



**CALIFORNIA STATE SCIENCE FAIR
2003 PROJECT SUMMARY**

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| Name(s) Swati Yanamadala | Project Number J0930 |
| Project Title The Remediating Effect of Ludwigia peploides and Aeration on Cultural Eutrophication | |
| <p style="text-align: center;">Abstract</p> <p>Objectives/Goals Cultural eutrophication is a major problem affecting lakes all over the world. Ludwigia peploides is a plant native to riparian communities in Southern California. It is unknown whether Ludwigia peploides should be cultivated or removed in Lake Machado to mitigate eutrophication. The effect of aerators currently running in the lake is also unknown. This project tested the effect of Ludwigia peploides and aeration on eutrophication. Ludwigia peploides should consume nitrates, phosphates, and oxygen, and the aerator should replenish the water with oxygen thus decreasing eutrophication and improving water quality.</p> <p>Methods/Materials Each of four containers had 1200 mL of storm drain water. Container B also had Ludwigia peploides. Container C also had an aerator. Container D also had both Ludwigia peploides and an aerator. Samples were tested periodically for phosphate, nitrate, dissolved oxygen, and pH content using the LaMotte Smart Colorimeter.</p> <p>Results Ludwigia peploides when alive probably does not affect phosphate concentration, however when it decomposes it probably rapidly adds phosphate. When decomposing Ludwigia peploides is combined with aeration this causes a tremendous increase in phosphate concentration. It also appears that Ludwigia peploides rapidly consumes nitrates while living, but when it decomposes it releases great amounts of nitrate which is only worsened by aeration. Ludwigia peploides also has a detrimental effect on dissolved oxygen levels, which are not fully replenished by aeration. While living Ludwigia peploides decreases pH levels and while decomposing increases pH levels. Aeration does not have a significant affect on pH levels.</p> <p>Conclusions/Discussion It appears that the presence of Ludwigia peploides in eutrophic lake water is beneficial as it consumes nitrates and only a small amount of oxygen while living. On the other hand when Ludwigia peploides decomposes, it rapidly releases nitrates and phosphates and consumes significant quantities of oxygen thus contributing to eutrophication. It also appears that aeration may not be as beneficial as previously thought. Therefore it is essential to monitor lake waters and remove any decaying or decomposing Ludwigia peploides and other organic matter.</p> | |
| Summary Statement My experiment tested the effect of Ludwigia peploides and aeration on cultural eutrophication. | |
| Help Received Parents drove and supervised | |