Research Article

PREPARATION OF 2-AMINO-5-METHYLPHENOL DERIVATIVES DETECTED BY GCMS AND ITS ANTIBACTERIAL ACTIVITY

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ABSTRACT

Various novel 2-amino-5-methylphenol derivatives (E)-2-((9-ethyl-9H-carbazol-3-yl) methyleneamino)-5-methylphenol were Preparation and detected by GCMS via a Nucleophilic substitution reactions of 3-(chloromethyl)-9-ethyl-9H-carbazole in presence of acidic condition and Antibacterial activity of derivatives. Results exhibited that 2-amino-5-methylphenol derivatives contain good antibacterial action. The reaction also proceeds in different media without using acidic condition but the yield is not satisfactorily.

Keywords: 2-amino-5-methylphenol, (E)-2-((9-ethyl-9H-carbazol-3-yl) methyleneamino)-5-methylphenol, Reflux, dilute HCl, 3-(chloromethyl)-9-ethyl-9H-carbazole.

INTRODUCTION

Phonol derivatives which are produced by microorganisms[1,12] and found in insect[8] possess various biological activities such as anti-tumor[2] and anti-microbial activities. [7,9,24] Although biological activity of actinomycin was elucidated, other phenoxyazine derivatives have not been examined well.

A literature search reveals that the Schiff base derived from 2-amino-5-methylphenol has not been reported. The nitrogens in the quinoxaline unit can be an acceptor for hydrogen bonding[25] and may lead to polymeric structures. The electronic environment in the metal complexes of this Schiff base might be different from those derived from salicylaldehyde.

In this article, we describe the studied Various novel 2-amino-5-methylphenol derivatives (E)-2-((9-ethyl-9H-carbazol-3-yl) methyleneamino)-5-methylphenol were Preparation and detected by GCMS via a Nucleophilic substitution reactions of 3-(chloromethyl)-9-ethyl-9H-carbazole in presence of acidic condition and Antibacterial activity of derivatives. Results exhibited that 2-amino-5-methylphenol derivatives contain good antibacterial action.

MATERIALS AND METHODS

Preparation of 2-amino-5-methylphenol derivatives

Experimental Procedure

2-amino-5-methylphenol and 3-(chloromethyl)-9-ethyl-9H-carbazole was refluxed for 5 hr with acidic condition and reaction completed by confirmation from different chemical methods the reaction mixture was filtered, washed with proper solvate and combined filtrate distilled. The residue was extracted with proper solvate and dried over sodium sulphate. The solvent was distilled off to give different mixture of products (E)-2-((9-ethyl-9H-carbazol-3-yl) methyleneamino)-5-methylphenol, 7-methoxybenzofuran-2-carboxylic acid etc one of these (E)-2-((9-ethyl-9H-carbazol-3-yl) methyleneamino)-5-methylphenol derivatives from 2-amino-5-methylphenol detected by GCMS. The reaction also proceeds in different media without using acidic condition but the yield is not satisfactorily.

Identified by Molecular formula $C_{22}H_{20}N_2O$, Exact Mass: 328.16, Mol. Wt.: 328.41, m/e: 328.16 (100.0%), 329.16 (24.1%), 330.16 (3.1%), C, 80.46; H, 6.14; N, 8.53; O, 4.87.

Antibacterial Activity

In the present research work, the antibacterial activity spectrum of 2-amino-5-methylphenol derivatives was analyzed. (Table-1) Two Gram positive bacteria, *Staphylococcus aureus*, and One Gram negative bacteria *Escherichia coli* were used. Inoculum size was adjusted to 1 to 2 × 10^7 CFU (Colony Forming Units)/ml by serial dilution with sterilized nutrient broth media. Nutrient agar (pH 7.2-7.4) was used for routine susceptibility testing of nonfastidious bacteria. Stock solution of 10000µg/ml was prepared in 20 % v/v water in DMSO. Using the stock solution, 6000µg/ml, 4000µg/ml, 2000µg/ml and 1500µg/ml solutions were prepared from which 100 µl solution was taken for assay. Ciprofloxacin was used as a standard. 20 % v/v WFI in DMSO was used as a control. Antibacterial assay was carried out by agar Well Diffusion Method. [1-3] After 16 to 18 hours of incubation, each plate is examined.

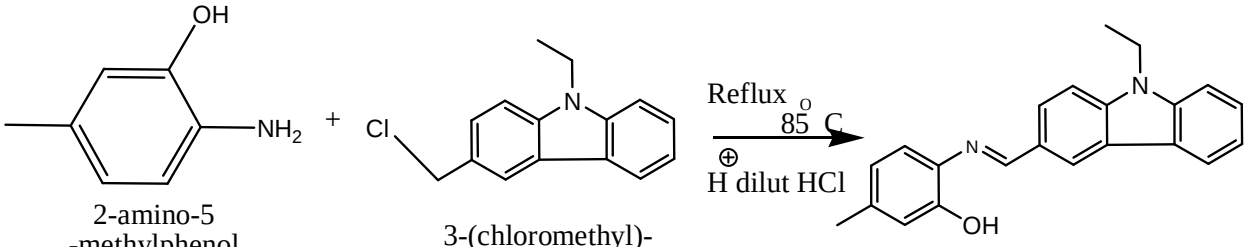
DISCUSSION

Preparation of 2-amino-5-methylphenol derivatives (E)-2-((9-ethyl-9H-carbazol-3-yl) methyleneamino)-5-methylphenol via a Nucleophilic substitution reactions of 3-(chloromethyl)-9-ethyl-9H-carbazole in presence of acidic condition derivatives from 2-amino-5-methylphenol detected by GCMS and Antibacterial activity of derivatives. Results exhibited that 2-amino-5-

methylphenol derivatives contain good antibacterial action. The reaction also proceeds in different media without using acidic condition but the yield is not satisfactorily and identified by Molecular formula $C_{22}H_{20}N_2O$, Exact Mass: 328.16, Mol. Wt.: 328.41, m/e: 328.16 (100.0%), 329.16 (24.1%), 330.16 (3.1%), C, 80.46; H, 6.14; N, 8.53; O, 4.87.

Reaction:

Scheme I (E)-2-((9-ethyl-9H-carbazol-3-yl)methyleneamino)-5-methylphenol derivatives from 2-amino-5-methylphenol



2-amino-5 -methylphenol

3-(chloromethyl)-9-ethyl-9*H*-carbazole

(*E*)-2-((9-ethyl-9*H*-carbazol-3-yl) methyleneamino)-5-methylphenol

RESULTS

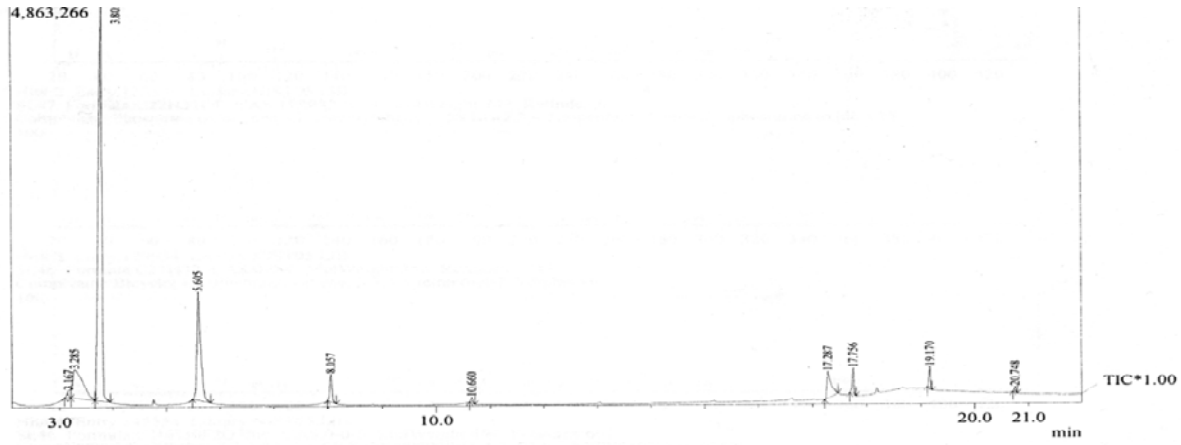
Sample Information

Analyzed by	: Admin
Analyzed	: 14/02/2009 7:49:11 PM
Sample Name	: 14022009 B1
Sample ID	: 14022009 B1
Injection Volume	: 1.000
Data File	: D:\GCMS-QP 2010\Methods\14022009 B1.QGD
Method File	: D:\GCMS-QP 2010\Methods\ORGANIC 14022009.qgm
Tuning File	: D:\GCMS-QP 2010\Tune\17may 2008.qgt

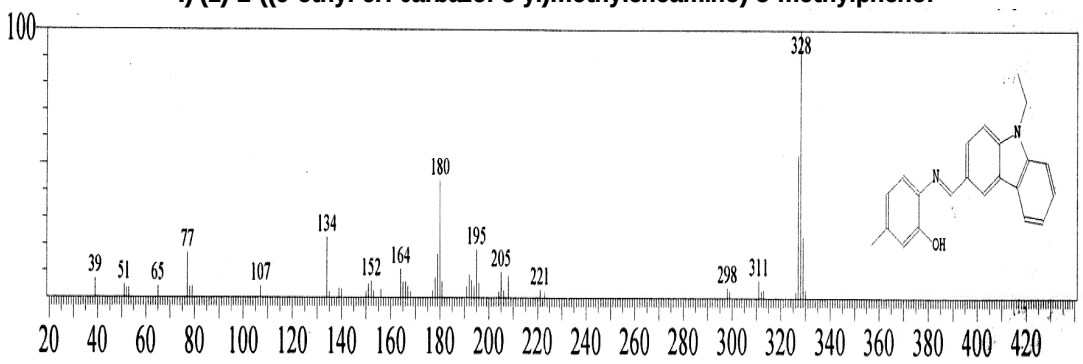
Peak Report TIC

Peak#	R.Time	Area	Area%	Height	Height%	Name
1	3.167	437912	1.17	88717	1.12	
2	3.285	4642009	12.38	345166	4.36	
3	3.805	21788536	58.12	4784405	60.45	
4	5.605	6268465	16.72	1307728	16.52	
5	8.057	1021193	2.72	342767	4.33	
6	10.660	160567	0.43	74065	0.94	
7	17.287	1820133	4.86	319074	4.03	
8	17.756	664478	1.77	316977	4.00	
9	19.170	537209	1.43	261064	3.30	
10	20.748	147843	0.39	75196	0.95	
		37488345	100.00	7915159	100.00	

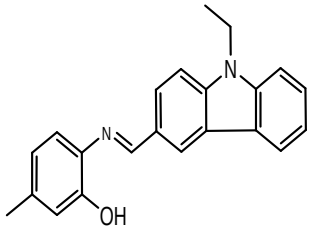
Figure 1: GCMS of 2-amino-5-methylphenol derivatives



I) (E)-2-((9-ethyl-9H-carbazol-3-yl)methyleneamino)-5-methylphenol



GC-MS of (*E*)-2-((9-ethyl-9*H*-carbazol-3-yl)methyleneamino)-5-methylphenol derivative obtained from 2-amino-5-methylphenol



(*E*)-2-((9-ethyl-9*H*-carbazol-3-yl)methyleneamino)-5-methylphenol

$C_{22}H_{20}N_2O$
Exact Mass: 328.16
Mol. Wt.: 328.41
m/e: 328.16 (100.0%), 329.16 (24.1%), 330.16 (3.1%)
C, 80.46; H, 6.14; N, 8.53; O, 4.87

Table I: Zone of inhibition of different concentration of Mix of derivatives by the diffusion method

Bacteria	Inhibition Zone		
	Reference substance	Water extract	
		150 µg/ well	200 µg/ well
E. coli	35.60 ± 0.53	37.10 ± 0.10	38.21 ± 0.10
Staphylococcus aureus	39.10 ±0.95	40.09 ± 0.85	41.18 ±0.59

CONCLUSION

Preparation of 2-amino-5-methylphenol derivatives (E)-2-((9-ethyl-9H-carbazol-3-yl) methyleneamino)-5-methylphenol via a Nucleophilic substitution reactions of 3-(chloromethyl)-9-ethyl-9H-carbazole in presence of acidic condition and the reaction also proceeds in different media without using acidic condition but the yield is not satisfactorily were detected by GCMS and Antibacterial activity of derivatives. Results exhibited that 2-amino-5-methylphenol derivatives contain good antibacterial action.

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