

# The Role of *Bacillus subtilis* on Algae Blooms for the Survival of Aquatic Ecosystems

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The purpose of this project is to find a more efficient, environmentally safe way to reduce algae bloom growth. If algae growth is decreased by the growth of the bacteria, *Bacillus subtilis*, more than the store-bought algae preventative and does not harm the *Daphnia magna*, then *Bacillus subtilis* is a more environmentally safe method of decreasing algae. The result of algae blooms can be devastating due to the depletion of oxygen in the water. A control group of spring water and daphnia was used to compare with the other groups. One group of spring water and *Daphnia magna* was exposed to a proportioned amount of a common fertilizer. Another group was exposed to the fertilizer, but *Bacillus subtilis* was added. The next group was exposed to the fertilizer, but the store-bought preventative was added. The store-bought preventative over a short amount of time killed all algae and all *Daphnia magna*. *Bacillus subtilis* sustained a controlled amount of algae. These jars had little loss of *Daphnia magna*. The t-Test for living *Daphnia* count with Group 3 ( *Bacillus subtilis*) and Group 4 (store-bought preventative) was highly significant (  $t = 4.07 > t_{0.01} = 3.06$ ). After data analysis and statistics, *Bacillus subtilis* is a more suitable option than the store-bought preventative. The hypothesis is supported.

**Awards Won:**