

**Resurrection of the sea pen genus *Ptilella* Gray, 1870
and description of *Ptilella grayi* n. sp. from the
NE Atlantic (Octocorallia: Pennatulacea)**

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Supplementary material

Table S1. – Data associated with all hauls where *Ptilella grayi* n. sp. and *Ptilella grandis* were observed including the number of colonies recorded at each.

Species	Cruise	Cruise no (haul)	Area	Coordinates Start - Stop	Depth range (m)	Date	No. colonies
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2005	1205S (S05357)	Rockall Bank, NE Atlantic	56°35.49N 14°31.57W-56°36.52N 14°28.72W	197-198	06-Sep-05	3
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2007	1207S (S07371)	Rockall Bank, NE Atlantic	57°09.39N 14°12.16W-57°09.59N 14°08.94W	166-170	13-Sep-07	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2007	1207S (S07386)	Rockall Bank, NE Atlantic	56°32.78N 14°32.25W-56°31.32N 14°34.00W	198-203	12-Sep-07	2
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2008	1108S (S08358)	Rockall Bank, NE Atlantic	56°28.03N 14°41.91W-56°27.82N 14°38.40W	199-202	06-Sep-08	5
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2008	1108S (S08360)	Rockall Bank, NE Atlantic	56°35.43N 14°32.20W-56°36.37N 14°29.54W	197-199	06-Sep-08	1
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2009	0409S (S09168)	Rockall Bank, NE Atlantic	56°43.54N 14°34.52W-56°46.84N 14°33.03W	187-195	5-May-09	1
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2009	0409S (S09169)	Rockall Bank, NE Atlantic	56°37.05N 14°25.39W-56°36.63N 14°31.29W	191-200	5-May-09	3
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2009	0409S (S09170)	Rockall Bank, NE Atlantic	57°17.82N 14°14.45W-57°14.44N 14°14.93W	170-178	6-May-09	3
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2009	0409S (S09172)	Rockall Bank, NE Atlantic	57°22.21N 13°52.59W-57°21.17N 13°58.32W	145-153	6-May-09	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2009	1209S (S09339)	Rockall Bank, NE Atlantic	57°03.65N 14°08.69W-57°02.74N 14°11.61W	167-191	07-Sep-09	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2009	1209S (S09347)	Rockall Bank, NE Atlantic	56°36.11N 14°29.97W-56°35.20N 14°32.73W	194-201	09-Sep-09	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2009	1209S (S09349)	Rockall Bank, NE Atlantic	56°43.69N 14°30.18W-56°44.51N 14°29.62W	192-198	09-Sep-09	2
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2009	1209S (S09350)	Rockall Bank, NE Atlantic	56°47.90N 14°05.97W-56°46.39N 14°08.07W	193-198	10-Sep-09	1
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2010	0410S (S10150)	Rockall Bank, NE Atlantic	56°25.22N 15°14.67W-56°22.91N 15°18.75W	238-262	06-Apr-10	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2011	0911S (S11426)	Rockall Bank, NE Atlantic	56°32.63N 14°30.92W-56°33.97N 14°28.78W	198-202	30-Aug-11	12
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2011	0911S (S11427)	Rockall Bank, NE Atlantic	56°35.18N 14°24.27W-56°36.48N 14°22.06W	204-209	30-Aug-11	2
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2011	0911S (S11430)	Rockall Bank, NE Atlantic	56°42.54N 14°03.67W-56°43.71N 14°01.29W	251-255	30-Aug-11	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2011	0911S (S11432)	Rockall Bank, NE Atlantic	57°02.48N 13°52.08W-57°03.75N 13°49.62W	182-186	30-Aug-11	1
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2012	0412S (S12141)	Rockall Bank, NE Atlantic	55°51.10N 15°19.53W-55°52.24N 15°13.35W	365-375	14-Apr-12	1
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2012	0412S (S12145)	Rockall Bank, NE Atlantic	56°32.34N 14°55.91W-56°35.17N 15°00.02W	195-225	15-Apr-12	3
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2012	0412S (S12146)	Rockall Bank, NE Atlantic	56°53.19N 14°44.00W-56°55.71N 14°39.29W	179-192	15-Apr-12	1
<i>Ptilella grayi</i> n. sp.	OFFCON 2012	0712S (S12287)	Rockall Bank, NE Atlantic	57°22.33N 13°54.87W-57°21.36N 13°57.73W	146-152	15-Apr-12	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2013	1113S (S13304)	Rockall Bank, NE Atlantic	56°43.65N 14°14.44W-56°41.83N 14°14.62W	196-203	14-Sep-13	2
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2013	1113S (S13305)	Rockall Bank, NE Atlantic	56°36.15N 14°22.46W-56°34.79N 14°24.46W	206-209	14-Sep-13	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2013	1113S (S13306)	Rockall Bank, NE Atlantic	56°36.05N 14°30.02W-56°35.75N 14°33.40W	196-199	14-Sep-13	6
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2013	1113S (S13307)	Rockall Bank, NE Atlantic	56°40.01N 14°39.58W-56°39.38N 14°40.49W	195-198	14-Sep-13	2
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2013	1413S (S13371)	Rockall Bank, NE Atlantic	56°36.59N 14°26.65W-56°35.81N 14°32.89W	197-199	24-Oct-13	82
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2013	1413S (S13372)	Rockall Bank, NE Atlantic	56°55.42N 14°31.33W-56°58.65N 14°28.61W	179-188	24-Oct-13	2
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2013	1413S (S13373)	Rockall Bank, NE Atlantic	57°10.17N 14°11.27W-57°12.81N 14°06.85W	165-171	24-Oct-13	4
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2014	0414S (S14141)	Rockall Bank, NE Atlantic	56°25.40N 14°57.37W-56°26.56N 14°54.75W	206-212	14-Apr-14	2
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2014	0414S (S14144)	Rockall Bank, NE Atlantic	56°41.94N 14°32.66W-56°45.50N 14°32.42W	193-199	15-Apr-14	2
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2015	0415S (S15142)	Rockall Bank, NE Atlantic	56°36.04N 14°14.27W-56°32.91N 14°16.67W	260-299	11-Apr-15	1

Species	Cruise	Cruise no (haul)	Area	Coordinates Start - Stop	Depth range (m)	Date	No. colo- nies
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2015	0415S (S15143)	Rockall Bank, NE Atlantic	56°36.27N 14°26.94W- 56°35.43N 14°32.96W	194-205	12-Apr-15	17
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2015	0415S (S15144)	Rockall Bank, NE Atlantic	56°29.97N 14°21.34W- 56°27.17N 14°24.64W	281-287	12-Apr-15	3
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2015	0415S (S15157)	Rockall Bank, NE Atlantic	56°25.35N 14°56.29W- 56°27.76N 14°51.81W	204-214	14-Apr-15	1
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2015	0415S (S15159)	Rockall Bank, NE Atlantic	56°34.02N 15°13.28W- 56°30.69N 15°15.78W	266-289	14-Apr-15	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2015	1115S (S15351)	Rockall Bank, NE Atlantic	56°35.93N 14°31.35W- 56°36.48N 14°28.27W	196-198	31-Aug-15	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2015	1115S (S15352)	Rockall Bank, NE Atlantic	56°36.95N 14°16.25W- 56°38.10N 14°13.72W	226-231	31-Aug-15	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2015	1115S (S15356)	Rockall Bank, NE Atlantic	57°02.91N 13°25.79W- 57°01.49N 13°27.53W	270-278	01-Sep-15	1
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2016	0416S (S16137)	Rockall Bank, NE Atlantic	57°36.48N 12°57.47W- 57°34.60N 12°57.59W	280-290	09-Apr-16	1
<i>Ptilella grayi</i> n. sp.	Rockall Anglerfish Survey 2016	0416S (S16164)	Rockall Bank, NE Atlantic	56°15.82N 16°14.36W- 56°12.51N 16°15.49W	358-389	13-Apr-16	2
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2016	1216S (S16365)	Rockall Bank, NE Atlantic	56°33.53N 14°29.33W- 56°32.22N 14°31.75W	199-201	05-Sep-16	3
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2016	1216S (S16366)	Rockall Bank, NE Atlantic	56°46.45N 14°27.75W- 56°44.81N 14°29.19W	186-193	05-Sep-16	3
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2016	1216S (S16368)	Rockall Bank, NE Atlantic	56°47.22N 14°05.67W- 56°45.63N 14°07.23W	193-200	05-Sep-16	1
<i>Ptilella grayi</i> n. sp.	Rockall Haddock Survey 2016	1216S (S16372)	Rockall Bank, NE Atlantic	57°07.74N 13°23.21W- 57°06.31N 13°25.09W	215-223	06-Sep-16	1
<i>Ptilella grandis</i>	Deepwater Time Series 2008	1108S (S08385)	Donegal Slope, NE Atlantic	55°13.79N 10°08.87W- 55°08.49N 10°10.66W	1018-1045	14-Sep-08	1
<i>Ptilella grandis</i>	OFFCON 2011	0711S (S11264)	Rockall Basin, NE Atlantic	57°36.37N 12°36.66W- 57°35.94N 12°36.98W	1601-1605	30-Jun-11	1
<i>Ptilella grandis</i>	North Sea Anglerfish Survey 2016	0412S (S12220)	S Norwegian Sea, NE Atlantic	61°55.05N 02°28.94E- 61°52.66N 02°34.22E	380-404	29-Apr-12	1
<i>Ptilella grandis</i>	MoreDeep 2014	1314S (S14379)	Rosemary Seamount, NE Atlantic	59°26.55N 10°09.34W- 59°26.60N 10°02.14W	859-889	15-Sep-14	1
<i>Ptilella grandis</i>	MoreDeep 2014	1314S (S14382)	Rosemary Seamount, NE Atlantic	59°05.37N 09°54.16W- 59°06.40N 09°51.58W	1052-1075	16-Sep-14	1
<i>Ptilella grandis</i>	Rockall Anglerfish Survey 2016	0416S (S16151)	West Rockall Bank, NE Atlantic	56°57.12N 14°15.98W- 56°56.60N 14°21.78W	723-761	11-Apr-16	1
<i>Ptilella grandis</i>	Rockall Anglerfish Survey 2016	0416S (S16155)	West Rockall Bank, NE Atlantic	56°36.27N 14°26.94W- 56°35.43N 14°32.96W	682-727	11-Apr-16	1
<i>Ptilella grandis</i>	MoreDeep 2016	1316S (S16379)	Rosemary Seamount, NE Atlantic	59°06.16N 09°52.17W- 59°05.16N 09°54.75W	1061-1100	19-Sep-16	2

Table S2. – Nucleotide substitution implying amino acid changes in the mitochondrial loci *mtMutS* and *Cox1*, between the sequences of *Ptilella* and *Pennatula* used in the molecular analyses, once homologous sites of a datamatrix including *Ptilella* and *Pennatula* sequences are aligned (see Table 2 and Fig. 5).

Loci	Nucleotide positions	Nucleotide triplet <i>Ptilella</i> / <i>Pennatula</i>	Aa position	Aa substitution <i>Ptilella</i> / <i>Pennatula</i>
<i>mtMutS</i>	34	ATG / GTA(GTG) ¹	12	Met (M) / Val (V)
	74	CCG / CAG	25	Pro (P) / Gln (Q)
	164	GCT / GTT	55	Ala (A) / Val (V)
	197	GGA / GAA	66	Gly (G) / Glu (E)
	199	GTA / ATA	67	Val (V) / Ile (I)
<i>Cox1</i>	533	GCC / GTC	181	Ala (A) / Val (V)
	226	TTG / ATG	76	Leu (L) / Met (M)
	271	TCA / GCA	91	Ser (S) / Ala (A)
	371	GCG(GCA) ² / GTA	124	Ala (A) / Val (V)
	388	ATT / CTT	130	Ile (I) / Leu (L)
	439	AGT / CTA(TTA)	147	Met (M) / Leu (L)
	568	GTA / ATA	190	Val (V) / Ile (I)
	574	GTT / ATT	192	Val (V) / Ile (I)

¹ and ², the third base of this triplet is a variable position within that genus (interspecific variability). The substitutions implying intergeneric differences occur in the first base of the triplet in 1, but in the second base in 2.

Table S3. – Nucleotide and amino acid differences in the mitochondrial loci *mtMutS* and *Cox1*, and nucleotide differences in the nuclear *28S* between *Ptilella grayi* n. sp. and *Pt. grandis*. Based on a datamatrix including only *Ptilella* and *Pennatula* species (see Table 2 and Fig. 5).

Loci	Nucleotide (position) <i>Pt. grayi</i> / <i>Pt. grandis</i>	Amino acid (position) <i>Pt. grayi</i> / <i>Pt. grandis</i>
<i>mtMutS</i>	(249) A / C	(83) Met / Ile
	(672) C / A	(225) Phe / Leu
<i>Cox1</i>	(372) A / G	(124) Ala / Ala
	(624) C / A	(208) Ile / Ile
28S	(166) C / A	
	(210) A / G	
	(519) G / C	

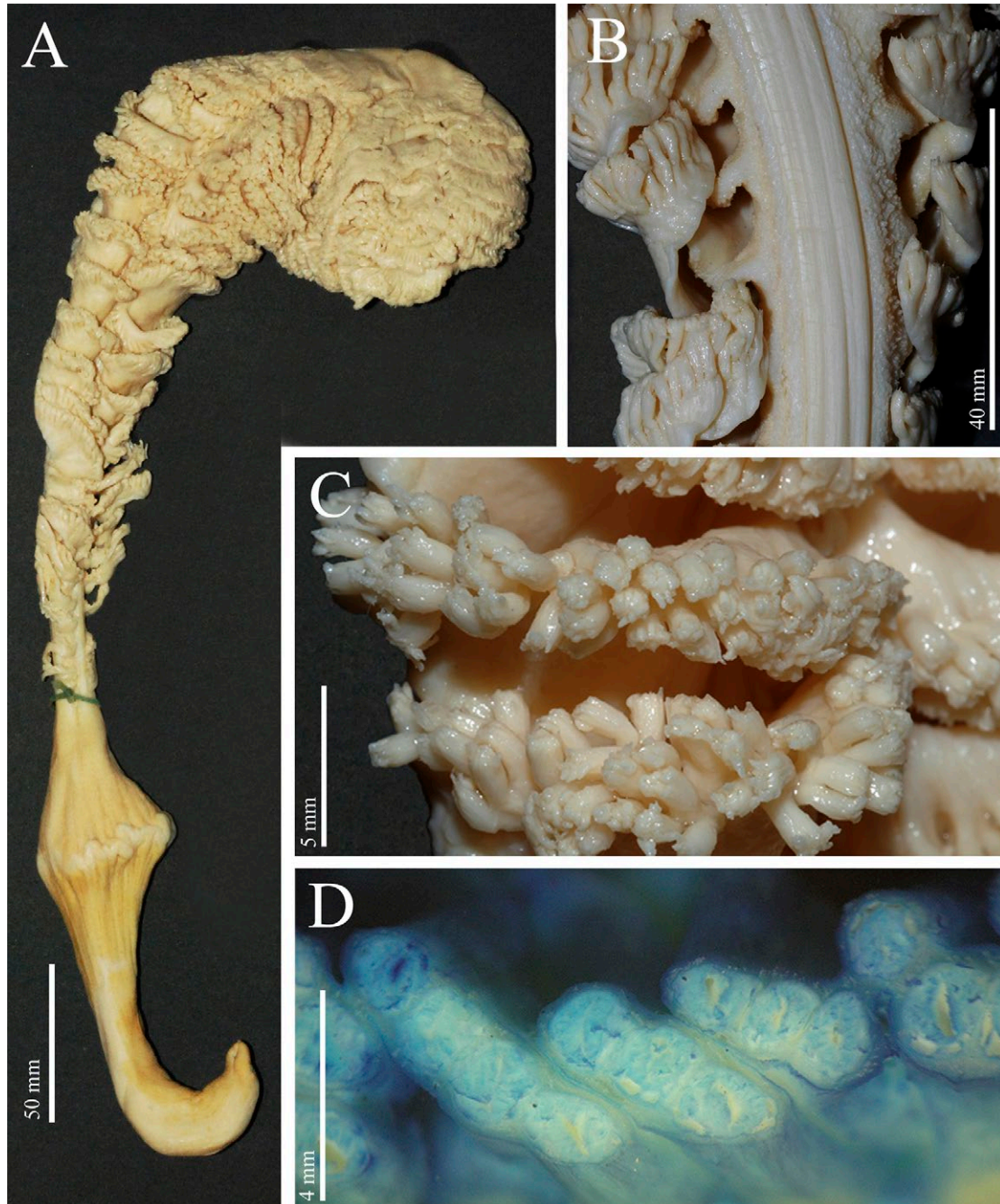


Fig. S1. – *Ptilella grayi* n. sp. Paratype (NMS.Z.2019.2.3). A, whole colony; B, dorsal view of polyp leaves and naked dorsal track showing the location of mesozooids; C, detail of autozooids on the ventral edge of the polyp leaves; D, detail of oblique rows of autozooids, sectioned basally, stained with methylene blue to increase contrast.

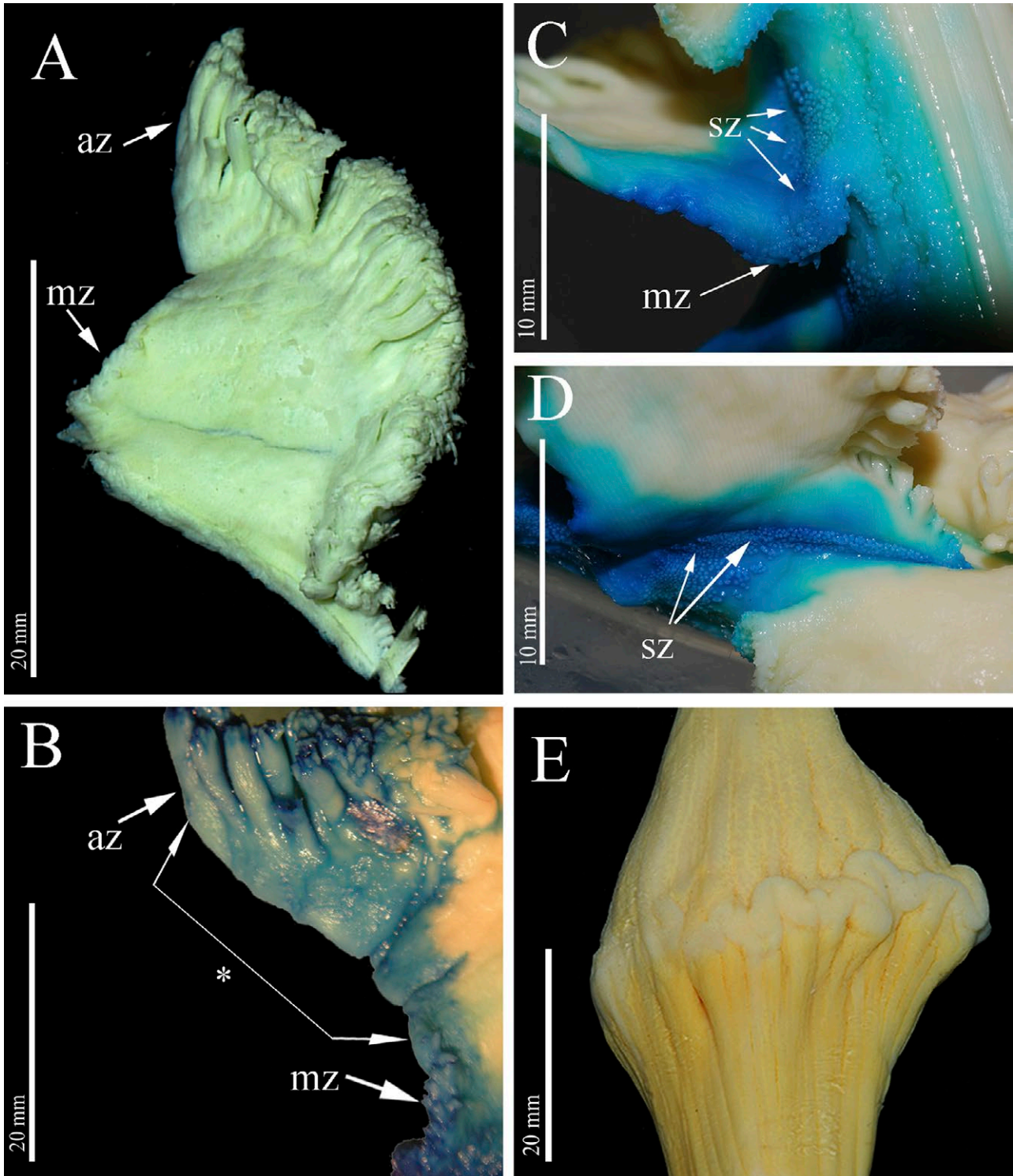


Fig. S2. – *Ptilella grayi* n. sp. Paratype (NMS.Z.2019.2.3). A, polyp-leaf sectioned from the base, lateral view; B, detail of dorsal area of a polyp-leaf showing autozooids (az) and mesozooids (mz), and distal area free of zooids (*); C, detail of dorsal basal part of polyp leaves showing siphonozooids (sz) and mesozooids (mz); D, detail of arrangement of siphonozooids (sz) in pad at the base of a polyp leaf; E, distinctive thickening at the rachis-peduncle limit and edged ring. B, C and D stained with methylene blue to increase contrast.

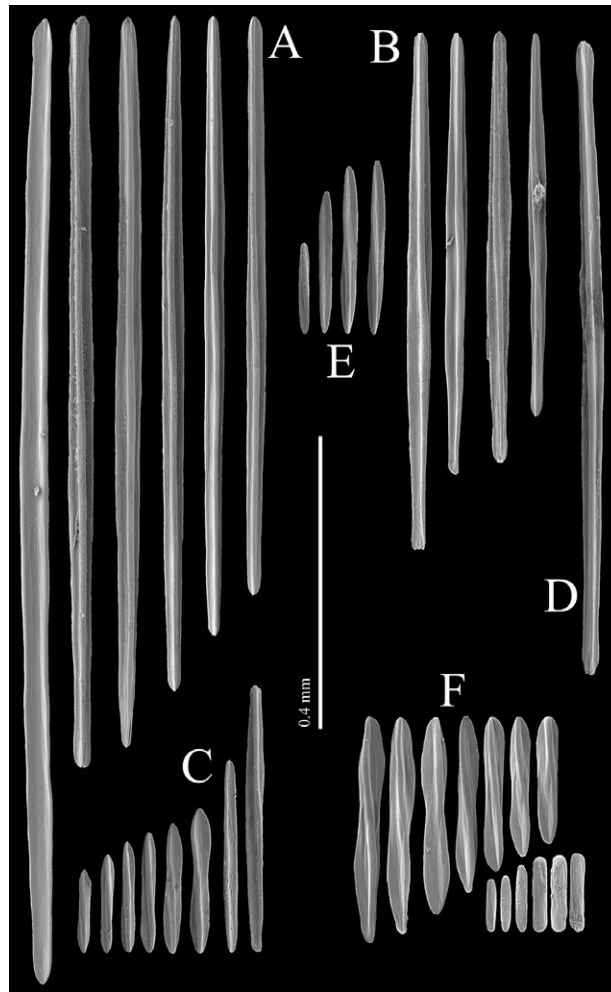


Fig. S3. – *Ptilella grayi* n. sp. Paratype (NMS.Z.2019.2.3). SEM photographs of sclerites. A, calyces; B, mesozooids; C, siphonozooids; D, polyp leaves; E, dorsal track; F, rachis-peduncle limit, above edged ring (upper row) and below edged ring (lower row).