

Bacteriological Characterization of Drinking Water Distribution Network Biofilms by Gene Sequencing Using Different Pipe Materials

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Abstract : Very little is concerned about the bacterial contamination in drinking water biofilm which provide a potential source for bacteria to grow and increase rapidly. So as to understand the microbial density in DWDs, a three-month study was carried out. The aim of this study was to examine biofilm in three different pipe materials including PVC, PPR and GI. A set of all these pipe materials was installed in DWDs at nine different locations and assessed on monthly basis. Drinking water quality was evaluated by different parameters and characterization of biofilm. Among various parameters are Temperature, pH, turbidity, TDS, electrical conductivity, BOD, COD, total phosphates, total nitrates, total organic carbon (TOC) free chlorine and total chlorine, coliforms and spread plate counts (SPC) according to standard methods. Predominant species were *Bacillus thuringiensis*, *Pseudomonas fluorescens*, *Staphylococcus haemolyticus*, *Bacillus safensis* and significant increase in bacterial population was observed in PVC pipes while least in cement pipes. The quantity of DWDs bacteria was directly depended on biofilm bacteria and its increase was correlated with growth and detachment of bacteria from biofilms. Pipe material also affected the microbial community in drinking water distribution network biofilm while Similarity in bacterial species was observed between systems due to same disinfectant dose, time period and plumbing pipes.

Keywords : biofilm, DWDs, pipe material, bacterial population

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