

Isolation and characterization of lytic phage from a swine farm to control *Salmonella* Minnesota

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Salmonella spp. is a gram-negative bacterium, mainly found in contaminated food, causing damage to the economy and health. Given the antimicrobial resistance, which is being acquired on a larger scale by microorganisms, some alternatives to control are needed. One way is using bacteriophages (phages) to control bacteria via elimination by lysis. Biological control using phages is a promising alternative, as it brings benefits such as low cost, speed, does not leave residues in the environment and is highly specific for the organism to be controlled. This study aimed to isolate a lytic phage for the control of *Salmonella* spp. The phage vB_SenM-UFV23 was isolated from swine stool samples. The samples were processed by centrifugation and filtration in a pore filter of size of 0.22 µm. Subsequently, the filtered samples were enriched with the addition of the culture medium Luria Bertani (LB) 2x and the host bacterium of interest, *Salmonella* Minnesota, to favor the replication of possible bacteriophages in the sample. After enrichment, the isolation of bacteriophages was confirmed through a double-layer assay and visualization of lysis plaques. The isolated phage was purified with 4 repetitions of recovery of the lysis plate. Phages are microorganisms that have high specificity in relation to the host bacteria. In this sense, we tested the phage's host spectrum to evaluate the phage's ability to infect other *Salmonella* serovars and the ability to infect other bacterial strains. The morphological characterization of the phage vB_SenM-UFV23 was performed through images obtained with the Zeiss EM 109 Transmission Electron Microscope. Phage vB_SenM-UFV23 has an elongated icosahedral capsid and a contractile tail. Thus, it was determined that the phage has characteristics of the *Caudovirales* order with Myovirus-like morphology. The dimensions of the capsid and tail were determined using the ImageJ program. Finally, DNA extraction was performed using the PCI/SDS method and the phage genome size was estimated using pulsed-field gel electrophoresis (PFGE). The results of this work indicate that the vB_SenM-UFV23 phage had characteristics that allow its use in *Salmonella* spp. biological control strategies. However, more studies are needed for its effective application in phage cocktails.

Key words: bacteriophage, salmonellosis, phage-therapy

Isolamento e caracterização de fago lítico advindo de granja de suíno para controle de *Salmonella* Minnesota

A salmonelose é uma doença transmitida por alimentos causada por sorovares de *Salmonella* spp. Uma vez que a resistência antimicrobiana vem se tornando um empecilho para os meios de controle tradicionais, métodos alternativos são necessários. Um desses é a fagoterapia, que consiste no uso de bacteriófagos líticos para o controle de bactérias patogênicas através da eliminação por lise. Este trabalho tem como proposta descrever o isolamento e a caracterização do fago vB_SenM-UFV23 obtido através de amostras ambientais de uma granja de suínos.

Palavras-chave: bacteriófago, salmonelose, fagoterapia.