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Isolation and Characterization of Lytic Bacteriophages Infecting *Pseudomonas aeruginosa* From Sewage water

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Abstract: This study was carried out during the period from April/ 2015 to January/ 2016. It included the isolation and identification of 50 *P.aeruginosa* isolates from 150 samples collected from different clinical and environmental sources. The distributions of these isolates were: 22(44%) from 50 burn samples, 8(32%) from 25 samples of urinary tract infections, 10(28.5%) from 35 samples of operative rooms and 10(25%) from 40 samples of sewage water.Onetype*P.aeruginosa* phage was isolated from 100 samples of sewage water according to difference in shape and diameter of the plaques primarily named Phage1.The results showed that the highest adsorption rate of isolated phage on bacterial cells was about 5-7 minutes, phage particles have an eclipse time about 6.5 minutes. The maximum lysis activity of phages was documented in about two hours, while complete lysis time was about 6 hours. The calculated data showed that the burst size was about 15±5 pfu\cell in time period about 14 minutes. The results also showed that the *P.aeruginosa* isolates from sewage water were more susceptible to phage infection than isolates from clinical cases. The isolated phage reached the maximum activity in the neutral medium between pH 6-8. This activity declined after pH 9. At temperature between 35-40C^{o} the phage activity was not affected but it decreased continuously when temperature increased to 50 C^{o}. At 55C^{o} the activity dramatically reduced and diminished in about 8-10 minutes. The phage host range was determined and the lytic phage infected all *P.aeruginosa* isolates, were isolated from the different environmental and clinical sources. While it was unable to infect other genera that used in this study (*Staphylococcus aureus*, *Escherichia coli*, *Streptococcus pyogenes*, *Klebsiellapneumoniae* and *Proteus vulgaris*).
Key words: Bacteriophages, *P.aeruginosa*, Phage kinetics, Host Range.

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