

A b s t r a c t

T i t l e	The Proposal of Risk Indicators for Bacterial Resistance in the Water Environment to Antibiotics for Human Therapy
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<p>[Summary]</p> <p>Antibiotic resistant bacteria (ARB) attract attention in these days, and have been detected in water environments. Although there are many studies on the occurrence of ARB in environments, the researches on resistance to new antibiotics that are currently used for human therapy are limited. This study focuses on antibiotic resistant <i>Escherichia coli</i>, and proposes new risk indicators for bacterial resistance to new antibiotics for human therapy in water environments.</p> <p>Totally 26 samples were taken at 9 sites in the Tama watershed. Approximate 200 strains of <i>E. coli</i> were isolated for each sample by selective media culture. After the examination by the selective media test, the disk diffusion method was applied to examine the profiles of resistances to both old antibiotics such as ampicillin, tetracycline and new antibiotics such as levofloxacin. The resistance ratios at least to one antibiotic were between 0.5% and 74%. Six indicators were proposed; 1) Concentration of <i>E. coli</i> (CFU/ml), 2) Ratio of resistant bacteria (RB), 3) Ratio of RB to antibiotics for human therapy, 4) Multi-drug resistance, 5) Maximum multi-drug score, 6) Average multi-drug score.</p> <p>Among the proposed indicators, concentration of <i>E. coli</i> increased in the case of the samples taken for treated wastewater and the downstream sampling points, while the ratio of RB reached maximum at the sampling points of slightly polluted locations. The ratio of RB for human therapy showed a similar trend as concentration of <i>E. coli</i>. Multi-drug resistance was not a good indicator to characterize the pollution, while average and maximum multi-drug scores can evaluate the quality of resistant depending on the degree of the clinical importance. Average multi-drug score is a useful indicator because it rarely depends on the number of strains examined. In addition, the change in average multi-drug score was corresponded with the change in the ratio of RB for human therapy.</p> <p>This study shows our newly proposed indicators of multi-drug scores and the ratio of RB for human therapy can evaluate the significance of ARB in water environment based on the clinical importance.</p>	