OTHER

DETERMINATION OF NUTRIENT HOT SPOTS ON CORAL REEFS USING A COMMON MACROALGAE

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/ CONTEXT

Coral reefs are diverse underwater ecosystems held together by calcium carbonate structures secreted by corals. Coral reefs are built by colonies of tiny animals found in marine water that contain few nutrients. This research focuses on nutrient dynamics on coral reefs. The Burkepile lab in collaboration with the Moorea Coral Reef Long Term Ecological Research Lab collected a common macroalgae, *Turbinaria ornata,* at 190 points around the island of Moorea, French Polynesia. Nutrient hot spots were evaluated by analyzing the tissue content of dried *Turbinaria* for carbon and nitrogen as well as stable isotopes.

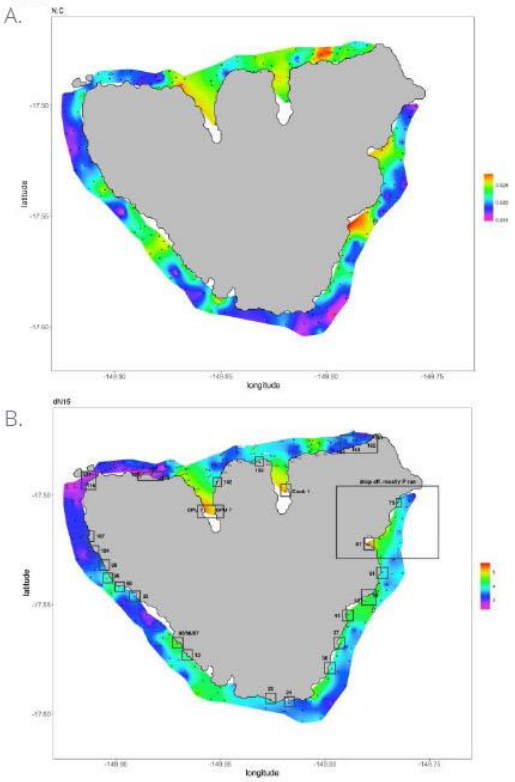
/ MATERIALS

- Bead beating Homogenizer: **Precellys® Evolution**
- Lysing Kit: **7mL metal tubes** (KT03961-1-602.M), 2 x 6.8mm Zirconium oxide beads (KT03961-1-107.BK)
- Tissue Samples: **10 dried *Turbinaria ornata* blades**

/ PROTOCOL

1) Collect 10 individuals of *Turbinaria ornata,* remove one blade 5 cm from apical tip on thallus
2) Scrub algae to remove epifauna, dry at 60°C for 72 hours
3) Load each sample (about 10 blades) in 7mL metal tube with two 6.8mm ceramic beads
4) Place tubes in Precellys® Evolution homogenizer with blocking plate, and set grinding protocols to 5,500 RPM 2 cycles of 20 sec with 20 sec pause
5) Repeat cycle if sample is not completely homogenized
6) Send homogenized samples to analytical lab for CHN, Stable Isotope Analysis

/ RESULTS



A.. Nitrogen : Carbon ratio B. Delta N15 stable isotopic signatures. Warm colors on maps indicate increased nitrogen enrichment

/ CUSTOMER

Moorea Coral Reef LTER
member of the NSF Long Term Ecological Research Network

/ CONCLUSION

Using a Carbon, Hydrogen, Nitrogen analyzer and continuous-flow isotope ratio mass spectrometer with macroalgae, we have mapped nutrient-enriched hot spots around an inhabited island in the South Pacific. This allows us to better understand the impact of anthropogenic nutrients on coral reefs and the areas of concern, including the populated north shore, two bays, and passes on the reef. The Precellys® Evolution with the 7ml metal tubes gives us confidence that our samples are uniformly homogenized and free of contamination for these analyses.

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