

End-Permian Mass Extinction: Geochemical Evidence for Volcanic Catastrophism in South China

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Abstract

This study investigates mass extinction mechanisms from South China Block during the End-Permian (252 Ma). Using geochemical analysis and statistical modeling, we analyze fossil specimens to understand evolutionary patterns and ecological relationships. Our findings provide new insights into the diversity and adaptation of ancient life forms, contributing to our understanding of paleobiological processes during this critical period in Earth's history.

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1. Introduction

The end-Permian mass extinction (252 Ma) represents the most severe biotic crisis in Earth's history, eliminating over 90% of marine species. Recent evidence points to massive volcanism from the Siberian Traps as the primary driver, but the specific kill mechanisms remain debated. Geochemical records from South China provide crucial insights into the environmental changes during this crisis interval.

2. Geochemical Analysis

High-resolution geochemical analysis was conducted on 127 samples spanning the Permian-Triassic boundary. Mercury concentrations, carbon isotopes, and trace element ratios were measured to identify volcanic inputs and environmental perturbations. Statistical modeling assessed the temporal relationship between volcanism and extinction patterns.