Oriental Journal of Chemistry Vol. **26**(3), 1199-1201 (2010)

Antimicrobial activity of 1;1 Bis {2-hydroxy-3[1' H-5' Aryl pyrazolin-3'-yl methyl phenyl} methane

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(Received: April 28, 2010; Accepted: May 30, 2010)

ABSTRACT

By condensation of hydrazine hydrate with Bis-chalcones in pyridine medium titled Bis-Pyrazolines have been synthesized. Structure of these compounds have been charecterised by spectral analysis. all compounds have been evaluated for their in vitro growth inhibitory activity against different microbes like *Staphylococcus aureus, Escherichia coli, Proteus mirabilis* and *Salmonella typhi.* The solutions were prepared in DMF solvents. The culture medium used was nutrient agar medium.

Key words: 1;1 Bis {2-hydroxy-3[1' H-5' Aryl pyrazolin-3'-yl methyl phenyl} methane; Antimicrobial activity

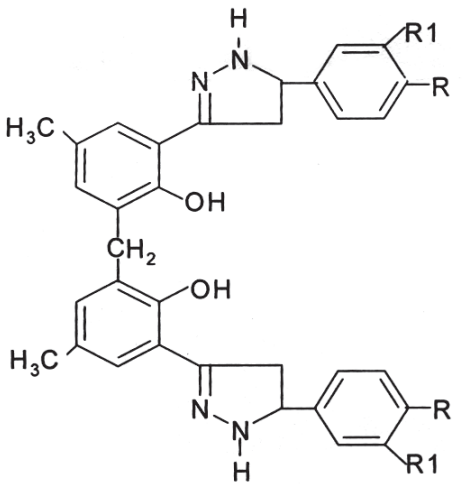
INTRODUCTION

Pyrazolines derivatives have shown considerable promise as a chemotherapeutic agents[1], due to this importance it is of current interest to synthesize some new pyrazolines. The reactive intermediate chalcones involve in their synthesis also exhibit various biological activity. Pyrazolines have been found to be effective insectisides[2-4], fungicidal activity[5-6], anti inflamatory[7] and herbicidal activity.

Survey of literature reveals that pyrazolines found to show antimicrobial activity[9-12].

Some Bis-pyrazoline derivatives show antimicrobial activity[13-15]. In view of this it is appeared of interest to synthesize some new bis-pyrazolines and study their antimicrobial activity.

The structure of synthesized compounds were assigned on the basis of elemental analysis and spectral study[16] (IR, NMR & UV). The compounds were evaluated for their microbial activity against gram+ve and gram-ve bacteria.



Compounds (I a-h).

Scheme 1.

EXPERIMENTAL

The titled compounds were screened in vitro for their antimicrobial activity against *Staphylococcus aureus, Escherichia coli, Proteus mirabilis* and *Salmonella typhi.* Using paper disc method[17] at concentration of 50µg/ml using DMF as solvent. The culture medium used was nutrient agar medium. After 24±2 hours of incubation at 37±2°c, zones of inhibition were measured in mm and recorded in Table 2.

RESULTS AND DISCUSSION

From above table it was observed that compound I(a) was moderately active towards *S. aureus* and *Pr. mirabilis* and weakly active towards *E. coli*. Same compound was inactive towards *S. typhi*.

The compound I(b) was strongly active towards *S. aureus* and weakly active towards *Pr. mirabilis* and same compound was inactive towards *E. coli* and *S. typhi*.

The compound I(c) showed moderately active against *E. coli* and was inactive words *S. aureus* and *Pr. mirabiils* and weakly active *S. typhi*.

The compound I(d) was inactive against all micro-organisms.

The compound I(e) showed moderate activity against *Pr. mirabiils* but inactive against remaining *S. aureus, E. coli* and *S. typhi*.

The compound I(f) was strongly active against *E. coli* and weakly active against *Pr. mirabiils* and inactive towards *S. aureus* and *S. typhi*.

Table 1: Physical and analytical data of 1;1 Bis {2-hydroxy-3[1' H-5' Aryl pyrazolin-3'-yl methyl phenyl} methane. I(a-h)

Compds	R	R¹	m.p. (°C)	Yield (%)	M.F.	N (%)	
						Found	Calcd
Ia	H	H	250-253	78	$C_{33}H_{32}N_4O_2$	9.67	10.85
Ib	OCH_3	H	246-249	76	$C_{35}H_{36}N_4O_4$	9.61	9.72
Ic	OH	OCH_3	221-224	82	$C_{35}H_{36}N_4O_6$	9.07	9.21
Id	OH	H	255-258	75	$C_{33}H_{32}N_4O_4$	11.33	10.21
Ie	NO_2	H	273	80	$C_{33}H_{30}N_6O_6$	14.22	13.86
If	$N(CH_3)_2$	H	173-176	82	$C_{37}H_{42}N_6O_2$	13.22	13.95
Ig	H	OCH_3	186-189	68	$C_{35}H_{36}N_4O_4$	9.32	9.72
Ih	OCH_3	OCH_3	213-215	70	$C_{37}H_{40}N_4O_6$	8.07	8.80

Table 2: Antimicrobial activity of 1;1 Bis {2-hydroxy-3[1' H-5' Aryl pyrazolin-3'-yl methyl phenyl} methane. I(a-h)

Compound	*S. aureus*	*E. coli*	*Pr. mirabilis*	*S. typhi*
Ia	++	+	++	-
Ib	+++	-	+	-
Ic	-	++	-	+
Id	-	-	-	-
Ie	-	-	++	-
If	-	+++	+	-
Ig	++	+++	+++	-
Ih	-	-	+	-

-Inactive, + Weakly active, ++ Moderatly active, +++Strongly active

The compound I(g) was strongly active towards *E. coli* and *Pr. mirabiils* but moderately active towards *S. aureus* and inactive against *S. typhi*.

The compound I(h) was weakly active towards *Pr. mirabiils* and *S. typhi* and same compound was inactive towards *S. aureus* and *E. coli*.

From above result it was observed that Bis pyrazolines (titled) were found more or less effective against, *Staphylococcus aureus, Escherichia coli, Proteus mirabilis* and *Salmonella typhi*. Hence those compounds can be easily used for treatment of diseases only when they do not have toxic and other side effects.

ACKNOLWEDGEMENTS

The authors are thankful to Dr. D.H. Tambekar, Head, Department of Microbilogy, SGB Amravati University, Amravati, Miss Vishaka Pathak and Non teaching staff for providing necessary facility.

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