# Use of Invasive Plants for Enhancing Nutrient Removal During Water Treatment

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The EPA is setting a new standard on nitrogen concentration in effluent water at water treatment plants; due to high amounts of nitrogen commonly present in this water, the current form of removal is to add chemicals in order to counteract nitrogen. This project experiments with removing major nitrogen compounds, ammonia and nitrates, as well as total coliform and E. coli, with the use of two invasive species of plants: water hyacinth and water lettuce. The research was conducted at a water treatment facility. Due to accessibility restraints, the apparatus was in a location that used water that had all organic solids removed and some chemical treatment initiated. This water was pumped through the testing apparatus that consisted of two sets of three bins containing water hyacinth, water lettuce, and no plants in separate bins. Water samples were collected from the influent and the effluent of each bin and tested for ammonia and nitrates. The influent and water hyacinth bin were also tested for total coliform and E. coli. To test the effects of long term exposure, the influent was shut off and left static for 24 hours and tested before and after the retention period for ammonia and nitrates. On average water lettuce had 1% less ammonia and 5% less nitrates, water hyacinth had 6% less ammonia and 5% less nitrates. In the comparison of pre-static and post-static water: water lettuce had 64% less ammonia and 94% less nitrate in post-static, water hyacinth had 71% less ammonia and 38% less nitrates in post-static. Compared to influent, water hyacinth had 66% less total coliform and 67% less E. coli. The data supported the hypothesis as the two plants reduced the levels of ammonia, nitrates, total coliform, and E. coli with constant flow of water and in static water.

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