

# Growth Characteristics of Lactococcal Phages Isolated from the Dairy Sources in India

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Host-phage interactions of four lactococcal phages, FRC1, FRC2, FRC3, and FRC4, were studied. Adsorption was maximum at 30° C and pH of 7.2 to 7.6 after 10 min. Optimal growth temperatures of the host and phage were 37° C. Plaques appeared after 4 h at 30° C and reached a plateau after 12 h. Thermal death points of the phages were in the range of 65 to 80° C. In M17 broth and skim milk, thermal death points were 5 to 10° C higher. Phages were stable at 4° C for 2 mo and 14 to 16 mo at -20° C. Phages survived 4 to 5 d under dry conditions and were sensitive to ether, ethanol, formaldehyde, iodine, potassium permanganate, phenol, phenyl, and SDS;  $\text{KH}_2\text{PO}_4$ ,  $\text{K}_2\text{HPO}_4$ ,  $\text{MgSO}_4$ ,  $\text{NaCl}$ ,  $\text{KCl}$ ,  $\text{CaCl}_2$ ,  $\text{Na}_2\text{SO}_4$ ,  $\text{K}_2\text{SO}_4$ , and  $\text{CH}_3\text{CO}-\text{ONa}$  promoted adsorption and phage-mediated lysis of host cells. The latent period, eclipse phase, rise period, and burst sizes of these phages were 40 to 45 min, 22 to 32 min, 15 to 20 min, and 70 to 150 min, respectively. Burst size decreased 15 to 37% at 33° C and 50 to 64% at 37° C. Lactococcal hosts challenged with homologous phages showed greatly decreased culture turbidity and lowered acid production (42 to 61%).

**Key Words:** bacteriophages • adsorption • burst size

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