TITLE: ANTIMICROBIAL ACTIVITY OF USNIC ACID AND POTASSIUM USNATE OF CLINICAL ISOLATES OF CAPRINE AND BOVINE MASTITIS.

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ABSTRACT:

One of the main agents causing mastitis is the microorganism Staphylococcus aureus, which install itself in the mammary glands of dairy herds, causing an infection. For productive purposes, the routine treatment on the properties is based on antibiotics. However, the indiscriminate use of these drugs for the treatment of mastitis has favored the selection of resistant strains. Therefore, the development of therapeutic alternatives for the control of this disease is necessary. Thus, lichenoic derivatives, such as usnic acid and potassium urea, present a promising alternative for the treatment of caprine and bovine mastitis. In this context, the present study evaluated the antibacterial activity of usnic acid, potassium usnate, oxacillin and nanoparticles of usnic acid and oxacillin in clinical isolates of caprine and bovine mastitis. Samples of Staphylococcus spp. were used, five of clinical caprine mastitis, five of bovine clinical mastitis, and the ATCC's 33591 and 25923, which were used as resistance references and biofilm production, respectively. The antimicrobial activity of the substances was carried out by the broth microdilution method. In addition, the biofilm quantification of all the isolates was performed by the microplate adhesion analysis and those that presented positive formation were used in the interference test. The synergistic antimicrobial evaluation was made with oxacillin and potassium usnate by the Checkerboard method. All tested substances have an antibacterial action, with the nanoparticle of usnic acid presenting the best results, with MIC ranging from 7.81 μ g / mL to 500 μ g / mL. Potassium usnate has shown to be effective at interfering with biofilm formation for all isolates, including ATCC 25923. In the syneraism test it was observed that synergistic concentrations culminated in an 80% reduction in standard antibiotic concentration. Thus, the usnic acid and potassium usnate can be therapeutic alternatives for the control of caprine and bovine mastitis caused by S. aureus, in which the usnic acid nanoparticle showed antimicrobial activity at lower concentrations. In addition, the use of potassium usnate associated with oxacillin showed to be effective by reducing the *in vitro* antibiotic dose.

Keywords: biofilm, lichen, nanocapsules, resistence, synergism.

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