

Stable carbon and oxygen isotope stratigraphic evidence of Shuram Excursion and PC-C boundary in Bilara carbonate sequence of Rajasthan

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The Post-Cryogenian period was a time of sharp increase in ocean primary productivity and subsequent oxygenation to present atmospheric level (PAL), due to the massive influx of terrestrial weathering-derived nutrients in the sea. This change along with palaeogeography of continents during Late Ediacaran period instigated large scale deposition of carbonates with highly negative $\delta^{13}\text{C}$ -carb. Like the continents those have established Shuram Excursion sites (i.e. Oman, Australia, China, North America), the location of Indian continent was also near atmospheric convergence zone (i.e. near the equator). Therefore a robust high-resolution carbon and oxygen stable isotope study was undertaken on Bilara carbonate sequences to test the possibility of Shuram Excursion and trace the Precambrian-Cambrian Boundary by comparing with well-dated established Shuram Excursion sites. The $\delta^{13}\text{C}$ -carb and $\delta^{18}\text{O}$ -carb in Bilara Group varies from -9.0 to 4.1 ‰ and from -10.7 to 8.3 ‰ respectively. Overall, most of the samples have $\delta^{18}\text{O}$ -carb significantly above -10‰ below which carbonates are considered diagenetically altered. The $\delta^{13}\text{C}$ -carb pattern is more similar to Yangtze Gorges platform where Ediacaran $\delta^{13}\text{C}$ -carb variation profile has been divided into four negative (EN1, EN2, EN3, EN4) and three positive excursions (EP1, EP2, EP3). Similarities of $\delta^{13}\text{C}$ -carb pattern demonstrate that Bilara is equivalent to Yangtze Gorges platform and, to some extent Shuram Formation. According to these comparisons, the Precambrian-Cambrian boundary lies near the top of Bilara Group.