

## Coral growth-rate insensitive Sr/Ca as a robust temperature recorder at the extreme latitudinal limits of Porites

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Corals are rich archives of climatic changes with high-resolution record of seasonal change such as sea-surface temperature (SST), in tropical and sub-tropical seas during recent and distant past. Past SST are commonly reconstructed from the trace elements present in annually-banded coral skeletons. Recently, reef building corals were found in temperate regions due to coral habitat range shifts and/or expansions. Therefore, it could be a powerful tool for reconstructing climatic changes such as global warming and ocean acidification over long period. However, because of the more stressful environment for corals in temperate region than tropic or subtropics, we have to know how to reconstruct palaeo-SST using temperate corals.

This paper was reported Sr/Ca-based SST reconstructions for temperate Porites corals collected from Kyushu, Japan, near the northern latitudinal extent of hermatypic corals. New, high-resolution Sr/Ca data, measured along the growth axes of Porites from Ushibuka, were compared to previously published  $\delta^{18}\text{O}$  data from the same specimens (Omata et al., 2006). Results indicate that Sr/Ca variations in a low-growth coral remain independent from growth rate, in contrast to the oxygen isotope ratios of the same coral. Results clearly indicate that Sr/Ca robustly reproduces SST variations from regions along the extreme latitudinal limits of hermatypic coral habitat, independent of growth rate variations.

Additionally, Sr/Ca of the other two Porites corals collected in Ushibuka were measured and the inter-colony variation of reconstructed SST was shown. At this stage, it is difficult to reconstruct accurate SST using only one specimen of Porites in temperate region. However, we can reconstruct SST within only 1 °C difference from observed SST if we calibrate Sr/Ca-SST using more than two corals. It is expected that in the future the fossil temperate corals will be commonly used for palaeo-SST reconstruction.