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PhD Candidate, 2012 to 2014

ARC Centre of Excellence for Coral Reef Studies

Supervised by:

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Drivers of colony-level variation in condition and resilience for reef-building corals

Chiara is originally from Rome, where she completed Undergraduate and Postgraduate degrees in Marine Science. She always dreamed about researching coral reefs and after working in Indonesia, she moved to Townsville in 2009 to start a Master of Applied Science in Marine Biology. In 2012 Chiara started her PhD in the ARC Centre of Excellence for Coral Reef Studies.

Coral reefs throughout the world have been subject to sustained and ongoing disturbances, causing declines in live coral cover, which can lead to catastrophic shifts in the structure of formerly coral-dominated habitats. Promoting resilience has been proposed as a key environmental management strategy. Significant variation in the capacity of corals to withstand and recover from major disturbances is well documented, but the underlying basis of this variation is still poorly understood. Chiara's research will fill this knowledge gap by investigating drivers of colony-condition and their energetic consequences for colony resilience.

Specific objectives are to:

1. Quantify background rates of partial mortality for coral populations at a hierarchy of spatial scales along the Great Barrier Reef for four common coral species; massive *Porites*; encrusting *Montipora*; *Acropora hyacinthus* and *Pocillopora damicornis*.
2. Test influence of disturbance history versus other biological and environmental factors on colony condition.
3. Experimentally induce partial mortality to test both the role of colony condition in determining capacity for tissue repair, and energetic consequences of tissue repair.
4. Explicitly test whether colony condition influence "resilience" (resistance and recovery) of corals to thermally-induced bleaching.

Chiara has found that the number of corals that were injured was significantly higher than uninjured. The severity of background partial mortality was also surprisingly high (between 5% and 21%), it varied at both small and large spatial scales, being two-times higher in the central and southern, than the northern GBR. She also found coral taxa differed significantly in the severity of background partial mortality, with differences between taxa consistent with latitude.



Publications

Cole, A.J. et al., 2014. The effects of coral bleaching on settlement preferences and growth of juvenile butterflyfishes. *Marine Environmental Research*, pp.1–5. Available at: <http://linkinghub.elsevier.com/retrieve/pii/S0141113614000452>

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Pratchett, M.S., Pisapia, C. & Sheppard, C.R.C., 2013. Background mortality rates for recovering populations of *Acropora cytherea* in the Chagos Archipelago, central Indian Ocean. *Marine environmental research*, 86, pp.29–34. Available at: <http://www.ncbi.nlm.nih.gov/pubmed/23518368>