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 believed to be mediated by an extrachromosomal agent, plasmids. Plasmid is free to transfer from the original host to neighboring cells, thus a xenobiotic degradation capability can be transferred to a 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 able 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 of biomass capable of 2,4-D degradation increased with time as well as 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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