Isolation of a Bacteriophage for Staphylococcus aureus from Rumen Fluid

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Staphylococcus aureus is the most dangerous of all common staphylococcal bacteria and, to make matters worse, the treatment of its numerous infections is becoming increasingly difficult. In the day and age where countless strains of harmful bacteria are evolving and adapting to become antibiotic resistant, scientists must pursue other means of combating these microbes. One of these potential solutions is bacteriophages, the natural predators of bacteria. Bacteriophages are a type of virus which infect, replicate within, and often destroy bacteria. As phages are abundant in nature, this research project involved the isolation of a bacteriophage from the rumen fluid of a cow; furthermore, it aimed to determine the phage's characteristics. Procedures such as the aseptic technique and serial dilution were utilized throughout the experiment, first to derive the bacteriophage from the rumen fluid and subsequently to plaque purify, ensuring that it was a single agent. A phage stock was also formulated and its abnormally small titer, 3.69×?10?^6, was determined. In addition, several experiments were conducted to find other bacteria that this bacteriophage was capable of infecting. Perhaps the most significant find was that it lysed the antibiotic resistant bacteria, Methicillin-resistant Staphylococcus aureus despite being highly selective and only completely infecting 7 of the 32 total. Finally, the way in which the bacteriophage replicates and its average burst size were defined in a growth curve experiment. Moreover, it was determined that the phage had a small burst size and may be temperate, not soley lytic. This phage could be utilized in human therapeutics, especially concerning treatment of MRSA; in hospitals for sterilization; as well as for food safety.

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