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Minimal research has been conducted on the geochemistry of acorn barnacles, yet recent studies suggest these sessile crustaceans have the potential to act as paleo-environment indicators, biomonitors of anthropogenic pollution, and tracers of marine megafauna movement. As there are nearly 900 species of acorn barnacles, it is necessary to investigate variations among species to determine their efficacy as proxies. The primary objective of this study is to compare trace metal concentrations of two extant barnacle species - Amphibalanus eburneus (ivory barnacle) and Semibalanus balanoides (northern rock barnacle) - to better understand their unique applications in the ocean sciences. Samples were collected from Manursing Island Club in Rye, New York, along the western shoreline of the Long Island Sound. Collected barnacles were photographed, and the rostro-carinal diameter of each specimen was measured to aid with identification. All barnacle plates were cleared of soft parts, sonicated in milli-Q water, brushed clean with vinegar, rinsed off, and soaked in bleach for 3 hours. Element/Ca ratios were measured using a ThermoScientific iCAPQ Quadrupole-Inductively Coupled Plasma-Mass Spectrometry (Q-ICP-MS). Li, Na, Mg, K, and Sr to Ca ratios were measured. A comparison of the K/Ca values of S. balanoides and A. eburneus was inconclusive. Additional data may be necessary to determine if there are interspecies differences within the same environment. However, Na/Ca, Li/Ca, and Sr/Ca ratios could be species-specific. S. balanoides was observed to have lower Na, Sr, and Li to Ca ratios than A. eburneus, although they were exposed to the same environmental conditions. Hence, any studies that wish to explore Na/Ca, Li/Ca, Sr/Ca in barnacles would need to target a given species or acknowledge potential offsets. Notably, S. balanoides samples collected downshore had lower Mg/Ca ratios than samples collected further upshore. This finding is not unsurprising as Mg/Ca values in barnacles have been known to be impacted by shore level. While the full extent of the utility of barnacle geochemistry is still undergoing exploration, we are just beginning to determine which potential proxies require species-specific investigations.