

# **Petrographic Evaluation of a Permian-Triassic Erosion Surface and Implications for Causes of the End-Permian Extinction**

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The purpose of this project is to evaluate the characteristics of an erosion surface that coincides with the end Permian mass extinction. Two different interpretations have been proposed for the origin of the surface: 1) it formed as the result of submarine dissolution on the seafloor from high ocean CO<sub>2</sub> connected with the extinction mechanism and Siberian Traps volcanism, or 2) formation as a karst surface (subaerial diagenesis) during sea level fall.

Sections were studied from the interior of an isolated carbonate platform in south China. The area is part of the south China plate that existed in the equatorial eastern Tethys. The end-Permian extinction horizon appears coincident with a sharp erosional contact between the underlying Upper Permian skeletal packstone and an overlying calcimicrobialite layer. Conodont biostratigraphy demonstrates a short hiatus in sedimentation at the truncation surface in comparison with the Meishan GSSP, and places the Permian-Triassic biostratigraphic boundary slightly above the extinction horizon in both sections.

Petrographic evaluation of polished slabs and thin sections are being made to evaluate the genesis of the surface. The Upper Permian facies is a skeletal packstone-grainstone with normal marine fossils that were deposited in shallow, open marine, subtidal environment. It also contains isopachous cements and lenses of carbonate mud. Although there are some leached fossil grains there were no meniscus or pendent cements observed in polished slabs. Calcimicrobialframestone was deposited above the erosion surface, and fills beneath overhangs in the irregular topography of the surface. The calcimicrobialite is composed of dendritic to globular cyanobacteria, also contains thin shelled gastropods and bivalves, carbonate mud, and fans of marine aragonite cement. Where the erosion surface diverges from a locally superimposed stylolite, it is a very sharp contact that cuts the underlying Permian grains and cements. It is an irregular surface with up to 10 cm of relief and has cut cavities doverhangs.

Thus far there is no evidence for a change in wave energy, water depth, nor subaerial exposure; our results favor genesis as a submarine dissolution surface resulting from ocean acidification during the end-Permian extinction.