

**TITLE:** *IN VITRO* BETA-LACTAMASE AND BIOFILM PRODUCTION BY *Staphylococcus aureus* ISOLATED FROM BOVINE MASTITIS.

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**ABSTRACT:**

Mastitis is one of the most prevalent diseases in dairy herds which causes high economic losses. *Staphylococcus aureus* (*S. aureus*) is one of the most important etiological agents of the bovine mastitis causing persistent and long-term infection. The persistence is related to the production of virulence factors such as biofilm and antimicrobial resistance contributing to the bacterial survival in mammary glands and making the staphylococcal mastitis control difficult. The aim of the present study was to evaluate the production of beta-lactamase and biofilm in 51 *S. aureus* strains isolated from bovine mastitis in dairy herds of Agreste of Pernambuco. Strains were screening for beta-lactamase production by the nitrocefin technique and classified as weak and strong producers. The *in vitro* antimicrobial susceptibility profile against beta-lactams was also evaluated. Biofilm production was investigated by a spectrophotometric (MTP) and Congo red agar (CRA) technique, and strains classified as weak, moderate and strong biofilm producers. The results showed that 49 strains (98%) were strong beta-lactamase producers and only one (2%) weak producer. All enzyme-producing strains showed resistance to penicillin and ampicillin. By the MTP technique, 32 strains (62.74%) were biofilm producers with 19 (59.37%) weak, 10 (31.25%) moderate and three (9.38%) strong biofilm producers. The CRA technique demonstrated that only three strains (5.88%) were biofilm producers. It was also observed that all biofilm producers were strong beta-lactamase producers. The results suggest that the abusive use of antimicrobial drugs as well as the absence of mastitis prevention and control measures in the evaluated herds, favors the selection of *S. aureus* antimicrobial resistance strains. Furthermore, it was demonstrated that the evaluated strains have potential to produce biofilm *in vivo* which may contributing with the persistence of *S. aureus* in mammary gland.

**Keywords:** pathogenicity, resistance mechanisms, staphylococcal mastitis