

Baby corals pass the acid test

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Corals can survive the early stages of their development even under the tough conditions that rising carbon emissions will impose on them says a new study from the ARC Centre of Excellence for Coral Reef Studies.

Globally, [ocean acidification](#) due to the burning of fossil fuels remains a major concern and scientists say it could have severe consequences for the health of adult corals, however, the evidence for negative effects on the early life stages of corals is less clear cut.

Dr Andrew Baird, Principal Research Fellow at the ARC Centre of Excellence for Coral Reef Studies and James Cook University, was part of the research team and explains their findings.

"The prevailing view is that ocean acidification will act like a [toxin](#) to corals, but we were unconvinced by results from previous work on young corals and ocean acidification so we tested critical early stages of development in several [coral species](#) at several different acid (or 'pH') concentrations of [seawater](#).

"Our results showed no clear response to increasing ocean acidification in any of the stages, or for any of the coral species," says Dr Baird. "In fact, in only one of nine experiments did we get the response expected if CO₂ was acting like a toxin. More often than not we found no effect."

By bubbling CO₂ through seawater the research team was able to simulate future levels of ocean acidification expected to result from rising human [carbon emissions](#). They tested the success of [embryo](#)

[development](#), the survival of coral [larvae](#) and finally their success in settling on [coral reefs](#).

Although their results suggest that ocean acidification may not affect the early stages of coral development, the team warn that this does not mean acidification is not a threat to corals.

"Undoubtedly, as the oceans become more acidic adult corals are going to struggle to build their skeletons, which might hinder their ability to grow, reproduce and compete for space on reefs. We also have to remember that the oceans are getting warmer, so corals will be dealing with higher temperatures, as well as higher acidity.

"Fortunately, before corals settle on to reefs they don't need to grow a skeleton, which might explain why they are apparently unaffected in by higher levels of ocean acidification," says Dr Chia-Miin Chua, the lead author of the study.

"This message is reinforced when we look at the early life stages of creatures that do need a larval [skeleton](#), such as sea urchins and oysters. In these cases we see early life stage development slowing down as acidity increases."

However the study does not discount the possibility that coral larvae may suffer other ill-effects from increasing ocean acidification, for example, their swimming speeds may slow down, but because coral larvae typically settle on the reef two or three weeks after birth it is unlikely that these effects will have a major impact on the survival or settlement of coral larvae.

Dr Baird says that while the long-term outlook for corals may be gloomy, this research highlights the fact that not all life stages of corals will be equally affected.

The paper "Near-future reductions in pH will have no consistent ecological effects on the early life-history stages of reef corals" by Chia-Miin Chua, William Leggat, Aurelie Moya and Andrew Baird is available online in the journal *Marine Ecology Progress Series*.

More information: www.int-res.com/abstracts/meps/v486/p143-151/

Provided by ARC Centre of Excellence in Coral Reef Studies

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