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Topic: Marine Biology & Sustainability, Coral Reef Restoration, Climate Change

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Title: The effects of temperature and acidification on 3 coral species



Abstract

Coral reefs are a vital ecosystem that, while only making up 0.1% of the Earth's surface, account for over 30% of marine biodiversity. Unfortunately, in recent decades, local and global threats have begun to pose more imminent threats to the world's reefs. Climate change and ocean acidification are inducing massive bleaching events and hindering reef recovery and survival. Pollution, overfishing, sedimentation, and deforestation are other environmental issues that are producing negative impacts among reef ecosystems. This particular study examined the effects of temperature change, specifically warmer temperatures, and acidification, or lower pH levels, on 3 coral species: *Sinularia* leather coral, *Caulastrea furcata*, and *Xenia elongata*. Previous literature has shown hardy coral species to be more resilient against temperature increases, and branching and soft coral species to be more resilient against acidification and lower pH. Hardy species tend to be tougher and more compact, while branching and soft are more subdued and at times more vulnerable. This study aims to explore and observe how corals respond to the pressures of temperature change and acidification, either through environmental adaptation or stress responses such as bleaching. The main points being measured will be coral bleaching as a result of stress and the impacts of the independent variables of temperature and pH on coral growth. The results of this research can be applied to marine conservation efforts for all marine-calcifying species, which use calcium to build their skeletons or shells, not just corals. The results can provide a more detailed understanding of the changing environment, the threats it is creating, and how to effectively combat these threats. Climate change is one of the planet's biggest perils. In order to preserve critical ecosystems for future generations, it is imperative that more research is conducted to analyze how different environmental shifts cause various coral species and regional reef ecosystems to respond and adapt.