

Jackson, J.E., and R.W. Castenholz. "Fidelity of Thermophilic Blue-Green Algae to Hot Spring Habitats." *Limnology and Oceanography* 20.3 (1975): 305-322. (Reviewed by Lucy Cho)

This was a study done by Richard W. Castenholz from the University of Oregon on the habitats of blue-green algae in Yellowstone National Park, the Willamette River, and the Everglades National Park in Florida. These sites were chosen for reasons specific to each site. The Yellowstone National Park was chosen because it is famous for its abundance of hot springs, the Willamette River because there are only a few hot springs found in the watershed, and the Everglades because it lacks any geothermal springs that have a temperature above 30°C. This trend was necessary in choosing their sites because one of their goals in doing this study was to be able to predict the nature of algal colonization and temporal change when new thermal environments such as power plants and industries are created, eventually adding more and more heat to the ecosystem.

It was found that the hot springs were the origin of the blue-green algae found in these sites. This was determined by the fact that the cell density decreased as distance downstream from the hot springs increased. The hot spring blue-green algae cells died when they reached the point of more than 100 km downstream. More tests were run to see what the effects of light were on these cells in cold water, and it was found that they were lethal conditions for the algae. Castenholz and Johnson concluded that it is likely that further industrialization may increase and expand the range in which blue-green algae can form, where it was once restricted to only geothermal springs.

Critique

I thought this study was a very interesting approach to learning the effects of temperature on the growth of the toxic blue-green algae in the three sites where samples were collected. Although the study was not focused on the Willamette River, the two other sites were useful, and even necessary. Yellowstone National Park and Everglades National Park served as the two extremes, with the Willamette in between. I believe this was a necessary approach to seeing any patterns in the types of blue-green algae that were found and their resilience to cold temperatures.

A good discussion was included of the possible human effects that might mirror those of the geothermal springs in terms of algae-growth. In this way it demonstrated the relevance and importance of this particular study. It briefly discusses the temperatures that would be critical for the survival of these blue-green algae, and how these temperatures would be attained in highly urbanized and industrialized areas because of the use of water as a coolant. I would have liked to see a discussion on how the introduction of blue-green algae would affect the species interactions and environmental impact this sort of range expansion would have.

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