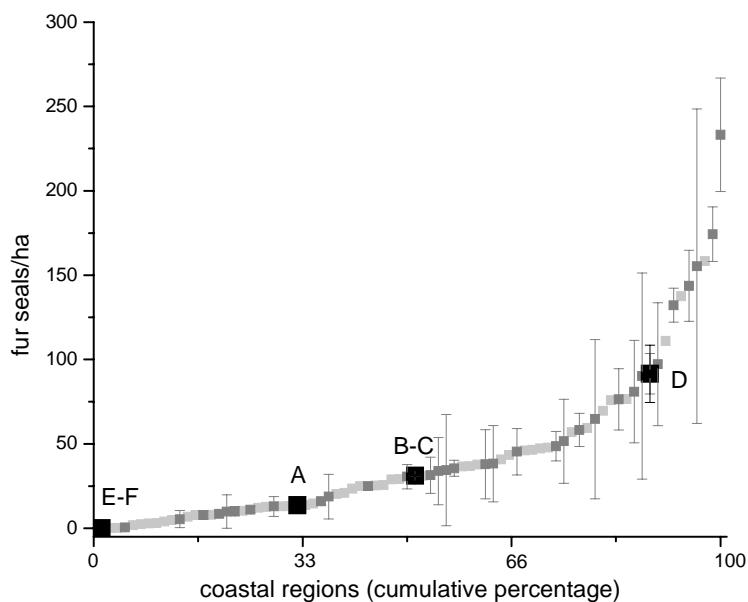


SUPPLEMENTARY MATERIALS

1) Fur seal abundance along the coasts of Signy Island.

Detailed census of fur seals along the Signy coasts has been undertaken annually since 1977, counts being made in defined coastal regions in late February. Macroplots A–D were established in coastal regions which displayed different levels of animal density in the census undertaken in late February 2008 and 2009 ($A = 14 \text{ individuals/ha}_{2009}$, $B-C = 31 \pm 0 \text{ individuals/ha}_{\text{av.} \pm \text{se} \text{ 2008-2009}}$, $D = 92 \pm 12 \text{ individuals/ha}_{\text{av.} \pm \text{se} \text{ 2008-2009}}$). Although a high degree of variability characterizes the numbers of fur seals observed in the different regions in all years, local counts and data from the whole-island census are correlated (Waluda *et al.* 2010). Accordingly, as counts through the overall surveyed regions ranged from 0 ± 0 to $233 \pm 37 \text{ individuals/ha}_{\text{av.} 2008-2009}$ and the total average count was $43 \pm 5 \text{ individuals/ha}_{\text{av.} 2008-2009}$, the regions where the plots were established are confidently representative of a low (A), medium (B-C) and high (C) animal pressure (Fig. a).

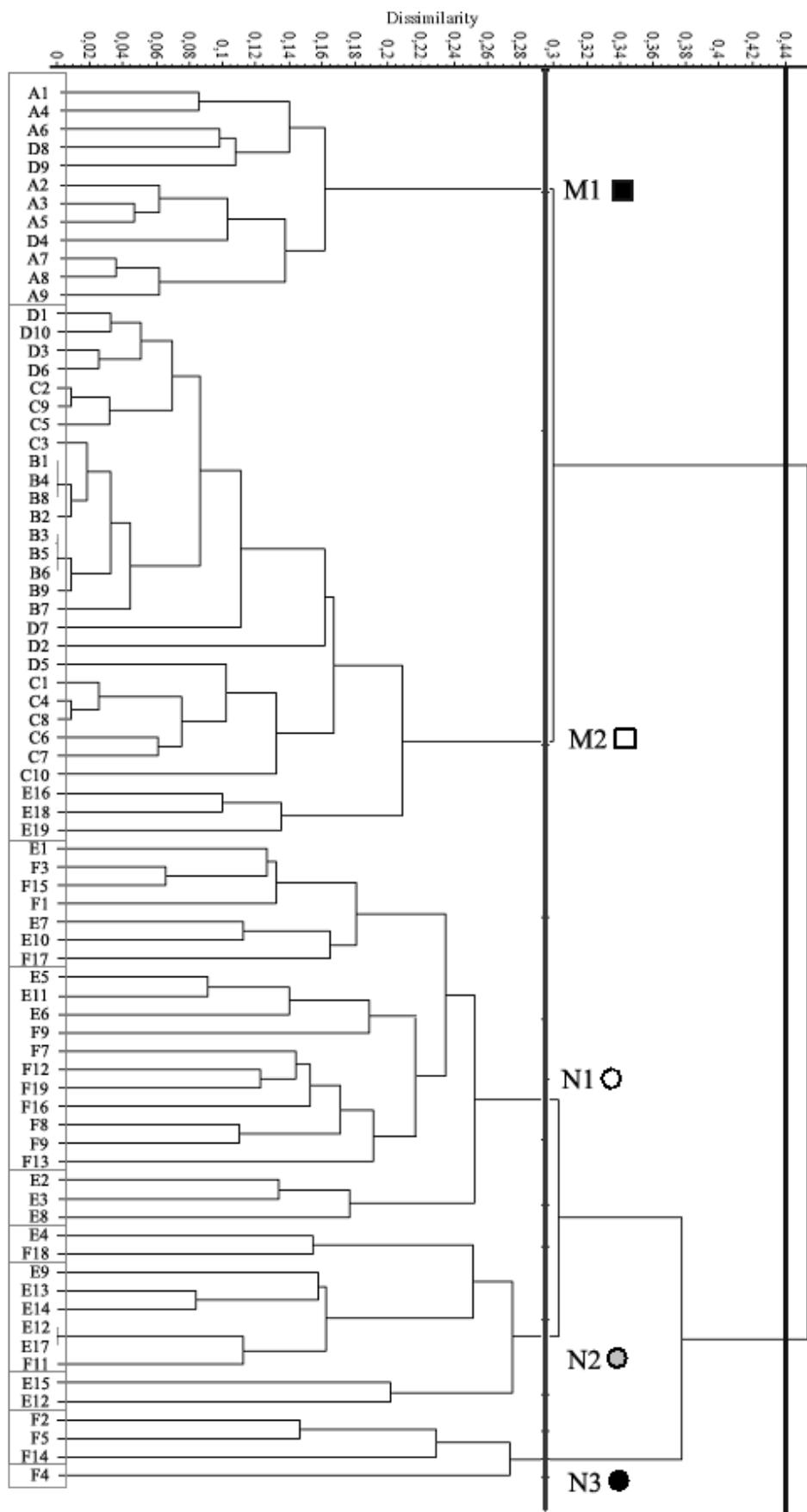


a. Data from the detailed census of fur seals undertaken in late February 2008 and/or 2009 in Signy coastal regions (dots) (D.R. Briggs, personal communication 2009). Light grey dots indicate regions for which only one datum is available; dark grey dots indicate regions for which data from the two census are available and reported as mean \pm standard error. Regions including the investigated macroplots (A–F) are displayed as black dots.

Information on data accession is available at: <http://www.antarctica.ac.uk/dms/full-record.php?id=GB/NERC/BAS/AEDC/00322>.

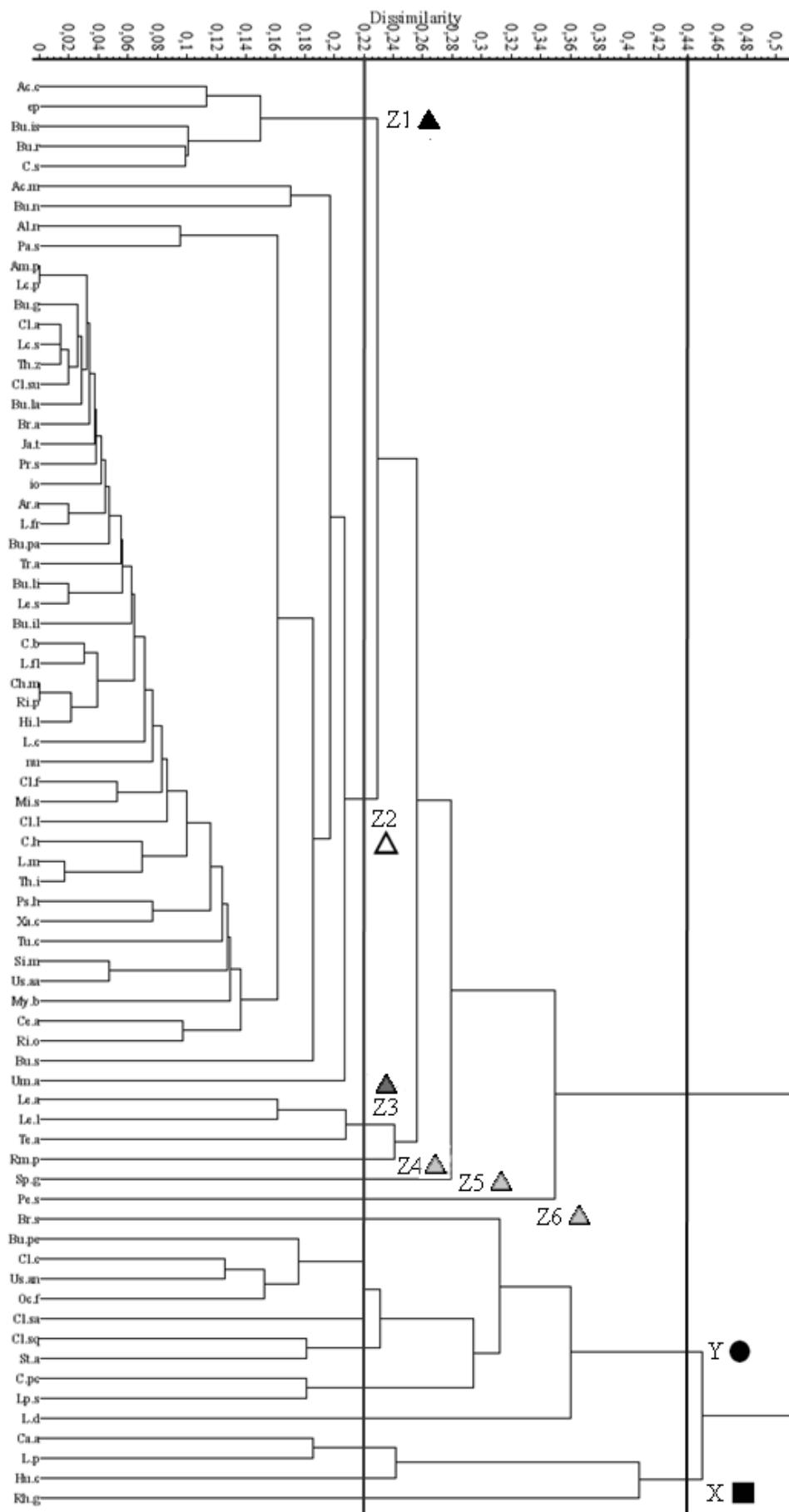
2) Classification of subplots with reference to the specific cover data

UPGMA, weighted dissimilarity as resemblance measure, no standardization, arbitrary resolution of ties, 0.44 and 0.30 dissimilarity as cut levels.



3) Classification of species with reference to the cover data through the overall surveyed plots

UPGMA, weighted dissimilarity as resemblance measure, no standardization, arbitrary resolution of ties, 0.44 and 0.22 dissimilarity as cut levels.



4) CCA scores

(4a) CCA scores calculated without downweighting of species having frequency < 10%.

Axes	1	2	3	4	Sum	Total inertia
Eigenvalues	0.729	0.447	0.303	0.150	1.629	7.255
Species-environmental correlations	0.966	0.930	0.833	0.664	3.393	
Cumulative percentage of variance						
- of species data	10.0	16.2	20.4	22.4		
- of species-environmental relation	39.3	63.3	79.7	87.7		
Monte Carlo Test	F-ratio	P-value				
Test of significance of the first canonical axis	7.373	0.0020				
Test of significance of all canonical axis	3.782	0.0020				
Inflation factor (VIF)	VIF	λ_1	λ_A	F-value	P-value	
Marginal and conditional effects						
Slope (SL)	4.8402	0.26	0.26	3.02	0.002	
Fur seal pressure (FS)	2.3371	0.62	0.62	6.64	0.002	
Surface stoniness (BL)	1.1583	0.27	0.21	2.47	0.012	
Nitrogen content (N)	1.4920	0.42	0.39	4.35	0.002	
C/N ratio (CN)	2.2663	0.45	0.22	2.59	0.002	
pH	4.6113	0.33	0.16	1.97	0.048	
Weighted correlation matrix	SL	FS	BL	N	CN	pH
Axis 1	-0.2723	0.9108	0.2370	0.2899	-0.6014	0.4312
Axis 2	-0.0680	-0.0238	0.0619	-0.8804	-0.3712	0.3534
Axis 3	0.6936	0.0317	-0.7508	-0.0934	-0.5595	-0.4801
Axis 4	-0.5977	-0.1324	-0.5790	0.0046	0.3003	0.4351
SL	1.0000					
FS	-0.0364	1.0000				
BL	-0.2784	0.2066	1.0000			
N	-0.1893	0.1402	0.1361	1.0000		
CN	-0.3907	-0.5845	0.0357	0.2000	1.0000	
pH	-0.8183	0.2402	0.1982	-0.0649	0.1538	1.0000

(4b) CCA scores calculated with downweighting of species having frequency < 10%.

Axes	1	2	3	4	Sum	Total inertia
Eigenvalues	0.709	0.388	0.278	0.119	1.494	5.292
Species-environmental correlations	0.962	0.899	0.809	0.696	3.366	
Cumulative percentage of variance						
- of species data	13.4	20.7	26.0	28.2		
- of species-environmental relation	44.3	68.6	85.9	93.4		
Monte Carlo Test	F-ratio	P-value				
Test of significance of the first canonical axis	10.202	0.0020				
Test of significance of all canonical axis	4.765	0.0020				
Inflation factor (VIF)	VIF	λ_1	λ_A	F-value	P-value	
Marginal and conditional effects						
Slope (SL)	5.0330	0.23	0.24	3.91	0.002	
Fur seal pressure (FS)	2.3506	0.60	0.60	9.01	0.002	
Surface stoniness (BL)	1.1775	0.24	0.17	2.99	0.002	
Nitrogen content (N)	1.4603	0.37	0.33	5.41	0.002	
C/N ratio (CN)	2.2735	0.41	0.17	3.01	0.002	
pH	4.7627	0.28	0.09	1.59	0.082	
Weighted correlation matrix	SL	FS	BL	N	CN	pH
Axis 1	-0.2695	0.9123	0.2495	0.2849	-0.5922	0.4396
Axis 2	-0.0628	-0.0152	0.0316	-0.8873	-0.3784	0.3180
Axis 3	0.7141	0.0487	-0.7383	-0.0939	-0.5478	-0.4566
Axis 4	-0.5333	-0.0745	-0.5815	0.0257	0.4201	0.5971
SL	1.0000					
FS	-0.0328	1.0000				
BL	-0.2847	0.2104	1.0000			
N	-0.1924	0.1314	0.1532	1.0000		
CN	-0.4046	-0.5807	0.0365	0.2010	1.0000	
pH	-0.8225	0.2472	0.1920	-0.0508	0.1673	1.0000

5) Relevés: summary of data for (I) the overall survey, (II-III) fur seal and control areas, (IV) different macroplots, (V) different subplots. Abbreviations in the first left column and at the end of the tables.

Plots	I - Total							II - Fur seal areas (A-D)							III - Control areas (E-F)									
Number of relevés (NR)	76							38							38									
Slope (SL, %)	8,6							8,9							9,2									
Exposition (EX)	~ N							~ N							~ N									
Boulders, cobbles, coarse gravel (BL, %)	22,9							22,4							20,7									
Fine gravel and sand (soil s.l.) (GS, %)	37,8							77,3							0,8									
Moss-covered soil (MC, %))	39,3							0,0							78,5									
Vegetation cover (VC, %, including the following 4 taxa and lichens)	78,7							69,4							98,2									
<i>Prasiola crispa</i> (Lightfoot) Kützing (P.c., cover %)	22,7							55,6							0,4									
Bryophyta (Br., cover %)	37,4							1,5							73,1									
<i>Deschampsia antarctica</i> Desv. (D.a., cover %)	2,3							0,0							3,6									
Basidiomycota (Bas., cover %)	0,0							0,0							0,0									
Lichens																								
Total cover (%)	16,33							12,2							21,1									
Alpha diversity (species richness)	74							40							47									
Rocks																								
Saxicolous lichen cover (SLC, %)	13,8							11,9							16,3									
Lichen-covered rock surfaces (LRS, %)	59,1							44,5							77,2									
Acarospora convoluta	abb.	cl.	w.d.	n ^a	% ^b	% ^c	% ^d	% ^e	n ^a	% ^b	% ^c	% ^d	% ^e	n ^a	% ^b	% ^c	% ^d	% ^e	n ^a	% ^b	% ^c	% ^d	% ^e	
Acarospora macrocyllos	Ac.c	Z1	E	§	11	0,197	0,032	0,234	0,141	9	0,537	0,066	0,550	0,294	2	0,012	0,003	0,016	0,013					
cfr. Bryonora	Ac.m	Z2	E	§	12	1,237	0,202	1,466	0,883	7	0,514	0,063	0,527	0,281	5	1,630	0,345	2,120	1,667					
Buellia cf. granulosa	Br.s	Y	-	#	20	1,804	0,295	2,139	1,288	0	0,000	0,000	0,000	0,000	20	2,787	0,589	3,625	2,850					
Buellia illecebabilis	Bu.g	Z2	E	*	1	0,004	0,001	0,005	0,003	1	0,011	0,001	0,012	0,006	0	0,000	0,000	0,000	0,000	2	0,249	0,053	0,324	0,254
Buellia isabellina	Bu.il	Z2	E	§	15	2,775	1,107	8,031	4,836	15	19,210	2,352	19,689	10,521	0	0,000	0,000	0,000	0,000	25	0,000	0,000	0,000	0,000
Buellia latemarginata	Bu.la	Z2	E	§	1	0,004	0,001	0,005	0,003	0	0,000	0,000	0,000	0,000	1	0,006	0,001	0,008	0,006					
Buellia lignoides	Bu.li	Z2	E	*	1	0,004	0,001	0,005	0,003	0	0,000	0,000	0,000	0,000	1	0,006	0,001	0,008	0,006					
Buellia nelsonii	Bu.bn	Z2	E	6	0,338	0,055	0,401	0,242	0	0,000	0,000	0,000	0,000	6	0,523	0,111	0,680	0,534						
Buellia cf. papillata	Bu.pa	Z2	Bip	*	1	0,004	0,001	0,005	0,003	0	0,000	0,000	0,000	0,000	1	0,006	0,001	0,008	0,006					
Buellia perlata	Bu.pe	Z	E	35	4,359	2,345	10,022	10,250	0	0,000	0,000	0,000	0,000	35	22,181	4,691	28,845	22,678						
Buellia russa	Bu.ru	Z1	E	§	28	12,322	2,014	14,615	8,801	28	34,959	4,281	35,832	19,146	0	0,000	0,000	0,000	0,000	27	13,216	2,795	17,186	13,511
Buellia subpedicellata	Bu.s	Z2	E	18	2,598	0,424	3,080	2,055	18	7,366	0,902	7,550	4,034	0	0,000	0,000	0,000	0,000	29	6,514	1,378	8,472	6,660	
Caloplaca cf. buelliae	C.b	Z2	E	3	0,012	0,002	0,014	0,009	3	0,034	0,004	0,035	0,019	0	0,000	0,000	0,000	0,000	24	8,487	1,795	11,036	8,677	
Caloplaca holocarpa	C.h	Z2	Bip	5	0,020	0,003	0,024	0,014	5	0,057	0,007	0,059	0,031	0	0,000	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000	
Caloplaca sublobulata	C.s	Z1	SSH	§	15	0,213	0,035	0,253	0,152	15	0,605	0,074	0,620	0,332	0	0,000	0,000	0,000	0,000	27	0,000	0,000	0,000	0,000
Carbonea assentiens	Ca.x	Z	E_sub	39	14,033	2,292	16,635	10,017	12	15,532	1,902	15,920	8,507	0	0,006	0,001	0,008	0,006	27	13,216	2,795	17,186	13,511	
Himantormia lugubris	Hil	Z2	E	2	0,008	0,001	0,010	0,006	1	0,011	0,001	0,012	0,006	1	0,006	0,001	0,008	0,006						
Huea coraligera	H.u.c	X	E	37	5,268	0,861	6,245	3,761	8	2,981	0,365	3,055	1,633	29	6,514	1,378	8,472	6,660						
Lecanora dancensis	L.d	Z	E	26	6,062	0,990	7,186	4,327	2	1,610	0,197	1,651	0,882	24	8,487	1,795	11,036	8,677						
Lecanora floriformis	L.fl	Z2	Cos	§	3	0,012	0,002	0,014	0,009	3	0,034	0,004	0,035	0,019	0	0,000	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000
Lecanora frustulosa	L.fr	Z2	Bip	*	2	0,008	0,001	0,010	0,006	2	0,023	0,003	0,023	0,013	0	0,000	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000
Lecanora mons-nivis	L.m	Z2	E	*	4	0,016	0,003	0,019	0,006	4	0,046	0,006	0,047	0,025	0	0,000	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000
Lecanora polytopa	L.p	X	Bip	§	50	8,575	1,401	10,165	6,121	19	5,756	0,705	5,900	3,152	31	10,111	2,138	13,148	10,337					
Lecidea atrobrunnea	L.c	Z2	E	*	6	1,051	0,172	1,246	0,750	6	2,981	0,365	3,055	1,633	0	0,000	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000
Lecidea lapicida	Le.l	Z3	Bip	*	8	0,894	0,146	1,060	0,638	0	0,000	0,000	0,000	0,000	8	1,381	0,292	1,796	1,412					
Lecidea sphagnicardum	Le.s	Z2	E	§	2	0,242	0,039	0,286	0,173	0	0,000	0,000	0,000	0,000	2	0,373	0,079	0,485	0,382					
Lecidella patavina	Lc.p	Z2	Bip	*	1	0,004	0,001	0,005	0,003	1	0,011	0,001	0,012	0,006	0	0,000	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000
Lecidella siamensis	Lc.s	Z	Cos	11	0,822	0,134	0,974	0,587	0	0,000	0,000	0,000	0,000	11	1,269	0,268	1,651	1,298						
Thelidium zwackhii	Th.z	Z2	Bip	*	5	0,020	0,003	0,024	0,014	5	0,057	0,007	0,058	0,031	0	0,000	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000
Trimmatothelopsis antarctica	Tr.a	Z2	E	*	6	0,411	0,067	0,487	0,293	6	1,165	0,143	1,194	0,638	0	0,000	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000
Turgidoculum complicatum	Tu.c	Z2	Bip	§	8	0,189	0,031	0,224	0,135	8	0,537	0,066	0,550	0,294	0	0,000	0,000	0,000	0,000	0	0,000	0,000	0,000	0,000
Umbilicaria antarctica	Um.a	Z2	E	*	8	0,032	0,005	0,038	0															

^a = number of subplots including the species, ^b = specific contribution to the total cover (%), ^c = specific cover with respect to the total surveyed surface (%), ^d = specific contribution to the total saxicolous/terricolous cover, ^e = specific cover with respect to the total surveyed rock/soil-moss surface, ^f = species cover in the subplot (0.1 = +).

Abbr., species abbreviation; cl. = cluster including the species according to the classification on the basis of specific cover data obtained through the overall survey; world distribution: E = Antarctic endemic, E_{sub} = Antarctic-sub-Antarctic endemic, Cos = cosmopolitan, Bip = bipolar, SSH = Southern South Hemisphere distributed (including Magellanic) (Øvstedal & Lewis Smith 2001), § = nitrophilous species according to Øvstedal & Lewis Smith (2001), first report for Southern Orkneys (*) and, possibly, for Antarctica (# = detailed investigation in progress).