

TITLE: ANTIMICROBIAL AND ANTIBIOFILM ACTIVITY OF CARYOPHYLLENE OXIDE IN FRONT OF BOVINE MASTITIS ISOLATED *Staphylococcus aureus*.

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ABSTRACT:

The bovine mastitis is a common disease in herds around the world, causing enormous damage. The disease is characterized by inflammatory processes in the udder, due to invasion and proliferation of pathogenic bacteria, mainly the species *Staphylococcus aureus*. This microorganism can produce biofilm, making it more resistant to antimicrobial agents, besides facilitating colonization in the mammary epithelium. Another related problem is resistance due to the indiscriminate use of antibiotics. Given this scenario there is a need to develop alternative, safe and efficient methods for treatment. The use of natural compounds, such as essential oils, has become a viable solution to the problem. The caryophyllene oxide is one of the main active components of essential oils derived from various plants. Thus, the objective of this research was to analyze the antimicrobial activity and antibiofilm of caryophyllene oxide on clinical isolates of *S. aureus*. Seven clinical isolates of mastitis and one control strain (ATCC 33591) were used. The caryophyllene oxide was commercially available. Minimum inhibitory concentration (MIC) and minimal bacterial concentration (MBC) were determined from broth microdilution. To determine the quantification of biofilm production by bacteria and antibiofilm activity of caryophyllene oxide, the isolates were cultured in TSBg (Tryptone Soya Broth) with 0.25% glucose). Thereafter, an aliquot was transferred to a microplate concomitantly with the TSBg or the antimicrobial solution in order to achieve the equivalent of half the CBM value. After 24 h of incubation at 37 ° C, the microplates were submitted to a 0.25% violet crystal staining methodology. The absorbance reading was 620 nm. It was observed that the caryophyllene oxide showed good antimicrobial activity, with mean CBM values of 281.25 µg / mL. 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 observed that the molecules of caryophyllene oxide interfered in the state of formation of the biofilm of all the isolates of *S. aureus*, leaving a state of strong or moderate to weak producer. But it did not have significant activity against the already established biofilm. Therefore, it was possible to conclude the antimicrobial and antibiofilm potential of caryophyllene oxide, indicating it as a possible adjuvant in the treatment of bovine mastitis.

Key words: antibiofilme, antimicrobial resistance, caryophyllene oxide, mastitis, phytotherapy.

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