234c Phytoremediation of Oxytetracycline from Wastewater

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The use of antibiotics in concentrated animal feeding operations as growth promoters and feed efficiency promoters has led to widespread exposure of antibiotics to the environment. Plants which can produce reactive oxygen species in root exudates may be used to inactivate these antibiotics. In this study, Pistia stratiotes has been investigated to remove oxytetracycline from artificial wastewater. Effects of the plant age, oxytetracycline concentration, pH, temperature and aeration condition on the oxytetracycline removal efficiency have been studied systematically in laboratory scale batch experiments. In addition, the phytoremediation efficiency has also been investigated in two integrated pond microcosm/bioreactor systems in field tests. Two bioreactors, plug flow reactor and continuous stirred tank reactor, have been tested. The results show that exudates from P. stratiotes can be used to degrade oxytetracycline effectively from wastewater. A kinetic reaction model derived from the laboratory batch experiments may be used to simulate laboratory data, as well as help to design large scale bioreactors.