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Summary

Like most prospective home buyers wishing to settle down in one place for a long time, tiny rice-shaped coral larvae scrutinize their potential neighbourhoods and domiciles before attaching to just the right spot on the reef and undergoing metamorphosis. Once attached to the reef, a coral recruit is immobile for the rest of its life which can be centuries long—a long time to deal with mouldy walls, contaminated water, and loud neighbours! Like a bouquet of flowers and the smell of freshly baked biscuits attracts a prospective homebuyer to a certain property, healthy crustose coralline algae (CCA) signal to coral larvae which areas on the reef are optimal places to settle. Although the interaction between coral and CCA has been well documented, there are still a lot of unknowns regarding CCA life cycle, chemistry, ecology, and even identification. For instance, DNA sequencing has revealed that CCAs formerly thought to have been one single species, are several species being mistaken for one another. Given how some CCA species are more appealing to coral than other CCA species, and how certain CCA species are detrimental to coral settlement, it is important to be able to differentiate between CCA species. My research seeks to fill in knowledge gaps surrounding CCA identity and name application, determine optimal conditions for growth and propagation of the most enticing CCA, and elucidate which chemical(s) produced by CCA are responsible for attracting coral larvae. The results of this research will be applied to upscaling the production of the best CCA for settling coral larvae and reseeding degraded portions of the Great Barrier Reef.

Research Expertise

- Field identification of algae and identification using dichotomous keys
- DNA extraction from algae (brown, green, red, calcified) and Polymerase Chain Reaction (PCR); editing and aligning DNA sequences
- Molecular species identification and phylogenetic analyses
- Data collection for biodiversity assessments (transect/quadrat data)
- Preservation and preparation of algal specimens for DNA extraction and herbarium use