

2nd International Conference on
WOUND CARE, TISSUE REPAIR
AND REGENERATIVE MEDICINE

&

World Congress on
MICROBIOLOGY & APPLIED
MICROBIOLOGY

February 21-22, 2019 | Paris, France

Isolation and characterization of *Klebsiella pneumoniae* bacteriophage

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Klebsiella pneumoniae is a gram-negative, non-motile bacteria that are found ubiquitously in nature. It frequently causes human nosocomial infections especially in immune compromised patients, leading to respiratory tract, urinary tract and blood stream infections. Due to the extensive usage of broad-spectrum antibiotics in hospitalized patients, the incidence of multidrug resistance producing strains among clinical isolates has been increasing. Consequently, this has rekindled the interest in using phage therapy as a safe and effective treatment for multidrug resistance pathogens. The rapid ability of phages to lyse bacteria and their specificity make them effective alternative to antibiotics. Results demonstrated a successful isolation of a *Klebsiella* bacteriophage isolated from sewage water. The bacteriophage was able to host and

completely lyse the *Klebsiella* bacterium as a first case reported in Palestine. The results were confirmed several times to ensure consistency. It also gave positive results when spotted on different *Klebsiella* strains. In addition, one-step growth curve using a double layer plaque assay was performed to determine the phage life cycle phases of infection. It showed a latent period of about 3.5h, burst period of 10h and a burst size of about 102.5×10^6 PFU /plaque, furthermore, SDS-PAGE results revealed that four major bands have been detected for phage structure proteins their size : 75KDa, 100KDa, 135KDa and 180KDa. We believe the isolated phage can be used as an effective and simple replacement to antibiotics used in the treatment of *Klebsiella pneumoniae*.

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