QCL WATER SCIENCE

STAZIONE ZOOLOGICA ANTON DOHRN
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Responses of Intertidal Algae To Climate Extremes

Context

Climatic extremes are becoming increasingly common against a background trend of global warming leading to changes in biodiversity and ecosystem functioning. Marine macroalgae are the most conspicuous organisms in the intertidal zone and their distribution and ecophysiology is strongly influenced by temperature. The present study, through the study of respirometric rate, aims to evaluate how macroalgae cope with experimentally simulated extremes of temperature.

Experimental Setup

Along the Calabrian coasts, organisms of macroalgae were collected and once in the lab, all the extraneous material that could alterate the measurement was removed from them. Then the samples were stored in aquaria and acclimated. Since the species showed different morphology and dimension, several chambers were tested to identify the proper setup for each species. 20 mL Pyroscience's vials and glass jars of 250 mL were selected and after the setting and calibration of the contactless optical fibers, a climatic chamber was equipped with four, individual stirring devices to ensure the constant mixing of water in each chamber during the measurements.

Fig. 1 Light set-up for oxygen production measurements. One jar is filled only with filtered seawater and used as a control

Results

As for animals, respirometry is a consolidated technique to estimate the metabolic rate but with photosynthetic organisms, it has to be considered oxygen consumption during dark respiration and also oxygen production during photosynthesis. Therefore, measurements were taken in both conditions: in light and dark.

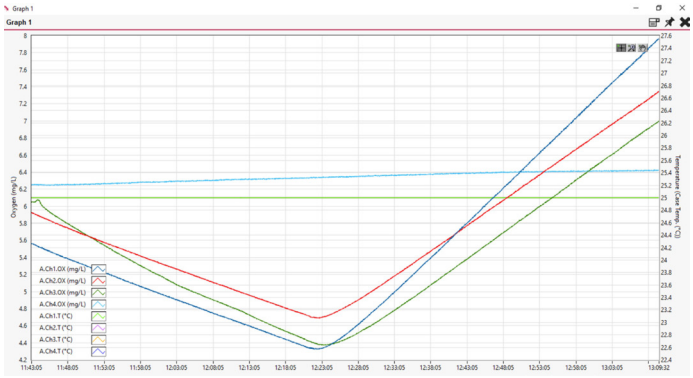

Fig. 2 Oxygen concentration (mg/L) recorded during measurements in light and dark conditions

Conclusion and Application

The study of oxygen consumption is a key approach to answering fundamental questions related not only to physiology but also to ecology. Researchers can find in Pyroscience a very versatile technology.

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