

## **Supplementary information**

### **Intra-specific variation in lichen secondary compounds across environmental gradients on Signy Island, maritime Antarctic**

#### **Polar Biology**

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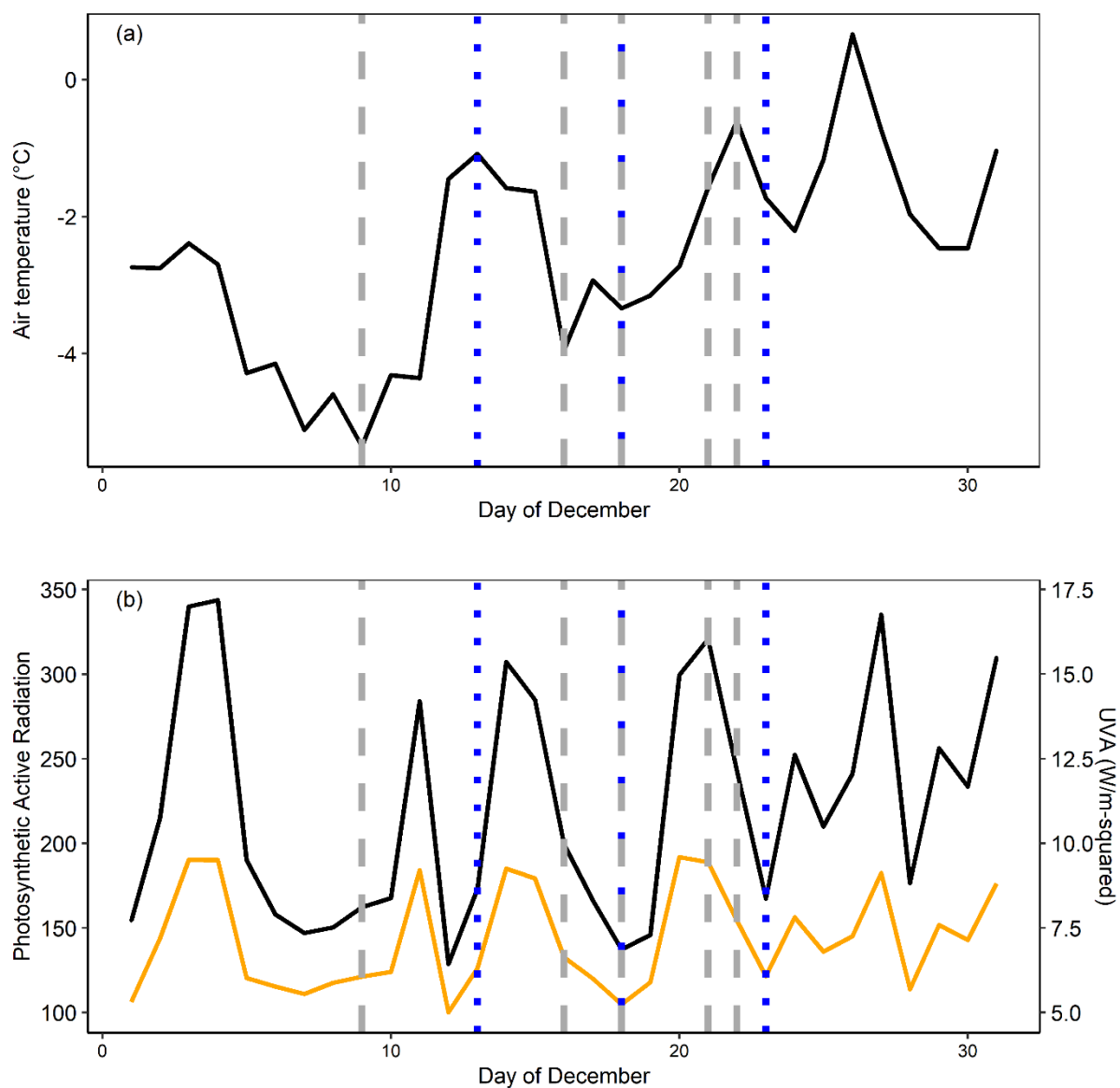
**Online Resource 1** Change in elevation along each transect and associated changes in lichen nitrogen and carbon based secondary compound concentration (mg/g dw) of *Usnea antarctica* and *Umbilicaria antarctica*. Rate of change (across 100 m vertical or horizontal distance) was calculated across five sampling points for each site (except at Moyes Cove which only had 4 sampling points). The overall trend of *Usnea antarctica* included the penguin affected sites only.

		Change in elevation	Change/100 m		
	Penguin influence present	(m/100m)	Nitrogen (mg g <sup>-1</sup> )	Fum (mg g <sup>-1</sup> )	Usnic (mg g <sup>-1</sup> )
<i>Usnea antarctica</i>					
Overall trend	+		-1.113*	0.2331	-0.1511
Moyes Cove	+	21	-0.811*	1.1670'	0.4641
North Point	+	21	-1.234'	0.1196	-0.4839
Spindrift Rocks	+	23	-1.116**	-0.4415	-0.0842
N-S traverse	-	2	-0.044	0.4054	0.1061
Moraine Valley	-	24	0.675	1.4540	1.9700
<i>Umbilicaria antarctica</i>					
				Gyrophoric acid	
Overall trend	+		-0.330*	-0.1076	
Gourlay Peninsula	+	3	-0.495**	-0.2393	
Moyes Cove	+	21	-0.149	-0.844*	
North Point	+	21	-1.079*	0.2647	

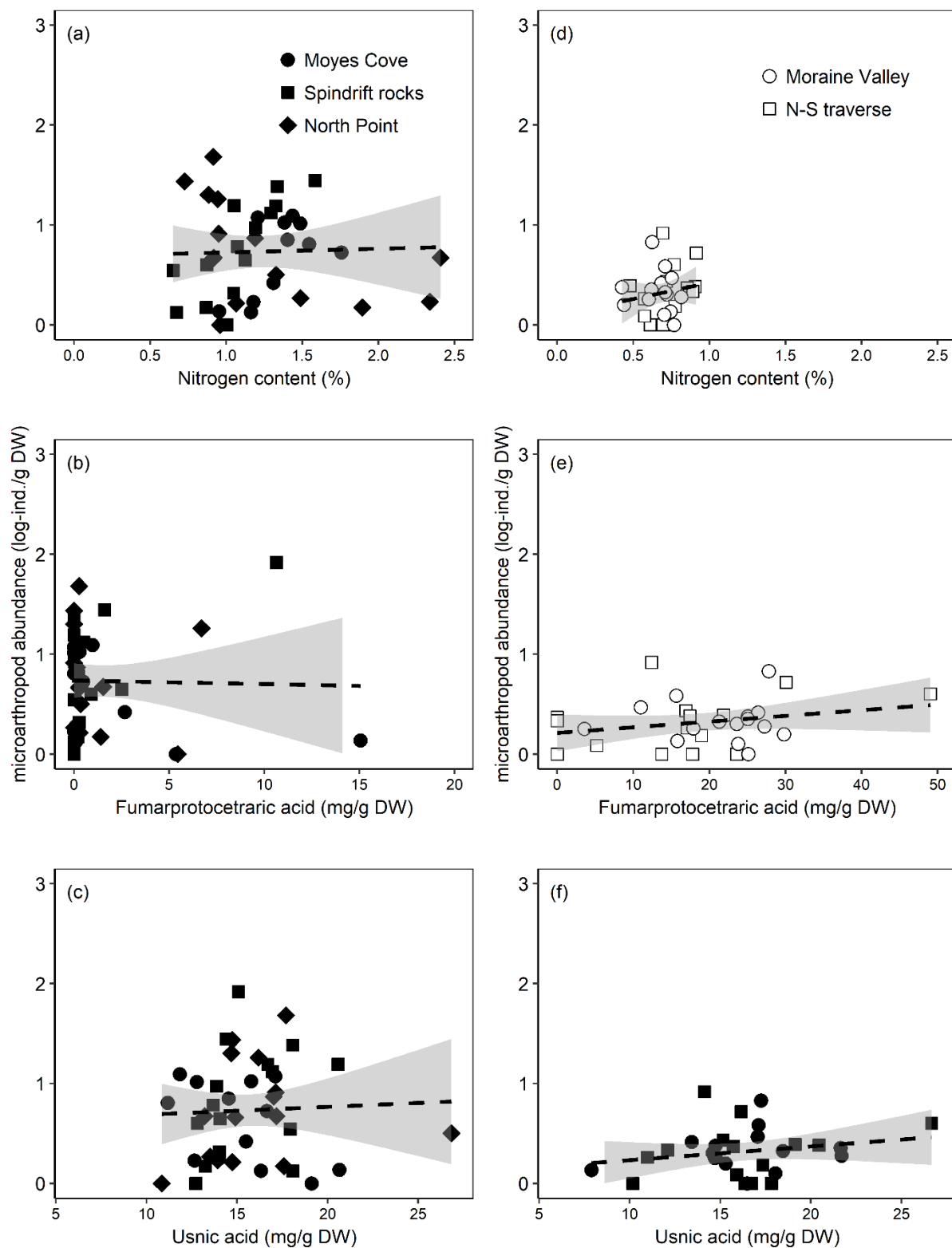
Significant regression changes of the variables with distance to the coast/along transects are indicated: 'p<0.1, \*p<0.05, \*\*p<0.01, \*\*\*P<

0.001. Fum: Fumarprotocetraric acid, Usnic: Usnic acid

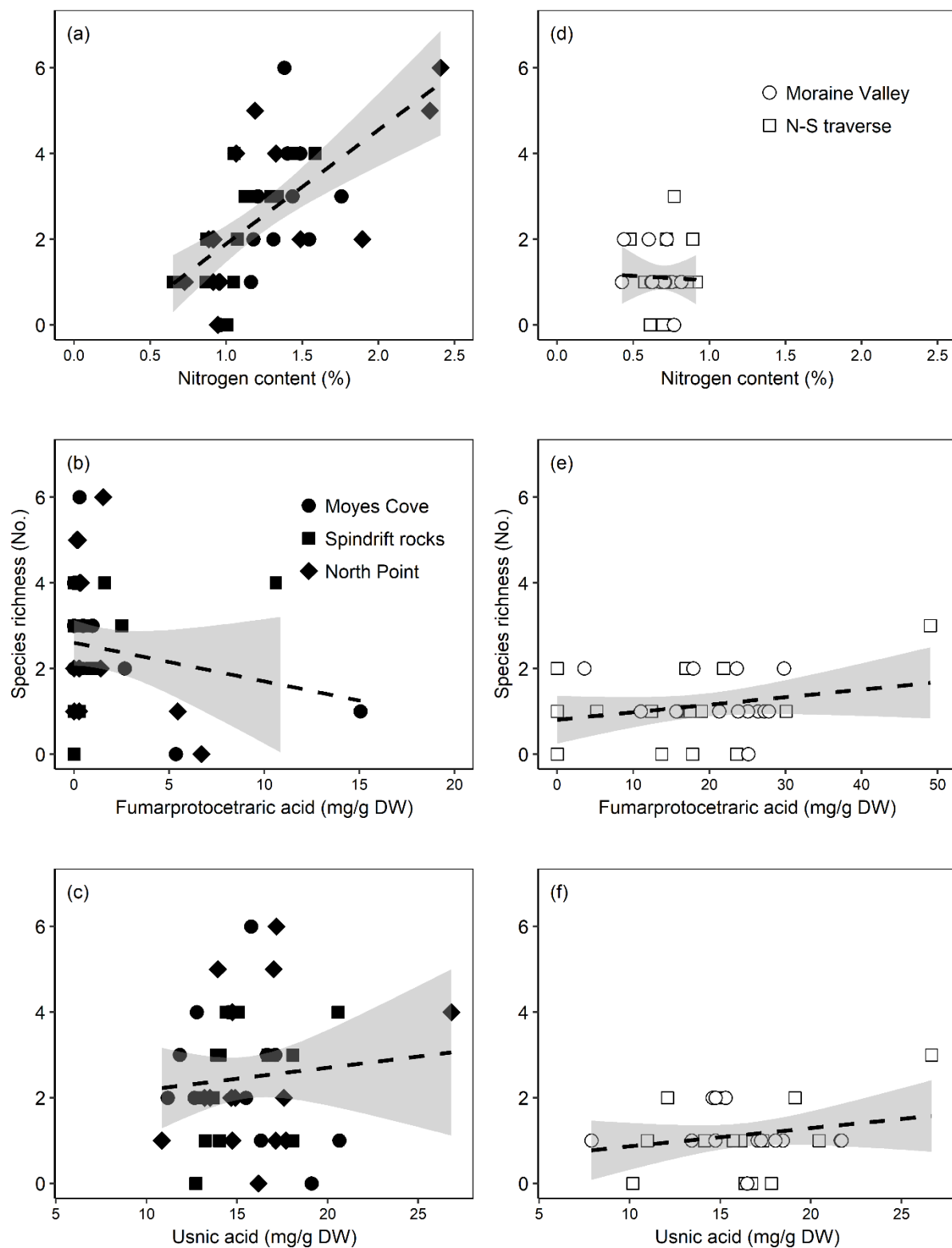
**Online Resource 2** Daily average ambient air temperature and solar radiation (PAR and UVA) during December 2013. Data obtained from the Jane Col weather station situated in the middle of Signy Island (Convey et al. 2020). Grey and blue dashed/dotted lines represent the sampling dates of *Usnea antarctica* and *Umbilicaria antarctica* respectively. See also Table 1



**Online Resource 3** Correlations between lichen nitrogen and carbon-based secondary compounds and microarthropod abundance for *Usnea antarctica* at sites influenced by penguins (a-c, n = 42) and sites beyond the influence of penguins (d-f, n = 30). Note the differences in x-axis scaling for b and e. 95% confidence intervals are shown by grey shading.



**Online Resource 4** Correlations between lichen nitrogen and carbon based secondary compounds and microarthropod species richness for *Usnea antarctica* along transects from the coast inland influenced by penguins (a-c, n = 42) and sites beyond the influence of penguins (d-f, n = 30). Note the differences in x-axis scaling for b and e



## **References**

Convey P, Newsham K, Geissler P, Massey A, Jobson M (2020). Microclimate data from Jane Col, 2007-2016. N. E. R. C. Polar Data Centre, UK Research & Innovation.