



CALIFORNIA STATE SCIENCE FAIR

2015 PROJECT SUMMARY

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Project Title Hope 2 Others (H2O): The Bioremediation of Water Using the Plants Moringa oleifera and Coriandrum sativum	
<div>Objectives/Goals Objectives/Goal: The objectives of this project were to study and compare the abilities of two widely available plants, Moringa oleifera (moringa) and Coriandrum sativum (cilantro), to purify water of turbidity, metals, and bacteria and to create a prototype that could be used in developing nations.</div> <div>Methods/Materials Three types of experiments were performed studying the effects of moringa seeds, fresh cilantro, and dried cilantro on turbidity, metals, and bacteria. In the turbidity experiment, dirt solutions were prepared and treated with one of the plants and the clarity of the water was recorded over time. In the metals experiment, solutions of copper, iron, and lead were prepared and treated with the plants. The concentrations of these metals were measured over time using metal test strips. In the bacteria experiment, contaminated water was collected from a local pond and treated with the plants in varying concentrations then poured through a filter of gravel, sand, and cheesecloth and then tested for bacteria using bacteria test strips. Finally, a prototype water purification system was created.</div> <div>Results Overall, we found that moringa was more effective than cilantro at purifying water. In terms of turbidity, moringa cleared the water significantly whereas cilantro did not. Moringa was also able to reduce levels of all the metals to 0 ppm in just 30 minutes. Dried and fresh cilantro were also able to reduce metals but were not as effective as moringa. Finally moringa was able to purify bacteria from water while both fresh and dried cilantro were ineffective.</div> <div>Conclusions/Discussion 780 million people in the world lack access to safe water and more than 3 million will die each year after drinking from a contaminated source. There are many water purification devices and methods, but these are often ineffective, expensive, or inaccessible. Bioremediation is the use of bacteria or plant matter to solve environmental problems. Moringa and cilantro are plants that grow widely in regions around the world that lack clean water. Our team compared the purification abilities of these plants and found that the moringa tree is an inexpensive, effective, and widely available solution to the need for clean water in developing nations. Bioremediation of water using native plants holds exciting potential to eradicate death and suffering from waterborne diseases and bring hope to others.</div>	
Summary Statement Our project studied the bioremediation of contaminated water using the plants Moringa oleifera and Coriandrum sativum.	
Help Received Parents helped purchase supplies, supervised procedures for safety, and provided transportation to collect pond water samples.	