Parallel Analysis of Antimicrobial Activities in Microbial Community Using Single-Strand Conformation Polymorphism

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Conventional antimicrobial activity analyses such as broth dilution method are demanding processes for new antimicrobial agent discovery and sensitive diagnosis on the infectious diseases. In this study, we developed a new antimicrobial activity analysis system based on single-strand conformation polymorphism (SSCP) combined with 16S rRNA gene specific PCR. By this method, population change of microbial community in response to the specific antimicrobial agents can be quantified with high sensitivity and accuracy from small amount of sample. Using a mixture of microorganisms containing E. coli, C. glutamicum, and A. calcoaceticus, it was found that the peak areas in 16S rRNA gene specific PCR-SSCP could quantify cell concentration. Subsequently, a comparison study with the broth dilution method using kanamycin, spectinomycin, and streptomycin showed that this method can be used for antimicrobial activity analysis. Results also demonstrated its high potential in the area of clinical diagnosis.