World Academy of Science, Engineering and Technology
International Journal of Biotechnology and Bioengineering
Vol:11, No:03, 2017

Stenotrophomonas maltophilia: The Major Carbapenem Resistance Bacteria from Waste Water Treatment Plant of Pig Farm

Authors : Young-Ji Kim, Jin-Hyeong Park, Hong-Seok Kim, Jung-Whan Chon, Kwang-Yeop Kim, Dong-Hyeon Kim, Il-Byeong Kang, Da-Na Jeong, Jin-Hyeok Yim, Ho-Seok Jang, Kwang-Young Song, Kun-Ho Seo

Abstract : Stenotrophomonas maltophilia is one of the emerging opportunistic pathogens, and also known to have extensive drug resistance intrinsically including carbepenems which is last resort for most serious infections. One possible way for S. maltophilia to infect human is via wastewater treatment plant (WWTP). In the period between October 2016 and February 2017, effluent samples of WWTP from 3 different pig farms were collected once a month and screened for isolation of S. maltophilia. Total 16 strains of S. maltophilia were isolated and, the antibiotic susceptibility phenotypes were determined by Vitek 2 system for 16 antibiotics, ampicillin (AMP), amoxicillin/clavulanic acid (AMC), piperacillin/tazobactam (TZP), cefazolin (CZ), cefoxitin (FOX), cefotaxime (CTX), ceftazidime (CAZ), cefepime (FEP), aztreonam (AZT), ertapenem (ETP), imipenem (IMP), amikacin (AK), gentamicin (GN), ciprofloxacin (CIP), tigecycline (TGC) and trimethoprim/sulfamethoxazole (SXT). All isolates showed high resistance to AMP (100%), CZ (100%), FOX (100%), CTX (100%), CAZ (100%), FEP (94%), AZT (100%), ETP (100%), IMP (100%), AK (100%), GN (100%) whereas were susceptible to CIP (0%), TGC (0%), SXT (6%). All strains harbored at least one of the antibiotic resistance determinant such as spgM, rmlA, and rpfF. Some isolates had similar MLST (multilocus sequence typing) types with clinical isolates, suggesting WWTP could have potential role in the transmission of S. maltophilia to aquatic environment and, possibly, to humans.

Keywords : Stenotrophomonas maltophilia, Carbapenem resistance, waste water treatment plant, pig farm
Conference Title : ICA 2017 : International Conference on Antimicrobials
Conference Location : Singapore, Singapore
Conference Dates : March 29-30, 2017