Modelling Faecal *Streptococci* Mortality in Constructed Wetlands Implanted With*eichhornia Crassipes*

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Abstract
Faecal streptococci mortality was investigated in a water hyacinth (Eichhornia crassipes) constructed wetland pond. The wetland was 7.5 m long, 1.5 m wide and 1.0 m deep, and was implanted with E. crassipes. In order to assess the performance of the system towards bacterial mortality, a mathematical model, based on plug flow philosophy was developed. The model incorporated the role of factors, namely solar intensity, pH, dissolved oxygen, temperature, sedimentation, and root attached growth. Model analysis strongly suggests that bacterial mortality rate constant was largely influenced by two factors, namely solar intensity and root biofilm attachment, with both contributing approximately 70.5% of removal. The contribution of other factors like temperature, dissolved oxygen, pH and sedimentation on bacterial mortality rate were less significant. For example, dissolved oxygen, pH and sedimentation contributed 5%, 8% and 0.82%, respectively. Thus, the sedimentation factor was omitted from the model because of its insignificant contribution. The same was done for temperature, due to low ambient temperature range (3.1°C) in the study area. The overall model bacterial removal efficiency was 83%.

Keywords
Bacterial mortality
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