TREATMENT OF BIOCHEMICAL OXYGEN DEMAND (BOD_5) AND TOTAL SUSPENDED SOLID (TSS) IN DOMESTIC WASTEWATER BY KANG KONG (*Ipomoea aquatica*) USING REED BED SYSTEM

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ABSTRACT

Constructed wetland technology is currently evolving into an acceptable, economically competitive alternative for many wastewater treatment applications. In this study, three subsurface flow reed bed systems with an area of 0.6633 m^2 respectively were utilised to treat the domestic wastewater. These reed bed systems were planted with *Ipomoea aquatica* (Kang Kong) and operated under the design flow rates from 0.1 $mlsec^{-1}$ to 0.6 $mlsec^{-1}$. The reed bed systems were setup by using three different kinds of media, which are fine gravel, medium gravel and coarse gravel. The aim of this study was to determine the removal efficiency of the suspended solids (TSS) and biochemical oxygen demand (BOD) in the reed bed system. Reed bed system was used in this study because studies had showed that the reed has a high potential potential to reduce TSS and BOD. In addition, reed bed system was chosen as the treatment system because it is environmental friendly, low energy consumption and low cost. The pollutants were removed by the sedimentation, adsorption, filtration and biological degradation in the matrix soil. Besides that the macrophytes remove pollutants by directly assimilating them into their tissue. The reed bed system showed 57-88% reduction of BOD and 14-91% reduction of TSS .

ABSTRAK

Tanah lembab buatan telah berkembang ke tahap yang boleh diterima and bersesuaian dalam aspek ekonomi untuk kegunaan dalam rawatan air sisa. Dalam kajian ini, tiga sistem "reed bed" dengan aliran bawah permukaan dan masing-masing dengan keluasan 0.6633 m^2 telah direka bentuk untuk merawat air sisa domestik. Kesemua sistem "reed bed" telah ditanam dengan *Ipomoea aquatica* (Kang Kong) dan beroperasi di bawah kadar alir dari 0.1 $mlsec^{-1}$ hingga 0.6 $mlsec^{-1}$. Sistem "reed bed" telah dibina dengan mengguna tiga media yang berbeza iaitu kelikir halus, kelikir sederhana dan kelikir kasar. Ujuan kajian ini adalah untuk menentukan kecekapan sistem "reed bed" dalam penyingkiran "suspended solids" (TSS) dan permintaan oksigen biokimia (BOD).

Sistem "reed bed" diguna dalam kajian ini kerana kajian yang telah dilakukan telah menunjukkan sistem ini mempunyai potensi yang tinggi dalam penyingkir TSS dan BOD. Ia juga amat mesra kepada alam semulajadi dengan penggunaan tenaga manusia yang sedikit dan kos pembinaan yang rendah. Bahan cemar disingkir dengan proses pemendakan, penyerapan, penurasan dan penguraian secara biologikal dalam lapisan tanah. Selain itu, tumbuhan juga menyingkir bahan tercemar dengan mencernanya secara berterusan ke dalam tisu tumbuhan.

Hasil kajian menunjukkan sistem "reed bed" telah menyingkirkan BOD dan TSS dengan kecekapan 57-88% dan 14-91% masing-masingnya.