

Diet- and tissue-specific incorporation of isotopes in the shark *Scyliorhinus stellaris*, a North Sea mesopredator

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Table S1. *Scyliorhinus canicula*. Stomach contents of *S. canicula* (SCY), summarized as occurrence (OI) and numerical (NI) indices. Mean isotopic values of carbon ($\delta^{13}\text{C}_{\text{DEL}}$, lipid-extracted) and nitrogen ($\delta^{15}\text{N}$) of the prey items found in the North Sea, either directly observed in the stomach contents or identified from the literature (see ‘Materials and methods’ section in the main article). We calculated the mean of the different prey groups (in blood: Annelida₁, Annelida₂, Anomura, Brachyura, Caridae, Chordata, Echinodermata, and Mollusca)

Species of prey item	OI _{SCY}	NI _{SCY}	<i>n</i>	$\delta^{13}\text{C}_{\text{DEL}}$	SD	$\delta^{15}\text{N}$	SD
Annelidae	28	13					
Polychaeta							
Group1				-16.47	0.20	14.99	0.62
Aphroditidae			3	-16.54	0.33	14.52	0.90
Nephtyidae	13	6	2	-16.37	0.18	15.69	0.76
Group2							
Indeterminate	13	6	1	-17.43	-	11.61	-
Indeterminate	3	1					
Arthropoda	63	45					
Malacostraca							
Decapoda							
Anomura	13	5		-16.67	0.44	13.14	0.82
Paguroidea	3	1	4	-15.97	0.51	14.63	0.69
Paguroidea	9	4	3	-17.61	0.15	11.14	0.54
Brachyura	31	14		-17.67	0.12	12.39	0.48
Atelecyclidae			5	-17.44	0.28	10.67	0.47
Carcinidae	22	10	6	-17.90	0.17	11.83	0.69
Carcinidae			6	-17.64	0.19	14.39	0.31
Indeterminate	9	4					
Caridae	41	26		-16.62	0.21	16.07	0.24
Crangonidae	9	7	3	-16.10	0.36	15.97	0.44
Crangonidae	16	7	4	-16.54	0.33	16.66	0.42

		Palaemonidae	<i>Palaemon serratus</i>	3	1	2	-15.67	0.12	15.70	0.52
		Pandalidae	<i>Pandalus montagui</i>	13	8	5	-17.38	0.10	15.81	0.46
		Indeterminate		3	3					
Chordata				34	19		-18.44	0.19	13.79	0.21
Actinopterygii										
		Clupeidae	<i>Sardina pilchardus</i>			3	-19.23	0.28	13.15	0.04
		Gadidae	<i>Trisopterus minutus</i>	6	3	3	-18.33	0.32	14.36	0.49
		Merlucciidae	<i>Merluccius merluccius</i>			3	-18.35	0.40	13.62	0.93
		Ammodytida	<i>Ammodytes tobianus</i>	13	7	9	-18.29	0.45	13.06	0.40
		Callionymidae	<i>Callionymus lyra</i>	3	1	3	-19.35	0.51	14.38	0.85
		Callionymidae	<i>Callionymus maculatus</i>			3	-18.79	0.29	13.57	0.75
		Carangidés	<i>Trachurus trachurus</i>			3	-18.35	0.42	12.88	0.46
		Scombridae	<i>Scomber scombris</i>			2	-18.30	0.68	14.24	1.00
		Soleidae	<i>Solea solea</i>	3	1	5	-18.09	1.11	14.12	0.53
		Soleidae	<i>Buglossidium luteum</i>	9	7	4	-17.99	0.20	15.35	0.26
Echinodermata										
		Echinoidae	<i>Psammechinus miliaris</i>	9	4	3	-16.04	0.40	12.47	0.64
Mollusca										
		Buccinidae	<i>Buccinum undatum</i>	19	17	5	-15.04	0.46	12.80	0.38
Number of species					17					
Average length (cm)					50.5±1.4					
Average mass (g)					545±41					
Number of empty stomachs					8					
Total number of stomachs					40					

Table S2. C/N ratio, $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ (means \pm SD) of the different species caught during the annual French International Bottom Trawl Survey 2008 (1 to 20 February) in the northern North Sea (see Fig. 1)

Phylum	Class	Order	Family	Species	<i>n</i>	C/N	SD	$\delta^{13}\text{C}$	SD	$\delta^{15}\text{N}$	SD
Annelida	Polychaeta	Phyllodocida	Aphroditidae	<i>Aphrodita aculeata</i>	3	3.84	0.27	-17.01	0.29	14.52	0.90
Arthropoda	Malacostraca	Decapoda	Atecyclusidae	<i>Atecyclus rotundatus</i>	3	4.29	0.06	-18.01	0.17	11.05	0.69
Arthropoda	Malacostraca	Decapoda	Carcinidae	<i>Carcinus maenas</i>	1	4.57	-	-19.14	-	15.77	-
Arthropoda	Malacostraca	Decapoda	Carcinidae	<i>Liocarcinus depurator</i>	3	4.80	0.30	-19.04	0.42	13.00	0.71
Arthropoda	Malacostraca	Decapoda	Carcinidae	<i>Liocarcinus holsatus</i>	6	5.28	0.33	-19.55	0.36	14.39	0.31
Arthropoda	Malacostraca	Decapoda	Carcinidae	<i>Liocarcinus mamoreus</i>	2	5.63	1.93	-19.48	0.75	14.67	0.41
Arthropoda	Malacostraca	Decapoda	Carcinidae	<i>Liocarcinus vernalis</i>	1	4.93	-	-18.66	-	14.21	-
Arthropoda	Malacostraca	Decapoda	Corystidae	<i>Corystes cassivelaunus</i>	2	4.63	0.03	-17.49	0.58	13.71	0.43
Arthropoda	Malacostraca	Decapoda	Crangonidae	<i>Crangon allmanni</i>	2	3.27	0.05	-16.07	0.67	16.29	0.52
Arthropoda	Malacostraca	Decapoda	Crangonidae	<i>Crangon crangon</i>	3	3.32	0.05	-16.30	0.38	16.58	0.59
Arthropoda	Malacostraca	Decapoda	Goneplacidae	<i>Goneplax rhomboides</i>	1	3.72	-	-17.53	-	13.17	-
Arthropoda	Malacostraca	Decapoda	Inachidae	<i>Macropodia tenuirostris</i>	3	3.96	0.65	-17.21	0.95	12.79	0.45
Arthropoda	Malacostraca	Decapoda	Macropipidae	<i>Necora puber</i>	1	3.59	-	-19.15	-	15.86	-
Arthropoda	Malacostraca	Decapoda	Nephropidae	<i>Nephrops norvegicus</i>	1	3.13	-	-16.70	-	13.70	-
Arthropoda	Malacostraca	Decapoda	Paguroidea	<i>Pagurus bernhardus</i>	4	3.23	0.04	-15.97	0.51	14.63	0.69
Arthropoda	Malacostraca	Decapoda	Paguroidea	<i>Pagurus prideaux</i>	2	3.48	0.16	-17.59	0.22	11.24	0.91
Arthropoda	Malacostraca	Decapoda	Palaemonidae	<i>Palaemon serratus</i>	2	3.38	0.01	-15.69	0.13	15.70	0.52
Arthropoda	Malacostraca	Decapoda	Pandalidae	<i>Pandalus montagui</i>	3	3.47	0.02	-17.50	0.16	15.33	0.66
Arthropoda	Malacostraca	Decapoda	Processidae	<i>Processa</i> sp.	1	3.14	-	-15.15	-	15.00	-
Chordata	Teleostei	Clupeiformes	Clupeidae	<i>Alosa fallax fallax</i>	3	4.58	0.45	-18.82	0.11	16.40	0.29
Chordata	Teleostei	Clupeiformes	Clupeidae	<i>Clupea harengus harengus</i>	4	4.45	0.61	-20.45	0.88	12.13	0.63
Chordata	Teleostei	Clupeiformes	Clupeidae	<i>Sardina pilchardus</i>	3	3.47	0.07	-19.34	0.21	13.15	0.04
Chordata	Teleostei	Clupeiformes	Clupeidae	<i>Sprattus sprattus sprattus</i>	6	5.08	0.50	-20.60	0.47	13.05	0.38
Chordata	Teleostei	Clupeiformes	Engraulidae	<i>Engraulis encrasicolus</i>	5	3.37	0.06	-18.40	0.12	14.03	0.28
Chordata	Teleostei	Gadiformes	Gadidae	<i>Gadus morhua</i>	3	3.45	0.05	-18.01	0.27	15.81	0.47
Chordata	Teleostei	Gadiformes	Gadidae	<i>Melanogrammus aeglefinus</i>	4	3.74	0.09	-19.07	0.31	12.78	0.13
Chordata	Teleostei	Gadiformes	Gadidae	<i>Merlangius merlangus</i>	4	3.41	0.11	-18.37	0.65	16.38	0.69
Chordata	Teleostei	Gadiformes	Gadidae	<i>Trisopterus esmarkii</i>	3	4.04	0.14	-20.06	0.14	12.73	0.57
Chordata	Teleostei	Gadiformes	Gadidae	<i>Trisopterus minutus</i>	3	3.45	0.17	-18.43	0.20	14.36	0.49
Chordata	Teleostei	Gadiformes	Lotidae	<i>Ciliatus mustela</i>	3	3.83	0.31	-18.27	0.30	14.19	0.82
Chordata	Teleostei	Gadiformes	Lotidae	<i>Enchelyopus cimbrius</i>	3	3.72	0.02	-18.18	0.16	15.42	0.07

Chordata	Teleostei	Gadiformes	Merlucciidae	<i>Merluccius merluccius</i>	3	3.95	0.34	-18.94	0.14	13.62	0.93
Chordata	Teleostei	Perciformes	Ammodytida	<i>Ammodytes tobianus</i>	7	3.37	0.04	-18.60	0.51	12.66	0.46
Chordata	Teleostei	Perciformes	Ammodytida	<i>Hyperoplus lanceolatus</i>	6	3.45	0.13	-18.87	0.56	14.06	0.20
Chordata	Teleostei	Perciformes	Callionymidae	<i>Callionymus lyra</i>	3	3.88	0.27	-19.88	0.62	14.38	0.85
Chordata	Teleostei	Perciformes	Callionymidae	<i>Callionymus maculatus</i>	3	3.63	0.13	-19.06	0.38	13.57	0.75
Chordata	Teleostei	Perciformes	Carangidés	<i>Trachurus trachurus</i>	3	3.29	0.07	-18.35	0.42	12.88	0.46
Chordata	Teleostei	Perciformes	Moronidae	<i>Dicentrarchus labrax</i>	1	3.96	-	-18.51	-	14.69	-
Chordata	Teleostei	Perciformes	Mullidae	<i>Mullus surmuletus</i>	3	5.01	0.49	-19.88	0.26	14.39	0.38
Chordata	Teleostei	Perciformes	Pholidae	<i>Pholis gunnellus</i>	1	3.28	-	-16.70	-	16.70	-
Chordata	Teleostei	Perciformes	Scombridae	<i>Scomber scombris</i>	2	4.12	0.31	-19.07	0.38	14.24	1.00
Chordata	Teleostei	Perciformes	Stichaeidés	<i>Lumpenus lumpretaeformis</i>	3	3.27	0.03	-17.95	0.16	13.06	0.12
Chordata	Teleostei	Perciformes	Trachinidés	<i>Echiichthys vipera</i>	3	3.73	0.10	-18.11	0.18	15.11	0.31
Chordata	Teleostei	Perciformes	Trachinidés	<i>Trachinus draco</i>	3	3.39	0.10	-18.06	0.27	14.29	0.11
Chordata	Teleostei	Pleuronectiformes	Bothidae	<i>Arnoglossus laterna</i>	3	3.68	0.29	-17.65	0.41	15.26	0.33
Chordata	Teleostei	Pleuronectiformes	Pleuronectidae	<i>Glyptocephalus cynoglossus</i>	1	3.35	-	-17.53	-	11.97	-
Chordata	Teleostei	Pleuronectiformes	Pleuronectidae	<i>Hippoglossoides platessoides</i>	3	3.36	0.07	-17.97	0.37	13.40	0.08
Chordata	Teleostei	Pleuronectiformes	Pleuronectidae	<i>Limanda limanda</i>	5	3.85	0.12	-19.17	0.61	14.63	0.25
Chordata	Teleostei	Pleuronectiformes	Pleuronectidae	<i>Microstomus kitt</i>	3	3.63	0.06	-18.07	0.25	13.81	0.59
Chordata	Teleostei	Pleuronectiformes	Pleuronectidae	<i>Platichthys flesus</i>	3	3.64	0.16	-14.83	0.70	16.21	0.56
Chordata	Teleostei	Pleuronectiformes	Pleuronectidae	<i>Pleuronectes platessa</i>	3	3.59	0.08	-17.92	0.43	14.33	0.23
Chordata	Teleostei	Pleuronectiformes	Scophthalmidae	<i>Scophthalmus rhombus</i>	1	3.16	-	-17.10	-	14.79	-
Chordata	Teleostei	Pleuronectiformes	Soleidae	<i>Buglossidium luteum</i>	3	4.34	0.21	-19.05	0.40	15.60	0.08
Chordata	Teleostei	Pleuronectiformes	Soleidae	<i>Microchirus variegatus</i>	2	3.42	0.13	-18.63	0.02	12.80	0.12
Chordata	Teleostei	Pleuronectiformes	Soleidae	<i>Solea solea</i>	5	3.34	0.17	-18.09	1.11	14.12	0.53
Chordata	Teleostei	Scorpaeniformes	Agonidae	<i>Agonus cataphractus</i>	3	3.94	0.13	-17.86	0.33	13.81	0.81
Chordata	Teleostei	Scorpaeniformes	Cyclopteridae	<i>Cyclopterus lumpus</i>	1	4.43	-	-18.69	-	15.24	-
Chordata	Teleostei	Scorpanaeniformes	Cottidae	<i>Myoxocephalus scorpius</i>	3	3.72	0.05	-18.26	1.37	12.50	0.29
Chordata	Teleostei	Scorpanaeniformes	Cottidae	<i>Taurulus bubalis</i>	3	3.84	0.17	-17.29	0.36	15.81	0.95
Chordata	Teleostei	Scorpanaeniformes	Cottidae	<i>Zeugopterus punctatus</i>	2	3.84	0.39	-18.75	0.24	14.75	0.80
Chordata	Teleostei	Scorpanaeniformes	Cyclopteridae	<i>Liparis liparis liparis</i>	3	3.53	0.02	-16.23	0.09	15.02	0.51
Chordata	Teleostei	Scorpanaeniformes	Triglidae	<i>Aspitrigla cuculus</i>	3	3.96	0.18	-18.56	0.27	13.88	0.05
Chordata	Teleostei	Scorpanaeniformes	Triglidae	<i>Chelidonichthys lucerna</i>	3	4.33	0.24	-19.05	0.26	15.16	0.24
Chordata	Teleostei	Scorpanaeniformes	Triglidae	<i>Eutrigla gurnardus</i>	3	5.05	0.31	-19.30	0.38	15.00	0.44
Chordata	Teleostei	Scorpanaeniformes	Triglidae	<i>Triglia lyra</i>	1	4.54	-	-19.44	-	15.48	-
Chordata	Teleostei	Syngnathiformes	Syngnathidae	<i>Syngnathus acus</i>	1	4.17	-	-19.78	-	8.62	-
Chordata	Teleostei	Zeiformes	Zeidae	<i>Zeus faber</i>	1	4.10	-	-19.30	-	15.35	-
Chordata	Myxini	Myxiniformes	Myxinidae	<i>Myxine glutinosa</i>	1	5.96	-	-20.84	-	13.08	-
Echinodermata	Asteroidea	Forcipulatida	Asteroidea	<i>Asterias rubens</i>	1	4.91	-	-18.60	-	13.48	-

Echinodermata	Asteroidea	Forcipulatida	Asteroidea	<i>Luida sarcis</i>	1	5.20	-	-16.62	-	8.97	-
Echinodermata	Echinoidea	Echinoida	Echinoidae	<i>Psammechinus miliaris</i>	3	5.48	0.38	-17.48	0.48	12.47	0.64
Mollusca	Bilvalvia	Ostreoida	Pectinidae	<i>Aequipecten opercularis</i>	1	3.23	-	-19.73	-	7.06	-
Mollusca	Bivalvia	Arcoidea	Glycymerididae	<i>Glycymeris glycymeris</i>	1	5.17	-	-20.27	-	10.02	-
Mollusca	Bivalvia	Mytiloidea	Mytilidae	<i>Mytilus edulis</i>	1	4.78	-	-20.01	-	9.16	-
Mollusca	Bivalvia	Ostreoida	Pectinidae	<i>Pecten maximus</i>	1	3.38	-	-19.39	-	10.19	-
Mollusca	Bivalvia	Veneroidea	Cardiidae	<i>Laevicardium crassum</i>	1	3.68	-	-19.91	-	8.84	-
Mollusca	Bivalvia	Veneroidea	Maत्रacea	<i>Lutraria lutraria</i>	1	3.88	-	-18.50	-	12.77	-
Mollusca	Bivalvia	Veneroidea	Pharidae	<i>Ensis arcuatus</i>	2	3.27	0.05	-18.41	0.22	12.47	0.46
Mollusca	Cephalopoda	Sepiida	Sepiidae	<i>Sepia officinalis</i>	3	3.46	0.01	-18.47	0.28	15.01	0.19
Mollusca	Cephalopoda	Sepiolida	Sepiolidae	<i>Sepiolo atlantica</i>	4	4.06	0.04	-18.78	0.31	13.39	0.65
Mollusca	Cephalopoda	Teuthida	Loliginidae	<i>Loligo vulgaris</i>	4	3.54	0.09	-18.77	0.19	14.63	0.23
Mollusca	Cephalopoda	Teuthida	Loliginidae	<i>Alloteuthis media</i>	3	4.05	0.05	-19.32	0.50	14.44	0.31
Mollusca	Cephalopoda	Teuthida	Ommastrephidae	<i>Todaropsis eblanae</i>	1	3.95	-	-19.45	-	14.36	-
Mollusca	Gastropoda	Cephalaspidea	Scaphandridae	<i>Scaphander lignarius</i>	1	4.33	-	-18.12	-	10.09	-
Mollusca	Gastropoda	Neogastropoda	Buccinidae	<i>Buccinum undatum</i>	3	4.52	0.29	-16.20	0.49	12.30	0.38
