Coral recovery in the central Maldives archipelago since the last major mass-bleaching, in 1998

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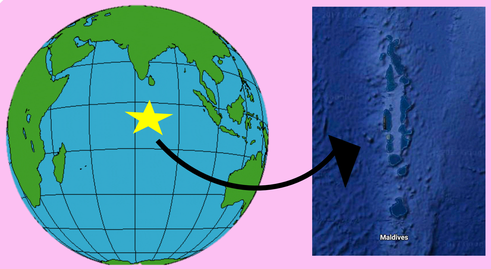


Figure 1. A map of Maldives, Indian Ocean, showing where data collection took place.

- Increasing frequency and severity of disturbances is causing global degradation of coral reef ecosystems = Important to identify specific reef types or environmental settings that confer increased resilience.

Methods

Figure 2. Data collection= temporal changes in live coral cover and coral composition 1997 to 2016= line transect methods- three replicate transects, on the reef crest (5 meters) and slope (10 meters).

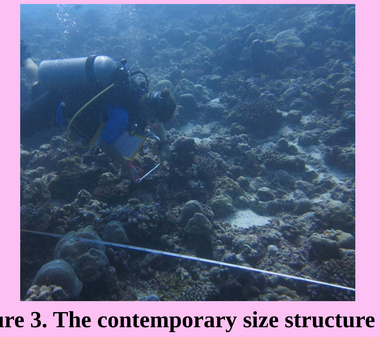


Figure 3. The contemporary size structure for five dominant coral taxa (Figure 6). 10 × 2 m belt transects. For every colony, maximum diameter and partial mortality (percentage of tissue loss) recorded.

Results Part 1

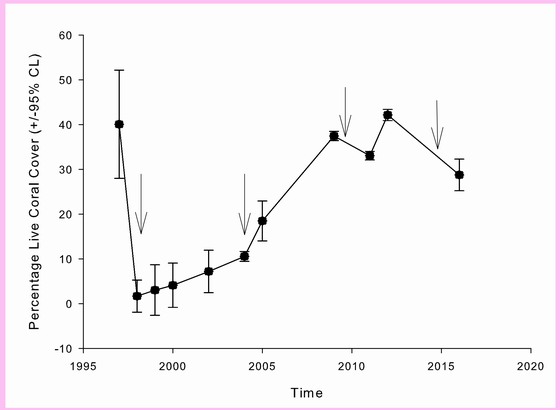
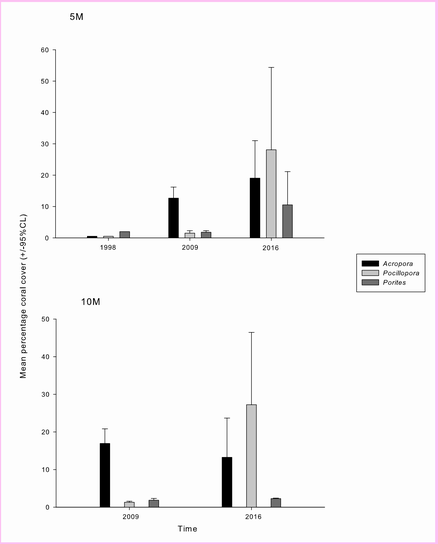
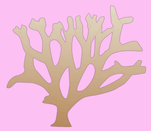


Figure 4. Variation in mean (±95% CL) coral cover at 5 meters in all study sites. The occurrence of the 1998 and 2010 coral bleaching events, the tsunami in 2004 and outbreaks of *A. planci* in 2015 is shown with arrows.
Data for 2016 were collected during the present study, while historical data on study sites from 1997 to 2013 were extrapolated from published papers.

Results Part 2





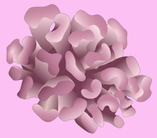
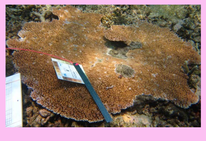


Figure 5. Temporal variation in mean percentage live coral cover (±95% CL) of major coral genera *Acropora*, *Pocillopora* and *Porites* at the study sites at 5 m and 10 m depth in 1998, 2009 and 2016.

Results Part 3



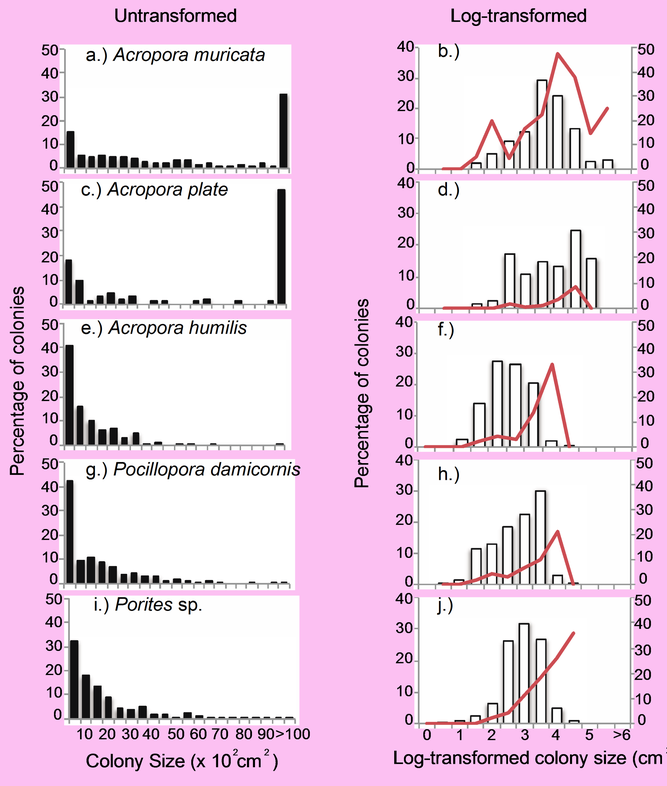


Figure 6. Log-transformed and untransformed size-frequency distributions of *Acropora muricata*, tabular *Acropora*, *Acropora humilis*, *Pocillopora* spp and *Porites* spp. The dark line indicates average partial mortality (%) for each size class.

Discussion

- Maldivian systems are slowly capable of recovery following multiple disturbancess--but this does not guarantee that theses reefs will be resilient to further disturbances.
- The size-frequency distributions dominated by larger size classes with over-centralized, peaked distributions (negatively skewed with positive kurtosis) = smaller size classes under-represented.
- Either there has been ongoing suppression of reproduction and recruitment, or that recent disturbances have caused disproportionate mortality among smaller size classes.

Acknowledgements

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