

## عنوان مقاله:

Nutrient removal efficiency by floating macrophytes; Lemna minor and Azolla pinnata in a constructed wetland

## محل انتشار:

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## خلاصه مقاله:

The use of constructed wetlands for purifying pre-treated wastewater is a cost effective technology that has been found to be more appropriate for many developing countries. The technology is also environmentally friendly with the wetlands being habitats for many water birds and other aquatic organisms. This study assessed nutrient removal efficiency of two floating macrophytes (Lemna minor and Azolla pinnata). The data generated was analyzed using both descriptive and inferential statistics. The significance level was maintained at 0.05. The results showed that the wastewater physicochemical parameters did not vary during the study period. The concentrations of nitrites and nitrates increased over the experimental period in all the treatments (Azolla pinnata, Lemna minor and control), and the increase between the sampling occasions was statistically significant for the two nutrients (Nitrates:  $F=24.78$ ,  $P=0.00$ ; Nitrites:  $F=198.26$ ,  $P=0.00$ ). To the contrary, in all the treatments the concentrations of ammonia, total phosphorous, soluble reactive phosphorous and total nitrogen, decreased over the experimental period. The decrease in concentration for these nutrients between the sampling occasions was statistically significant (ammonia:  $F=195.57$ ,  $p=0.00$ ; total phosphorous:  $F=56.50$ ,  $p=0.00$ ; soluble reactive phosphorous:  $F=37.11$ ,  $p=0.00$ ; total phosphorous:  $F=104.025$ ,  $p=0.00$ ). Azolla pinnata proved to be better than Lemna minor in the uptake of the nutrients particularly for the soluble reactive phosphorous ( $F=35.18$ ,  $P=0.044$ ). We conclude that the two macrophytes are good for wastewater treatment. It is recommended introduction and/or multiplication of Azolla pinnata in the constructed wetlands meant for wastewater treatment especially within the tropics.

## کلمات کلیدی:

constructed wetland, Effectiveness, Efficiency, macrophytes, Nutrients, Physicochemical parameters

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