AN INVESTIGATIVE STUDY OF THE IMPACTS OF INCREASING OCEAN ACIDIFICATION ON CORAL REEF HEALTH AND MARINE BIODIVERSITY

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As anthropogenic carbon dioxide emissions continue to rise, the oceans are absorbing more CO_2, leading to a decrease in PH levels and ocean acidification. This global phenomenon poses significant threats, particularly to coral reef ecosystems and marine biodiversity. Studying the impacts of ocean acidification on coral reef health and marine biodiversity can be identified as the problem with this study. The main objective of this study is to explore the impacts of increasing ocean acidification on coral reef health and the subsequent consequences on marine biodiversity, and to identify mitigation strategies to mitigate the threats posed by ocean acidification to these fragile ecosystems. The research mainly depended on secondary sources of information: research articles, magazines, books, and suitable web sites. Increased ocean acidification and a decline in seawater PH can lead to reduced calcification rates in corals and disrupt the delicate balance of carbonate ions essential for coral classification, affecting their skeletal growth and structural integrity. This decrease in calcification also affects the success of coral reef ecosystems in providing essential nurseries, habitats, shelter, and feeding grounds for countless marine species. Additionally, ocean acidification can alter the symbiotic relationship between corals and zooxanthellae, leading to coral bleaching events. As coral health declines, there are wave effects on associated marine species, including fish, invertebrates, and microorganisms, leading to reduced biodiversity and ecosystem instability. The research findings reveal a clear correlation between increasing ocean acidity and declining coral health, leading to reduced reef growth and structural degradation. Increased ocean acidification disrupts the delicate balance of marine ecosystems. Therefore, there is an urgent need for continued research and proactive measures to mitigate the impacts of ocean acidification on coral reef health and marine ecosystems, highlight the importance of reducing carbon emissions, and implement conservation strategies to safeguard these fragile habitats. Ocean acidification poses a serious threat to coral reef ecosystems and marine biodiversity, and addressing ocean acidification requires collaborative efforts from the global community to ensure the long-term survival and resilience of coral reefs and the myriad of marine species that depend on them.

Keywords - *ocean acidification, coral reefs, marine biodiversity, carbon emissions.*

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