

# **Li, Mg and Sr isotope compositions of marine carbonates from the Salitre Formation, Irecê Basin: tracking changes in continental weathering of the West Gondwana during the Late Ediacaran**

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Marine carbonate successions of the Salitre Formation (Irecê Basin, eastern Brazil) record paleoenvironmental changes and marine dynamics occurred during the Ediacaran-Cambrian transition in West Gondwana. This interval is notable for recording the appearance of biomineralized benthic organisms, possibly driven by a global shift from dolomite-aragonite to aragonite seas, with increased alkalinity of seawater. Given that silicate weathering transfers bioessential elements from continents to oceans via rivers, it likely played a critical role in altering ocean chemistry during this time. To investigate this hypothesis, we deployed lithium, magnesium, and strontium isotope compositions of carbonate rocks retrieved from an outcrop section of the unit to track weathering regimes. A notable increase in Sr/Ca ratios is observed at the base of the section and is accompanied by decreasing trends in  $\delta^7\text{Li}$ ,  $\delta^{26}\text{Mg}$  values, and  $^{87}\text{Sr}/^{86}\text{Sr}$  ratios. These trends suggest increased seawater alkalinity driven by a shift from incongruent to a congruent weathering regime, possibly kinetically-limited. Such seawater condition was essential to the spread of the Ediacaran skeletal fauna elsewhere on the Planet. However, no significant fossil record of biomineralized benthic macroorganisms has been reported in the Salitre Formation. We suggest that the lack of skeletal fauna is the outcome of restricted-sea depositional environments in the Irecê Basin, where high nutrient supply related to congruent weathering could have led to eutrophication and a consequent decline in habitability. The coupled behavior of the isotopes changes to an antithetical behavior between  $\delta^7\text{Li}$  and  $\delta^{26}\text{Mg}$  values upwards. This suggests a change in the nature of the congruent weathering regimes, shifting to supply-limited. The multi-proxy approach here deployed shows a good potential to track different weathering conditions and could be a further step forward to understand how climate and weathering operated