Horizontal Transfer of Degradation Capacity in an Activated Sludge Treating a Persistent Organic

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ABSTRACT

The ability of an indigenous microbial population to degrade a persistent xenobiotic organic compound is generally acquired after the microbes are acclimated to the target compound. The degradation pathway is believes to be mediated by an extra chromosomal agent plasmids. Plasmid is free to transfer from the original host to neighboring cells, thus a xenobiotic degradation capability can be transfer to population that has not previously been acclimated to the target. The purpose of this research was to investigate the extent to which an activated sludge acclimated to 2,4-D was to transfer its degradation ability horizontally to one not acclimated. Experimental procedures were to place acclimated and non-acclimated activated sludge in a water suspension with the solution of 2,4-D. Degradation results indicated that 1) horizontal transfer did occur, the amount biomass capable of 2,4-D degradation increased with time in addition to growth, 2) the amount of acclimated activated sludge increases the rate of transfer, while the amount of recipient activated sludge did not affect transfer rate significantly.

Keywords : persistent ; plasmid ; conjugation ; 2,4-D ; acclimation ; activated sludge ; degradation capability ; horizontal transfer

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