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Supplement of

Ecological and environmental controls on plant wax production and stable isotope fractionation in modern terrestrial Arctic vegetation

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S1. Introduction

This supplement contains Figures S1-S3 and Tables S1-S3.

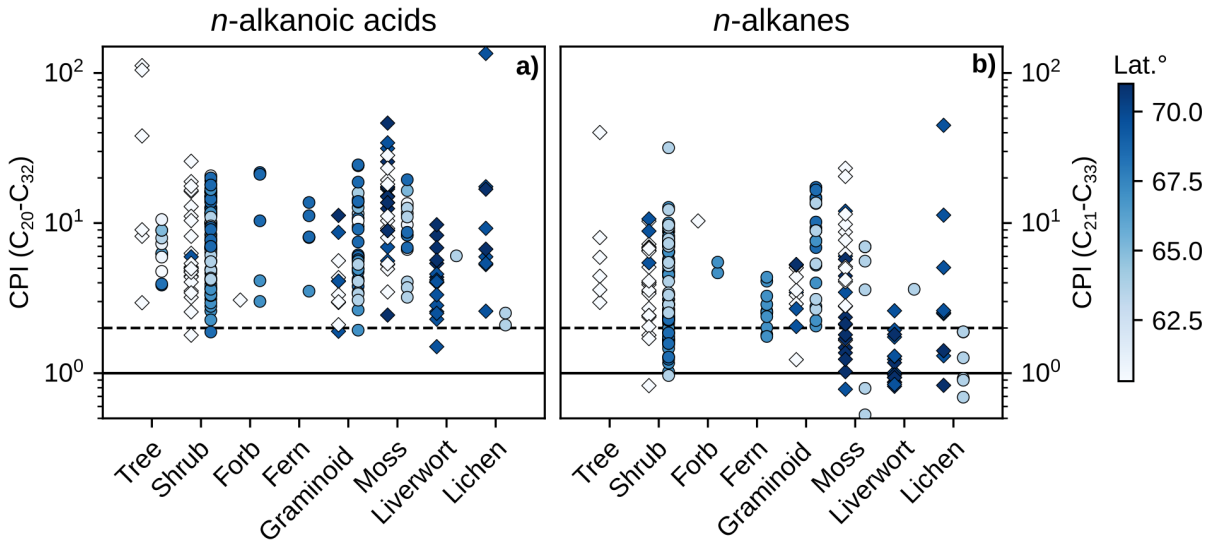

Figure S1. Scatterplots of plant wax Carbon Preference Index (CPI; Eq. 4, 5; Marzi et al., 1993) results from this study (diamonds) and the pan-Arctic literature compilation (circles) grouped by plant growth form. (a) *n*-alkanoic acid CPI for carbon chain-lengths C_{20} through C_{32}. (b) *n*-alkane CPI for carbon chain-lengths C_{21} through C_{33}. Data points are shaded by sampling site latitude. Solid and dashed horizontal lines mark CPI values of 1 and 2, respectively.

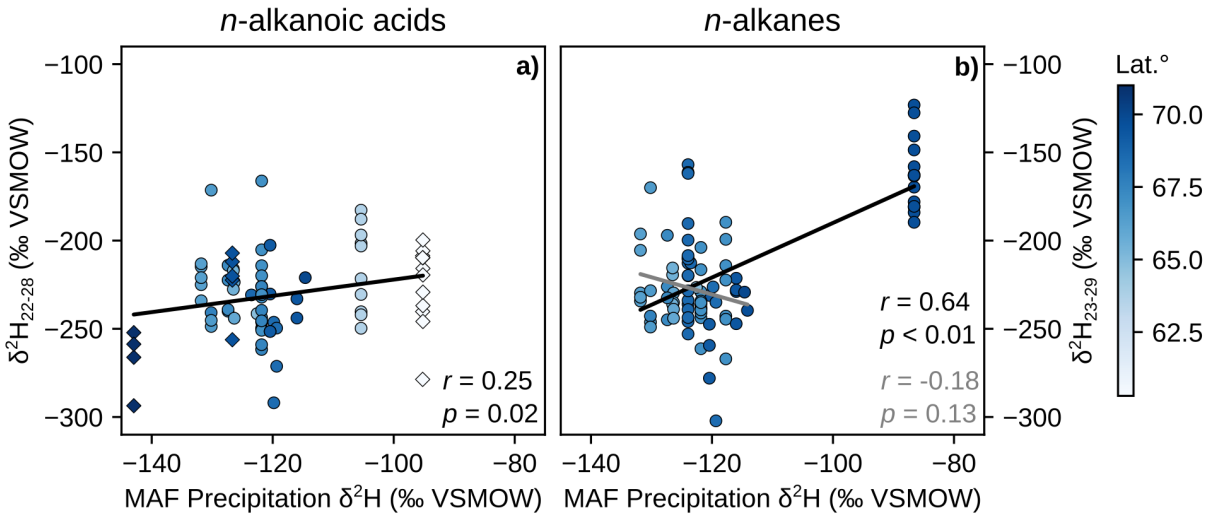

Figure S2. Scatterplots of plant wax δ^2H from this study (diamonds) and the pan-Arctic data compilation (circles) vs. sample site MAF amount-weighted precipitation δ^2H (Bowen et al., 2005; Bowen and Revenaugh, 2003). (a) *n*-alkanoic acid δ^2H (C_{22}-C_{28}). (b) *n*-alkane δ^2H (C_{23}-C_{29}). Pearson correlation *r* and *p* values are shown in the bottom-right corner of each panel. Black lines represent linear regressions fit for all data points. The grey line in panel b represents the linear regression fit without the data from Hollabåttjønnen Bog in northern Norway (Balascio et al., 2018). Data points are shaded by sampling site latitude. Pearson correlations and linear regressions in each panel were performed on the pan-Arctic dataset using all plant growth forms (see Table S2 for sample counts).

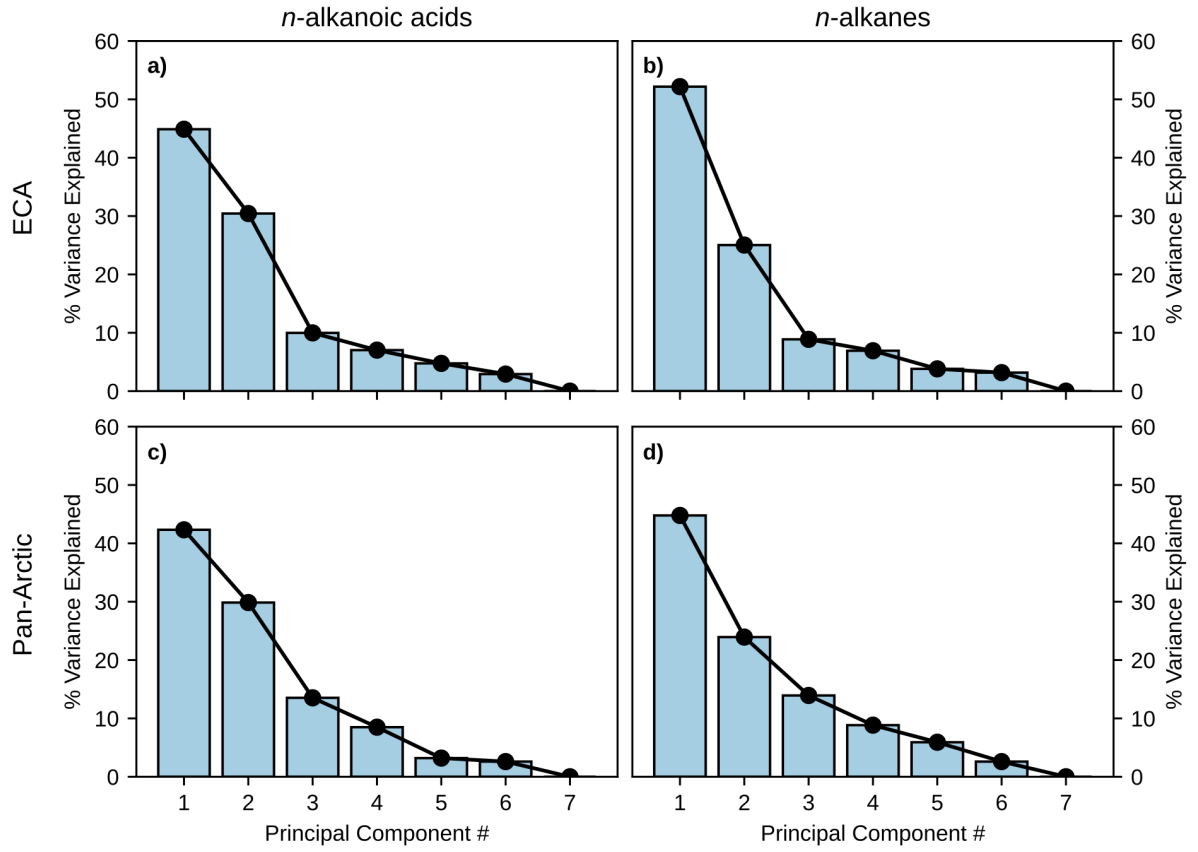

Figure S3. Scree plots of the percent variance explained by each principal component number. (a) ECA *n*-alkanoic acid PCA, (b) ECA *n*-alkane PCA, (c) pan-Arctic *n*-alkanoic acid PCA, (d) pan-Arctic *n*-alkane PCA. Panel lettering corresponds to that shown in Fig. 5.

Table S1. Pan-Arctic plant wax data sample sizes per data type and plant growth form.

	n-alkanoic acids				*n*-alkanes			
Growth Form	Conc.	ACL	δ^{13}C	δ^{2}H	Conc.	ACL	δ^{13}C	δ^{2}H
Tree	17	17	2	2	6	7	0	1
Shrub	102	130	35	73	129	165	16	115
Forb	6	13	2	9	6	13	2	12
Fern	5	5	1	0	15	15	1	11
Graminoid	46	47	11	20	39	41	5	19
Moss	49	50	8	9	49	51	0	4
Liverwort	18	18	5	4	18	18	0	0
Lichen	13	13	2	2	17	17	0	2

Table S2. Pan-Arctic plant wax data sample sizes per data type and plant growth form with plant samples of the same species from the same location and sample year averaged.

	n-alkanoic acids				*n*-alkanes			
Growth Form	Conc.	ACL	δ^{13}C	δ^{2}H	Conc.	ACL	δ^{13}C	δ^{2}H
Tree	14	14	2	2	4	5	0	1
Shrub	55	82	17	43	44	79	5	53
Forb	6	13	2	9	6	13	2	12
Fern	5	5	1	0	6	6	1	3
Graminoid	36	37	11	14	27	29	5	13
Moss	42	43	6	7	37	39	0	4
Liverwort	10	10	3	3	10	10	0	0
Lichen	8	8	2	2	12	12	0	2

Table S3. *P*-value results of Shapiro-Wilk tests performed on each plant growth form for each plant wax data type by compound class. *P*-values ≥ 0.05 indicate that measurements within a plant growth form are normally distributed. Missing values (-) are due to a plant growth form not having enough measurements ($n < 3$) of an individual plant wax data type.

	n-alkanoic acids				*n*-alkanes			
Growth Form	log Conc.	ACL	δ^{13}C	ϵ_{app}	log Conc.	ACL	δ^{13}C	ϵ_{app}
Tree	0.260	0.376	-	-	0.957	0.664	-	-
Shrub	<0.001	<0.001	0.972	0.049	0.389	0.023	0.926	<0.001
Forb	0.475	0.593	-	0.527	0.833	0.234	-	0.404
Fern	0.538	0.342	-	-	0.043	0.011	-	0.778
Graminoid	0.118	0.859	0.421	0.059	0.376	0.004	0.946	0.279
Moss	0.976	0.628	0.593	0.596	0.748	0.540	-	0.946
Liverwort	0.857	0.875	0.247	0.705	0.752	0.114	-	-
Lichen	0.745	0.309	-	-	0.074	0.018	-	-

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