The effect of the presence of *Syringodium filiforme* on the physiology of *Acropora cervicornis* under ocean acidification conditions

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**ABSTRACT**

The aim of the study is to evaluate the effect of the presence of *S. filiforme* seagrass on the physiology of *A. cervicornis* coral. We hypothesize the presence of *S. filiforme* will alleviate the effects of ocean acidification on coral growth and physiology in the seawater. This, in turn, will show greater rate of calcification with presence of seagrass in low pH environments as well as increased rates of coral photosynthesis and respiration.

**RESULTS**

![Experiment 1](image1.png)  
**Experiment 1**

- **Experiment 1**
  - **Experiment 2**
    - **Experiment 2**

**DISCUSSION & CONCLUSIONS**

- The majority of the *A. cervicornis* samples in the 7.6 pH condition underwent severe rapid tissue loss after five weeks in the system, which for some samples resulted in death. The tissue loss occurred in tanks both with and without seagrass.
- The results suggest that *A. cervicornis* are sensitive to a lower pH and are likely to be negatively impacted by severe decreases of pH.
- The presence of *S. filiforme* seagrass increased the rate of photosynthesis under both pH conditions.
- Within each pH condition, the corals have likely acclimated to their base average rate of photosynthesis. The presence of the seagrass may have altered the levels of dissolved carbon molecules, increasing the concentration of carbonate ions used by the zooxanthellae within *A. cervicornis* for photosynthesis.
- After two weeks, the rate of growth was significantly greater in corals under lower pH conditions. Larger amount of carbon dioxide available in low pH condition in short-term, may increase the carbon fixation by *A. cervicornis*, leading to a faster growth rate. The results are consistent with the other findings by the ocean acidification program researchers (Muller et al. unpublished data).
- Coral response to the ocean acidification conditions is species specific.

**ACKNOWLEDGMENTS**

I would like to express my deepest gratitude to Dr. Emily R. Hall, my primary supervisor, for her expertise and guidance on this project. I would also like to acknowledge the guidance I received from Dr. Erin M. Muller and Jim Gibling throughout the project. I would also like to thank Rebecca Pauze, Charles Miller, Britania Colon, Joan Kim, Lucinda Li, Peter Chen, and Alana Boyles for their help in the ocean acidification system.

I am indebted to NSF OCE 1541749 grant for funding the research and Mote Marine Laboratory’s Ocean Acidification and REU programs for trusting me with the great pleasure and responsibility of an individual project in the area of my interest.

**OBJECTIVE & HYPOTHESIS**

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**RESULTS**

![Experiment 1](image2.png)  
**Experiment 1**

- **Experiment 2**
  - **Experiment 2**

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**RESULTS**

![Experiment 1](image3.png)  
**Experiment 1**

- **Experiment 2**
  - **Experiment 2**

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