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Study the Antibacterial and Antifungal Activities of the Newly Synthesis Compounds of the Tri-thiazyltrichloride with $FeSO_4$ and $CuSO_4$

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Abstract: Nitrogen and sulphur compounds and their derivatives have been used as medicinal applications and medicines e.g. sulpha drugs and azides. Several applications of sulphur - nitrogen compounds and their derivatives encourage researchers to increase their synthesis as an alternative for the treatment of pathogenic microbe infections. Tri-thiazyltrichloride is a cyclic compound of Tetra sulphur Tetra nitride. Compounds of copper sulphate and ferrous sulphate with Tri-thiazyltrichloride synthesized. The synthesized novel compounds of ferrous sulphate and copper sulphate screen against the gram -Ve bacteria E. Coli. and S. Typhimurium as well as gram +Ve S.Auren and S. Abbus and fungi Aspergillus, Penicillium.

Keywords: Synthesis, Trithiothiazyltrichloride, Copper Sulphate, Ferrous Sulphate and Anti-microbial Screening.

I. INTRODUCTION

Tri-thiazyltrichloride is the derivative of Tetra sulphur Tetra nitride, which was also reportedas antifungal activities in protection of seeds (Oscar) as well as insecticides by Michela Fiorenza . Sulfur nitrogen compounds and their derivatives are most interesting chemical agents which are used as medicines. The antifungal and antimicrobial studies of other derivatives of Tetra sulphur Tetra nitride were carried out. This present paper deals the antimicrobial and antifungal activities of complex compounds of tri-thiazyltrichloride with $FeSO_4$ and $CuSO_4$. Antibacterial activities of chemical compounds can be usually done by in vitro as well as in Vivo methods. In the present work only in vitro method has been used.

II. RESULT AND MATERIALS AND METHODS

The newly synthesized compounds were taken to be used as screening the antibacterial and antifungal activity in this presented paper. The gram +ve and gram-ve bacteria were collectedfrom microbiology department of Aligarh Muslim University, Aligarh.

The infected seed samples of Triticum aestivum, Hordeum vulgare and Raphanus sativuswere moistened and placed in petri dish. The developed fungi on surface of seed were identified and used for experiments.

Sterilization of glass apparatus All the glass apparatus like petri plates, conical flask, pipette and test tubes were cleaned with chromic acid and rinse with distilled water than sterilised inan autoclave at the pressure of 20 lb and temperature of 100 ^{0}C.

Preparation of media for the growth of the microbes

For the preparation of liquid media the ingredients peptone,(2.5g),goat extract(.75g,),yeast extract(0.5g), sodium chloride (2.5g)and glucose (2.5g) were placed in 1 L Conical flask and Shake for 5 minutes in 250 mL warm distilled water to dissolve all ingredients.

The PH of themedia solution was adjusted 7.5 by adding sodium hydroxide solution with the help of pH meter. Four boiling tubes were marked with the name of bacteria and 50 mL media was transferred to each test tube plugged with non-absorbent cotton and autoclave 100^{0}C for the sterilization of media. These test tube containing media work cool down to 40 ^{0}C.

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Each bacterial strain was transferred in the marked test tube separately with the help of platinum wire loop and then incubated at 37 ^{0}C for 24 hours.

To check inhibition growth of bacteria thepetri plates were prepared by pouring 20 mL of molten media into sterile petri plates after solidification of media 25 µl suspension of bacterial inoculums were swabbed uniformly.

To preparation of the solution of the synthesized compounds were dissolved in DMF tomaking a solution 5.0mg/mL for testing. Evaluation of the antifungal activity of the compounds.

Different seed samples with maximum growth of different fungi were transferred to petri plates containing the solution of the test compounds of different concentrations 50,100,200,400ppm at 27 ^{0}C. Different fungi treated with different solutions of synthesizedcompound were examined 24h intervals for knowing the percentage inhibition.

III. RESULT AND DISCUSSION

The screening of the compounds against the gram positive and gram negative bacteria showinhibitor agent and very active to them in table-1.

Table -2 shows the innovation of fungi causing is college of many seeds and vegetables, growth of all fungi totally invited at 400 ppm of both compounds. The results were so that that copper sulphate compound is more active than ferrous sulphate compound to all fungi.

The compounds were also administered to the albino rates in mg/mL / kg body weight to observe their effect on central nervous system .The compounds have cause depression and found to be toxic in nature, therefore these compounds can be unused against pathogenic bacteria but these can be used as insecticides.

Table -1 Antibacterial screening of the synthesized compounds.

S. No.	Formula of the compounds	Gram positive bacteria	Gram negative bacteria
1	$(CuSO_4S_3N_3Cl_3)_3$	+4 +3	+1 +2
2	$(FeSO_4S_3N_3Cl_3)_5$	+3 +2	+2 +1

Table -2(a) Effect of $(CuSO_4S_3N_2Cl_2)_3$ and $(FeSO_4S_3N_3Cl_3)_5$compounds on inhibition offungi

S. No.	Compounds	Concentration(in ppm)	A. Flavus	A. Niger	P.Humicola	P.Oxalicum
1	$(CuSO_4S_3N_2Cl_2)_3$	50	40	50	50	50
		100	70	80	75	75
		200	90	95	90	90
		400	100	100	100	100
2	$(FeSO_4S_3N_3Cl_3)_5$	50	30	30	35	30
		100	50	45	70	70
		200	75	75	85	80
		400	100	100	100	100

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Table -2(b) Effect of $(CuSO_4S_3N_2Cl_2)_3$ and $(FeSO_4S_3N_3Cl_3)_5$compounds on inhibition of fungi

S. No.	Compounds	Concentration(in ppm)	Rhizopus Nigricoms	Monila Geophila
1	$(CuSO_4S_3N_2Cl_2)_3$	50	50	55
		100	80	70
		200	90	94
		400	100	100
2	$(FeSO_4S_3N_3Cl_3)_5$	50	40	45
		100	65	50
		200	80	65
		400	100	100

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