# Characterizing the end-Permian mass extinction in the neo-Tethys through organic geochemistry

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The end of the Palaeozoic marks the largest environmental disaster in the Phanerozoic, the Permian-Triassic Mass Extinction (PTME; ~252 million years ago). The PTME is distinguishable by the extinction of approximately 90% of marine biota over a very short period of time (< 0.5 Ma). Biomarkers, atomic and molecular fossils, can persist through diagenesis and are especially useful in reconstructing paleoenvironmental conditions and dynamics such as organic matter source, ocean oxygen levels, and thermal maturity of the rocks. Using biomarkers to understand the most devastating event at the Palaeozoic-Mesozoic boundary provides important inferences on understanding the marine ecosystem and paleoenvironment. Studies of biomarker geochemistry at the PTME do not provide a complete global paleoenvironmental model. The organic geochemistry of the Neo-Tethys will provide necessary knowledge to better understand the extinction horizon and recovery throughout the ocean basin. We provide a low resolution preliminary biomarker investigation of the southern Neo-Tethys.

The section includes the Permian black shale from the Gungri formation, the superimposed ferruginous layer, and the Triassic interbedded shale limestone from the Mikin formation (Spiti Valley, Himachal Pradesh, India). Various biomarkers were identified and quantified by Gas Chromatography-Mass Spectrometry (GC-MS) and we further refined the biomarker stratigraphy through compound specific isotope ratio mass spectrometry (GC-IRMS) where we identified $\delta^{13}C$ of individual biomarkers. Evaluating the biomarkers of the Neo-Tethys provides information on the extent of the extinction horizon and recovery of the shelf primary producing and microbial ecosystems, paleoenvironmental conditions, and chemostratigraphic correlations. Specifically, this research better determines the (1) thermal maturity and biomarker presence to develop further studies and (2) assess general basinwide conditions to decouple local (Neo-Tethys) and regional (Paleo-Tethys) environmental change occurring at the time of the extinction. Results of the biomarker analysis are compared to previously published biomarker results from other sections of similar stratigraphic and time period surrounding the PTME.