



Assessing the utility of elemental ratios as a paleotemperature proxy in shells of patelloid limpets

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Archaeological shell and fish middens are rich sources of paleoenvironmental proxy data. Carbonate hard part remains contained in such deposits have been used as archives of coastal marine climate and human-climate interactions. Oxygen isotope records from fast-growing limpet shells potentially capture summer and winter seasons, and thus, approach the full seasonal range of sea surface temperature (SST). Fast-growing shells are often short-lived, providing “snap-shots” of multi-year seasonal cycles. Patelloid limpet shells are common constituents in archaeological middens found along European, African, and South American coastlines. Oxygen isotope ratios of archaeological limpet shells from the genus, *Patella*, have been used to reconstruct seasonal SST and ocean circulation patterns during the Late Quaternary. Such studies depend on the ability to constrain the oxygen isotope ratio of seawater; therefore, alternative proxies are necessary for coastal localities where this is not possible. Elemental ratios (e.g., Sr/Ca, Mg/Ca) have been used as paleotemperature proxies in corals and foraminifera with varying degrees of success and appear problematic in bivalves. Here, we test whether such elemental ratios are useful as an alternative SST proxy in patelloid limpet shells.