A Comparative Study of Different Plant and Limestone Combinations, and Their Ability to Naturally Mitigate the Harmful Effects of Ocean Acidification on Costal Coral Reef Health

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Coral reefs are a critical part of the ocean’s ecology, being home to 4,000 fish species and 700 types of coral. Increasing levels of carbon dioxide are causing the oceans to acidify. This acidification in turn is causing massive coral death. This experiment sought to determine the natural ability of three different marine plants and limestone combinations to mitigate the harmful effects of ocean acidification on costal coral reef health. It was predicted that if mangroves, halimeda plants or maiden’s hair algae are combined with limestone to naturally mitigate the effects of ocean acidification on coral reef health, then the mangrove and limestone combination would prove to be most effective. During experimentation, eight reef aquaria were set up and an identical selection of corals were added to each. Similar amounts of limestone were added to each aquarium, and then plants were added into six of the eight aquaria, with two aquaria designated per each plant/limestone combination. Carbon dioxide was then diffused at a constant rate in all of the aquaria, and the pH levels, calcium levels and physical coral health scores were recorded throughout the experiment. While the parameters in all of the aquaria with the plant/limestone combinations remained significantly higher than those of the aquaria exposed to carbon dioxide with only limestone present, the mangrove/limestone combination worked the best, as the aquaria with this combination present retained the second highest pH and calcium levels, as well as the highest zooxanthellae counts and visual health score.

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