

Biological Treatment of Bacterial Biofilms from Drinking Water Distribution System in Lebanon

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Abstract : Drinking Water Distribution Systems provide opportunities for microorganisms that enter the drinking water to develop into biofilms. Antimicrobial agents, mainly chlorine, are used to disinfect drinking water, however, there are not yet standardized disinfection strategies with reliable efficacy and development of novel anti-biofilm strategies is still of major concern. In the present study the ability of *Lactobacillus acidophilus* and *Streptomyces* sp. cell free supernatants to inhibit the bacterial biofilm formation in Drinking Water Distribution System in Lebanon was investigated. Treatment with cell free supernatants of *Lactobacillus acidophilus* and *Streptomyces* sp. at 20% concentration resulted in average biofilm inhibition (52.89 and 39.66% respectively). A preliminary investigation about the mode of action of biofilm inhibition revealed that cell free supernatants showed no bacteriostatic or bactericidal activity against all the tested isolates. Pre-coating wells with supernatants revealed that *Lactobacillus acidophilus* cell free supernatant inhibited average biofilm formation (62.53%) by altering the adhesion of bacterial isolates to the surface, preventing the initial attachment step, which is important for biofilm production.

Keywords : biofilm, cell free supernatant, distribution system, drinking water, *lactobacillus acidophilus*, *streptomyces* sp, adhesion

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