

Supplementary Material

Heritability of the structures and ^{13}C fractionation in tomato leaf wax alkanes: a genetic model system to inform paleoenvironmental reconstructions

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1 Supplementary Data

Supplemental Code. R code files are available at: <http://github.com/aldbender/13C-heritability>.

Supplemental Dataset 1. Alkane $n\text{-C}_{29}$ and $n\text{-C}_{31}$ $\delta^{13}\text{C}$ values in Figure 1 compiled from literature sources among C_3 and C_4 plant groups from around the world (Bi et al., 2005; Chikaraishi et al., 2004; Chikaraishi and Naraoka, 2003, 2006; Collister et al., 1994; Diefendorf et al., 2011; Krull et al., 2006; Lockheart et al., 1997; Pedentchouk et al., 2008; Rieley et al., 1991; Rommerskirchen et al., 2006; Vogts et al., 2009).

Supplemental Dataset 2. Seed stock list with each IL accession name converted to the in-house lineage number, with DC numbers 1-76 corresponding to the ILs and DC 77 corresponding to cv M82.

Supplemental Dataset 3. Daily-averaged measurements of ambient CO_2 in the greenhouse during growth of the ILs, including $p\text{CO}_2$ and $\delta^{13}\text{C}_{\text{CO}_2}$; data summarized in Supplemental Figure 2.

Supplemental Dataset 4. Leaf wax trait values measured from all ILs, used to perform linear modeling.

Supplemental Dataset 5. Summary values of leaf wax traits and transformations used to model each trait.

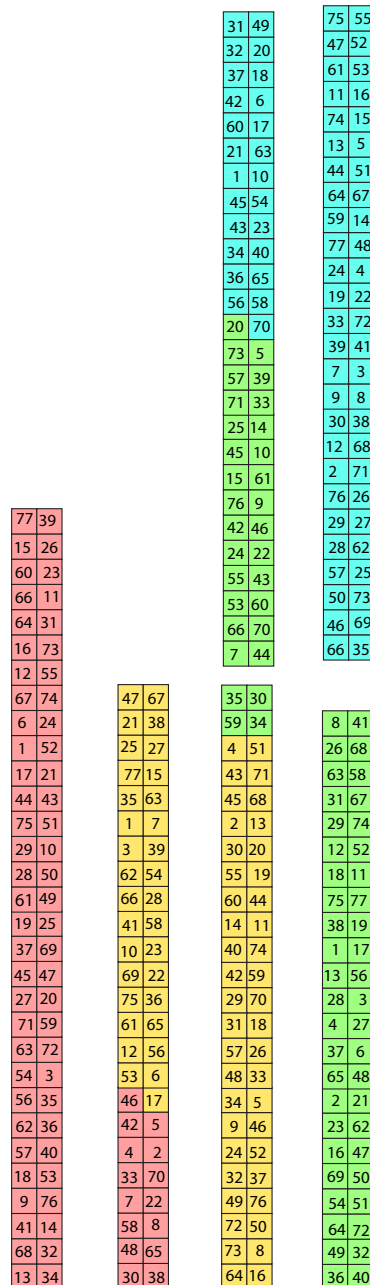
Supplemental Dataset 6. Genetic (IL) and environmental (Plot, Residual) variances used to calculate H^2 values for each trait.

Supplemental Dataset 7. Pair-wise Pearson correlation coefficient (ρ) values and significance values, including p -values and BH-adjusted p -values, of leaf wax traits correlated with each other.

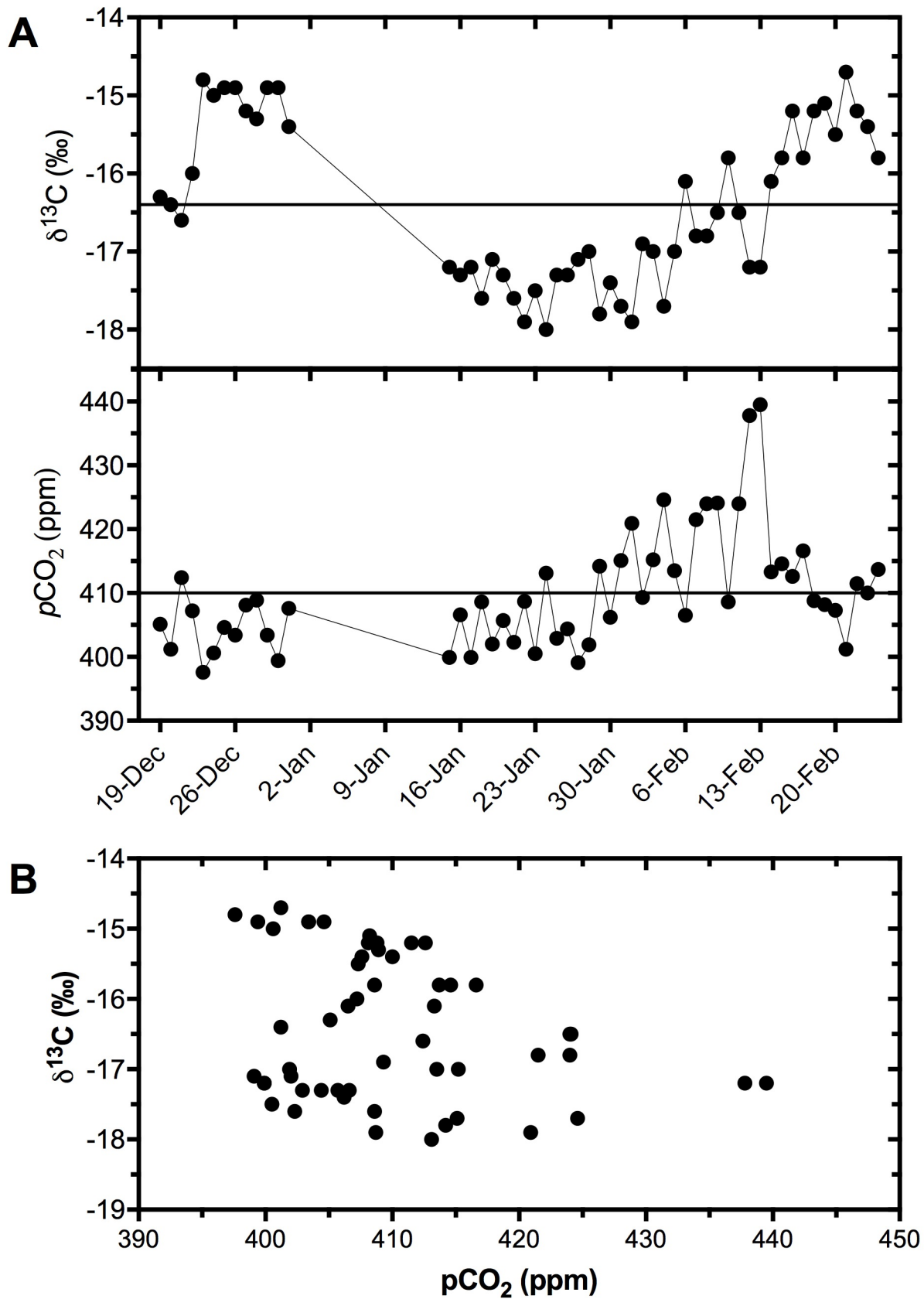
Supplemental Dataset 8. Pair-wise Pearson correlation coefficient (ρ) values and significance values, including p -values and BH-adjusted p -values, of leaf wax traits from this study and traits from previous studies correlated with each other.

2 Supplementary Figures and Tables

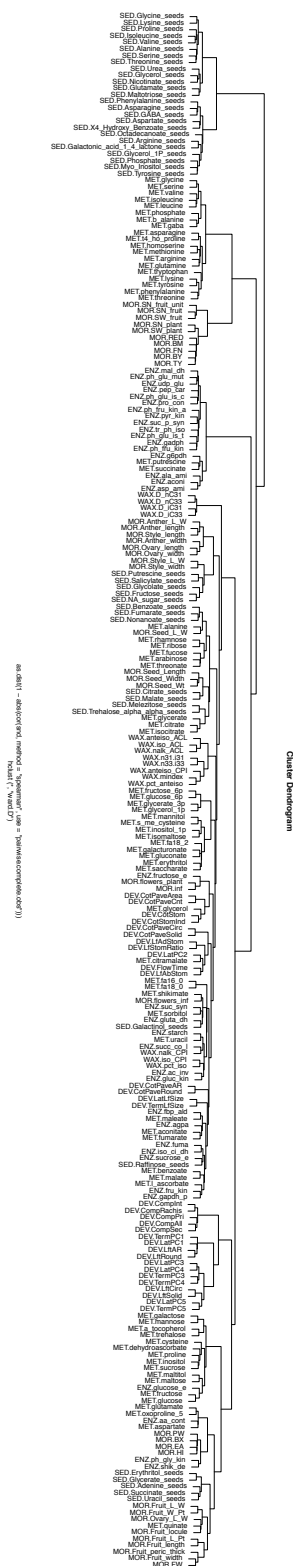
2.1 Supplementary Figures



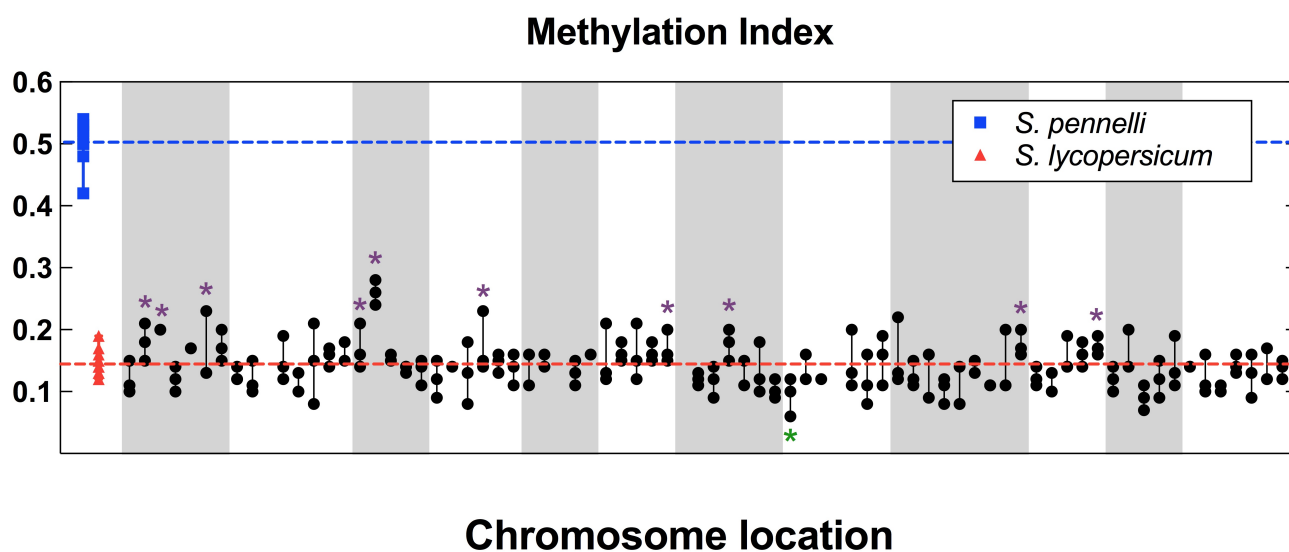
Supplemental Figure 1. Randomized block design of IL plants and cv M82 grown in the greenhouse. Each color corresponds to a different “block” of IL plants. Values in the square correspond to each plant lineage, with “77” equating “DC77,” which is the cv M82 plant. DC numbers 1-76 correspond to the ILs, as coded in Supplemental Dataset 2.



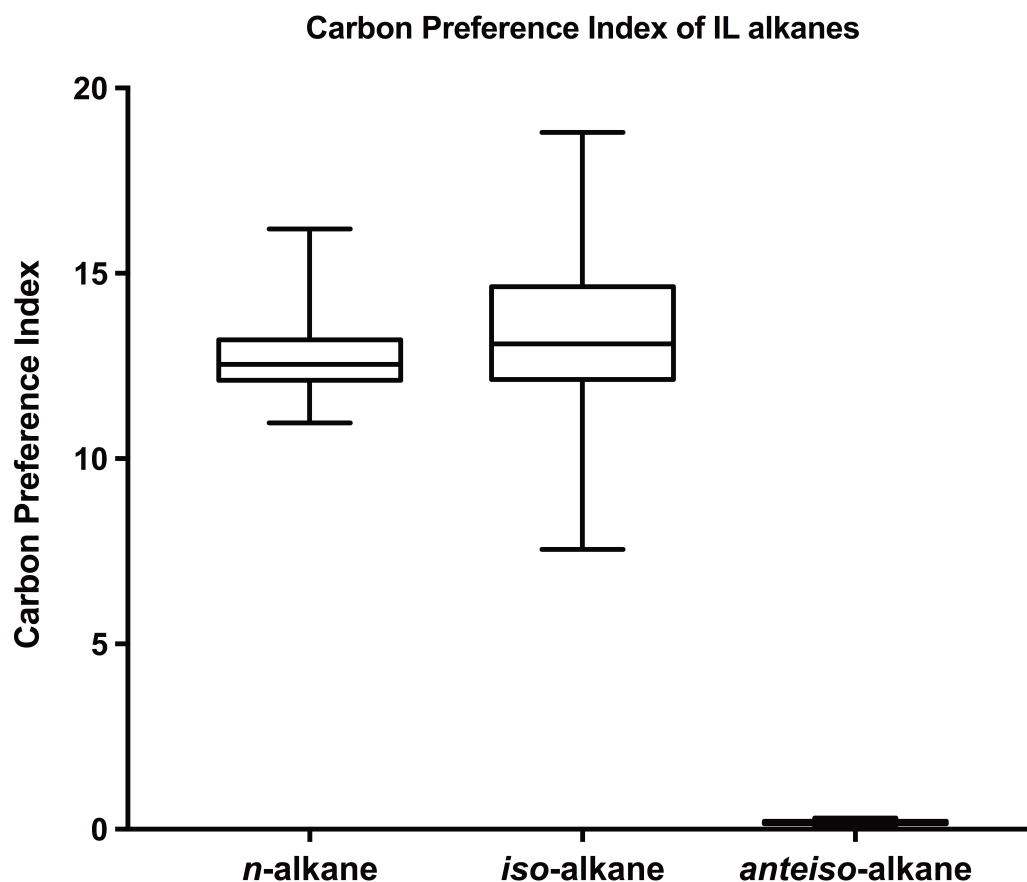
Supplemental Figure 2. Environmental CO₂ monitored during growth of the ILs. **(A)** Daily-averaged $\delta^{13}\text{C}$ and $p\text{CO}_2$ values of ambient CO₂ plotted against time of the experiment; **(B)** $p\text{CO}_2$ of ambient CO₂ against corresponding $\delta^{13}\text{C}_{\text{CO}_2}$ values during the experiment. Note that instrument error halted data collection from January 1-14; data available in Supplemental Dataset 3.



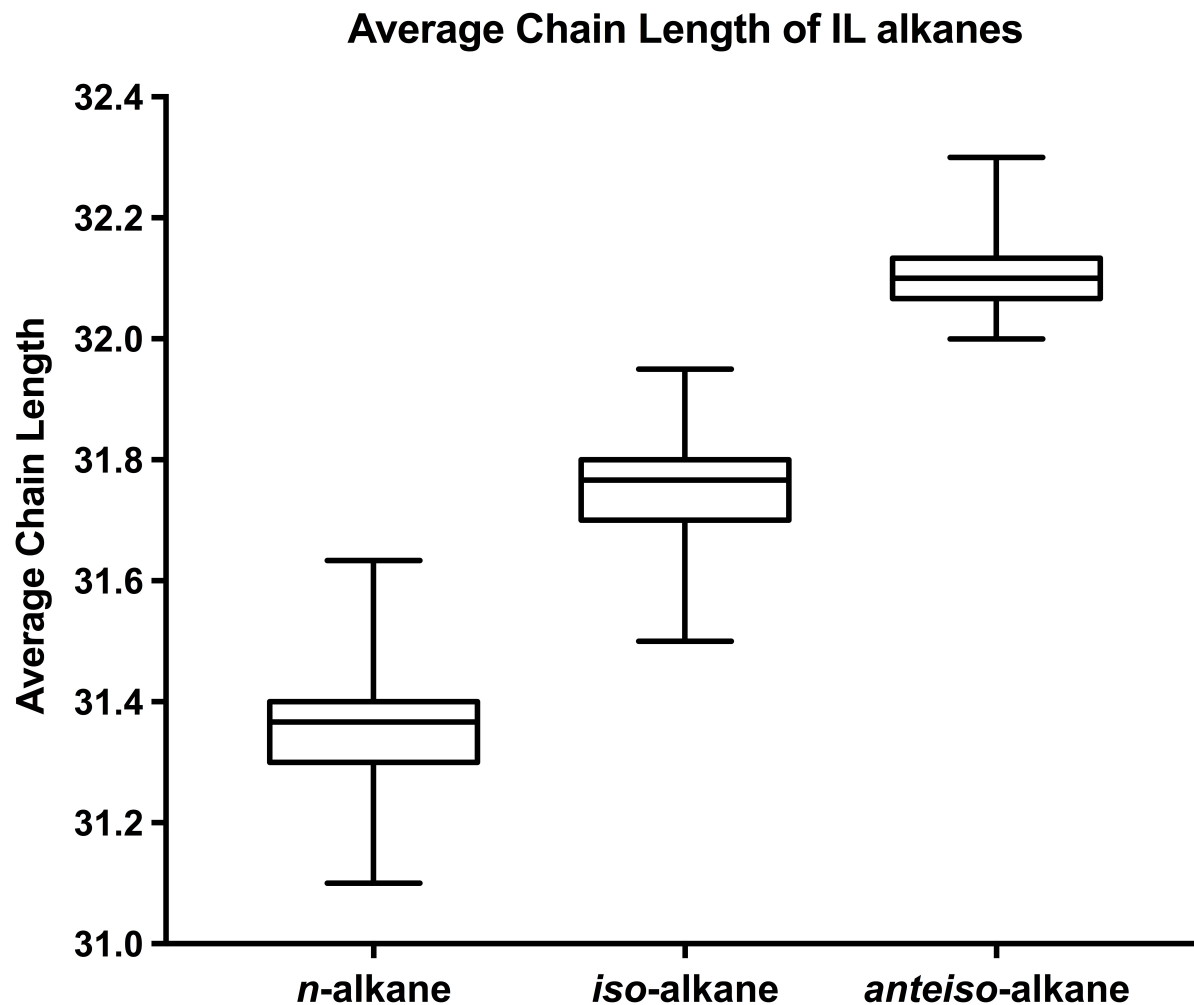
Supplemental Figure 3. Close-up of hierarchical clustering for meta-analysis of traits analyzed from this and previous studies. Note that the clustering in this figure is flipped vertically when compared to Figure 6.



Supplemental Figure 4. Methylation indices for IL plants compared against methylation indices of *S. pennellii* (blue) and cv M82 (red). Methylation indices are plotted based on chromosome location of IL introgression. Purple asterisks indicate methylation indices for ILs that are significant towards *S. pennellii* ($p < 0.05$); green asterisks indicate methylation indices that are transgressive beyond cv M82 ($p < 0.05$).



Supplemental Figure 5. Box plot of carbon preference index values measured from ILs for *n*-, *iso*-, and *anteiso*-alkanes.



Supplemental Figure 6. Box plot of average chain length values measured from ILs for *n*-, *iso*-, and *anteiso*-alkanes.

2.2 Supplementary Tables

Supplemental Table 1. QTL detected with p -value < 0.05 for leaf wax traits in ILs. QTL that are transgressive beyond cv M82 and *S. pennellii* are designated with “M82” or “Sp,” respectively.

3 Supplementary References

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