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CARBONATE MICROFACIES AND $\delta^{13}C_{carb}$ AND $\delta^{15}N$ SYSTEMATICS ACROSS THE PERMIAN-TRIASSIC BOUNDARY NEAR JULFA (NW IRAN)

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Investigation of the sedimentary and geochemical characteristics of the Permian-Triassic (P-Tr) boundary beds is one approach to the study of the most dramatic extinction event in Earth's history. In a new multidisciplinary project, carbon isotope analysis of bulk carbonate rocks ($\delta^{13}C_{carb}$), carbon and nitrogen isotopes of marine organic matter ($\delta^{13}C_{org}$ and $\delta^{15}N$), and detailed carbonate petrography have been conducted for two fossil-rich, pelagic P-Tr boundary sections in NW Iran (Kuh-e-Ali Bashi and Aras Valley). The *Paratirolites* Limestone of the latest Permian is a strongly bioturbated, nodular, red, bioclastic lime mudstone and wackestone that were deposited under well-oxygenated, moderately deep to deep water. A strong facies change to red claystone with few limestone nodules (total thickness 60-190 cm) occurs at the base of the Boundary Clay. This is overlain by gray, platy limestones of the earliest Triassic Elikah Fm. Lagoonal argillaceous lime mudstones and oncoid floatstones, shallow marine subtidal gastropod wackestones and packestones reveal a strong change in sediment character at the P-Tr boundary, concomitant with scarce fossil content. A characteristic feature of the latest Permian and earliest Triassic sediments is the mass occurrence of more or less articulated sponges, marking a 'sponge spike' not at, but around the P-Tr boundary. Carbon isotope data highlight the environmental change across the P-Tr boundary and show the well-known negative tendency from the Late Permian into the Early Triassic. This negative excursion starts in the Changxingian *Paratirolites* Limestone at the stratigraphic level of the *C. changxingensis*-*C. deflecta* Zone. Most negative values were measured for the *C. meishanensis*-*C. praeparvus* Zone in the Elikah Formation, immediately below the conodont-defined P-Tr boundary. Low $\delta^{15}N$ values are observed for the topmost *Paratirolites* Limestone and at the base of the Boundary Clay; these are probably caused by diazotrophic N_2-fixation in nitrate-depleted shallow water masses. The continuation of the main negative $\delta^{13}C$ after the end of the $\delta^{15}N$ excursion may indicate the mixing of the water column after the anoxic period. Data of carbonate microfacies as well as stable isotopes show that the P-Tr event started in the Late Permian below the P-Tr extinction event.

Keywords: Permian, Triassic, boundary, carbonate microfacies, stable isotopes