Title:	Biotic and Environmental Fluctuations during Permian- Triassic transition: A Biomarker and Stable Isotope Approach
Authors:	Vasudev (/jspui/browse?type=author&value=Vasudev)
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Abstract:	The Permian-Triassic transition qualifies as the severest mass extinction boundary the planet has so far witnessed. In the present study, we report geochemical analyses, viz. biomarker and stable isotope record of continental Permo-Triassic sediments from a core (=257 m) retrieved from a borehole located at Madhukunda, Raniganj sub-basin in West Bengal in an attempt to understand any biotic and palaeoenvironmental fluctuations accompanying the Permo-Triassic extinction event. The present study also documents field observations from the Gondwana Permo-Triassic sediments. Typical Permian Gondwana flora viz. Glossopteris, Vertebraria and Equisetales were found in the Permian Raniganj Formation; however, these were not observed in the Triassic rocks. The biomarker analysis was performed by extracting the soluble organic matter from the sediments in a speed extractor and fractionating the bitumen into saturated hydrocarbon fraction using silica gel chromatography. The saturated hydrocarbon fraction was analyzed using gas chromatography mass spectrometry (GC-MS). Pronounced shifts in the biomarker and stable isotopic composition were noteworthy. Normal alkanes which are derivatives of epicuticular waxes were recorded in the presently studied samples ranging in chain length from n-C 16 to n- C 31 . The normal alkane distribution was characterized by a predominance of n-C 23 and n-C 25 chain lengths in the Permian sediments which switched to a prevalence of n-C 27 and n-C 29 chain lengths in the Triassic sediments. A changeover is also reflected in the pristine-phytane (Pr/Ph) distribution which are acyclic isoprenoids derived from the phytyl side chain of chlorophyll wherein the Pr/Ph values decrease towards the Triassic sediments. These reflect a shift in the environmental conditions from an oxic, swampy, coal-forming environment during the Permian to drier conditions in the Triassic. Signatures of microbial reworking of the organic matter include the series of hopanes ranging from C 27 to C 32 . Trisnorneohopane (Ts) and trisnorhopane (Tm) are the dominant C 27 hopanes detected. A marked decrease in the Ts and Tm concentrations has been noted for the Triassic sediments. Both □□ and □□ stereoisomers of C 30 hopanes were detected. 4□(H)-19-Norisopimarane, a tricyclic diterpane, was detected in low abundance in the Triassic samples whereas both tricyclic and tetracyclic diterpanes like ent- kaurane and phyllocladane were recorded from the Permian sediments reflecting the prevalence of broader diversity of gymnosperm flora during the Permian period.
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