

Qaidam Basin *n*-alkanes reflect climatic and ecologic changes on the northeastern Tibetan Plateau during the Early Eocene Climatic Optimum

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The Early Eocene Climatic Optimum (EECO, ~53-50 Ma) was a hyperthermal event that appears to mimic predicted future global warming, thus providing analogs for future potential climate change trends and ecologic responses. However, there are very few terrestrial records of the EECO. Based on new analysis on *n*-alkanes and re-evaluations of clay mineral assemblages and rock magnetic indices, in this study, the paleoecologic and paleoclimatic evolution of the Qaidam Basin (QB) on the Northeastern Tibetan Plateau (NE TP) for the 53.1-45.1 Ma period was reconstructed. Then, the results indicated that the paleoecology and paleoclimate of this area responded to changes in global temperatures. To be specific, (1) the carbon preference index (CPI) was low and microbial activity was strong; (2) low pristane / phytane (Pr/Ph) values indicate that the sedimentary environment was relatively hypoxic; (3) the average chain length (ACL), $nC_{33} / (nC_{29} + nC_{33})$ and $nC_{33} / (nC_{27} + nC_{33})$ values were low, while nC_{23}/nC_{31} and the relative proportion of mid-chain to long-chain *n*-alkane homologues (Paq') were high, implying that plant assemblages changed, with woods, shrubs and *Sphagnum* mosses being proportionately high in content, aquatic (principally submerged and floating) plant input increasing, and emergent plants and terrestrial herbs decreasing relatively; and (4) smectite and kaolinite values were high, whereas illite, chlorite, and the relative content of hematite exhibited low abundances. Besides, palygorskite was almost absent. These observations would suggest that the environment in this area was warm and humid, caused principally by rising temperatures resulting from increases in CO₂ concentrations.