

**TITLE:** IRON CHELATORS ON BIOFILME FORMATION AND GROWTH OF *Staphylococcus aureus* ISOLATED BOVINE MASTITIS

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**ABSTRACT:**

Control measures of mastitis are of great importance and *Staphylococcus aureus* is one of the main agents involved in this pathogenesis, due this bacterium to having several virulence factors, such as biofilm. In bacterial metabolism, iron is an essential nutrient for various biochemical pathways. The host defense system produces iron chelators, which act to restrict the use of this metal by microorganisms, a process that can be adopted alternately in the fight against pathogens. Therefore, the purpose of this study was to evaluate the interference of sodium alginate and 2,2'-Bipyridyl in bacterial growth and biofilm produced by *S. aureus* isolated from bovine mastitis. For this, the antimicrobial resistance and biofilm production of the *S. aureus* isolates were confirmed phenotypically and genotypically. Then, the siderophores presence was evaluated by Polymerase Chain Reaction with the *sfaD* and *sbnD* genes and the activity by the test of growth of these microorganisms with exogenous source of iron. Minimum inhibitory and bactericidal concentrations were also evaluated for the chelators tested. Next, the interaction of the chelators in the growth pattern of the isolates was studied, as well as the influence of these substances on the biofilm produced by *S. aureus*. Finally, the synergistic effect of the use of 2,2'-Bipyridyl associated with oxacillin was studied. The isolates showed resistance to three of the six classes tested, in addition to the presence of the *blaZ* gene in all isolates. The two chelators inhibited the growth of the isolates exposed to an exogenous source of iron, although 100% of the tested strains showed the presence of the *sfaD* and *sbnD* genes. Sodium alginate showed no bactericidal activity other than 2,2'-Bipyridyl, which showed bactericidal concentrations ranging from 0.0156% to 0.2500% against *S. aureus*. In the growth curve, the tested isolates presented delayed growth in the presence of chelators. Although the substances did not show an effective reduction during the stage of biofilm formation, there was interference in the structure of the biofilm consolidated by the two chelators. In this assay, 2,2'-Bipyridyl showed interference in 66.66% of the isolates, suggesting the use of this, in an isolated way. Thus, the data presented in the present study evidences the potential use of 2,2'-Bipyridyl in the fight against the biofilm produced by *S. aureus*, as well as its use in the aid treatment of mastitis.

**Keywords:** biofilm, 2,2'-Bipyridyl, sodium alginate, siderophores.

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