STABLE ISOTOPE (C, N) COMPOSITION OF BIVALVE SHELL ORGANIC MATTER AND SALINITY

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Stable isotope signatures in biogenic carbonates and tissues represent a common proxy for reconstructing environmental conditions. Today, salinity reconstruction has been recognized as a major goal. This study focuses on the isotopic signatures of the organic matrix of bivalve shells collected along estuarine salinity gradients. Two systems are compared: the Scheldt Estuary (in the Netherlands) using *Mytilus edulis* and the Auray River (Gulf of Morbihan, France) with *Ruditapes philippinarum*. The carbonate phase of the shell is removed by acid treatment leaving behind the organic shell matrix that faithfully preserves the original tri-dimensional shell structure, possibly allowing for subsampling of different time windows of the animals life. This bulk organic matter is analyzed by EA-IRMS. As observed for soft tissues, the shell organic matrix yields an isotopic composition close to that of suspended organic matter. Furthermore, the isotopic composition of the suspended organic matter along the strong biogeochemical gradient of the estuary is correlated with the salinity. Therefore, the $\delta^{13}C$ and $\delta^{15}N$ values of shell organic matter can be related to the average salinity of each location where the shells were collected. Moreover, shell organic matrix offers advantages over soft tissue: first, it provides a signature integrated over the animal's life time, thus smoothing out seasonal variations; second, it makes it possible to work with fossil organic matter to reconstruct past environmental conditions. It is protected from degradation after the death of the organism by the shell's mineral phase. However, when using different specimens, possible physiological effects (the avoidance of which requires that similar ages, sizes or weights be selected), food availability (importance of location, season) or species (*Mytilus vs. Ruditapes*) must be considered.