

INGRID CRIPPS

ingrid.cripps@gmail.com

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Supervised by:

Dr. Philip Munday (JCU)

Dr. Mark McCormick (JCU)

Dr. Andrew Negri (AIMS)

The effects of ocean acidification on predator-prey interactions in reef fish

Ingrid grew up in Melbourne and moved to Townsville to follow a life-long ambition to study marine biology. After completing her honour project and a highly regarded publication, Ingrid secured a graduate role with the Australian public service in Canberra.

Ocean acidification is already detectable and should global carbon dioxide (CO₂) emissions continue to increase on the present trajectory, average pH of the oceans could fall by approximately 0.5 units by 2100. Ocean acidification is predicted to negatively impact marine biodiversity, in particular marine calcifying organisms. However, research on its influence on reef fish populations is in its infancy.

Recent research has indicated that the olfactory sensory abilities of coral reef fish can be severely affected by elevated dissolved CO₂, with pre-settlement larvae becoming attracted to the smell of their predators. Through this project, Ingrid investigated whether the predators of the larval fish were affected in the same way. This is important as it will help to inform managers of the potential effect of ocean acidification on higher order trophic levels on reefs.

In contrast to the 100% reduction in prey smelling and avoiding predators, Ingrid found that attraction of predators to the smell of injured prey is reduced by only about 20% at comparable levels of CO₂.

As larval fishes already face extremely high predation at settlement, the observed reduced predator detection of prey is unlikely to compensate for the high mortality rates of larval fish. This supports the findings that ocean acidification is a potential threat to future fish population replenishment.

Marine ecosystems are facing a multitude of human threats; climate change; overfishing; and increased sedimentation and nutrient input. The synergism of these impacts on fish populations and coral reef systems can make predictions of the effects of ocean acidification difficult to determine. However, Ingrid's research indicates that without significant reductions in global carbon dioxide emissions, ocean acidification could have profound consequences for marine ecosystems and reef fish populations worldwide.

Publications

Cripps, I.L., Munday, P.L. & McCormick, M.I., 2011. Ocean acidification affects prey detection by a predatory reef fish. *PloS one*, 6(7), p.e22736. Available at: <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=3145675&tool=pmcentrez&endertype=abstract>

