

Paleoclimatic and paleoecological implications of a Paleocene–Eocene fossil leaf
assemblage, Chickaloon Formation, Alaska

David Sunderlin,^{1*} Garrison Loope,² Nancy E. Parker,^{1,3} and Christopher J. Williams⁴

¹Lafayette College, Department of Geology and Environmental Geosciences, Easton, Pennsylvania 18042, USA; ²Oberlin College, Department of Geology, Oberlin, Ohio 44074, USA; ³University of Wisconsin, Department of Geography, Madison, Wisconsin 53706, USA; ⁴Franklin & Marshall College, Department of Earth & Environment, Lancaster, Pennsylvania 17604, USA
e-mail: sunderld@lafayette.edu
*Corresponding author.

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ABSTRACT

New collections of a leaf compression-impression paleoflora preserved in fluvio-lacustrine sediments of the upper Chickaloon Formation, south-central Alaska, United States, provide leaf physiognomic climate estimates for the early Eocene in southern Alaska and rare data on plant-insect interactions from a subarctic setting. Thirty-nine broadleaf angiosperm morphotypes occur in a parautochthonous assemblage along with *Metasequoia* shoots and trunks, compressions of a diverse suite of seeds, monocotyledonous aquatic plants, freshwater gastropods, and inclusion-bearing dispersed amber. Leaf-character derived mean annual temperature estimates (11–14.6 °C) are significantly warmer than Alaska at present and indicate warm temperate conditions at the time of deposition. Leaf-derived mean annual precipitation estimates of ~110–160 cm/annum are comparable to those from similar-age paleofloras in Arctic Canada and indicate wetter conditions than nearly coeval paleofloras further south in the North American mid-latitudes. Leaf herbivory is rare in the Chickaloon assemblage (~9% of leaf fragments) as compared to other, lower latitude Eocene assemblages, but exhibits four of the main leaf-damage guilds (hole feeding, margin feeding, surface feeding, and skeletonization). These data provide a rare glimpse at a high-latitude terrestrial forested ecosystem during a global hothouse climate phase and thus have implications in understanding how biogeographic patterning and ecological systems respond to non-analog, warm high-latitude environmental conditions.