

A method for rapid characterization of microbial communities in freshwater samples.  
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Characterization of the wide variety of both known and unknown microorganisms which occur in freshwater sources relies upon a variety of methods. Microarrays offer the possibility for using a single methodology to process freshwater samples and obtain a profile of the most abundant microbial species in a given water source. A prototype microarray using 50-mer oligonucleotides derived from a variable portion of SSU rDNA was developed for testing DNA extracted from freshwater samples. Sequences included both known and unknown eukaryotic and prokaryotic rDNA sequences obtained from GenBank and genomic libraries. The microarray includes probes for infectious agents, known microbial species such as cyanobacteria, indicators associated with specific environmental pollutants, and several unknown sequences. The method employs DNA extracted from microbes recovered by filtration and is followed by a multiplex PCR amplification, fluorescent labeling, and hybridization with the microarray. The microarray generates specific signals and allows semi-quantification of abundant rDNAs. By using differential fluorescent labeling, the possibility for comparing samples is also described.

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