

TITLE: DETECTION OF BIOFILM AND OPERON *ICA* IN *S. AUREUS* ISOLATED FROM FOOD HANDLERS

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ABSTRACT

The pilot kitchens are responsible for preparing and distributing meals to students in all public schools. However, these foods are subject to contamination through the sanitizing flaws of food handlers. As part of the human microbiota, bacteria of the genus *Staphylococcus* are one of the most frequent pathogens found in this environment, where these officials can facilitate the spread of these bacteria to food and surfaces becoming potential sources for biofilm formation, mainly encoded by the operon *ica* containing the *icaADBC* genes, responsible for the production and export of intercellular polysaccharide adhesin (PIA), the main component responsible for adhesion between bacteria and surfaces. Samples were isolated and identified by tests Gram stain, catalase, coagulase and PCR for determination of *S. aureus* (*Sa442* gene) 16 samples of nasal cavities and nails of food handlers of a pilot kitchen of the region West of São Paulo. The samples were studied for phenotypic biofilm formation in Congo red agar (CRA) and adherence level in borosilicate (TB) tubes. For PCR, the *icaADBC* genes were detected. The test sensitivity, specificity and agreement Kappa between phenotypic and genotypic methods was performed. Of the 32 samples collected, 28 confirmed to be *Staphylococcus*, 84.4% were *S. aureus*. By PCR 100% of the samples revealed the presence of *icaA* and *icaD* genes, 71.43% the *icaB*, 42.86% *icaC* and 35.71% showed the complete operon. The biofilm formation showed growth of 96.43% in CRA and 35.71% of these samples had the complete operon, 92.86% in TB which 38.46% were strong adherent with 20% complete operon, 38.46% medium adherent and 23.08% weak adherent, both with 40% carrying the *icaADBC* gene. The two phenotypic techniques presented 100% sensitivity, specificity was 11.10% for adherence in TB and 5.60% for CRA technique and there was no kappa agreement ($k < 0$) between the two techniques. The data indicate that all food handlers were colonized by *S. aureus* and all samples have high capacity for biofilm formation and the concomitant presence of *icaADBC* genes indicates an increase in the enzymatic activity responsible for biofilm production, which explains the importance hygiene and biosafety standards.

Keywords: Food handlers; *S. aureus*; Operon *ica*; Biofilm.

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