Supplementary material

Trophic state of benthic deep-sea ecosystems from two different continental margins off Iberia

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Supplementary Tables S1-S5

Table S1. Sampling periods and station location in the open slopes and canyons of the Catalan and Portuguese margins.

Catalan margin				
Habitat	Sampling period	Depth (m)	Latitude (°N)	Longitude (°E)
Open slope	May 2004	985	42.129	3.777
"	October 2005	985	42.129	3.777
"	August 2006	990	42.129	3.777
"	May 2004	1874	42.125	4.058
"	October 2005	1887	42.118	4.046
"	August 2006	1890	42.118	4.046
Cap de Creus canyon	May 2004	960	42.308	3.610
"	October 2005	960	42.308	3.610
"	August 2006	960	42.308	3.610
"	May 2004	1801	42.173	4.070
"	October 2005	1874	42.213	4.257
"	August 2006	1870	42.213	4.257

Portuguese margin				
Habitat	Sampling period	Depth (m)	Latitude (°N)	Longitude (°E)
Open slope	September 2006	420	40.111	9.667
"	"	960	40.111	9.833
"	"	3470	40.111	10.000
"	"	4080	40.111	10.167
Nazarè canyon	September 2006	460	39.409	9.190
"	"	900	39.398	9.404
"	"	3230	39.336	9.843
"	"	4260	39.396	10.167

Table S2. Output of the three-way analysis of variance and pair-wise comparison testing for differences in the bioavailability of organic matter and its nutritional value between sediments collected in different habitats (open slope *vs* canyon), at different depths and in different sampling periods in the Catalan margin. *** P<0.001, **P<0.01, *P<0.05, ns=not significant. na=not available. C= Canyon, S=Slope, M=May 2004, O=October 2005, A=August 2006.

						TIME				HABITAT						DEPTH					
Variable	**Source**	**df**	**MS**	**Pseudo-F**	**P**	**S 1000 m**	**S 1900 m**	**C 1000 m**	**C 1900 m**	**M 1000 m**	**M 1900 m**	**O 1000 m**	**O 1900 m**	**A 1000 m**	**A 1900 m**	**M S**	**M C**	**O S**	**O C**	**A S**	**A C**
Total phytopigments	**Time (T)**	1	2.4	72.0	***	O<A	O<A	O<A	O<A	na	na	S< C	ns	S< C	S< C	na	na	1000> 1900	1000> 1900	1000> 1900	1000> 1900
	Habitat (H)	1	6.0	183.3	***																
	Depth (D)	1	10.3	314.7	***																
	T x H	1	0.1	3.2	ns																
	T x D	1	0.2	6.1	*																
	H x D	1	3.4	103.5	***																
	T x H x D	1	0.1	4.4	ns																
	Res	16	0.0																		
	Total	23																			
Hydrolysable proteins	**Time (T)**	2	5.3	17.6	***	M>O >A	M>O= A	O>M = A	M=O> A	ns	ns	S< C	ns	ns	ns	ns	ns	ns	ns	1900> 1000	ns
	Habitat (H)	1	1.3	4.4	ns																
	Depth (D)	1	0.0	0.0	ns																
	T x H	2	3.2	10.6	**																
	T x D	2	2.0	6.8	**																
	H x D	1	2.3	7.8	*																
	T x H x D	2	1.6	5.5	*																
	Res	24	0.3																		
	Total	35																			
Hydrolysable proteins to total protein pools	**Time (T)**	2	612.4	20.3	***	O>M >A	ns	O>M > A	M>A= O	ns	ns	ns	ns	ns	S> C	ns	1900> 1000	ns	ns	1900> 1000	1900> 1000
	Habitat (H)	1	45.0	1.5	ns																
	Depth (D)	1	93.8	3.1	ns																
	T x H	2	135.4	4.5	*																
	T x D	2	968.2	32.0	***																
	H x D	1	113.2	3.7	ns																

	T x H x D	2	180.4	6.0	**																
	Res	24	30.2																		
	Total	35																			
Hydrolysable carbohydrates	**Time (T)**	2	0.2	0.4	ns	M>A >O	ns	ns	M=A< O	S> C	ns	ns	ns	ns	ns	1000> 1900	ns	1900> 1000	ns	ns	ns
	Habitat (H)	1	0.6	1.4	ns																
	Depth (D)	1	0.5	1.2	ns																
	T x H	2	5.1	11.7	***																
	T x D	2	3.9	9.0	***																
	H x D	1	0.7	1.6	ns																
	T x H x D	2	2.3	5.3	*																
	Res	24	0.4																		
	Total	35																			
Hydrolysable carbohydrates to total carbohydrate pools	**Time (T)**	2	1709.0	51.5	***	O< M = A	A>O > M	A>O = M	A>O> M	ns	ns	ns	C>S	ns	ns	ns	ns	1900> 1000	1900> 1000	ns	1900> 1000
	Habitat (H)	1	66.5	2.0	ns																
	Depth (D)	1	431.7	13.0	**																
	T x H	2	124.2	3.7	*																
	T x D	2	315.9	9.5	**																
	H x D	1	52.5	1.6	ns																
	T x H x D	2	10.6	0.3	ns																
	Res	24	33.2																		
	Total	35																			
Bioavailable C pool	**Time (T)**	2	2.2	5.2	*	M>O = A	ns	ns	M>O= A	ns	ns	S<C	ns	ns	ns	ns	ns	1900> 1000	ns	1900> 1000	ns
	Habitat (H)	1	0.2	0.5	ns																
	Depth (D)	1	0.1	0.2	ns																
	T x H	2	5.1	11.9	***																
	T x D	2	1.4	3.2	ns																
	H x D	1	2.2	5.1	*																
	T x H x D	2	2.3	5.5	**																
	Res	24	0.4																		
	Total	35																			
Bioavailable C to total biopolymeric C pool	**Time (T)**	2	81.9	11.3	**	ns	A>O= M	O>M =A	O=A> M	ns	ns	ns	ns	S> C	S> C	ns	1900> 1000	ns	ns	1900> 1000	1900> 1000
	Habitat (H)	1	26.0	3.6	ns																
	Depth (D)	1	373.2	51.5	***																
	T x H	2	84.2	11.6	***																
	T x D	2	181.9	25.1	***																

	H x D	1	13.7	1.9	ns															
	T x H x D	2	35.0	4.8	*															
	Res	24	7.2																	
	Total	35																		
Hydrolysable proteins to BAOC pools	**Time (T)**	2	2968.2	98.0	***	O>M >A	M> O=A	M= O>A	M> O=A	ns	C> S	ns	ns	C> S	S> C	1900> 1000	ns	1900> 1000	1000 > 1900	1900> 1000	ns
	Habitat (H)	1	274.1	9.0	**															
	Depth (D)	1	20.6	0.7	ns															
	T x H	2	22.1	0.7	ns															
	T x D	2	1259.0	41.6	***															
	H x D	1	307.3	10.1	**															
	T x H x D	2	78.3	2.6	ns															
	Res	24	30.3																	
	Total	35																		

Table S3. Total protein (TPRT), total carbohydrate (TCHO), total lipid (TLIP) and biopolymeric C (BPC) concentrations in surface sediments of the Cap de Creus canyon and adjacent open slope of the Catalan margin collected in the different sampling periods. Mean values (n=3) and standard deviations (±) are reported.

Habitat	Sampling period	Depth (m)	TPRT mg g^{-1}	TCHO mg g^{-1}	TLIP mg g^{-1}	BPC mg g^{-1}
Open slope	May 2004	1000	1.72±0.37	3.07±1.04	1.37±0.58	3.10±1.03
	October 2005	“	0.34±0.03	1.33±0.19	0.28±0.06	0.91±0.14
	August 2006	“	0.98±0.06	0.77±0.39	0.47±0.04	1.14±0.21
	May 2004	1900	1.27±0.46	2.40±0.85	0.86±0.22	2.22±0.73
	October 2005	“	0.78±0.13	1.98±0.22	0.22±0.05	1.34±0.19
	August 2006	“	0.63±0.08	0.89±0.05	0.27±0.04	0.86±0.08
Cap de Creus canyon	May 2004	1000	1.48±0.54	1.79±0.52	1.11±0.43	2.28±0.80
	October 2005	“	1.28±0.09	3.37±0.51	0.90±0.08	2.65±0.31
	August 2006	“	1.39±0.25	1.27±0.32	1.05±0.17	1.98±0.38
	May 2004	1900	1.06±0.24	1.79±0.65	0.82±0.14	1.85±0.48
	October 2005	“	1.07±0.22	1.86±0.17	0.22±0.05	1.43±0.22
	August 2006	“	0.73±0.15	0.55±0.16	0.19±0.01	0.72±0.14

Table S4. Output of the two-way analysis of variance and pair-wise comparison testing for differences in the bioavailability of organic matter and its nutritional value between sediments collected in different habitats (open slope *vs* canyon) and at different depths in the Portuguese margin. *** P<0.001, **P<0.01, *P<0.05, ns=not significant. C=Canyon, S=Slope.

						HABITAT				DEPTH	
Variable	**Source**	**df**	**MS**	**Pseudo-F**	**P**	**400 m**	**960 m**	**3200 m**	**4200 m**	**Slope**	**Canyon**
Total phytopigments	**Habitat (H)**	1	3117	304.6	***	C>S	C>S	C>S	C>S	4200=3200>400=960	400>960>3200=4200
	Depth (D)	3	171	16.7	***						
	H x D	3	313	30.6	***						
	Residual	16	10								
	Total	23									
Hydrolysable proteins	**Habitat (H)**	1	1064100	20.6	***	C>S	ns	C>S	C>S	ns	960 < others
	Depth (D)	3	108380	2.1	ns						
	H x D	3	240830	4.7	**						
	Residual	16	51680								
	Total	23									
Hydrolysable proteins to total protein pools	**Habitat (H)**	1	1042	42.0	***	S>C	S>C	C>S	C>S	400 > 960 > others	960 < others
	Depth (D)	3	1654	66.6	***						
	H x D	3	3305	133.1	***						
	Residual	16	25								
	Total	23									
Hydrolysable carbohydrates	**Habitat (H)**	1	24438	1.9	ns	ns	C>S	ns	ns	400 < others	400=960> others
	Depth (D)	3	37690	3.0	*						
	H x D	3	111260	8.8	***						
	Residual	16	12596								
	Total	23									
Hydrolysable carbohydrates to total carbohydrate pools	**Habitat (H)**	1	1903	105.0	***	S>C	S>C	S>C	S>C	4200 < others	400 = 960 > others
	Depth (D)	3	785	43.3	***						
	H x D	3	160	8.9	***						
	Residual	16	18								

	Total	23									
Bioavailable C pool	**Habitat (H)**	1	322610	14.3	**	C>S	ns	C>S	C>S	400 < others	ns
	Depth (D)	3	7815	0.3	ns						
	H x D	3	44877	2.0	*						
	Residual	16	22597								
	Total	23									
Bioavailable C to total biopolymeric C pool	**Habitat (H)**	1	1108	74.0	***	S>C	S>C	ns	C>S	400 > 960 > 3200 > 4200	960 < others
	Depth (D)	3	588	39.3	***						
	H x D	3	789	52.7	***						
	Residual	16	15								
	Total	23									
Hydrolysable proteins to BAOC pools	**Habitat (H)**	1	648	65.8	***	ns	S>C	C>S	C>S	400=960 > 4200 > 3200	960 < others
	Depth (D)	3	567	57.6	***						
	H x D	3	1362	138.3	***						
	Residual	16	10								
	Total	23									

Table S5. Total protein (TPRT), total carbohydrate (TCHO), total lipid (TLIP) and biopolymeric C (BPC) concentrations in surface sediments of the Nararè canyon and adjacent open slope of the Portuguese margin. Mean values (n=3) and standard deviations (±) are reported.

Habitat	Depth (m)	TPRT mg g-1	TCHO mg g-1	TLIP mg g-1	BPC mg g-1
Open slope	400	0.32±0.05	0.36±0.03	0.10±0.02	0.37±0.05
	960	0.72±0.13	0.68±0.12	0.11±0.01	0.71±0.12
	3200	1.43±0.17	1.20±0.12	0.20±0.05	1.33±0.17
	4200	1.53±0.26	2.60±0.74	0.58±0.07	2.22±0.48
Nazarè canyon	400	2.59±0.90	1.94±0.31	0.73±0.11	2.59±0.65
	960	2.43±0.18	2.28±0.63	0.77±0.17	2.68±0.47
	3200	1.63±0.32	1.78±0.14	0.81±0.13	2.12±0.31
	4200	1.88±0.41	2.49±0.51	0.20±0.08	2.07±0.46