Title:	Biotic response to environmental shift during the Permian-Triassic transition: Assessment from organic geochemical proxies and palynomorphs in terrestrial sediments from Raniganj Sub-basin, India
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Abstract:	The Permian-Triassic (P/T) mass extinction qualifies as the severest biotic perturbation in the history of our planet. Biomarkers, stable isotopes and palynomorphs are excellent proxies offering glimpses into palaeobiota and past ecosystems. These were investigated from coal-bearing upper Permian (Raniganj Formation) and Lower Triassic (Panchet Formation) Gondwana sediments recovered from the Raniganj Sub-basin, eastern India. The geochemical and palaeobotanical data suggest a shift in the terrestrial vegetation during the Early Triassic. A distinct change occurs from high abundance of n-C23 and n-C25 alkanes and higher CPI values in the upper Permian sediments to predominantly n-C27 and n-C29 alkanes along with relatively lower CPI values in the Lower Triassic. A sharp decline of the diterpenoid compounds and Glossopteridales pollens with a concomitant rise in lycopsid spores in the Lower Triassic sediments reflects the waning of a gymnosperm-dominated mire and onset of a stressed environment. Unlike the Glossopteridales, the Coniferales appear to be a resilient floral group with several new genera adapting to the growing arid conditions in the Early Triassic. The microbial community also responded to the contemporaneous ecosystem shift, with higher concentration of C27 sterane relative to C29 sterane in Lower Triassic sediments indicating proliferation of algal phytoplankton. The decreasing moretane/hopane (M/H) suggests that the soil bacteria were adversely affected plausibly due to enhanced soil erosion at the early part of the Triassic. A marked shift in the bulk isotopic composition (δ13Corg) from higher values in the upper Permian sediments (-21.0 to -24.1‰) to lower values in the Lower Triassic sediments (-21.2 to -32.5‰) is diagnostic of a vegetation changeover as a result of environmental deterioration. This is the first integrated study using molecular organic geochemical proxies and palynology from terrestrial Gondwana sediments in the Indian subcontinent, designed to investigate the pattern of floral and microbial restructuring as a result of an environmental shift during the Permian-Triassic transition.
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