

A b s t r a c t

T i t l e	The characteristics and carbapenemase producing genes of carbapenem-resistant bacteria isolated from river water
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<p>[summary]</p> <p>It has been reported to be difficult to treat infections by antibiotic resistant bacteria. Resistant to carbapenems among various antibiotics are threatening.</p> <p>In this study, the occurrence of carbapenem-resistant bacteria in the environment was focused. The samples were taken at 2 sites at the upstream and midstream of the Tama river as well as treated wastewater at the Kitano wastewater treatment plant.</p> <p>Approximate 50 strains of carbapenem-resistant bacteria for each sample were isolated from plates containing carbapenems. The disk diffusion method was applied to examine the profiles of resistances followed by the determination of species of the carbapenem-resistant bacteria by the Api10S. Carbapenemase producing genes were detected by multiplex PCR method. For selective isolation of the resistant bacteria from samples, 4 types of medium supplemented with antibiotic were used.</p> <p>Among the total of bacteria that grow on Mueller Hinton agar without antibiotics, 0.036% were able to form colonies on IPM-added plates, and a fewer strains (0.032%) were IPM and ST agar, while CHROMagarKPC detected 0.035% of the total counts. By the addition of MPM, the number of colonies was reduced to 2% of the original plates in the case of the measurement by CHROMagarECC.</p> <p>The MPM-added CHROMagarECC medium was mainly used in the characterization and genetic studies because it can detect clinically-important gram-negative microorganisms.</p> <p>The result showed that the resistant ratio was 3.1 to 3.8% at the upstream sampling site and 0.51 to 0.55% in the midstream site. All the isolated strains were resistant to MPM, while 99.97% were resistant to IPM. The most of the strains (99.99%) had the multiple resistant to third-generation cephalosporin cefotaxime. The results on the determination of species showed that 48.2% of carbapenem resistant isolates were <i>Stenotrophomonas maltophilia</i> and 36.1% were <i>Acinetobacter baumannii</i>. The results on the multiplex PCR showed that 6 strains(6.9%), had the gene encoding carbapenemases (1 strain : IPM type, 1 strain : VIM type, and 4 strains : NDM type).</p> <p>Other carbapenem-resistant strains might carry chromosomal resistant genes other than plasmid mediated resistant genes. Though experimental problems took place during the detection by the PCR.</p>	