

NOTE

Synthesis and Antimicrobial Activity of Some α : β -Unsaturated Aromatic Ketones

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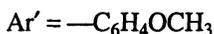
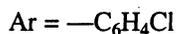
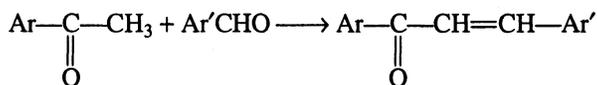
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Some α : β -unsaturated aromatic ketones were synthesised from *p*-chloro, *p*-nitro and *p*-methoxy acetophenones and screened for their antimicrobial activity against *Escherichia coli*, *Bacillus subtilis*, *Colletotrichum capsici* and *Candida albicans*.

Key Words: Synthesis, α : β -Unsaturated aromatic ketones, Antimicrobial activity,

Commonly α : β -unsaturated aromatic ketone is known as chalcone. Chalcone are very reactive compounds and owe their reactivity to ketoenolic (O=C—C=C) type of conjugated double bond system present in the molecule. They undergo a variety of chemical reactions and useful in the synthesis of several heterocyclic compounds such as flavones, flavanones, flavanols etc. Some chalcones are found to exist free in nature, *i.e.*, butein, hyssopin etc. Harborne reported 58 naturally occurring chalcone aglycones. Chalcones are also useful in deciding the structure of many naturally occurring pigments¹, *e.g.*, fistein, hemlock and tannin. They are also used as intermediates for the preparation of substances having therapeutic value.

Generally chalcone is synthesiZed by Claisen-Schmidt condensation reaction:



A solution of NaOH (2.2g) in water (20 mL) and rectified spirit (15 mL) is cooled in a conical flask kept in an ice bath. To the Cooled solution substituted

acetophenone (0.043 mol) is added followed by the addition of aromatic substituted aldehyde (0.043 mol). The reaction mixture is constantly stirred at 25°C for 2–3 h till the mixture becomes viscous and more stirring is effective. The mixture is kept overnight in refrigerator. The separated product is filtered under suction and washed well with cold water. The chalcones prepared were recorded in Table-1 showing the yield obtained in each case along with their melting points.

TABLE-1

Compd.	Chalcones	m.f.	Yield (%)	m.p. (°C)
1	1-(4''-methoxyphenyl)-3-(4'-chlorophenyl)-1-propene-3-one	C ₁₆ H ₁₃ O ₂ Cl	72	87
2	1-Furyl-3-(4'-methoxyphenyl)-1-propene-3-one	C ₁₄ H ₁₂ O ₃	90	79
3	1-Furyl-3-(4'-chlorophenyl)-1-propene-3-one	C ₁₃ H ₉ O ₂ Cl	76	102
4	1-phenyl-3-(4'-nitrophenyl)-1-propene-3-one	C ₁₅ H ₁₁ NO ₃	82	94
5	1-furyl-3-(4'-nitrophenyl)-1-propene-3-one	C ₁₃ H ₉ NO ₄	94	98
6	1-(phenyl)-3-(4'-chlorophenyl)-1-propene-3-one	C ₁₅ H ₁₁ OCl	97	127
7	1-(phenyl)-5-(4'-chlorophenyl)-1,3-pentadien-5-one	C ₁₇ H ₁₃ OCl	73	100
8	1-(phenyl)-5-(4'-nitrophenyl)-1,3-pentadien-5-one	C ₁₇ H ₁₃ NO ₃	88	107
9	1-(4''-methoxy phenyl)-3-(4'-nitrophenyl)-1-propene-3-one	C ₁₆ H ₁₃ NO ₄	89	118

The structure of chalcones was confirmed by their elements analysis and IR spectra. IR (cm⁻¹) (KBr): ν (C—H) (bending) 71, ν (C—O) (stretching) 1380, ν (C—H) (bending) 1460, α - β unsaturated cyclic 1600 cm⁻¹, ν (C=O) (stretching) 1720, ν (C—H) (stretching) 2850, 2975.

The activity was determined by using filter paper disc diffusion plate method and measuring the inhibition zone in mm. All the compounds (1–9) were screened *in vitro* for their antimicrobial activity against bacteria, and their bacterial and fungal details have been cited in Table-2.

TABLE-2
COMPARABLE ANTIMICROBIAL ACTIVITY OF (1-9) WITH KNOWN
CHOSEN STANDARD DRUGS

Standard drugs	Compd.	Antibacterial activity		Antifungal activity	
		<i>E. coli</i>	<i>B. subtilis</i>	<i>C. capsici</i>	<i>C. albicans</i>
	1	(18)	(17)	(15)	(21)
	2	(20)	(19)	(16)	(18)
	3	(17)	(16)	(18)	(19)
	4	(20)	(22)	(20)	(21)
	5	(16)	(18)	(18)	(15)
	6	(22)	(16)	(19)	(20)
	7	(17)	(18)	(16)	(19)
	8	(16)	(19)	(21)	(19)
	9	(20)	(17)	(18)	(20)
Norfloxacin		27	25	20	25
Ampicillin		22	23	24	18
Chloronphenicol		20	27	20	20

REFERENCES

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