SYNTHESIS AND ANTIFUNGAL ACTIVITY OF SOME NEW 1, 2-BENZISOXAZOLE

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Abstract:
Various 3H-N-substituted phenyl / thiazolyl 1,2-benzisoxazole have been synthesized by the reaction of schiffs base with DMSO-I_2 in presence of H_2SO_4 and characterized by IR,NMR spectral studies and elemental analysis. These compounds showed significant activities against plant pathogenic fungi viz. *Alterneria burnsii* and *Macrophomina phasiolina.*

Introduction

Benzisoxazoles are currently the most important building blocks in drug discovery and their derivatives are medicinally important[1]. The chemistry of substituted 1,2-benzisoxazole amides occupies an extremely important role in field of pharmaceutical and in medicinal fields. In continuation of our work on heterocyclic compounds[2-5], we have synthesized some new 1,2-benzisoxazoles **(2).**

Result and discussion

We have described the synthesis of substituted 1, 2-benzisoxazoles (2a-j) derivatives from the reaction of schiff's base with DMSO-I_2 in presence of concentrate H_2SO_4. I.R. spectra shows peaks at 1540 cm^{-1} (C – N), 3050 cm^{-1} (aromatic C – H), 1065 cm^{-1} (C–O) and ^{1}HNMR shows peaks at δ 7.3-7.9 (8H,m, aromatic C – H) and δ 2.5 (2H,d > CH_2)ppm, which confirms the formation of 3H-N-(2-chlorophenyl)-1, 2-benzisoxazoles.

Antifungal Activity

The test microbes, taken for evaluation of ten synthesized 1,2-benzisoxazoles, were two plant pathogenic fungi viz. *Alterneria burnsii* and *Macrophomina phaseolina.* Food poison technique was used to evaluate antifungal activity of compounds at 100 ppm and 500 ppm doses. All the compounds showed varied antifungal activity which was dose dependent. Out of ten compound tested, maximum inhibition was observed with compound 2e and 2j which contained fluorine atom.

Experimental

Melting points were determined in open capillaries and are uncorrected. The IR spectra (cm^{-1}) were recorded on a SHIMADZU 8400S FT-IR spectrometer in KBr pellets.^{1}HNMR spectra were recorded on JEOL DRX-300 spectrometer (300 MHz) using TMS as an internal standard (chemical shifts are reported in δ scale). Purity of compounds were checked by TLC on silica gel plate.

N-[(2-hydroxy phenyl)-methylidinyl]-2-chloroaniline (1)

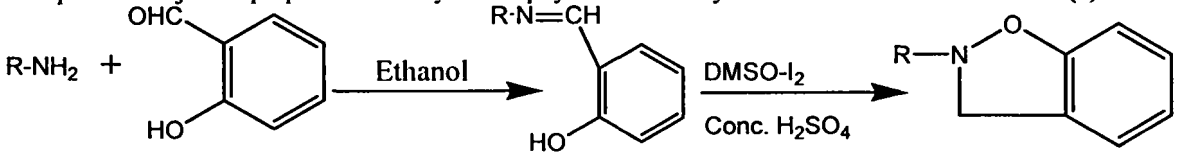
A mixture of 2-chloroaniline (0.01mol) and salicyaldehyde (0.01mol) was heated under reflux for 8-10 h in ethanol on water bath. The reaction mixture was cooled and crude product was crystallized from ethanol to yield **1** (74%), m.p.75°. I.R.(KBr)$V_{max.}$: 3400 (OH), 1620 (CH=N),3010 (arom.C-H)cm^{-1}; ^{1}HNMR ($CDCl_3$) δ:2.4(1H,s,CH),8.8(1H,s,–OH), 7.1-7.7 (8H,m,Ar–H)ppm.

3H-N-(2-chlorophenyl)-1, 2-benzisoxazole (2a)

A mixture of a 1 (0.01 mol), DMSO (40 ml) and I_2 in presence of concentrate H_2SO_4 was heated on water bath for one hr. The reaction mixture was poured into cold water, filtered and crystallized from ethanol to yield 2a (70%), m.p. 170°,

I.R.(KBr)V_{max}:1540(C–N), 3050(arom.C–H), 2830(aliphatic C–H), 1065 (C–O)cm^{-1}; ^{1}HNMR($CDCL_3$)δ: 2.5 (2H, d > CH_2), 7.3-7.9 (8H,m, Ar–H)ppm.

Compounds 2b-j were prepared similarly. Their physical and analytical data are recorded in Table **(1)**



1 **2a-j**

R = 2-Cl.C_6H_4, 3-Cl.C_6H_4, 4-Cl.C_6H_4, 5-Cl.C_6H_3NS, 2,4-F.C_6H_3
4-Br.C_6H_4, 4-Cl.C_6H_3NS, 2,3-$CH_3C_6H_3$, 4,6 -$CH_3C_6H_2NS$, 6-F.C_6H_3NS

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Table 1: Physical and Analytical Data of the Compounds

Compounds	R	Mol. Formula	M. P. (°C)	Yield %	Elemental Analysis % found / (calcd.) C	H	N	S
2a	2-Cl.C_6H_4	$C_{13}H_{10}NOCl$	170	70	67.33 (67.39)	4.31 (4.35)	6.02 (6.05)	-
2b	3-Cl-C_6H_4	$C_{13}H_{10}NOCl$	241	64	67.35 (67.39)	4.33 (4.35)	6.02 (6.05)	-
2c	4-Cl-C_6H_4	$C_{13}H_{10}NOCl$	260	70	67.35 (67.39)	4.31 (4.35)	6.00 (6.05)	-
2d	5-Cl-C_6H_3NS	$C_{14}H_9N_2SOCl$	150	74	58.18 (58.23)	3.09 (3.14)	9.57 (9.70)	10.94 (11.10)
2e	2, 4-F.C_6H_3	$C_{13}H_9F_2NO$	70-75	60	66.92 (66.95)	3.81 (3.89)	5.97 (6.01)	-
2f	4-Br.C_6H_4	$C_{13}H_{10}NOBr$	267	65	56.51 (56.55)	3.60 (3.65)	5.01 (5.07)	-
2g	4-Cl-C_6H_3NS	$C_{14}H_9N_2SOCl$	265	72	58.15 (58.23)	3.08 (3.14)	9.64 (9.70)	11.02 (11.10)
2h	2, 3-CH_3.C_6H_3	$C_{15}H_{15}NO$	230	65	79.92 (79.97)	6.69 (6.71)	6.20 (6.22)	-
2i	4,6 -CH_3-C_6H_2NS	$C_{16}H_{14}N_2SO$	86	68	68.02 (68.06)	4.96 (5.00)	9.88 (9.92)	11.32 (11.36)
2j	6-F-C_6H_3NS	$C_{14}H_9N_2SOF$	180	65	61.71 (61.75)	3.29 (3.33)	10.24 (10.29)	11.71 (11.78)

References

1 R.M. Kumbhare and V.N.Ingle, *Indian J.Chem.* **48B** , 996 (2009).

2 V. Sareen, V.Khatri, U. Garg, P.Jain and K.Sharma, Phosphorous,Sulphur and Silicon **182** ,2943 (2007)

3 V.Sareen,U.Gupta, V.Khatri and S.Chug, *Indian J. Heterocyclic Chem.*, **17**, 355(2008).

4 V.Sareen, V. Khatri, P. Jain and K.Sharma, *Phosphorous, Sulphur and Silicon*,**185**,146(2010).

5 V.Sareen, V.Khatri, K.Sharma D.Shinde and S.Sareen, Heterocyclic *Communications* 2010 (in press).

Received on December 5, 2009.