

Trace element concentrations of sub-tropical modern brachiopod *Basiliola lucida* collected off Okinawa-jima, Japan

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Trace element concentrations in biogenic carbonates have been widely used as an indicator for paleoceanographic conditions, such as seawater temperature, chemical and isotopic composition, and oceanic carbonate system. Since calcium carbonates (CaCO_3) are easy to treat and handle for their geochemical analyses, the combined use of trace element and isotopic ratios (e.g., Me/Ca and $\delta^{18}\text{O}$) analyzed from the same powder samples from calcareous fossils provides multi-proxy constraints on paleoenvironmental reconstructions. Brachiopods, one of the most crucial marine calcifiers throughout the Phanerozoic, have been regarded as key taxa for expanding our knowledge on the evolution of Earth's oceans and climate. Brachiopod-based paleoenvironments, however, have been mainly reconstructed from carbon and oxygen isotope composition, and the use of their trace element concentrations has been limited. Although some studies were conducted on within-shell variability of trace elements in modern brachiopod shells, it is still uncertain what environmental and/or physiological factors control the incorporation of trace elements into the shells and how precisely the shells record environmental signals of ambient seawater. In order to resolve these questions, it is necessary to compare trace element ratios of modern brachiopod shells with those in seawater along with oceanographic properties at the brachiopod growth site. This study investigates trace element concentrations in shells of a sub-tropical modern brachiopod, *Basiliola lucida*, collected to the west of Okinawa-jima, Ryukyu Islands, southwestern Japan. A previous study indicates no biological controls on carbon and oxygen isotope compositions of *B. lucida* shells. Since a large amount data were obtained on oceanographic conditions and seawater chemistry by scientific cruises of the Geological Survey of Japan of the National Institute of Advanced Industrial Science and Technology (AIST/GSJ) from this region, it is expected that we can specify primary factor(s) controlling the incorporation of trace elements into brachiopod shells.

Keywords: Brachiopoda, Trace element concentrations, Ryukyu Islands, Paleoenvironmental proxy