

Paul Olsen

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**Evidence for Early Mesozoic Mass Extinctions
In Eastern North American Rift Deposits
(Late Triassic–Early Jurassic, Newark Supergroup)**

Paul E. OLSEN, Bruce CORNET

(Lamont-Doherty Geological Observatory of Columbia University, Palisades, New York 10964, USA)

Newark Supergroup rocks provide an unprecedented fine scale record of continental faunal and floral change spanning all of the Late Triassic and most of the Early Jurassic (Carnian-?Toarcian). Sedimentary cycles produced by rift lake level changes were apparently controlled by orbitally induced climate changes and potentially permit calibration of faunal and floral change at a less than 21,000 year level of resolution over a 40 million year span.

Taxonomic faunal and floral turnover is concentrated in two episodes: 1) an older episode dated by palynostratigraphy as Middle Carnian marking the transition from a still poorly known South American-like assemblage dominated by mammal-like reptiles and archosauromorph reptiles to a typical North American Late Triassic assemblage strongly dominated by "primitive" archosaurs, especially phytosaurs; and 2) a younger episode dated by palynostratigraphy as at the Triassic-Jurassic boundary marking the transition from the latter to a dinosaur and crocodile-dominated assemblage. The Carnian episode is characterized by the **replacement** of one assemblage of terrestrial vertebrates with another while the Triassic-Jurassic episode represents a large number of extinctions **without** replacement: the succeeding assemblage consists of survivors. In palynomorphs, the Carnian episode is characterized by the replacement of a diverse spore-rich assemblage by a diverse pollen-rich one. In contrast, the Triassic-Jurassic episode is marked by the dramatic and seemingly sudden elimination of a relatively high diversity Triassic pollen assemblage with the survivors constituting a Jurassic assemblage of very low diversity overwhelmingly dominated by *Corollina*. Within the Newark the palynoflora never recovers its previous levels of diversity.

No interval of concentrated taxonomic turnover is apparent in strata dated by palynostratigraphy as straddling the Carnian-Norian boundary in the Newark Supergroup, either in terrestrial vertebrates or palynomorphs. This is a significant difference from literature tabulations by others which have suggested an episode of high extinction in marine organisms at that boundary. Either the Newark Carnian episode is misdated or the marine and terrestrial transitions are not synchronous.

In contrast, the Triassic-Jurassic Newark faunal and floral transition does seem synchronous with massive marine extinctions. Preliminary data suggest the Newark pollen and spore transition took place in less than 40,000 years, while available bone and footprint data suggest the extinction of ecologically dominant Late Triassic terrestrial vertebrates over a maximum duration of less than 850,000 years.

Within the Newark Supergroup, available evidence does not suggest a catastrophic mass extinction event at the Carnian-Norian boundary, or anywhere early in the Triassic. Although we are still in the early stages of investigation, everything known about the Newark Triassic-Jurassic episode is consistent with a very large and abrupt mass extinction event, synchronous in both terrestrial and marine environments.