

Table S1. Stable carbon ($\delta^{13}\text{C}$) and nitrogen ($\delta^{15}\text{N}$) values of various marine organisms from the Southern Ocean.

Species	Location	Tissue	n	$\delta^{13}\text{C}$ (‰)	$\delta^{15}\text{N}$ (‰)	Source
Mid latitude waters (<55°S)						
Euphausiids						
<i>Euphausia frigida</i>	Weddell Sea (49°S, 20°E)	Whole individuals	4	-24.3 ± 0.9	4.9 ± 0.3	Schmidt et al. (2004)
Fish						
<i>Krefflichthys anderssoni</i>	Kerguelen (49°21'S, 70°18'E)	White muscle	12	-22.3 ± 0.2	7.6 ± 0.2	Cherel et al. (2008)
<i>Electrona antarctica</i>	Kerguelen (49°21'S, 70°18'E)	White muscle	10	-22.2 ± 0.9	8.0 ± 0.5	This study
<i>Gymnoscopelus fraseri</i>	Kerguelen (49°21'S, 70°18'E)	White muscle	7	-22.5 ± 1.1	8.0 ± 0.5	This study
<i>Gymnoscopelus nicholsi</i>	Kerguelen (49°21'S, 70°18'E)	White muscle	10	-22.7 ± 0.5	9.7 ± 0.7	This study
<i>Protomyctophum tenisoni</i>	Kerguelen (49°21'S, 70°18'E)	White muscle	5	-22.1 ± 1.0	6.4 ± 0.3	This study
<i>Gymnoscopelus piabilis</i>	Kerguelen (49°21'S, 70°18'E)	White muscle	2	-20.4 ± 0.3	7.8 ± 0.1	This study
Squid						
<i>Histioteuthis eltaninae</i> (LRL: 2.2±0.2 mm)	Macquarie Island (54°30'S, 158°57'E)	Beaks (corrected)	26	-21.2 ± 0.6	7.8 ± 1.9	Hughes (unpubl. data)
<i>Martialia hyadesi</i> (LRL: 6.5± 0.3 mm)	Macquarie Island (54°30'S, 158°57'E)	Beaks (corrected)	17	-21.6 ± 1.2	6.6 ± 1.5	Hughes (unpubl. data)
High latitude waters (>60°S)						
Amphipod						
<i>Themisto gaudichaudii</i>	Dumont d'Urville Sea (65°30'S, 143°E)	Whole individuals	7	-26.0 ± 0.5	5.4 ± 0.4	This study
Euphausiids						
<i>Euphausia superba</i>	Adélie Land (66°S, 136°E)	Whole individuals	12	-25.8 ± 0.4	5.5 ± 0.4	Cherel (2008)
<i>Euphausia triacantha</i>	Dumont d'Urville Sea (63°S, 140°E)	Whole individuals	10	-23.6 ± 0.5	6.3 ± 0.6	This study
Fish						
<i>Electrona antarctica</i>	Dumont d'Urville Sea (62°S, 140°E)	White muscle	9	-23.2 ± 0.4	8.3 ± 0.4	This study
Squid						
<i>Psychrotheuthis glacialis</i>	Northern Ross Sea (65°S, 180°E)	Mantle	20	-25.3 ± 0.6	7.9 ± 0.6	Bury et al.(2008)
<i>Galiteuthis glacialis</i>	Northern Ross Sea (65°S, 180°E)	Mantle	3	-24.7 ± 0.9	8.1 ± 0.4	Bury et al.(2008)
<i>Kondakovia longimana</i>	Northern Ross Sea (65°S, 180°E)	Mantle	20	-25.1 ± 0.6	7.6 ± 0.6	Bury et al.(2008)
<i>Bathyeuthis abyssicola</i>	Dumont d'Urville Sea (63°S, 140°E)	Mantle	2	-24.2 ± 0.3	8.0 ± 0.3	This study
<i>Psychrotheuthis glacialis</i>	Dumont d'Urville Sea (65°30'S, 140°E)	Mantle	3	-25.9 ± 0.2	10.0 ± 0.5	This study

Beaks (corrected) = Squid beak isotopic values presented are corrected for reduced $\delta^{15}\text{N}$ enrichment due to chitin. See Materials and Methods for details.
 LRL = Lower Rostral Length of squid beaks