Salinity effect on skeletal chemical composition in cultured zooxanthellate corals

Pretet Chloé[1], Reynaud Stéphanie[2], Ferrier-Pagès Christine[2], Gattuso Jean-Pierre[3], Kamber Balz[4] & Samankassou Elias[1]

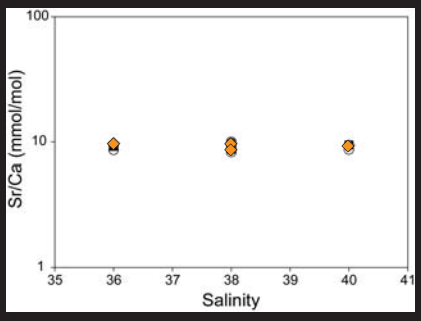
[1] Université de Genève, Switzerland; [2] Centre scientifique de Monaco; [3] CNRS, Université Pierre et Marie Curie, France; [4] Trinity College Dublin, Ireland

Aim and material

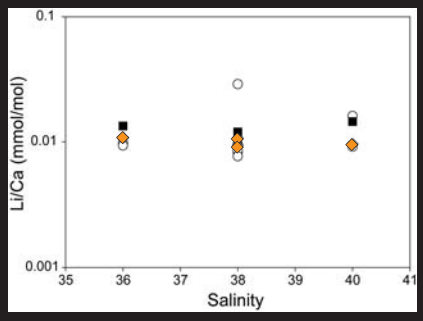
- Investigate the influence of salinity variations on coral skeleton composition.
- Corals: *Acropora* sp. (●), *Montipora verrucosa* (■), *Stylophora pistillata* (♦)
- Coral cultured at different salinities (36, 38 and 40). All other parameters kept constant.

Acropora sp.

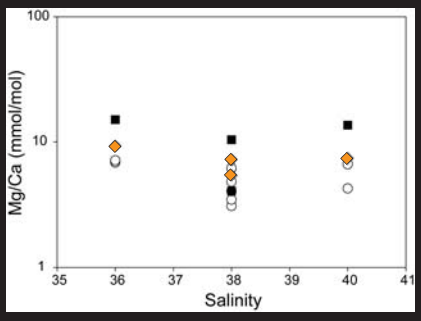
Salinity has no influence on Sr/Ca, Li/Ca and Mg/Ca



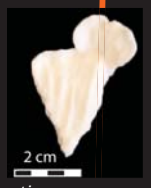
ANOVA: p-value = 0.963
No significant difference



ANOVA: p-value = 0.503
No significant difference

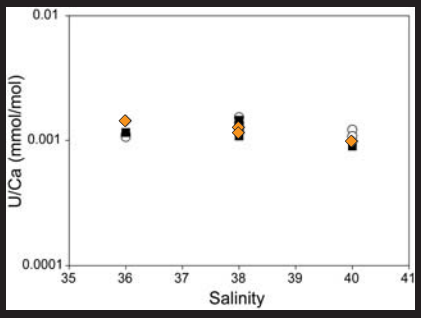


ANOVA (On ranks): p-value = 0.056
No significant difference. Normality failed

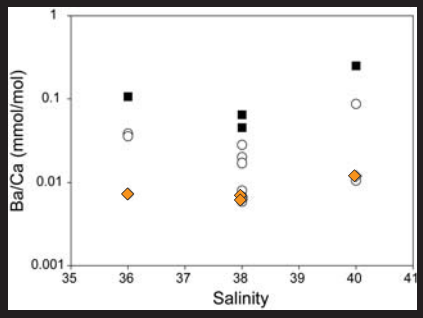


Montipora verrucosa

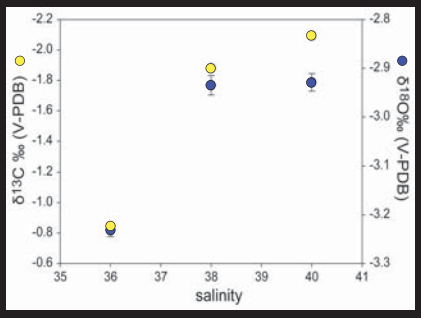
Salinity influences U/Ca, Ba/Ca, Cd/Ca, δ¹⁸O and δ¹³C



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



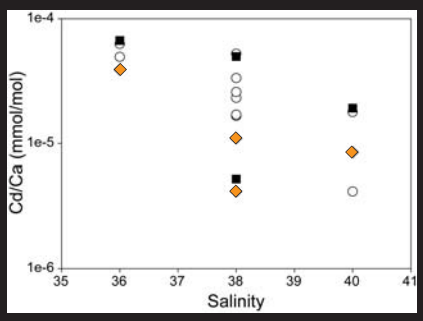
ANOVA: p-value < 0.05
Significant diff. between Montipora-Stylophora



δ¹⁸O increase with salinity
δ¹³C decrease wiith salinity
for *Acropora* sp.

Stylophora pistillata

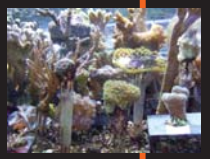
Cd/Ca proxy of salinity



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

Conclusions of this experimental study

- Sr/Ca, Li/Ca are 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 dependent. These results call for caution when using these proxies for temperature or upwelling variations, respectively.
- Cd/Ca appears to be a confident proxy for salinity.



References & Aknowledgement:

Corrège 2006, Sea surface temperature and salinity reconstruction from coral geochemical tracers, Palaeo3 232, 408-428

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