IMPROVED SENSITIVITY OF FLUORESCENT IN SITU HYBRIDIZATION FOR DETECTION OF MICROBIAL COMMUNITIES BY USE OF TYRAMIDE SIGNAL AMPLIFICATION SYSTEM

A tyramide signal amplification system was used to increase the sensitivity of fluorescent in situ hybridization. The system was consisted of a fluorescent labeled-16S rRNA oligonucleotide probe, anti-fluorescent horseradish peroxidase conjugated, biotinylated tyramide, and streptavidin-fluorescent conjugated. Whole cell hybridization technique was used to compare the fluorescent signal conferred with one monolabeled probe with those of the TSA system. The fluorescent signal of probe conferred TSA system was much higher than those obtained with monolabeled probes. The technique was successfully applied for in situ detection of microbial communities of an acetate-enriched culture. It was demonstrated that TSA resulted in increase in sensitivity, as the level of fluorescent signal was low with monolabeled probe.