



Light and temperature effects on Sr/Ca and Mg/Ca ratios in the scleractinian coral *Acropora* sp.

S. Reynaud (1), C. Ferrier-Pagès (1), R. Mortlock (2), D. Allemand (1), R. Fairbanks (2)

(1) Centre Scientifique de Monaco, Avenue Saint Martin, MC-98000, Principality of Monaco,

(2) Lamont Doherty Earth Observatory, 61 Rt. 9W/ P.O. Box 1000, Palisades, NY 10964

U.S.A (sreynaud@centrescientifique.mc / Fax: +377-92167981)

This study was designed to investigate the effect of temperature and light on Sr/Ca and Mg/Ca ratios of the skeleton of the coral *Acropora* sp. For this purpose, coral nubbins were cultivated in aquaria filled with natural seawater and two experiments were conducted. In the first one, 3 light intensities (100, 200 and 400 $\mu\text{mol m}^{-2} \text{s}^{-1}$) were set-up, and the temperature was kept constant (27°C). In the second experiment, corals were cultivated at 5 temperatures (21, 23, 25, 27 and 29°C) and the light level (400 $\mu\text{mol photons m}^{-2} \text{s}^{-1}$) was constant. The calcification rate of the corals was followed during the whole experiment, and the newly-formed skeleton was sampled after two months to perform trace element ratios analysis.

The rates of calcification were enhanced by 5.7 and 1.7 fold following a 8°C increase in temperature or a 4 fold increase in light respectively. These results suggested that an increase in the calcification rate induced by temperature or light was due to different mechanistic.

Significant correlations were obtained between Mg/Ca or Sr/Ca and seawater temperature, whereas light only induced a change in the Mg/Ca ratios. We also obtained a good correlation between Mg/Ca or Sr/Ca and calcification rates in the temperature experiment.

Thus, the Mg and Sr ions react differently during skeletogenesis suggesting a strong biological control. This provides an indication that Mg and Sr have different pathways from the seawater to the skeleton and that they play different roles in the coral calcification process.