

**TITLE:** ANTIMICROBIAL AND ANTI BIOFILME ACTIVITIES OF ESSENTIAL OILS AGAINST ISOLATES OF *Staphylococcus aureus*.

**AUTHORS:** TEIXEIRA, A.S.<sup>1</sup>; SILVA, M.V.<sup>2</sup>; SOUZA, R.F.S.<sup>1</sup>; COSTA, M.M.<sup>1</sup>

**INSTITUTION:** 1. UNIVERSIDADE FEDERAL DO VALE DO SÃO FRANCISCO – UNIVASF (RODOVIA BR 407, LOTE 543 PROJETO DE IRRIGAÇÃO NILO COELHO, S/N, CEP 56300-000, PETROLINA, PERNAMBUCO, BRASIL). 2. UNIVERSIDADE FEDERAL DE PERNAMBUCO – UFPE (AVENIDA PROF.MORAES REGO S/N, 50670420, RECIFE, PERNAMBUCO, BRASIL).

**ABSTRACT:**

The production of bovine milk is one of the most important agricultural activities in Brazil. Genetic selection of herds in order to achieve greater milk production has an impact on animal welfare and disease incidence, such as mastitis. Mastitis is an inflammation in the mammary glands, caused mainly by bacterial agents, especially *Staphylococcus aureus*. The main strategy for treatment is antibiotic therapy, however, due to the selection of resistant strains and biofilm production capacity by isolates, varying degrees of efficiency have been observed. Therefore, there is a demand for the development of more efficient and safe methods. The use of natural compounds, such as the use of essential oils, has become a viable solution to the problem because they are aromatic liquids of low molecular weight and that can present hundreds of chemical components. Thus, the objective of the study was to verify the antimicrobial activity and antibiofilm of essential oils against clinical isolates of *S. aureus*. Seven clinical isolates of mastitis and one control strain (ATCC 33591) and five essential oils obtained from: *Eugenia brejoensis*, *Eugenia stictopetala*, *Attalea speciosa*, *Campomanesia sp.* and *Eugenia gracillima*. Minimum inhibitory concentration (MIC) and minimal bacterial concentration (CBM) were determined from broth microdilution. The determination of the antibiofilm activity was evaluated by the interference of the essential oils on the formation, as well as by their action on the consolidated biofilm, using the method of staining with crystal of violet at 0.25%. The absorbance reading was 620nm. It has been found that the essential oils of *A. speciosa*, *Campomanesia sp.* and *E. brejoensis* presented better antimicrobial activity, with mean values of CBM of 62.5 µg / mL, 134.8 µg / mL and 164 µg / mL, respectively. Of the seven isolates of *S. aureus*, four were characterized as strong biofilm producers and three as moderate producers. On the antibiofilm effect it was verified that all the essential oils were able to interfere in the formation of the biofilm, going from the strong or moderate state, to weak or negative. And only the essential oil of *Campomanesia sp.* and *E. stictopetala*, had a satisfactory interference in the consolidated biofilm. Therefore, it was possible to conclude the promising antimicrobial and antibiofilm potential of the essential oils on the studied microorganisms and, therefore, are candidates for an alternative treatment of bovine mastitis.

**Key words:** antibiofilm, antimicrobial resistance, essential oils, mastitis, phytotherapy.

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