Ancient Science of Life, Vol No. XV2 October 1995, Pages 137-139

AN IN VITRO STUDY ON THE ANTIMICROBIAL EFFECT OF SELECT HETEROCYCLIC NITROGEN COMPOUNDS

Y.S.R. REDDY, SAMA VENKATESH, UMA SHANKAR MISRA, B. SURESH, Md AFZAL AZAM and M.SETHURAMAN

Department of Pharmaceutical chemistry, J.S.S College of Pharmacy,
Rocklands, Ooty – 643 001.

Received: 3 August, 1995 **Accepted: 9 August,1995**

ABSTRACT: *In vitro antimicrobial activity of seventeen heterocyclic nitrogen compounds {2substituted pyrido [1,2-a] pyrimidin -4-oxo-1 [4]-3-Carbonitriles and ethyl 5-amino-3(substituted) – pyrazole-3-Carboxylates} was tested against Escherichia coli, Bacillus subtilis and candida albicans strains, Antimicrobial activity was measured using standard two –fold serial dilution method and the minimum inhibitory concentration (MIC) values are determined, The MIC of pyrazoles and pyrido[1,2 –a] pyrimidines are found to be 25 µg/ml to 50 µg/ml against E. Coli and 50 µg/ml against B.subtilis respectively. Both pyrazole and pyrido [1,2-a] Pyrimidines are found to be totally ineffective against C. albicans.*

INTRODUCTION

The roles played by many pyrazoles, pyridine and pyrimidine compounds are well known for their therapeutic properties and are widely used to treat various diseases. 1-8 The antibacterial , analgesic and anti-inflammatory effects of some pyrido [1,2-a] pyrimidines and pyrazole compounds are reported earlier elsewhere.9 The present work was undertaken to assess the antimicrobial activity of select heterocyclic nitrogen compounds.

MATERIALS & METHODS

The authentic bacterial and fungal cultures were procured from central drug research Institute, Lucknow and also form National collection of Industrial micro organisms, Pune. We selected three strains for use in the present study. They are Coli (2345 NCIM) , B.subtilis (2439, NCIM) and C albicans (27, CDRI). The above strains were maintained in our laboratory by periodic subculturing technique, the fungal culture was maintained on sabouroud DexroseAgar (SDA) and bacterial strains in nutrient broth, the inhibition studies were carried out by two – fold serial dilution method and the MIC values were calculated[10].

RESULTS AND DISCUSSIONS

Results of antimicrobial effect of seven teen heterocyclic nitrogen compounds are presented in Table 1 and 2. It is evident from the data that pyrazole compounds a redound to show inhibition against E.coil strain (MIC:-25 µg/ml -50 µg/ml). The pyrido [1,2 – a] pyrmidin compounds are also found to be effective in inhibiting B. subtilis strains (MIC : 50 µg/ml).

However, both pyrazole and pyrido [1,2-a] pyrimidine compounds are totally devoid of inhibitory action against C. albicans. The low anti-microbial effect exhibited by all the test compounds was reflected by their high MIC values. The overall antimicrobial

activity observed in the present study on heterocyclinc nitrogen compounds are not comparable with than of standard drugs such as ampicillin and clotrimazoe. However, the present findings of this study are subject to confirmation through future studies providing necessary facilities indifferent models with more number of strains.

ACKNOWLEDGEMENT

The authors wish to place eon regard their heartfelt thanks to His Holiness Jagadguru Sri shivarathree Deshkendra Maha Swamigalavaru of Sri Sultur Mutt for information through future studies

Table – 1

Antimicrobial effect of Pyrido [1,2-a] pyrimidines

Substitutent	MIC values (µg/ml)		
"R"	E.coli	B.subtilis	C. albicans
Dicyclohexylamino Diethylamino N-isopropylamino Ethylamino Ampicillin Clotrimazole	No activity " " " 12.5 -	50 " " " 12.5 -	No activity " " " -12.5

Substitutent "R"	R1	MIC values (µg/ml)		
		E.coli	B.subtilis	C. albicans
p-Bromo phenyl	Hydrogen	50	NA*	NA*

Table – 2

Antimicrobial effect of Pyrazoles

Substitutent	MIC values (µg/ml)		
"R"	E.coli	B.subtilis	C. albicans
Dicyclohexylamino Diethylamino N-isopropylamino Ethylamino Ampicillin Clotrimazole	No activity " " " 12.5 -	50 " " " 12.5 -	No activity " " " -12.5

Substitutent "R"	R1	MIC values (µg/ml)		
		E.coli	B.subtilis	C. albicans
p-Bromo phenyl	Hydrogen	50	NA*	NA*
p-Chloro phenyl	"	"	"	"
p-Nitro phenyl	"	"	25	"
p-Hydroxy phenyl	"	"	"	"
Thiozolidine	"	"	NA*	"
o-Methoxy phenyl	"	25	50	"
p-Bromo phenyl	2,4 – Dinitrophenyl	"	NA*	"
p-Chloro phenyl	"	"	25	"
p-Nitro phenyl	"	"	50	"

NA * indicates no activity

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