Title: ANTIMICROBIAL ACTIVITY OF COUMARIN

Authors Silva, T.P [1], Silva, M.R. [1], Feniman-De-Stefano, G.M.M. [2], Moritz, C.M.F. [1]

Institution [1]UEM - State University of Maringá, Campus of Umuarama (Av. Ângelo Moreira da Fonseca, 1800 – Parque Danielle – 87506.370 – Umuarama/PR), [2]FSP – Faculty Southwest São Paulo (Av. Prof. Celso Ferreira da Silva, 1001 – 18707.150 – Avaré/SP)

Abstract:

The emergence of resistant and opportunistic microorganisms has created great concern in public health, which arouses the search for new antimicrobial substances from natural sources, mainly medicinal plants. The genus *Mikania*, popularly known as guaco, has been associated with expectorant and against influenza, anti-inflammatory, bronchodilator, antiallergic, antiasthmatic, antiulcerogenic, and relaxing of smooth muscle. The aim of this research was to evaluate the antimicrobial activity of coumarin, one of the major components of guaco, determining the Minimum Inhibitory Concentration (MIC) for 8 bacterial species. We used the broth microdilution method with Müeller-Hinton broth, supplemented with 0.5% Tween 80, preparing concentrations of 5,120, 2,560, 1,280, 640, 320, 160, 80, 40, 20 and 10 mg/mL (w/v) in 100 µL final volume in each well of the plate. The species tested were *Staphylococcus aureus* subsp. *aureus* (ATCC 14458), *Listeria monocytogenes* (ATCC 7644), *Bacillus cereus* (ATCC 11778), *Escherichia coli* (ATCC 11229), *Salmonella enterica* subsp. *enterica* serovar. Typhimurium (ATCC 13311), and *Xanthomonas axonpodis* (ATCC 8718) standardized in 0.85% sterile saline in the range of 0.5 MacFarland, getting the final bacterial suspension around 5.0 $x10^7$ CFU/mL. The reading of the plates was done after incubation at 37°C/24h, with addition of 15 µL redox indicator (resazurin 0.1%), and blue color indicated negative for bacterial growth and pink color indicated positive for bacterial growth. Tests were performed in triplicate for each bacteria and its MIC was considered the lowest concentration at which there was no bacterial growth in at least two replicates after the incubation period. For *S. aureus* (ATCC 14458) was obtained MIC of 1.280 mg/mL and for other bacteria to MIC was 640 mg/mL. However, it was observed the incomplete dissolution of coumarin crystals, and this fact may have influenced less action powerful of coumarin against the bacteria this study. These results demonstrate that coumarin can also be exploited as an antimicrobial,. Thus, from the results of this work with coumarin is possible to outline more specific studies for its application as natural and alternative antimicrobial.

Keywords: natural products, antimicrobials, coumarin

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