

## Stable isotope composition of pearls - Biomineralization in cultured pearl oysters in Ago Bay, Mie, Japan -

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The  $\delta^{18}\text{O}$ ,  $\delta^{13}\text{C}$  and trace element composition of pearls collected from the Ago Bay were investigated in order to evaluate biomineralization in the cultured pearl oyster (*Pinctada fucata martensii*). The oxygen isotopic compositions of the pearls suggest that the pearls were produced around 23-24°C, mainly in June to early July, which is consistent with their occurrence in the field. Therefore the pearls were produced under or close to isotopic equilibrium condition in spite of high growth rate (higher than 0.2-1.0 g cm<sup>-2</sup>yr<sup>-1</sup>), under which coral skeletons (~0.28 g cm<sup>-2</sup>yr<sup>-1</sup>) often show non-equilibrium isotope partitioning. The  $\delta^{13}\text{C}$  values were ~ 2.9 lower than those calculated for offshore water under equilibrium condition. It may be caused by low- $\delta^{13}\text{C}$  bottom waters due to degradation of organic matter (OM) or by a contribution of low- $\delta^{13}\text{C}$  food. In the latter case, a simple mass balance calculation gives respiration component of 14%. Twelve trace elements of bulk pearl samples were classified into 4 groups on the basis of their enrichment/depletion relative to seawater and correlation among them: Group 1 (Co, Cr, Pb), Group 2 (Ba, Cs, U), Group 3 (Cu, Sn, V) and Group 4 (other elements such as Mn, Rb, Mo). Comparison with coral skeletons suggests that proteinaceous OM in pearls contains abundant Ba and Mn and significant amount of elements in Group 3 relative to aragonite crystals.