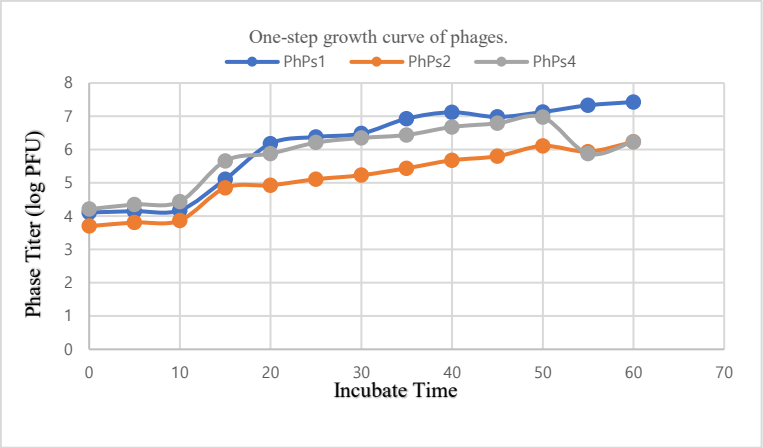
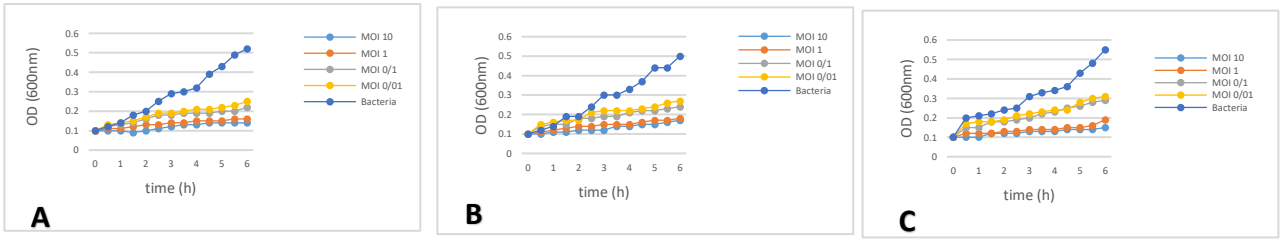
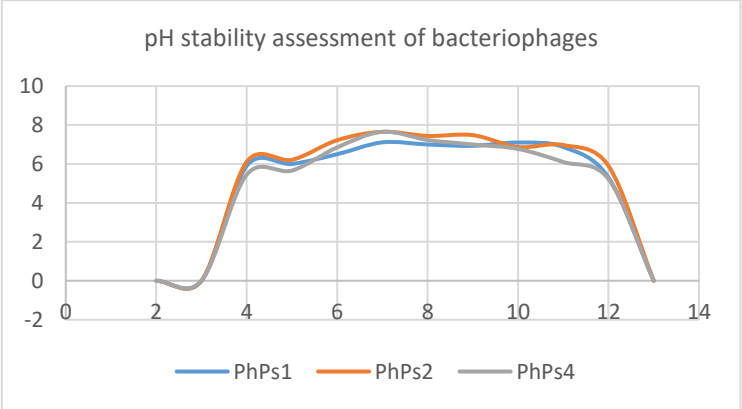


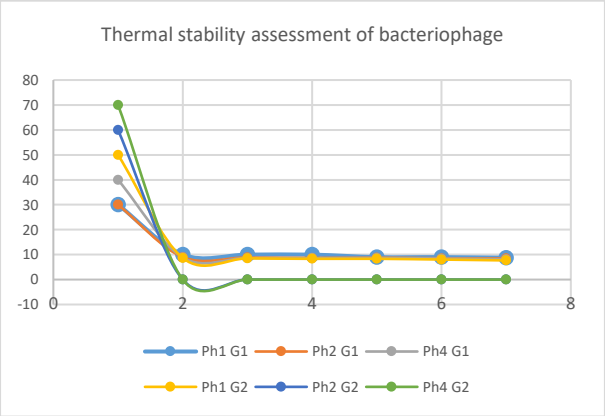
Appendix 1. One-step growth curves of bacteriophages Phps1 (blue), Phps2 (orange), and Phps4 (gray). The curves show that Phps4 had the shortest latent period (10 minutes) and the fastest initial replication. Phps1 achieved the highest final titer (~log 7.8 PFU/mL), indicating the strongest lytic activity. In contrast, Phps2 exhibited the weakest lytic performance, with slower replication and a lower phage titer.



Appendix 2. Results of multiplicity of infection (MOI) for phages. (A) Phps1, (B) Phps2, (C) Phps4



Appendix 3. pH stability assessment of bacteriophages. (A) Phps1: The phage remained stable across pH 4-12, with activity intact. Activity decreased under extreme conditions (pH ≥ 13, pH ≤ 3.0), but was still detectable, with the highest titer at pH 7 (7.11 log PFU/mL). (B) Phps2: Stable between pH 4-12, with reduced activity under extreme pH (pH ≥ 13, pH ≤ 3.0). (C) Phps4: Stable between pH 4-12, with decreased activity at extreme pH levels. The highest titer was observed at pH 7 (7.65 log PFU/mL).



Appendix 4. Thermal stability assessment of bacteriophages was Phps1, Phps2, and Phps4 1evaluated at temperatures ranging from 30° C to 80° C, with incubation times of 30° C G1 (Group) minutes and 60 °C G2 (Group)minutes.