



Sustainable Phytoremediation of Domestic Waste Water in Constructed Wetland

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ABSTRACT: Constructed wetland (CW) has been proved as low cost, environmental friendly on-site approach of waste water management system, employing different physical, chemical and biological processes for the treatment of waste water. In constructed wetland waste water are treated with the help of aquatic plants through various mechanism of phytoremediation such as phytoextraction, phytodegradation, rhizofiltration and phytovoltalization. A constructed wetland (162.5×57.5×70 cm) has been designed with gravel media to study its efficiency using submerged aquatic macrophytes *Potamogeton crispus* and *Hydrilla verticillata*. After 6 months of growth and establishment of macrophytes in CW, waste water was fed into the CW for treatment. The physicochemical analysis of waste water was analyzed before and after the treatment at different retention time in CW. The percentage removal (%) of the different physicochemical parameters at 72 h of retention time in constructed wetland was; conductivity (60.42%), TDS (67.27%), TSS (86.10%), BOD (87.81%), NO₃-N (81.28%) and PO₄-P (83.54%). Aquatic macrophytes used in CW also accumulate toxic elements present in waste water. *P. crispus* accumulated the highest Mn (86.36 µg g⁻¹ dw) in its tissue followed by Cr (54.16 µg g⁻¹ dw), Pb (31.56 µg g⁻¹ dw), Zn (28.06 µg g⁻¹ dw) and Cu (25.76 µg g⁻¹ dw), respectively. In the case of *H. verticillata*, it was Zn (45.29), Mn (42.64), Pb (22.62), Cu (18.09) and Cr (16.31 µg g⁻¹ dw). Results suggest that designed CW can remove 87.81% of BOD, increased DO to 3.03 mg/L and toxic metals from waste water. © 2016 iGlobal Research and Publishing Foundation. All rights reserved.

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