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Isolation and characterization of a bacteriophage that hosts on Avian-pathogenic *Escherichia coli* (APEC)

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Infectious Colibacillosis disease caused by Avian-pathogenic *Escherichia coli* (APEC) commonly threatens poultry flocks worldwide. It limits productivity and causes severe economic losses to poultry sector. In addition, the emergence of multidrug resistance among APEC is an increasing concern since these resistant bacteria can infect humans and develop mechanisms that enable them to resist the commonly used antibiotics. The use of phages in treating pathogenic bacteria is considered a possible alternative to the conventional use of antibiotics. This study describes the isolation and characterization of a bacteriophage with broad lytic spectra against the APEC *E. coli*. It was isolated using soft agar overlay method and through monitoring the formation of clear zones on a lawn culture of APEC hosts bacterium. The isolated phage

apparently has a small genome size and with small number of multiple copies of same proteins as revealed by SDS-PAGE. The quantification of infectious viruses in bacterial suspension was further determined through a one-step growth curve analysis using double layer test. It revealed a latent period of about 24 h, burst period of 70 h and a burst size of about 24×10^3 plaque forming units (PFU) per plaque. The host range of the bacteriophage was determined by performing spot tests with four APEC bacterial strains. The phage was capable of lysing all tested strains, an indicative of wide host range for this isolated bacteriophage. We conclude that bacteriophages can be used to eliminate or reduce the scope of APEC infection in poultry and possibly used as an alternative to antibiotics.

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