Using Geochemical Mapping of Marsh Foraminifera Tests to Analyze Cytoplasmic Deposition of Trace Elements

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Over the course of several geologic timescales, the geochemical compositions of agglutinated foraminifera change with the addition or subtraction of various trace elements into the marsh ecosystem. Finding a distinct pattern in this process can help elucidate the methods by which external trace elements are incorporated into the organic cement in agglutinated foraminiferal tests. The aim of this study is to better understand the movement of external trace elements in foraminiferal cytoplasm, a process that can clarify the longterm geobiological and environmental effects of the changing chemical makeup of the marsh ecosystem. It was hypothesized that the chemical differences found within ossified cytoplasm would point ot he internal deposition of trace elements into the foraminiferal tests via cytoplasmic streaming. Foraminiferal samples were collected form a sediment core that my mentor vibrocored from a coastal marsh ecosystem. Samples underwent locational imaging and geochemical analysis using a scanning electron microscope and an energy dispersive x-ray spectroscope (EDS), respectively. It was determined that there are non-linear geochemical trends along transections of each test in a single stratigraphical level, indicating that agglutinated marsh foraminifera from each layer of the marsh readily uptake elements from the environment internally through cytoplasmic streaming.

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