

Li, Mg, Sr, and Ba Incorporation in Stylasterid Corals from the Global Ocean: Insights into Paleooceanographic Proxies and Biocalcification Mechanisms

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The effects of anthropogenic climate change on shallow-water corals are well characterized; however, much remains unclear for the future of deep-sea corals. Stylasterids, an understudied and often overlooked taxa of deep-sea corals in the fields of biogeochemistry and marine ecology, warrant further attention. Given their global distribution and reliance on calcium carbonate to build their skeletons, understanding the vulnerability of stylasterid corals to a changing environment is crucial for advancing marine ecosystem protection. A critical prerequisite for assessing their resilience to changing ocean chemistry is a deeper understanding of the biomineralization mechanisms employed by stylasterids. These mechanisms are unique not only in their ability to precipitate both aragonite and calcite skeletons but also in enabling these corals to thrive in undersaturated waters despite little modification of internal pH [1].

Here, we characterize the controls over stylasterid geochemistry by examining the covariance between ICP-MS derived trace element concentrations and ambient hydrographic parameters, species, and skeletal regions in 61 stylasterid corals collected from the global ocean. Additionally, this approach offers an opportunity to assess the potential of stylasterids as novel paleoproxies.

[1] Stewart *et al.* (2022) *Sci. Rep.*, **12**, 13105.