RJC

RASĀYAN *J. Chem.*
Vol. 6 | No.1 | 65-67 | January-March | 2013
ISSN: 0974-1496 | e-ISSN: 0976-0083 | CODEN: RJCABP
http://www.rasayanjournal.com
http://www.rasayanjournal.co.in

SYNTHESIS, CHARECTERISATION AND ANTIBACTERIAL ACTIVITIES OF SOME NEW BROMO/NITRO 1,3-THIAZENES

Ram S. Ganorkar[1],*, Rajesh P.Ganorkar[2] and V. V. Parhate[1]
[1]Department of Chemistry, VidyabhartiMahavidyalaya, Amravati. (MS) 444602.India
[2]Department of Chemistry, Mahatma FuleArts,Commerce&Sitaramji Chaudhari Science Mahavidyalaya, WarudDist. Amravati. (MS) 444906.India
*E-mail:ramganorkar03@gmail.com

ABSTRACT
1, 3-thiazines are prepared by refluxing the mixture of 2-Hydroxy-3-bromo/nitro -5-chlorochalcone and phenylthiourea in alcohol and aq.KOH medium. The newly synthesized 1,3-thiazenes were characterized on the basis of elemental analysis and spectroscopic data of IR,NMR. The melting points were taken in an open capillary tube. All compounds have been evaluated for their *in vitro* growth of inhibitory activity against*Escherichia coli, Staphylococcus aureaus , Bacillus subtilis and Phaseolusargenosa.*
Keywords:1,3-Thiazines, Antibacterial Activity,pathogenic bacteria.

INTRODUCTION

Thiazine is a six membered heterocyclic which contains two hetero atoms (N and S) placed in the heterocyclic ring at 1,3 positions. 1,3-thiazines have a very broad spectrum of fungicides, insecticides, growth promoting hormonal effect etc.
Thiazines are very useful units in the fields of medicinal and pharmaceutical chemistry and have been reported to exhibit a variety of biological activities[1-2].The reaction of thiourea withα, β- unsaturated ketones results in 1, 3 thiazine[3-4] .Some chloro-substituted-1, 3-thiazines have been reported for antimicrobial activity[5].
The ability of thiazine to exhibit antitubercular, antibacterial in which inactivate HIV in biological fluid and used as cannabinoid receptor agonist[6].1,3-thiazine derivatives and their evaluation as potential antimycobacterial agents[7].The synthesis of 2,4-dihydro-1H-benzo[d] [1,3]thiazines via silver catalyzed tandem addition-cyclization reactions are reported[8]. Synthesize of new chromene base heterocyclic like thiazine from 2-Amino-5-hydroxy-4-phenyl-7-methyl-4H[1-chromeno-3-carbonitrile which may show a good biological activity[9].Some 1,3-thiazines are reported for its antimicrobial activity. [10]

EXPERIMENTAL

The synthesis of 1,3-thiazines from 3-bromo-5-chlorochalcone and 3-nitro-5-chlorochalcone on treatment with phenylthiourea in presence of alcoholic KOH. The melting points of these compounds were recorded on 'Tempo' melting point apparatus and are uncorrected. The carbon, nitrogen, sulphur and hydrogen analysis was carried out on 'Carlo Ebra 1106' analyzer. The IR spectra were recorded on 'Perkin-Elmer Infra Red spectrophotometer. The PMR spectra were recorded on DRX 300 spectrometer in $CDCl_3$. Purity of the compound was tested by TLC.
The study were treated for their antibacterial impact against some common pathogenic bacteria viz. *E. coli,S. aureus, B. Subtilis, P. argenosa.*
The solutions of 0.01 mol dilution of test compounds were prepared in dioxane solvent separately. The discs were soaked, assuming that each disc will contain approximately 0.01 ml of test solution.

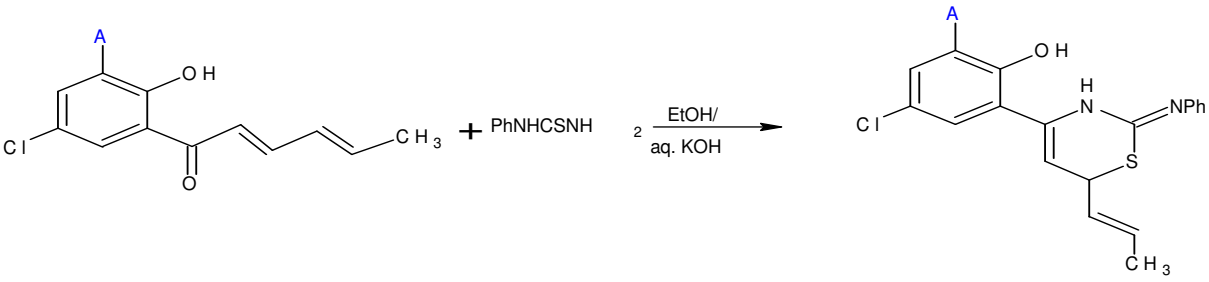
The culture media was prepared by using following composition for one liter distilled water-

Peptone	:	5.0 g./litre
Sodium chloride	:	5.0 g./litre
Beef extract	:	1.5 g./litre
Yeast extract	:	1.5 g./litre
Agar	:	15.0 g./litre
pH (approximately)	:	7.4 ± 0.2.

The culture medium thus prepared was sterilized in autoclave at 15 lbs/inch pressure and 121 ^{0}C temperature for 15 minutes. After sterilization, it was cooled down to about 50 ^{0}C and poured into pre-sterilized petriplates of 8.5 cm in diameter each and allowed to solidify the nutrient agar medium of about 14 mm depth. The petriplates were kept with nutrient broth at 37 ^{0}C for2 4 hr. in an incubator.

(a) Preparation of 4-(2-hydroxy-3-bromo/nitro-5-chlorophenyl)-6-(1'-propene)-2-iminophenyl-3,6-dihydro-1, 3-thiazine (IIa/b)

2-Hydroxy-3-bromo/nitro -5-chlorochalcone and phenylthiourea were dissolved in ethanol. To this aqueous KOH solution was added and this reaction mixture was refluxed for three hours, after cooling, diluted with water and acidified with 1:1 HCl. The product thus obtained was 4-(2-hydroxy-3-bromo/nitro -5-chlorophenyl)-6-(1'-propene)-2-iminophenyl-3,6-dihydro-1, 3-thiazine.



A=Br/NO_2

Scheme-1

Spectral interpretation of (IIb)

(a) The important frequencies observed in the IR spectrum recorded in KBr are correlated as follows-

IR(υmax)cm^{-1}:3423**υ** (-OH Stretching); 2320 **υ** (-C=N Stretching); 1444 **υ** (Ar-NO_2); 1230 **υ** (C=O Stretching); 1313**υ** (C-N Stretching)

(b) The PMR spectrum of the compound (IIb) was recorded in $CDCl_3$ with TMS as an internal standard. The observed chemical shifts and their correlations are as follows-

NMR :δ 1.2 (S,3H , =CH-C**H**$_3$); 2.5 (S,1H , N-**H**); 3.6 (t,1HC**H**-C=C); 5.57 (m,1H, HC=C**H**-CH_3); 5.74 (m,1H , C**H**=CH-CH_3); 6.6 (d,1H , NH-C=C**H**); 7.1-7.8 (m, 7H ,Ar-**H**); 9.6 (s,1H, Ar-O**H**)

RESULTS AND DISCUSSION

The 1,3-thiazines when screened in vitro against some common bacteria viz. *E. coli,S. aureaus*, *B. subtilis, P. argenosa* it was noticed that most of all these compounds have shown remarkable inhibitory activity.

An assay of newly synthesized 1,3-thiazines revels that, almost all the compounds were strongly active against all the test pathogensE. coli, S. aureaus, B. subtilis, P. argenosa. Their inhibitory impact on the bacterial growth is remarkable.

Table-1

Compound	Molecular formula	Melting Point(°C)	Yield (%)	Rf Value
IIa	$C_{19}H_{16}N_2BrSOCl$	140°C	75%	0.56
IIb	$C_{19}H_{16}N_3SO_3Cl$	125°C	70%	0.35

Table-2: Antibacterial activities of test compounds

S. No.	Test Compounds	Zone of inhibition (mm)			
		E. coli	*S. aureus*	*B.subtilis*	*P. argenosa*
1	IIa	26	22	22	27
2	IIb	29	27	22	26

ACKNOWLEDGEMENTS

The authors are thankful to V.B.M.V. Amravati for providing all the facilities to carry out the work ,Dr. D. T. Mahajan, Head, Department of Chemistry, Dr. P.R. Rajput, Associate Professor, VidyaBharatiMahavidyalaya, Amravati.

REFERENCES

1. R.Vyas, P.Choudhary, H. Sharma and B. L. Varma, *Indian J. Heterocyclic Chem.,* **17(1)**, 237(2008).
2. Y. S. Jhala, Pradhuman, S. Ranawat, S. S. Dulawat and B. L. Varma, *Indian J. Heterocyclic Chem.*, **14,** 357(2005).
3. A. C. Jain and A. K. Prasad, *Indian J. Chem.,* **34 B**, 496 (1995).
4. Yoshiu, *Chem. Soc. Jpn.*, **93(2)** 1016 (2004).
5. S.P.Rathod,A.P.Charjanand P. R.Rajput, *Rasayan J.Chem.*,**3, (2)** 363(2010),
6. V.V.Dabholkar; S.D. Parab, *Heterolett.Org.*,**1**, 176(2011).
7. M**.**Koketsu, K.Tanaka,Y.Takenaka, C.D.Kwong, H.Ishihara ,*Eur.J. of Pharm. Sci.*,**15, (3**),307(2002).
8. D.Qiuping and W.Jie, *J. Comb. Chem.,***10(4),** 541(2008), DOI:10.1021/cc800043r.
9. F.K.Mohammed, A.Y.Soliman, A.Ssawy, M.G.Badre, *J. Chem. Pharm. Res*, **1 (1)**, 213(2009).
10. F. H. Z. Haider, *J. Pharm. Res.,* **4(4)**,2263(2012).

[RJC-1016/2013]