Sheltering habits help sharks cope with acid oceans

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This is an epaulette shark sheltering in a reef. Credit: M. Heupel

A shark's habitat can reduce its sensitivity to rising CO2 levels, according to Australian scientists.

Globally, ocean acidification - linked to emissions of greenhouse gases - remains a major concern and scientists say it will harm many marine

species over the next century.

Researchers from the ARC Centre of Excellence for Coral Reef Studies (Coral CoE) at James Cook University have found that the epaulette shark, a species that shelters within reefs and copes with low oxygen levels, is able to tolerate increased carbon dioxide in the water without any obvious physical impact.

"As part of the study we exposed the sharks to increased CO2 for more than two months, mirroring the levels predicted for the end of the century," says study co-author Dr Jodie Rummer from Coral CoE.

"We then tested the sharks' respiratory system, measuring how much oxygen it needed to maintain basic function under the experimental conditions."

The researchers found the sharks were regulating their systems to counter the higher levels of acid in their bodies. Importantly, Dr Rummer explains, the sharks' ability to cope with low oxygen levels – similar to that found in its natural habitat – was unaffected by high CO2 levels.

Study co-author, Professor Philip Munday from the Coral CoE says the sharks' physiological adaptations, which enables it to cope with the conditions within reefs, makes them better able to tolerate ocean acidification.

"Species that live in shallow reef environments, where they can experience naturally high CO2 levels on a regular basis, may have adaptations that make them more tolerant to future rises in CO2 levels than other species."

Professor Munday says the next critical step is to test the sensitivity of

other shark species to ocean acidification.

"Species that live in the open ocean may be more susceptible to future acidification than those that naturally live in shallow reef environments where they already experience a variable environment."

Dr Rummer adds that by determining which animals are more and less susceptible to high CO2 than others, scientists will be better able to predict the future consequences of ocean acidification on marine ecosystems.

Provided by ARC Centre of Excellence in Coral Reef Studies