**Characterization of ten newly isolated phages against the foodborne pathogen *Shigella flexneri***

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RESUMEN

*Shigella* is one of the most important waterborne and foodborne bacterial pathogens in the world. The species most commonly isolated from shigellosis patients is *Shigella flexneri*, which is found predominantly in developing countries like Argentina. Shigellosis is considered to be the most important cause of bloody diarrhea worldwide and is one of the main causes of children’s morbidity and mortality in Argentina. Ten (10) bacteriophages (AShi, Shi3, Shi22, Shi30, Shi33, Shi34, Shi40, Shi88, Shi93, and Shi113) with lytic activity against *Shigella flexneri* strains were tested for their resistance to physicochemical conditions found in food matrices. Phage viability and activity were assessed at different temperatures, pH values and NaCl concentrations. In addition, challenge tests with each individual phage against *S. flexneri* ATCC12022 were conducted to evaluate their use as biocontrol agents. Although phages showed high resistance up to 60°C, Shi30, Shi33 and Shi93 showed higher thermal resistance since phage particles were detected after a 1-h incubation at 70°C. The ten phages tolerated pH treatments well, being more resistant to alkaline conditions - up to pH 11 - since the viability and activity of phages were completely abolished only at the extreme pH values tested, namely pH 2 and 12. The NaCl concentrations evaluated showed no significant influence on phage counts. However, the activity of two phages was slightly affected only at the highest concentration tested (10%). Furthermore, challenge tests against ATCC12022 resulted in significant CFU mL-1 reductions. Results showed that the phages evaluated were resistant i) to a wide range of temperatures, ii) at pH values from 3 to 11, and iii) at all the concentrations of NaCl tested. Therefore, the phages evaluated in this study could be used in several food matrices since they are viable and active in a wide range of environmental conditions.

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