SYNTHESIS AND BIOLOGICAL ACTIVITY OF SOME NEW QUINOLONE DERIVATIVES

A SYNOPSIS

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SYNOPSIS

The dissertatioin entitled "SYNTHESIS AND BIOLOGICAL ACTIVITY OF SOME NEW QUINOLONE DERIVATIVES" presented to the Faculty of Science, Shivaji University, Kolhapur, in partial fulfilment of the degree of MASTER OF PHILOSOPHY in Chemistry.

The dissertation consists of three chapters.

Chapter-I describes quinoline and its derivatives as an interesting class of heterocyclic compounds having a wide range of applications as drug. Most of them have antiseptic, analgesics, tryphocidal, germicidal, antitubercular, anthermintic and antiserotonin activities. In addition to these quinolines show good antibacterial, antifungal, amoebicidal, antiviral activities. Some quinolines acts as antidepressants and antihypertensive agents.

The same chapter includes a brief survey of the literature on 2-quinolones and its N^1-substituted derivatives with reference to methods of synthesis and biological and industrial importance. At the end of the chapter scope of the present work is given.

Chapter-II is an experimental work and is divided into three parts.

Part-I : describes the details of experimental methods used for the synthesis of N^1-Hydrazido-6-chloro-4-methyl quinolin-2(1H)-one and its hydrazone and thiazolidinone derivatives.

The strategy employed for the synthesis of desired compound involved the reaction of p-chloro aniline with aceto acetic ester in benzene to form acetoacetanilide (I) which when cyclised in presence of sulphuric acid gave substituted quinolin-2(1H)-ones (II). The compound (II) on reaction with ethyl chloroformate gave corresponding N^1-carbethoxy derivatives (III). The compound (III) undergo nucleophilic substitution with hydrazine hydrate (80%) to form their N^1-hydrazido-6-chloro-4-methyl- quinolin-2(1H) one (IV). These hydrazides were further reacted with substituted aryl aldehydes to form hydrazones (V). Cycloaddition of mercaptoacetic acid to hydrazones (Va-d) in presence of anhydrous zinc chloride in DMF furnished targetted thiozolidino- nes (Va-d). Scheme-1.

Part-II describes the details of experimental methods used for the synthesis of N^1-Acetyl hydrazido-8-chloro-4 – methyl-quinolin -2(1H)-one and its hydrazone and thiazolidinone derivatives (Scheme-II).

Part-III : describes the details of experimental methods used for the synthesis of N^1-Hydrazido-4,6-dimethylquinolin-2(1H)-one and its hydrazone and thiazolidinone derivatives.(Scheme-III).

Part-IV : describes the details of experimental methods used for the synthesis of N^1-Acetyl hydrazido-6-chloro-2-methylquinolin-4(1H)-one.

The strategy employed for the synthesis of desired compound involved the reaction of p-chloro aniline with acetoacetic ester in benzene to form (I) which when cyclised in presence of sulphuric acid gave substituted quinolin -4(1H)-ones (II). The compound (II) on reaction with methylchloroacetate gave corresponding N^1-methoxycarbonyl methyl derivatives (III). The compound (III) undergo nucleophillic substitution with hydrazine hydrate (80%) to form their N^1-substituted methyl hydrazido-6-chloro-2-methyl quinolin-4(1H)-one (IV). These hydrazides were further reacted with substituted aryl aldehydes to form hydrazones (Va-d). Cycloaddition of mercaptoacetic acid to hydrazones (Va-d) in presence of anhydrous zinc chloride in DMF furnished targetted thiazolidinones (VIa-d) respectively (Scheme-IV).

Part-V : desdcribes the details of experimental methods used for the synthesis of N^1-Hydrazido-8-chloro-2-methyl quinolin-4(1H)-one and its hydrazone and thiazolidinone derivatives (Scheme-V)

Chapter-III deals with the evaluation of the antimicrobial screening of the synthesised compounds by Agar plate diffusion method against (gram +ve) and (gram -ve) bacteria using tetracycline as standard compound.

The bacterial species selected for the antimicrobial screening were Staphylo aureus, (gram +ve) and Escherichia coli (gram -ve) bacteria.

Most of the compounds included in the present study have exhibited moderate to good antibacterial activity against E. coli (Gram -ve) while they are less active against S. aureus (Gram +ve). The presence of methyl group in the phenyl ring of quinolinone nucleus and N^1-substitution with heterocyclic moiety enhances the antibacterial activity.

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