

## **Biological and physical characterization of bacteriophage JHA against multidrug-resistant *Acinetobacter baumannii***

### **ABSTRACT**

Due to the emergence of antibiotic resistance, bacteriophage therapy appears to be an ideal weapon to utilize against pathogenic bacteria. This study aimed to isolate, identify and characterize the lytic bacteriophage effective against the multidrug-resistant *Acinetobacter baumannii* clinical isolates. The isolated bacteriophage caused lysis by applying the double-layer agar technique on *A. baumannii* up to 99% in 18 hours of incubation at 37°C. The bacterial growth reduction assay exhibited that JHA phage had high adsorption rates and could rapidly inhibit bacterial growth. The pH and thermal stability testing showed that JHA phage was stable in vast ranges of pH from 5 to 9 but its activity was highest at pH7 ( $1860000 \pm 1000$  pfu/mL). It was stable in broad ranges of temperatures from 25°C to 60°C but the highest activity was found at 37°C ( $1300000 \pm 30000$  pfu/mL). One-step growth test results showed that it has a short latent period, strong lytic ability, high burst size, and adsorption rates and was host specific. Scanning electron microscopy (SEM) of JHA phage demonstrated icosahedral heads and tailless particles. Transmission electron microscopy (TEM) revealed JHA phage belongs to Tectiviridae family. All the characteristics of JHA phage possess lytic activity against *A. baumannii* strains and exhibit novel candidates to use as an alternative competitor to antibiotics in controlling such infections.