

## SYNTHESIS AND COMPARATIVE STUDY OF 2-MERCAPTO PYRIMIDINE AND 2-HYDROXY PYRIMIDINE FROM STRUCTURAL NATURE AND ITS ANTIFUNGAL ACTIVITY POINT OF VIEW.

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### ABSTRACT

2-mercapto 4-substituted phenyl pyrimidine and 2-hydroxy 4-substituted phenyl pyrimidine were synthesized by using diketones. The structure of the compounds were elucidated by elemental and spectral analysis (IR and PMR) and structural nature by XRD and chemical properties. The synthesized compounds were screened for its structural nature and their antifungal activity by disc diffusion method. The results have been interpreted in terms of antifungal activity and its structural nature point of view.

**Key words:-** Pyrimidine, Diketone, Antifungal activity.

### Introduction

In the recent past pyrimidine have been the subject of substantial attention by synthetic and medicinal chemists because of the presence of heteroaromatic ring in many biological activities such as anticancer, anti-inflammatory, antifungal, antimicrobial, analgesic properties were widely cited.

Literature survey reveals that synthesis of pyrimidines based on condensation were reported by many researches (Aberkane, A. et al, 2002; Carey, J. et al, 2003). Wilay and slamakar observed that on condensation malonic dialdehyde (Chamilos, G., et al, 2005) with acetamide (Gutierrez, F., et al, 2005) gives 2-methyl pyrimidine (Lassflorl, C., et al, 2006) under acidic conditions. Malonaldehyde with urea and thiourea gives 2-hydroxy pyrimidine and 2-mercapto pyrimidine.

From the literature survey it reveals that mercapto and hydroxy phenyl

pyrimidine compounds are very good antifungal agents which play important role in destroying many diseases like cancer, asthma etc.

### Materials and Methods

Literature survey reveals the significance of diketone as an important starting material for the synthesis of heterocyclic compound and their wide varieties of applications.

Novel methods have been reviewed for the synthesis of 2-mercapto and 2-hydroxy substituted phenyl pyrimidine derivatives using diketone as a starting material on treatment with thiourea and urea respectively in DMF solvent on waterbath at 75-90<sup>0</sup>C for one hour. (Datir S., et al, 2011)

The antifungal activity of novel 2-mercapto substituted phenyl pyrimidine and 2-hydroxy substituted phenyl pyrimidine was also found in literature.

The melting points were determined by melting point apparatus .IR spectra were recorded on FTIR spectrophotometer using KBr pellets.The purity of compounds was tested by Thin Layer chromatography on Silica-G layers.

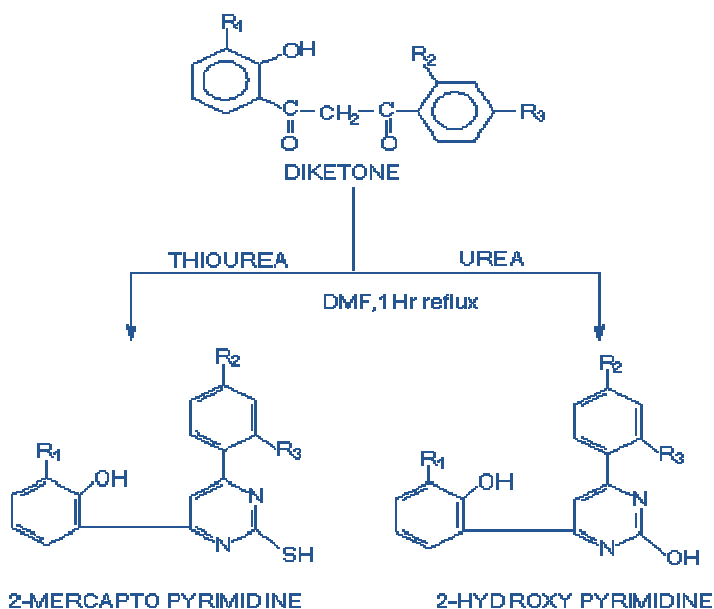
The biological activities are significantly shown by N-heterocyclic nucleus which incorporated with-OH in pyrimidines are found to have antifungal activity.

The disc-diffusion method was employed to study the preliminary antifungal activity of pyrimidine against three pathogenic organisms i.e, Aspergillus niger, Aspergillus flavus, Curvularia lunata.

Potato dextrose agar (PDA) medium was employed to study the

preliminary antifungal activity of the 2-mercapto and 2-hydroxy phenyl substituted pyrimidine against above three fungus.

The petridisc for the inoculation of fungal organism were sterilized.1ml of organic compound (2-mercapto pyrimidine and 2-hydroxy pyrimidine)was mixed with potato dextrose agar medium and this medium was poured in sterilized petri disc for inoculation of fungal organisms.The petri disc were incubated at room temp for 4-days (at 37<sup>0</sup>C) for antifungal activity.Zone of inhibition produced by each compound by fungus was measured.



## Results

All the above three fungus studied are human pathogens from the results of screening, conclusion are drawn.

Comparative study of 2-mercapto and 2-hydroxy pyrimidines indicates remarkable activity shown by 2-hydroxy pyrimidine against fungal growth which even relates with its structural nature

determine by XRD than 2-mercapto pyrimidine.

From XRD determination (fig.1), it indicates pure crystalline nature of 2-hydroxy compound than 2-mercapto

compound. Thus it has also been found that antifungal activity of the compound increases with increase in structure complexity.

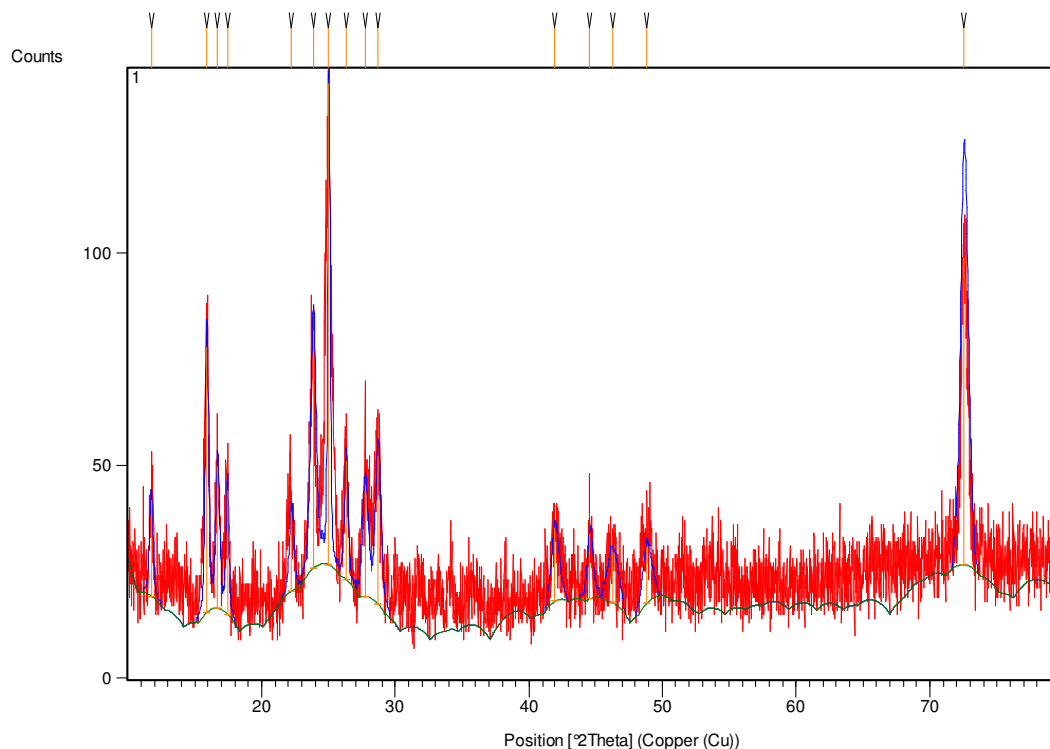


Fig.1

### Discussion

From the survey it is clear that pyrimidines may help to fight the cancer. It is clearly observed that the growth of fungus was completely stopped by pyrimidines.

XRD determinations reveal the presence of sharp peaks of -OH group in hydroxy pyrimidine compounds, hence more crystalline in nature than mercapto pyrimidine.

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