

Double Precessional Cycles and Traversodont Cynodont-Dominated Provinces in Equatorial Pangea

Details

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Session	Greenhouse/Icehouse Climates: Organic Proxies and Mechanisms Leading to Organic-Rich Marine Sediments II Posters
Identifier	PP41A-1180 Whiteside, J H*, Brown University, 324 Brook Street, Box 1846, Providence, RI 02912 United States Olsen, P E, LDEO of Columbia University, 61 Route 9W, Palisades, NY 10964 United States
Authors	Kent, D V, Rutgers University, 610 Taylor Road, Piscataway, NJ 08554 United States Eglinton, T I, Woods Hole Oceanographic Institution, MS#4, Woods Hole Road, Woods Hole, MA 02543 United States Organic and biogenic geochemistry [1055] Biogeochemical cycles, processes, and modeling [1615]
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Abstract

Terrestrial tetrapod faunules dominated by traversodont cynodonts are restricted to a narrow equatorial swath in Late Triassic age strata in eastern North America. Thought to be typical of a particular age, we show that this assemblage persists for over 20 m.y. in a humid zone at 3° S on either side of the equator where both lithological indicators and carbon isotopic records of bulk organic matter and specific biomarker hydrocarbons (n₂₅-n₃₂ n-alkanes inferred to be predominately derived from leaf wax lipids of plant cuticles) from lacustrine strata show strong "sub-Milankovitch" fluctuations. We use the $\delta^{13}\text{C}$ of bulk organic matter, wood, and specific biomarker hydrocarbons. In contrast, three contemporaneous, semi-arid regions from 5-8° N had procolophonid-dominated faunal assemblages associated with a much stronger expression of the ~20 ky cycle. In the absence of geographic barriers, precession cycle doubling is a driver in the increased humidity of the equatorial tropics and apparently in sorting terrestrial vertebrate taxa. Biogeographic provinciality, associated with distinctive climatic zones within the Greenhouse mode, is an aspect of the Late Triassic world different from the rest of the Early Mesozoic, especially the post-mass extinction Early Jurassic. This provinciality is associated with diverse taxa comparable in trophic and structural diversity to the Neogene.

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