

9<sup>th</sup> Edition of International Conference on **Environmental Science & Technology**  
&  
48<sup>th</sup> World Congress on **Microbiology**  
&  
50<sup>th</sup> International Congress on **Nursing Care**

June 24-25, 2019 Moscow, Russia



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### In dual species biofilm *Lactobacillus plantarum* impaired *Listeria monocytogenes* resistance to an acidic disinfectant

The main goal of this work was to investigate the role of *Lactobacillus plantarum* in dual species biofilm with *Listeria monocytogenes* in susceptibility assays with an acidic commercial disinfectant based on hydrogen peroxide/peracetic acid - P3-oxonia active. Nine *L. monocytogenes* including a control and eight persistent strains from the meat industry were used. Biofilms were produced on stainless steel coupons, at 11°C (refrigeration temperature) or at 25°C (room temperature), simulating the food industry environment after deficient sanitation (1/10 diluted TSB) or in control medium (TSB). Concentration and contact time of the disinfectant were raised as needed to achieve the recommended 4 log reduction threshold (EN 13697). In both nutrient conditions, there was no significant differences ( $p > 0.05$ ) between *L. monocytogenes* cell enumeration in mono and in dual species. Although, *L. monocytogenes* was the dominant species in dual species biofilms and it was generally more susceptible than in mono species. In nutrient conditions mimicking food industry environment (TSB/10) and with the lower concentration of P3 tested (0.5%), none of the mono species biofilms reached the 4 log reduction. In spite of the role of *L. plantarum* in impairing *L. monocytogenes* resistance, five dual species biofilms also did not reach this threshold. When a linkage distance of about 1.7 was used, apart from the control strain in a separate cluster, all eight persistent strains were gathered in the same cluster based on their susceptibility behavior. Although, dual-species biofilms were generally easier to control, biofilms produced under conditions approaching the real food industry environment may be more difficult to eradicate. It is therefore important to proceed with the investigation on multi-species biofilms produced at low temperature and under nutrient scarcity when susceptibility to sanitizers is being assessed.

#### Recent Publications

1. Costa A, Lourenco A, Civera T and Brito L (2018) *Listeria innocua* and *Listeria monocytogenes* strains from dairy plants behave similarly in biofilm sanitizer testing. *LWT - Food Science and Technology* 92:477-483.
2. Araujo V, Neves E, Silva A C, Martins A P L and Brito L C (2017) *Listeria monocytogenes* cells under nutrient deprivation showed reduced ability to infect the human intestinal cell line HT-29. *Journal of Medical Microbiology* 67(1):110-117.
3. Costa A, Bertolotti L, Brito L and Civera T (2016) Biofilm formation and disinfectant susceptibility of persistent and non-persistent *Listeria monocytogenes* isolates from Gorgonzola cheese processing plants. *Food Borne Pathogens and Disease* 13(11):602-609.

## JOINT EVENT

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4. Dutra V, Silva A C, Cabrita P, Peres C, Malcata X and Brito L (2016) *Lactobacillus plantarum* lb95 impairs the virulence potential of gram-positive and gram-negative food-borne pathogens in ht-29 and vero cell cultures. *Journal of Medical Microbiology* 65:28-35.

### Biography

Luisa Brito is an Assistant Professor in Habilitation at University of Lisbon, Portugal. She is a Coordinator of different courses of the Degrees and Masters in Biology and Food Engineering. She has been Supervisor of several Undergraduate, Master and Doctoral theses. She develops research on pathogenic food borne bacteria. Some of these studies involved proteomic, transcriptomic and phenotypic analysis of planktonic and biofilm cells. The use of lactic acid bacteria with probiotic characteristics in the attenuation of the virulence of these pathogens is another area of research. This area is related with the development of new and healthier food based on the fermentation of underexplored fruit and vegetables materials with high content in functional compounds.

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### Notes: