

# Ecophysiology of *Lophelia pertusa* and *Madrepora oculata* from Formigas seamount (Azores): the influence of different water masses

Núria Viladrich<sup>1</sup>, Andrea Gori<sup>2</sup>, Juancho Movilla<sup>3</sup>, Cristina Gutiérrez-Zárate<sup>4</sup>, Maria Rakka<sup>4</sup>, Ángela Mosquera<sup>5</sup>,  
Alberto Aparicio<sup>3</sup>, Pedro Velez-Belchí<sup>5</sup>, Covadonga Orejas<sup>3</sup>

1. Institut de Ciències del Mar (CSIC), Barcelona (Spain) 2. Università del Salento, Lecce (Italy) 3. Centro Oceanográfico de Baleares (IEO), Mallorca (Spain)  
4. Instituto do Mar, Universidade dos Açores, Açores (Portugal) 5. Centro Oceanográfico de Canarias (IEO), Santa Cruz de Tenerife (Spain)

## INTRODUCTION

Water masses have been identified as potential important drivers of cold-water corals (CWC) distribution. It has been hypothesized that Mediterranean Outflow Water (MOW) driven the CWC colonization of North-East Atlantic after the last glacial period, promoting transport of coral larvae and generating suitable environmental conditions enhancing coral growth.

Several seamounts inhabited by the CWC *Lophelia pertusa* and *Madrepora oculata* are directly influenced by the MOW along its way west to Azores Islands. To advance in the exploration of the possible influence of MOW on the past and current distribution of Atlantic CWC, this study experimentally assessed the respiration rates of *L. pertusa* and *M. oculata*, under the influence of Mediterranean and Atlantic waters.

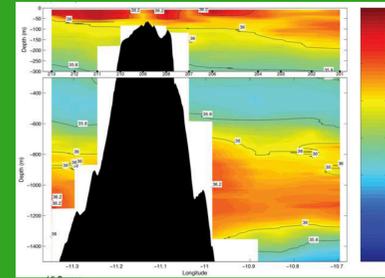
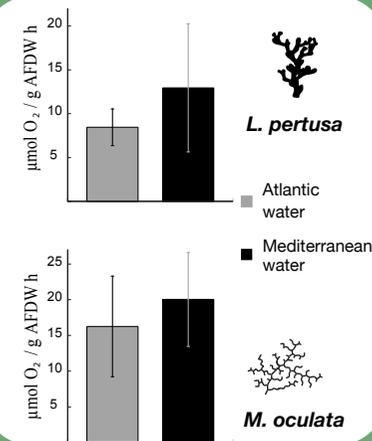


Fig.1 MOW flows characterized by high salinity and temperature in the Ormonde seamount region.

## EXPERIMENTAL DESIGN

- *L. pertusa* and *M. oculata* specimens were collected in Formigas seamount (North-Eastern Atlantic) at 1.000-1.250m depth by means of a remotely operated vehicle, during the research cruise MEDWAVES on-board the RV 'Sarmiento de Gamboa'.
- Six coral nubbins of each species were prepared and maintained in the 100-L acclimation tank for 5 days.
- After the acclimation, 3 nubbins of each species were maintained in Mediterranean and Atlantic seawater and temperature conditions.
- For the experiments, nubbins were transferred to incubation chambers (~300 ml volume; three replicates of each species per treatment and an extra empty chamber used as a control) with Mediterranean or Atlantic seawater sampled by CTD-rosette and pre-filtered by 50  $\mu$ m.
- Each experiment last for 6 hours. At the beginning (Ti) and at the end (Tf) of the experiment, measurements of oxygen concentration was conducted.

## RESULTS



## CONCLUSIONS

Our results show that exist a tendency, although not significant ( $p$ -value > 0.05), to **increase the metabolism rates of *Lophelia pertusa* and *Madrepora oculata* in the Mediterranean Outflow Water** compared to native Atlantic water. This increase is probably related to the higher temperature of the MOW (12°C) compared to the Atlantic water (7°C).

## ACKNOWLEDGEMENTS

The authors are grateful to the technical support from the UTM (CSIC) for helping with the coral care on-board of RV 'Sarmiento de Gamboa' and also to the MEDWAVES teams for helping during all the cruise. This Project has received funding from the European Union's Horizon 2020 research and innovation program under Grant Agreement no. 678760 (ATLAS). This output reflects only the author's view and the European Union cannot be held responsible for any use that may be made of the information contained therein.

