

Isolation, Characterization and Application of Bacteriophages on the Biocontrol of *Listeria monocytogenes* in Soft Cheese

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Abstract : Bacteriophages are one of the most abundant replicating entities on Earth and can be found everywhere in which their hosts live and there are reports regarding isolation from different niches such as soil and foods. Since studies are moving forward with regard to biotechnology area, different research projects are being performed focusing on the phage technology and its use by the food industry. This study aimed to evaluate a cocktail (LP501) of phages isolated in Brazil for its lytic potential against *Listeria monocytogenes*. Three bacteriophages (LP05, LP12 and LP20) were isolated from soil samples and all of them showed 100% lysis against a panel of 10 *L. monocytogenes* strains representing different serotypes of this pathogen. A mix of *L. monocytogenes* 1/2a and 4b were inoculated in soft cheeses (approximately 105 cfu/cm²) with the phage cocktail added thereafter (1 x 10⁹ PFU/cm²). Samples were analyzed immediately and then stored at 10°C for ten days. At 30 min post-infection, the cocktail reduced *L. monocytogenes* counts approximately 1.5 logs, compared to controls without bacteriophage. The treatment produced a statistically significant decrease in the counts of viable cells ($p < 0.05$) and in all assays performed we observed a decrease of up to 4 logs of *L. monocytogenes*. This study will make available to the international community behavioral and molecular data regarding bacteriophages present in soil samples in Brazil. Furthermore, there is the possibility to apply this new cocktail of phages in different food products to combat *L. monocytogenes*.

Keywords : bacteriophages, biocontrol, listeria monocytogenes, soft cheese

Conference Title : ICFTAE 2016 : International Conference on Food Technology and Agricultural Engineering

Conference Location : Miami, United States

Conference Dates : March 24-25, 2016