Effects of extreme ocean temperature rise on *Acartia spp* respiration rates.

Author's Names: A.D. Pitsika[1,2], S. Zervoudaki[1], M.K. de Boer[2]
Affiliations:

1. Hellenic Centre for Marine Research, Institute of Oceanography, P.O. Box 712, 19013, Athens, Greece
2. University of Groningen, Netherlands, FSE Department, Marine Biology

Presenting author: Aikaterini Dimitra Pitsika
Presenting author email: katepitsika@gmail.com

Abstract

This study investigated the impact of ocean warming on copepod respiration rates in the oligotrophic Aegean Sea. Zooplankton, crucial for carbon distribution and multiple other ecosystem functions, is particularly vulnerable to climate-induced variations. Rising water temperature has been proven to increase zooplankton metabolic rates, leading to elevated respiration needs. Research over the natural temperature range has been limited, particularly in enclosed oligotrophic waters, such as the Aegean Sea, where copepods are the dominant zooplanktonic group. In this study, we measured the respiration rates per individual of two Acartia species, at different temperatures ranging from 14 to 34^{o}C, using the PRESENS respirometer. Respiration rates of different life stages were measured. We hypothesised that copepod respiration rates will linearly increase with temperature over the natural range up to a certain degree, showcasing species-specific thermal limits. The results demonstrate a clear rising trend in respiration rates, which is correlated with temperature increase up to a certain plateau at 24^{o}C for both species. Over 24^{o}C the respiration decreased and stabilised. These findings may inform fisheries management, offering insights into ecosystem-carrying capacity and fostering sustainable practices in a changing environment. Understanding copepod dynamics in response to climate change is paramount for comprehending broader marine ecosystem shifts and human-dependent activities.

Presentation Preference

Oral Presentation

Poster

Special Issue Consideration:

. I would like my abstract to be considered for the special issue of the Journal Marine Ecology.