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

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# 1 Introduction

This supplement contains Figures S1-S3 and Table S1.
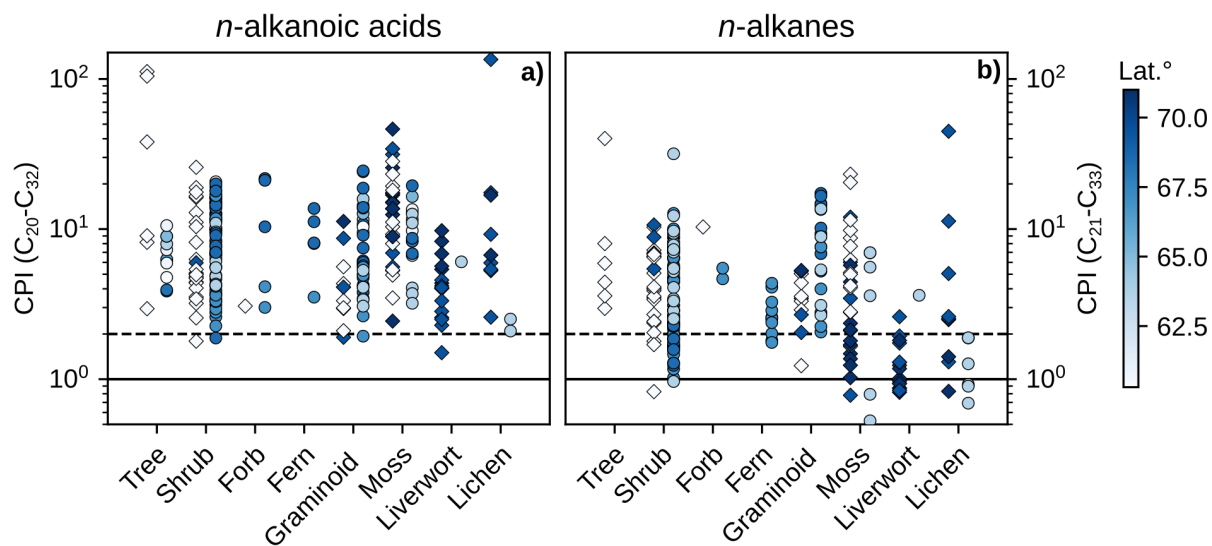
**Figure S1.** Scatterplots of plant wax Carbon Preference Index (CPI) results from this study (diamonds) and the pan-Arctic literature compilation (circles) grouped by plant growth form. (a) $n$-alkanoic acid CPI for carbon chain-lengths $C_{20}$ through $C_{32}$. (b) $n$-alkane CPI for carbon chain-lengths $C_{21}$ through $C_{33}$. Data points are shaded by sampling site latitude. Solid and dashed horizontal lines mark CPI values of 1 and 2, respectively.
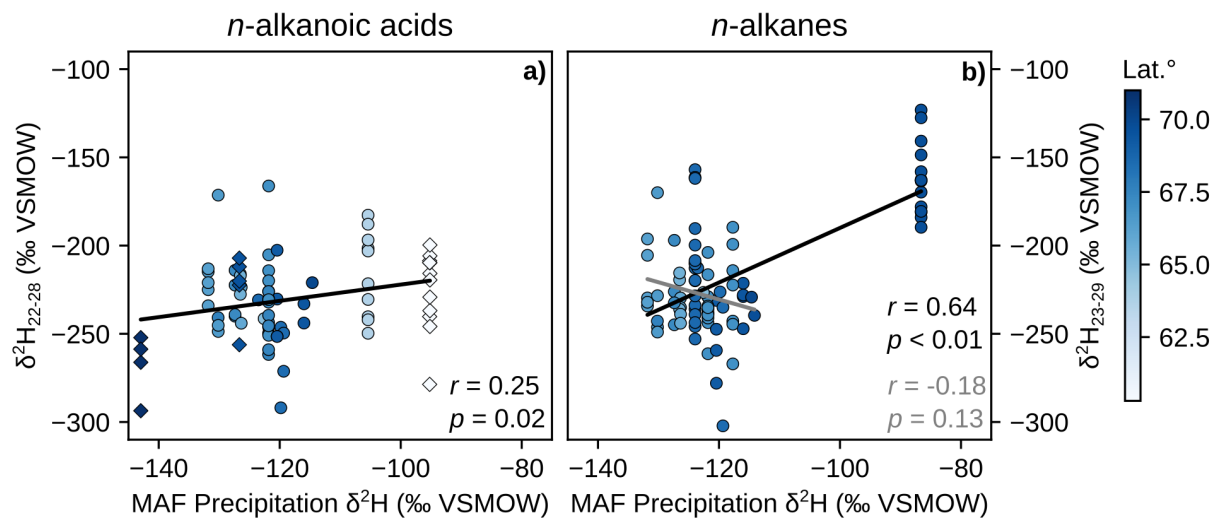
**Figure S2.** Scatterplots of plant wax $\delta^2$H from this study (diamonds) and the pan-Arctic data compilation (circles) vs. sample site MAF amount-weighted precipitation $\delta^2$H. (a) *n*-alkanoic acid $\delta^2$H ($C_{22}$-$C_{28}$). (b) *n*-alkane $\delta^2$H ($C_{23}$-$C_{29}$). Pearson correlation *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.
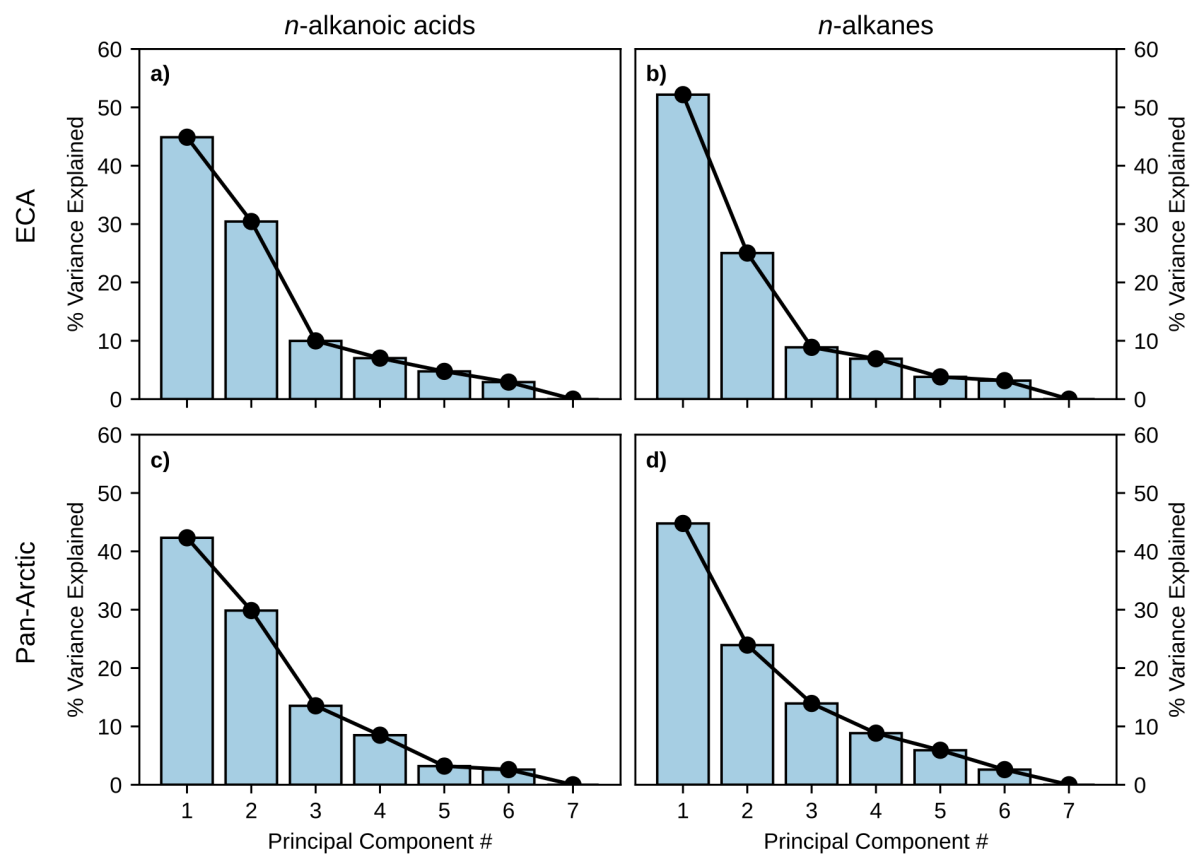
**Figure S3.** Scree plots of the percent variance explained by each principal component number. (a) ECA *n*-alkanoic acid PCA, (b) ECA *n*-alkane PCA, (c) pan-Arctic *n*-alkanoic acid PCA, (d) pan-Arctic *n*-alkane PCA. Panel lettering corresponds to that shown in Fig. 5.

**Table S1.** *P*-values of Shapiro-Wilk tests performed on each plant growth form for each plant wax data type by compound class. *P*-values $\geq$ 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 a plant wax data type.

| Growth Form | *n*-alkanoic acids | | | | *n*-alkanes | | | |
|---|---|---|---|---|---|---|---|---|
| | log Conc. | ACL | $\delta^{13}$C | $\epsilon_{app}$ | log Conc. | ACL | $\delta^{13}$C | $\epsilon_{app}$ |
| 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 | - | - | |

# References

Balascio, N. L., D'Andrea, W. J., Anderson, R. S., and Wickler, S.: Influence of vegetation type on n-alkane composition and hydrogen isotope values from a high latitude ombrotrophic bog, Organic Geochemistry, 121, 48–57, https://doi.org/10.1016/j.orggeochem.2018.03.008, 2018.