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Influence of bed media characteristics on ammonia and nitrate removal in shallow horizontal subsurface flow constructed wetlandsA. Albuquerque^a, , J. Oliveira^b, ¹, S. Semitela^a, L. Amaral^c, ²^a Department of Civil Engineering and Architectural and C-MADE, University of Beira Interior, Bloco II das Engenharias, Calçada do Lameiro, 6201-001 Covilha, Portugal^b Municipality of Penamacor, Largo do Município, 6090-543 Penamacor, Portugal^c Department of Sciences and Environmental Engineering, Faculty of Sciences and Technology, New University of Lisbon, Monte de Caparica, 2829-516 Caparica, Portugal**Choose an option to locate/access this article:**Check if you have access
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credentials or your institution[Check access](#)[Purchase \\$41.95](#) [Rent at DeepDyve](#)[Get Full Text Elsewhere](#)**Abstract**

Two bed media were tested (gravel and Filtralite) in shallow horizontal subsurface flow (HSSF) constructed wetlands in order to evaluate the removal of ammonia and nitrate for different types of wastewater (acetate-based and domestic wastewater) and different COD/N ratios. The use of Filtralite allowed both higher mass removal rates ($1.1 \text{ g NH}_4\text{-N m}^{-2} \text{ d}^{-1}$ and $3 \text{ g NO}_3\text{-N m}^{-2} \text{ d}^{-1}$) and removal efficiencies ($>62\%$ for ammonia, $90\text{--}100\%$ for nitrate), in less than 2 weeks, when compared to the ones observed with gravel. The COD/N ratio seems to have no significant influence on nitrate removal and the removal of both ammonia and nitrate seems to have involved not only the conventional pathways of nitrification–denitrification. The nitrogen loading rate of both ammonia ($0.8\text{--}2.4 \text{ g NH}_4\text{-N m}^{-2} \text{ d}^{-1}$) and nitrate ($0.6\text{--}3.2 \text{ g NO}_3\text{-N m}^{-2} \text{ d}^{-1}$) seem to have influenced the respective removal rates.

Keywords

Bed media; Ammonia removal; Nitrate removal; Constructed wetlands; Shallow bed

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