Trace element ratios in corals *Porites lobata* and *Dipsastraea speciosa* from Koshiki Island (Japan)

CLAIRE ROLLION-BARD[1]*, PIERRE BURCKEL[1], DOMINIQUE BLAMART[2], TSUYOSHI WATANABE[3] & SARA MILNER[1]

[1]IPGP, 1 rue Jussieu, 75005 Paris, France (*correspondence: rollion@ipgp.fr)
[2]LSCE, av. de la Terrasse, 91198 Gif-sur-Yvette, France
[3]Hokkaido University, Japan

Temperature of the ocean is one of the major parameters to understand climate change. Minor and trace elements measured in the aragonitic coral skeleton can be used as environmental proxies. Here, we present analyses of Li/Ca, B/Ca, Na/Ca, Mg/Ca, Sr/Ca, and U/Ca ratios in two slabs of scleractinian corals, *Porites lobata* and *Dipsastraea speciosa*, collected alive from Koshiki Island (Japan). The key point of these corals is that they experienced a large sea surface temperature (SST) seasonality, with winter SST of a about 15°C up to 28°C in summer. These corals are thus an ideal target to check the validity of SST proxies.

Solution ICP-MS measurements were carried out on micromill samples with a spatial resolution of 300 µm. About 250 samples were analysed for the *P. lobata* slab and about 300 samples for the *D. speciosa* piece. The isotopes of ^{7}Li, ^{11}B, ^{23}Na, ^{24}Mg, ^{43}Ca, ^{44}Ca, ^{88}Sr and ^{238}U were measured after dissolution with ultraclean nitric acid. Possible contamination was checked by the determination of Al and Mn contents. The standard JCp-1 was analysed every 5 samples to ensure the stability and the accuracy of the measurements.

The Li/Ca, B/Ca, Sr/Ca and U/Ca ratios are all negatively correlated with temperatures. The relation between B/Ca and temperature is the inverse to the findings of Dissard et al. (2012) in culture *Acropora* sp., but is consistent with previous studies on natural corals (e.g. Hart and Cohen, 1996; Montagna et al, 2007). In *P. lobata*, U/Ca and Sr/Ca ratios are positively correlated with a correlation coefficient R^2 of 0.89. This correlation is in agreement with the data of Min et al. (1995) and Cardinal et al. (2001). The geochemical signals of these two corals have to be examined in more details to highlight their potential use as environmental proxies.

Cardinal et al (2001) Chem. Geol., 176, 213-233.
Dissard et al (2012) Biogeosciences, 9, 4589-4605.
Hart and Cohen (1996) GCA, 60, 3075-3084.
Min et al (1995) GCA, 59, 2025-2042.
Montagna et al (2007) Quaternary Sci. Rev., 26, 441-462.