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Short Communication

Synthesis and Biological activity for 4-Methoxyphenyl (pyrazin-2-yl) Methanone and its detection by GC-MS Techniques

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Abstract

The synthesis of 4-methoxyphenyl (pyrazin-2-yl) methanone and its detection by GC-MS technique by p-methoxybenzaldehyde reacted with pyrazin-2-yl in the presence of suitable solvent in different condition to form p-methoxybenzaldehyde. The structure detected with GC-MS and the compound identified with T.L.C. technique and then examined for antibacterial activity.

Key words: 4-methoxyphenyl (pyrazin-2-yl), GC-MS, antibacterial activity, p-methoxybenzaldehyde derivatives.

Introduction

The microorganisms can produce the phenol derivatives and may find in insects, have various biological activities such as anti-microbial and anti-tumor[4] activities[1,2,3,4,5,6]. Although biological activity of actinomycin elucidated, other phenoxyazine derivatives have not been examined well.

The literature search reveals that the Schiff base derived from 4-methoxyphenyl (pyrazin-2-yl) methanone l has not been reported. The nitrogen of the quinoxaline unit, an acceptor for hydrogen bonding and may lead to polymeric structures[7]. The electronic environment in the metal complexes of this Schiff base from those derived from salicylaldehyde might different. In this article, we describe the studied various novel p-methoxybenzaldehyde derivatives 4-methoxyphenyl (pyrazin-2-yl) methanone were preparation and detected by GC-MS and the antibacterial activity of derivatives.

Material and Methods

Preparation of 4-methoxyphenyl (pyrazin-2-yl) methanone: The 2.7 gm of p-methoxybenzaldehyde dissolved in 20 ml solvent and the 1.4 gm of pyrazin-2-yl dissolved in 20 ml solvent and then add 0.5 gm sodium acetate and let it be dissolved completely. The p-methoxybenzaldehyde mixture is added drop by drop with continuous stirring. This mixture is reflux for one hour at 90^0C temperature with continuous stirring. After an hour, stop heating and cool the mixture at room temp and now it's ready for further analysis. The mixture filtration is done with separation of the solvent by simple distillation methods.

Study of Antibacterial Activity: In the present research work the analysis done for the antibacterial activity spectrum of p-methoxybenzaldehyde derivates. The Gram-positive bacteria, *Staphylococcus aureus* and Gram-negative bacteria *Escherichia coli are* used for this study. The inoculums size adjusted to 1 to 2 × 10^7 CFU (colony forming units)/ml by serial dilution with sterilized nutrient broth media. The nutrient agar (pH 7.2-7.4) used for routine susceptibility and testing of nonfastidious bacteria. The stock solution 10000 µg/ml is prepared in 20% v/v water in DMSO. By using the stock solution, 6000 µg/ml, 4000 µg/ml, 2000 µg/ml and 1500 µg/ml solution preparation done and out of which 100 µl solution taken for assay[8]. The Ciprofloxacin used as a standard. The 20% v/v WFI in DMSO used as a control. The antibacterial assay carried out by agar well diffusion method[9,10]. After 16 to 18 hours period of incubation, examination of each plate was done.

Results and Discussion

The results of preliminary evaluation showed that the antibacterial activity of the derivatives from p-methoxybenzaldehyde evaluated at two different concentrations by the diffusion method. The derivatives from p-methoxybenzaldehyde show the antibacterial activity at varied levels in the *E. coli and S. aureus*. The *S. Aureus* was found less active in inhibition zone. The antibacterial activity of derivatives from p-methoxybenzaldehyde has seen and its detection with suitable solvent in different condition p-methoxybenzaldehyde which reacted with pyrazin-2-yl to form p-methoxybenzaldehyde done by GC-MS. The structures detected with GC-MS and compounds checked with TLC technique and detection for antibacterial activity.

Conclusion

In presence of p-methoxybenzaldehyde, synthesis of 4-methoxyphenyl (pyrazin-2-yl) methanone of 3-(chloromethyl) -9-ethyl-9H-carbazole done with suitable solvent in different conditions and the reaction also proceeds in different media without using acidic condition

but the yield is not satisfactorily detected by GC-MS and antibacterial activity of derivatives. The results exhibited in the table 1 show that a 4-methoxyphenyl (pyrazin-2-yl) methanone derivative has good antibacterial action.

Table-1
Antibacterial activity of 4-methoxyphenyl (pyrazin-2-yl) methanone by agar well diffusion method

Microorganism	Inhibition Zone (mm) 4-methoxyphenyl (pyrazin-2-yl) methanone
Staphylococcus aureus	32 mm
Escherichia coli	29 mm

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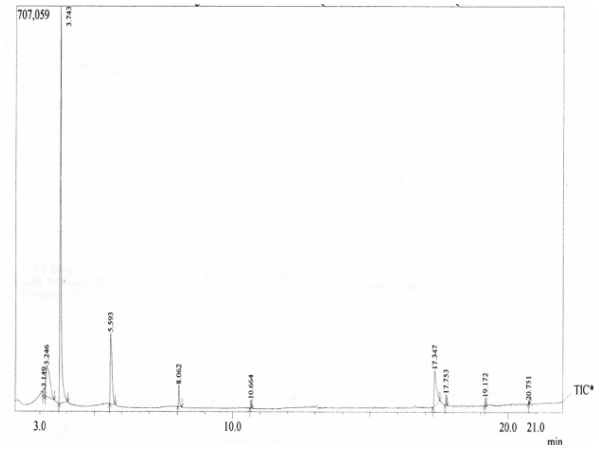


Figure-1
GC-MS of 2-amino-5-methylphenol derivatives

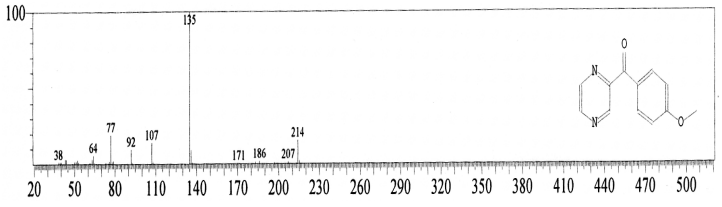
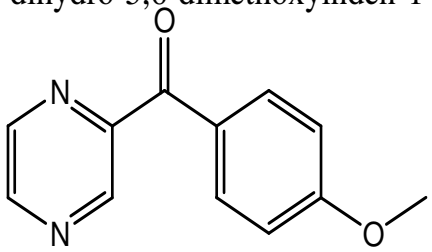


Figure-2
4-methoxyphenyl (pyrazin-2-yl) methanone

GC-MS of 4-methoxyphenyl(pyrazin-2-yl)methanone derivative obtained from 2,3-dihydro-5,6-dimethoxyinden-1-one.



4-methoxyphenyl(pyrazin-2-yl)methanone

$C_{12}H_{10}N_2O_2$
Exact Mass: 214.07
Mol. Wt.: 214.22
m/e:
C, 67.28; H, 4.71; N, 13.08; O, 14.94

Scheme- I
4-methoxyphenyl (pyrazin-2-yl) methanone derivatives from p-methoxybenzaldehyde