

# Cold-water coral *Lophelia pertusa* as a high-resolution archive of paleo-environmental conditions in the central Mediterranean

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Cold-water corals are one of the most promising paleo-environmental archives in paleo-climate research that contain high-resolution records of long-term climate change (ROBERTS ET AL. 2006). This study focuses on several examples of the cold-water coral *Lophelia pertusa* as well as water samples from different locations in the central Mediterranean Sea collected during Meteor cruise M70/1 in October 2006. The intention is to compare present-day with paleo-environmental conditions during the Last Glacial Maximum (LGM) and the Younger Dryas.

We used ion-microprobe imaging to map elemental distributions of Mg, Ca, Sr, S and P across the thecal wall of the coralline aragonite. On same sections LA-MC-ICP-MS measurements were performed to determine stable strontium isotopes ( $\delta^{88/86}\text{Sr}$ ) as a proxy for the reconstruction of intermediate water temperatures following the approach of FIETZKE ET AL. (2008). Water samples were collected together with the coral species and were analysed using ICP-MS and ICP-OES techniques for concentrations of Mg, Ca, Sr, Ba, B, Li and P. Fossil coral samples were AMS <sup>14</sup>C-dated after having been checked for alteration.

The geochemistry of recent coral skeletons will be compared and calibrated to the analysed water samples. The focus will be on environmental parameters like temperature, salinity and nutrient concentration using Mg/Ca, Ba/Ca, and Sr/Ca ratios, as well as P/Ca and dissolved inorganic phosphorous (DIP). Stable strontium isotopes ( $\delta^{88/86}\text{Sr}$ ) will be used to complete the temperature calibration published earlier by RÜGGERBERG ET AL. (2008).

On the basis of this comparison it should be possible to reconstruct the environmental conditions of the LGM and the Younger Dryas, especially the nutrient content and the temperature of intermediate water masses in the central Mediterranean Sea.

## Literature

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- RÜGGERBERG, A., FIETZKE, J., LIEBETRAU, V., EISENHAEUER, A., DULLO, W.-CHR. & FREIWALD, A. (2008): Stable strontium isotopes ( $\delta^{88/86}\text{Sr}$ ) in cold-water corals - A new proxy for reconstruction of intermediate ocean water temperatures. – *Earth and Planetary Science Letters*, 269: 569-574.