Salinity effect on skeletal chemical composition in cultured zooxanthellate corals

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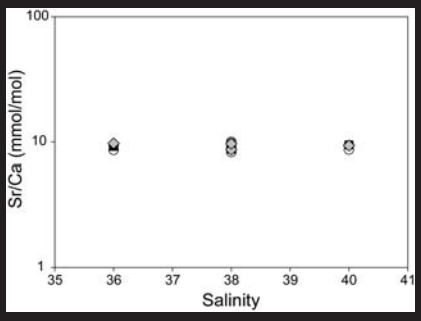
Aim and material:

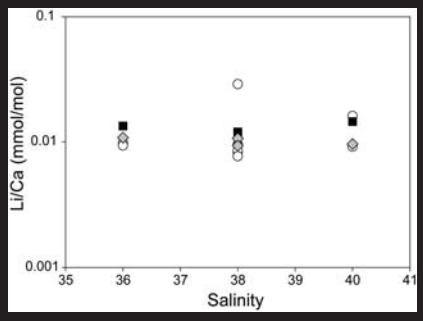
- Investigate the influence of salinity variation on coral skeleton composition
- Corals: *Acropora* sp. (●), *Montipora verrucosa* (■), *Stylophora pistillata* (♦)
- Corals cultured at different salinities (36, 38, 40). All other parameters keep constant

Acropora sp.

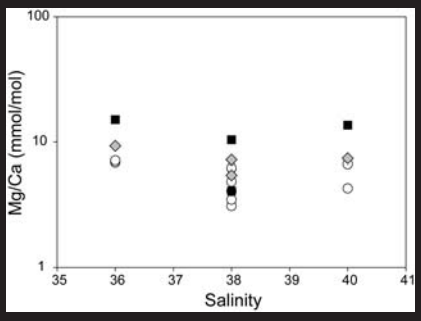
Salinity has no influence on Sr/Ca, Li/Ca, Mg/Ca



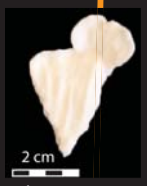
ANOVA: p-value = 0.963
No significant difference



ANOVA: p-value = 0.503
No significant difference

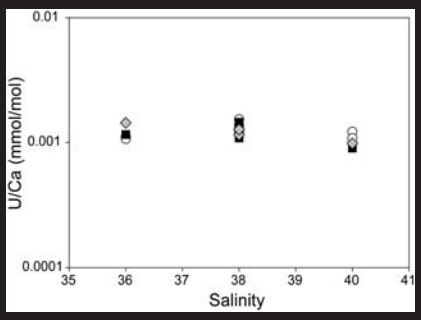


ANOVA (On ranks): p-value = 0.056
No significant difference. Normality failed

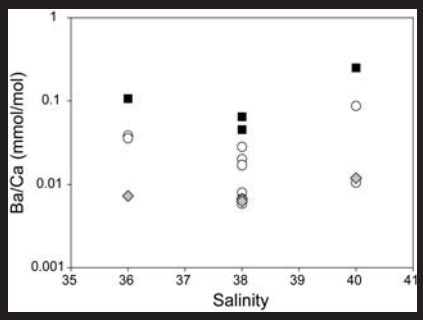


Montipora verrucosa

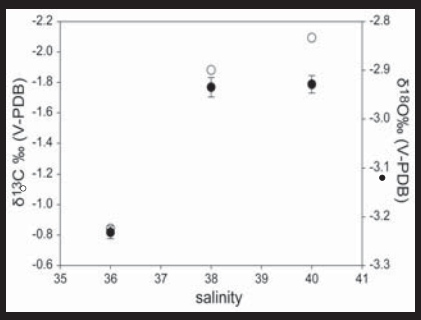
Salinity influence U/Ca, $\delta^{18}O$ and $\delta^{13}C$. Ba/Ca is species dependant



ANOVA: p-value < 0.05
Significant diff. between salinity 38-40



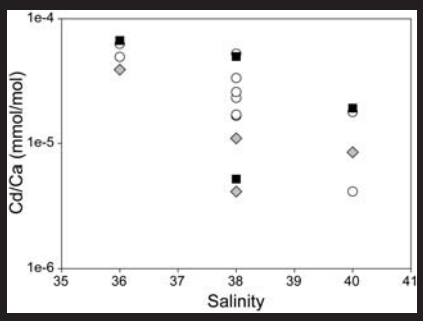
ANOVA: p-value < 0.05
Significant diff. between Montipora-Stylophora



$\delta^{18}O$ increase with salinity
$\delta^{13}C$ decrease with salinity
for *Acropora* sp.

Stylophora pistillata

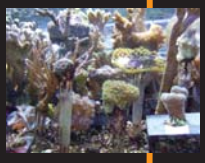
Cd/Ca : salinity proxy



ANOVA: p-value < 0.05
Significant diff. between 36-38 and 36-40
Corr. Coef: -0.7 / p-value = 0.001
Negative linear correlation

Conclusion of this experimental study

- Sr/Ca and Li/Ca not affected by salinity variations. The effect is minor for Mg/Ca.
- Sr/Ca is a robust temperature proxy, in agreement with previous studies (e.g. Corrège, 2006).
- U/Ca is sensitive to salinity variations. Ba/Ca is species dependant. These results call for caution when using these proxies for temperature and upwelling, respectively.
- Cd/Ca appears as confident salinometer, in agreement with Carriquiry and Villaescusa (2010).



References & Aknowledgement:

Carriquiry & Villaescusa, 2010, Coral Cd/Ca and Mn/Ca records of El Niño variability in the Gulf of California, CPD 6, 63-85
Corrège, 2006, Sea surface temperature and salinity reconstruction from coral geochemical tracers, Palaeo3 232, 408-428
This research is supported by the Swiss Nation Science Fundation (Grant n° 20 MA21-115944).