Functional capacities of gill mitochondria in oyster

Sessile animals that live on the foreshore undergo tidal cycles, and have to face variations in physical and chemical parameters such as oxygen concentration. During emersion, availability of dissolved oxygen can be lowered for bivalves, which have only a small reserve of seawater inside their closed shell. Differences in oxygen concentration are thus expected to lead to modifications of the metabolism, including changes in mitochondrial activity. Previous studies investigated air exposure under extreme conditions, which do not always reflect environmental conditions these invertebrates have to cope with. In this study, oxidative capacities of gill mitochondria of the oyster Crassostrea gigas were studied during a tidal cycle period, by comparing oysters collected after emersion and immersion. Only minor differences were found in state 3 (oxidative phosphorylation) or state 4 (non-phosphorylating oxygen consumption) rates between the two conditions. Similarly, no difference was observed in cytochrome c oxidase activity or in oxygen consumption related to maximal electron flux through complexes I-IV, II-IV and IV. While capacities of substrate oxidation were maintained in both emersion and immersion conditions, capacity of mitochondria to produce adenosine triphosphate (ATP) was significantly lower in oysters sampled during emersion. These results suggest that although C. gigas could maintain aerobic metabolism during emersion period within a tidal cycle in its environment, energy producing mechanisms are affected.

Auteurs du document : Tony Dudognon, Philippe Soudant, Catherine Seguineau, Claudie Quéré, Michel Auffret, Edouard Kraffe
Obtenir le document : EDP Sciences
Mots clés : Mitochondria, oxygen consumption, ATP production, respiratory chain inhibitor
Thème (issu du Text Mining) : BIOCHIMIE - CHIMIE
Date : 2013-06-07
Format : text/xml
Source : https://doi.org/10.1051/alr/2013053
Langue : Anglais
Télécharger les documents : https://www.alr-journal.org/10.1051/alr/2013053/pdf
Permalien : https://www.documentation.eauetbiodiversite.fr/notice/functional-capacities-of-gill-mitochondria-in-oyster0