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Synthesis and characterization of 3-[(5-phenyl hydroxyl-1, 3, 4-oxadiazol-2-yl) methyl amino]-2-methyl quinazolin-4(3*H*)-one

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ABSTRACT

Quinazolinone is a heterocyclic compound. There are two structural isomers, 2-quinazolinone and 4-quinazolinone, with the 4-isomer being the more common. Various novel classes of structurally different quinazolinones have been designed and synthesized depicting potential interventions such as antibacterial, antifungal, antiviral, anticonvulsant, CNS depressant, anti-inflammatory, antihistaminic, anticancer and so on. At present some novel quinazolinone derivatives are synthesized and characterized by IR, H^1 NMR, MASS Spectral studies.

Key words: Quinazolinone, Anthranilic acid, 2-methyl 3-amino quinazoline 4(3H) one, Acetyl chloride, Chloro ethylacetate, Ethanol.

INTRODUCTION

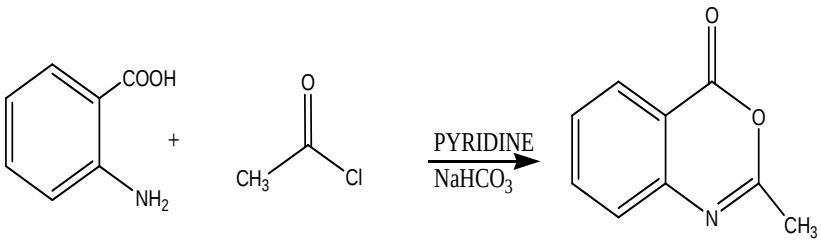
Quinazolinone has been considered as a magic moiety possessing myriad spectrum of medicinal activities. Diversity of biological response profile has attracted considerable interest of several researchers across the globe to explore this skeleton for its assorted therapeutic significance. Various novel classes of structurally different quinazolinones have been designed and synthesized depicting potential interventions such as antibacterial, antifungal, antiviral, anticonvulsant, CNS depressant, anti-inflammatory, antihistaminic, anticancer and so on. Moreover, the nucleus constitutes an integral structural component in a number of drugs currently employed in several clinical therapies [1, 2].

MATERIALS AND METHODS

1. Preparation of 2-methyl 3amino quinqzolin-4(3H) one IV

Step: 1

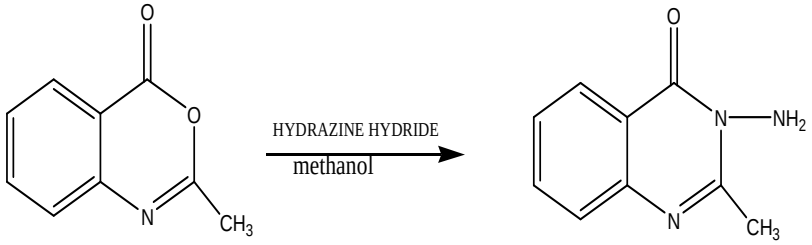
To a solution of anthranilic acid (0.1mol) is taken in a beaker and pyridine, acetyl chloride (0.2mol) was added. The reaction mixture is stirred continuously at 60^o–90^o further followed by 5%of sodium bicarbonate. The solid obtained is recrystalized from ethanol and dried [5, 6].



Anthranilic acid 2-methyl-4H-benzo[d][1,3]oxazin-4-one

Step: 2

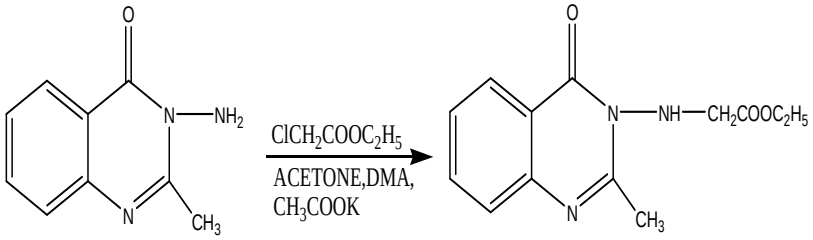
A mixture of 2-methyl-4H-benzo[d][1,3]oxazin-4-one (0.01mole) compound was taken in round bottom flask and treated with hydrazine hydrate in ethanol was refluxed for 3hrs at 60°–90° and the resulting solution was poured in to the crushed ice. A white precipitated was obtained and recrystalized with ethanol and dried [6].



2-methyl3amino quinqzolin 4(3H)one **I**

2**. Preparation of ethyl 2-(4-oxo-2-methyl quinazolin-3(4H)-yl amino) acetate II**

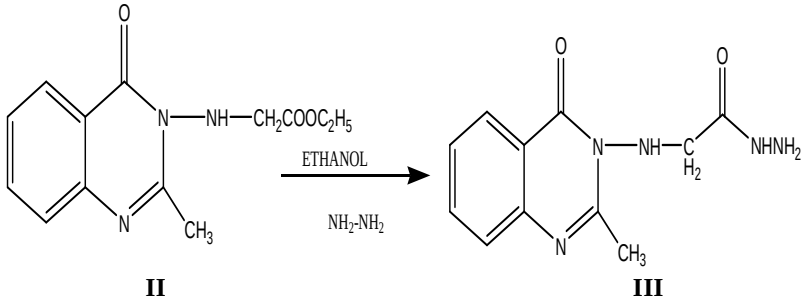
A mixture of 2-methyl 3amino quinqzolin-4(3H)-one compound (0.01mole) was taken in round bottom flask and treated with chloro ethyl acetate (0.01mole), DMA, acetone, potassium acetate, and refluxed for 6hrs and the resulting solution was poured in to crushed ice, precipitated was obtain, filtered and recrystalized with ethanol for two times and dried[7,8].



I **II**

3. **Preparation of 2-(4-oxo-2-methylquinazolin-3(4H)-yl-amino)aceto hydrazide III**

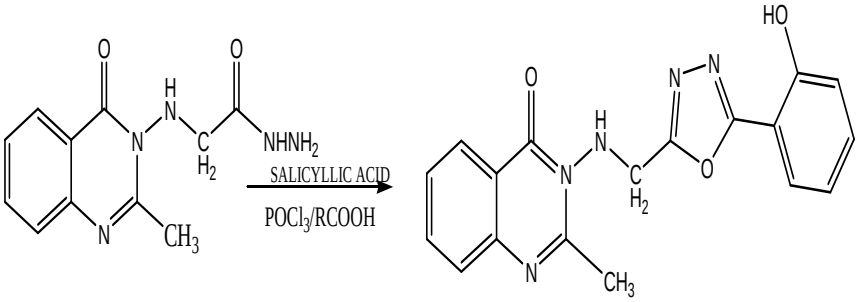
A Mixture of ethyl 2-(4-oxo-2-methyl quinazolin-3(4H)-yl-amino) acetate (0.01mole)was taken in round bottom flask and treated with hydrazine hydrate (0.01mole), in ethanol refluxed for 3hrs at 60°–90° and the resulting solution was poured in to crushed ice, precipitated was obtain, filtered and recrystalized with ethanol for two times and dried[9].



II **III**

4. **Preparation of 3-((5-phenylhydroxyl -1, 3, 4-oxadiazol-2-yl) methylamino)-2-methyl Quinazolin-4(3H)-one IV**

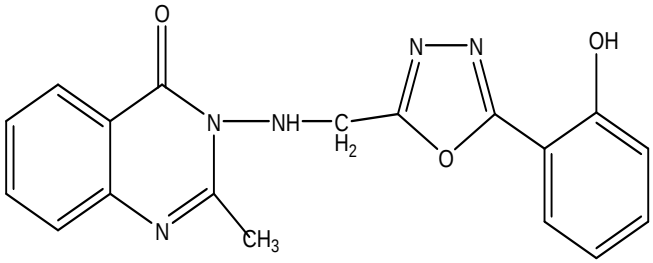
A mixture of 2-(4-oxo-2-methylquinazolin-3(4H)-yl-amino) aceto hydrazide compound (0.1mol) was treated with salicylic acid in $POCl_3$ was refluxed for 5hrs at 60^o–90^o and the contents were cooled and poured in to crushed ice. Then it was neutralized with $NaHCO_3$ solution and resulting solid was filtered and recrystalized with ethanol and dried.



III **IV**

RESULTS AND DISCUSSION

The synthesized quinqzoline derivatives further studied for characterization of UV, IR, NMR and Mass. To study the structure- activity relationship and to optimize the structure 3-((5-phenylhydroxyl-1, 3, 4-oxadiazol-2-yl) methyl-amino)-2-methyl quinazolin-4(3H)-one



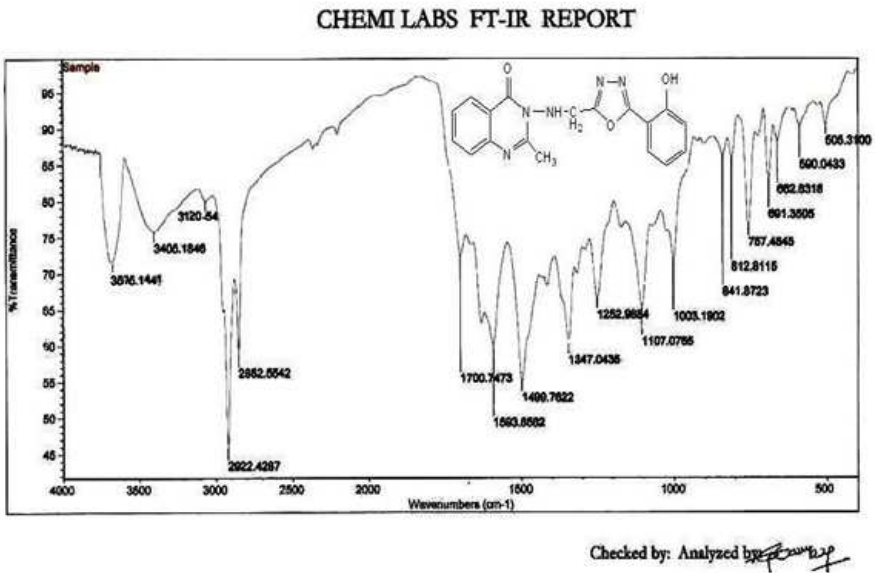
1. IR spectrum:

The IR spectrum of the compound IV was recorded on FTIR spectrometer by KBr method. The FTIR spectra from the figure 6.1.4 and the table 6.1.4 shows bands at 3405.50 cm^{-1},3120.10cm^{-1} , 1593.30 cm^{-1}, 1107.20 cm^{-1} and 1700.20 cm^{-1} corresponds to 2^o amine, aromatic C-H (strech), Imine (C=N), (C-O-C) stretch and quinazolinone (C=O) repectively. These observed values are in match with the reference values.

Table.1 IR values of compound IV

Compound	Types of vibration	Wave number [Cm^{-1}]	
		Observed value	**Standard value**
IV	N-H stretch	3405	3450
	C-H Stretch(Ar)	3120	3090
	C=O	1700	1665
	C-O-C	1107	1580
	C=N stretch	1593	1163
	OH	3575	3454

Figure.1IR for compound IV



2. Proton Magnetic Resonance Spectrum:

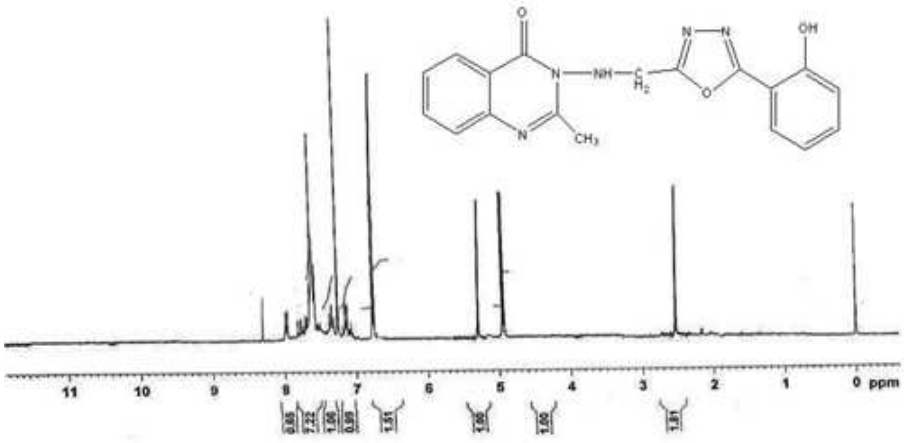
The ^{1}H NMR spectrum was recorded on JMR spectrometer using TMS as internal standard and DMSO as solvent.

The ^{1}H NMR spectrum of compound IV shown in figure.2 and table .2 showed singlets at δ 2.35 (3H, S, CH_3) which represent the methyl group and at δ 9.8 (1H, S, N-H) which represent the N-H group. It showed multiplets at δ 7.1-8.1(8H, M, Ar-H) which represent the aromatic protons.

Table.2 ^{1}H NMR values of compound IV

Compound	Types of proton	Nature of signal	Δ value(ppm)		No.of ^{1}H
			Observed value	**Standard value**	
IV	Aromatic	Multiplet	7.1-8.1	6.5-7.7	8
	OH-	Singlet	5-4	5.0-6.0	1
	-NH-	Singlet	6.8	10.5	1
	CH_2-	Singlet	4.95	4.22	2
	CH_3-	Singlet	2.6	2.49	3

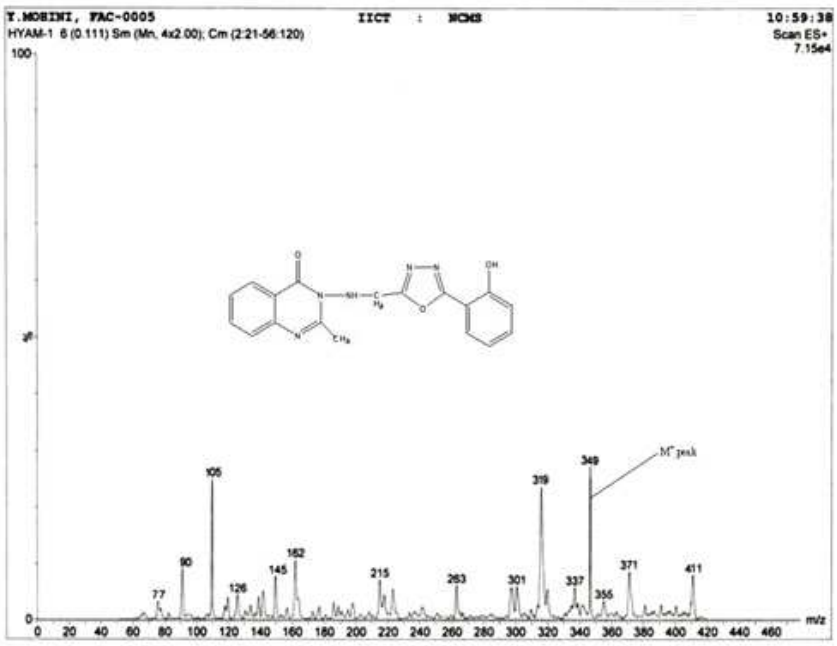
Figure.2 ^{1}HNMR for compound IV



3. Mass Spectrum of compound IV:

Conclusive evidence was obtained from the mass spectrum data in fig.3 the mass spectrum showed M^+ peak indicating molecular weight of the compound 349. Thus the structure of the compound IV is confirmed.

Figure.3 Mass spectrum for IV



Observations:

Table.3 Physical and analytical data of synthesized compounds

S.no	Compound	M.P	Yield	TLC	R_f Value
1.	I	220°c	65%	hexane: ethyl acetate (1:1)	0.33
2.	II	477°c	59%	hexane: ethyl acetate (1:1)	0.62
3.	III	501°c	58%	hexane: ethyl acetate (1:1)	0.30
4.	IV	640°c	59%	hexane: ethyl acetate (1:1)	0.44

CONCLUSION

The synthesized quinqzolinone derivatives characterized by IR, NMR and Mass spectral studies.By this studies find the structure-activity relationship and to optimize the structure. The new synthesized quinazolinone derivative i.e., 3-((5-phenyl hyroxyl -1, 3,4-oxadiazol-2-yl) methyl amino)-2-methylquinazolin-4-(3H)-one was confirmed by physicochemical and spectral analysis.

Acknowledgement

I am indebted to my parents for their inspiration and encouragement given to me during this work with deep appreciation for their determination and enthusiasm at each and every front of my life to transform my dreams into reality. I am very thankful and prevail age to my deep sense of gratitude to Abdul Mohammed Bari, M.pharm, Ph.D, Director of Bright laboratories, Hyderabad.

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