



## A Study on Biological Importance of Nitrogenous Based Heterocyclic Compounds

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**ABSTRACT:** Heterocyclic compounds are widely distributed in nature and are of great significance to life because their structural subunits exist in many natural products such as antibiotics, hormones, and vitamins hence, they have attracted considerable attention in the design of biologically active molecules. In heterocyclic compounds, nitrogen based heterocycles are abundantly distributed in nature and are essential to life, playing a vital role in the metabolism of all living cells. They are found in natural products such as amino acid derivatives, vitamins, antibiotics, alkaloids and toxins and also contributed to the society from biological and industrial point which helps to understand life processes. Due to long lasting interest in heterocyclic compounds, here we reported the biological importance of nitrogenous based pyrimidine compounds and its derivatives and they shows significant antibacterial activity against different strains of Gram Positive and Gram negative bacteria.

**Key words:** heterocyclic, nitrogenous base, biological active, antimicrobial, essential, Gram Positive, Gram Negative.

### I. INTRODUCTION

Nitrogen containing heterocyclic compounds has been attracting increasing interest because of their utility in various applications; they are present in a wide variety of drugs, biomolecules, and biologically active compounds, including antimicrobial, antibacterial, antifungal, antiviral, fungicidal, and insecticidal agents. Among these pyrimidines represent one of the most important and significant heterocycle found in nature such as vitamins, antibiotics, and many synthetic compounds, The pyrimidines represent one of the most active classes of compounds possessing wide spectrum of biological and pharmacological activities like anti-tumor, anti-bacterial, anti-fungal, anti-leishmanial, anti-inflammatory, anti-viral, anti-allergic and anti-cancer activities. However, the current study is to focus on the significance of pyrimidine and its derivatives as antimicrobial agents to the development of more potent as well as effective antimicrobial agents.

### II. MATERIAL AND METHOD

To check the antibacterial activity of pyrimidine compound they were tested against different strains of gram positive and gram negative bacteria i.e. (*Bacillus Subtilis*, *Klebsiella*) against Streptomycin as a standard drug, by Agar cup method, and purity of the compound

checked by Thin Layer Chromatography, here we described an efficient protocol for the synthesis of substituted pyrimidines as above

With the help of coupling method substituted benzaldehyde and methyl iso-butyrate along with urea are fused together in presence of dimethylformamide (DMF) as a catalyst at 145-155<sup>o</sup>C and we get a chlorinated pyrimidine derivative. Now this substituted chlorinated derivative further treated with di isobutyl aluminium hydride in presence of toluene then we get an intermediate product-A which is further treated with phosphorous tri bromide to get intermediate **b**. This intermediate **b** is treated with benzaldehyde using sodium tripolyphosphate as a base along with DMSO to get the targeted compound (2-choloro-4-(4-fluorophenyl)-6-isopropyl-5-E-substitued pyrimidine.

### III. RESULT AND DISCUSSION

Nitrogenous based pyrimidine compound and its derivatives have remarkable biological activities, hence to check its antibacterial activity against different strains of gram positive and negative bacteria, i.e. *Klebsiella*, *Bascillus Subtillis* using Streptomycin as a standard drug, using Agar Cup Plate Method and the result of our study shows that compounds have significant activity against both the gram positive and gram negative bacteria.

#### IV. CONCLUSION

Microbial diseases are uncountable and increased in a very higher rate every year, therefore advancement of effective antimicrobial drugs has become a great concern for chemists. Pyrimidine and its derivatives possess remarkable biological activities, hence in this paper the antibacterial activity of pyrimidine derivatives were tested against gram negative and gram positive bacteria, and the result of our study shows that these compound possess significant activity.

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