



# CALIFORNIA SCIENCE & ENGINEERING FAIR

## 2018 PROJECT SUMMARY

<b>Name(s)</b> <b>Sasha Avakyan</b>	<b>Project Number</b> <b>S1104</b>
<b>Project Title</b> <b>Reverse Eutrophication of Freshwater Samples Containing Spirogyra Using a Liverwort Moss Specimen</b>	
<div><div><b>Objectives/Goals</b><p>The purpose of this experiment was to support the idea that cheap species of plants found almost anywhere in the world can serve as mechanisms for nutrient reduction in an effort to reduce the harmful effects of water over-enrichment. It was hypothesized that if the Liverwort specimen is present in a sample of water containing Spirogyra, the water's levels of nitrogen and phosphorous will decrease.</p></div><div><b>Abstract</b><p></p></div><div><b>Methods/Materials</b><p>In this study, two different environmental situations were mimicked: a eutrophic body of water containing Spirogyra (algae) and a eutrophic body of water containing Spirogyra and a live Liverwort, a species of flat-leaved moss. These two samples underwent the same conditions including temperature, volumes of water, and exposure to light, when cultivated in a 7-day period. The samples were tested for N and P using test tablets.</p></div><div><b>Results</b><p>After allowing substantial growth, samples were collected from each container, and after testing, the container with the liverwort moss showed noticeably fewer amounts of both N and P. The results from the experiment show that a certain species of moss, specifically the liverwort, can play a key role in the mitigation of eutrophic bodies of water due to their method of nutrient absorption.</p></div><div><b>Conclusions/Discussion</b><p>The practical implications of this study's findings, which show that the liverwort absorbs excess N and P, include possible large-scale ecosystem projects like artificial wetlands. Nevertheless, further research into the compatibility of this species of moss in certain ecosystems in which eutrophication is present is desirable to extend the knowledge of its possible outcomes. Overall, these findings have the potential to enrich future research in order to reduce the harmful effects of eutrophication on the welfare of surrounding people, flora, fauna, and the ambiance of the environment.</p></div></div>	
<b>Summary Statement</b> <p>In this study, I tested the effects of the liverwort moss' presence in a eutrophic sample of water to assess whether this plant serves as a mechanism for excess nitrogen and phosphorus absorption.</p>	
<b>Help Received</b> <p>Mr. William Lapin, my biology teacher, reviewed my final paper.</p>	