



Laboratory experiments on elemental and isotopic fractionation in coral aragonite precipitation

Noa Fruchter (1), Anton Eisenhauer (1), Jonathan Erez (2), Florian Boehm (1), and Jan Fietzke (1)
(1) IFM-GEOMAR, Kiel, Germany, (2) The Hebrew University of Jerusalem, Israel

The common use of corals skeletons as a recorder for paleoenvironmental conditions undergoes a significant progress with the development of analytical methods. Non-traditional stable isotopes (e.g. Ca, Sr, Mg) are measured in corals skeletons, and their incorporation as a function of changing environmental conditions is being examined (e.g. Böhm et al., 2006). Laboratory experiments simulating varying environmental conditions are crucial for understanding the processes causing isotope fractionation along the way of the non-traditional stable isotopes from the seawater to the site of calcification and incorporation in the biogenic skeleton.

In order to follow this approach we cultured seven micro colonies of *Acropora* sp. that originated from the same mother colony in natural seawater with different pH range (from 7.9 to 8.3) and different temperatures (from 19°C to 28°C). The corals were cultivated in closed system with continuous seawater flow for seven weeks to create the right conditions for the corals to precipitate sufficient skeleton for chemical analysis (Fietzke et al., 2010). During the experiment, we measured the alkalinity, pH and oxygen values of the experimental water in order to monitor the physiological conditions of the specimens and to assess the skeletons growth rates. Isotopic and elemental ratios analyses were applied for the skeletons, and for the experimental water samples. The comparison between the different conditions that applied to the skeletons will shed some light on the incorporation trace elements and isotopes into the coral skeleton.

Böhm, F., Gussone, N., Eisenhauer, A., Dullo, W.-C., Reynaud, S., & Paytan, A. (2006). Calcium isotope fractionation in modern scleractinian corals. *Geochimica et Cosmochimica Acta*, 70(17), 4452–4462.

Fietzke, J., Heinemann, A., Taubner, I., Böhm, F., Erez, J., & Eisenhauer, A. (2010). Boron isotope ratio determination in carbonates via LA-MC-ICP-MS using soda-lime glass standards as reference material. *Journal of Analytical Atomic Spectrometry*, 25(12), 1953. doi: 10.1039/c0ja00036a.