

Researchers publish rebuttal of prior study on ocean acidification effects on the behavior of coral reef fishes

October 22 2020



Credit: CC0 Public Domain

A group of thirteen researchers from six countries has released a new scientific paper rejecting an earlier study claiming ocean acidification

has no effects of the behavior of coral reef fishes.

Earlier this year, a [paper](#) by Clark et al. published in *Nature* claimed that previous experiments on the effects of elevated CO₂ on reef fish behavior could not be repeated, and argued [ocean acidification](#) has no effects on the behaviors of coral reef fishes.

In a comprehensive rebuttal published in *Nature*, lead author Professor Philip Munday from the Centre of Excellence for Coral Reef Studies at James Cook University said there are fundamental methodological differences between the studies conducted in the "provocative" Clark et al. article and the earlier studies with which they made direct comparison.

"There are so many fundamental differences in what Clark et al. have done compared with the previous studies that the comparisons are invalid," Prof Munday said.

The authors of the rebuttal argue that experiments conducted by Clark et al. differed in at least 16 critical ways compared with previous research.

"Clark et al. claim to have closely repeated earlier studies, but failed to replicate key species, used different life stages and ecological histories, and altered methods in critical ways that reduce the likelihood of detecting ocean acidification effects."

Prof Munday said that contrary to their assertions, Clark et al. did not closely replicate the methods of past studies, some conducted over a decade ago. Instead, they made fundamental changes to flume design and methodology that would have affected results. In addition, their experimental treatments lacked the stability needed to meet necessary standards and were much more variable than in previous studies.

"The evidence that elevated CO₂ can affect fish behavior is overwhelming," says Prof Göran Nilsson, a co-author from the University of Oslo. "Over 85 peer-reviewed papers by many different authors have demonstrated that elevated CO₂ can affect the behavior of fish from coral reefs and other habitats, including at least 8 papers by the authors of Clark et al., which they fail to acknowledge in their paper. They also fail to address the striking result that fish exposed to elevated CO₂ have altered behavior and reduced survival in the field."

"A [reproducibility crisis](#) in science is inevitable if no attempt is made to accurately replicate previous work and to acknowledge other vital evidence," Prof Munday said.

Prof Munday said scientists are still increasing their understanding of the impact of ocean acidification on fish behavior.

"Since the earliest experiments in this field were published, we have learnt that not all species are equally affected, and with factors such as sensory compensation, CO₂ fluctuations, high temperature and risk history diminishing, or even reversing, the behavioral effects of elevated CO₂ on [reef](#) fish."

"By contrast, recent studies report dramatic effects of elevated CO₂ on the survival of early life stages of some temperate fishes. We still have much to learn before generalizations about the impacts of elevated CO₂ on wild [fish](#) populations are possible," Prof Munday said.

The paper has been published in the journal Nature

More information: Philip L. Munday et al. Methods matter in repeating ocean acidification studies, *Nature* (2020). [DOI: 10.1038/s41586-020-2803-x](https://doi.org/10.1038/s41586-020-2803-x)

Additional material associated with the Matters Arising article published in *Nature* by Munday and colleagues: [DOI: 10.25903/7rz7-4640](https://doi.org/10.25903/7rz7-4640)

Provided by James Cook University

Citation: Researchers publish rebuttal of prior study on ocean acidification effects on the behavior of coral reef fishes (2020, October 22) retrieved 28 April 2024 from <https://phys.org/news/2020-10-publish-rebuttal-prior-ocean-acidification.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.