

TITLE: ANTIBIOFILM ACTIVITY OF THE ESSENTIAL OIL OF *ROSMARINUS OFFICINALIS* FRONT OF BIOFILM OF *LISTERIA MONOCYTOGENES* IN POLYSTYRENE SURFACE

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ABSTRACT:

Listeria monocytogenes has characteristics that confer persistence on different surfaces of food processing plants, such as antimicrobial resistance and the ability to form biofilms. Such characteristics provide greater tolerance to this pathogen in the presence of physical and chemical agents, in this context, it is necessary to look for alternative technologies for use on these surfaces, an example of essential oils, such as *Rosmarinum officinalis*. The objective of this work was to evaluate the activity of *R. officinalis* oil in the formation of *L. monocytogenes* biofilm and to compare its efficiency with peracetic acid. Two isolates of *L. monocytogenes* belonging to serotype IVb. Were used. OE was obtained commercially from FERQUIMA-Indústria e Comércio Ltda. Initially, the minimum inhibitory concentration (MIC) of OE and AP was determined according to the standard protocol. The isolates were adjusted in the range of 0.5 McFarland and 1,5 mL aliquots in quadruplicate with the presence of MICs deposited in polystyrene plate wells to evaluate biofilm formation. 1,5 ml aliquots containing only bacterial suspension were used as a positive control. Plates were incubated at 96 hr/37°C orbital shaking. The wells were then washed with 1,5 ml of Phosphate Buffered Saline (PBS) to remove planktonic cells. The sessile cells were detached by friction with sterile swabs, immersed in tubes containing saline solution and vortexed for 120 seconds. Subsequently, appropriate decimal dilutions, seeded in TSA-YE, enumerated after 24h/37°C, the results were expressed in CFU/cm². The assays were obtained in two replicates. CIMs were obtained from 2 mg/mL and 3 mg/mL for OE and 0,015% for PA. *L. monocytogenes* was able to form biofilms on the polystyrene surface with a count of 6.92 CFU/cm². When evaluating the action of MICs, *R. officinalis* oil biofilms reduced 71,24% (99 log UFC/cm²) to the concentration of 3 mg / mL and 59,68% (2,79 log UFC/cm²) at the concentration of 2 mg/ml. The reduced count is only 31,07% (4,77log UFC / cm²) when evaluated along with the MIC of the AP. Thus, it can be shown that the essential oil of *r. officinalis* was able to reduce the initial biofilm count when compared to PA, demonstrating the possibility of inclusion of *R. officinalis* OE in the industrial hygiene protocols.

Keywords: *Listeria monocytogenes*, biofilms, essential oil