TITLE: ANTIBACTERIAL ACTIVITY ANALYSIS OF HETEROCYCLIC SULFONAMIDES

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INSTITUTION: 1- PROGRAMA DE PÓS-GRADUAÇÃO EM MICROBIOLOGIA AGRÍCOLA E DO AMBIENTE, INSTITUTO DE CIÊNCAS BÁSICAS DA SAÚDE (ICBS), UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL (R. SARMENTO LEITE, 500, CEP 9035190, PORTO ALEGRE – RS, BRAZIL)
2-PROGRAMA DE PÓS-GRADUAÇÃO EM CIÊNCIAS FARMACÊUTICAS DA UNVERSIDADE FEDERAL DO RIO GRANDE DO SUL (AV. IPIRANGA, 2752, 1º ANDAR, CEP 90610-000, PORTO ALEGRE-RS, BRAZIL)

ABSTRACT:

In face of the rising incidence of serious infections caused by multiresistant microorganisms it becomes increasingly necessary the development of new antimicrobials. In this context, a list of priority microorganisms was disclosed by World Health Organization (WHO) in 2017, such as *Staphylococcus aureus* methicillin-resistant (MRSA), vancomicyn-resistant (VRSA) and intermediate (VISA), *Acinetobacter baumannii* carbapenem-resistant, *Pseudomonas aeruginosa* carbapenem-resistant among others. Sulfonamide-containing compounds have been used as antimicrobials for decades due to their notorious activity. Based on this knowledge, our group has developed 6 compounds from heterocyclic sulfonamides and assessed its antibacterial activity. The 6 compounds were synthesized in the Pharmaceutical synthesis group laboratory. For the evaluation of antibacterial activity, the broth microdilution technique was used to determine the minimum inhibitory concentration (MIC), using 96-well plates and concentrations ranging from 0,125µg/ml to 64 µg/ml. A total of 8 ATCC strains were used in this study: *E. faecalis* 29212*, S. epidermidis* 35984*, S. aureus* 29213, *P. aeruginosa* 27853, *K. pneumoniae* 700605*, S. flexneri* 12022*, E. aerogenes* 13048 and *E. coli* 35218. Compounds which showed larger activity against the ATCC strains were also tested for 20 strains of *S. aureus* from our samples collection. Compounds 01, 02, 03 and 05 presented MIC values between 4µg/ml and 32 µg/ml for *E. faecalis*, *S. epidermidis* and *S. aureus* ATCC strains. Regarding the 20 strains tested from the samples collection, MIC50 and MIC90 results were 16 µg/ml and 32 µg/ml for compound 01, 32 µg/ml and 64 µg/ml for 03 and >64 µg/ml for both results in 02, 04, 05 and 06 compounds. The results of our study demonstrated that compounds 01 and 03 showed superior biological activity, thus becoming promising for the development of new antimicrobial drugs.

Keywords: Heterocyclic sulfonamides, antibacterial activity, *Staphylococcus aureus*

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