

SYNOPSIS

The dissertation entitled, " SYNTHESIS OF SOME NEW N¹SUBSTITUTED QUINOLINE 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, anther-mintic and antiserotonin activities. In addition to these quinolines show good antibacterial, antifungal, amoebicidal, antiviral activities. Some quinolines act as antidepressants and antihypertensive agents.

The same chapter includes a brief survey of the literature on 2-quinolones and its N¹-substituted derivatives with reference to methods of synthesis, biological and industrial importance. At the end of the chapter the scope of the present work is given.

CHAPTER - II

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 N¹-Hydrazido-4-methyl, quinolin-2(1H)-one derivatives. The strategy employed for the synthesis of desired compound involved the

reaction of substituted aromatic amines with acetoacetic ester in dioxane to form acetoacetanilides (Ia-c) which when cyclised in presence of sulphuric acid gave substituted quinolin-2(1H)-ones (IIa-c). The compound (IIIa-c) on N¹-carbomethoxylation with ethyl chloroformate gave corresponding N¹-carbomethoxy derivatives (IIIa-c). The compound (IIIa-c) undergo nucleophilic substitution with hydrazine hydrate (80%) to form their N¹-hydrazido-4-methyl-quinolin-2(1H)-ones (IVa-c). These hydrazides were further reacted with phenyl isothiocyanate yielded substituted quinolinoyl thiosemicarbazides (V a-c) as a key intermediate. These when cyclised in presence of sodium hydroxide, I₂ in KI and phosphoric acid furnished targeted (4-phenyl-2-(4'-methyl, quinolin-2'-one-1'-yl)-5-mercapto-1,3,4-triazole (V Ia-c), 5-anilino-2-(4'-methyl, quinolin-2'-one-1'-yl)1,3,4-oxadiazole(V IIa-c) and 5-anilino-2-(4'-methyl, quinolin-2'-one-1'-yl)-1,3,4-thiadiazole (VIIa-c) respectively (Scheme-I).

Part-IIA : deals with the synthesis of some new derivatives of N¹-Methyl hydrazido-4-methyl-quinolin-2(1H)-one.

The compounds I'a-c were synthesised as per same methodology described in the Part-I of this dissertation. The reaction of I'a-c with methyl chloro acetate in the presence of potassium carbonate in acetone gave corresponding N¹-carbomethoxymethyl, 4-methyl quinolin-2(1H)-ones (II'a-c) which when refluxed in ethanolic hydrazine hydrate gave corresponding N¹-substituted methylhydrazido-4-methyl quinolin-2(1H) ones (III'a-c). These hydrazides (III'a-c) were converted into their corresponding thiosemicarbazides (IV'a-c) by reacting them with phenylisocyanate in ethanol.

- 3 -

The compounds (IV'a-c) were cyclised by using different reagent such as sodium hydroxide, I₂ in KI and phosphoric acid to their N¹-substituted 4-methyl, quinolin-2(1H) ones with five membered hetero-cycles such as triazoles (V'a-c), oxadiazoles (VI'a-c) and thiadiazoles (VII'a-c). (Scheme II).

Part II I : includes the preparation of hydrazones of N¹ substituted Hydrazides/Methyl hydrazides of 4-methyl, quinoline-2(1H)ones. (I''a-c) by reacting them with citral in methanol to form their corresponding arylidene derivatives.

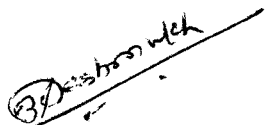
The structures of these compounds have been confirmed by UV, IR, ¹H NMR, Mass spectral studies and elemental analysis. Mass spectral fragmentation patterns of some of the compounds have been reported in the Part-II of the Chapter-II (Scheme-III and IV).

CHAPTER - III

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 Staphylococcus aureus, Staphylococcus citreus (gram +ve) and Pseudomonas aeruginosa, Klebsiella pneumoniae and Escherichia coli (gram -ve) bacteria.

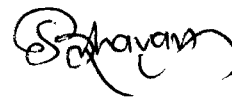
Most of the compounds included in the present study have exhibited moderated to good antibacterial activity against P. aeruginosa, K. pneumoniae and E. coli (Gram -ve) while they are observed to be less active against S. aureus and S. citreus (Gram, +ve). The presence of the methyl group in the phenyl ring of quinolinone nucleus and N¹-substitution with heterocyclic moiety enhances the antibacterial activity.



Dr. M.B. Deshmukh (Hogale)

Research Guide

Department of Chemistry,
Shivaji University, Kolhapur-416004.



Miss P.B. Chavan

Research Student