

## SYNTHESIS AND ANTIMICROBIAL EVALUATION OF NOVEL PYRAZOLE, IMIDAZOLE AND PYRIMIDINE DERIVATIVES POSSESSING IMIDAZO[4,5-B]INDOL MOIETY

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**Abstract.** In this study, new pyrazole, imidazole, pyrimidine derivatives having imidazo[4,5-b]indol moiety were successfully synthesized, elucidated by spectroscopic techniques, and evaluated as potential antimicrobial agents. The structure-activity relationship was investigated to obtain a better understanding of the relationship between the chemical structure of the synthesized compounds and their corresponding biological activity. Compounds **2b** and **3b** exhibited potent antibacterial activities against *Bacillus subtilis* bacteria comparable to that of Ampicillin standard. Structure-activity relationship studies revealed that the presence of withdrawing carbonyl group on 5-position of pyrazole moiety **2b**, phenylpyrazole moiety **3b** led to an enhancement in the antibacterial activity of pyrazole derivatives. Furthermore, the presence of carbonyl group on 2-position of the pyrimidine ring of compounds **4a**, **5a** and **6a** has a significant effect on their antibacterial activity against *Bacillus subtilis*. The antifungal studies indicated that compounds **3b**, **4b**, **7** and **9** have comparable antifungal activity to that of standard Amphotericin B against *Candida albicans* and *Aspergillus flavus* fungi.

**Keywords:** pyrazole, imidazole, pyrimidine, indol, antimicrobial activity.

Received: 13 September 2019/ Revised final: 25 November 2019/ Accepted: 30 November 2019

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