



The relative impact of vital effect and environmental factors on the coral skeleton oxygen isotope ratio

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Coral skeleton is formed under organism control and its geochemical properties are strongly influenced by biological effects embedding environmental signal.

Isotopic analyzes of cultured *Acropora* have been performed at micrometer size scale taking into account of microstructure of the skeleton. Indeed, microscopic observation of all coral genera reveals the existence of two types of crystal: more or less isolated centers of calcification surrounded by smaller fibers. Each of these growth units shows a specific oxygen isotopic signature. Center of calcification oxygen isotopic ratio are almost constant and lowest and fibers one are scattered on several ‰. Obviously, the fiber isotopic variability is affected by biologic activity related to the photo-periodicity insuring the optimal growth conditions of the culture. However it does not mean that fiber oxygen isotopic ratio is not influenced by environmental parameters.

By adding seawater oxygen isotopic ratio to the Weber and Woodhead data series (1972) we assess new calibrations oxygen isotopic ratio of vita-seasurface temperature (SST) for *Porites* and *Acropora*. Since the annual isotopic value associated to each SST is derived from several colonies we consider that the "vital effect" is statistically removed. In this case, we obtain relationships showing a slope (the isotopic deviation per °C) similar with that calculated by Epstein et al (1953). It indicates that the "bulk" value, from which the biological variability has been removed, is in By combining these two evidences, we examine the consequences on paleoclimatic records.

isotopic equilibrium with seawater.