



**CALIFORNIA STATE SCIENCE FAIR
2015 PROJECT SUMMARY**

Name(s) Elina B. Yon	Project Number 35820
Project Title Effects of P. stratiotes Phytoremediation of Nitrates and Phosphates and Effects as Organic Mulch Fertilizer on Lettuce	
Abstract Objectives/Goals In my research, I have found that nutrient pollution is one of the most prominent problems in America. Excess nitrogen and phosphorus can lead to eutrophication and algal blooms. A source of this nutrient pollution is lawn fertilizers that add nitrates and phosphates to the ecosystem. My project serves to contribute to the measures being taken to effectively reduce nutrient pollution in water and soil by phytoremediation. Rather than merely increasing it by using lawn fertilizers and adding to the nutrient pollution, my project involves creating an organic fertilizer as a way to recycle the nitrogen and phosphorus in our environment. Methods/Materials I performed my experiment by growing my water lettuce plants in denitrized water with different levels of nitrates and phosphates. I had three different settings with high, moderate, and relatively small amounts of nitrates and phosphates. I mulched the water lettuce plants that showed to have the most nitrate and phosphate uptake to use as organic mulch fertilizer with a food chopper; I prepared 5 pots with this mulch fertilizer, 5 with commercial chemical fertilizer, and 5 control ones. I grew 10 romaine lettuce seeds in each pot. Results I observed that the group with the most nitrates and phosphates saw the most uptake in nutrients. My second experimental group followed, then the group with the least amount of nitrates and phosphates showed the least uptake in nitrates and phosphates. The difference between the three data groups is shown to be statistically significant using ANOVA. My results show that plants treated with the organic mulch fertilizer had the most growth in both height and biomass compared to commercial fertilizer as well as the control group. Although my data is not statistically significant, this shows that organic mulch fertilizer will allow for the efficient recycling of nitrates and phosphates in the ecosystem. Conclusions/Discussion Through my project, I demonstrated that P. stratiotes can be used to not only clean up nutrient pollution in water, but also prevent it in soil by replacing chemical fertilizers. The phytoremediative capability of P. stratiotes has been demonstrated as well as the positive effect organic mulch fertilizer has on the growth of Lactuca Sativa.	
Summary Statement Through my project I demonstrated that P. stratiotes can be used to not only clean up nutrient pollution in water, but also prevent it in soil by replacing chemical fertilizers with an eco-friendly organic one.	
Help Received Research Science Teacher gave me basic guidelines throughout project	