RESUMO - AMBIENTAL

ISOLATION AND CHARACTERIZATION OF LYTIC BACTERIOPHAGES FOR THE BIOCONTROL OF SALMONELLA ENTERICA: POTENTIAL FOR APPLICATION IN THE FOOD INDUSTRY

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Most foodborne illnesses are caused by pathogenic microorganisms, with Salmonella enterica being one of the main pathogens. Treatments such as steam, dry heat and UV light have been evaluated to control the main agents that cause food poisoning. However, the current technologies used to inactivate pathogens in foods are not always effective and, in addition, they can cause problems of acceptability and deterioration of the organoleptic properties of foods. In this context, bacteriophages (or phages) have emerged as a potential tool for the biocontrol of pathogenic bacteria. The research presented aimed to isolate and characterize lytic phages for S. enterica. Phage isolation was achieved departing from sewage samples from the food industry. Biological

characterization of the phage particles included determination of the phage titer, host range and EOP, as well as growth parameters via the OSGC and adsorption rate onto its host. Physical characterization of the phages included UV-Vis spectral scans to determine molar extinction coefficients, as well as analysis by DLS (Dynamic Laser light Scattering) to determine the size of the phage particles. The spectral scans allowed to observe that the wavelength at which there was greater absorption of the two phages was 255 nm for phages ph0036 and ph0046. At 245 nm it was possible to observe a minimum of absorbance, indicative of the absence of contaminants such as bacterial cell wall debris. The titers of the suspensions of the two phages were 9.93x1010 PFU/mL for phage ph0036 and 3.21x1011 PFU/mL for phage ph0046. The approximate sizes of the two phages were 83.80 ± 1.19 nm and 72.46 ± 1.01 nm. The OSGC (growth curve in a single synchronous cycle) was performed to determine the eclipse period, latent period, intracellular accumulation period and number of virions released by bacterial cell (burst size), whereas determination of the adsorption curve aimed at calculating the adsorption rate of bacteriophage particles onto the host cells. The isolated phage particles showed lytic activity only against Salmonella enterica and, thus, showed promise for use as agents in the biocontrol of contamination by Salmonella enterica.