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Effects of carbonate leaching on foraminifer stable isotopes ratios

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Stable carbon and oxygen isotope ratios were measured on 125 individual epifaunal and infaunal benthic foraminifers from two discrete intervals in a shallow-water sediment core (~ 450 m) from the Timor Sea. Methane seeps are common in the area, likely resulting in significant precipitation of secondary calcite, the effects of which were assessed by subjecting foraminifers to varying degrees of pretreatment. All foraminifers received standard cleaning with ethanol and brief sonication. A subset were further cleaned and sonicated in a dilute HCl solution (~ 0.003 M). Foraminifer tests were photographed using both reflected light and scanning electron microscopes during the course of treatment to monitor the changing degree of secondary calcite contamination as increasingly aggressive cleaning methods were employed. While foraminifers subjected to treatment with HCl exhibit a lower relative standard deviation, the variance remains high relative to expected results. Therefore, a similar experiment is being conducted on living individuals (stained with Rose Bengal) taken from a nearby multicore with complementary isotope ratios of overlying seawater, porewater, and DIC.

Keywords: stable isotopes ratios, foraminifera, carbonate leaching