ISSN : 2320 4850

BI MONTHLY

AJPRD

Asian Journal of Pharmaceutical Research And Development

(An International Peer Reviewed Journal of Pharmaceutical Research and Development)

Volume - 02 Issue - 02 MAR-APR 2014

website: www.ajprd.com
editor@ajprd.com

Asian Journal of Pharmaceutical Research and Development
(An International Peer-Reviewed Journal of Pharmaceutical Research and Development)
www.ajprd.com
ISSN 2320-4850

Research Article

BIOLOGICAL ACTIVITIES OF HYDROXYTRIAZENES AND THEIR IRON COMPLEXES

N.K. Choubisa*, K. K. Kodli, A.K. Panwar, R.S,chauhan, A. K. Goswami
Coordination Chemistry Lab. Department of Chemistry,
M.L. Sukhadia University, Udaipur – 31 3001 (Raj.), India

Received: April 2014 *Revised and Accepted: May 2014*

ABSTRACT

The present method reports synthesis,characterization and antimicrobial activity of four hydroxytriazenes, against bacteria. All the hydroxytriazene have been Synthesized by diazo coupling reaction between diazonium salt and phenyl hydroxyl amine. The entire synthesized compounds were characterized by CHN, and IR spectra analysis. The entire synthesized compound were subjected to antimicrobial activity by zone inhibition method.

KEYWORDS: *Hydroxytriazenes, Antimicrobial Activity, Iron Complexe Biological Activity*

INTRODUCTION

Hydroxytriazenes are the important compounds owing to their wide range of biological activities and spectrophotometric applications. They have been found to possess the pharmacological activities such as antifungal[1-3], antibacterial[4-6], insecticidal[7-12], analgesic[13] and anti-inflammatory[14-15] and wound healing activity[16] etc. They also serve as organic chelating agents, and used for the determination of transition and non-transition metal ions in spectrophotometric determination. The antimicrobial activity, which can be altered depending upon the type of substituent present on the aromatic rings. In view of these above biological importance of hydroxytriazenes.

*Corresponding author

N.K. Choubisa
Coordination Chemistry Lab.
Department of Chemistry
M.L. Sukhadia University,
Udaipur – 31 3001 (Raj.), India
Mob.No.: 09461132786
Email: choubisan@gmail.com

We synthesized some novel hydroxytriazenes. All the synthesized compounds have been characterized on the basis of their M.P, TLC, and IR. The antimicrobial activity of these compounds was evaluated by Agar diffusion method. The main aim of the present work is to find new antimicrobial molecules

MATERIALS AND METHOD

General Procedure for the Synthesis of Hydroxytriazenes

Step A: Preparation of Phenylhydroxylamine

The present work is oriented towards synthesis of some hydroxytriazenes of by three step method[17] in following manner. In this method 0.1mol of nitrobenzene, 7.5g of NH_4Cl, 100mL of water along with 50mL of rectified spirit were taken and stirred mechanically. The temperature of the reaction mixture was maintained between 50 to 60^0C. After this, 20g of zinc dust was added in small portions with continuous stirring. After complete addition of zinc dust, the reaction mixture was further stirred mechanically for another 15 minutes. The resulting mixture was filtered under suction and the residue was washed with ice cold

water. The filtrate was taken in another beaker and kept in fridge to cool.

Step B: Diazotisation of 2,4 dimethyl anilline

In a 500mL beaker, 0.1mol of 2,4 dimethyl anilline was dissolved in warm mixture of 25mL of concentrated HCl and 25mL of distilled water. After stirring vigorously the mixture was put in an ice bath to maintain temperature between 0-50 ^{0}C. In another beaker 6.9g of sodium nitrite was dissolved in 20mL of distilled water and it was kept in freezer for cooling. Sodium nitrite solution was added to 2,4 dimethyl anilline dropwise with continuous stirring. The diazotised product so obtained was directly used for coupling.

Step C: Coupling

The diazonium compound prepared as above was added slowly to the phenylhydroxylamine solution under constant stirring. Temperature of mixture was maintained between 0- 5^{o}C. The pH of mixture was adjusted close to six by occasional addition of sodium acetate solution as and when required. The reaction mixture was further stirred for 15 minutes after complete addition of diazonium compound.
Stirring was continued and after sometime product came out as brownish colored. The compound was filtered under suction and washed with cold water
It was repeatedly crystallized with absolute alcohol. The final product was obtained as yellow needle shaped crystals.
The purity of compound was checked by the Physicochemical Method like color, M.P and CHN analysis etc. Melting points of the synthesized compounds were determined by open capillary and are uncorrected. The purity of the compounds was checked using pre-coated TLC plates (MERCK, 60F).

Table: 1. Physical Characteristics, M.P., CHN values of the Reagent

	Colour and shape of the crystals	Solvent used	Elemental analysis				M.P. (°C)
				% Carbon	% Hydrogen	% Nitrogen	
$C_{14}H_{15}N_3O$	Yellow coloured micro crystals	Ethanol	Th.	41.86	4.65	24.41	109
			Exp.	41.90	4.61	24.40	
$C_{15}H_{17}N_3O$	Light Yellow coloured crystals	Ethanol	Th.	70.56	6.71	16.46	122
			Exp	69.91	7.44	18.89	
$C_{15}H_{17}N_3O$	Brown coloured crystals	Ethanol	Th.	69.08	5.91	15.94	132
			Exp	68.40	6.34	13.98	
$C_{14}H_{14}N_3ClO$	Yellow crystals	Ethanol	Th.	60.98	15.12	15.24	171
			Exp	62.01	14.44	16.89	

IR spectral analysis

Following bands were observed 1460 cm (vN-N), 1655 cm$^-$ (N=N Str),
3066(C-H), 3252(OH), 1391(C-N Str).

Antimicrobial Activity

The antimicrobial activity of all the synthesized compounds were examined against different Staphylococci, Streptococci, E. coli and Klebsiella organisms by measuring zone of inhibition. The antimicrobial activity was performed by Agar diffusion method at the concentration level of 200µg/ml. Fluconazole used as standard drug at same concentration. Nutrient agar was used as culture media for antibacterial activity and Sabouraud dextrose agar was used as culture media for antifungal activity and DMSO as control. The results of the antimicrobial activity are shown in Table: 1.

Table 2: Zone of inhibition (mm) data of synthesized compounds at 200PPM

Comp. code	Name of Compound	staphylococci	streptococci	E.coli	Klebsiella
(i)	3-hydroxy-3-(phenyl) -1-(2,4 dimethyl phenyl) triazene	22	21	24	18
(ii)	3-hydroxy-3-(3 methyl phenyl) -1-(2,4 di methyl phenyl) traizene	20	20	23	17
(iii)	3-hydroxy-3-(4 methyl phenyl) -1-(2,4 di methyl phenyl) triazene	22	21	21	19
(iv)	3-hydroxy-3-(4 chloro phenyl)-1-(2,4 di methyl phenyl)triazene	22	22	23	20
Control		-	-	-	-
Fluconazole		25	25	25	25

RESULTS AND DISCUSSION

All the synthesized compounds were bioactive agent. In accordance with the data obtained from antimicrobial activity, all the synthesized hydroxytriazenes have shown good activity against the tested microbes at 200µg/ml. The antibacterial studies of Hyroxytriazenes show very good result against *E. Coli* and least activity against bacterial stain *Klebseila.*

CONCLUSION

Antibacterial and antifungal activity of the synthesized compound was done in comparison with Fluconazole as standard to reveal the potency of synthesized compounds. All the three selected strains of microbes namely Staphylococci, Streptococci, *E. Coli*, Klebsiella sensitivity to all compounds at higher concentration (200µg/ml) and no sensitivity at lower concentration.

REFERENCES

1. *Goswami, A.K., & Purohit, D.N. Anal. Sciences. 2001, 17: 1789.*
2. *Hura, I.S., Naulakha, N., Goswami, A.K. & Shrivastav, M.K. (2003). Indian Journals of Microbiology. 2003,43(4), 275.*
3. *Naulakha, N., Garg, M., Jodha, J.S., Pareek, N., Joshi, P., Chauhan, R.S. & Goswami, A.K. (2009). Pestology. 2009, 33(2), 46.*
4. *Goswami, A.K., & Purohit, D.N. Anal. Sciences. 2001, 17, 1789.*
5. *Manferedo, Hoiner et al. (2008). Rev. Brac. Scienece. Farm.2008, 44, (3)*
6. *Hura, I.S, Naulakha, N., Goswami, A.K. & Shrivastav, M.K. (2003). Indian Journals of Microbiology.2003, 43(4): 275.*
7. *Purohit, D.N., Goswami, A.K., Chauhan, R.S., Rassalan, S. & Behrooz, R. Asian J. Chem.1997, 9: 891.*
8. *Purohit, D.N., Goswami, A.K., Chauhan, R.S., Rassalan, S. & Ombaca, Ochieng. Pestology Res. J.1998, 22(8): 9.*
9. *Purohit, D.N., Goswami, A.K., Chauhan, R.S., Rassalan, S. & Behrooz, R. Pestology Res. J.1998, 10(2): 235.*
10. *Goswami, A.K. Pesticide Research Journal.2002, 14(2): 213.*
11. *Naulakha, N., Garg, M., Jodha, J.S., Chundawat, N.S., Patel, P., Chauhan, R.S. & Goswami, A.K. Pestology. 2008, 32(9).*
12. *Kumar, S., Garg, M., Jodha, J.S., Singh, R.P., Pareek, N., Chauhan, R.S. & Goswami, A.K. E. Journal of Chemistry. 2009, 6(2), 466.*
13. *Chauhan, L.S., Jain, C.P., Chauhan, R.S. & Goswami, A.K. Asian J. Chem. 2007, 19(6), 4684.*
14. *Chauhan, L.S., Jain, C.P., Chauhan, R.S. & Goswami, A.K. (2006). Biosciences-Biotechnology research Asia. 2006, 3(2): 381.*
15. *Singh, K., Patel, P. & Goswami, A.K. E. J. of Chem., 2008, 5(52):1144.*

16. Chauhan, L.S., Jain, C.P., Chauhan, R.S. & Goswami, A.K. (2006). Adv. Pharmacol Toxicol. 2006, 7(3):73.

17. Schillinger, V. & Lucke, F.K. (1989),55:1901.