

# Isolation of lytic bacteriophages to control *Salmonella enterica*

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Poultry and pork products are the main means of transmission of *Salmonella* and its most varied strains. Although Brazil is the second largest poultry exporter in the world and an excellent producer of pork, salmonellosis is still a significant concern due to the potential for contamination of products and the risks to public health, as contaminated products can be a source of infection to humans. In this scenario, phage therapy - a therapeutic approach that uses bacteriophages to treat bacterial infections - has been explored as an alternative to antibiotics in the prevention and treatment of bacterial infections in poultry and pigs. In a world where concern is growing about the indiscriminate use of antibiotics and bacterial resistance, phage therapy proves to be advantageous over conventional antibiotics. We now know that many bacteriophages are promiscuous and infect multiple strains or even multiple species of bacteria. The present work aimed to isolate a phage that could infect one or more of the six strains of *Salmonella* collected at the swine farm at the Federal University of Viçosa: *Salmonella* Mbandaka-188, *Salmonella* Mbandaka-166, *Salmonella* Heidelberg-63, *Salmonella* Heidelberg-65, *Salmonella* Minnesota-64, *Salmonella* Minnesota-65. To isolate the phages from the collected samples, centrifugation was performed at 6000 x g for ten minutes, followed by filtration of the supernatant through a 0.22µm membrane. The filtrate was incubated in culture medium and plated by the double layer method using semi-solid (0.7% agar) and solid (1.4% agar) LB medium. Subsequently, the plates were incubated overnight at 37°C. After isolation, there was the presence of lysis plaques only in the *Salmonella* Minnesota-64 plates, of which triplicates and subsequent viral titration were performed, obtaining a titer of 3.8x10<sup>7</sup> PFU/ml. Samples of *S.* Mbandaka-188 propagated in *S.* Heidelberg-63 did not show lysis plaques. The preliminary result demonstrates that bacteriophages are, in most cases, strain-specific, and, therefore, it is necessary to isolate new phages and develop phage libraries to catalog as many strains as possible in order to assist in strategies control of *Salmonella enterica* in poultry and pork products and, consequently, in public health.

**Key words:** Bacteriophage; *Salmonella*; phagetherapy.

## Isolamento de bacteriófagos líticos para controle de *Salmonella enterica*

A presença de *Salmonella* em aves e suínos e, em última instância, em humanos, representa um risco à saúde pública. Neste contexto, seis fagos para *Salmonella* foram isolados na suinocultura da Universidade Federal de Viçosa e testados quanto à viabilidade para a construção de um coquetel fágico para controle de *Salmonella enterica*. Dos seis fagos isolados, apenas um bacteriófago demonstrou atividade lítica (para a cepa *S.* Minnesota-64) eficiente. O presente estudo demonstrou, portanto, a efetividade dos fagos para controle da salmonelose animal e a necessidade de isolamento de novos fagos para um melhor controle da doença.

**Palavras-chave:** Bacteriófago; *Salmonella*; fagoterapia.

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