A b s t r a c t

T i t l e	Prevention of spread of antimicrobial resistant bacterial by Membrane Bioreactor
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〔summary〕

Microbial resistance to antibiotics has become an important problem among health problems. Many researchers are focusing on the pathway of antibiotic resistant bacteria (ARB) and antibiotic resistant gene (ARG) to the environment, because high concentrations of ARBs and ARGs in wastewater may contribute to the spread of ARB and ARG. In this research, the role of the membrane bioreactor (MBR) in controlling the fate of ARB and ARG during wastewater treatment was investigated to the prevention of the spread of ARB.

Escherichia coli HB101 harboring a self-transmissible, CTX-resistant plasmid was inoculated into a laboratory MBR. The fates of *E.coli* HB101 and the plasmid in the reactor were investigated by real-time PCR targeting *tbpA* gene on the chromosome of HB101 and *bla*CTX-M-1 gene on the plasmid.

A rapid decrease of *tbpA* gene during seven days after the addition of HB101 suggested the difficulty of the survival of ARB added to the reactor. In addition, the higher decrease rate in *bla*CTX-M-1 compared with *tbpA* suggested that the transfer of ARG in MBR to other bacteria in activated sludge was not active. Throughout the experimental period, the amount of CTX-M-1 gene in the permeated was about 1/500 of the mixed liquor of the activated sludge. In addition, the concentration of the gene in the permeate was approximately 1/50 compared with the centrifugal supernatant of the activated sludge mixed solution.

In conclusion, MBR was shown to be more effective as a method for the treatment of wastewater than conventional processes in controlling the spread of ARG and ARB.

注１：英語要旨―３００ワード程度。