

Supplementary material

1. Substrate assessment

Substrate type in each image was recorded using the following categories based on Wentworth (1922): bedrock, reef framework, live reef, cobbles, coral rubble, pebbles, coral gravel, gravel and sand. Examples of each are found in Figure 1; Table 1 lists the size classes associated with each category.

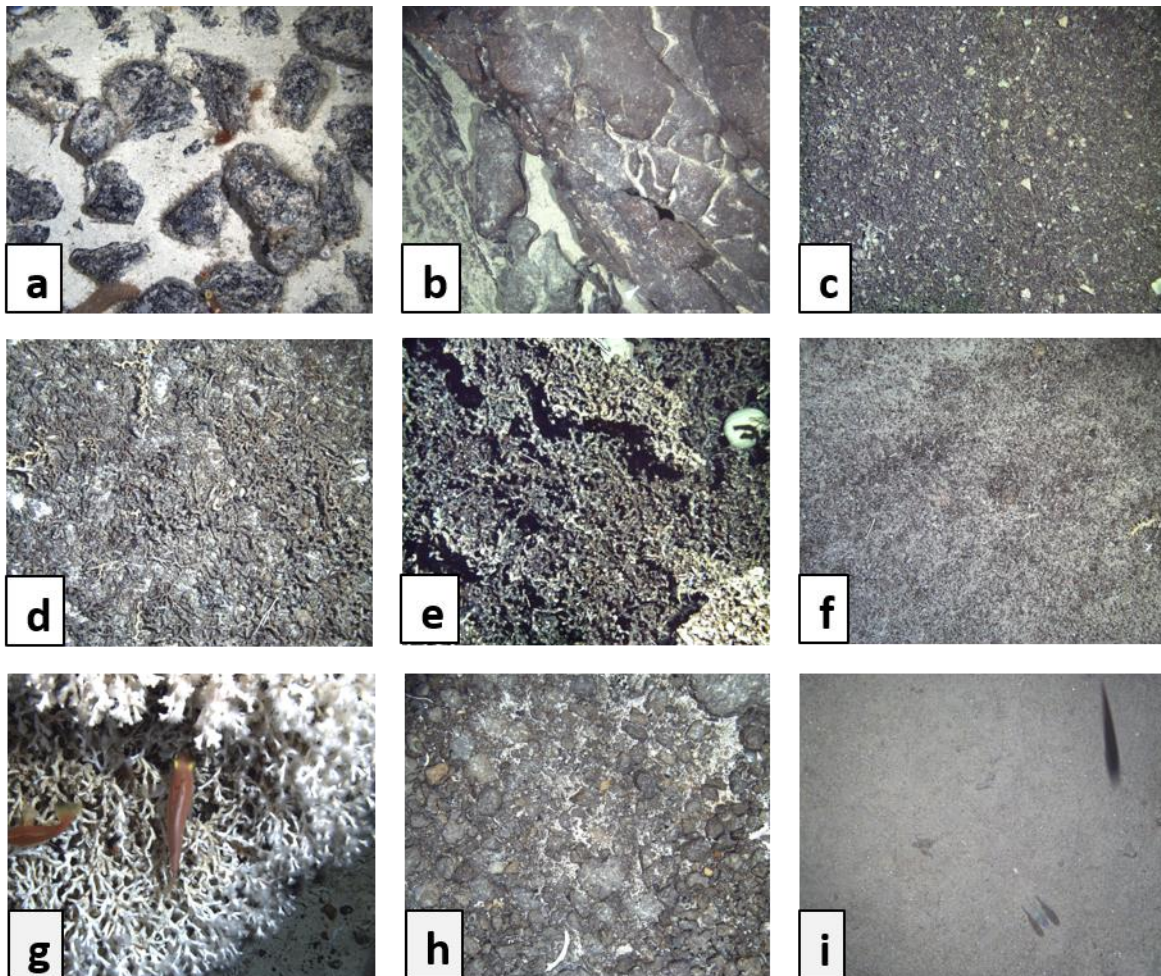


Figure 1: Example images where the dominant substrate is one of the categories used: (a) cobbles, (b) bedrock, (c) coral gravel, (d) coral rubble, (e) reef framework, (f) gravel, (g) live coral reef, (h) pebbles, (i) sand.

Table 1: Size classes associated with each substrate category used.

Category	Minimum size (mm)	Maximum size (mm)
Bedrock	NA	NA
Reef framework	NA	NA
Live reef	NA	NA
Cobbles	64	256
Coral rubble	NA	NA
Pebbles	4	64
Coral gravel	NA	NA
Gravel	2	4
Sand	NA	2

Wentworth, C. K. (1922) 'A scale of grade and class terms for clastic sediments', *The Journal of Geology*, 30(5).

2. Correlation matrix

A Pearson's correlation matrix was calculated in Primer to identify correlated variables to remove to avoid the potential for autocorrelation issues within the DistLM (Table 2). Coefficients >0.7 were deemed strong, and one correlate was removed.

Table 2: Correlation matrix for DistLM variables calculated in Primer v.6 (rounded to 3 d.p.). Coefficients >0.7 are shown in bold.

	Substrate hardness	Latitude	POC flux to depth	Surface primary productivity	Depth	Log(Rugosity)	Curvature	Slope	FBPI	BBPI
Substrate hardness	-	-	-	-	-	-	-	-	-	-
Latitude	0.114	-	-	-	-	-	-	-	-	-
POC flux to depth	0.382	-0.247	-	-	-	-	-	-	-	-
Surface primary productivity	-0.248	-0.932	0.178	-	-	-	-	-	-	-
Depth	-0.436	0.308	-0.467	-0.323	-	-	-	-	-	-
Log(Rugosity)	0.480	-0.396	-0.001	0.259	-0.297	-	-	-	-	-
Curvature	-0.251	-0.526	0.178	0.513	0.0237	0.378	-	-	-	-
Slope	0.273	-0.428	0.270	0.367	-0.3417	0.463	0.529	-	-	-
FBPI	-0.216	-0.438	0.021	0.333	0.443	0.412	0.496	0.086	-	-
BBPI	-0.379	-0.325	-0.055	0.331	0.417	-0.001	0.289	-0.406	0.451	-

3. DistLM results

To ensure the selection of latitude over surface primary productivity was not changing the results, a DistLM was run allowing the model to choose from the following variables: surface primary productivity, longitude, rugosity, curvature, slope, FBPI, BBPI, substrate hardness and POC flux to depth. The optimum solution from the DistLM routine, selected based on AIC score, is detailed in Table 3. The variance explained by surface primary productivity is not significantly different to that explained by latitude. Using this selection, FBPI explains slightly more (+0.33%) variance, and longitude explains slightly less (-0.16%).

Table 3: DistLM metrics for the model using surface primary productivity instead of latitude.

Variable	SS (trace)	Pseudo-F	p-value	% variance explained (2 d.p.)
Surface Primary Productivity	46451	13.184	0.001	15.48
Depth	13044	3.8488	0.001	4.35
FBPI	7937.8	2.3878	0.001	2.64
Longitude	7131.3	2.1815	0.001	2.38
Slope	6821.3	2.1205	0.001	2.27

4. dbRDA on SIMPROF

The 22 biological assemblages identified in the SIMPROF analysis (labelled a – v) are graphically depicted on a dbRDA plot in Figure 2, with each assemblage coded individually.

Interpretation of the dbRDA plot is found in the main text.

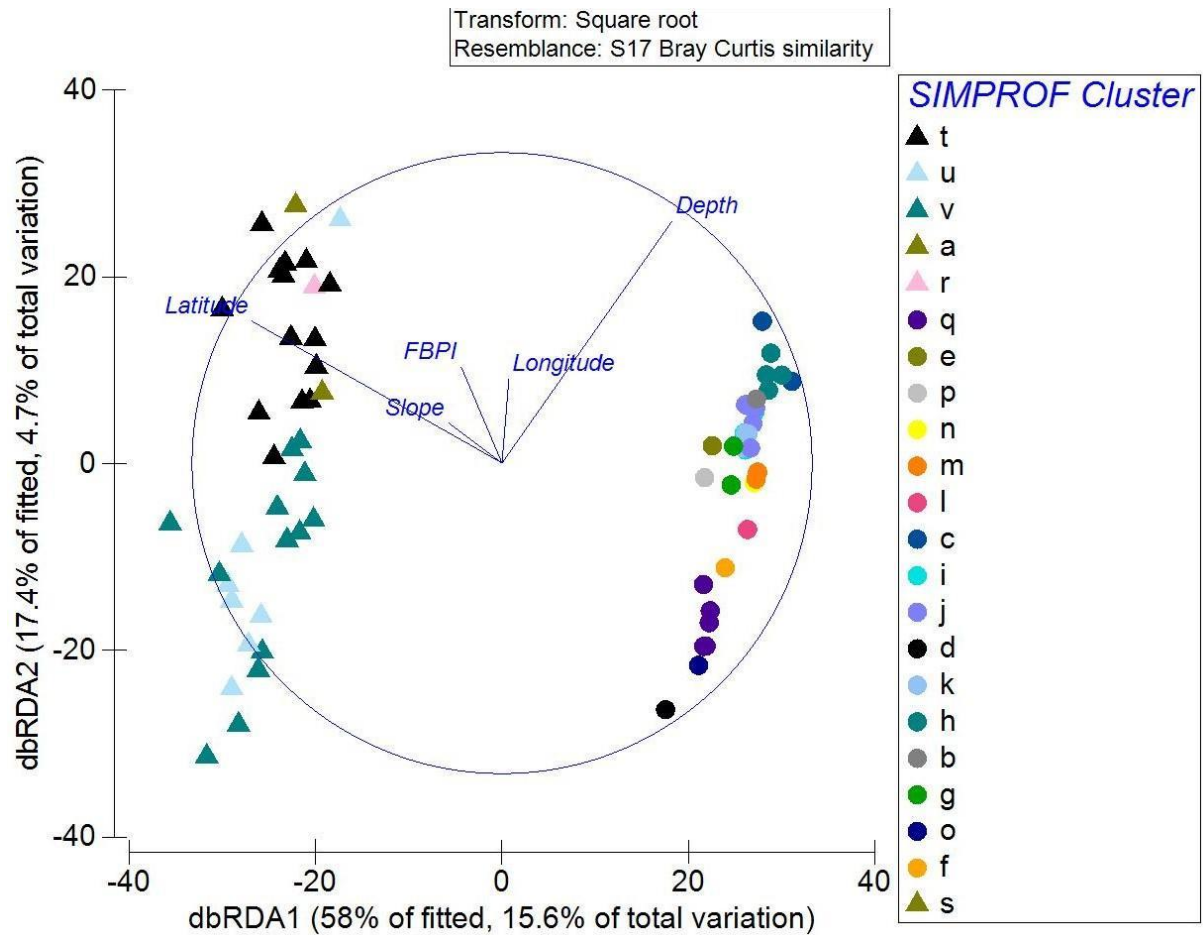


Figure 2: dbRDA plot with each SIMPROF cluster identified. Tropical clusters are represented as coloured triangles and temperate clusters by coloured circles. Significant environmental drivers as identified by the DistLM are overlaid.

5. SIMPROF results

The uncollapsed dendrogram produced in Primer v.6 can be seen in Figure 3. Lines in red depict that the transects cluster in the same group as other lines descending from each black node. The SIMPROF clusters (a – v) are identified by the text labels.

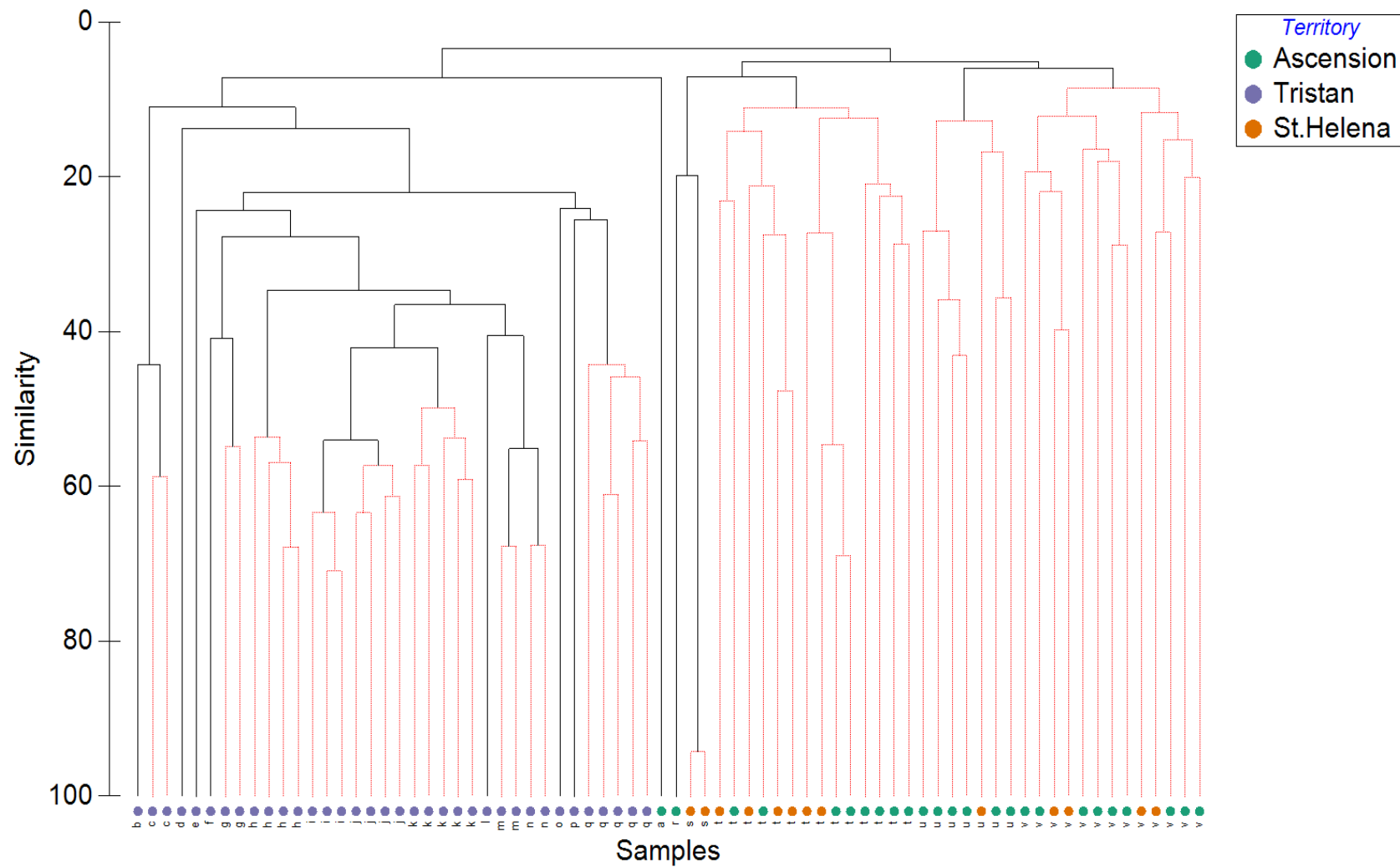


Figure 3: Full hierarchical cluster dendrogram with SIMPROF clusters (a – v) as labels, colour-coded by territory.

6. Full data table

Table 4: Full data table for $n=74$ transects. Territory names shortened to Asc. (Ascension), St. Hel. (St. Helena).

Transect	Territory	No. images	SIMPRO F Cluster	Substrate hardness	Latitude	Longitude	POC flux to depth	Surface primary productivity	Depth	Rugosity	Curvature (2d.p.)	Slope (2d.p.)	FBP I	BBP I
Asc_20	Asc.	21	t	2.00	-7.876	-14.383	0.77423	0.001083	-232	0.0007766	0.06	26.25	0	67
Asc_21	Asc.	20	t	3.00	-7.875	-14.379	0.77423	0.001083	-299	0.0054147	-0.10	27.56	10	53
Asc_22	Asc.	21	u	3.00	-7.858	-14.374	0.77423	0.001083	-745	0.0007771	0.75	4.32	3	60
Asc_23	Asc.	20	v	4.00	-7.852	-14.367	0.77423	0.001083	-932	0.0122607	-3.75	41.05	-24	43
Asc_28	Asc.	18	a	4.00	-7.966	-14.288	0.9158	0.001073	-190	0.0039117	0.44	25.24	11	101
Asc_29	Asc.	20	t	6.00	-7.966	-14.272	0.9158	0.001073	-505	0.0061206	2.47	22.17	5	50
Asc_30	Asc.	20	v	4.00	-7.968	-14.261	0.9158	0.001073	-790	0.0019275	-1.46	34.26	2	8
Asc_31	Asc.	11	v	6.00	-7.968	-14.255	0.9158	0.001073	-1011	0.0033248	-0.86	18.95	-9	-78
Asc_32	Asc.	21	t	5.00	-8.01	-14.337	8.4380999	0.001056	-292	0.0063152	0.58	33.78	22	169
Asc_33	Asc.	21	u	4.00	-8.016	-14.342	8.4380999	0.001056	-676	0.0010879	-0.40	6.10	2	-66
Asc_34	Asc.	21	t	3.00	-8.023	-14.345	8.4380999	0.001056	-472	0.0028086	-0.05	32.84	30	257
Asc_35	Asc.	20	v	5.00	-8.027	-14.335	8.4380999	0.001056	-824	0.0543641	1.34	28.63	30	4
Asc_36	Asc.	23	t	4.00	-8.018	-14.408	8.4380999	0.001056	-276	0.0038765	0.93	7.73	13	67
Asc_37	Asc.	7	v	5.00	-8.034	-14.407	8.4380999	0.001056	-604	0.0224324	-5.44	55.80	-31	17
Asc_4	Asc.	21	u	3.00	-8.068	-14.424	5.3221998	0.001044	-875	0.0016078	-0.67	13.77	-10	-36
Asc_5	Asc.	19	u	3.00	-8.063	-14.432	5.3221998	0.001044	-768	0.0005026	0.00	10.68	0	-20
Asc_6	Asc.	20	t	3.00	-8.043	-14.442	5.3221998	0.001044	-502	0.0011132	-1.79	2.32	-1	35
Asc_7	Asc.	18	r	2.00	-8.011	-14.439	5.3221998	0.001044	-218	0.0000221	-0.20	1.72	0	6
Grattan_143	Asc.	20	u	2.00	-9.737	-12.774	1.7711	0.000692	-855	0.0019282	-0.05	23.25	-8	-58
Grattan_144	Asc.	19	u	3.00	-9.759	-12.837	1.7158999	0.000691	-790	3.25143025	-1.06	18.98	-9	-39
Grattan_39	Asc.	19	v	4.00	-9.759	-12.797	1.7412	0.000683	-487	0.0014567	-0.56	3.94	-4	-27
Grattan_40	Asc.	21	v	3.00	-9.752	-12.791	1.7711	0.000683	-510	0.0001212	-0.34	1.62	-1	-45
HS_7	Asc.	20	v	4.00	-8.47	-16.99	1.6094	0.000806	-793	0.0162652	-1.21	18.19	-9	-102
HS_8	Asc.	18	v	6.00	-8.474	-16.993	1.6094	0.000806	-590	0.0054617	-2.99	39.48	-4	31

Unnamed_102	Asc.	21	t	6.00	-9.763	-12.074	1.7714	0.000728	-371	0.0002643	0.18	3.05	-5	-74
Bon_87	St. Hel.	19	v	4.50	-15.714	-6.985	6.9496999	0.001128	-734	0.0074933	1.99	25.65	9	15
Bon_91	St. Hel.	19	t	3.65	-15.609	-6.996	2.543	0.001116	-433	0.022113	-0.00	5.76	22	98
Car_105	St. Hel.	17	t	3.85	-13.029	-6.036	3.9698	0.000707	-445	0.0039924	0.29	5.43	22	17
Car_106	St. Hel.	20	u	2.05	-13.023	-6.038	3.9698	0.000707	-278	0.0000337	0.03	2.40	4	94
Car_118	St. Hel.	19	t	2.00	-13.04	-6.037	3.9698	0.000707	-568	0.0000771	-0.20	1.23	1	4
Car_120	St. Hel.	18	v	5.20	-13.056	-6.033	3.9698	0.000707	-950	0.0049002	-0.68	7.27	-10	8
SC_128	St. Hel.	19	t	2.00	-12.852	-5.739	3.0362999	0.000697	-533	0.004387	1.50	17.02	7	38
SC_129	St. Hel.	19	t	5.20	-12.852	-5.738	3.0362999	0.000697	-563	0.0019433	-0.27	12.95	-7	11
STHGI_74	St. Hel.	19	s	2.00	-16.013	-5.611	3.0943	0.001793	-597	0.0025742	1.59	5.92	12	104
STHGI_75	St. Hel.	16	s	2.00	-16.013	-5.611	3.0943	0.001793	-597	0.0025742	1.59	5.92	12	104
STHLT_61	St. Hel.	18	t	3.35	-15.945	-5.784	2.9748001	0.001674	-581	0.0092707	1.67	34.37	15	13
STHLT_62	St. Hel.	20	v	2.15	-15.945	-5.79	2.9748001	0.001674	-774	0.0007255	-0.20	16.64	0	-6
STHSL_80	St. Hel.	19	v	4.35	-16.158	-5.745	10.0290003	0.001739	-860	0.0024072	0.80	18.52	10	59
CrawE_48	Tristan	20	q	5.35	-38.79	-10.548	6.8355999	0.006022	-588	0.0009347	0.69	6.54	0	-10
CrawE_49	Tristan	20	q	4.30	-38.801	-10.526	4.5100999	0.006022	-571	0.0008962	-0.12	5.67	1	-7
CrawE_50	Tristan	20	q	4.45	-38.796	-10.497	4.5100999	0.006018	-615	0.0002538	-0.41	0.24	0	0
CrawE_52	Tristan	23	e	5.79	-38.788	-10.522	4.5100999	0.006022	-376	0.0145832	0.85	8.71	17	119

CrawE_53	Tristan	20	q	5.60	-38.779	-10.509	4.5100999	0.006022	-624	0.0001708	0.49	4.50	0	-26
CrawE_54	Tristan	20	p	3.70	-38.787	-10.53	4.5100999	0.006022	-434	0.0097557	1.29	12.76	16	64
CrawE_55	Tristan	20	q	6.00	-38.772	-10.556	6.8355999	0.006022	-550	0.00379075	1.15	3.40	7	63.25
CrawW_62	Tristan	19	n	3.25	-38.747	-11.663	6.7635002	0.006083	-295	0.0002325	-0.62	0.78	0	2
CrawW_63	Tristan	20	n	3.65	-38.761	-11.666	6.7375002	0.006075	-318	0.0001157	0.30	3.28	0	3
CrawW_64	Tristan	20	m	2.25	-38.758	-11.688	6.7635002	0.006065	-297	0.000329	0.11	1.99	0	1
CrawW_65	Tristan	19	m	2.68	-38.749	-11.709	5.4326	0.006071	-307	0.0000663	-0.24	1.49	0	-1
CrawW_73	Tristan	8	l	3.13	-38.764	-11.746	5.4527001	0.006065	-386	0.0017173	-1.22	3.76	-2	7
Gough_43	Tristan	18	c	4.65	-40.389	-9.885	1.2104	0.005599	-186	0.000842	0.59	19.96	16	110
Gough_50	Tristan	10	c	5.60	-40.315	-10.054	7.4797001	0.005663	-170	0.0000293	0.15	1.12	1	44
JakE_28	Tristan	20	i	4.90	-39.466	-7.832	3.5824001	0.006053	-327	0.0001718	0.17	2.82	2	3
JakE_30	Tristan	20	i	5.60	-39.455	-7.806	3.6355	0.006053	-285	0.0021022	-0.43	6.12	-1	0
JakE_35	Tristan	21	i	3.19	-39.485	-7.828	3.5824001	0.006053	-345	0.0001373	0.09	2.23	0	1
JakE_36	Tristan	20	j	2.85	-39.491	-7.803	3.5421	0.006053	-303	0.000933	0.41	5.41	-1	4
JakE_37	Tristan	20	j	5.15	-39.462	-7.792	3.6355	0.006053	-273	0.0001389	0.36	1.52	0	0
JakE_41	Tristan	21	d	2.71	-39.265	-8.064	3.5936	0.005896	-837	0.0142701	0.55	27.97	0	-159
JakW_10	Tristan	19	k	3.88	-39.284	-8.059	3.5936	0.005896	-331	0.0000898	-0.03	1.26	0	15

JakW_11	Tristan	20	k	3.55	-39.291	-8.075	3.6343	0.005896	-314	0.0001974	-0.48	2.35	0	2
JakW_12	Tristan	20	k	4.95	-39.276	-8.087	3.6679001	0.005907	-334	0.0002172	0.77	2.36	0	4
JakW_13	Tristan	20	k	4.20	-39.277	-8.105	3.6679001	0.005907	-324	0.010519	-4.46	7.63	0	2
JakW_17	Tristan	20	k	4.00	-39.28	-8.131	3.6679001	0.005907	-338	0.0004775	0.52	0.83	1	2
JakW_18	Tristan	20	j	3.85	-39.296	-8.134	3.6277001	0.005907	-323	0.0005676	0.19	0.80	-2	-11
JakW_19	Tristan	21	j	3.48	-39.304	-8.081	3.6343	0.005896	-293	0.0061724	-0.57	8.67	3	1
McNish_14	Tristan	19	h	3.75	-40.16	-8.604	5.5551	0.005535	-232	0.0005314	0.85	9.12	5	43
McNish_15	Tristan	20	h	3.20	-40.158	-8.586	5.5551	0.005535	-190	0.0000174	0.35	0.71	0	4
McNish_16	Tristan	17	h	4.80	-40.084	-8.561	5.5551	0.005564	-194	0.0004996	0.62	7.79	5	53
McNish_17	Tristan	16	h	4.68	-40.072	-8.57	4.1740999	0.005604	-249	0.0020072	0.00	12.94	1	57
Nightingale_71	Tristan	12	b	2.67	-37.34	-12.5	4.6069002	0.005695	-178	0.0018031	-1.03	6.76	0	46
RSA_33	Tristan	19	g	3.40	-39.503	-6.791	15.303001	0.005716	-374	0.0007488	0.64	2.86	2	7
RSA_34	Tristan	16	g	4.80	-39.489	-6.792	15.303001	0.005743	-423	0.0007665	-0.47	1.91	-1	14
RSA_36	Tristan	20	o	4.30	-39.469	-6.813	15.303001	0.005743	-703	0.0003029	0.34	4.08	-7	-28
RSA_37	Tristan	18	f	4.30	-39.491	-6.806	15.303001	0.005743	-531	0.0020123	-0.10	0.76	-7	-19

7. Descriptions of clusters with example images

Cluster a

Description: The majority of this single-transect cluster from around Ascension Island shows hard substrate with a thin sediment veneer on top. Megafaunal species richness is low, with only few live taxa visible; serpulid worm casings are present on some rocks, but it is not clear whether they contain live organisms as no feeding appendages can be seen. Small *Desmophyllum pertusum* colonies are observed on some rocky outcrops but density is not high enough to be considered a coral garden. Figure 4 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No



Figure 4: Cluster a example image.

Cluster b

Description: This cluster contains a single transect from Nightingale Island (Tristan da Cunha archipelago); most images depict numerous pebbles and cobbles on coarse sand. Much of the hard substrate is colonised by Cnidarians, largely *Caryophyllia* spp. cup coral, *Thourella* spp. and stylasterids. Figure 5 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: Mosaic of coral garden (dominated by gorgonians and stylasterids) and a hard-bottom cup coral field of *Caryophyllia* spp.

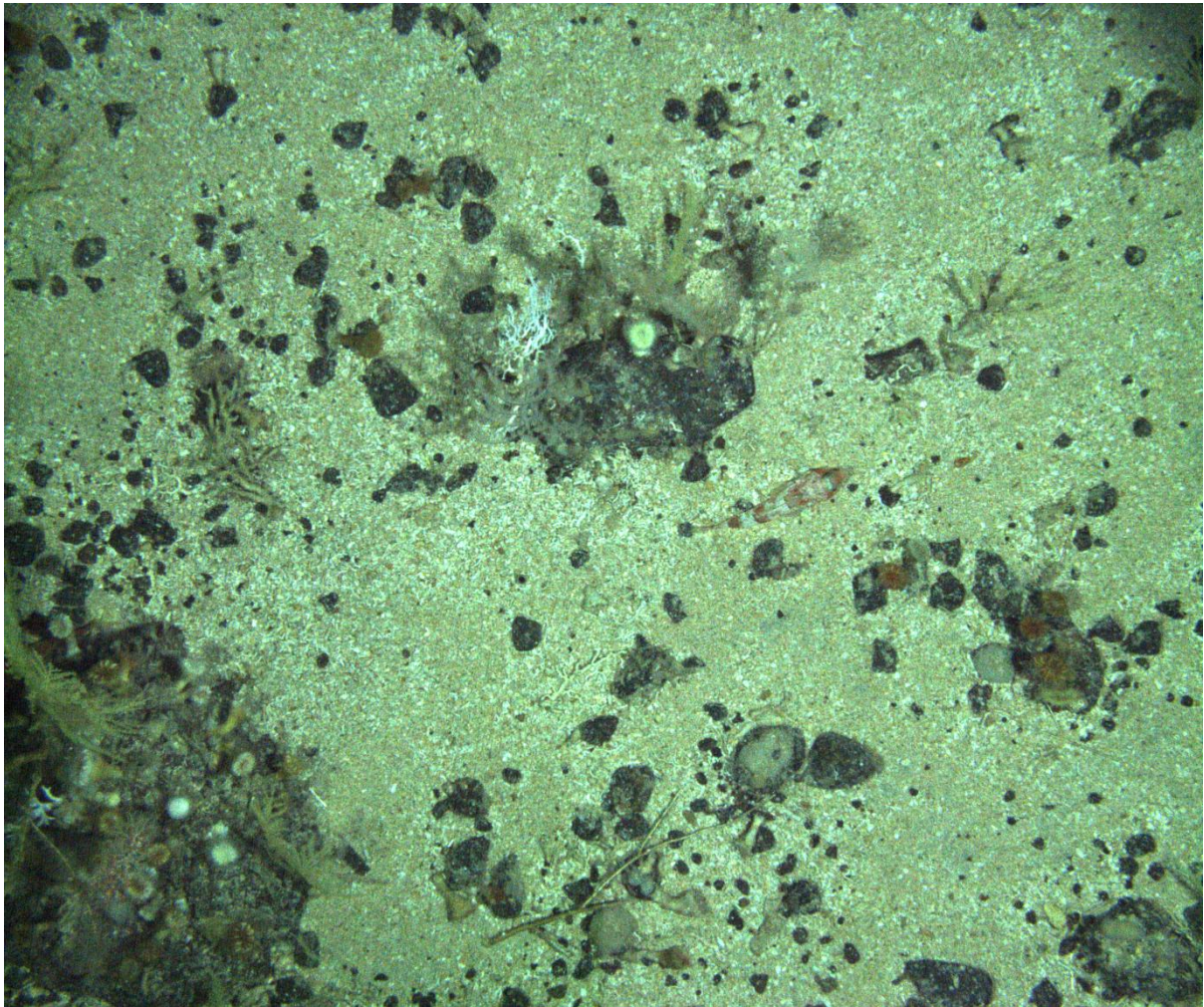


Figure 5: Cluster b example image.

Cluster c

Description: This cluster contains images from Gough, the most southern island in the Tristan da Cunha archipelago. Substrate consists of pebbles and boulders situated on gravel. Large *Thourella* spp. as well as numerous *Caryophyllia* spp. cup corals colonise the larger hard substrate along with encrusting and structure-forming sponges. Figure 6 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: Mosaic of coral garden (dominated by gorgonians and stylasterids) and a hard-bottom cup coral field of *Caryophyllia* spp.

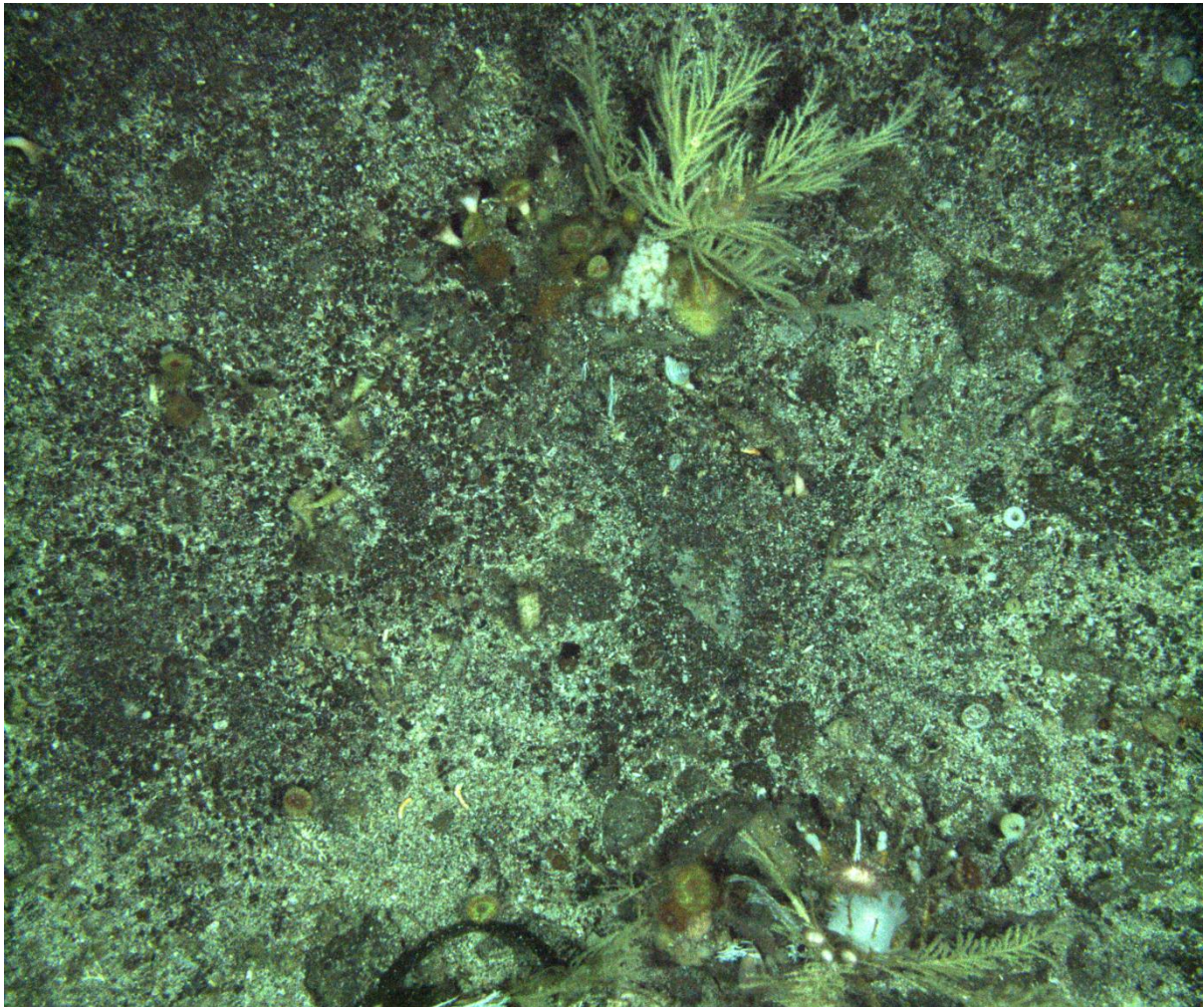


Figure 6: Cluster c example image.

Cluster d

Description: Cluster d contains images from a single transect from Yakhont seamount in the Tristan da Cunha EEZ. The substrate consists of coral gravel with some exposed fine sand; there are a large amount of echinoid tests also present. The cluster is faunally sparse, with few brachiopods and Cnidarians (anemones and zoanthids). Small sea pens are present on some patches of exposed fine sediment, but this is not common enough for the transect to be considered a sea pen field. Figure 7 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No

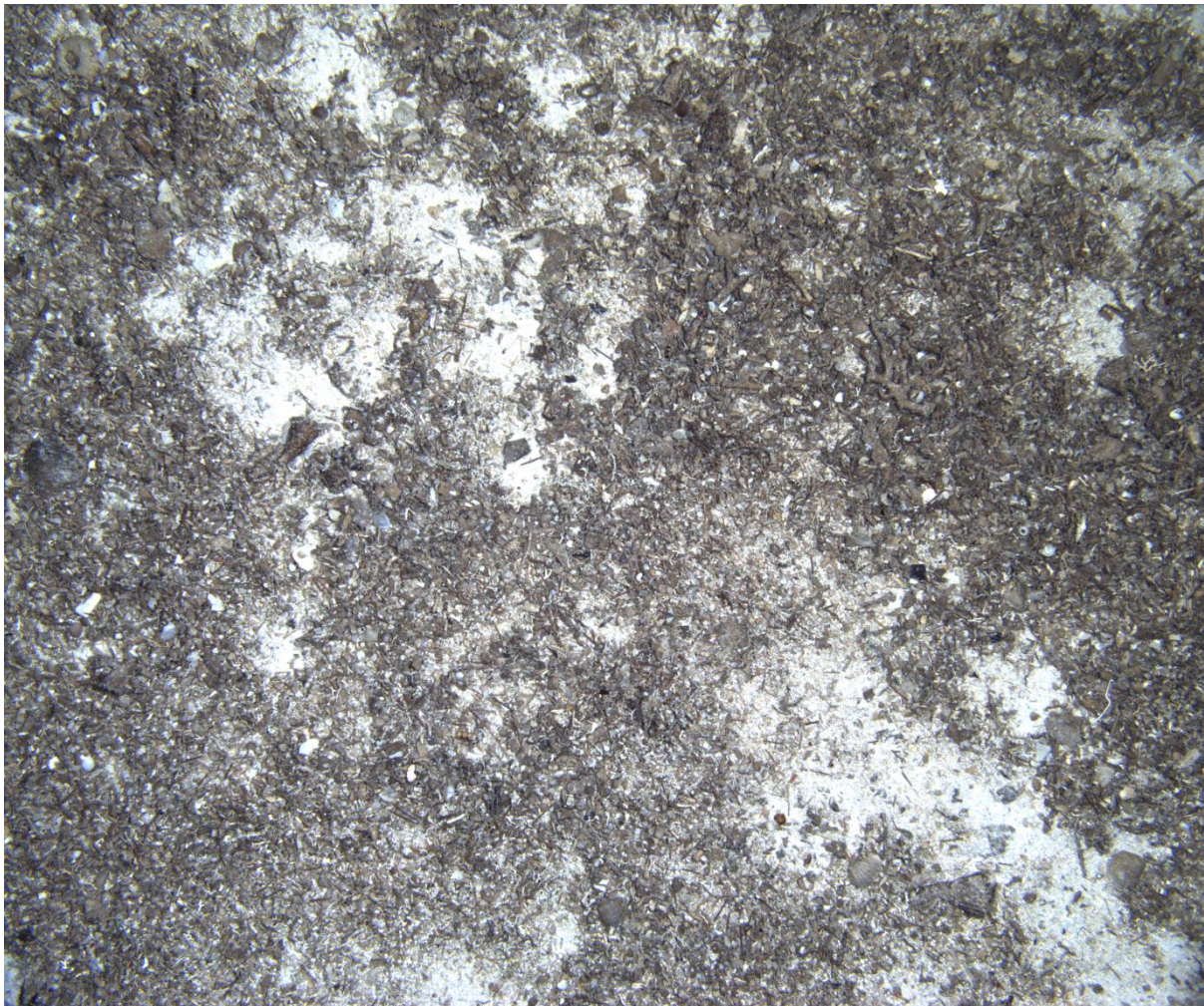


Figure 7: Cluster d example image.

Cluster e

Description: This single-cluster transect from Crawford seamount in the Tristan da Cunha EEZ is characterised by exposed bedrock with infrequent boulders. Hard substrate is often colonised by encrusting species (largely sponges and serpulid worm casings). Large aggregations of an unidentified echinoid are present also. Figure 8 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No

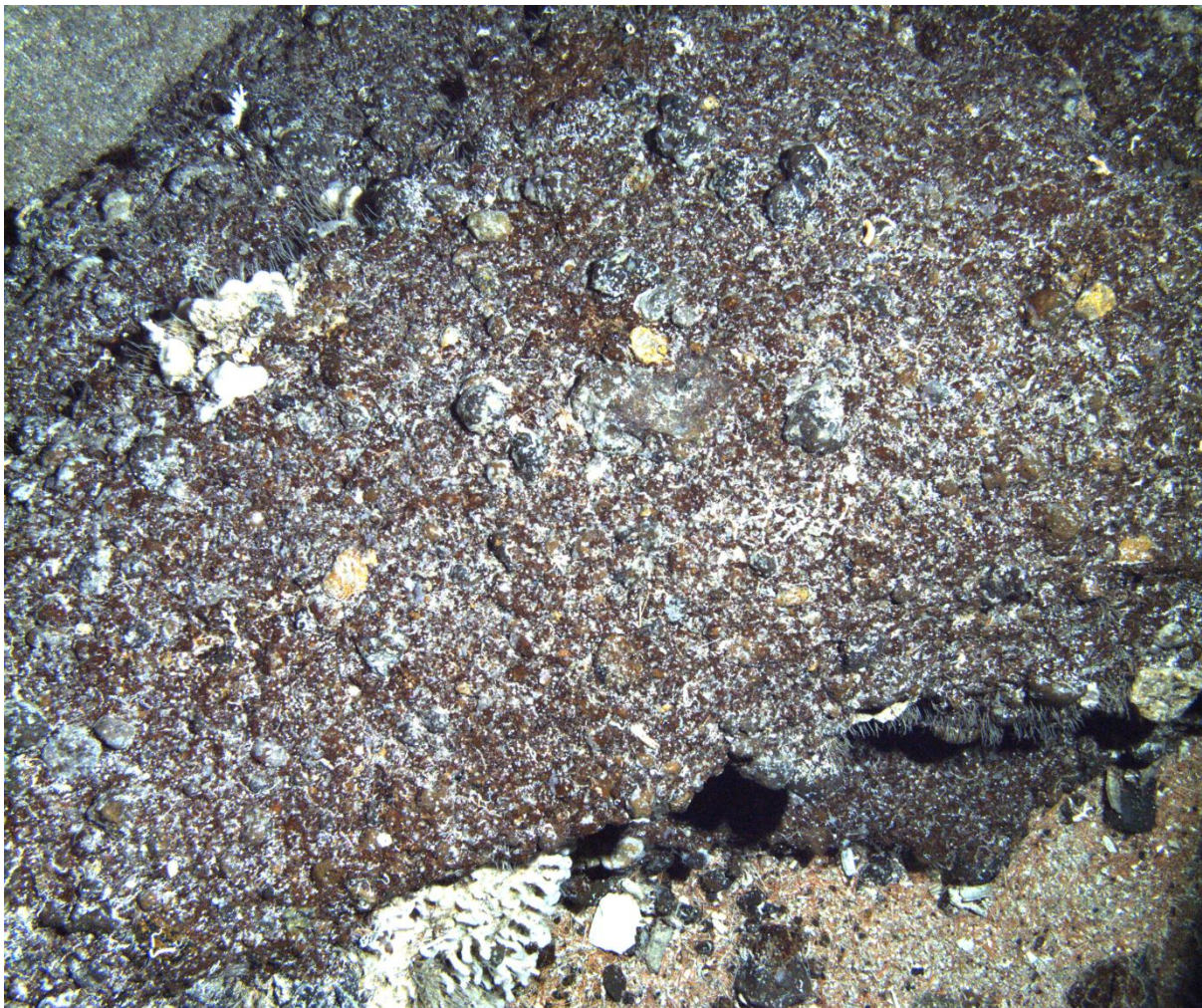


Figure 8: Cluster e example image.

Cluster f

Description: Cluster f is a single-transect cluster from RSA seamount in the far southeast of the Tristan da Cunha EEZ. Images show a thin sediment veneer on rough bedrock with some infrequent pebbles, although two images show a cobble substrate similar to that of cluster h. There are infrequent aggregations of very small, structure-forming sponges however there is not enough evidence to class the area as a VME. Figure 9 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No



Figure 9: Cluster f example image.

Cluster g

Description: Cluster g is composed of two transects from RSA seamount in the far southeast of the Tristan da Cunha EEZ. Images show a mix of substrates including bedrock, pebbles and sand. Most areas have low species richness, although some contain very small structure-forming sponges and small stylasterids. Figure 10 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No



Figure 10: Cluster g example image.

Cluster h

Description: This cluster contains all transects from McNish seamount in the southeast portion of the Tristan da Cunha EEZ. Images show densely packed pebbles and cobbles with small soft substrate channels in between. Rock is typically colonised with encrusting and structure-forming sponges, an unidentified bivalve and *Caryophyllia* spp. cup corals; *Thourella* spp. are observed on the larger rocks. One of the four transects that make up the cluster contains larger areas of soft substrate and is consequently less species rich, although the same taxa colonise the less frequent patches of hard substrate as seen in the other transects. Figure 11 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: Mosaic of coral garden (dominated by stylasterids) and a hard-bottom cup coral field of *Caryophyllia* spp.

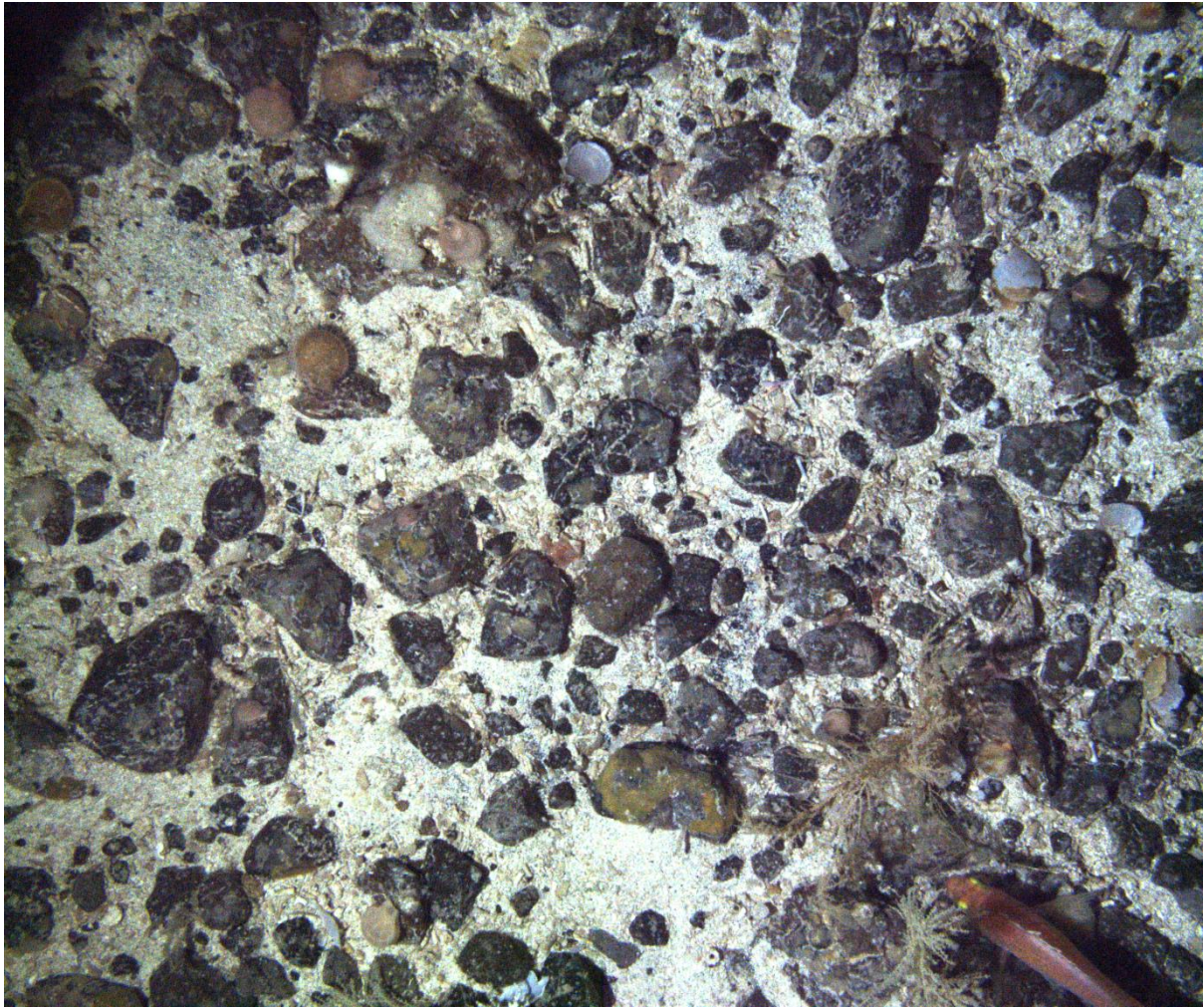


Figure 11: Cluster h example image.

Cluster i

Description: Transects within cluster i are from Yakhont seamount. Similarly to cluster h, they show pebbles and cobbles densely packed with small soft substrate channels in between. Hard substrate is typically colonised by sponges, hydroids, with many large ophiuroids also present. There are occasional stylasterids, antipatharians and large anemones (possible *Bolocera tuediae*) present. Figure 12 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No

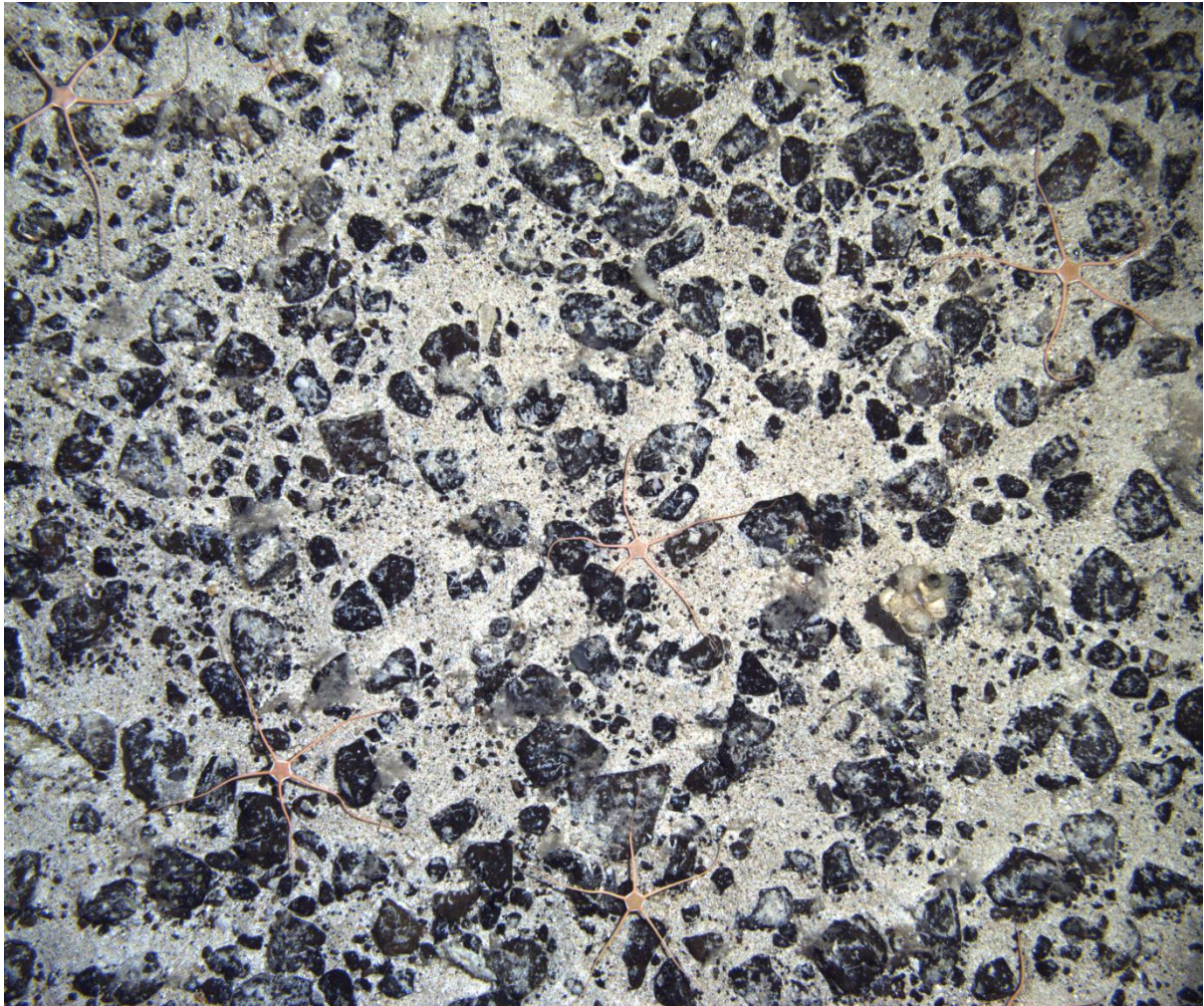


Figure 12: Cluster i example image.

Cluster j

Description: Cluster j comprises four transects from Yakhont seamount in the Tristan da Cunha EEZ. The substrate type is characterised by pebbles and cobbles (with a large size range of both) on fine sand. Hard-bottom *Caryophyllia* spp. cup corals are the most dominant taxa along with ophiuroids and sponges. There are also occasional gorgonians (family: Chrysogorgiidae) and stylasterids. One of the four transects was not considered a VME on its own, although this was only by a small margin. Figure 13 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: Mosaic of hard-bottom cup coral field of *Caryophyllia* spp. and a coral garden (dominated by gorgonians and stylasterids)

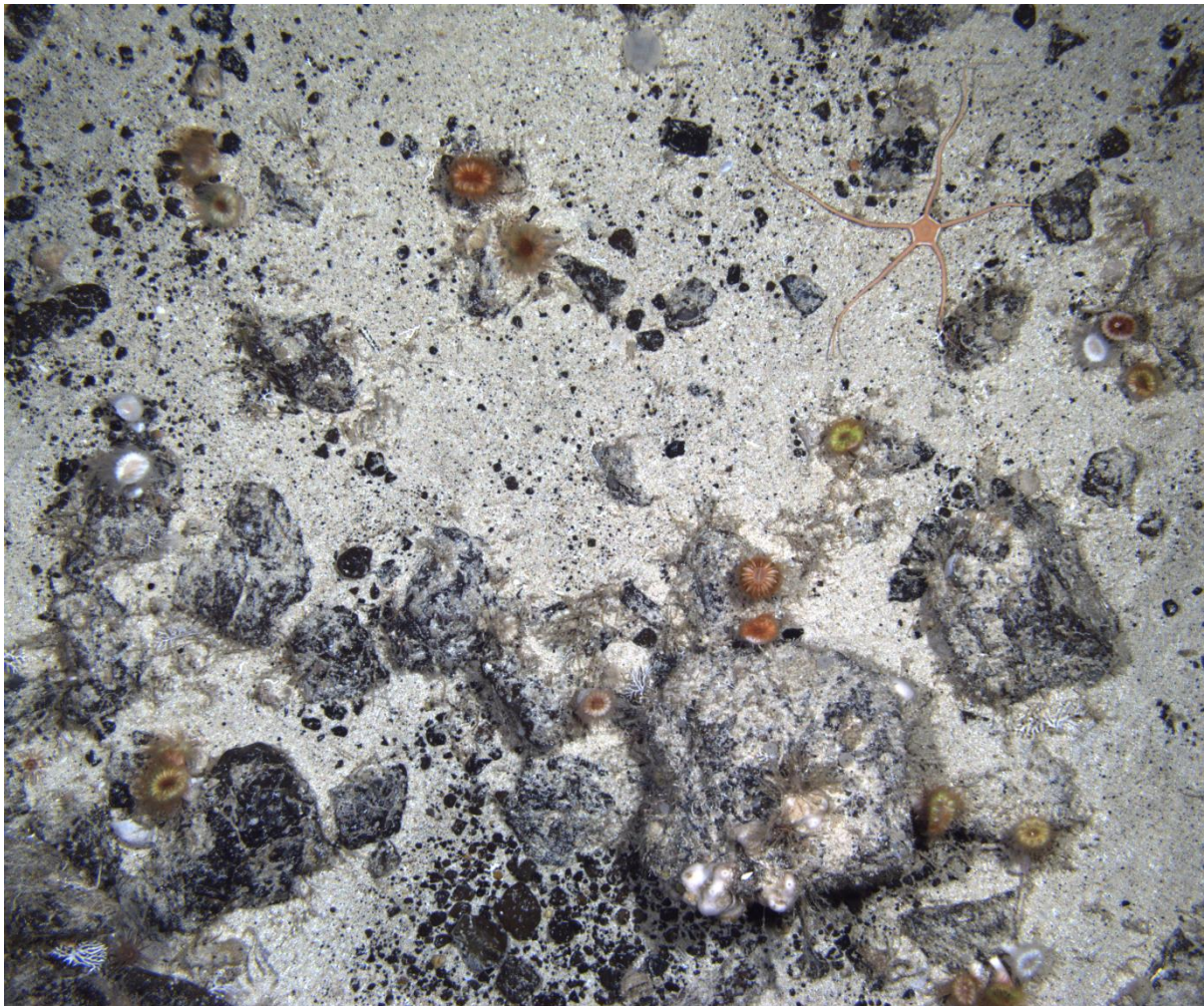


Figure 13: Cluster j example image.

Cluster k

Description: This cluster contains five transects from Yakhont seamount in the Tristan da Cunha EEZ. Substrate type is variable with fine sand being covered by small pebbles to large cobbles, often supporting hydroid and ophiuroid communities. One of the five transects shows dense *Desmophyllum pertusum* reef (Figure 14) with a small epifaunal community comprised largely of ophiuroids, decapods, and some *Lepidoperca coatsii*. Areas with hard substrate shows VME taxa including antipatharians, stylasterids and *Caryophyllia* spp. cup corals, but

these do not characterise the cluster overall. Figure 15 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: Partial *Desmophyllum pertusum* reef



Figure 14: *Desmophyllum pertusum* reef in cluster *k*.

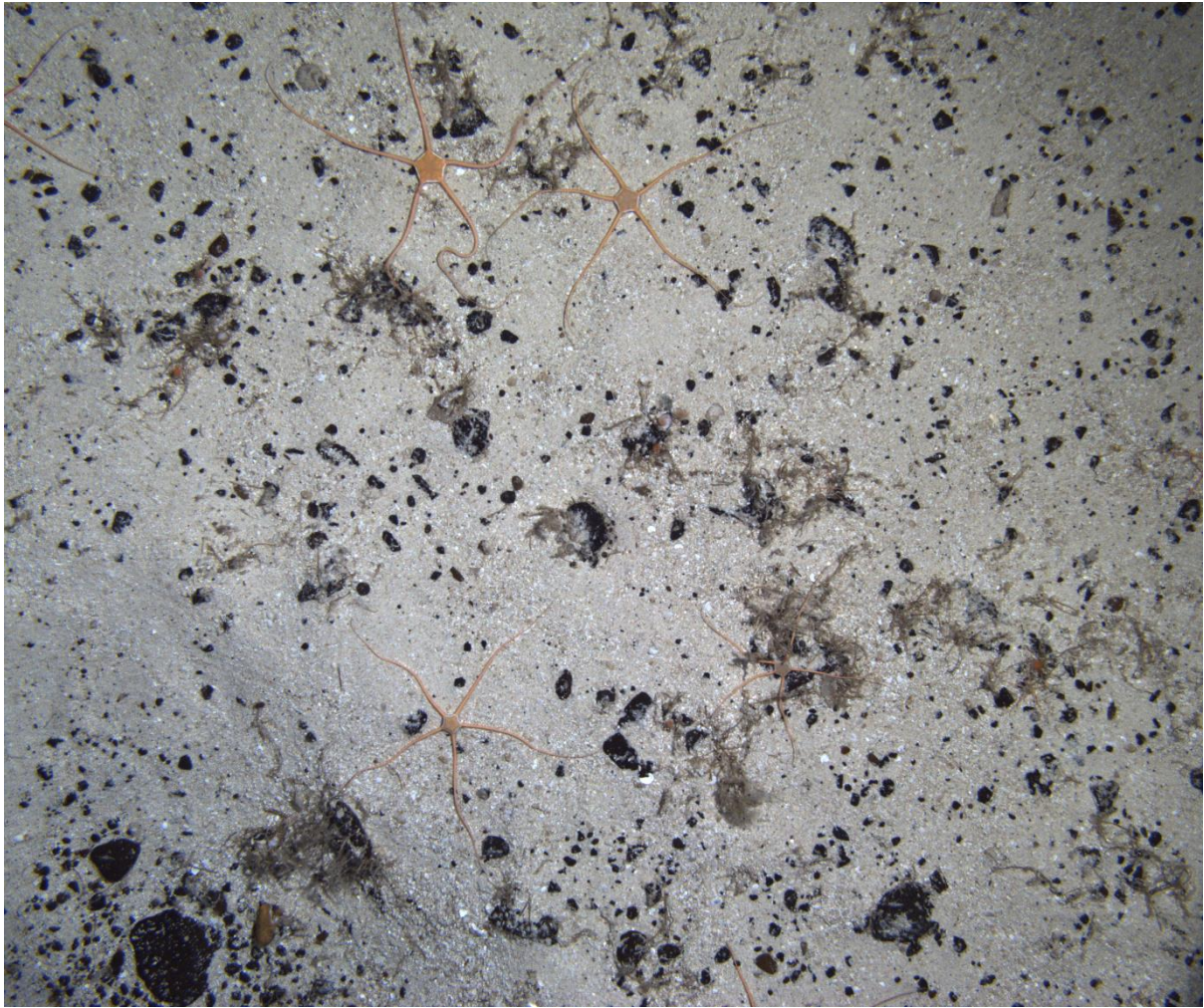


Figure 15: Cluster k example image.

Cluster l

Description: This single-transect cluster comes from Crawford seamount in the central region of the Tristan da Cunha EEZ. Substrate consists largely of coral rubble and/or gravel with few pebbles. There is little live taxa in view, although there is an encrusting sponge on some hard substrate. Figure 16 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No

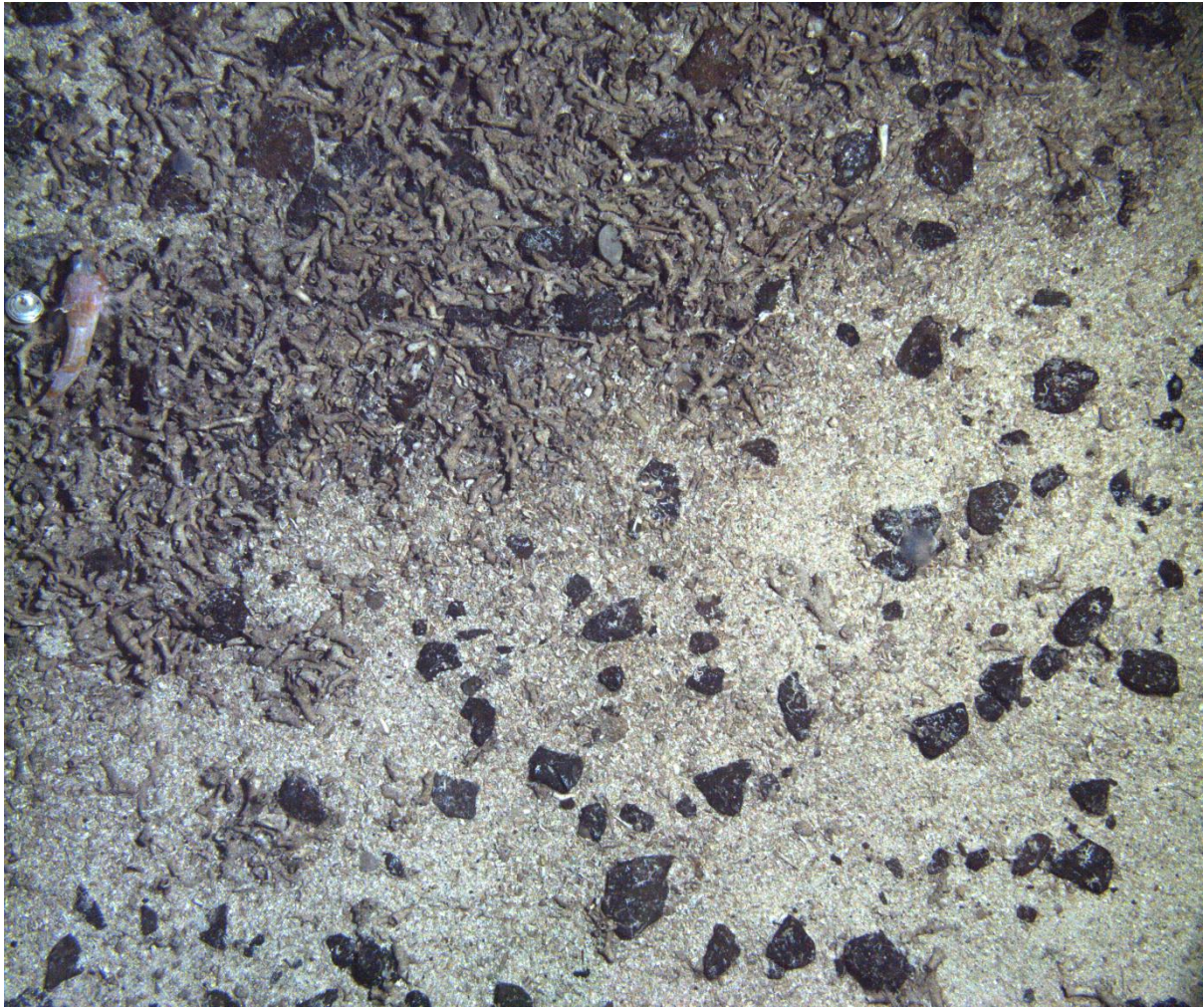


Figure 16: Cluster l example image.

Cluster m

Description: Cluster m is comprised of two transects from Crawford seamount in the central region of the Tristan da Cunha EEZ. Fine sand makes up the majority of the substrate of one transect, whilst the other has more hard substrate in the form of pebbles and cobbles upon which there are structure-forming sponges and *Caryophyllia* spp. cup corals. This transects constitutes a mosaic VME of hard-bottom cup coral field and coral garden, however the cluster overall cannot be described as a VME. Figure 17 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No

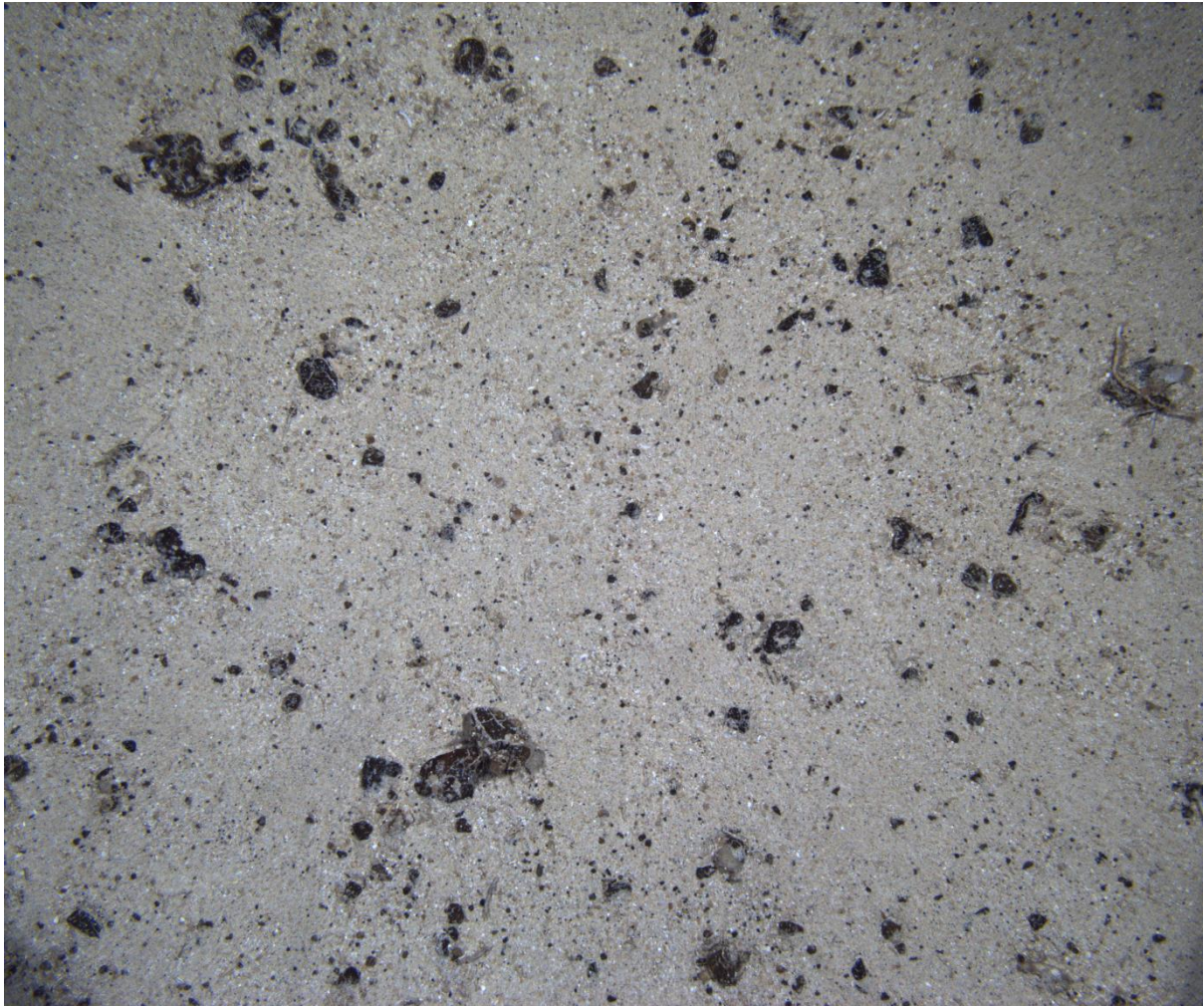


Figure 17: Cluster m example image.

Cluster n

Description: Cluster n is comprised of two transects from Crawford seamount in the central region of the Tristan da Cunha EEZ. Dominant substrate types are pebbles and cobbles on fine sand. Where there is hard substrate, faunal communities are species rich and dominated by hard-bottom *Caryophyllia* spp. cup corals (Figure 18) and structure-forming sponges; larger rocks support some antipatharians. Figure 19 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: Mosaic of hard-bottom cup coral field of *Caryophyllia* spp. and a coral garden (dominated by antipatharians)

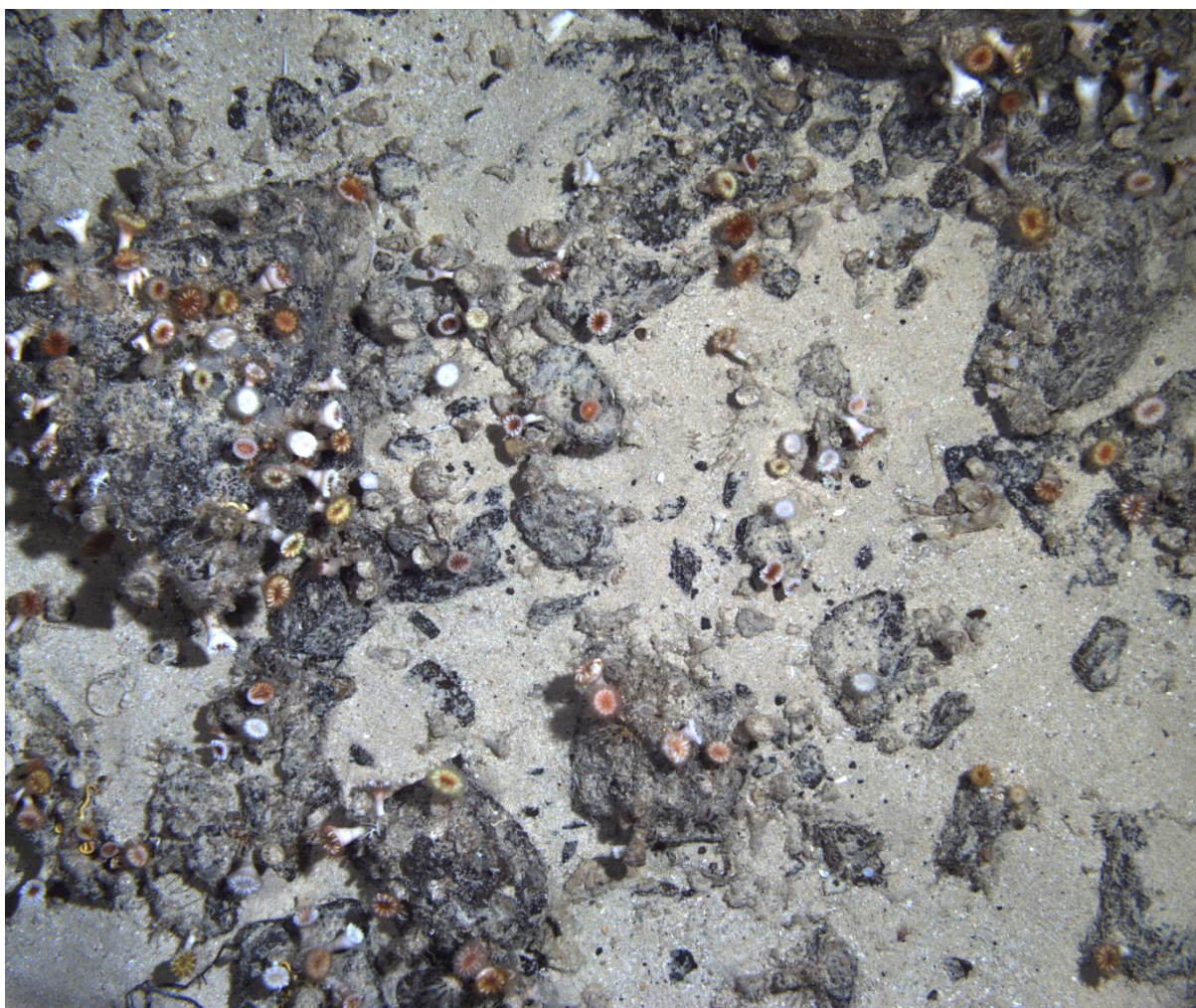


Figure 18: Hard-bottom cup coral field VME example from cluster n.

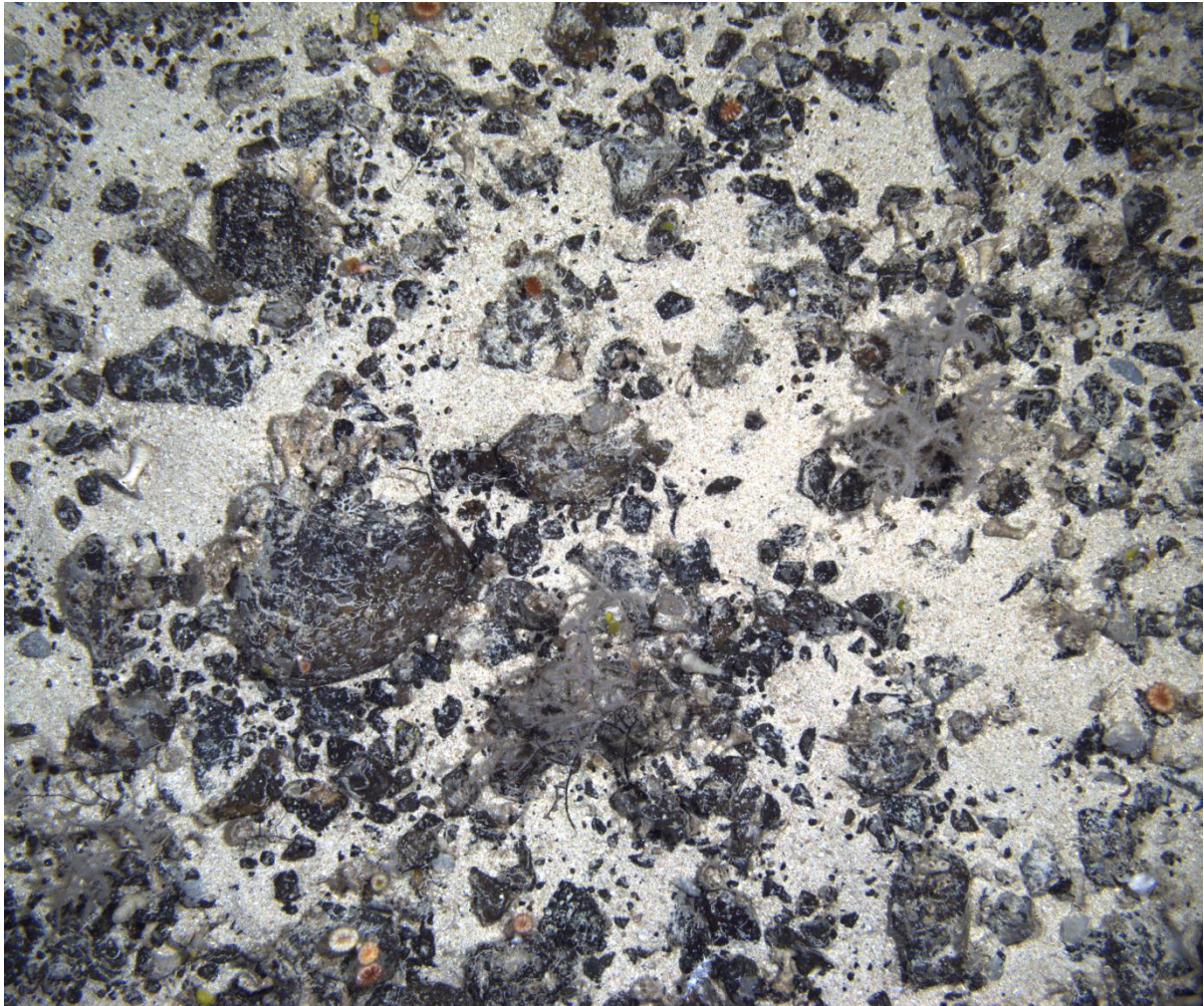


Figure 19: Cluster n example image.

Cluster o

Description: Dominant substrate types are variable including coral rubble and exposed bedrock, the latter of which is often covered by a thin sediment veneer. The faunal community seems linked to substrate type with large ophiuroids dominating the coral rubble areas, and structure-forming sponges and gorgonians on the bedrock/sediment veneer. Numerous images show aggregations of antipatharians (likely *Bathypathes* spp.), hence its classification as a hard-bottom coral garden. Figure 20 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: Hard-bottom coral garden dominated by antipatharians



Figure 20: Cluster o example image depicting an antipatharian-dominated hard-bottom coral garden VME.

Cluster p

Description: Cluster p consists of a single transect from Crawford seamount in the central region of the Tristan da Cunha EEZ. Substrate is typically bedrock and/or coral rubble. On the hard substrate, communities of stylasterids are present, along with some sponge taxa. The coral rubble appears dominated by hydroids and hermit crabs with a commensal anemone. Figure 21 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No

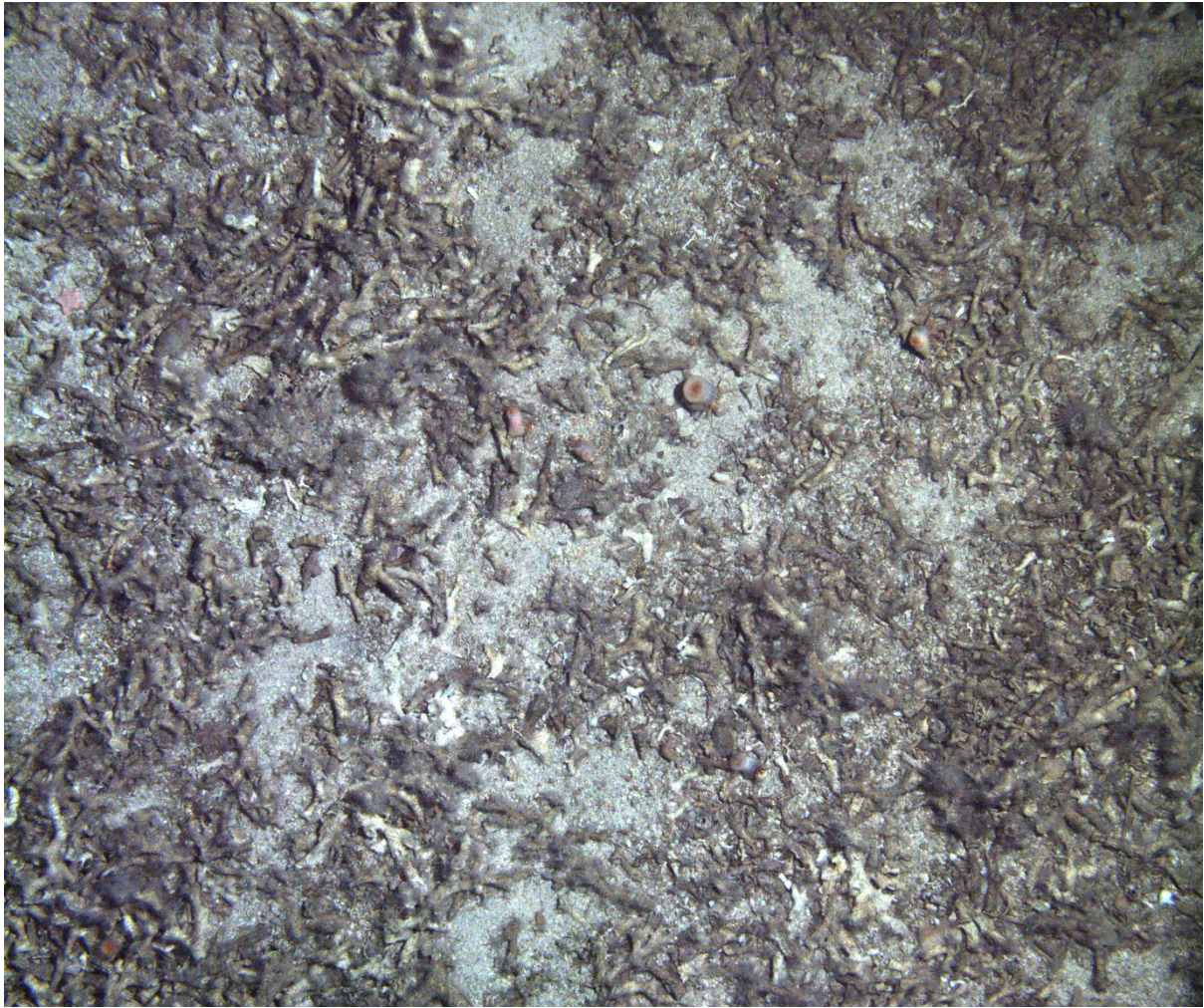


Figure 21: Cluster p example image.

Cluster q

Description: Cluster q contains of five transects from Crawford seamount in the central region of the Tristan da Cunha EEZ. Substrate type is mixed across the cluster, although there is a dominance of coral-related substrate including *Solenosmilia variabilis* reef framework and rubble. Reef framework supports an epifaunal community consisting largely of ophiuroids, encrusting sponges, squat lobsters and hydroids, whilst the rubble provides substrate for brachiopods. Two transects support a stylasterid-dominated coral garden VME (Figure 22) and this is characterised by bedrock with a thin sediment veneer. Figure 23 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: *Solenosmilia variabilis* reef (largely dead framework) and stylasterid-dominated coral garden



Figure 22: Stylasterid-dominated hard-bottom coral garden VME in cluster q.

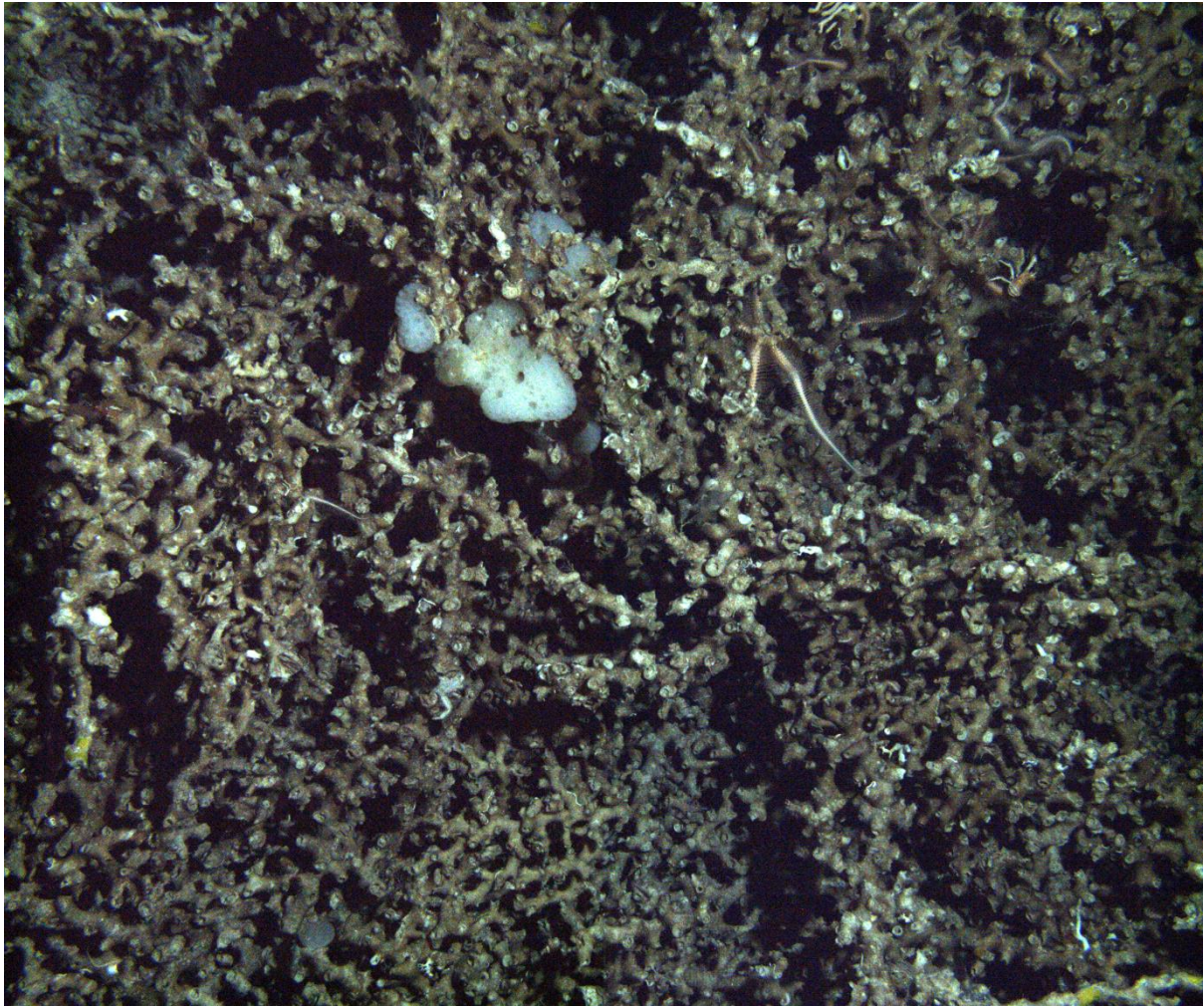


Figure 23: Cluster q example image.

Cluster r

Description: Cluster r contains a single transect from around Ascension Island. The dominant substrate type is coarse sand with some occasional gravel. Mobile taxa are observed in almost all images, often showing multiple fish species. There appears to be no sessile, benthic epifaunal community in most instances. Figure 24 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No

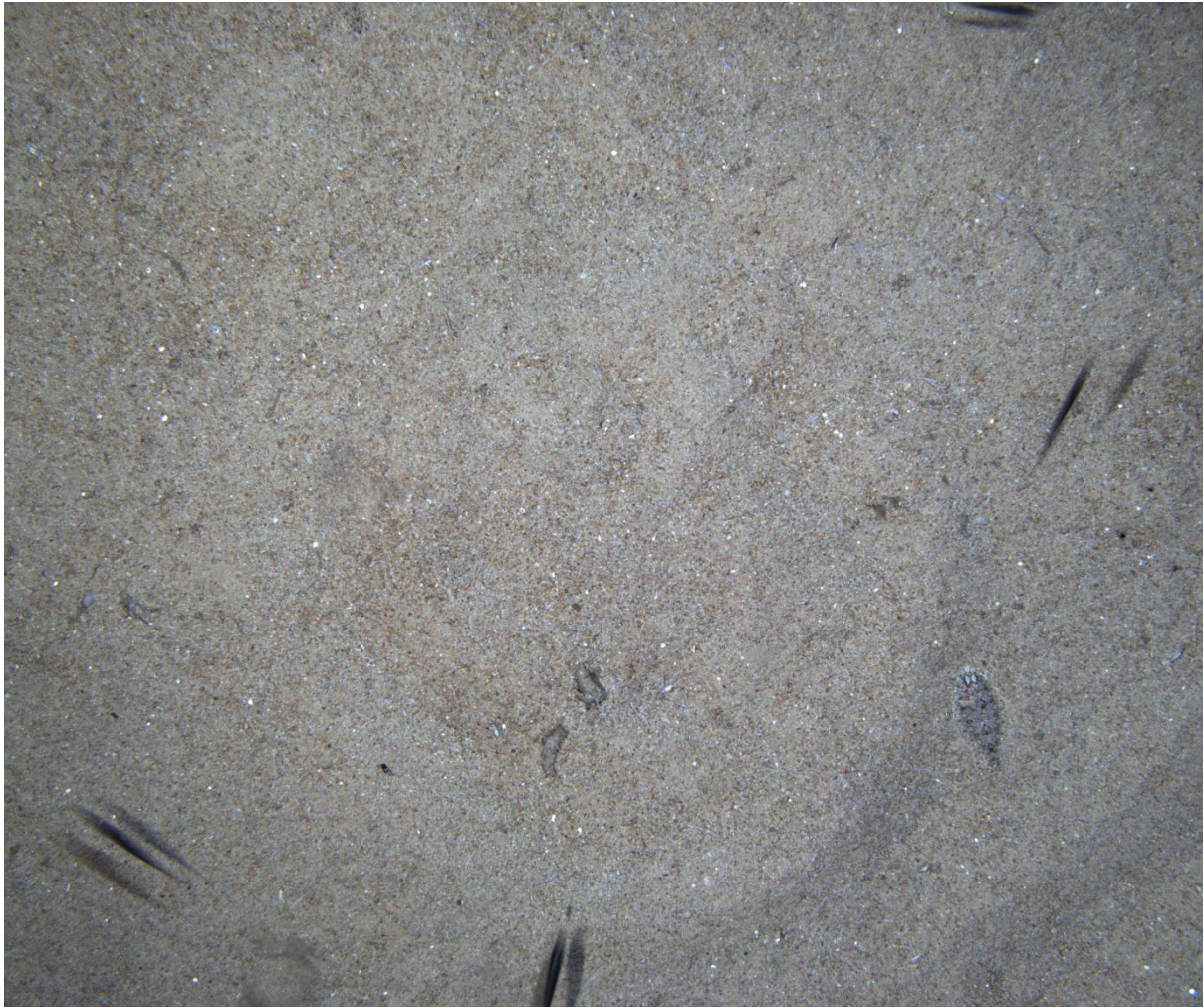


Figure 24: Cluster r example image.

Cluster s

Description: Cluster s consists of two transects from around the island of Saint Helena. The dominant substrate type in all images is sand although the grain sizes vary. Very few fauna are present with the exception of cerianthids and the occasional cidarid urchin. Figure 25 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No

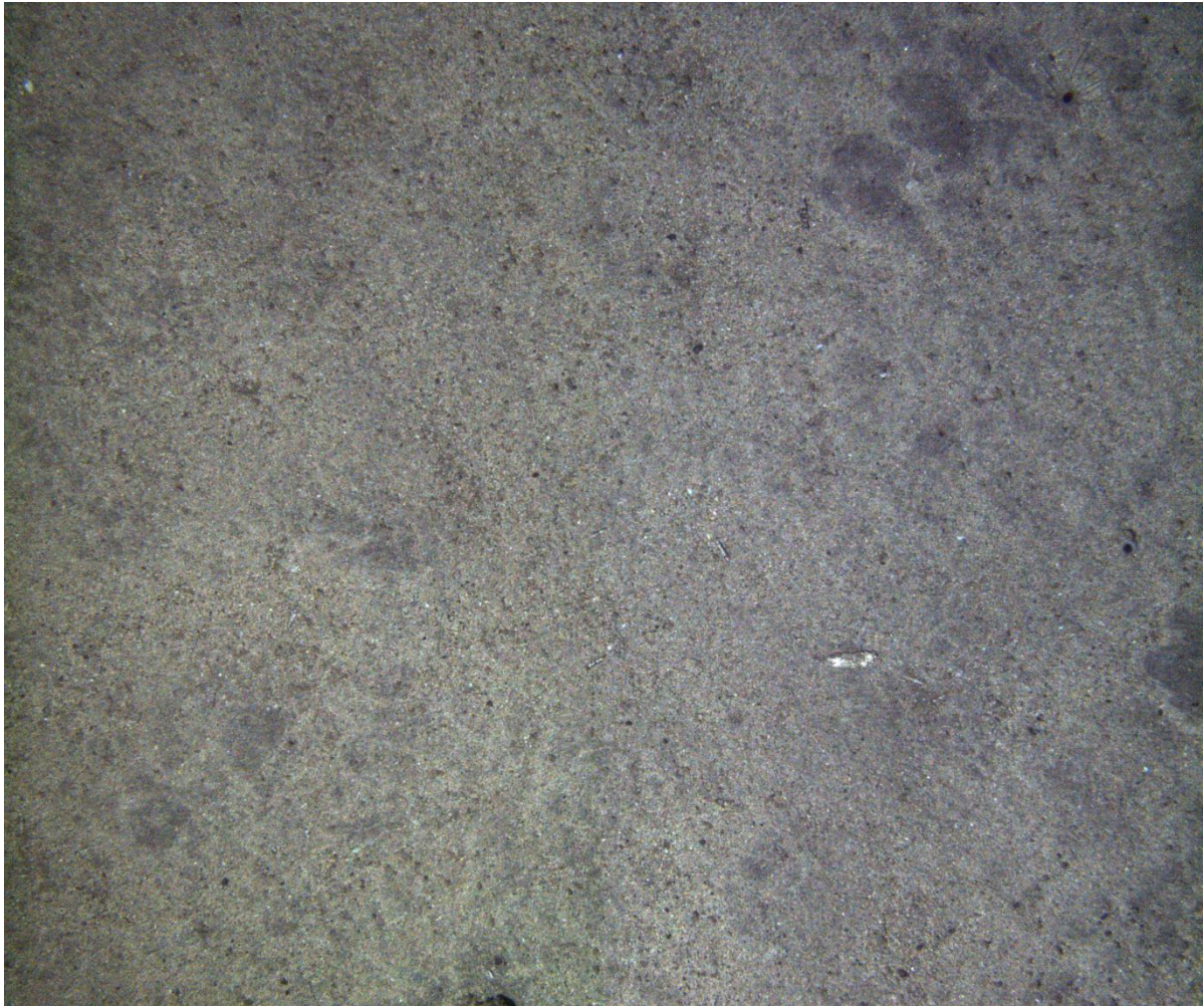


Figure 25: Cluster s example image.

Cluster t

Description: Cluster t comprises 14 transects from 5 locations across the EEZs of both Ascension and Saint Helena. This cluster includes a range of habitat types including *Desmophyllum pertusum* reef (Figure 26) and a sea pen field (Figure 27), both of which are classed as VMEs. Substrates vary dependent on transect, with soft sediment areas, reef framework and bedrock all represented in the images. Soft sediment areas are typically dominated by cidarid urchins and soft-bottom cup corals, and in one area by multiple species of sea pen (sometimes of the *Protoptilum* genus). Reef framework is often dominated by ophiuroid mats, but large, filter feeding *Aphrocallistes* spp. are also present along with anemones. Whilst this cluster seems less coherent than others, there is a strong presence of

cidarid urchins in all transects. Figure 26 and Figure 27 provide example images and full environmental information is supplied in the electronic supplementary material.

VME: Partial *Desmophyllum pertusum* reef and sea pen field

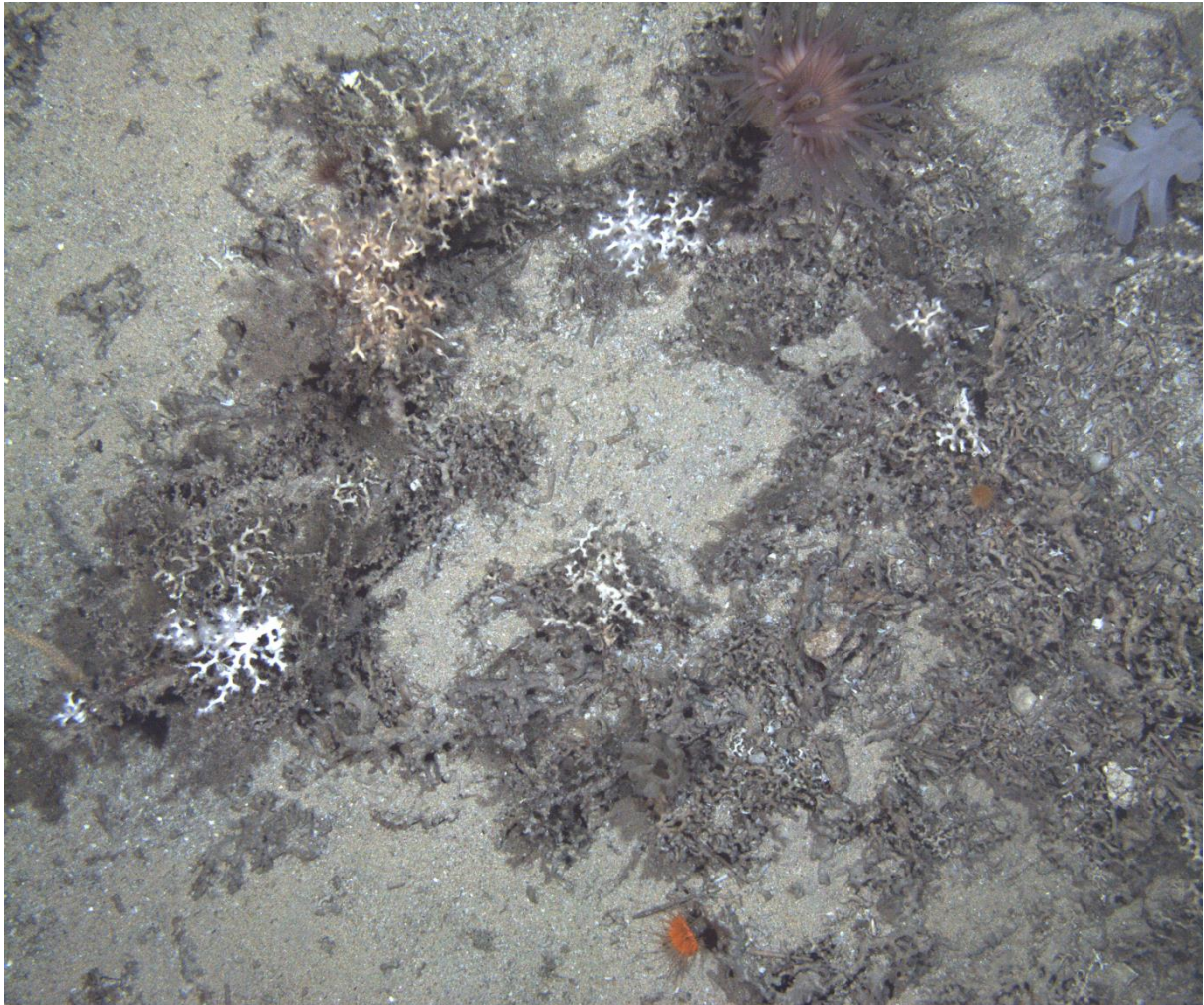


Figure 26: Desmophyllum pertusum reef VME from cluster t.



Figure 27: Seapen field VME from cluster t.

Cluster u

Description: Whilst species richness is low, there are occasional soft-bottom fauna observed including gastropods, sea pens, cerinathids and soft-bottom cup corals. The hard substrate that is present has a low species richness also. Figure 28 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: No

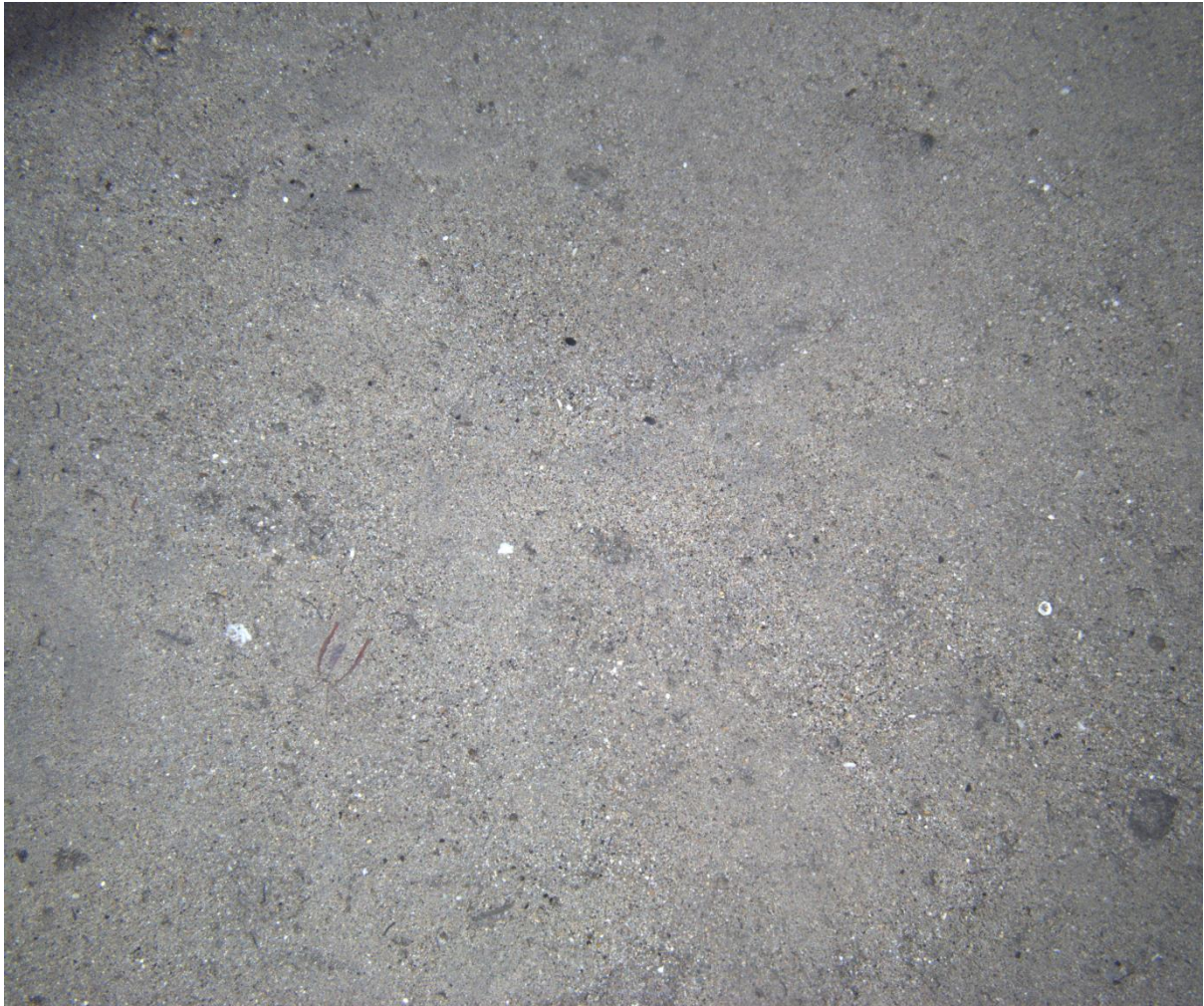


Figure 28: Cluster u example image.

Cluster v

Description: The 13 transects that make up cluster v are from 6 sites across the EEZs of Ascension and Saint Helena. This cluster is typically characterised by hard substrates including reef framework and boulders, however some images show soft substrates including sand (these typically show sediment around the base of rocky outcrops). Rock is often encrusted with serpulid worms. There are small patches of live *Solenosmilia variabilis* on reef framework (Figure 29) as well as epifaunal crinoids and encrusting sponges. Figure 29 provides an example image and full environmental information is supplied in the electronic supplementary material.

VME: Partial *Solenosmilia variabilis* reef

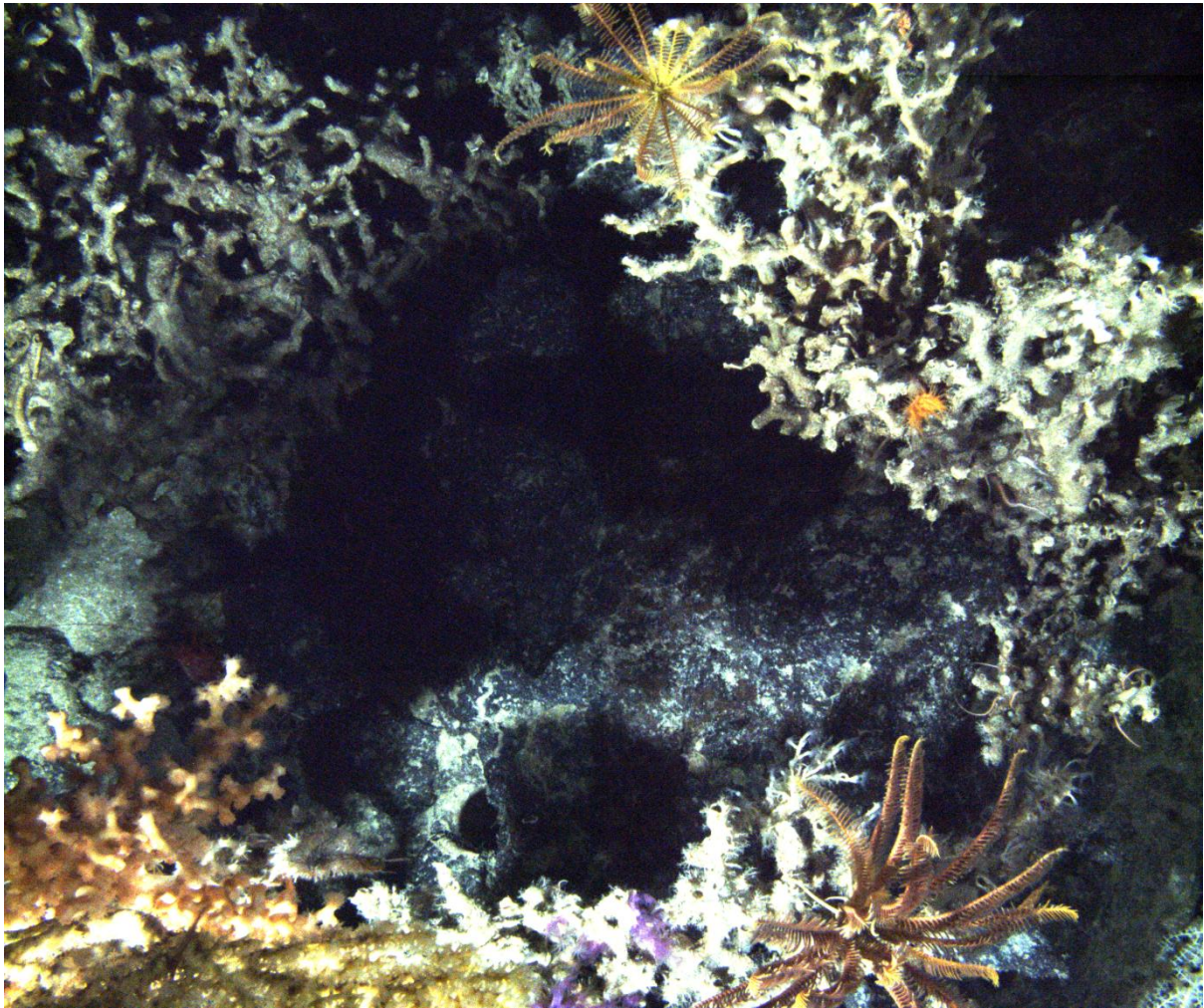


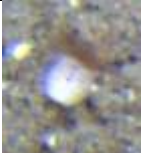



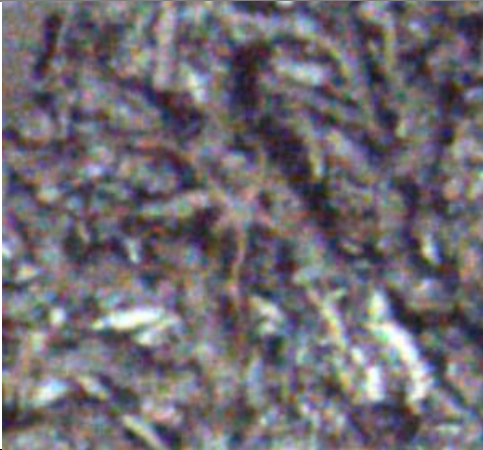
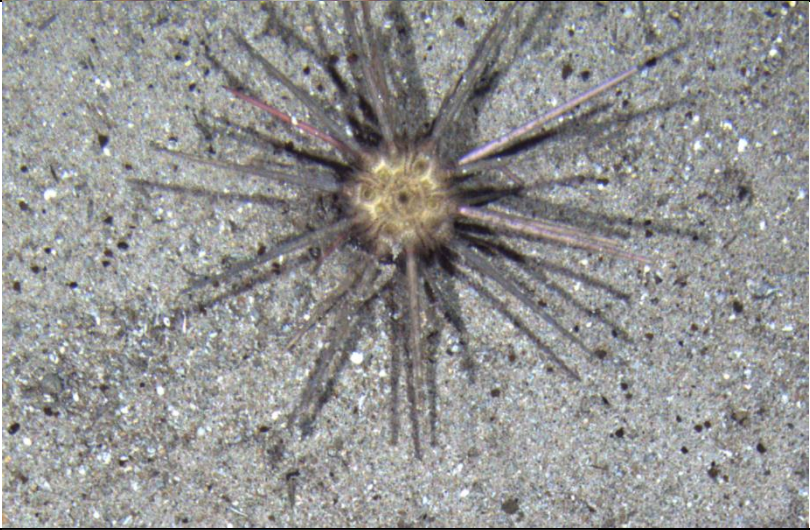

Figure 29: *Solenosmilia variabilis* reef VME in cluster v.




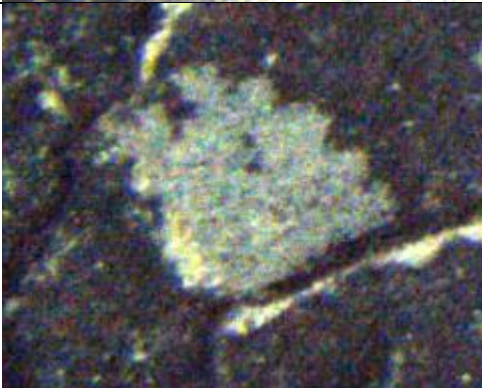
8. Characterising taxa images






Table 5: Images, Operational Taxonomic Unit (OTU) codes and descriptions of the characterising taxa identified by the SIMPER.


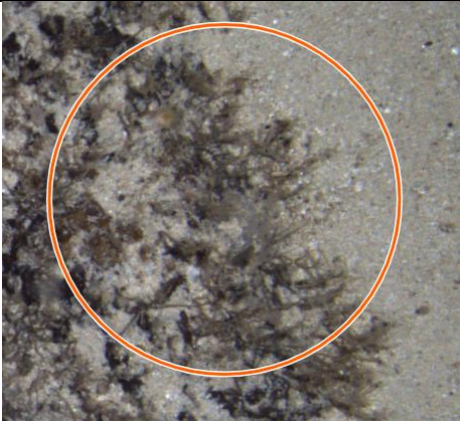


OTU Code	Description in SIMPER table(s)	Image
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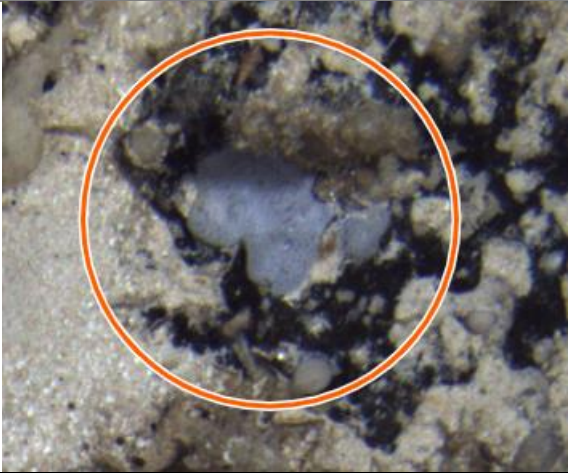
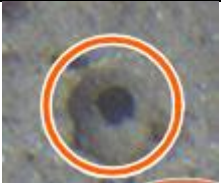
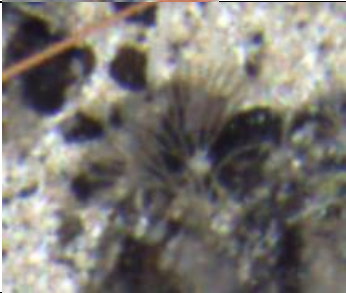
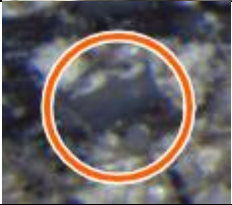

AB01	Hard-bottom <i>Caryophyllia</i> spp.		
AB114	Soft-bottom Caryophyllid ae		
AB174	Actiniaria 4		
AB198	Actiniaria 3		




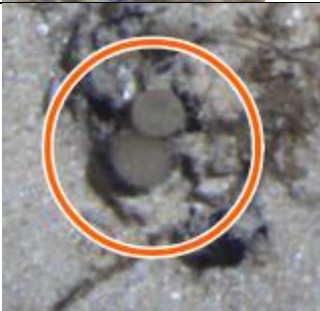
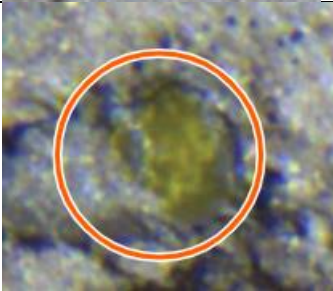
AB199	Reef-associated Ophiuroidea		
AB205	Cidaroida		
AB235	<i>Ophiomusium</i> sp.		



AB24	<i>Thouarella</i> spp.		
AB287	Gastropoda 2		
AB294	Serpulidae		
AB298	Bryozoan 2		

AB300/17 9 (merged)	Decapoda		
AB315	SF sponge 5		
AB346	Galatheaidea		
AB418	Brachiopoda		
AB433	Gastropoda 1		

AB48	Hydroid 2		
AB567	Hydroid 1		
AB568	Zoantharia		
AB569	Actiniaria 1		

AB571	EC sponge 2		
AB579	SF sponge 4		
AB582	Hydroid 3		
AB583	EC sponge 1		
AB585	Bivalvia 1		

AB586	SF sponge 3		
AB587	Hormathiidae		
AB591	Bryozoan 1		
AB596	SF sponge 1		
AB62	EC sponge 3		

AB633	SF sponge 2		
AB696	Stylasteridae 1		
AB726	EC sponge 4	