JEP> Vol.3 No.8A, August 2012

OPEN ACCESS

Heavy Metals Removal from Swine Wastewater Using Constructed Wetlands with Horizontal Sub-Surface Flow

PDF (Size:290KB) PP. 871-877 DOI: 10.4236/jep.2012.328102

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ABSTRACT

The removal efficiency of Cu and Zn from swine wastewater was evaluated as effected by three variables: the hydraulic retention time (HRT) (24, 48, 72 and 96 hours), two different plant species (*Typha domingensis* Pers. and *Eleocharis cellulosa*) and two different sizes of filter media (5 and 15 mm) using a horizontal sub-surface flow constructed wetland. From the results, a significant difference was observed in the removal efficiency of Cu and Zn with respect to different hydraulic retention times. The best results were obtained in the HRT of 96 hours for Zn where 96% removal of Zn with *Typha domingensis* Pers. specie with gravel of 15 mm (experimental unit 6) was achieved. For Cu, at 72 hours of HRT, the efficiency was nearly 100% in five of the six study units (1, 2, 3, 5 and 6). In contrast, in experimental unit 4 with gravel of 15 mm and without plants, only 86% Cu removal was achieved.

KEYWORDS

Swine Wastewater; *Typha domingensis* Pers.; *Eleocharis cellulosa*; Heavy Metals; Constructed Wetlands; Horizontal Sub-Surface Flow

Cite this paper

J. Cortes-Esquivel, G. Giácoman-Vallejos, I. Barceló-Quintal, R. Méndez-Novelo and M. Ponce-Caballero, "Heavy Metals Removal from Swine Wastewater Using Constructed Wetlands with Horizontal Sub-Surface Flow," *Journal of Environmental Protection*, Vol. 3 No. 8A, 2012, pp. 871-877. doi: 10.4236/jep.2012.328102.

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