

TITLE: ANTIMICROBIAL ACTIVITY OF NEW 4,5-DIHYDRO-1-*H*-PYRAZOLE-1-CARBOXIMIDAMIDE HYDROCHLORIDES AGAINST PATHOGENIC MICROORGANISMS

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ABSTRACT:

The uncontrolled use of antibiotics, have made the microorganisms increasingly resistant. In this context, pathogenic microorganisms represent a serious health risk and search for alternatives against these pathogens it becomes necessary. Among many compounds that arouse interest for the present antimicrobial activity, recent research indicates those with pyrazoline nucleus, precursors of pyrazoles of the 1,2-diazole class. Thus, from the synthesis of thirteen new 4,5-dihydro-1*H*-pyrazole-1-carboximidamides hydrochlorides, this study investigated its antimicrobial action against pathogenic bacteria and yeasts, using the broth micro dilution test, in 96-well micro plates according to *CLSI, 2012*. The chosen microorganisms were *E. faecalis*, *S. aureus*, *S. Typhimurium*, *E. coli* and *Candida albicans*, *C. glabrata*, *C. krusei* and *C. tropicalis* from the *American Type Culture Collection*, which were standardized in a spectrophotometer in the adjustment of $1,5 \times 10^8$ CFU/mL for bacteria and $2,5 \times 10^6$ CFU/mL for yeasts. The compounds were diluted in DMSO (5%), the concentrations tested were from 3.9 to 1000 µg/mL and were used Müller-Hinton broth for bacteria and RPMI for yeasts. The results were visualized after the incubation period. The best Minimum Inhibitory Concentration (MIC) obtained in the test was 7.8 µg/mL of the compound 5-(4-bromophenyl)-3-(2-hydroxyphenyl)-4,5-dihydro-1*H*-pyrazole-1-carboximidamide against *S. aureus* and *E. faecalis*. For *S. Typhimurium* and *E. coli* the MIC was 31.25 µg/mL of the compound 3-(2-hydroxyphenyl)-5-(4-(trifluoromethyl)phenyl)-4,5-dihydro-1*H*-pyrazol-1-carboximidamide. The compound 3-(2-hydroxyphenyl)-5-p-toluoyl-4,5-dihydro-1*H*-pyrazole-1-carboximidamide showed the best results against *Candida krusei*, *C. tropicalis*, *C. albicans* and *C. glabrata* with MIC of 31.25, 62.5, 125 and 125 µg/mL respectively. The thirteen compounds showed activity against the tested microorganisms and the Minimum Inhibitory Concentrations ranged from 7.8 to 1000 µg/mL, except for the compound 3-(2-hydroxyphenyl)-5-(pyridin-2-yl)-4,5-dihydro-1*H*-pyrazole-1-carboximidamide, which was the only one not showing activity against yeasts. The results show that according to the substituent change, and the position in which it is at the molecule structure, the activity against the microorganisms also varies. Thus, we have seen that the tested compounds showed promising antimicrobial activity, which suggests further studies so that they can be used as future antimicrobials.

Keywords: Antimicrobials. Pyrazolines. Minimum Inhibitory Concentration.

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