Diversity of Arctic Ice Bacteria in Relation to Position and Distance from the Shore

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Microorganisms that live in sea ice are essential to the Arctic ecosystem. The presence of Arctic ice is rapidly declining, so time is running out to study the unique environment. There have been studies done to identify bacteria in ice, but few studies that investigated a correlation between the diversity of bacteria and environmental factors. The observance of these organisms over a period of time could allow for the prediction of other species levels in the Arctic. The identification of these microorganisms is also a gateway to theorising the characteristics of microscopic life on other planets. Eight ice cores were taken from the Chukchi Sea off the coast of Utqiagvik, Alaska and divided up into forty-two samples. The samples were melted down, centrifuged, and then plated onto nutrient agar. Then, a sample from each unique colony was taken and run through Polymerase Chain Reaction (PCR). The PCR product was then sequenced and used to identify the species of bacteria. From the linear regressions performed, no significant relationship was found between any of the seven bacteria identified and the position in the ice or distance from the shore. The p-values for the relationship between bacterias A, E, and F and the distance from the seawater were 0.12, 0.3, and 0.055 respectively, while the p-values for shore distance were 0.76, 0.46, and 0.94. Future studies should examine other variables such as salinity or temperature on a larger scale to look for a relationship with bacterial diversity.

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