Cymbopogon martinii ESSENTIAL OIL ACTION AGAINST *Pseudomonas aeruginosa* BIOFILM FORMATION

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Biofilms consist of cells that are adhered to a surface, either biotic or abiotic, immersed in an exopolysaccharides matrix. The adhesion capacity of microorganisms on surfaces and equipment used in the food industry is concerning in terms of economic losses and the harm it can bring to the consumers' health. The use of essential oil (EO) occurs because it is able to act as a natural antimicrobial. This may cause small changes in the cytoplasmic membrane structure, affecting its metabolism, including the synthesis of macromolecules. The objective of this study was to evaluate the action of the *Cymbopogon martinii* EO, faced with the formation of biofilms of *Pseudomonas aeruginosa* ATCC 27853. Antibiofilm activity verification was performed through quantification methodologies of biomass and quantification of viable cells. Three three oil concentrations were used in the process: 0.20%, 0.39% and 0.78%, the experiments were performed in triplicate. The biofilms were inoculated in polypropylene microtiter plates and incubated in an orbital shaker (Tecnal, Brazil) at 37°C, 80 rpm stirring, containing the treatments with oil and the positive control containing only the bacterial suspension in TSB to $2x10^8$ CFU/mL without oil. After 24 hours there was the biomass quantification, staining the biofilm with crystal violet pigment and the reading was performed later at 630 nm in ELISA spectrophotometer (Biotek, USA). For quantification of viable cells, they were submitted for six minutes to ultrasound bath (Unique, Brazil). The serial dilution of samples and plating on Tryptone Soy Agar surface - TSA occurred, using the microdrop technique. After 24 hours of incubation the count of viable cells in biofilms was performed. The greater reduction in viable cell occurred at 0.38% EO concentration, a reduction of 0.94 log10 $UFC.cm^{-2}$, however, there was no significant reduction in the number of cells. In the biomass quantification analyzes, Pseudomonas aeruginosa demonstrated high capacity of biofilm formation on the surface. There was a significant reduction ($P<0.01$) in the amount of biomass at concentrations of 0.38% and 0.78% of EO. This result demonstrated the efficient reduction in exopolysaccharide production by the bacterium. In this study, it was concluded that *P. aeruginosa* is a bacterium with great biofilm formation capacity in the polypropylene surface and the viable cells showed resistance to EO in the studied conditions.

Key words: essencial oil, biofilm, exopolysaccharide.

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