

Research title	The Removal of Antibiotic Resistance Bacteria and their Resistance Phenotypes using Photocatalytic Oxidation by TiO ₂
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The aim of this study was investigated the fate of antibiotic resistant bacteria among wastewater treatment plant (WWTP) in community area and disinfectant processes included chlorination and photocatalytic oxidation by TiO₂. The results indicated high efficiency of WWTP process to removal *E. coli* (98.7%) and almost of tested were antibiotic resistant *E. coli* (92-98%). Of 76-88% *E. coli* were resisted up to 2 antibiotic agents and highly resisted (>50%) to Tetracycline, Cefuroxime, Cetazidime and Ampicillin. Furthermore, *E. coli* were developed to high level of antibiotic resistant inside aeration tank, MAR index of influent wastewater was 0.238 and increased to 0.273 in aeration tank. However, survival *E. coli* in effluent wastewater decreased MAR index to 0.133, it indicated that the WWTP had affected to decreased/control the widespread of antibiotic resistant bacteria to environment source. The processes inside WWTP such as aeration, absorption, retention time, and density of bacteria (MLSS) might effect to antibiotic resistant profiles. Therefore, to protect the health risk from antibiotic resistant bacteria in environment sources, this study design the experiment to study efficiency of disinfectant processes. The data suggested that chlorination and photocatalytic oxidation by TiO₂ had high efficiency to removal *E. coli* (>75%) included 1) chlorination process with chlorine 1 and 2 mg/l for 30 and 60 min of contact time (76.8-99.7%) and 2) photocatalytic oxidation by TiO₂ process for 30 and 60 min (75.1-92.4%). Focusing on antibiotic resistant profile, it point out that tested *E. coli* had increased the resistant level from MAR index value 0.473 to 0.491-0.636 and 0.436-0.491 for chlorination and photocatalytic oxidation by TiO₂, respectively. Moreover, MAR index of tested *E. coli* was decreased to 0.327-0.545 (chlorination) and 0.418-0.473 (photocatalytic oxidation by TiO₂) after storage the treated wastewater for 24 and 48 hours. Therefore, considered on the results of antibiotic resistant bacteria it suggested that photocatalytic oxidation by TiO₂ process had suitable for used as

disinfectant process for treated community wastewater due to the process had efficiency to remove/control antibiotic resistant bacteria.