

Diagenetic alteration of Triassic coral from the aragonite Konservat-Lagerstätte in Alakir Çay, Turkey: Implications for geochemical measurements

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ABSTRACT

Skeletons of Norian corals from the aragonite Konservat-Lagerstätte in Alakir Çay, Turkey are commonly considered to be exceptionally preserved. However, one example of *Pachysolenia cylindrica* shows that although aragonite is the dominant mineral phase (about 86.2%), the distribution of microscale diagenetic features in the skeleton complicate its usage as a paleoenvironmental archive. We used a density separation technique to isolate aragonite-enriched powders of skeletal material, which compared to powders of bulk skeleton (~8.3% more calcite than aragonite-enriched powders), exhibit higher Sr/Ca (by an average of 0.27 mmol/mol), lower Mg/Ca (by an average of 1.34 mmol/mol), and lower $\delta^{18}\text{O}$ (by an average of 0.28‰). In addition, paleo-sea surface temperatures calculated using values from bulk measurements are 1.1–3.4 °C colder (3.3–3.4 °C for Sr/Ca and 1.1–2.0 °C for $\delta^{18}\text{O}$) than temperatures calculated from the density-separated, aragonite-enriched powders. These data suggest that the presence of about 13.8% of secondary calcite can influence the robustness of geochemical proxies and that density separation is an effective tool for recovering the original geochemical signal from diagenetically altered samples.