The Effect of Anthropogenic Noise Pollution on the Photosynthetic Yield of Aiptasia

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Background: Human activity has added a surplus of noise to the ocean. The effects of anthropogenic noise are well-studied in larger vertebrate organisms, but although coral is a keystone species, the effects of anthropogenic noise on coral are largely unknown. The Aiptasia anemone is a model organism for coral, both have photosynthetic symbiotes that will be expelled if stressed (also known as bleaching). Methods: Anemones were evenly distributed into multiple tanks. Each identical tank setup was exposed to different levels of anthropogenic noise pollution (boat motor recording) over the course of at least thirty days. Photosynthetic yield was measured before and after the experiment with a chlorophyll fluorometer. Results: In trial one, the group exposed to ambient noise saw a decrease in photosynthetic yield whereas the two groups exposed to medium or high level of noise saw increases in photosynthetic yield. The group with the highest decibels of anthropogenic noise at 88dB saw the largest increase. In trial two when anthropogenic noise was increased, there was a decrease in photosynthetic yield as anthropogenic noise increased, with the highest level of noise pollution having a 21% decrease in photosynthetic yield. Conclusion: There is a correlation between photosynthetic yield and anthropogenic noise pollution in Aptasia anemones. The data suggests that the aneomes are healthier with some noise (closer to natural levels) but too much noise can cause decreased photosynthetic yield lowering anemone health. This suggests the need for further studies on the affect of noise pollution stress on coral and other invertebrates.

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