

## **Effect of Selected Aquatic Macrophytes in Controlling Some Human Enteric Pathogens of Sewage Sludge Collected from Common Waste Water Treatment Plant at Biyagama EPZ**

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The macrophyte based constructed wetlands (CWs) are economically feasible, easy to manage and an effective phyto-remediation method to treat sewage sludge safely. These wetlands have also been used for the removal of human enteric pathogens from sewage sludge. The present study assessed the effect of *Eichhornia crassipes*, *Salvinia molesta* and *Pistia stratiotes* in controlling fecal coliform and *Salmonella* in sewage sludge collected from the Common Waste Water Treatment Plant (CWWTP), EPZ Biyagama in dry and wet seasons. Equal weights of acclimatized young plants of each species were placed in three pre-set batch type CWs simultaneously. Controls were maintained and triplicates of all treatments were continued for 28 days. Sludge samples were analyzed weekly for fecal coliform and *Salmonella* following USEPA standard methods. Data were analyzed using MINITAB (version 14.12.0). According to the results, the fecal coliform content in raw sludge did not show a significant difference between dry ( $3.1 \times 10^4$  MPN/g (dry weight)) and wet ( $3.7 \times 10^4$  MPN/g (dry weight)) seasons (Two-sample T-test;  $p=0.670$ ). CWs that contained different macrophytes lowered the initial fecal coliform content after the 3<sup>rd</sup> week in the dry season. Nevertheless, a gradual reduction of fecal coliform content was observed in wet season in all CWs that contained macrophytes. On the other hand, the controls lowered the fecal coliform content up to 2<sup>nd</sup> week and then increased in both dry and wet seasons. When compared all three macrophyte treatments, a significant reduction of fecal coliform content on day 28 was shown by the CWs that contained *S. molesta* in both seasons (One-way ANOVA;  $p=0.003$  in wet season and  $p=0.004$  in dry season). *Salmonella* was not recorded in either raw or treated sludge in CWs. Altogether, the results suggested that CWs consist of *S. molesta* have a high potential to lower the level of fecal coliform in sewage sludge generated at CWWTP at Biyagama EPZ.

**Keywords:** Batch type constructed wetlands, fecal coliform, *Salvinia molesta*, sewage sludge

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