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Research Article

New Approach for the Synthesis of *N*-(4-oxo-3-substituted-2-Sulfanylidene Imidazolidin-1-yl)Naphtho[2,1-*b*]Furan-2-Carboxamide Derivatives and Their Antimicrobial Activity

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ABSTRACT

The reaction of naphtho[2,1-*b*]furan-2-carbohydrazide **4** on treatment with various aromatic phenyl isothiocyanates in glacial acetic acid affords 2-(naphtho[2,1-*b*]furan-2-carbonyl)-N-(substitued)hydrazine-1-carbothioamides **5a-f.** This on heating with chloroacetyl chloride in DMF produces *N*-(4-oxo-3-substituted-2-sulfanylidene imidazolidin-1-yl)naphtho[2,1-*b*]furan-2-carboxamides **6a–f**. The structures of **6a-f** have been established by spectral studies. In addition they have been screened for antimicrobial activities.

Key words: naphtho[2,1-*b*]furan-2-carbohydrazide and antimicrobial activities.

INTRODUCTION

Imidazolidenes are important heterocycles found in many biologically active compounds. Imidazolidines are biologically active pharmacophores and synthetic intermediates in medicinal chemistry. Imidazolidenes exhibit high range of biological activities[1-2] including anti-inflammatory, antinociceptive activities[3], anticonvulsant[4] anti-proliferative[5], antihyperglycemic[6], antihypertensive[7], anticancer[8] and antiulcer[9] activities. Naphtho[2,1-*b*]furan derivatives were known to show various biological[10-14] and pharmacological activities. Naphtho[2,1-*b*]furan derivatives with imidazolidene ring is not synthesised so far. Hence it was thought to synthesize new derivatives of naphtho[2,1-*b*]furan derivatives with imidazolidene ring by simple method and screened them for antimicrobial activities.

MATERIALS AND METHODS

All the chemicals were of A. R. grade and used with further purification. Melting points were determined with the open capillary and are uncorrected. IR spectra was recorded in Nicolet 5700 FT-IR instrument (Nicolet, Madison, WI, USA) by using KBr pellets. The ^{1}H NMR spectra are recorded on VNMRS–400 Agilent–NMR instrument using TMS as internal reference. Chemical shifts are reported in δ (ppm). Mass spectra were recorded using Water's SYNAPT G2 QTOF LCMS instrument. Purity of the compounds was checked by TLC.

EXPERIMENTAL

2-Naphthol is subjected to Reimar-Tiemann reaction to get 2-hydroxy-1- naphthaldehyde **2.** This on reaction with ethyl chloroacetate gives ethyl naptho[2,1-*b*] furan-2-carboxylate **3.** The ester **3** on condensation with hydrazine hydrate in ethanol gave naphtho[2,1-*b*]furan-2-carbohydrazide **4.** This on treatment with various isothiocyanates yielded 2-(naphtho[2,1-*b*]furan-2-carbonyl)-*N*-(substituted)hydrazine-1-carbothioamide. These compounds on condensation with chloroacetyl chloride in DMF gave the title compounds *N*-(4-oxo-3-substituted-2-sulfanylideneimidazolidin-1-yl)naphtho[2,1-*b*]furan-2-carboxamide derivatives **6a–f.**