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Preservation effects on the isotopic and elemental composition of skeletal structures in the deep-sea Bamboo Coral *Lepidisis* spp. (Isididae).

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Abstract: Trace elements and stable isotopes ($\delta^{13}\text{C}$ and $\delta^{15}\text{N}$) in deep-sea coral have been used as proxies to reconstruct past climate, and to investigate food web structure. However, there is a paucity of information regarding the effect of preservation on the chemical integrity of archived coral. In this study a live-caught colony of Bamboo coral (southern Australia), genus (*Lepidisis*), was sectioned into three pieces and stored for approximately one year to investigate the influence of preservation in ethanol and preservation in seawater, that mimics the early stages of fossilization, against a dry preserved control. Storage and preservation have no significant effect on the isotopic signature of $\Delta^{14}\text{C}$, bulk $\delta^{15}\text{N}$, $\delta^{15}\text{N}$ and $\delta^{13}\text{C}$ of individual amino acids, or C:N in the fibrillar protein matrix, with the only offset ($\sim 0.2\%$) being observed in part of the $\delta^{13}\text{C}$ record. In the high-magnesium calcite lattice Ba/Ca appears to be significantly different after storage in ethanol, whereas $\Delta^{14}\text{C}$, B/Ca, Mg/Ca, Sr/Ca, and U/Ca remain largely unaltered. Possible mechanisms responsible for these observed differences centre around the

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