

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-I₂ in presence of H₂SO₄ and characterized by IR,NMR spectral studies and elemental analysis. These compounds showed significant activities against plant pathogenic fungi viz. *Alternaria burnsii* and *Macrophomina phaseolina*.

Introduction

Benzisoxazoles are currently the most important building blocks in drug discovery and their derivatives are medicinally important¹. 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 compounds²⁻⁵, 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-I₂ in presence of concentrate H₂SO₄. I.R. spectra shows peaks at 1540 cm⁻¹ (C – N), 3050 cm⁻¹ (aromatic C – H), 1065 cm⁻¹ (C–O) and ¹HNMR shows peaks at δ 7.3-7.9 (8H,m, aromatic C – H) and δ 2.5 (2H,d > CH₂)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. *Alternaria 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. ¹HNMR 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)-methylidiny]-2-chloroaniline (1)

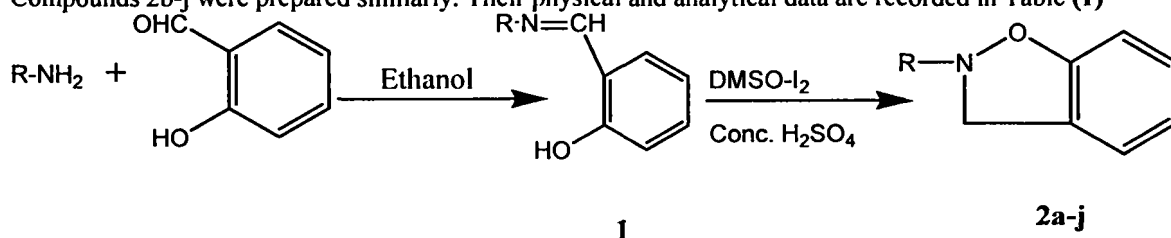
A mixture of 2-chloroaniline (0.01mol) and salicylaldehyde (0.01mol) was heated under reflux for 8-10 h in ethanol on water bath. The reaction mixture was cooled and crude product was crystallized from ethanol to yield 1 (74%), m.p.75°. I.R.(KBr) $\nu_{\max}$: 3400 (OH), 1620 (CH=N),3010 (arom.C-H)cm⁻¹; ¹HNMR (CDCl₃) 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 I₂ in presence of concentrate H₂SO₄ 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} ; $^1\text{H NMR}(\text{CDCl}_3)\delta$: 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)



R = 2-Cl.C₆H₄, 3-Cl.C₆H₄, 4-Cl.C₆H₄, 5-Cl.C₆H₃NS, 2,4-F.C₆H₃,
4-Br.C₆H₄, 4-Cl.C₆H₃NS, 2,3-CH₃ C₆H₃, 4,6 -CH₃ C₆H₂NS, 6-F.C₆H₃NS

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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 ₆ H ₄	C ₁₃ H ₁₀ NOCl	170	70	67.33 (67.39)	4.31 (4.35)	6.02 (6.05)	-
2b	3-Cl.C ₆ H ₄	C ₁₃ H ₁₀ NOCl	241	64	67.35 (67.39)	4.33 (4.35)	6.02 (6.05)	-
2c	4-Cl.C ₆ H ₄	C ₁₃ H ₁₀ NOCl	260	70	67.35 (67.39)	4.31 (4.35)	6.00 (6.05)	-
2d	5-Cl.C ₆ H ₃ NS	C ₁₄ H ₉ N ₂ SOCl	150	74	58.18 (58.23)	3.09 (3.14)	9.57 (9.70)	10.94 (11.10)
2e	2, 4-F.C ₆ H ₃	C ₁₃ H ₉ F ₂ NO	70-75	60	66.92 (66.95)	3.81 (3.89)	5.97 (6.01)	-
2f	4-Br.C ₆ H ₄	C ₁₃ H ₁₀ NOBr	267	65	56.51 (56.55)	3.60 (3.65)	5.01 (5.07)	-
2g	4-Cl.C ₆ H ₃ NS	C ₁₄ H ₉ N ₂ SOCl	265	72	58.15 (58.23)	3.08 (3.14)	9.64 (9.70)	11.02 (11.10)
2h	2, 3-CH ₃ .C ₆ H 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 ₆ H ₂ NS	C ₁₆ H ₁₄ N ₂ SO	86	68	68.02 (68.06)	4.96 (5.00)	9.88 (9.92)	11.32 (11.36)
2j	6-F.C ₆ H ₃ NS	C ₁₄ H ₉ N ₂ SOF	180	65	61.71 (61.75)	3.29 (3.33)	10.24 (10.29)	11.71 (11.78)

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