IJARSCT
ISSN (Online) 2581-9429
International Journal of Advanced Research in Science, Communication and Technology (IJARSCT)
Volume 12, Issue 4, December 2021
Impact Factor: 5.731

Synthesis, Characterization and Biological Evaluation of 4-(4-Bromo-1-Hydroxy Naphthalen-2-Yl)-6-(4-Methoxy Phenyl)-5,6-Dihydropyrimidine-2(1h)-One

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Abstract: *1-(4- Bromo -1-hydroxynaphthalen-2-yl)-ethan-1-one was prepared by refluxing 4-bromonaphthalen-1-ol with glacial acetic acid in presence of fused $ZnCl_2$. By condensing 1-(4- bromo -1-hydroxynaphthalen-2- yl)-ethan-1-ones with 4- methoxy benzaldehyde, to prepared by 1-(4- bromo -1-hydroxynaphthalen-2-yl)-3-(4-methoxy phenyl)-prop-2-en-1-one were synthesized.1-(4- bromo -1-hydroxynaphthalen-2-yl)-3-(4-methoxy phenyl)-prop-2-en-1-one, urea and concentrated HCl in DMF were added and refluxed. Cool and pour in crushed ice. Treat it with cold NH_4OH solution to obtain titled compounds. The compounds thus synthesized have been characterized by physical and spectral data. All of these titled synthesized compounds have been screened for antimicrobial study and are found to possess excellent antimicrobial activities.*

Keywords: Antimicrobial activities, cold NH_4OH solution, concentrated HCl in DMF.

I. Introduction

Dihydropyrimidin-2(1H)-one are classified as hetero-cyclic compound and containing pyrimidine ring which is containing two nitrogen atoms in the six-member ring. In the field of heterocyclic chemistry dihydropyrimidine-2(1H)-one was synthesized through the one -pot condensation of an aromatic aldehyde and urea in the presence of the basic [1-3].

Dihydropyrimidines are one of the important heterocyclic compounds, which are of interest due to its efficiency towards various pharmacological uses [4].

The synthesis of the dihydropyridine and their derivatives increasing tremendously significant because they generally show diverse medicinal properties [5]. Newly researcher goal dihydropyrimidine derivatives modulated heat shock responses and have neuro protective responses such like that optimized for their ability to modulate cellular stress responses based on favorable toxicological data and Hsp co-inducing activity [6].Many aryls substituted dihydropyrimidine-2-one are found to exhibited biological activities [7]. Many reports exploring in Vivo and in Vitro dihydropymidine-2-one derivatives show variety of pharmacological activities such as active and safe tumor anti-initiating and multi-potent blocking agent [8], anxiolytic [9], antihypertensive agents [10], anticonvulsant [11], anticancer [12], analgesic activities [13], anti-bacterial [14], channel blockers [15], antiHIV [16].

Their efforts are quite significant in literature hence considering the scope of dihydropyridine derivativeswe havesynthesized novel4-(4-bromo-1-hydroxynaphthalen-2-yl)-6-(4-methoxy phenyl)-5,6-dihydropyrimidine-2(1h)-one from 4- bromonaphthalen-1-ol and studied for their biological activities.

II. Materials and Method

Synthesis of 1-(4-Bromo-1-hydroxynaphthalen-2-yl)-ethan-1-one

1-(4-Bromo-1-hydroxynaphthalen-2-yl) ethan-1-one was prepared by modified Nenchis method in which 4-bromo-naphthalen-1-ol was refluxed with glacial acidic acid in presence of fused $ZnCl_2$.

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Synthesis of 1-(4-Bromo-1-hydroxynaphthalen-2-yl)-3-(4-methoxy phenyl)-prop-2-en-1-one.

1-(4-Bromo-1-hydroxynaphthalen-2-yl)-3-(4-methoxy phenyl)-prop-2-en-1-one were synthesized from 1-(4-Bromo-1-hydroxynaphthalen-2-yl) ethan-1-one by condensing it with 4-methoxy Benzaldehydewere added in ethanol solvent and KOH mixture.

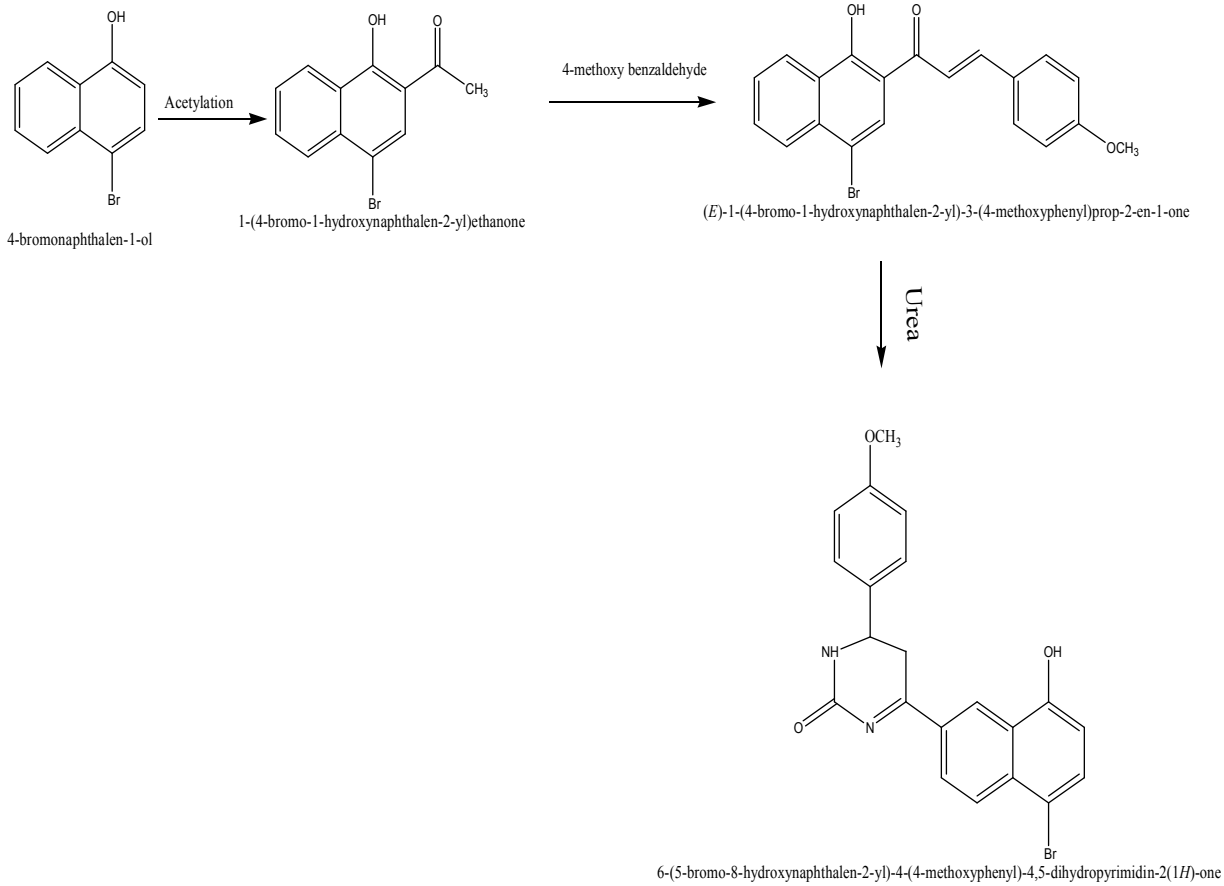
Synthesis of 4-(4-Bromo-1-hydroxy naphthalen-2-yl)-6-(4-methoxy phenyl)-5,6-dihydropyrimidine-2(1H)-one.

4-(4-Bromo-1-hydroxy naphthalen-2-yl)-6-(4-methoxy phenyl)-5,6-dihydropyrimidine-2(1H)-one were prepared from 1-(4-Bromo-1-hydroxynaphthalen-2-yl)-3-(4-methoxy phenyl)-prop-2-en-1-one was reflux with urea and concentrated HCl in DMF. It was then treated with cold NH_4OH.

In present work the compounds under investigation are:

- Compound 1: - 4-(4-Bromo-1-hydroxy naphthalen-2-yl)-6-(4-methoxy phenyl)-5,6-dihydropyrimidine-2(1H)-one.
- Compound 2: - 4-(4-Bromo-1-hydroxy naphthalen-2-yl)-6-(3, 4-Dimethoxy phenyl)-5,6-dihydropyrimidine-2(1H)-one.
- Compound 3: - 4-(4-Bromo-1-hydroxy naphthalen-2-yl)-6-(3-Hydroxy phenyl)-5,6-dihydropyrimidine-2(1H)-one.
- Compound 4: - 4-(4-Bromo-1-hydroxy naphthalen-2-yl)-6-(4-Hydroxy phenyl)-5,6-dihydropyrimidine-2(1H)-one.

Scheme:



4-bromonaphthalen-1-ol

1-(4-bromo-1-hydroxynaphthalen-2-yl)ethanone

(*E*)-1-(4-bromo-1-hydroxynaphthalen-2-yl)-3-(4-methoxyphenyl)prop-2-en-1-one

6-(5-bromo-8-hydroxynaphthalen-2-yl)-4-(4-methoxyphenyl)-4,5-dihydropyrimidin-2(1*H*)-one

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Sr. no	Compound no	R1	R2	Molecular formula	Melting Point 0C	% Yield	% Nitrogen		R.F Value
							Found	Calculated	
1	1	-OCH3	-H	C17H17N2O2Br	259^{0}C	45%	6.65	6.62	0.59
2	2	-OCH3	-OCH3	C17H19N2O4Br	225^{0}C	48%	6.23	6.20	0.67
3	3	-H	-OH	C17H15N2OBr	228^{0}C	45%	6.90	6.85	0.56
4	4	-OH	-H	C17H15N2O2Br	269^{0}C	51%	5.89	5.82	0.55

Table 1: Physical Data of Synthesized Compounds

Spectral Analysis:

IR(vmax) (cm^{-1}): 1625 (C=O, str), 3345 (NH, str), 1569 (C=N),1171(C-O-C),758(monosubstituted Benzene

NMR (δ ppm): 1.3-1.8 (m, 2H, -CH_2 of pyrimidine), 10.31 (s, 1H, -OH),3.62 (s, 3H, -OCH_3),2.53 (s, 3H, CH_3,)

Antimicrobial Studies

All above synthesized 4-(4-Bromo-1-hydroxy naphthalen-2-yl)-6-(4-methoxy phenyl)-5,6-dihydropyrimidine-2(1H)-one have been studied for their antimicrobial activity against Escherichia coli, Proteus mirabilis, Staphylococcus aureus, Pseudomonas aeruginosa. The culture of each species was incubated at 370C and the zone of inhibition was measured after 24 hr. Results are tabulated in Table. Most of these compounds were found active

Sr. no	Compound Number	Antimicrobial Activity			
		E-coli	Proteus mirabilis	Staphylococcus aureus	Pseudomonas aeruginosa
1	1	18	17	16	09
2	2	16	08	17	13
3	3	17	12	13	17
4	4	14	13	10	12

Strongly active, range 15-19 Weakly active, range 7-10 mm, moderately active, range 11-14mm, Inactive, -

III. Conclusion

Thus, from above results it was observed that these heterocyclic compounds were found effective against Escherichia coli, Proteus mirabilis, Staphylococcus aureus, Pseudomonas aeruginosa. So those compounds can be easily be used for the treatment of diseases caused by test pathogens, only when they do not have toxic and other side effects.

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