

Poly- β -Hydroxyalkanoates Consumption During Degradation of 2,4,6-Trichlorophenol by *Sphingopyxis Chilensis* S37

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Abstract

Aims: To analyse the possible effect of poly- β -hydroxyalkanoate (PHA) consumption on 2,4,6-trichlorophenol (2,4,6-TCP) degradation during starvation by *Sphingopyxis chilensis* S37 strain, which stores PHAs and degrades 2,4,6-TCP.

Methods and Results: The strain was inoculated in saline solution supplemented with 2,4,6-TCP (25–400 μM). Chlorophenol degradation was followed both spectrophotometrically and by chlorine released; viable bacterial counts were also determined. Cells starved for 24, 48 or 72 h were incubated with 25 μM of 2,4,6-TCP and PHA in cells investigated by spectrofluorimetric and flow cytometry. Results demonstrated that starvation decreased the ability to degrade 2,4,6-TCP. After 72 h of starvation, degradation of 2,4,6-TCP decreased to less than 10% and the relative PHA content diminished to ca 50% during the first 24 h.

Conclusion: Utilization of PHA may be an important factor for the degradation of toxic compounds, such as 2,4,6-TCP, in bacterial strains unable to use this toxic compound as carbon and energy source.

Significance and Impact of the Study: This is the first study describing a relationship between intracellular PHA consumption and 2,4,6-TCP degradation. Therefore, PHAs provides an endogenous carbon and energy source under starvation and can play a significant role in the degradation of toxic compounds.