

Battling Algal Blooms: How Rotifers Keep Microcystis in Check

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Harmful Algae Blooms (HABs) are growths of microalgae that produce harmful toxins. *Microcystis aeruginosa* is the cyanobacterium commonly found in HABs. *Microcystis* produces the cyanotoxin microcystin, a hepatotoxin that has caused death in livestock as well as humans. Native to Arkansas, rotifer *Brachionus calyciflorus* is an omnivorous holoplankton that digests microalgae and is known for its resistance to environmental pressures. This project researches rotifer *Brachionus calyciflorus* and how it could possibly reduce *Microcystis* HAB concentrations effectively. The cultures of *Microcystis* were grown under an LED growth light over the course of the experiment, then diluted to the desired concentration (100,000 or 1,000,000 cells/mL), with three trials per concentration. Each trial included *Microcystis* alone, *Brachionus* alone, and *Microcystis* & *Brachionus* together, which were each placed into three tubes with freshwater medium. The samples were placed under the LED light and regularly measured for *Microcystis* concentrations using a hemocytometer. The weekly percentage change of *Microcystis* cultured with *Brachionus*, on average, trends downward over time. Every trial's *Microcystis* growth significantly decreased (ANCOVA test, all $p < 0.05$) in comparison to the control group. A 2-sample t-test was performed between *Microcystis* with and without *Brachionus* per trial, showing a significant difference (all p-values < 0.05). Though the reduction in *Microcystis* was significant, it did not last, so the rotifers may need to be re-implemented after a few weeks for a constant effect. This study is an important opportunity for helping treat or even prevent blooms, especially in vulnerable locations.

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