IMPACTS OF OCEAN ACIDIFICATION THROUGHOUT THE LIFE CYCLE OF THE EUROPEAN ABALONE HALIOTIS TUBERCULATA

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Résumé

Ocean acidification (OA) and the changes in carbonate chemistry induced by the increasing uptake of CO2 in seawater are major threats for calcifying organisms. In marine molluscs, OA has been shown to reduce survival and growth, alter morphology and impair shell calcification. This presentation summarises a series of experimental studies on the effects of OA throughout the life cycle of the abalone *Haliotis tuberculata*, a commercially important resource for fishery and aquaculture in Brittany.

Controlled laboratory experiments were performed by exposing abalone to relevant OA scenarios, ambient pH (_˜8.0) and decreased pH (_˜7.7) over a period ranging from a few days to several months. Several biological parameters were measured in larval, juvenile and adult abalone by combining physiological, calcification and behavioural measurements. No effect of decreased pH was observed on adult metabolism, reproduction and behaviour, suggesting that abalone maintain their vital functions. However, shell growth, microstructure and mechanical properties were altered at pH 7.7 leading to a more fragile shell. Developmental abnormalities and significant decreases in shell length and calcification were also observed in larvae and juvenile exposed to reduced pH.

These results show that OA has a negative impact on the European abalone at every stage of

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its life cycle, with calcification being the most affected function. Abalone with more fragile shells could be more vulnerable to predators and pathogens under future climate conditions. In addition, the sensitivity of early stages to pH reduction could also compromise the recruitment success in wild populations.

Mots-Clés: abalone, ocean acidification, physiology, shell growth and calcification, beahaviour