

Online Resource Table A: Minimum number of individual cephalopods identified from accumulated beaks, with the percentage numerical abundance (%NA) in brackets, for the 12 studies of southern elephant seal diet which recovered cephalopod beaks. All identifications were updated following Cherel (2020). ad: adult; subad: subadult; juv: juvenile; M: male; F: female.

References	This study	Green & Burton 1993	Slip 1995	Green & Burton 1993	van den Hoff 2004	Field et al. 2007	Rodhouse et al. 1992	Piatkowski et al. 2002	Daner et al. 2015	Burdman et al. 2015	Clarke & MacLeod 1982	van den Hoff et al. 2003											
Year	Aug/Sep 1976	Dec 1987 - Feb 1988	Jul 1992 - Mar 1993	1978, 1985, Dec 1987 - Feb 1988, Dec 1989 - Feb 1990	sum (Dec - Mar)	Sep 1999 - Sep 2000	Nov 1986, Nov 1988 - Feb 1989	sum 1991/92, 1992/93	sum 1995/96 - 2003	spr-sum 2003, 2004, 2005	Nov 1962 - May 1963, Jan 1964	Feb-Mar 2000											
Location	Marion Island	Heard Island	Heard Island	Macquarie Island	Macquarie Island	Macquarie Island	Husvik (South Georgia)	King George Island (South Shetland islands)	Isla 25 de Mayo, King George (South Shetland islands)	Isla 25 de Mayo, King George (South Shetland islands)	Signy Island (South Orkney Islands)	Vincennes Bay (East Antarctica)											
Method of sampling	Killed ind.	Lavage & dead ind.	Lavage	Lavage & killed ind.	Lavage	Lavage	Lavage	Lavage	Lavage	Lavage	Killed ind.	Lavage											
Details of sampled southern elephant seals (ad/subad/juv, M/F)	M - juv	M/F, ad/subad	M/F, juv/ad	M/F, juv/subad/ad	juv	M/F, juv	M/F	F	M/F, juv/subad	M/F, juv	M/F, subad/ad	M, subad/ad											
Number of sampled stomach contents	2	48	65	71	45	141	46	30	162	32	11	8											
Number of beaks	69 lower, 68 upper	532 lower	1492 lower	1139 lower	601 lower	2706 lower	1070 lower, 1162 upper	160 lower	1739 lower, 1486 upper	194 lower, 163 upper	50 lower, 68 upper	11 lower, 8 upper											
DECAPODA																							
Batoteuthidae																							
<i>Batoteuthis skolops</i>																							
11	(12.6)						3	(0.3)															
Brachioteuthidae																							
<i>Brachioteuthis linkovskiyi</i>																							
1	(1.1)	7	(1.3)	40	(2.7)	25	(2.2)	28	(4.7)	90	(3.3)												
<i>Slosarczykovi circumantarctica</i>																							
26	(4.9)	157	(10.5)	23	(2.0)	106	(17.6)	468	(17.3)	192	(17.9)	6	(3.8)	541	(31.1)	27	(14.0)						
<i>Brachioteuthis</i> sp.																							
1	(1.1)																						
Chiroteuthidae																							
<i>Chiroteuthis veranyi</i>																							
1	(1.1)						6	(0.6)		1	(0.1)												
Cranichidae																							
<i>Galliteuthis glacialis</i>																							
2	(2.3)	15	(2.8)	78	(5.2)	13	(1.1)	20	(3.3)	54	(2.0)												
<i>Liocranchia</i> sp.*																							
		1	(0.1)			p						7	(0.7)	8	(5.0)	20	(1.2)	3	(1.6)	1	(2.2)		
<i>Mesonychoteuthis hamiltoni</i>																							
												2	(0.2)										
<i>Taonius notalia</i>																							
1	(1.1)	1	(0.2)	1	(0.1)	5	(0.4)			27	(1.0)												
Gonateuthidae																							
<i>Gonatus antarcticus</i>																							
4	(4.6)	65	(12.2)	209	(14.0)	20	(1.8)	24	(4.0)	123	(4.5)	67	(6.3)	2	(1.3)	28	(1.6)	19	(9.8)	21	(46.7)		
Histiototeuthidae																							
<i>Histiototeuthis "A"</i>																							
						1	(0.1)	p															
<i>Histiototeuthis</i> sp. A																							
6	(6.9)									7	(0.3)												
<i>Histiototeuthis atlantica</i>																							
2	(2.3)	31	(5.8)	13	(0.9)	735	(64.5)	69	(11.5)	945	(34.9)												
<i>Histiototeuthis eltaninae</i>																							
												58	(5.4)										
<i>Histiototeuthis atlantica / H. eltaninae</i>																							
Lycoteuthidae																							
<i>Lycoteuthis longera</i>																							
						p																	
Mastigoteuthidae																							
<i>Mastigoteuthis psychrophila</i>																							
1	(1.1)											5	(0.5)										
<i>Mastigoteuthis psychrophila / Batoteuthis skolops</i>																							
			313	(21.0)																			
<i>Mastigoteuthis</i> sp. B																							
			1	(0.1)																			
Neoteuthidae																							
<i>Alluroteuthis antarcticus</i>																							
9	(10.3)	65	(12.2)	106	(7.1)	66	(5.8)	65	(10.8)	406	(15.0)	51	(4.8)	5	(3.1)	67	(3.8)	10	(5.2)	1	(2.2)	2	(18.2)
<i>Neoteuthis</i> sp.																							
2	(2.3)			64	(4.3)	46	(4.0)	67	(11.1)	115	(4.2)	43	(4.0)					2	(1.0)				
Ommastrephidae																							
<i>Martialia hyadesi</i>																							
						18	(1.6)	p															
<i>Todarodes filippovae</i>																							
		1	(0.2)	7	(0.5)																		
<i>Todarodes</i> sp.																							
Onychoteuthidae																							
<i>Filippovia knipovitchi</i>																							
7	(8.0)	97	(18.2)	216	(14.5)	49	(4.3)	121	(20.1)			121	(11.3)			8	(0.5)	9	(4.7)	7	(15.6)		
<i>Moroteuthopsis ingens</i>																							
7	(8.0)	103	(19.3)	75	(5.0)	52	(4.5)	86	(14.3)	25	(0.9)												
<i>Moroteuthopsis longimana</i>																							
5	(5.7)	53	(9.9)	204	(13.7)	73	(6.4)	15	(2.5)	42	(1.6)	143	(13.4)	2	(1.3)	28	(1.6)			2	(4.4)		
<i>Filippovia knipovitchi / Moroteuthopsis</i> sp. B																							
										136	(5.0)												
<i>Moroteuthopsis</i> sp.																							
										20	(0.7)												
<i>Onychoteuthis</i> sp.																							
6	(6.9)																						
Pholidoteuthidae																							
<i>Pholidoteuthis massyae</i>																							
		8	(1.5)			p				2	(0.1)												
Psychroteuthidae																							
<i>Psychroteuthis glacialis</i> †																							
61	(11.5)					12	(1.0)					361	(33.7)	137	(85.6)	994	(57.2)	116	(60.1)	3	(6.7)	9	(81.8)
<i>Psychroteuthis</i> sp. B (Imber)																							
												191	(7.1)							10	(22.2)		
Vampyroteuthidae																							
<i>Vampyroteuthis infernalis</i>																							
4	(4.6)					1	(0.1)																
Unidentified Decapoda																							
			4	(0.3)								55	(2.0)										
OCTOPODA																							
Megaleledonidae																							
<i>Adelieledone polymorpha</i>																							
												6	(0.6)			2	(0.1)	1	(0.5)				
<i>Pareledone charcoti</i>																							
												5	(0.5)										
<i>Pareledone turqueti</i>																							
																27	(1.5)	4	(2.1)				
<i>Pareledone</i> sp.																							
																23	(1.3)	2	(1.0)				
Eledonidae																							
<i>Eledonis</i> sp. B																							
																				5	(11.1)		

*Dubful identification according to Cherel 2020

†Potentially a mix of *P. glacialis* and *P. sp. B* (Imber) in samples with *P. glacialis* of two modes (Cherel 2020)

Online Resource Table B: Measurements of lower and upper uneroded cephalopod beaks, and estimates of mantle length (mm) and wet weight (g) using allometric equations described in Xavier & Chérel (2021) and Jackson et al. (1997).

Family	Species	Number of beaks measured		Lower rostral length (mm)	Upper rostral length (mm)	Estimated mantle length (mm)		Estimated wet weight (g)	
		Lower	Upper	mean ± SD	mean ± SD	mean ± SD	(range)	mean ± SD	(range)
Batoteuthidae	<i>Batoteuthis skolops</i>	4	11	2.31 ± 0.37	2.19 ± 0.19	67.8 ± 9.2	(62.0 - 81.4)	7.8 ± 3.7	(5.6 - 13.4)
Brachioteuthidae	<i>Brachioteuthis linkovskyi</i>	1	0	2.50		-		-	
	<i>Slosarczykovia circumantarctica</i>	16	16	2.44 ± 0.52	2.39 ± 0.47	65.5 ± 10.4	(52.4 - 81.5)	6.2 ± 1.8	(3.1 - 9.1)
Chiroteuthidae	<i>Chiroteuthis veranyi</i>	1	1	5.65	5.72	109.2		84.3	
Cranchiidae	<i>Galiteuthis glacialis</i>	1	2	4.00	3.14 ± 0.28	362.0		81.4	
	<i>Taonius notalia</i>	0	1		4.78				
Gonatidae	<i>Gonatus antarcticus</i>	3	5	4.89 ± 1.06	4.47 ± 0.72	155.6 ± 63.5	(82.8 - 199.7)	106.8 ± 79.1	(17.5 - 167.9)
Histioteuthidae	<i>Histioteuthis atlantica</i>	3	4	2.96 ± 0.19	3.58 ± 0.83	65.4 ± 4.8	(62.2 - 70.9)	63.5 ± 10	(56.8 - 74.9)
	<i>Histioteuthis eltaninae</i>	1	1	2.75	2.75	63.7		32.3	
Mastigoteuthidae	<i>Mastigoteuthis psychrophila</i>	0	1		2.18				
Neoteuthidae	<i>Alluroteuthis antarcticus</i>	8	7	4.35 ± 0.46	4.12 ± 0.23	147.9 ± 16.1	(115.4 - 162.3)	265.9 ± 72.5	(127.6 - 337.8)
Onychoteuthidae	<i>Filippovia knipovitchi</i>	4	4	4.26 ± 1.80	4.42 ± 0.54	160.1 ± 112.2	(67.1 - 310.3)	185.6 ± 254.6	(27.2 - 559.0)
	<i>Moroteuthopsis ingens</i>	4	2	7.68 ± 2.38	4.13 ± 0.18	314.1 ± 69.5	(227.9 - 398.7)	1236.7 ± 929.1	(359.3 - 2620.3)
	<i>Moroteuthopsis longimana</i>	1	1	4.43	4.67	143.0		77.7	

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