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Water temperature and Harmful Algal Bloom Rate

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ABSTRACT

Harmful algal blooms, made up of cyanobacteria, is an increasing problem in Midwestern lakes. Nitrogen and phosphorus fertilizers used in crops such as corn and soybeans run off into streams and eventually lakes. Nitrogen and phosphorus in the form of nitrate and phosphate respectively is then used by cyanobacteria as a food source, allowing them to bloom at an alarming rate. Massive bloom events can be hazardous to both human health and the natural environment because of the release of neurotoxins, hepatotoxins and others into the air and drinking water. We set out to find if different water temperature can affect the rate at which cyanobacteria can use nitrate. Six different species of cyanobacteria were analyzed. For each species, two solutions with known amounts of nitrate and excess phosphate were mixed, with one solution kept at 31 degrees Celsius and the other kept at room temperature. Overtime, the concentration of nitrate was measured. We found that, on average, the species kept at a higher temperature were able to use nitrate faster than their colder counterpart.

KEYWORDS

Algae, cyanobacteria, fertilizer, isotopes