



Assessment of tetracycline antibiotic removal from hospital wastewater by extended aeration activated sludge

Abdolkazem Neisi^a, Mohammad Javad Mohammadi^{b,c}, Afshin Takdastan^d,
Ali Akbar Babaei^e, Ahmad Reza Yari^f, Majid Farhadi^{g,*}

^a*Environmental Technologies Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, email: neisi_a@yahoo.com*

^b*Abadan School of Medical Sciences, Abadan, Iran, email: javad.sam200@gmail.com*

^c*Student Research Committee, Department of Environmental Health Engineering, School of Public Health and Environmental Technologies Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran*

^d*Environmental Technologies Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, email: afshin_ir@yahoo.com*

^e*Environmental Technologies Research Center, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, email: ababaei52@gmail.com*

^f*Research Center for Environmental Pollutants, Qom University of Medical Sciences, Qom, Iran, email: yari1ahr@gmail.com*

^g*Environmental Health Engineering, School of Health, Ahvaz Jundishapur University of Medical Sciences, Ahvaz, Iran, Tel. +989355439707; Fax: +986113361544; emails: mirmajidfarhadi@yahoo.com, mirmajid100farhadi@gmail.com*

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ABSTRACT

Antibiotics are very effective in the treatment of bacterial infections that can be very dangerous for environment, human beings and animals. The purpose of this study was to evaluate and analyze the efficiency of the extended aeration activated sludge (EAAS) system in the removal of tetracycline (TC) from hospital wastewater. This study employed a cross-sectional design. Data were collected through laboratory scale and sampling was done in three hospitals of Ahvaz city in Iran. During sampling, 44 samples were collected from untreated hospital wastewaters and post-treatment outlet wastewater treatment plants (WWTPs) in 2016. Samples were extracted for TC by ethanol and nitrogen gas. Finally, with 2 mL injected methanol, TC was analyzed by high-performance liquid chromatography (HPLC). During this study in different seasons, the highest TC concentration was observed in hospital WWTPs in summer (0.368 mg L⁻¹). According to the results of the study, the maximum removal percentage was observed in summer (98%). Also, the lowest TC concentration was observed in WWTPs in winter. The results showed that percentage of minimum removal of TC was in autumn. In addition, EAAS was the best process for removal of TC. Furthermore, it should be mentioned that in the hot season, the rate of TC removal was increased and conversely, it was decreased in the cold season.

Keywords: Tetracycline removal; Wastewater treatment; Antibiotic; Extended aeration; Activated sludge; Hospital

* Corresponding author.