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Antimicrobial and Antifungal Activities of Osmium Metal Complex with Benzoxazole Derivative

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Abstract:
The combination of some Osmium metal ions with an important 2-(1,3-benzoxazole -2-yl - sulfanyl)-N-phenyl acetamide (BSPA) ligand to form coordination compounds is an important area of current research. Less explored biologically important 2-(1,3-benzoxazole -2-yl - sulfanyl)-N-phenyl acetamide ligand is allowed to react with solution of some rare metal perchlorates and attempt has been made to synthesize solid 2-(1,3-benzoxazole -2-yl- sulfanyl)-N-phenyl acetamide complexes. These 2-(1,3-benzoxazole-2-yl-sulfanyl)-N-phenyl acetamide complexes are subjected to antimicrobial activity of these complexes has been evaluated by standard methods and attempts have been made to correlate structural characteristics with properties of these 2-(1,3-benzoxazole -2-yl - sulfanyl)-N-phenyl acetamide complexes.

Keywords: Spectroscopic characterization, 2-(1,3-Benzoxazole-2-yl-sulfanyl)-N-phenyl acetamide (BSPA) complex, antimicrobial activity, antifungal activity.

1.0 Antibacterial activity:

This part deals with the in-vitro screening of the complexes for antibacterial activity. The species *S.aureus*, *E.coli*, *S.Phyogenus* and *P.Aeruginosa* have been taken for the antibacterial[1] activities. Agar-cup method was carried[2-5] out for the in-vitro screening for antibacterial activity.[6-8] The results of the compounds employed for antibacterial screening are mentioned in following Table.

Table : 1 Antimicrobial activity of Standard drugs

STANDARD DRUGS				
MINIMUM INHIBITION CONCENTRATION (µg/ml)				
DRUG	***E.coli***	***P.aeruginosa***	***S.aureus***	***S.phyogenus***
µg/ml	**MTCC 443**	**MTCC 1688**	**MTCC 96**	**MTCC 442**
GENTAMYCIN	0.05	1	0.25	0.5
AMPICILLIN	100	--	250	100
CHLORAMPHENICOL	50	50	50	50
CIPROFLOXACIN	25	25	50	50

NORFLOXACIN	10	10	10	10

Table: 2 Antibacterial activity of BSPA Ligand with Osmium metal Complexes

ANTIBACTERIAL ACTIVITY TABLE					
MINIMUM INHIBITION CONCENTRATION µg/ml					
SR NO	CODE NO	*E.coli* MTCC 443	*P.aeruginosa* MTCC 1688	*S.aureus* MTCC 96	*S.phyogenus* MTCC 442
1	BSPA	200	200	100	125
2	Os-BSPA	240	197	110	84

Comparison of antimicrobial activity of produced compounds with that of standard antimicrobial drugs reveals that [9-11] the synthesized compounds show moderate to good activity against all four bacterial strains.

2.0 Antifungal activity:

This part deals with the in-vitro screening of newly prepared compounds for activity. The species *C. albicans*, *A.niger*, *A.clavatus* [12-15]have been taken for the antifungal activities. Agar-cup method was used for the in-vitro screening for antifungal activity.[16-20] The results of the compounds for antifungal screening are mentioned in following table.

Table: 3 Antifungal Activity of Standard Drugs

MINIMAL INHIBITION CONCENTRATION Standard drugs			
DRUGS	*C.albicans*	*A.niger*	*A.clavatus*
	MTCC 227	MTCC 282	MTCC 1323
mg/ml			
NYSTSTIN	100	100	100
GRESEOFULVIN	500	100	100

Table: 4 Antifungal activity of BSPA ligand with Osmium metal Complex

ANTIFUNGAL ACTIVITY TABLE				
MINIMAL FUNGICIDAL CONCENTRATION µg/ml				
SR. NO.	CODE NO	*C.albicans* MTCC 227	*A.niger* MTCC 282	*A.clavatus* MTCC 1323
1	BSPA	500	1000	>1000
2	Os-BSPA	232	472	465

Comparison of antimicrobial activity of produced compounds with that of standard antimicrobial drugs reveals [9-11] that the prepared complexes show moderate to good activity against all three fungal strains. [21-24]

2.1 Results and Discussion of Antimicrobial Activities

Results of antibacterial activities of the complexes suggested that complex exhibited equal activity as standard drug ampicillin towards *E.coli.* against *S.aureus* showed equal activity and greater activity was exhibited by Os-BSPA complex compared to standard ampicillin drug. The remaining antibiotics exhibited greater activities compared to the antibacterial performance of the complex. The antifungal activities of the complex were found to be less than that of standard antifungal antibiotic drugs.

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