

Nitrate Absorption Between Pickerel Weed (*Pontederia cordata*) and Duck Potato (*Sagittaria latifolia*) in the Lake Waco Wetlands

Amanda Flynn, David Garcia & Bekah Hernandez
Biology 1406, Spring 2010, Baylor University, Waco, Tx

Abstract

Two common plants to the Waco Wetlands are Pickerel Weed and Duck Potato. This preliminary experiment was performed to determine which plant absorbs more nitrates. Our hypothesis is that, due to its size and structure, pickerel weed would be the more efficient of the two plants. The results show that pickerel weed consistently absorbed the most



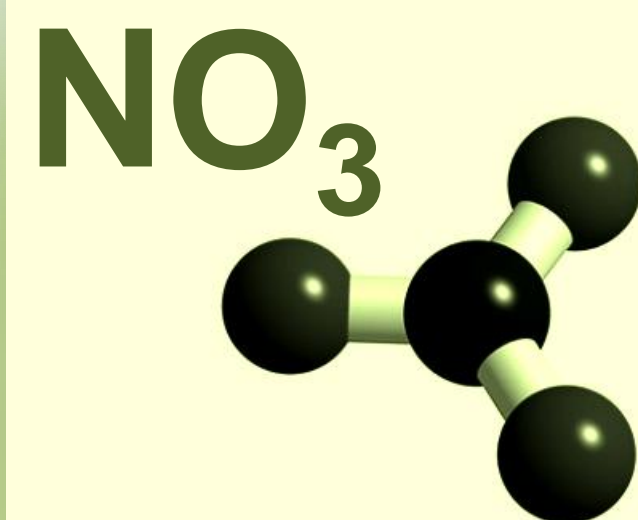
Pickerel Weed



Duck Potato

Introduction

Nitrate is a common water pollutant that is harmful to aquatic wildlife and potentially harmful to human health at high levels (Reilly). Plants play a big role in nitrate absorption, ranging from 3%-47% of the total absorption (Wang 2010). This study compared nitrate absorption between duck potato and pickerel weed. The hypothesis was pickerel weed would absorb more nitrate.



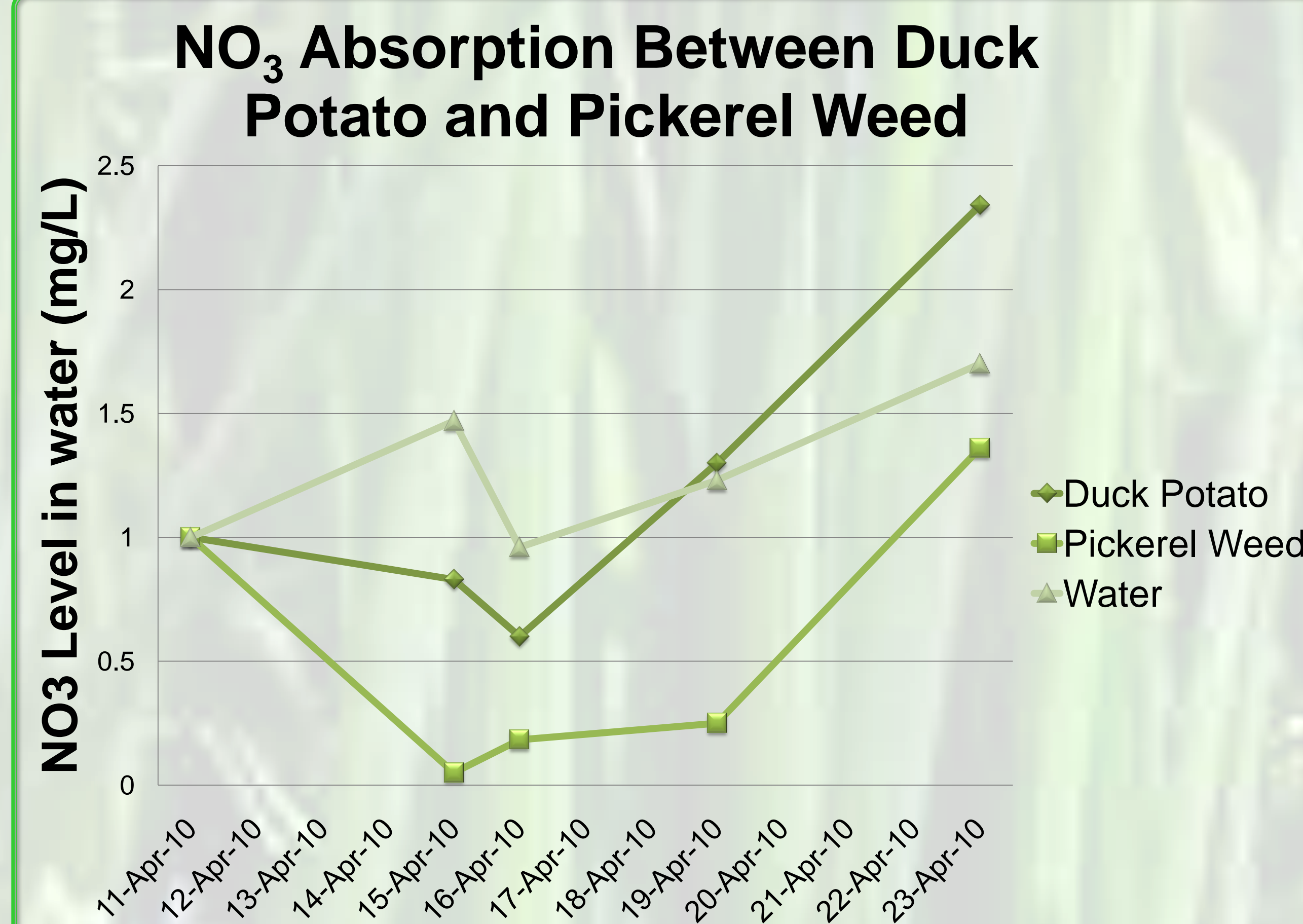
Materials & Methods

This study was conducted at the Lake Waco Wetlands.

1. For this study, 15 of both Pickerel Weed and Duck Potato, nine 18.93 liter containers, and one 1892.71 L mesocosm were obtained. 5324.37 cm³ of soil, 10,000 mL of water from the wetlands, and 12.5 mL of fertilizer with a 7-7-7 concentration were placed in each container.
2. The containers were set up so that 3 containers had 5 pickerel weed, three have 5 duck potato, and 3 containers were the controls, which were just soil and water. Water samples of 50 mL were collected from each container on April 11th, 15th, 16th, 19th and 23rd. Nitrate levels in the water samples were tested using the HACH 890 colorimeter low to mid range cadmium reduction methods.

Results

The results showed that pickerel weed had consistently lower levels of nitrate through out the weeks tested.



Conclusion

A statistician consulted the data and concluded that pickerel weed has a 0.0097 probability of absorbing more nitrates than duck potato. This data proves the hypothesis and concludes the experiment. It also proves that wetlands with pickerel weed could be an effective way to remove nitrate from contaminated water (Ingersoll).



Amanda Flynn testing for nitrates



Bekah Hernandez & David Garcia with Pickerel Weed

Literature

- Ingersoll, Todd L., & Lawrence A. Baker. "Nitrate Removal in Wetland Microcosms." *Water Research*. 32.3 (1998): 677-684. Web.
- Reilly, James F. et al. "Nitrate removal from a drinking water supply with large free-surface constructed wetlands prior to groundwater recharge." *Ecological Engineering*. 14.1-2. (2000): 33-47. Web.
- Wang, Lin et al. "Characteristic Analysis of Plants for the Removal of Nutrients from a Constructed Wetland using Reclaimed Water." *Clean*. 38.1 (2010): 35-43. Web.

Acknowledgements

Special Thanks to:

Dr. Marty Harvill, Dr. Shannon Hill, Nora Schell, Kristen Rose, Lake Waco Wetlands, Baylor University College of Arts and Sciences, and Biology Department.