

Continental weathering changes tracked through coupled Li and Sr isotope trends in the late Ediacaran-Cambrian carbonate rocks of the Salitre Formation, Brazil

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Carbonates of the Salitre Formation in eastern Brazil (Irecê Basin, São Francisco Craton) are part of the sedimentary record of marine transgressions that occurred during the Ediacaran-Cambrian transition in the West Gondwana. We used coupled lithium and strontium isotope compositions of carbonates rocks to investigate the weathering fluxes in this basin in the context of an epicontinental sea. From base to top, carbonates show a decrease in the $d^7\text{Li}$ values concomitant to a decrease in the $^{87}\text{Sr}/^{86}\text{Sr}$ ratios during the regressive stage of the basal sequence of the Salitre Formation. Such concomitant decreasing trends in the Li and Sr isotopes suggest an environmental change from incongruent to congruent weathering at source areas. This change could have resulted in higher alkalinity to seawater, conditions suitable for biomineralization, as recorded in other coeval basins. However, we suggest that the lack of fossil fauna in the Salitre Formation results from the predominance of restricted-sea depositional environments in the Irecê Basin at the core of the Gondwana continent. The congruent weathering would also result in a high nutrient supply, probably leading to eutrophication and declining habitability in this restricted marine environment. Both Li and Sr isotope budgets of seawater in this continental setting were possibly controlled by local weathering conditions and large sea-level fluctuations, illustrating how basin restriction due to supercontinent assembly may have precluded animal dispersion across Ediacaran-Cambrian transition.