

8<sup>th</sup> International conference on  
**Recycling, Pollution Control and Waste Management**  
August 06-07, 2021 | Webinar

## **Assessment of the Robustness of Biofil Toilet Technology for the Treatment of Black water**

**Lakachew Yihunie Alemneh**

Bahir Dar University, Ethiopia

As black water management is a problem in the densely populated urban poor communities due to the limited space and the high generation of excreta without effective technologies for treatment and its reduction; the Biofil Toilet Technology (BTT) has been developed to help and solve the problem. BTT works by enhancing the symbiotic work of both micro and macro-organisms (earthworms) to treat black water. Extensive use of bactericidal household chemicals for cleaning of toilet rooms may affect the activity of the earthworms and hence it was necessary to test resistance of earthworms towards such chemicals for the optimization of the technology. In this study chloroxynol (Dettol) with concentrations [0.3-5 mg/ml], sodium hypochlorite (Para zone) concentrations [0.6-9 mg/ml] and lactic acid (Mr Muscle) concentrations of [0.7-7 mg/ml] were selected for the test based on the frequent use of these chemicals by the urban and peri urban community householders in Ghana. The results obtained showed that earthworms were able to survive up to 25% when exposed to chloroxynol (Dettol) without any 100% lethal effect; however, earthworms were not able to resist the effect of sodium hypochlorite (Para zone) with 2.5 mg/ml concentration and 7 mg/ml concentration of lactic acid

(Mr. Muscle) which caused 100% mortality effect over the 21 days of exposure time. After 7 days of exposure, due to the toxicity effect of various concentrations of the three test chemicals, the earthworms showed body weight loss of 28.5% and relatively low contaminant removal potential. Up to 37% COD, 30% BOD, 53% TDS and 54% TSS removals were recorded. However, after 14 days of exposure and onwards, the earthworms were able to recover from the toxicity effect and started to increase their body weight by about 38.7%. Furthermore, during this time the earthworms were able to remove the COD up to 86%; BOD up to 89%; TDS up to 92% and TSS 94% from black water in the biofil toilet technology. 4.5 log and 4.6 log removals of pathogenic pollutants namely; E. coli, total coliforms were achieved. Moreover, 87% Helminthes ova removal was attained by earthworms in the BTT. In conclusion increase in the concentrations of the tested chemicals increased toxicity to earthworms which resulted in some mortality, body weight loss and low removal of Contaminants but the survived earthworms after a longer exposure (14 to 21 days) could increase in their body weight as well as efficiency in the removal of contaminants.

e: lakex12@gmail.com