Impact of Ocean Acidification on Relative Fitness and Interspecies Interactions of Picophytoplankton

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Ocean Acidification (OA) is caused by increase of CO2 in the atmosphere due to industrialization. Oceanic pH prior to the industrial revolution was 8.2. By 2100, pH will be 7.8 if acidification continues as predicted. OA is expected to globally impact health and physiology of marine organisms. This study investigated how elevated CO2 affects relative fitness of two dominant species of marine picophytoplankton: Prochlorococcus and Synechococcus. These species were cultured individually at ambient or elevated CO2 conditions and then were mixed into co-culture to compete at these conditions. It was determined using difference in growth rates between the 2 conditions that the fitness of the species is not impacted by CO2 alone. Culturing conditions affect fitness of both species. When Prochlorococcus is co-cultured with Synechococcus, the harmful effect of CO2 is mitigated. This shows that the conservation of biodiversity and climate change prevention are important at the microbial level.

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