

NOTE

Synthesis and Antimicrobial Study of Some New Chlorosubstituted 4-Aroyl Isoxazolines

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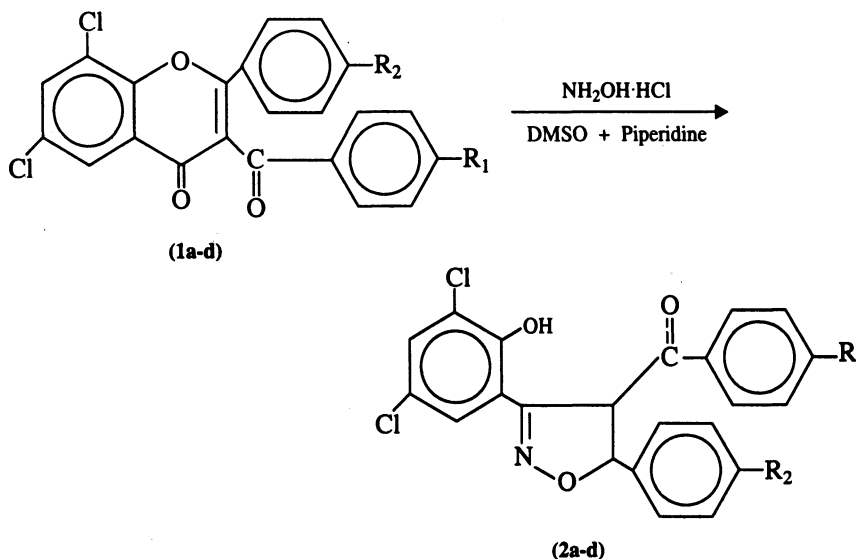
Some new chlorosubstituted 4-royl isoxalines (**2a-d**) have been synthesized by the interaction of chlorosubstituted 3-royl flavanones (**1a-d**) with $\text{NH}_2\text{OH}\cdot\text{HCl}$ in DMSO containing a few drops of piperidine. The structural assignments of these compounds are based on their elemental analysis, chemical properties and spectral data. The newly synthesized chlorosubstituted 4-roylisoxazolines were evaluated for their antimicrobial activity against *E. coli*, *S. aureus*, *P. aeruginosa*, *P. vulgaris* by disc diffusion method. The antibacterial results obtained are very encouraging.

Key Words: Synthesis, Antimicrobial study, Chlorosubstituted 4-royl isoxazolines.

Isoxazolines play a vital role owing to their wide range of biological¹⁻⁵ and anticonvulsant⁶. It has been revealed⁷ that substituent in the phenyl ring enhances their antibacterial activity. It was considered worthwhile to synthesize the new chlorosubstituted 4-royl isoxazolines to screen them for antimicrobial activity. We report here the synthesis of chlorosubstituted 4-royl isoxazolines (**2a-d**) from chlorosubstituted 3-roylflavanones (**1a-d**) and hydroxylamine hydrochloride in DMSO containing a little piperidine. The structures of the compounds (**2a-d**) were established by elemental analysis, chemical properties and spectral data. These compounds were then assayed against some human pathogens for their antimicrobial activities.

Chlorosubstituted 3-royl flavanones (0.01 mol) (**1a-d**) were separately allowed to be refluxed for 1.5 h with $\text{NH}_2\text{OH}\cdot\text{HCl}$ (0.02 mol) in DMSO (20 mL) containing a few drops of piperidine. After cooling the reaction mixture was acidified with dil. HCl (1 : 1). The solid products thus separated were filtered, washed first with sodium bicarbonate solution (10%) and then with water. Finally they were separately crystallized from ethanol-acetic acid mixture to get the compounds (**2a-d**).

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Spectral data of the newly synthesized compound (2c) is as summarized below.

IR (nujol) (cm^{-1}) show absorption bands at 3426 $\nu(\text{OH})$, 1646 $\nu(>\text{C}=\text{O})$, 1603 $\nu(>\text{C}=\text{N})$, 827 $\nu(\text{C}-\text{Cl})$. UV-Vis: (CHCl_3) showed λ_{max} at 367 nm corresponding to $n \rightarrow \pi^*$ transition. PMR: (CDCl_3) showed 3.88 (s, 3H, Ar— OCH_3), 5.21 (d, 1H, $\text{CH}_\text{A}-\text{CH}_\text{H}$), 5.63 (d, 1H, $\text{CH}-\text{CH}_\text{B}$), 6.73–8.17 (m, 10H, Ar—H), 11.5 (s, 1H, Ar—OH).

m.p.s were determined in open capillaries and are uncorrected. Purity of the compounds was checked by TLC on glass coated plates in the laboratory with silica gel-G in benzene and CCl_4 .

The molecular formulae, yields, m.p.s and elemental analyses of compounds (2a–d) are presented in Table-1.

TABLE-1
ANALYTICAL AND PHYSICAL DATA OF
3,5-DIARYL-4-AROYL ISOXAZOLINES (2a–d)

Compd.	m.f.	R ₁	R ₂	Yield (%)	m.p. (°C)	Found	Calcd.
2a	C ₂₄ H ₁₉ NO ₅ Cl ₂	—OCH ₃	—OCH ₃	80	192	2.80	2.96
2b	C ₂₂ H ₁₅ NO ₅ Cl ₂	—H	—H	75	188	3.30	3.39
2c	C ₂₃ H ₁₇ NO ₄ Cl ₂	—H	—OCH ₃	70	180	3.05	3.16
2d	C ₂₃ H ₁₇ NO ₄ Cl ₂	—OCH ₃	—H	75	190	3.09	3.16

Antibacterial activity: All the newly synthesized compounds were screened for their antibacterial activities *in vitro* against *E. coli*, *S. aureus*, *P. aeruginosa* and *P. vulgaris* in dioxane medium at a concentration of 100 mg/mL by disc diffusion method⁸. The zones of inhibition were measured in mm (Table-2). The antibacterial results indicate that compounds (2a), (2c) and (2d), bearing methoxy

group were found to exhibit greater degree of antibacterial activities against *P. vulgaris*.

However, all the compounds (**2a-d**) showed moderate activity against *E. coli*, *S. aureus* and *P. aeruginosa*.

TABLE-2
ANTIBACTERIAL ACTIVITY DATA OF 3,5-DIARYL-4-AROYL ISOXAZOLINES

Compound	Zones of inhibition (mm)			
	<i>E. coli</i>	<i>S. aureus</i>	<i>P. aeruginosa</i>	<i>P. vulgaris</i>
2a	9	10	11	14
2b	8	11	10	10
2c	11	12	12	14
2d	10	11	12	13

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