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Intraspecific variations in carbon and oxygen isotopic composition of the modern brachiopod from Otuchi Bay

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In the past decades, many studies have been conducted on carbon and oxygen isotopic composition of fossil rynchonelliform brachiopod shells in order to delineate secular variations in ancient seawater isotopic composition and to reconstruct the history of paleoenvironmental conditions during the Phanerozoic. These studies rely on the assumption that biogenic carbonates of the brachiopods were precipitated in or close to isotopic equilibrium with ambient seawater. However, several investigations showed that the brachiopod shells display variable offsets of the isotopic composition from equilibrium calcite (=calcite precipitated in isotopic equilibrium with ambient seawater), which can be attributed to kinetic and metabolic fractionation effects during shell secretion. This indicates that shell portions secreted in isotopic equilibrium with ambient seawater should be specified and selected to use the isotopic composition of the brachiopod shells as paleoenvironmental proxies. However, only one brachiopod shell has been examined on within-shell variability of isotopic composition in each of the previous studies.

Here, we show intraspecific variations in carbon and oxygen isotope composition of the modern brachiopod *Terebratulina crossei* from Otuchi Bay, Iwate Prefecture, northern Japan.

Keywords: Brachiopod, Carbon isotope composition, Oxygen isotope composition, Intraspecific variation, Otuchi Bay