Transfer of Degradation Capacity Between Microorganisms Treating a Persistent of 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 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 capacity can be transferred to the 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. We sifted out the single bacteria from the sludge that have the ability to degrade the 2,4-D, and identified this pure bacteria. We were trying to transfer the degradation capacity to Escherichia coli and Bacillus subtilis, and investigate if these could acquire the capacity of degradation.

The results showed that: 1) we obtained the pure bacteria that can degrade the 2,4-D. It's called Bacillus cereus after identification, and it can degrade 2,4-D very well. 2) After transferring, the degradation velocity of mixed bacteria was faster than single Bacillus cereus. The part of the increase in velocity was due to the acceptor of transfer already having the capacity of degradation.

Keywords: plasmid; 2,4-D; conjugation; capacity of degradation; horizontal transfer

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