Corals Prolonged and Controlled Heat Adaptation

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The purpose of this investigation is to determine if there is a relationship between different coral species and their ability to adapt to heat. This experiment explores how corals might increase their thermal tolerance as a potential enabling strategy in response to climate challenges and coral bleaching. Three tanks were filled with reverse osmosis water mixed to a salinity of 34 ppt and cycled using the API Master Test Kit. Coral fragments from two species, Acropora Palmetta and Acropora Cervicornis were acclimated and placed on frag racks. Tank 3 was designated as the control and maintained at 24.4C with no signs of bleaching ever occurring while Tanks 1 and 2 started at 24.4C and were raised 1C daily until the corals exhibited signs of bleaching. The Cervicornis began to bleach at 26.3C in the first trial, 27.5C in the second, 28.3C in the third trial, and 29.3C in the fourth trial. After each bleaching, temperatures were reduced back to the original resting temperature of 24.4C. Similarly, the Palmetta began to bleach at 26.6C in the first trial and demonstrated the same degree of improvement in subsequent trials as the Blazing Banshee. These results indicate that both species developed greater thermal tolerance following repeated heat exposures. Findings support the initial hypothesis demonstrating that controlled acclimatization lead to increased thermal tolerance in both species. The implications of these results suggest that artificial selection techniques provide valuable insights for improving future restoration attempts aimed at preserving coral in the face of climate stress. These continued efforts will help refine approaches to coral restoration and contribute to combating the challenges posed by global warming and reef degradation.

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