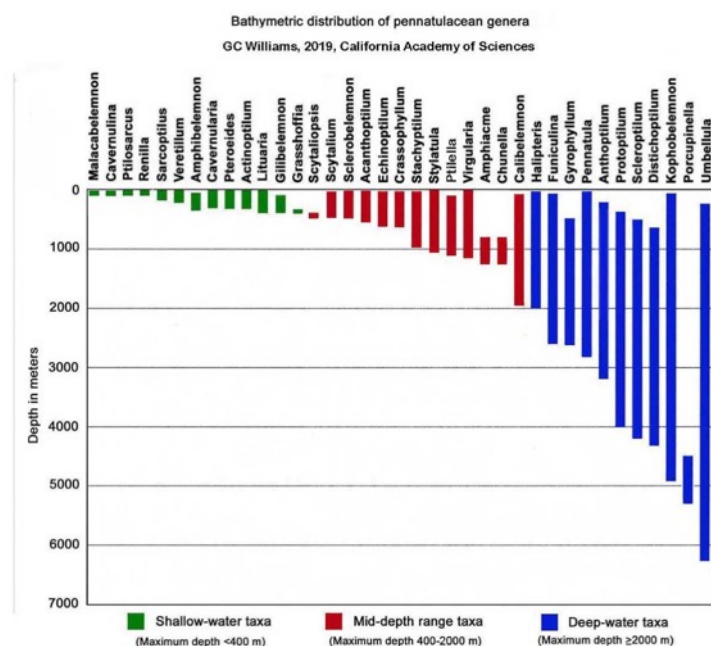


Generic

Subselliflorae	# Genera	Genera
Family Balticinidae	1	<i>Balticina</i> [=Halipteris]
Family Pennatulidae	7	<i>Pennatula</i> , <i>Crassophyllum</i> , <i>Gyrophyllum</i> , <i>Pteroeides</i> , <i>Ptilella</i> , <i>Ptilosarcus</i> , <i>Sarcoptilus</i>
Family Virgulariidae	6	<i>Virgularia</i> , <i>Acanthoptilum</i> , <i>Grasshoffia</i> , <i>Scytaliopsis</i> , <i>Scytalium</i> , <i>Stylatula</i>
Sessilliflorae	# Genera	Genera
Family Anthoptilidae	1	<i>Anthoptilum</i>
Family Chunellidae	3	<i>Chunella</i> , <i>Amphiacme</i> , <i>Porcupinella</i>
Family Echinoptilidae	2	<i>Echinoptilum</i> , <i>Actinoptilum</i>
Family Funiculinidae	1	<i>Funiculina</i>
Family Kophobelemnidae	3	<i>Kophobelemnon</i> , <i>Malacobelemnon</i> , <i>Sclerobelemnon</i>
Family Protoptilidae	2	<i>Protoptilum</i> , <i>Distichoptilum</i>
Family Renillidae	1	<i>Renilla</i>
Family Scleroptilidae	2	<i>Scleroptilum</i> , <i>Calibelemnon</i>
Family Stachyptilidae	2	<i>Stachyptilum</i> , <i>Gilibelemnon</i>
Family Umbellulidae	1	<i>Umbellula</i>
Family Veretellidae	5	<i>Veretillum</i> , <i>Amphibelemnon</i> , <i>Cavernularia</i> , <i>Cavernulina</i> , <i>Lituaria</i>

Shallow, Mid-range, Deep

Depth Distribution by genus



Original version published as Williams GC (2011) The Global Diversity of Sea Pens (Cnidaria: Octocorallia: Pennatulacea). PLoS ONE 6(7): e22747

Updated version shown here kindly provided by Gary Williams

Note: as of May 2021, *Halipteris* is a jun. syn. of *Balticina*. See: Pérez et al. 2021. Revised nomenclature of the sea pen genus *Balticina* Gray, 1870 (= *Halipteris* Kölliker, 1870) (Anthozoa: Octocorallia). *Zootaxa* 4966 (2): 237–244.

Gross morphology photo ID key

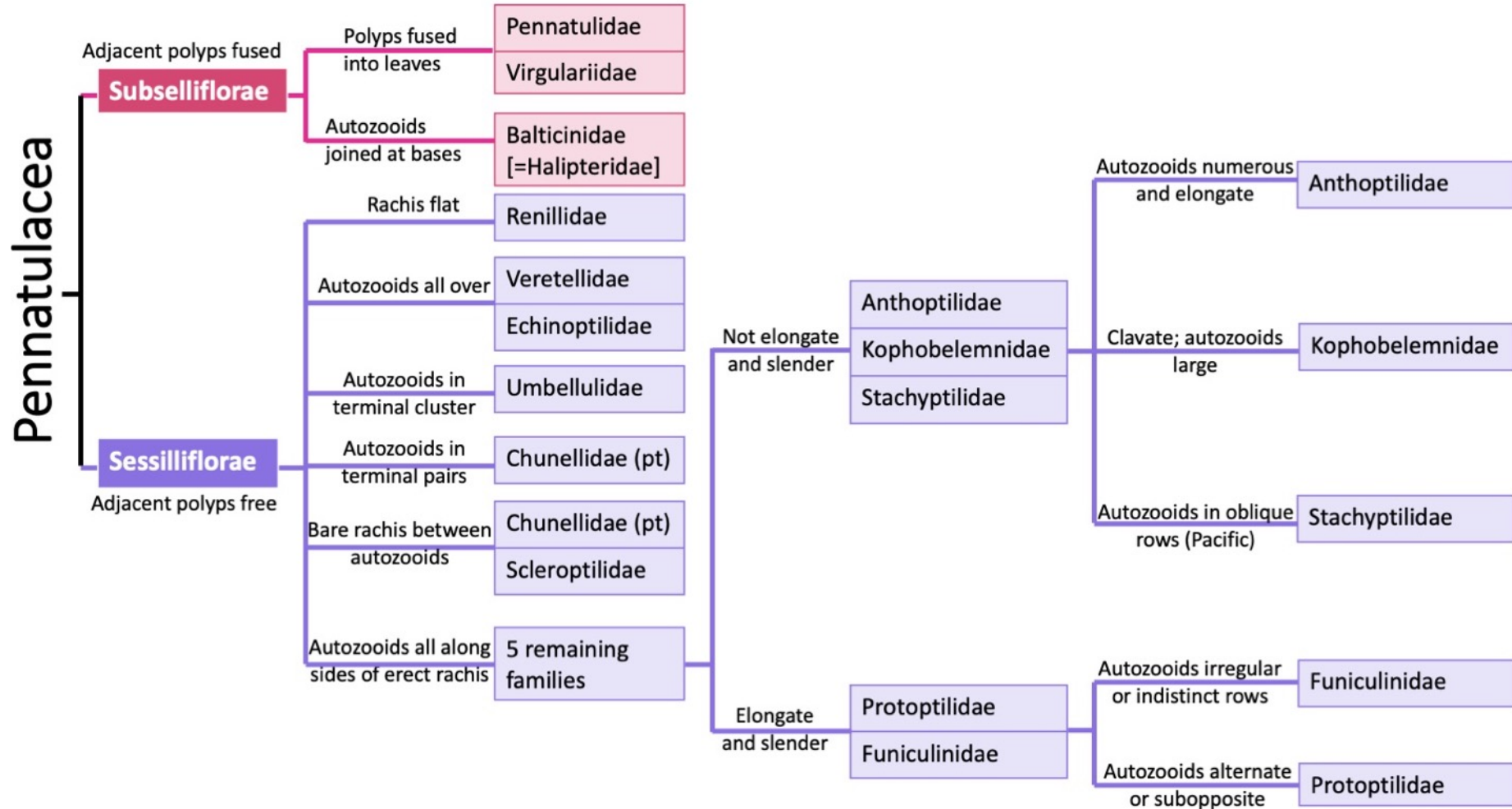


Photo Guide
Pennatulidae

North East Atlantic deep-water species

Pennatula

- Rachis-peduncle limit just under the lower polyp leaves, as a narrowing, *without a distinct thickening or swelling*.
- Autozooids in *one single row along the ventral edge* of polyp leaves.

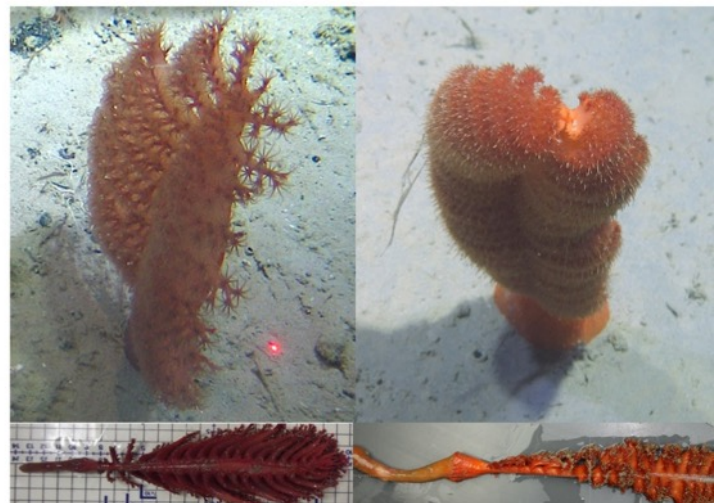


Pennatula phosphorea (left)
Ptilella grandis (right)
Ptilella grayi (far right)

Credit: NUI Galway
© Marine Institute

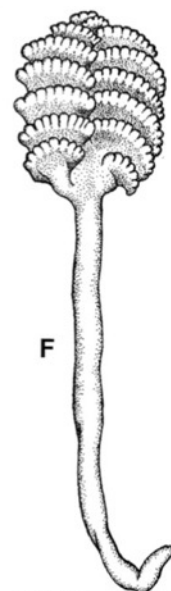
Ptilella

- Rachis-peduncle limit *with a distinct thickening or swelling*.
- Autozooids in groups of 3-4 (occasionally 2) polyps on ventral edge of polyp leaves, groups of polyps in oblique lines.



Gyrophyllum

- Clavate; polyp leaves thick, fleshy, and fan-like, 6–9 leaves per side of rachis. Autozooids 20–50 per leaf, in two rows at the leaf margin.
- 1 species – *Gyrophyllum hirondelle*



Williams GC (1995) Living genera of sea pens (Coelenterata: Octocorallia: Pennatulacea): illustrated key and synopses. Zoological Journal of the Linnean Society, 113: 93–140.

Balticinidae [=Halipteridae]

North East Atlantic deep-water species

***Balticina* [=Halipteris]**

Balticina: 1 species – probably *B. finmarchica* but difference between *B. christii* and *B. finmarchica* not defined.



Umbellulidae

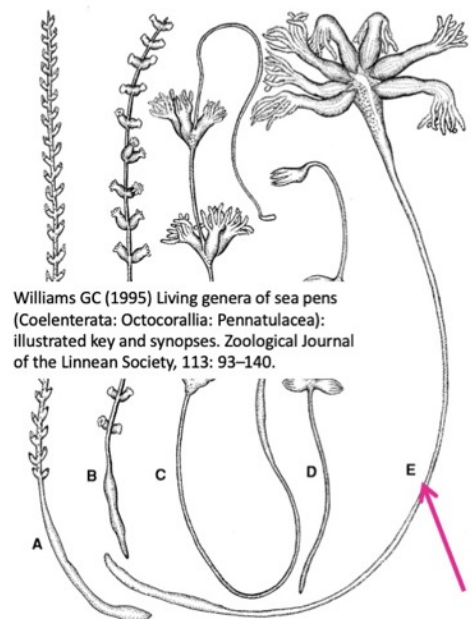
North East Atlantic deep-water species

Umbellula

Umbellula: At least 3 (probably indistinguishable) species present and these are not closely related. Expect taxonomic changes in the future.



Umbellula
Credit: NUI Galway, © Marine Institute



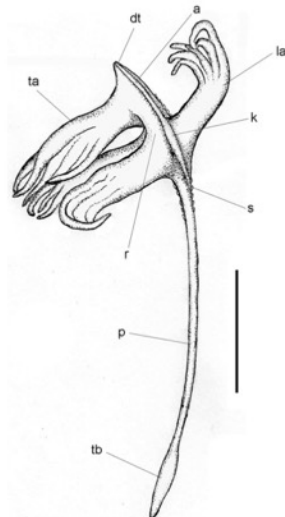
Williams GC (1995) Living genera of sea pens (Coelenterata: Octocorallia: Pennatulacea): illustrated key and synopses. Zoological Journal of the Linnean Society, 113: 93–140.

Chunellidae

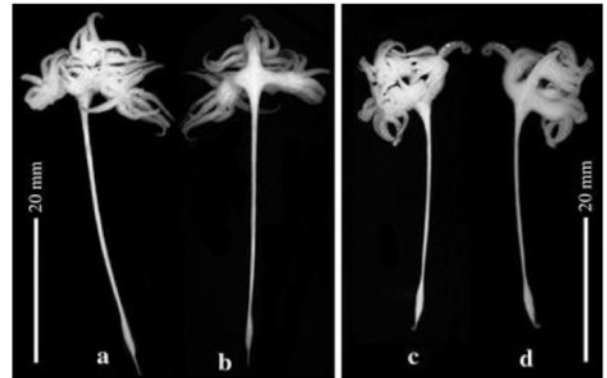
Chunellidae (part)

Defining Features: Pairs of lateral polyps congested in distal region of rachis

Williams GC (2021) The deep-sea pennatulacean genus *Porcupinella* – with the description of a new species from Tasmania (Anthozoa, Octocorallia, Chunellidae). *ZooKeys*, 1019: 1–14



Lopez-Gonzalez P & Williams GC (2011) A new deep-sea pennatulacean (Anthozoa: Octocorallia: Chunellidae) from the Porcupine Abyssal Plain (NE Atlantic). *Helgolander Marine Research*, 65: 309–318



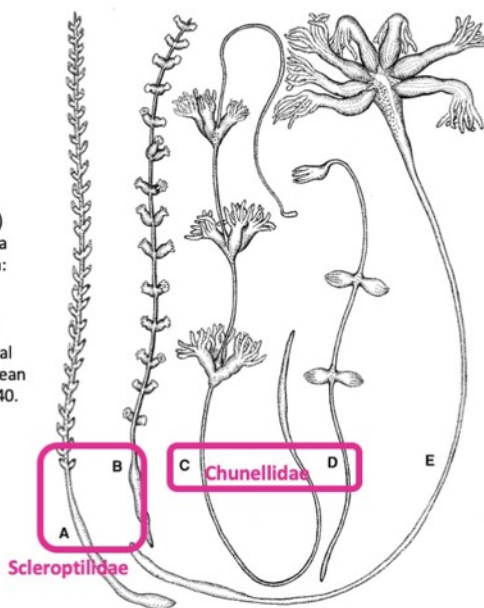
North East Atlantic deep-water species:

Porcupinella: 1 species – *Porcupinella profundorum* [Known specimens <5 cm total length]

Chunellidae & Scleroptilidae

Defining Features: Bare rachis between polyps

Williams GC (1995) Living genera of sea pens (Coelenterata: Octocorallia: Pennatulacea): illustrated key and synopses. *Zoological Journal of the Linnean Society*, 113: 93–140.



Scleroptilum
Credit: David Shale / MAREco

North East Atlantic deep-water species:
Scleroptilum: 1 species – *Scleroptilum grandiflorum*.

Protoptilidae

North East Atlantic deep-water species

Protoptilidae: *Distichoptilum*

- One species world wide: *Distichoptilum gracile*



Distichoptilum gracile (left)
Protoptilum sp. (right)

Credit: NUI Galway
© Marine Institute

Protoptilidae: *Protoptilum*

- At least four species in the North Atlantic
- *Protoptilum carpenteri* Kölliker, 1872; *P. denticulatum* Jungersen, 1904; *P. smitti* Lölliker, 1872; *P. thomsoni* Kölliker, 1872



Funiculinidae

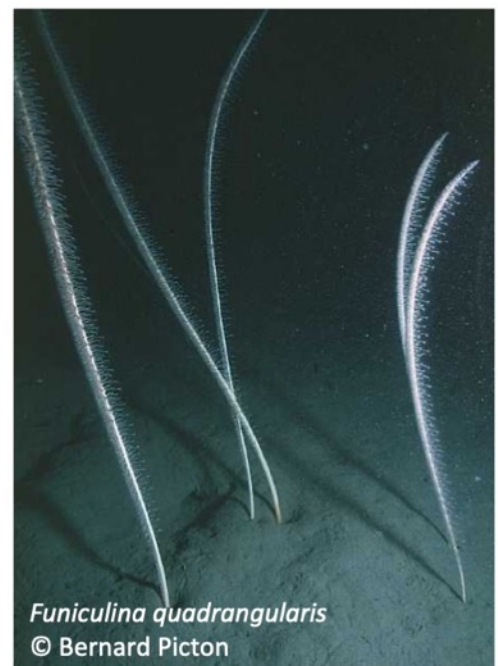
North East Atlantic deep-water species

Funiculinidae: *Funiculina*

- One species in North East Atlantic: *Funiculina quadrangularis* (Pallas, 1776)



Funiculina quadrangularis
Credit: NUI Galway © Marine Institute



Funiculina quadrangularis
© Bernard Picton

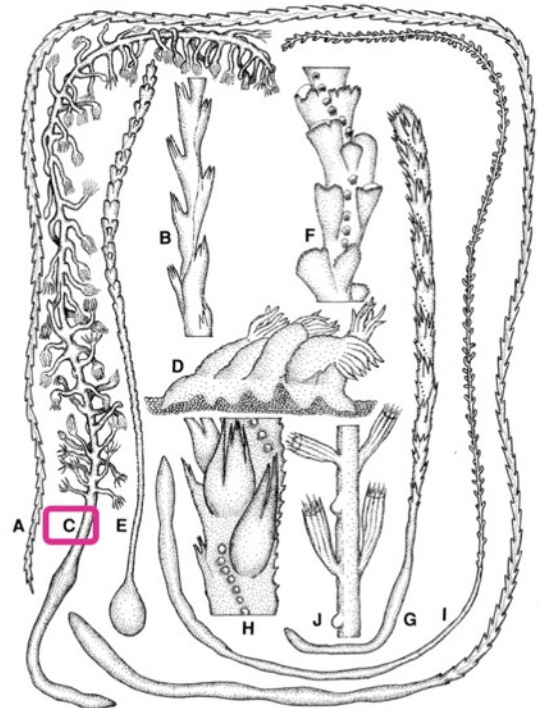
Anthoptilidae

Anthoptilidae

Defining Features: Autozooids all along sides of erect rachis
 Not elongate and slender
 Autozooids numerous and elongate



Anthoptilum. Credit: NOAA OKEANOS EXPLORER Program; Our Deepwater Backyard: Exploring Atlantic Canyons and Seamounts 2014



Williams GC (1995) Living genera of sea pens (Coelenterata: Octocorallia: Pennatulacea): illustrated key and synopses. *Zoological Journal of the Linnean Society*, 113: 93–140.

North East Atlantic deep-water species

Anthoptilum

Maybe two species present: *Anthoptilum grandiflorum* (Verrill, 1879); *A. murrayi* Kölliker, 1880.



Anthoptilum sp.
 Credit: NUI Galway, © Marine Institute



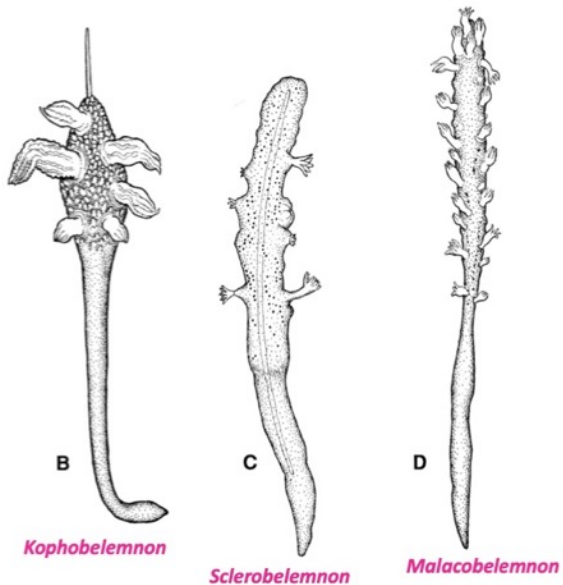
Anthoptilum sp.
 Credit: NUI Galway, © Marine Institute

Kophobelemnidae

Kophobelemnidae

Defining Features: Autozooids all along sides of erect rachis
Not elongate and slender
Clavate; autozooids large

Williams GC (1995)
Living genera of sea
pens (Coelenterata:
Octocorallia:
Pennatulacea):
illustrated key and
synopses. Zoological
Journal of the
Linnean Society, 113:
93–140.



North East Atlantic deep-water species

Kophobelemnion

At least two species present and possibly more: *Kophobelemnion macrospinosum* J. A. Thomson, 1927; *K. stelliferum* (Müller, 1776)

