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## THE EFFECT OF VARIOUS PLANTS ON TREATMENT EFFICIENCY OF HORIZONTAL SUBSURFACE FLOW CONSTRUCTED WETLANDS BASED ON THE HYDRAULIC RETENTION TIME

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### Abstract

In this study the effectiveness of *Lactuca sativa*, *Medicago sativa* and *Phragmites australis* for the treatment of domestic wastewater in horizontal subsurface flow was investigated. The removal efficiency of chemical oxygen demand (COD), total nitrogen (TKN), total phosphorus (TP), and total suspended solids (TSS) was measured. The experiment was conducted in two different retention time (5 and 7 days) in three seasons (spring, summer and fall). The removal efficiency was increased as the retention time increased. Based on the results, *M. sativa* had the highest removal efficiency of COD (90.7%), TSS (87.8%) and TKN (59%) in 7 days HRT. Meanwhile, *P. australis* removed (67%) TP during 7 days HRT from wastewater. Seasonal changes showed different effects on removal rate and *L. sativa* showed lower removal efficiency compared to other two plants.

*Key words:* *Lactuca sativa*, *Medicago sativa*, *Phragmites australis*, Sub-Surface Flow Constructed wetland, Wastewater treatment

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