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A bacteriophage infecting a foodborne pathogen Salmonella enterica serovar Thompson

Jean Lu

Kennesaw State University E-mail: jean_lu@kennesaw.edu

Abstract

Salmonella is one of the most common food-borne bacterial pathogens in the world. In the United States, Salmonella causes more than one million food-borne diseases and billions of dollars in social losses every year. Salmonella serotype Thompson is one of the common serotypes that cause salmonellosis. Effective control of S. Thompson and other Salmonella serotypes is critical to public health. The use of bacteriophages (bacteriophages) to control foodborne bacterial pathogens, especially antibiotic resistant Salmonella, is a promising new biological control method. Purpose: The purpose of this study is to isolate and characterize the isolated phage infected with Salmonella Thompson. Materials and methods: Phages infected by S. Thompson were isolated from turkeys (named ?? | Ent). Bacteriophages form medium-sized transparent patches on their host turf. Transmission electron microscopy reveals this? |Ent belongs to the Siphoviridae family. A single-step growth kinetic study (multiplicity of infection is 0.02) shows that what is the incubation period? βEnt is about 40 minutes (including 10 minutes of adsorption), the rise time is 30 minutes, and the average burst size is 32 phage particles per infected cell. Host range studies have shown that bacteriophages can also infect other Salmonella serotypes, including Salmonella infantis. Protein analysis showed that the phage has several structural proteins in the range of 30 to 70 kDa. Phage infection in the model food system caused rapid cell lysis. Results: What do these results indicate? βEnt has high potential as a biological control agent for Salmonella in the food system. Among the most widely used antibiotics in hospitals and livestock, the global problem of bacterial resistance to antibiotics is developing rapidly. Recently, multi-drug resistant bacterial infections (MDR) have become the leading cause of death worldwide. Current antibiotics are not very effective in treating Salmonella MDR infections, which have become a threat to public health. Therefore, new methods are needed to rapidly detect and effectively control antibiotic resistant pathogens. Bacteriophages (bacteriophages) have regained attention due to their host-specific properties to meet these requirements. Therefore, this review aims to discuss the possibility of using bacteriophages as detection tools to identify bacterial cell surface receptors and alternative methods to control antibiotic-resistant pathogens in the food system. Salmonella is one of the leading causes of foodborne illness outbreaks. Because the traditional control method is less effective against newer Salmonella or antimicrobial Salmonella serotypes, a new method was tested. Because the use of bacteriophages as biological control agents has many advantages, the use of lytic phages for the biological control of Salmonella has become an attractive method in the food industry. Bacteriophages are a natural alternative to traditional antibacterial agents; have been shown to be effective in the control of bacterial pathogens in the food industry, which has led to the development of different bacteriophage products. Treatment with specific phages in the food industry can prevent the rotting of products and the spread of bacterial diseases and ultimately promote a safe environment for the production, processing and processing of animal and plant foods. After an extensive study of in the current literature, this review focuses on the successful control of Salmonella bacteriophage. In the food. This review also discussed the current knowledge about the pathogenic characteristics of Salmonella, the prevalence of new outbreaks of Salmonella, the isolation and characterization of Salmonella-specific phage, the effectiveness of Salmonella-specific phage as a biological control agent, and its intended use.

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