



Mesquite wood chips (*Prosopis*) as filter media in a biofilter system for municipal wastewater treatment

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Published March 2016, 73 (6) 1454-1462; DOI: 10.2166/wst.2015.595

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Abstract

The biofiltration system over organic bed (BFOB) uses organic filter material (OFM) to treat municipal wastewater (MWW). This study evaluated the performance of a BFOB system employing mesquite wood chips (*Prosopis*) as OFM. It also evaluated the effect of hydraulic loading rates (HLRs) in order to achieve the operational parameters required to remove organic matter, suspended material, and pathogens, thus meeting Mexican and US regulations for reuse in irrigation. Two biofilters (BFs) connected in series were installed; the first one aerated ($0.62 \text{ m}^3 \text{ air m}^{-2} \text{ h}^{-1}$) and the second one unaerated. The source of MWW was a treatment plant located in Durango, Mexico. For 200 days, three HLRs (0.54 , 1.07 , and $1.34 \text{ m}^3 \text{ m}^{-2} \text{ d}^{-1}$) were tested. The maximum HLR at which the system showed a high removal efficiency of pollutants and met regulatory standards for reuse in irrigation was $1.07 \text{ m}^3 \text{ m}^{-2} \text{ d}^{-1}$, achieving removal efficiencies of biochemical oxygen demand (BOD_5) 92%, chemical oxygen demand (COD) 78%, total suspended solids (TSS) 95%, and four log units of fecal coliforms. Electrical conductivity in the effluent ensures that it would not cause soil salinity. Therefore, mesquite wood chips can be considered an innovative material suitable as OFM for BFs treating wastewaters.

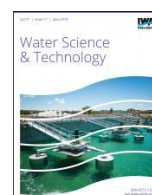
First received 17 June 2015.

Accepted in revised form 9 November 2015.

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Keywords

decentralized system, organic filter media, wastewater treatment in arid areas

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