**DIRECTORY CONTENTS**

**1. DATA FILES**

**Finalized.Database.forests.csv:** summary data of the 64 fossil sites and 9 leafpack sites examined in this manuscript. Additional information about the fossil sites can be found in Currano et al. 2021. Age is given in Ma, temperature in degrees Celsius, and precipitation in millimeters/yr. DepEnv stands for depositional environment. Herbivory metric abbreviations are as follows: “dt” is “damage type”, “ffg” is functional feeding group”, “num” is “number of”, and “perc” is “percent of” and indicates the percent of leaves in an assemblage with a given type of herbivory damage; “dam” is any herbivory damage, “spec” is specialized damage, “HF” is hole feeding, “mf” is margin feeding, “skel” is skeletonization, “sf” is surface feeding, “pierce” is piercing & sucking; “raw.dt” and “raw.ffg” indicate the total number of damage types and functional feeding groups, respectively observed in a flora; “div.dt”, “div.spec”, “div.mine”, and “div.gall” indicate the number of damage types, specialized damage types, mine types, or gall types observed at 300 leaves, standardized using the methodology of Gunkel and Wappler (2015). Plant ecology metrics are as follows: “Shannon” is the Shannon diversity metric, “Pj” is Pielou’s J, and “div.plant” is the number of plant species observed at 300 leaves, standardized using rarefaction.

**Finalized.Database.forests\_litter.added.csv:** Extension of Finalized.Database.forests.csv that also includes published leaf litter studies (Smith and Nufio 2004, Adams et al. 2011).

**HFffgdef.csv, LSffgdef.csv, SERCffgdef.csv:** Lists of what functional feeding group each damage type at each site belongs to. The first column is the damage type number (or alphanumeric if the damage type could not be assigned to an existing damage type). The second column is the functional feeding group, with 0= not herbivory damage, 1= skeletonization, 2= surface feeding, 3= galls, 4=hole feeding, 5= mines, 6= margin feeding, and 7= piercing & sucking.

**HFmask.csv, LSmask.csv, SERCmask.csv:** Categorization of each damage type at each site as damage (“All”), specialized damage (“Spec”), gall, and/or mine. T or F indicates True or False.

**map\_USA\_updated.csv** and **map\_data\_updated.csv:** GPS coordinates for all sites used in this study.

**rawdata.csv:** Presence-absence matrix showing the occurrences of each damage type (columns) on each leaf (rows) collected at Harvard Forest (HF), SERC (Smithsonian Environmental Research Center), and LS (La Selva).

**Rawplantcount.csv:** The number of leaves of each plant species observed in each quarry. Species abbreviations are as follows: BE = American Beech, BI = Birch, RM = Red Maple, RO = Red Oak, LTA = Large Toothed Aspen, SU = Sugar Maple, BC = Black Cherry, BW = Black Walnut, WO = White oak, MH = Mockernut Hickory, LB = Spicebush, SG = Sweetgum, SRO = Southern Red Oak, AH = American Hornbeam, CO = Chestnut Oak, SCO = Swamp Chestnut Oak, TP = Tulip Poplar, AE = American Elm, GA = Green Ash, PO = American Sycamore, RA = Rhododendron, BO = Black Oak, PIO = Pin Oak, IO = American Holly, QS = Post Oak, WIO = Willow Oak, HFX = Harvard Forest Morphospecies, MDX = SERC Morphospecies, LSX = La Selva Morphospecies.

**2. R CODE**

***\*Code needed to replicated values in summary tables\****

**raref\_leafs\_extra.R:** Code modified from Gunkel and Wappler 2015 that calculates standard damage metrics for each site, including analytical rarefaction for total, specialized, mine, and gall damage richness.

**PlantDivMetrics.R:** Code to calculate plant diversity metrics (Shannon index, Pielou’s J, and rarefied richness at 300 leaves) for each leafpack site.

**Col.Pals.R:** Color palettes used in figures

***\*Summary files that can be recreated above are used in the below R scripts\****

**boxplot\_dam~epoch.R:** Code to examine changes in herbivory metrics through time (Fig. 3, S2, S3).

**lm.MATvsherb\_manuscript.R:** Code to examine and plot relationship between mean annual temperature and herbivory metrics (Fig. 4).

**raincloud\_manuscript.R:** Code to construct the rain cloud plots of Fig. 2.

**3. SUPPLEMENTARY FILES:**

Supplementary methods, figures, tables, and datasets referenced in the manuscript and included as the Appendix to the manuscript.

**4. REFERENCES:**

J. M. Adams, S. Ahn, N. Ainuddin, M. L. Lee, A further test of a Palaeoecological thermometer: Tropical rainforests have more herbivore damage diversity than temperate forests. Rev. Palaeobot. Palynol. 164,60–66 (2011).

E. D. Currano, L. Azevedo-Schmidt, S. Maccracken, A. Swain, Scars on fossil leaves: An exploration of ecological patterns in plant-insect herbivore associations during the Age of Angiosperms. Palaeogeogr. Palaeoclimatol. Palaeoecol. 582, 1–16 (2021).

S. Gunkel, T. Wappler, Plant-insect interactions in the upper Oligocene of Enspel (Westerwald, Germany),including an extended mathematical framework for rarefaction. Palaeobiodivers. Palaeoenviron. 95, 55–75 (2015).

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