AN ECOSYSTEM ENGINEER IN A CHANGING OCEAN

EFFECTS OF OCEAN WARMING AND ACIDIFICATION ON CRASSOSTREA GIGAS JUVENILES

Catarina Santos^{1,2*} | Marta Pimentel ^{1,2} | Mariana Hinzmann^{2,3} | Sofia Francisco¹ | Inês Rosa¹ | Jorge Machado² Rui Rosa¹

#catarina.cp.santos@gmail.com

¹MARE | Marine and Environmental Sciences Centre, Laboratório Marítimo da Guia, 2750-374 Cascais, Portugal ²ICBAS | Abel Salazar Biomedical Sciences Institute, University of Porto, Porto, 4050-313, Portugal **CIIMAR**³ Centre of Marine and Environmental Research, University of Porto, Porto, 4050-123, Portugal



En an a

INTRODUTION

Subtidal oysters are often described as ecosystem

Rising temperatures and ocean

Bas Kers, 20U



engineers, due to their ability to form dense reefs that shape the surrounding environment.

Ber and a well a well a de weller

acidification pose ges for sessile calcifiers, such as oysters, particularly during their early-life. politics.

Seo tu

PH

Acidification Warning

Crassostrea gigas has become the dominant farmed oyster, being able to out-compete indigenous species.

METHODS

Acclimation:

Endpoints:

CONTROL 28°C | pH 8.0

is we all and a geo and a we

WARMING 31°C | pH 8.0

- Period: 90 days
- **Temperature:** $\triangle 4^{\circ}C$ \uparrow
- **pH value:** Δ 0.5 units \downarrow
- Heat Shock Response (HSR: HSP70/HSC70).
- Cellular damage: Lipid peroxidation (malondialdehyde levels).
- Metabolic potential: Citrate synthase and Lactate dehydrogenase activity.

Oyster Bed, McClellanville

Oyster farm

- Total Haemocyte Count Viability;
- Shell ultrastructure



RESULTS



CONCLUSIONS

- The exposure to the experimental conditions triggered the activation of a stress response, although not sufficient to prevent cellular damage, particularly under hypercapnia.
- Our results also denote a shift from aerobic towards anaerobic metabolism. Haematological parameters were likewise affected by the experimental conditions, particularly acidification.
- Additionally, over time, the shell ultrastructure suffered major alternations as a consequence of the synergistic action of ocean warming and acidification

