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Studying of Biological Activity (Bacteria & Fungi) for Sulfur Compounds

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Abstract
In this work , we studied biological activity for synthesized compounds which we prepared them in past our paper [1] represented in Thia-compounds, Thia- iazine, Thi - azepine ,Thia -diazepin , Thiazole and Thia -diazole as a sulfur cycles which have a wide spectrum of bio- active characterization and properties and due to its content from sulfur atoms and significant pharmacological activities.
Keywords: pharm , rang .

Introduction

This compounds included in bio- molecules like vitamins , neuclic acid , amino acids which have important biological properties and synthetic compounds which used in various studies and previously literatures , especially in pharmaceutical chemistry with tablet and drugs and a grow chemical research and development. sulfur cycles are of a special interest pharmaceutical activities, it has attracted much attention recently as their synthesis is more accessible and their diverse properties are appreciated.

The biological activity of any compound depends on its molecular structure, The compounds containing the (sulfur , sulfone)- moiety exhibit a wide range of biological activities [1-7].From these classes of sulfur heterocycles, the synthesis of new derivatives of thiazine, thiazol, thiadiazine, thiadiazole, thiazpine has been attracting considerable attention because of various pharmaceutical properties like antioxidant, antifungal, anticancer, DNA-Inhibitory activity, HIV- Inhibitors and other applications in medicine field and synthetic chemistry field[8-11].

Materials and Procedures :

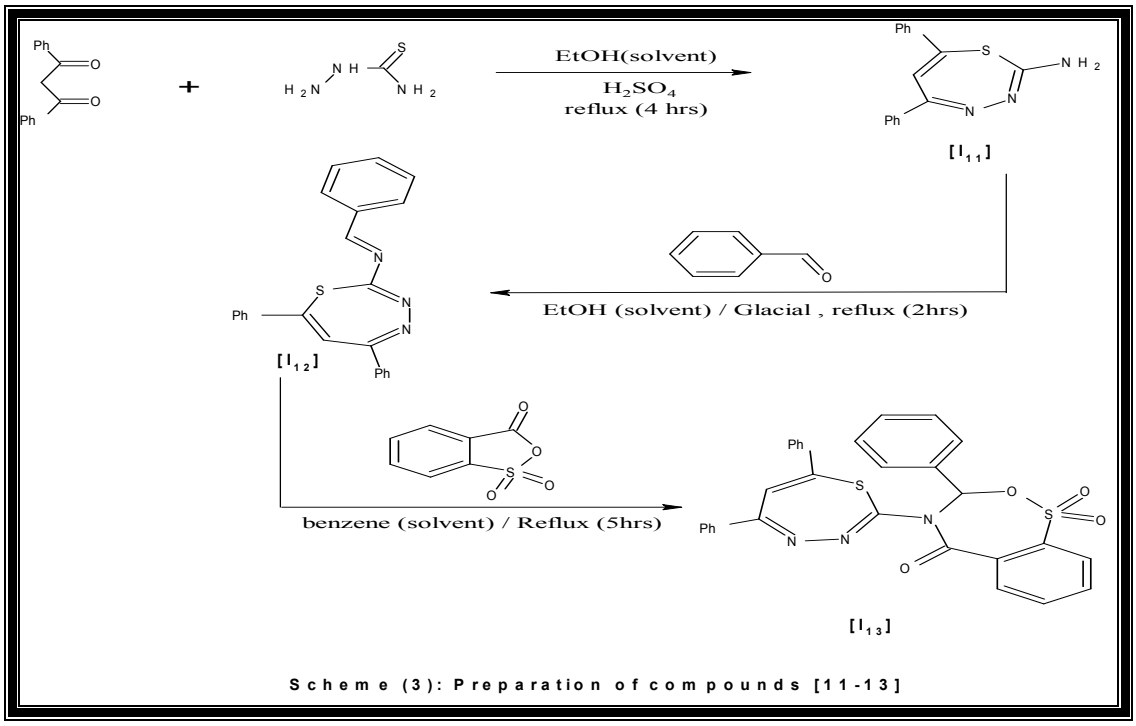
All chemical materials and some instrumentals carried out in college of education, biological study carried out in Bio – lab in biological department.,

Antimicrobial Assay :

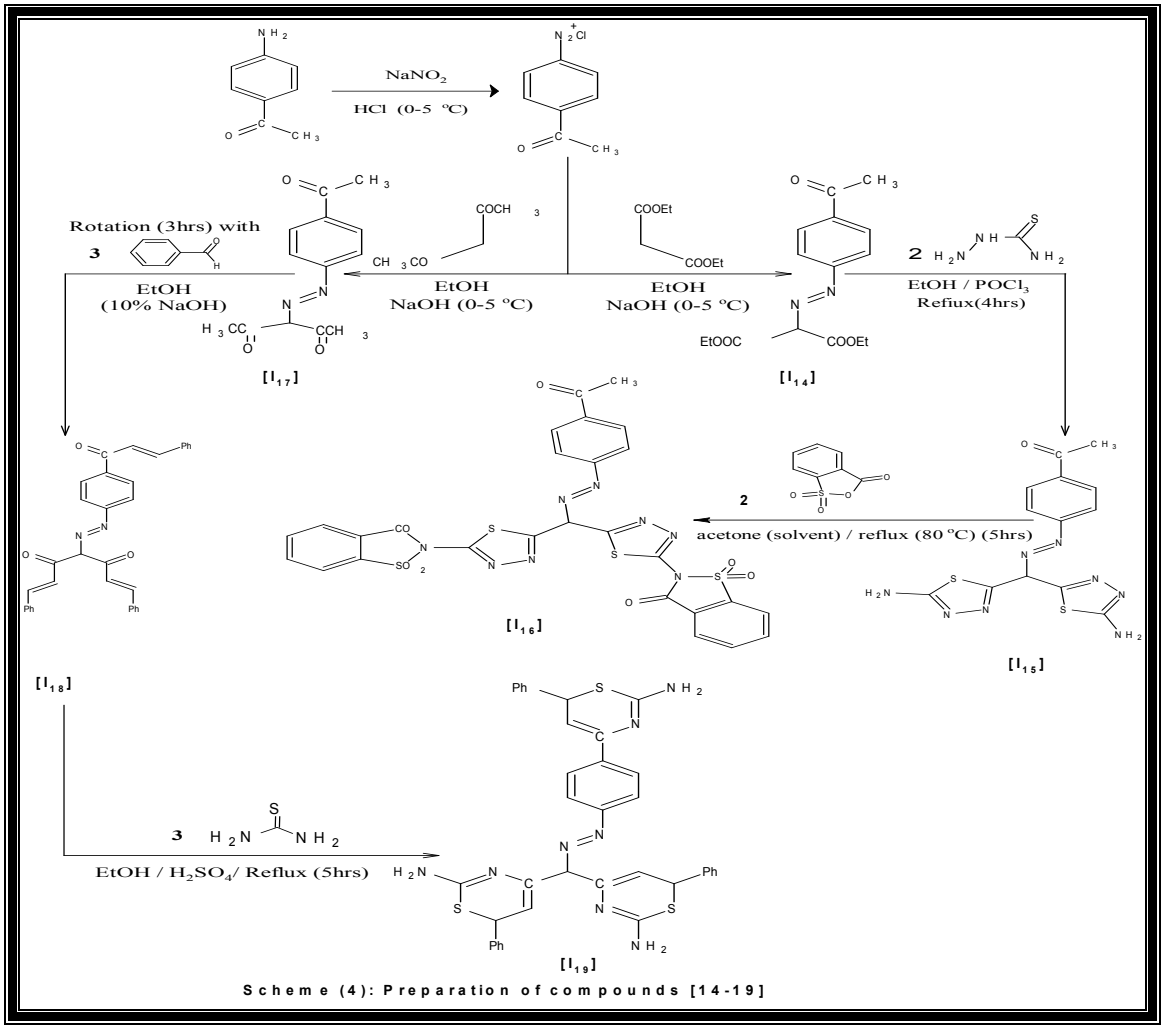
The biological activities of synthesized compounds have been studied for their antibacterial and antifungal activities by agar via biological methods[1]. The antibacterial studying and antifungal styding were tested at 150 mg/ml concentrations in DMSO as solvent through using three types of bacteria (***Bacillus subtilis*** , ***Pseudomonas .aeruginosa*** and ***Salmonella typhi***) and two types of fungi (***A. niger*** and ***P. chrysogenum***). These bacterial strains were incubated for 24hr at 37^{o}C and fungi strains incubated for two days at 37^{o}C.

Synthesized Compounds In Our Previously Paper[1] :

In our previously work , we synthesized (9) compounds , but we will study the bio – activity for them (second part of compounds) compounds [11-19] in this work :



Scheme (3): Preparation of compounds [11-13]



Scheme (4): Preparation of compounds [14-19]

Results and Discussion :

In previously paper of our work, we synthesized these sulfur cyclic compounds but now we will study of antimicrobial activity against bacteria and fungi .

Antibacterial and Antifungal assay :

The antimicrobial results are listed at table (1). From results of antibacterial studies it was found to be potentially activity against all types of bacteria and fungi . while antifungal activity were listed in table (2). It is evident from the results that the biological activity of all compounds have high biological activity which inhibit the growth of bacteria and fungi .

The high bi -activity of compounds [16, 14 , 17, 18 ,19] may be due to that, is an essential micronutrient during transcription and transformation of nuclei

Acids which shown to inhibit cellular protein and RNA , they included some groups with sulfur atoms and hence inhibit the bacterial growth.

Furthermore, the mechanism of action of the compounds may involve the formation of hydrogen bond with the active centers of the cell constituents resulting in the interference with the normal cell process.

In general, the intake of a drug depends on the balance between hydrophilic and lipophilic properties and the solubility which are substituent dependent which increases the lipophilicity of a drug and this may be the reason for the enhanced activity upon sulfur compounds . Hydrogen bonding and the antimetabolite action of the compound may be main factor in antimicrobial activity.

Table (1):Antimicrobial Activity (bacteria)of Compounds (Inhibition Zone in (mm)) of Compounds [11–19] in Concentration (150 mg.ml^{-1})

Comp. No.	*Pseudomonas aeruginosa*	*B. subtilis*	*Salmonella .typhi*
I_{11}	28	22	22
I_{12}	26	24	20
I_{13}	24	20	22
I_{14}	26	22	22
I_{15}	20	24	24
I_{16}	24	24	22
I_{17}	30	26	22
I_{18}	32	30	26
[I_{19}]	32	32	28

The synthesized compounds showed excellent activity against bacteria and fungi.

Table (2):Antimicrobial Activity (fungi) of Compounds [11– 19] in Concentration (150 mg.ml^{-1})

Comp. No.	*A. niger*	*P. crysogenum*
I_{11}	24	24
I_{12}	28	22
I_{13}	20	22
I_{14}	18	16
I_{15}	22	24
I_{16}	26	22
I_{17}	24	28
I_{18}	20	24
I_{19}	28	22

Photo for Antimicrobial for Compounds :

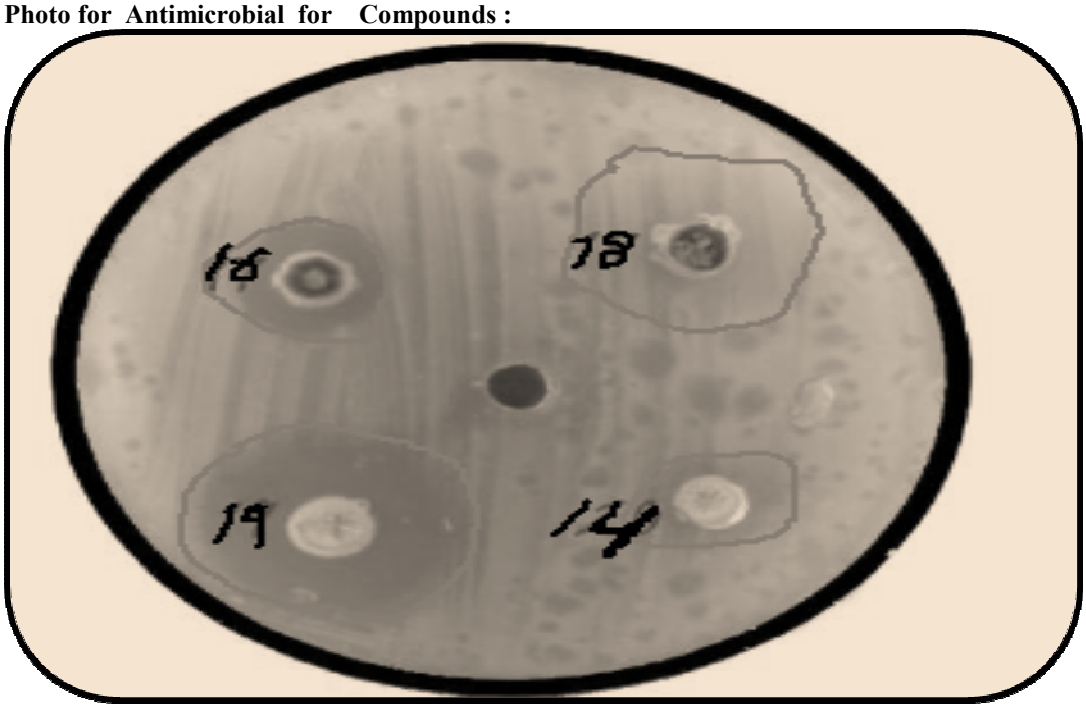


Photo (1):Antibacterial activity – *P.aeruginosa*

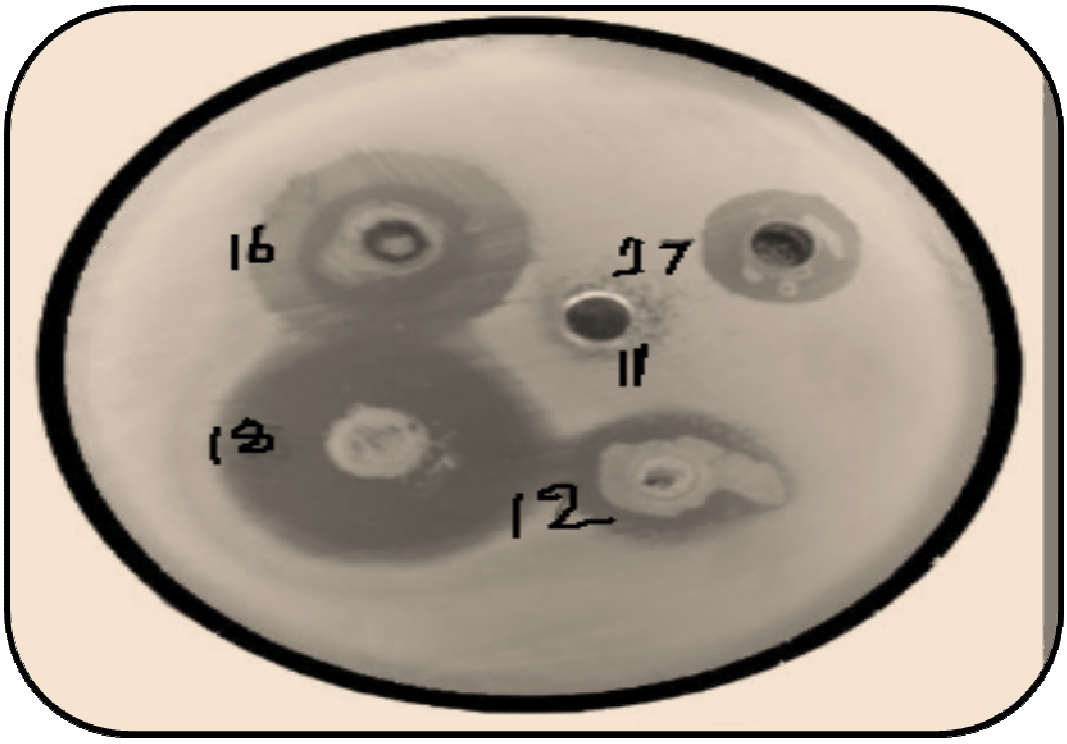


Photo (2):Antibacterial activity – *B. subtilis*

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