

Development and application of bacterial species identification DNA chip in real field

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The activated sludge flocs contain bacterial cells as well as inorganic or organic particles. However, most of the foaming, bulking and scumming problems are caused by uncontrolled overgrowth of filamentous bacteria.

In this study, for the high-throughput analysis, customized DNA microarrays were constructed to discriminate the distribution of microbial community. Random genomic DNA libraries were constructed with several different bacteria commonly existed in the activated sludge. Some of them are responsible for sludge bulking, forming, and scumming problems and the other are related with removal of nutrients such as nitrogen, sulphur, and phosphorus. Randomly digested genomic DNA of total 13 bacteria was spotted on the chip. DNA chip was tested with the real sludge sample to confirm whether these bacteria exist or not. To increase the detection limit from the normal sludge sample, bacteria were cultivated in the rich nutrient medium. Therefore, this method can be used to monitor specific bacteria abundance in the activated sludge and to control the activated sludge process efficiently.