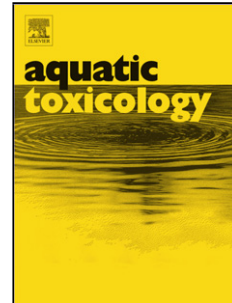


Accepted Manuscript

Title: Effects of ocean acidification on copepods

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PII: S0166-445X(18)30004-3
DOI: <https://doi.org/10.1016/j.aquatox.2018.01.004>
Reference: AQTOX 4833

To appear in: *Aquatic Toxicology*

Received date: 22-9-2017
Revised date: 22-12-2017
Accepted date: 4-1-2018

Please cite this article as: Wang, Minghua, Jeong, Chang-Bum, Lee, Young Hwan, Lee, Jae-Seong, Effects of ocean acidification on copepods. *Aquatic Toxicology* <https://doi.org/10.1016/j.aquatox.2018.01.004>

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Elsevier Editorial System(tm) for Aquatic
Toxicology
Manuscript Draft

Manuscript Number: AQTOX-D-17-00676R2

Title: Effects of ocean acidification on copepods

Article Type: Review Article

Keywords: Acclimatization/adaptation; Copepods; Long-term effects; Ocean acidification; Response

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Abstract: Ocean acidification (OA) leads to significant changes in seawater carbon chemistry, broadly affects marine organisms, and considered as a global threat to the fitness of marine ecosystems. Due to the crucial role of copepods in marine food webs of transferring energy from primary producers to higher trophic levels, numerous studies have been conducted to examine the impacts of OA on biological traits of copepods such as growth and reproduction. Under OA stress, the copepods demonstrated species-specific and stage-dependent responses. Notably, different populations of the same copepod species demonstrated different sensitivities to the increased pCO₂. In copepods, the deleterious effects of OA are also reinforced by other naturally occurring co-stressors (e.g., thermal stress, food deprivation, and metal pollution). Given that most OA stress studies have focused on the effects of short-term exposure (shorter than a single generation), experiments using adults might have underestimated the damaging effects of OA and the long-term multigenerational exposure to multiple stressors (e.g., increased pCO₂ and food shortage) will be required. Particularly, omics-based technologies (e.g., genomics, proteomics, and metabolomics) will be helpful to better understand the underlying processes behind biological responses (e.g., survival, development, and offspring production) at the mechanistic level which will improve our predictions of the responses of copepods to climate change stressors including OA.

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