

Reply to reviewer's comments

This is an interesting paper that extends some of the results presented in Frederick et al. (2024) regarding adaption of the metabolic rate of copepods to low oxygen conditions in an eastern boundary upwelling system (EBUS). While the title and abstract imply that this manuscript will be a general review of hypoxia stress on EBUS zooplankton, their focus is on modification of respiration (P_{crit}) and reactive oxygen stress (ROS). There are other zooplankton individual, population and community responses such as reductions in fecundity, growth rate, species size, changes in the species composition, etc. which are not addressed in this Review and Synthesis. The authors might want to acknowledge this narrower focus (perhaps change the Title) and provide references to other reviews of hypoxia effects on zooplankton.

R. We appreciate comments and suggestions from the reviewer. It is true that previous studies have reported different aspects of ecological effects of hypoxia on plankton. In our review, we are not intending to cover all these aspects, but to focus specifically on some physiological aspects largely less considered, and which we believe are essential to understand how the organisms may or may not adapt to cope with potential future ocean deoxygenation. In this regard, we agreed with the reviewer that is better to change the tittle a bit to be more specific. Our new tittle will be “Reviews and synthesis on increasing hypoxia in eastern boundary upwelling systems: zooplankton under metabolic stress”

Line 84: The authors cite Chisholm and Rolf (1990) as the reference for oxygen-regulators/conformers as related to P_{crit} . This citation was not in the references and I do not think it is the proper reference for this topic.

R. We agree with this comment and it was a mistake to add this cite. We are now correcting and the right cite is Portner & Grieshaber (1993) which has also been added to the reference list.

The focus of the paper is on zooplankton of the EBUS, most of which are copepods which do not have gills. Many of the references (lines 95-98) provided on oxygen regulation are for fish and invertebrates which have gills which may have different regulatory oxygen capacity than copepods which obtain oxygen by diffusion through their body surface.

R. The reviewer is right, although the modelling of these metabolic responses was indeed developed in fishes and then lately applied to invertebrate such as crustacean including

copepods without gills. We have modified the paragraph to be more specific and now citing other studies on copepods.

The Legend for Figure 3 is not correct. The Y axis is Metabolic Rate (presumably oxygen consumption/zooplankton and the X axis is Oxygen Partial Pressure (presumably in kPA). Pcrit is the oxygen partial pressure at which the slope of the line changes.

R. Thanks for spotting this, it has now been amended

Line 127-128. It should be noted that the study referenced for *Acartia tonsa* was conducted in Chesapeake Bay, a shallow estuary in the U.S. not an OMZ.

R. Agreed. The text has been modified. We now report these effects on other copepod species, and in the case of *Acartia* we now specify that such hypoxic conditions have an origin other than due to the presence of an OMZ.

Line 145. Perhaps a reference should be listed to support this sentence.

R. Agreed: a reference has been added (Zheng, 2021 for review)