

## **ANTIMICROBIAL RESEARCH AGAINST GRAM-POSITIVE BACTERIA USING 2-THIAZOLINE-2-THIOL LIGANDS DERIVATIVE COMPLEXED WITH METALS**

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Gram-positive cocci are important agents of infection and the resistance of these pathogens to antimicrobial agents has increased particularly in a hospital environment. In this regard, synthetic compounds present a major source research of new antimicrobial agents. 2-thiazoline-2-thiol compounds, as well as its derivatives, have several pharmaceutical applications, mainly in the development of antibiotics. Thus, this study aimed to evaluate the *in vitro* antimicrobial activity of 16 compounds consisting of ligands derived from 2-thiazoline-2-thiol complexed with different metals such as Co, Cu, Cr, Fe, Mn, Zn and Ag, against Gram-positive bacteria. The bacteria used were *Staphylococcus aureus* ATCC 29213, *Staphylococcus saprophyticus* ATCC 15305 and *Streptococcus agalactiae* ATCC13813. To evaluate the antimicrobial activity, the compounds were subjected to the determination of Minimum Inhibitory Concentration (MIC) by broth microdilution technique as provided by the CLSI (2003) with modifications. The following concentrations were tested: 500; 250; 125; 62.5; 31.25; 15.63; 7.81 and 3.90 µg /mL. Streptomycin was used as positive control and dimethylsulfoxide was used in the dilution of compounds, as negative control. To evaluate the Minimum Bactericidal Concentration (MBC) of the compounds that showed MIC at the tested concentrations, it was plated 25 µL aliquots from each well in Mueller Hinton agar, and the plates were incubated at 35 ° C for 18h. The hydrotris (2-mercaptopthiazolyl) borate complexed with Cu ( $L_1 - Cu^{2+}$ ) and 1 , 2-bis (2-thiazoline-2-ylsulfonyl) ethane complexed with Ag ( $L_2 - Ag^{2+}$ ) were the compounds that showed better activity. The complex  $L_2 - Ag^{2+}$  showed the best activity against all tested bacteria, with MIC values of 3.90 µg / mL against *S. saprophyticus*, the same value observed to streptomycin, and 31.25 and 15.63 µg / mL against *S. aureus* and *S. agalactiae*, respectively. Therefore, this compound was selected for further studies of cytotoxicity in eukaryotic cells and *in vivo* studies because of its promising antimicrobial activity.

**Keywords:** 2-thiazoline-2-thiol, Gram-positive bacteria, antimicrobial activity

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