

Predators drive clownfish relationship with an unlikely friend

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A clownfish hiding away in the anemones. Credit: Stefan Andrews

Predators have been identified as the shaping force behind mutually beneficial relationships between species such as clownfish and anemones.

The finding results from a University of Queensland and Deakin University-led study.

UQ School of Biological Sciences researcher and Australian-American Fulbright Scholar Dr. William Feeney said the research aimed to

understand the origin of such relationships, known as interspecies mutualisms, which are extremely common in nature.

"Clownfish – like Nemo from Finding Nemo – and [anemones](#) are a great example of this type of relationship," he said.

"Clownfish live in and around anemones, helping drive off the anemone's predators and providing it with food, while in exchange the anemone provides protection with its stinging tentacles.

"Clownfish have evolved to resist the stings of the anemone, so it ends up being a very beneficial [relationship](#) for both species."

The researchers said the study helped explain how [natural selection](#) had shaped global patterns of biological diversity.

"We tested and confirmed a very basic and intuitive – but logistically difficult – idea in evolutionary ecology," Dr. Feeney said.

"In a nutshell, we were looking to find out whether [external pressures](#), such as predators, can explain the repeated evolution of these kinds of mutually beneficial partnerships.



Credit: University of Queensland

The research combined [genetic analysis](#) with field experiments in French Polynesia to build a better understanding of fish-anemone mutualism dynamics.

Deakin University Centre for Integrative Ecology Research Fellow Dr. Rohan Brooker said the team found that fish-anemone mutualisms had evolved at least 55 times across 16 fish families over the past 60 million years.

"This is much more common than previously thought. Over a quarter of coral reef-associated fish families have at least one species that associates with anemones," Dr. Brooker said.

"Our results suggest that the risk of predation has selected these relationships, and that partnerships with anemones primarily benefit

smaller fishes.

"Overall, this study suggests that predation can explain the independent evolution of cooperative behaviours between species, and that this evolutionary pattern could apply globally.

"If you can't find Nemo, it might be a good idea to go rummaging through the tentacles of his anemone friends."

The study is published in *Ecology Letters*.

More information: William E. Feeney et al. Predation drives recurrent convergence of an interspecies mutualism, *Ecology Letters* (2018). [DOI: 10.1111/ele.13184](https://doi.org/10.1111/ele.13184)

Provided by University of Queensland

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