Adelaide Almeida et al., Biol Syst Open Access 2015, 4:2
http://dx.doi.org/10.4172/2329-6577.S1.003

OMICS International
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3rd International Conference on
Integrative Biology

August 04-06, 2015 Valencia, Spain

Phage inactivation of *Salmonella typhimurium* in cockles during depuration

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Salmonella enterica serovar *typhimurium* (*Salmonella typhimurium*) is the most common causative agent of human gastroenteritis after consumption of contaminated seafood. The use of lytic bacteriophages against this pathogen can be a new and promising approach for the prevention of food-contamination and food-borne infection. This study investigated the potential application of the bacteriophage SE-5 during depuration to reduce *S. typhimurium* in cockles (*Cerastoderma edule*) at different multiplicity of infection (MOI). Cockles were infected with 106 colony-forming units (CFU)/mL of *S. typhimurium* in the seawater and each infected group was treated with four different MOI values: 100, 10, 1 and 0.1. Infected cockles were depurated in non-recirculating seawater at 16°C for 12 hour. After *S. typhimurium* accumulation at 16° C, the initial mean values of bacteria in cockles were 6.20 log CFU/g. Depuration with phages at MOI 0.1 was the best condition to inactivate *S. typhimurium* in cockles, the concentration was reduced by 1.7 log CFU/g after 2 hours of depuration. Reduction for the other MOI values (MOI=1; MOI=10; MOI=100) was 1.13, 1.21 and 2.10 log CFU/g after 6 hours, 12 hours and 12 hours of treatment respectively. To our knowledge, this is the first report of a depuration trial using bacteriophage in the cockle treatment process. The data of this study indicate clearly that the application of the bacteriophages could reduce significantly the population of *S. typhimurium* in infected cockles. Moreover, cockles could be maintained alive during the depuration process. Therefore, the application of bacteriophage was effectively proven to be useful for shellfish depuration.

Biography

Adelaide Almeida is an Assistant Professor at the Department of Biology from the University of Aveiro (Portugal), where she got her PhD degree in 2001. She is an Integrated Member of the Associated Laboratory Centre for Environmental and Marine Sciences (CESAM). In the previous years, she was involved in the development and application of alternative methods to the use of antibiotics such as photo dynamic therapy and phage therapy and has publications in these fields.

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