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Syntheses, Characterization and Antimicrobial Evaluation of Some 1, 3, 5-Trisubstituted Pyrazole Derivatives

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Abstract: A series of 1, 3, 5-trisubstituted pyrazole derivatives were synthesized and screened for antimicrobial activity. The compounds (**2j-o**) were evaluated against two gram-positive and two gram-negative bacteria and one fungus, at concentrations of 10 µg/mL and 50 µg/mL. The compounds were founds to be inactive against *P. aeruginosa* and *A. niger* but exhibited moderate activity against *B. subtilis*, *E. coli* and *S. aureus*. It can be concluded that the newly synthesized compounds possess promising antimicrobial activity.

Keywords: Pyrazoles, Antimicrobial activity, Diketo compounds, FTIR.

Introduction

In the past few decades, the development of resistant microbes has been greatly accelerated by several concurrent trends. These have worked to increase the number of infections and thus expand the need for antimicrobials[1].

In this situation, enlargement of innovative drugs with dual activity against bacterial and fungal pathogens is required to over come this problem[2]. Pyrazoles are important nitrogen-containing five-membered heterocyclic compounds possessing some important pharmacological activities like antitumour[3], immunosuppressive[4], antibacterial[5], antitubercular anti-inflammatory[6], anticancer[7], antidiabetic[8] and antidepressant properties[9]. Some novel pyrazolo[3,4-d] pyrimidine derivatives have been reported for antimicrobial potential against *E. coli, S. aureus, P. aerunginosa*, *B. subtilis, C. albicans* and *A. fumigatus*[10]. A series of 3, 4-diarylpyrazoles was synthesized and evaluated for the ability to selectively inhibit cyclooxygenase-2 (COX-2)[11]. Pyrazole-4-carboxylic acid derivatives were found to possess *in vivo* hypoglycemic activity[12]. Some unsymmetrical *N*-endocyclic and *N*-exocyclic derivatives from benzoylation of 3- and 5- aminopyrazole were shown to have anticonvulsant activity[13].