

of Biscay, the three dominant epibenthic species are certainly linked with the anteriorly described environmental conditions in the confinement area of the submarine valley (reduced substratum, oxygen depletion and stagnation of near-bottom water). Such a dominance of a few species in canyon communities in comparison with adjacent non-canyon slope communities was also reported for the epi- and megabenthic fauna of the Hatteras, Alvin and Hudson canyons from the east coast of North America [10, 11, 23, 24]. However, this peculiarity was not observed by Houston and Haedrich [13] for the Carson canyon (Grand Banks) which was considered as an 'active' canyon where sediment was continually flushed out all along the submarine valley, thus preventing the development of abundant epibenthic populations. Finally, as previously suggested by Rowe [24] and Rowe et al. [25], such dominant epibenthic species may be considered as 'canyon indicator species' mainly observed in canyons which act as depocenter for organic matter. Further investigations on the benthic communities of the Capbreton canyon will provide new insights on the distribution of these species with regard to the extension of the confinement area within the upper portion of this submarine valley.

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Appendix I. Abundance and percentage contribution of the macrobenthic crustaceans sampled with an epibenthic sled within sites A and B of the Capbreton canyon. * Damaged specimens; unid.: unidentified specimens; juv.: juveniles; MYS: Mysidacea; AMP: Amphipoda; CUM: Cumacea; ISO: Isopoda; TAN: Tanaidacea; EUP: Euphausiacea; DEC: Decapoda.

Site/Station		A/DI19		B/DI66		Site/Station		A/DI19		B/DI66	
Depth (m)		923		1 009		Depth (m)		923		1 009	
	Species	No. ind.	%	No. ind.	%		Species	No. ind.	%	No. ind.	%
MYS	<i>Amblyops spinifera</i>	1	0.02	—	0.00	CUM	<i>Stegocephaloides auratus</i>	1	0.02	—	0.00
	<i>Paramblyops rostrata</i>	22	0.48	—	0.00		<i>Bruzelia typica</i>	9	0.20	—	0.00
	<i>Parapseudomma calloplura</i>	2	0.04	—	0.00		<i>Gammaridea unid.*</i>	50	1.09	17	2.37
	<i>Parerythrops obesa</i>	1	0.02	—	0.00		<i>Parvipalpus major</i>	15	0.33	—	0.00
	<i>Erythropini unid.*</i>	2	0.04	—	0.00		<i>Caprellidae unid.</i>	—	0.00	17	2.37
	<i>Bathymysis helgae</i>	1	0.02	—	0.00		<i>Bathycuma brevirostre</i>	—	0.00	13	1.81
	<i>Mysidacea unid.</i>	2	0.04	—	0.00		<i>Cyclaspis longicaudata</i>	—	0.00	6	0.84
	<i>Iphimedia obesa</i>	1	0.02	—	0.00		<i>Diastyloides serrata</i>	12	0.26	2	0.28
	<i>Ampelisca declivitatis</i>	1	0.02	—	0.00		<i>Leptostyliis villosa</i>	—	0.00	7	0.98
	<i>Ampelisca pusilla</i>	8	0.17	60	8.37		<i>Makrokylindrus longicaudatus</i>	—	0.00	10	1.39
AMP	<i>Ampelisca uncinata</i>	10	0.22	—	0.00		<i>Makrokylindrus longipes</i>	112	2.44	20	2.79
	<i>Byblis gernei</i>	5	0.11	—	0.00		<i>Vemakylindrus hastatus</i>	5	0.11	15	2.09
	<i>Haploops cf. proxima</i>	—	0.00	1	0.14		<i>Hemilamprops normani</i>	—	0.00	2	0.28
	<i>Gitana abyssicola</i>	—	0.00	1	0.14		<i>Eudorella truncatula</i>	1	0.02	21	2.93
	<i>Amphilochidae unid.</i>	—	0.00	1	0.14		<i>Epileucon pusillus</i>	—	0.00	20	2.79
	<i>Aoridae unid.</i>	1	0.02	9	1.25		<i>Leucon (Crymoleucon) tener</i>	9	0.20	28	3.90
	<i>Argissia hamatipes</i>	—	0.00	5	0.70		<i>Leucon (Crymoleucon) sp.A</i>	3	0.07	—	0.00
	<i>Chevreuxius grandimanus</i>	—	0.00	76	10.60		<i>Leucon (Crymoleucon) sp.B</i>	—	0.00	5	0.70
	<i>Eriichthius cf. fasciatus</i>	18	0.39	—	0.00		<i>Leucon (Leucon) serratus</i>	43	0.94	50	6.97
	<i>Cleonardopsis carinata</i>	22	0.48	—	0.00		<i>Leucon (Macrauloleucon) siphonatus</i>	2	0.04	10	1.39
ISO	<i>Eusirus longipes</i>	5	0.11	—	0.00		<i>Leucon spp.*</i>	1	0.02	—	0.00
	<i>Rhachotropis caeca</i>	10	0.22	—	0.00		<i>Campylaspis glabra</i>	—	0.00	1	0.14
	<i>Rhachotropis gracilis</i>	5	0.11	—	0.00		<i>Campylaspis squamifera</i>	—	0.00	1	0.14
	<i>Rhachotropis grimaldii</i>	2	0.04	6	0.84		<i>Cumella gracillima</i>	—	0.00	1	0.14
	<i>Rhachotropis rostrata</i>	—	0.00	1	0.14		<i>Procampylaspis armata</i>	—	0.00	24	3.35
	<i>Rhachotropis spp.*</i>	5	0.11	—	0.00		<i>Chelator insignis</i>	439	9.56	4	0.56
	<i>Carangoliopsis spinulosa</i>	94	2.05	7	0.97		<i>Desmosoma elongatum</i>	14	0.30	1	0.14
	<i>Eriopisa elongata</i>	3	0.07	—	0.00		<i>Eugerda filipes</i>	2	0.04	—	0.00
	<i>Maera sp.*</i>	—	0.00	1	0.14		<i>Desmosomatidae*</i>	—	0.00	7	0.98
	<i>Bonniarella abyssorum</i>	1 218	26.51	20	2.79		<i>Haplomesus sp.A</i>	—	0.00	2	0.28
TAN	<i>Listriella sp. A</i>	4	0.09	—	0.00		<i>Macrostylis spinifera</i>	—	0.00	9	1.25
	<i>Liljeborgia cf. macronyx</i>	4	0.09	—	0.00		<i>Macrostylis sp.A</i>	—	0.00	1	0.14
	<i>Orchomenes humilis</i>	3	0.07	—	0.00		<i>Belonectes parvus</i>	2	0.04	—	0.00
	<i>Scopelocheirus hopei</i>	8	0.17	—	0.00		<i>Eurycope complanata</i>	—	0.00	13	1.81
	<i>Tryphosella insignis</i>	13	0.28	2	0.28		<i>Ilyarachna longicornis</i>	—	0.00	17	2.37
	<i>Arrhis mediterraneus</i>	5	0.11	29	4.04		<i>Ilyarachna polita</i>	22	0.48	6	0.84
	<i>Bathymedon longimanus</i>	1	0.02	9	1.25		<i>Pseudarachna hirsuta</i>	5	0.11	—	0.00
	<i>Monoculodes packardi</i>	—	0.00	5	0.70		<i>Janirella nansenii</i>	11	0.24	—	0.00
	<i>Synchelidium maculatum</i>	1	0.02	1	0.14		<i>Bullowanthura aquitanica</i>	5	0.11	4	0.56
	<i>Oedicerotidae sp.A</i>	—	0.00	3	0.42		<i>Leptanthuria tenuis</i>	—	0.00	14	1.95
EUP	<i>Oedicerotidae unid.*</i>	—	0.00	25	3.49		<i>Gnathia sp.</i>	—	0.00	3	0.42
	<i>Epimera cornigera</i>	9	0.20	—	0.00		<i>Arcturopis giardi</i>	997	21.70	—	0.00
	<i>Halice abyssi</i>	—	0.00	1	0.14		<i>Apseudes spinosus</i>	1 097	23.88	10	1.39
	<i>Pardalisca mediterranea</i>	1	0.02	1	0.14		<i>Sphyrapus malleolus</i>	—	0.00	5	0.70
	<i>Pardalisella sp.A</i>	2	0.04	—	0.00		unid.	4	0.09	41	5.72
	<i>Harpinia antennaria</i>	9	0.20	—	0.00		<i>Meganyctiphanes norvegica</i>	12	0.26	—	0.00
	<i>Harpinia crenulata</i>	11	0.24	—	0.00		<i>Euphausiacea unid.*</i>	—	0.00	1	0.14
	<i>Harpinia latipes</i>	85	1.85	20	2.79		<i>Metacrangon jacqueti jacqueti</i>	1	0.02	—	0.00
	<i>Harpinia sp.D</i>	—	0.00	5	0.70		<i>Pontophilus norvegicus</i>	1	0.02	1	0.14
	<i>Harpinia sp.E</i>	—	0.00	4	0.56		<i>Calocaris macandreae</i>	18	0.39	—	0.00
DEC	<i>Harpinia spp.*</i>	5	0.11	—	0.00		<i>Geryon sp.</i>	—	0.00	1	0.14
	<i>Leptophoxus falcatus</i>	6	0.13	4	0.56		<i>Brachyura unid. (juv.)</i>	—	0.00	1	0.14
	<i>Metaphoxus simplex</i>	—	0.00	7	0.97		Total	4 594	100.00	717	100.00
	<i>Pseudharpinia excavata</i>	—	0.00	1	0.14						
	<i>Phoxocephalidae unid.*</i>	—	0.00	1	0.14						
	<i>Laetmatophilus tuberculatus</i>	95	2.07	—	0.00						

Appendix II. Abundance, density (ind·100 m⁻²) and percentage contribution of the macrobenthic crustaceans sampled with a box-corer within sites A and B of the Capbreton canyon.

* Damaged specimens; unid.: unidentified specimens; ?: total number of individuals; \bar{x} : mean value; s: standard deviation; MYS: Mysidae; AMP: Amphipoda; CUM: Cumacea; ISO: Isopoda; TAN: Tanidae; EUP: Euphausiacea; DEC: Decapoda.

Site	Station	A						B						Density					
		KF50	KF51	KF52	KF53	KF57	KF58	KF60	KF38	KF39	KF40	KF41	KF42	KF43	KF44	KF45			
Depth (m)	1 000	995	997	994	995	1 002	995	1 003	1 020	990	1 004	1 017	1 010	1 025	1 000	Σ	\bar{x}	\pm s	%
Group/Species																			
MYS		7	7	7	7	7	7	7	0	0	0	0	0	0	0	0	0.0	0.0	0.0
AMP	<i>Amphelisca pusilla</i>	4	7	3	7	7	7	15.4	26.6	13.5	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0
	<i>Haploops cf. proxima</i>	-	-	-	-	-	-	0	0.0	0.0	-	-	-	-	-	-	1	1.9	5.4
	<i>Autone longidigitatus</i>	2	-	-	-	-	2	4.4	11.6	3.8	-	-	-	-	-	-	1	1.9	5.4
	<i>Carangollopis spinulosa</i>	-	-	-	-	3	6.6	17.4	5.8	-	-	-	-	-	-	0	0.0	0.0	0.0
	<i>Eriopisa elongata</i>	-	-	-	-	1	2.2	5.8	1.9	-	-	-	-	-	-	0	0.0	0.0	0.0
	<i>Bonnierella abyssorum</i>	3	-	-	-	-	3	6.6	17.4	5.8	-	-	-	-	-	0	0.0	0.0	0.0
	<i>Arrhis mediterraneus</i>	1	-	-	-	-	1	2.2	5.8	1.9	1	-	1	-	-	-	2	3.8	7.1
	<i>Bathymedon longimanus</i>	-	-	-	-	-	0	0.0	0.0	-	-	1	-	-	-	-	1	1.9	5.4
	<i>Oedicerotidae</i> unid.*	1	-	-	-	-	2	4.4	7.5	3.8	-	-	-	-	-	0	0.0	0.0	0.0
	<i>Pardaliscidae</i> unid.*	-	-	-	-	1	2.2	5.8	1.9	1	-	1	-	-	-	-	2	3.8	7.1
	<i>Harpinia latipes</i>	-	-	1	1	6	13.2	16.4	11.6	1	-	3	2	-	-	-	8	15.4	18.4
	<i>Harpinia truncata</i>	5	-	-	-	5	11.0	29.1	9.6	-	-	-	-	-	-	-	0	0.0	0.0
	<i>Harpinia</i> spp.*	-	-	1	2	-	3	6.6	12.1	5.8	-	-	-	-	-	0	0.0	0.0	0.0
	<i>Lepiochirus falciatus</i>	-	-	-	-	0	0.0	0.0	0.0	2	1	-	1	-	-	-	7	13.5	12.8
	<i>Metaphoxus simplex</i>	3	-	-	-	3	6.6	17.4	5.8	-	-	-	-	-	-	-	0	0.0	0.0
	<i>Pseudoharpinia excavata</i>	-	-	1	-	0	2.2	5.8	1.9	-	3	-	-	-	-	-	3	5.8	16.3
	<i>Gammaridea</i> unid.*	1	-	-	-	1	2.2	5.8	1.9	-	1	-	-	-	-	-	1	1.9	5.4
	<i>Hyperiidae</i> unid.*	-	-	-	-	0	0.0	0.0	0.0	2	1	-	1	-	-	-	1	1.9	5.4
CUM	<i>Makrotylindus longicaudatus</i>	-	-	-	-	0	0.0	0.0	1	-	-	-	-	-	-	-	1	1.9	5.4
	<i>Makrotylindus longipes</i>	-	-	2	4.4	11.6	3.9	-	1	-	-	-	-	-	-	-	1	1.9	5.4
	<i>Leucon (Crynoleucon) tener</i>	-	-	-	0	0.0	0.0	-	-	-	-	1	-	-	-	-	1	1.9	5.4
	<i>Leucon (Leucon) serratus</i>	-	-	-	-	1	2.2	5.8	1.9	-	-	-	-	-	-	-	0	0.0	0.0
	<i>Leucon (Macrauleucon)</i>	-	-	-	-	0	0.0	0.0	-	1	-	-	-	-	-	-	1	1.9	5.4
	<i>siphonatus</i>	-	-	-	-	1	2.2	5.8	1.9	-	-	-	-	-	-	-	0	0.0	0.0
	<i>Leucon</i> spp.*	-	-	-	-	0	0.0	0.0	0.0	-	1	-	-	-	-	-	1	1.9	5.4
	<i>Chelator insignis</i>	-	-	-	-	0	0.0	0.0	0.0	2	-	1	-	-	-	-	4	7.7	11.6
	<i>Desmosoma elongatum</i>	-	-	-	-	1	2.2	5.8	1.9	-	1	-	-	-	-	-	0	0.0	0.0
	<i>Engerda</i> sp.*	-	-	-	-	0	0.0	0.0	0.0	-	1	-	-	-	-	-	1	1.9	5.4
	<i>Hoplomesus</i> sp.A	-	-	-	-	0	0.0	0.0	0.0	1	-	2	-	-	-	-	3	5.8	11.4
	<i>Macrostylis spinifera</i>	-	-	-	-	0	0.0	0.0	0.0	1	-	2	-	-	-	-	1	1.9	5.4
	<i>Ilyarachna longicornis</i>	-	-	-	-	0	0.0	0.0	0.0	1	-	-	-	-	-	-	1	1.9	5.4
	<i>Ilyarachna polita</i>	-	-	-	-	1	2.2	5.8	1.9	-	-	1	-	-	-	-	1	1.9	5.4
	<i>Thambenatidae</i> ?	-	-	-	-	0	0.0	0.0	1	-	-	-	1	-	-	-	3	5.8	8
	<i>Bullionanthura aquitanica</i>	-	-	-	-	0	0.0	0.0	0.0	-	1	-	2	-	-	-	4	7.7	11.6
	<i>Lepianthura annae</i>	-	-	-	-	0	0.0	0.0	0.0	-	1	-	1	-	-	-	3	5.8	8
TAN	<i>Apseudes spinosus</i>	3	-	-	-	3	6.6	17.4	5.8	-	-	1	-	-	-	-	1	1.9	5.4
	<i>Sphyrapus malleolus</i>	-	-	-	-	0	0.0	0.0	0.0	-	2	1	-	-	-	-	5	9.6	14.1
EUP	unid.	4	-	-	-	4	8.8	23.3	7.7	-	1	-	-	-	-	-	1	1.9	5.4
DEC	<i>Natantia</i> unid.*	-	-	-	-	0	0.0	0.0	0.0	1	-	-	-	-	-	-	0	0.0	0.0
	Total	28	0	0	2	20	1	52	114.4	178.1	100.0	10	4	19	2	5	60	115.1	90.1