

Listeria monocytogenes: biofilm formation ability

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Introduction

Listeria monocytogenes is an important foodborne pathogen responsible for cases and outbreaks of listeriosis associated with a variety of food products (Farber and Peterkin, 1991; Arslan and Ozdemir, 2008). Biofilm formation is an environmental adaptation where a community of microorganisms adsorb to a solid surface and is embedded in an organic polymer matrix of bacterial origin. This is a strategy to survive harsh conditions protecting bacteria against antibiotics, disinfectants and biocides (Poulsen, 1999). The presence of biofilms of *L. monocytogenes* in food processing environments is of great concern, and may be responsible for the presence of persistent strains often found in food processing plants.

The aim of this study was to characterize *L. monocytogenes* isolates in terms of biofilm production, using two different temperatures.

Results and Discussion

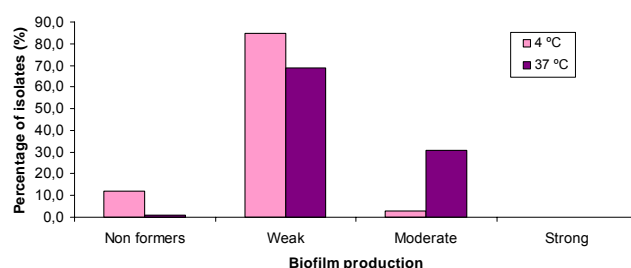


Figure 1. Percentage of biofilm producers isolates (%) at both temperatures tested.

At both temperatures, none of the strains were classified as strong biofilm producers. At 4 °C, 31 (12.0%), 219 (84.9%) and 8 (3.1%) strains were classified as non-formers, weak or moderate biofilm formers, respectively. At 37 °C, only 2 (0.8%) isolates were non-formers, and 177 (68.6%) and 79 (30.6%) were classified as weak and moderate biofilm formers, respectively. Other authors also found *L. monocytogenes* isolates with the ability to form biofilms on plastic surfaces (Djordjevic *et al.*, 2002; Stepanović *et al.*, 2004).

The importance of those isolates in food industry is of great concern since, nowadays, a lot of equipment and accessories incorporate plastic materials.

The capacity to grow at refrigeration temperatures by *L. monocytogenes* is well known. In this study the ability of isolates to form biofilm at 4 °C was evident, although the fewer number of moderate biofilm formers at this temperature when compared with 37 °C, was notable.

Further studies are necessary and will be conducted in order to evaluate the efficacy of several disinfectants against biofilms formed by *L. monocytogenes* isolates.

Material and Methods

A total of 258 strains of *L. monocytogenes*, isolated from various food products, were investigated in terms of biofilm production in 96-wells microtiter plate assays, at 4 °C during 5 days and 37 °C during 24 h. The strains were classified as strong ($OD_{630nm} \geq 0.220$), moderate ($0.110 \leq OD_{630nm} < 0.220$), weak ($0.055 \leq OD_{630nm} < 0.110$) or no biofilm formers ($OD_{630nm} \leq 0.055$) based upon the OD at 630 nm of stained bacterial films (Stepanović *et al.*, 2004).

References

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Acknowledgements

This work was financially supported by "Fundação para a Ciência e a Tecnologia" / FEDER, project PTDC/AGR-ALI/64662/2006.