

## Viability and Sensitivity of SFN6B (Host-Specific Bacteriophage) towards Shigella Flexneri in Various Water Samples

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**Abstract :** Bacteriophages are the most abundant and genetically diverse living entities on earth; they help in regulating and maintaining microbial diversity and balance in its natural ecosystem. In this study, the infectivity of SFN6B tailed phage was investigated in various water samples. Host bacteria (*Shigella flexneri*) were spiked in sterilized environmental and domestic water samples, followed by SFN6B treatment. Two incubation conditions were selected for this study, 37 °C and room temperature. *S. flexneri* and SFN6B viability were monitored hourly for consecutive 7 hours and extended viability study for consecutive 4 days. Absorbance of all bacteria spiked water samples were taken to monitor the bacteria count. Results showed reduction in the absorbance of the SFN6B treated water sample as compared to negative control, indicating reduction in bacterial count either due to negative growth or lysis by the lytic bacteriophage. Consistent with the result, SFN6B titer increases for first two days. However, prolong incubation of these cultures reaches equilibrium, between phage and bacteria. Temperature and water sample source also influence the interaction between *S. flexneri* and SFN6B. Stronger interaction was observed in 37°C as compared to room temperature, where higher bacteria count and phage titer increase were recorded. Availability of nutrient in water sample also plays a crucial role in the interaction between bacteria and phage. Higher nutrient level, such as lake and river waters were observed to give better infectivity and viability of both bacteria and phage as compared to tap water. It is believed that *S. flexneri* continue to remain viable and able to grow in the presence of SFN6B bacteriophage, but the number was closely regulated by surrounding phages. This allows better understanding of the characteristics of SFN6B that could serve as the basis for future studies and applications.

**Keywords :** bacteriophage, *Shigella flexneri*, infection, microbial diversity

**Conference Title :** ICB 2016 : International Conference on Bacteriophages

**Conference Location :** Kuala Lumpur, Malaysia

**Conference Dates :** February 11-12, 2016