

Supporting information

Quillfeldt et al.: Variation among species and populations, and carry-over effects of winter exposure on mercury accumulation in small petrels

Fig. S1. Core moult period in tracked Blue petrels, Thin-billed prions and Antarctic prions, based on immersion data.

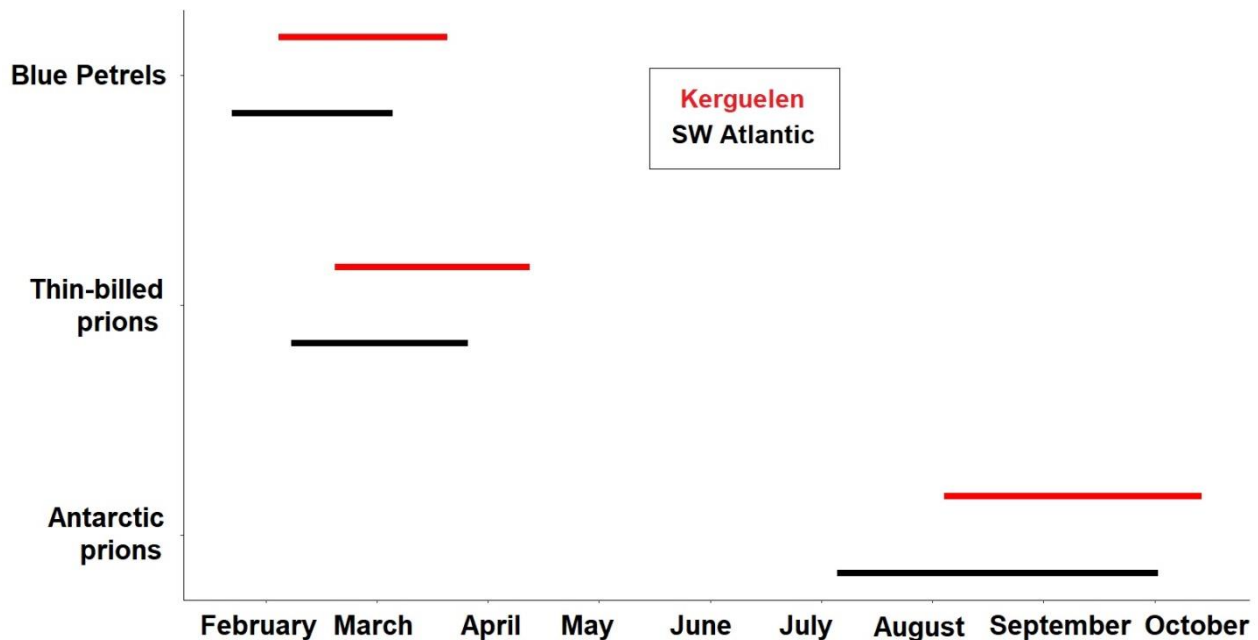


Table S1. Mean start, end and duration of the core moult period in Blue Petrels (BP), Thin-billed Prions (TBP) and Antarctic Prions (AP), based on immersion data.

Population	N	Duration				
		(days)	Start (min)	Start (mean)	End (mean)	End (max)
BP_Kerguelen	16	46.6	07.02.2012	18.02.2012	04.04.2012	13.04.2012
BP_South Georgia	10	43.4	18.01.2011	05.02.2011	21.03.2011	28.03.2011
TBP_Kerguelen	20	53.5	12.02.2012	04.03.2012	26.04.2012	18.05.2012
TBP_New Island	40	48.5	-	-	-	-
2010	20	47.2	06.02.2010	24.02.2010	11.04.2010	10.05.2010
2011	13	48.9	31.01.2011	24.02.2011	13.04.2011	25.05.2011
2013	7	51.7	08.02.2013	12.02.2013	03.04.2013	18.04.2013
AP_Kerguelen	11	70.6	06.08.2012	16.08.2012	24.10.2012	13.11.2012
AP_South Georgia	7	87.8	30.05.2011	19.07.2011	14.10.2011	28.10.2011

Fig. S2. Year-round latitudinal and longitudinal distribution of Blue Petrels from different breeding colonies.

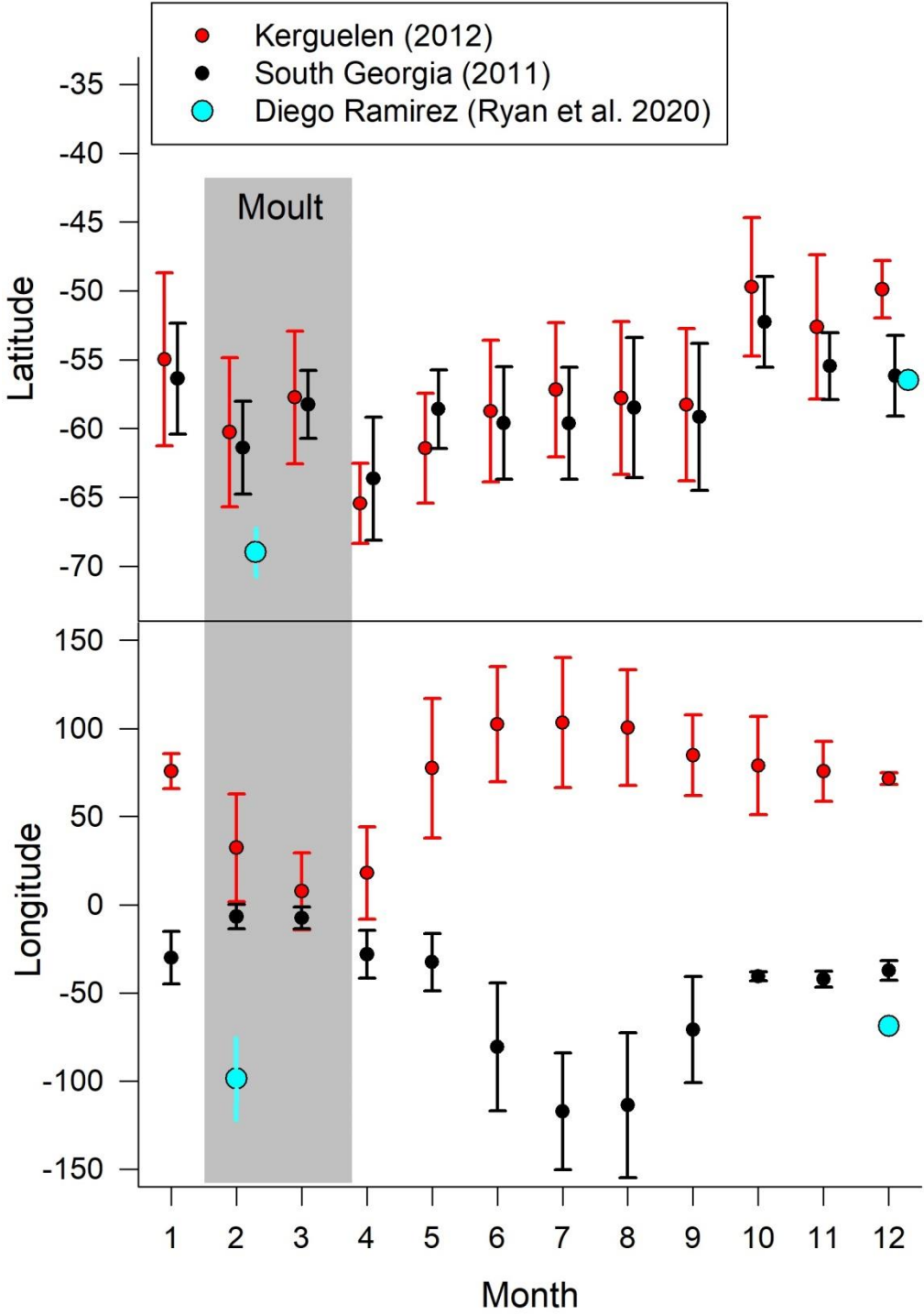


Fig. S3. Year-round latitudinal and longitudinal distribution of Thin-billed Prions from different breeding colonies.

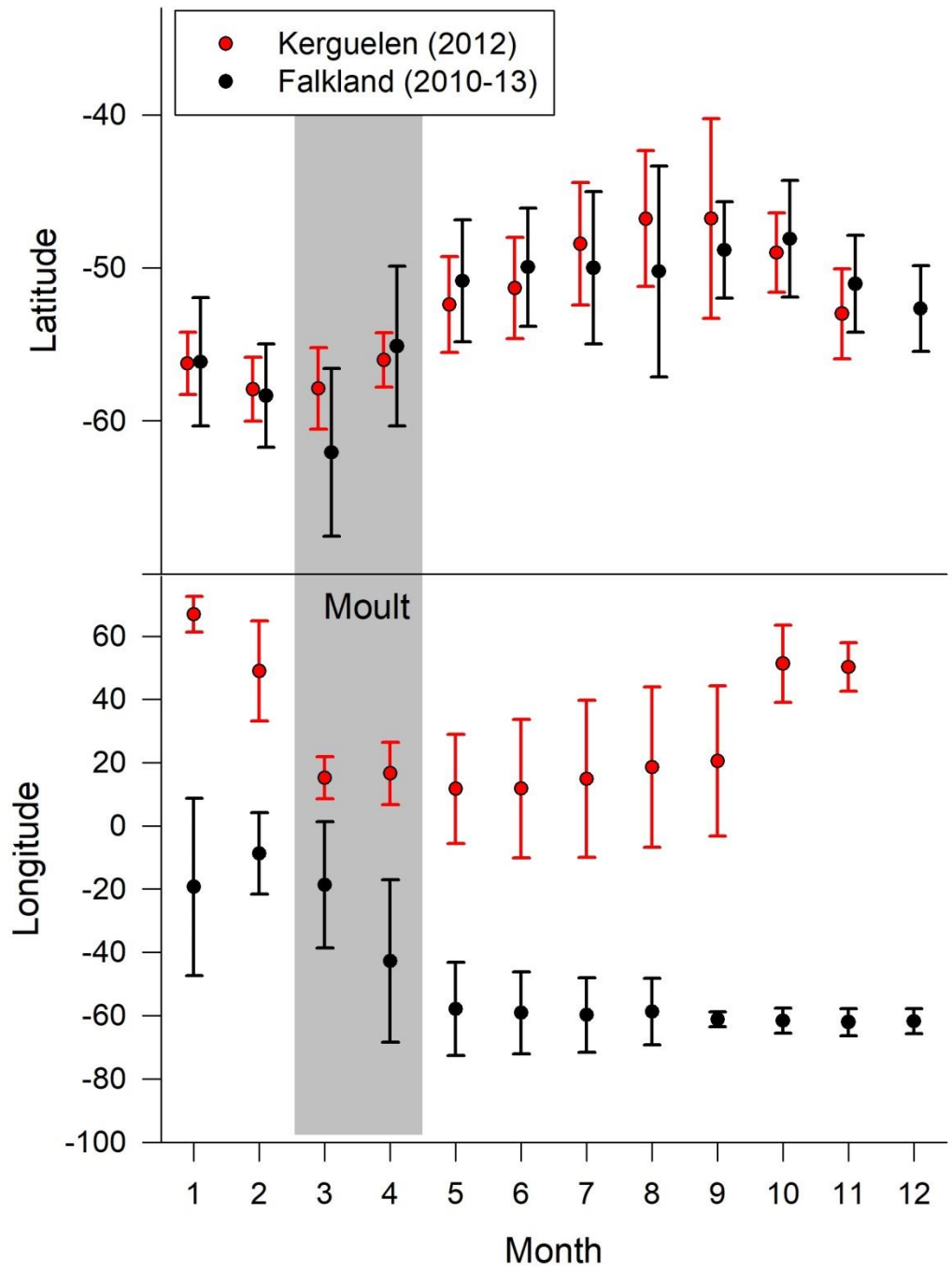


Fig. S4. Year-round latitudinal and longitudinal distribution of Antarctic Prions from different breeding colonies.

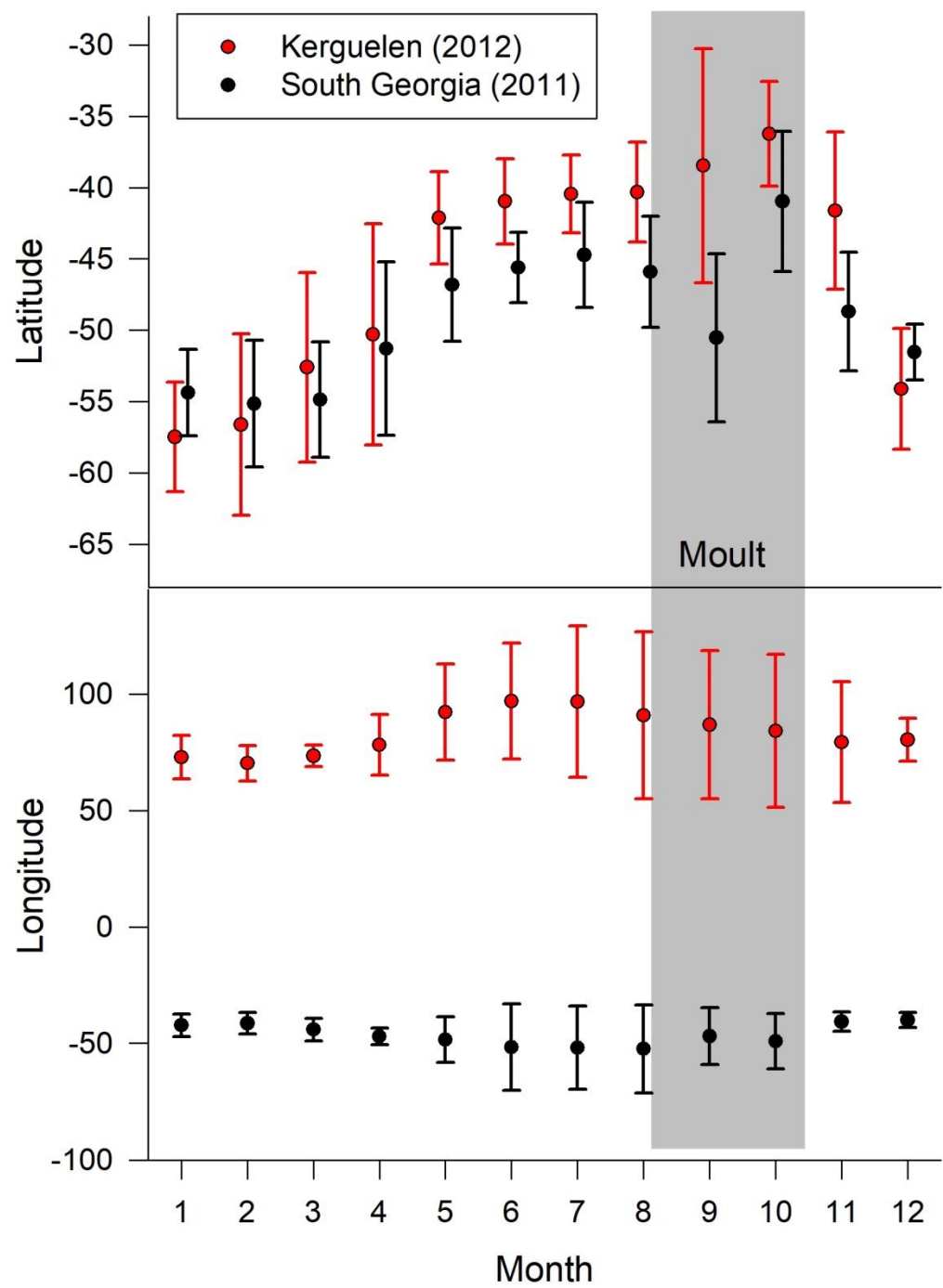


Fig. S5. Stable isotope values in feathers of Blue Petrels, Thin-billed Prions and Antarctic Prions. The upper panel shows the summary of seven populations, while the lower panel shows data of different years separately.

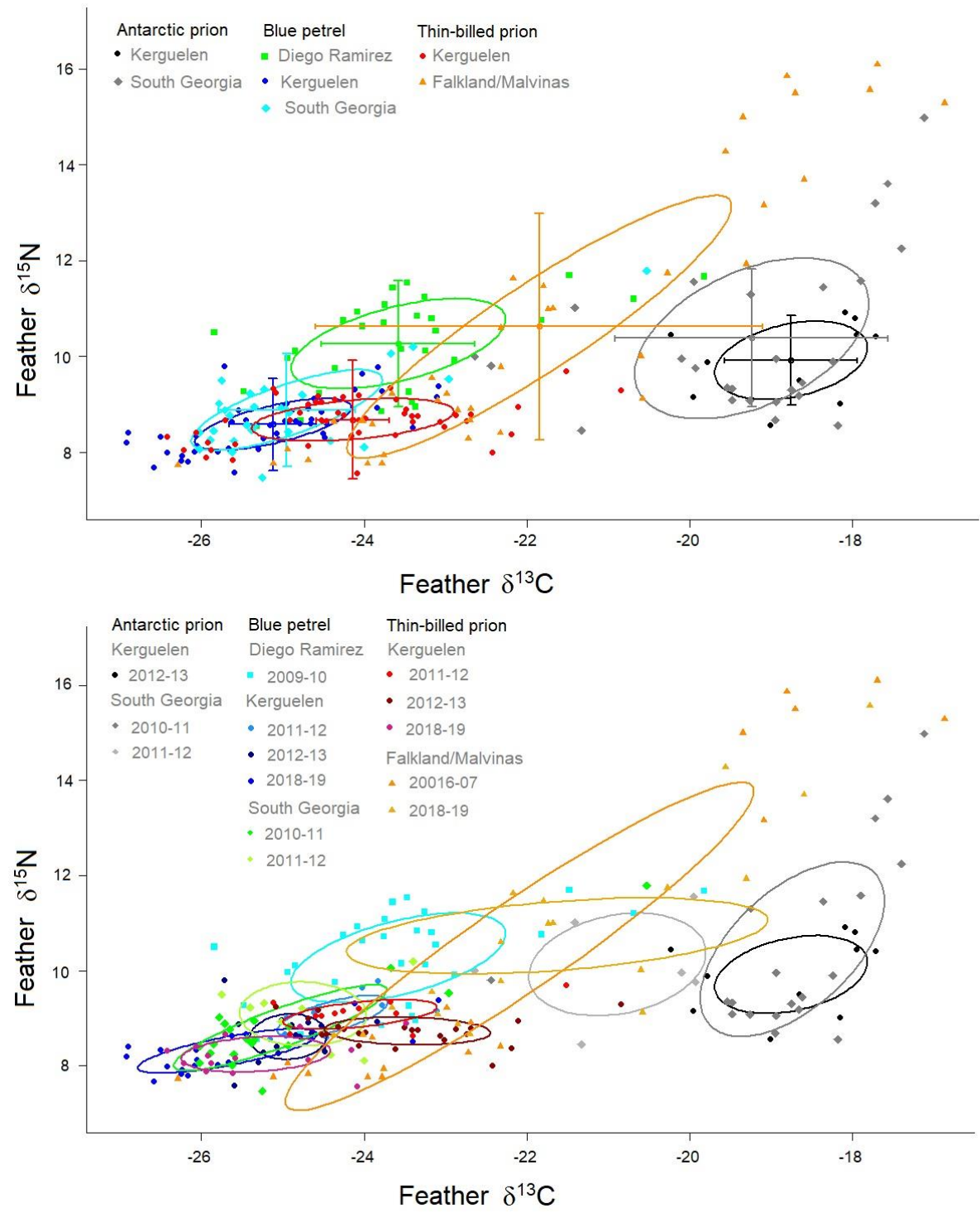


Fig S6. Trophic positions in feathers of Blue Petrels and Thin-billed Prions, measured with compound-specific stable isotope analysis of nitrogen stable isotope values in amino acids.

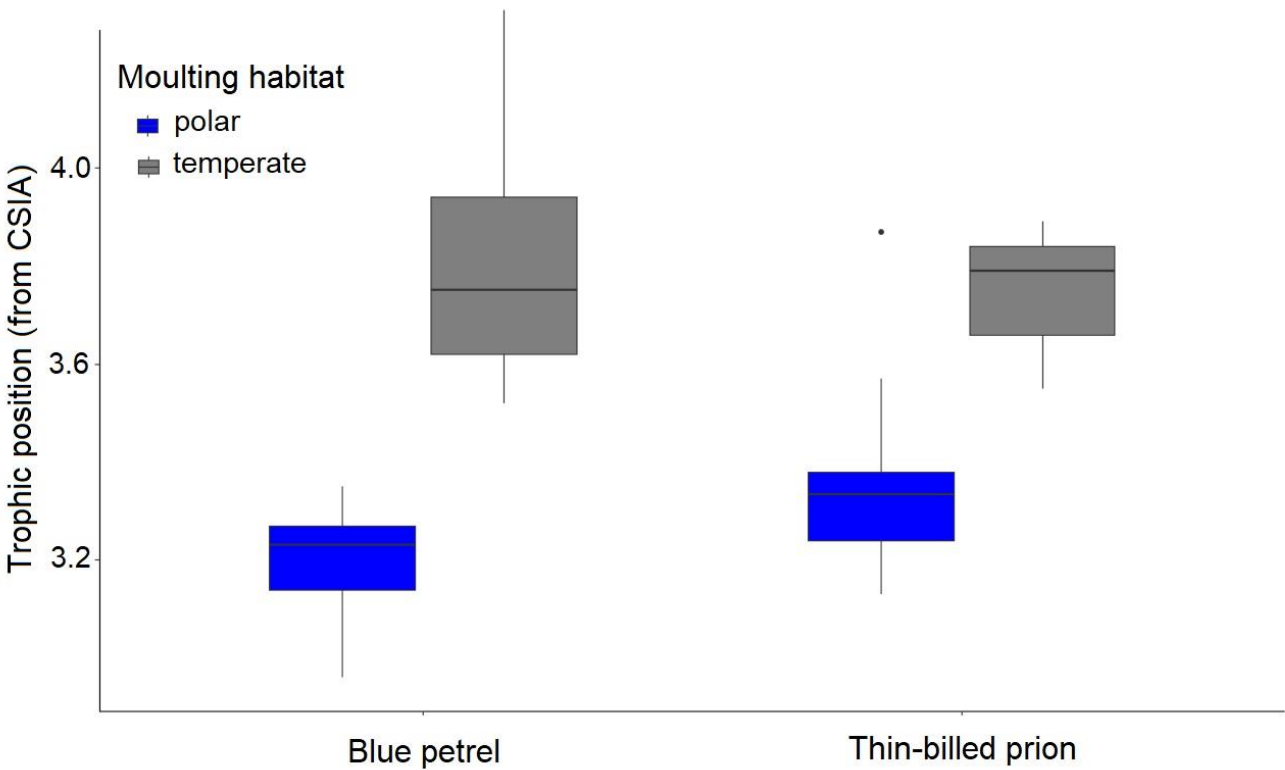


Fig S7. Violin plot showing the distribution of mercury in feathers of Blue Petrels, Thin-billed Prions and Antarctic Prions.

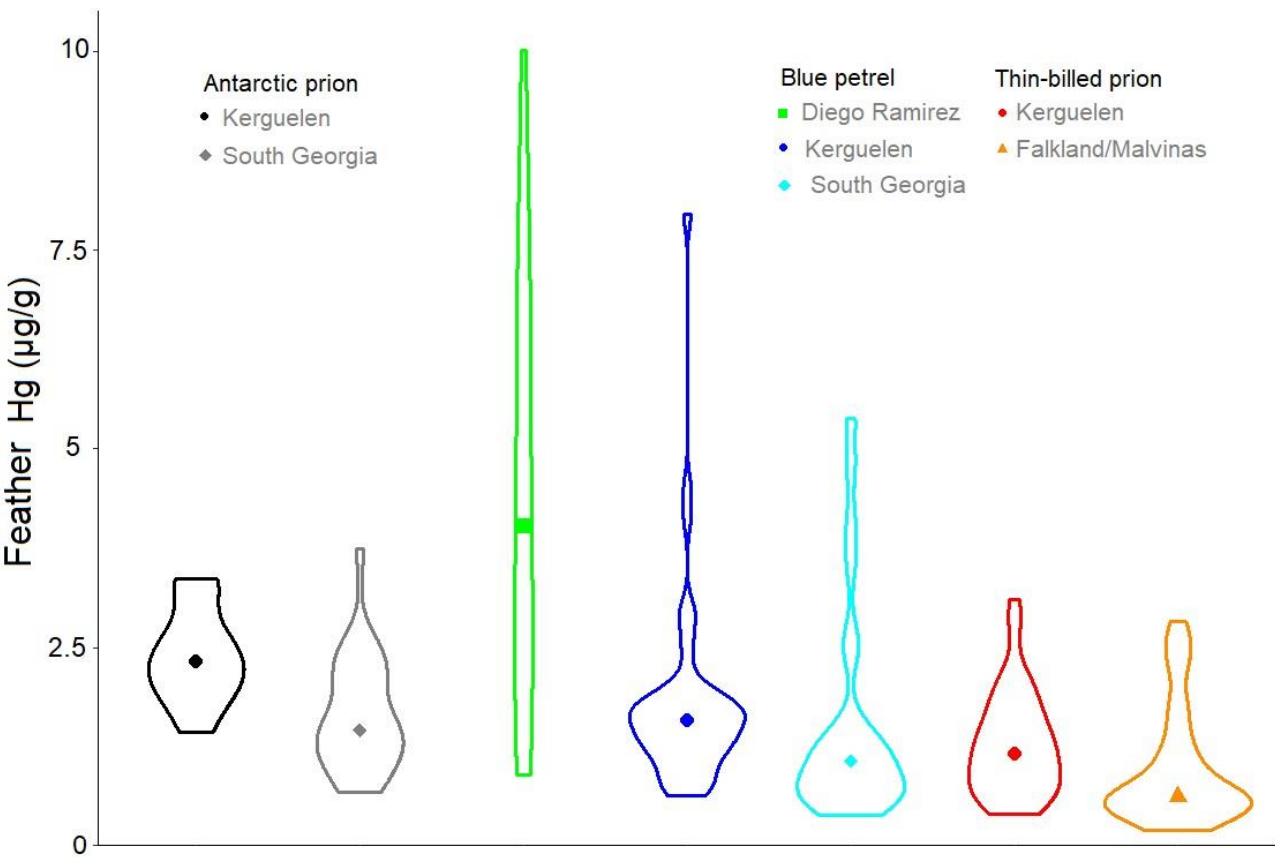


Fig. S8. Mercury (mean \pm SD) in relation to stable isotope values in feathers of Blue Petrels, Thin-billed Prions and Antarctic Prions. A linear smoother is shown in grey shade, although a linear model ($\text{lm}(\text{Hg} \sim \delta^{13}\text{C} + \delta^{15}\text{N}, \text{data}=\text{feathers})$) was not statistically significant overall ($P=0.738$), for $\delta^{13}\text{C}$ ($P=0.600$) or $\delta^{15}\text{N}$ ($P=0.464$).

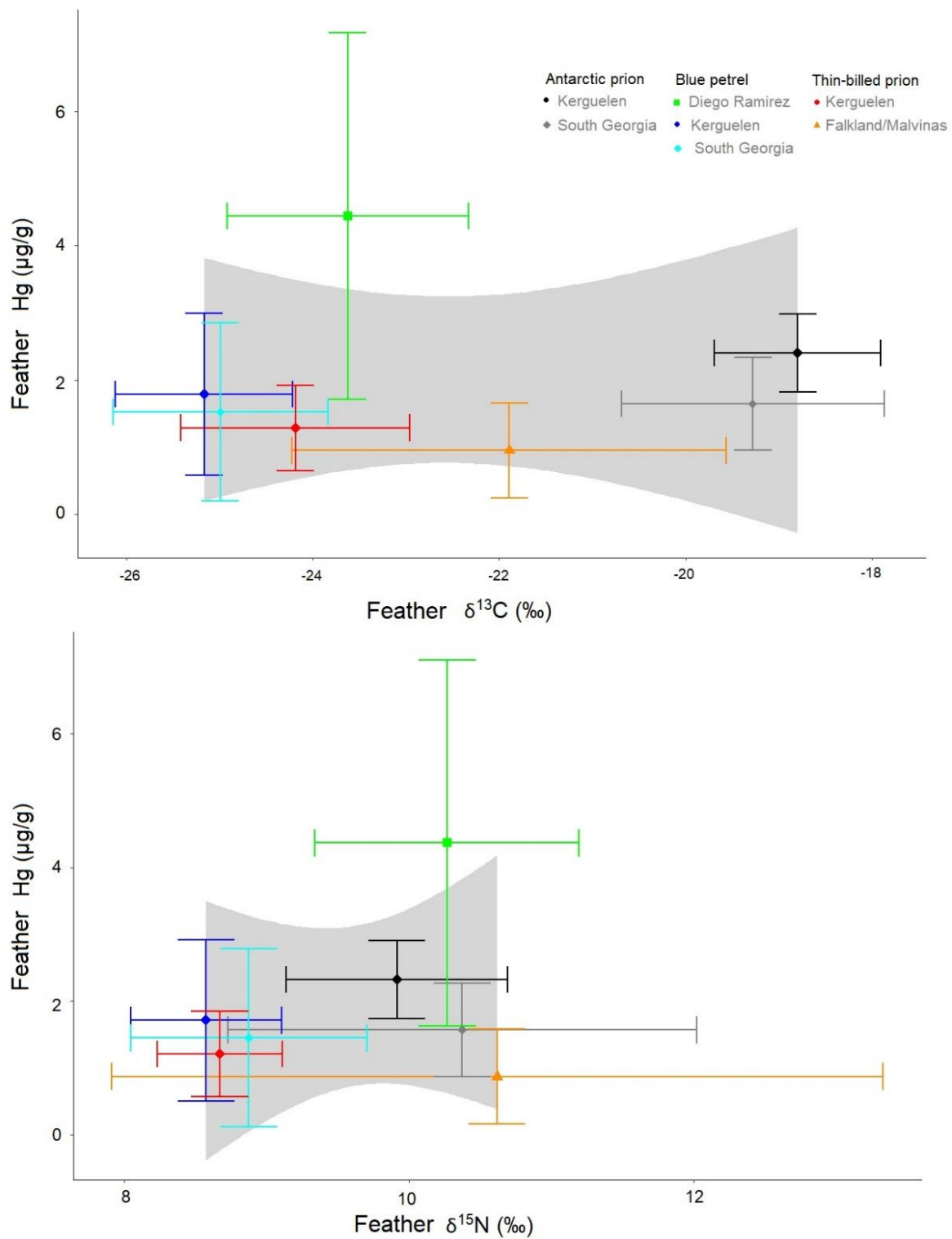


Fig. S9. Mercury concentrations ($\mu\text{g/g dw}$) in feathers in relation to $\delta^{13}\text{C}$ and $\delta^{15}\text{N}$ values.

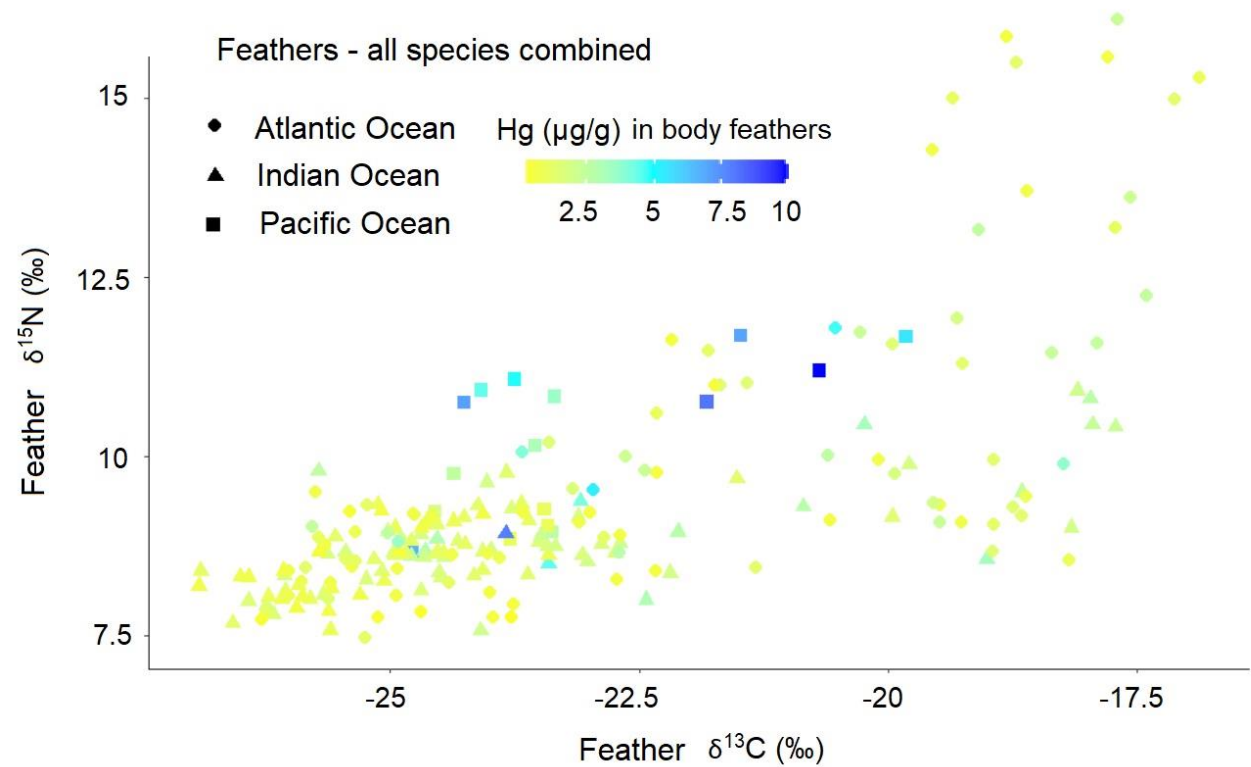


Fig. S10. Mercury in relation to carbon stable isotope values in blood samples of Blue Petrels, Thin-billed Prions and Antarctic Prions, shown for the incubation (a,b) and chick-rearing (c,d) periods. Grey areas show gam smoothed confidence intervals, obtained in the R package ggplot2, separately for the populations.

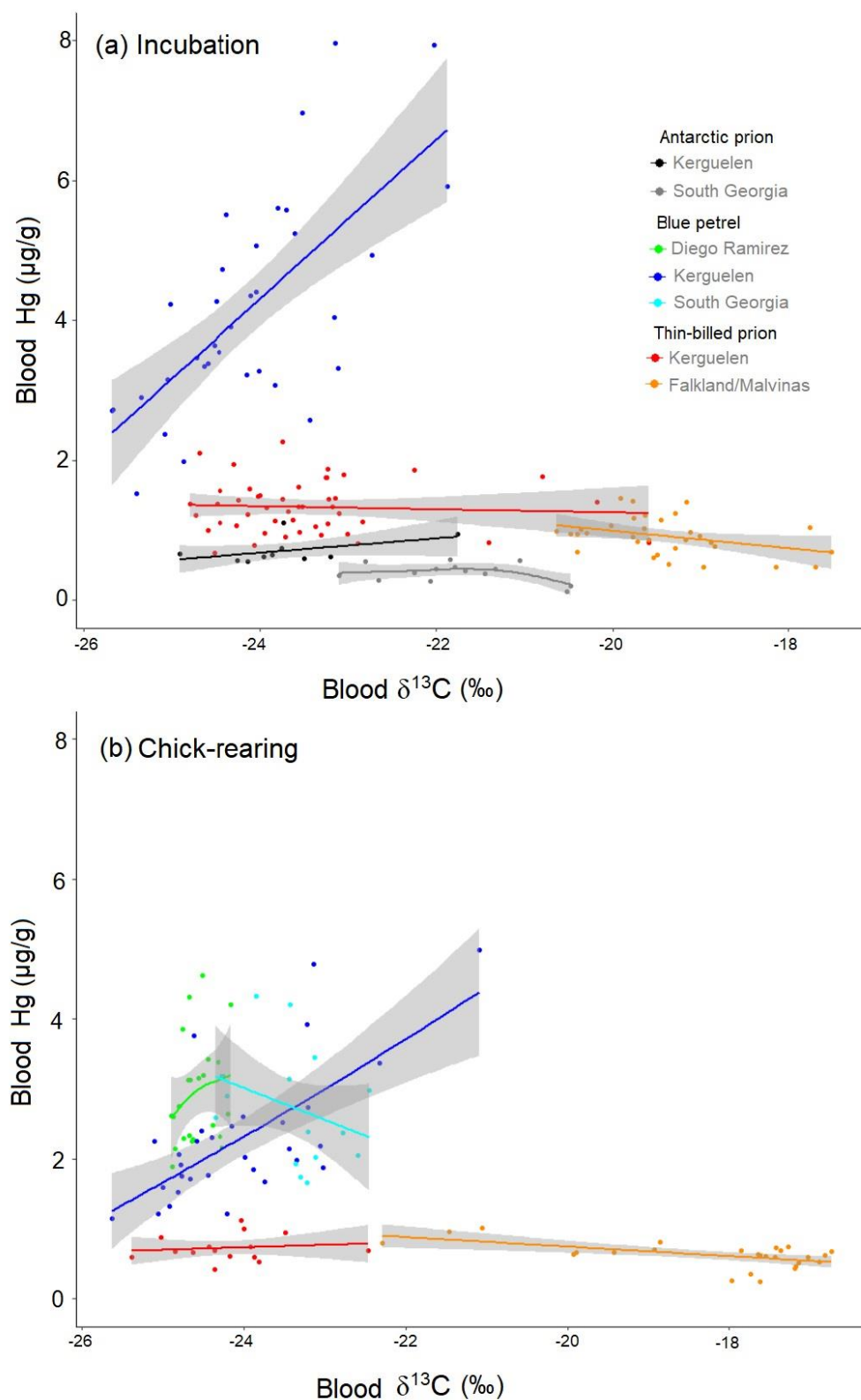


Table S2. Previous data on mercury. Data available from the literature for the three species: Blue Petrel, Thin-billed Prion and Antarctic Prion.

Population		Sample type			Hg ($\mu\text{g}\cdot\text{g}^{-1}$ dry weight);	Reference
Species	Colony site	age	tissue	Collection date	mean \pm SD (n) range	
Blue petrel	South Georgia	adults	feathers	1998	3.10 ± 0.14 (3) 2.96-3.24	Becker et al. 2002
		adults	feathers	2001	2.69 ± 1.29 (5) 1.94-4.99	Anderson et al. 2009
		adults	blood	2001	0.56 ± 0.28 (2) 0.36–0.75	Anderson et al. 2009
	Kerguelen	adults	feathers	2011	1.05 ± 0.720 (25) 0.43-33.32	Carravieri et al. 2014
		chicks	feather	2003	0.84 ± 0.18 (13) 0.58–1.14	Blévin et al. 2013
	Marion	adults	feathers	2011	4.62 ± 4.11 (9) 0.89-11.05	Becker et al. 2016
Thin-billed prion	Kerguelen	adults	feathers	2011	0.63 ± 0.55 (20) 0.24-2.49	Carravieri et al. 2014
		chicks	feathers	2003	0.22 ± 0.09 (9) 0.12–0.40	Blévin et al. 2013
Antarctic prion	South Georgia	adults	feathers	2001	4.51 ± 1.26 (15) 2.58-6.82	Anderson et al. 2009
		adults	blood	2001	0.53 ± 0.21 (16) 0.24–1.19	Anderson et al. 2009
	Kerguelen	adults	feathers	2011	1.73 ± 0.05 (10) 1.28-2.61	Carravieri et al. 2014
		adults	feathers	2012	2.8 ± 1.2 (10)	Fromant et al. 2016
		adults	blood	2012	0.67 ± 0.11 (10)	Fromant et al. 2016
		chicks	feathers	2008	0.21 ± 0.05 (10) 0.16–0.31	Blévin et al. 2013