



Exploring foraminiferal Sr/Ca as a new carbonate system proxy

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In present day paleoclimate research one of the most pressing challenges is the reconstruction of atmospheric CO₂ concentrations. A variety of proxies for several components of the marine inorganic carbon system have been developed in this context (e.g. B isotopes, B/Ca, U/Ca) to allow reconstruction of past seawater pH, HCO₃⁻ and CO₃²⁻ and thereby facilitate estimates of past atmospheric pCO₂. Based on culture experiments using the benthic foraminifera *Ammonia* sp. we describe a positive correlation between Sr/Ca and the carbonate system, namely DIC/bicarbonate ion concentration. Foraminiferal Sr/Ca ratios provide potentially additional constraints on the carbonate system proxy, because the analysis of foraminiferal carbonate Sr/Ca is straightforward and not easily contaminated. Applying our calibration to a published dataset of paleo-Sr/Ca suggests the validity of Sr/Ca as a carbonate system proxy. Furthermore, we explore how our data can be used to advance conceptual understanding of the foraminiferal biomineralization mechanism.