

## Effect of Salt on Bacteria-Phage System

### Part 2. Effect of salt on Escherichia coli B and phages T1, T3, T4 and T5

Akira Murata, Hiromu Tani, Daisuke Sato,  
Fumio Kato and Kohzo Kanda  
Department of Applied Biological Sciences,  
Saga University

#### Summary

Phage contamination is a serious problem in industrial fermentation processes employing bacteria. This problem has not been solved yet, although much work has been done. With the recent development of recombinant DNA technology, genetically modified bacteria have been increasingly employed for the large-scale production of useful substances. Studies on the prevention of phage contamination and the control of phages in industrial processes are currently of importance.

Effect of salt on phages has not been studied yet in relation to phage control. Therefore, we previously investigated the effect of salt on phages S1 and S2 and Escherichia coli K-12.

This paper describes the effect of salt on phages T1, T3, T4 and T5 and Escherichia coli B.

Salt completely inhibited the growth of bacterial cells at 0.8 M and more. Under these concentrations, colony-forming activity of cells decreased. This loss of colony-forming activity was not the results of cellular death, because the colony-forming ability was restored after treatment with betaine. Salt did not affect the infectivity of free phages. It inhibited the adsorption of phages onto host cells. It completely inhibited the growth of phages T1 and T3 at 0.9 M and more. It completely inhibited the growth of phages T4 and T5 at 0.8 M and more. With phages T1 and T3 the decreases in the infective centers were slow, but they were rapid with phages T4 and T5. The loss of plaque-forming activity was not restored after treatment of betaine.

These findings suggest the possible use of salt or the control of phages in industrial processes.