Exploring the Environmental Impact of Copper II Sulfate on Dugesia tigrina and Lemna minor

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Geological deposits, volcanic activity, and weathering, along with mining, agriculture, and manufacturing are some of the many ways copper gets into waterways. Copper is one of the most toxic metals to aquatic organisms and ecosystems. The purpose of the science experiment was to determine the effects of copper II sulfate on aquatic life. Specifically, Dugesia tigrina (planaria) and Lemna minor (duckweed) were exposed to various concentrations (0.0 ppm, 0.1 ppm, 0.2 ppm, 0.3 ppm, and 0.4 ppm) of copper II sulfate. The effects of the metal on survival and growth/regeneration were measured over time. To do this study, copper II sulfate solutions were prepared. Planaria were placed in petri dishes for 16 days and duckweed was placed in culture dishes for five weeks, both with various copper II sulfate concentrations. The survival and growth/regeneration were measured. Results were averaged and statistical analysis was conducted on the data. After conducting five trials and averaging the results, it was determined that the Dugesia tigrina and Lemna minor had the highest rates of growth/regeneration in the control environment, without the presence of copper II sulfate. All concentrations of copper II sulfate had a negative effect on both species. Based on statistical analysis, the Dugesia tigrina had significantly higher survival ($p = 0.000122$) and regeneration rates ($p < .0001$) in the control environment than all other test groups, except 0.02 ppm copper II sulfate. After conducting statistical analysis on the Lemna minor portion of the experiment, it was determined that the Lemna minor had significantly more growth in the control group than any of the copper II sulfate test groups ($p < .0001$).

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