{rokbox title=|Ejemplar de Lophelia pertusa :: Foto: A. Gori (ICM-CSIC)| thumb=|images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-covadonga-orejas-lophelia-pertusa-y-madrepora-oculata-naumann-et-al-2013-thumb.jpg|}images/stories/ieo/imagenespublicaciones/centro-oceanografico-baleares-covadonga-orejas-lophelia-pertusa-y-madrepora-oculata-naumann-et-al-2013.jpg{/rokbox}

Malik S. Naumann, **Covadonga Orejas**, Christine Ferrier-Pagès, (2013). **Species-specific physiological response by the cold-water corals *Lophelia pertusa* and *Madrepora oculata* to variations within their natural temperature range**. Deep-Sea Research Part II: Topical Studies in Oceanography. (2013), http://dx.doi.org/10.1016/j.dsr2.2013.05.025i

Abstract: The scleractinian cold-water corals (CWC) *Lophelia pertusa* and *Madrepora oculata* represent two major deep-sea reef-forming species that act as key ecosystem engineers over a wide temperature range, extending from the northern Atlantic (ca. 5–9 °C) to the Mediterranean Sea (ca. 11–13 °C). Recent research suggests that environmental parameters, such as food supply, settling substrate availability or aragonite saturation state may represent important precursors controlling habitat suitability for CWC. However, the effect of one principal environmental factor, temperature, on CWC key physiological processes is still unknown. In order to evaluate this effect on calcification, respiration, and dissolved organic carbon (DOC) net flux, colonies of Mediterranean L. pertusa and M. oculata were acclimated in aquaria to three temperatures (12, 9 and 6 °C), by consecutive decrements of 1 month duration.
L. pertusa
and
M. oculata
maintained at Mediterranean control conditions (i.e. 12 °C) displayed constant rates, on average respiring 4.8 and 4.0 µmol O2 cm−2 coral surface area d−1, calcifying 22.3 and 12.3 µmol CaCO3 g−1 skeletal dry weight d−1 and net releasing 2.6 and 3.1 µmol DOC cm−2 coral surface area d−1, respectively. Respiration of
L. pertusa
was not affected by lowered temperatures, while
M. oculata
respiration declined significantly (by 48%) when temperature decreased to 9 °C and 6 °C relative to controls.
L. pertusa
calcification at 9 °C was similar to controls, but decreased significantly (by 58%) at 6 °C. For
M. oculata

, calcification declined by 41% at 9 °C and by 69% at 6 °C. DOC net flux was similar throughout the experiment for both CWC. These findings reveal species-specific physiological responses by CWC within their natural temperature range.
L. pertusa
shows thermal acclimation in respiration and calcification, while these mechanisms appear largely absent in
M. oculata
. Conclusively, species-specific thermal acclimation may significantly affect the occurrence and local abundance of cosmopolitan CWC species, consequently influencing their important role in habitat engineering and ecosystem functioning in various thermal environments.

Keywords: Calcification, Respiration, Dissolved organic carbon, Thermal acclimation, Tolerance, Reef-forming Scleractinia