The effects of sediments and nutrients on Moreton Bay corals

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Sediments and nutrients can be controlling factors limiting the formation of coral reefs, often reducing species diversity and growth rates 1,2. Corals have a variety of mechanisms for dealing with sedimentation, however their ability to cope differs both within and between coral species. In Moreton Bay, there is a distinct gradient in the composition of coral reef communities which is most likely a result of the interactions between intermittent flooding events, water quality gradients and oceanic flushing 3. This study examined the effects of different sedimentation regimes and increased nutrients on a variety of physiological responses of Acropora digitifera and Favia speciosa, including photosynthetic capacity, chlorophyll content and density of symbiotic dinoflagellates.

Results and Discussion

The effects of different sedimentation regimes and increased nutrients on the photosynthetic capacity (Fv/Fm) of corals. Environmental variables such as light and temperature appeared to have a greater impact on Fv/Fm than the experimental treatments.

Methods

Aquaria experiments exposed corals to a variety of sediment and nutrient loading regimes. Treatments were maintained over a 15 d period and included the addition of kaolin, kaolin and sorbed nutrients, Moreton Bay sediments and controls.

Results

Observe differences in the amount of chlorophyll present in the endosymbiotic dinoflagellates was attributed to increased levels of nutrients for A. digitifera, and both photoacclimation (due to turbidity decreasing light availability) and nutrient addition for F. speciosa.

![Graph showing chlorophyll content of two coral species following 15 d exposure to various sediment and nutrient regimes.](Photo: Chris Roelfsema)

There were no significant differences in the density of symbiotic dinoflagellates between the different sediment and nutrient treatments, for either A. digitifera or F. speciosa.

![Graph showing density of symbiotic dinoflagellates of two coral species following 15 d exposure to various sediment and nutrient regimes.](Photo: Chris Roelfsema)

Overall, F. speciosa demonstrated greater tolerance to increased sedimentation and decreased light availability than A. digitifera, possibly due to differences in the mechanisms used by these two species to cope with sedimentation and/or turbidity.

References:


Photo: Chris Roelfsema