

MICROALGAE-BASED PROCESS FOR THE DEPLETION OF TETRACYCLINES IN SWINE WASTEWATER

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Abstract: Antibiotics (ATB) have been used to treat animal diseases and, in some countries, to promote animal growth in livestock industry. The use of ATB in food-producing brings up an environmental trouble once it is known that a significant amount of the ATB is excreted and reach the environment. This study evaluated the degradation efficiency of four tetracyclines (TCs) by a consortium of indigenous microalgae (mainly *Chlorella* spp.) cultivated in swine wastewater. Reactors containing chlorine-free water (64% v v⁻¹), effluents from an UASB reactor (6% v v⁻¹), microalgae consortium (30% v v⁻¹) and 1 mg L⁻¹ of ATB were exposed to white light (21.6 W m⁻²) in a 12h:12h light:dark cycle, temperature of 23 °C and continuous agitation for 11 days. TCs were extracted from culture samples using pre-conditioned Oasis HLB SPE cartridge and after elution they were analyzed by ESI(+)-LC-MS/MS. The results of biomass growth showed no significant difference among the experiments and the control (p>0.05), showing that concentration of the TCs did not inhibit the growth rate. ATB depletion was around 98% for tetracycline, 91% for doxycycline, 89% for oxytetracycline and 87% for chlortetracycline by the phycoremediation process (considering 0% at time zero) after 11 days of treatment. This work concludes that the microalgae-based process is an efficient technology for tetracycline degradation in swine wastewater.

Keywords: Veterinary antibiotics, phycoremediation, biomass.



Video presentation