Synthesis of some new antimicrobial imidazole derivatives

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Abstract: Recently, in number of studies about imidazole nucleosides have been published like 2'deoxy-4'thioimidazole nucleosides etc. These limited studies concerning the heterocyclic nucleosides make further research in this area. In this study, we have synthesized number of imidazole's derivatives containing carbohydrate moieties.

Introduction: The heterocyclic compounds particularly those incorporating nitrogen in the ring, are very widely distributed in nature as protein, nucleic acid, alkaloids, vitamins etc.

There are several methods reported for synthesis of imidazole derivatives such as hetero-cope rearrangement.

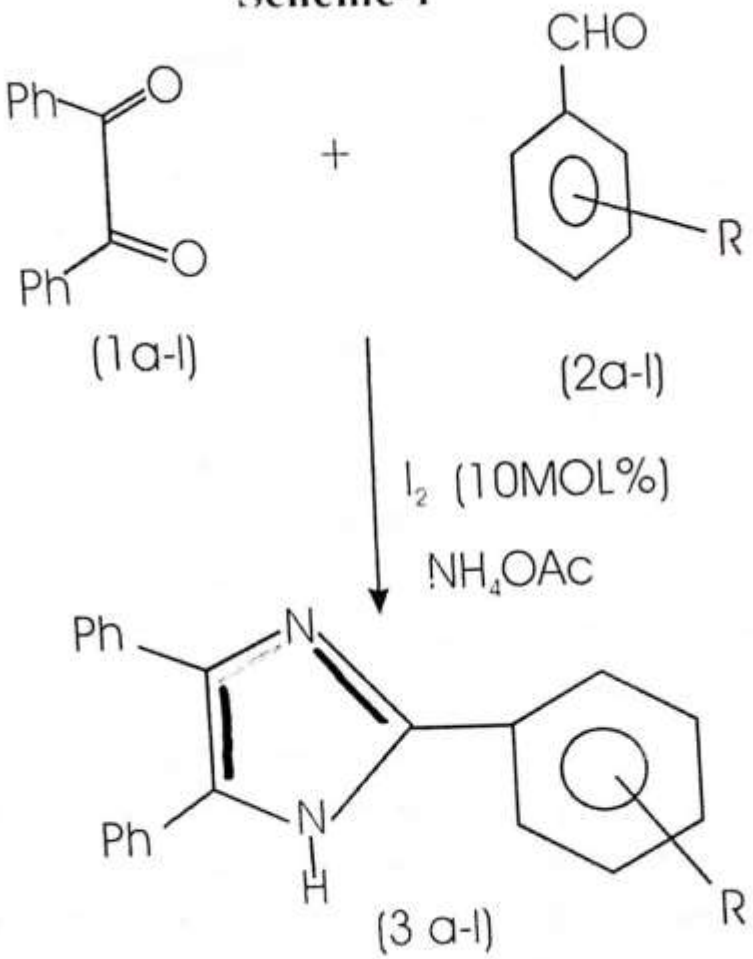
Compounds with imidazole ring system have many pharmacological properties and play important roles in bio chemical processes. Many of the substituted imidazole are known as inhibitor of fungi acids and herbicides.

Experiment, Result and Discussion…….

2,4,5 trisubstituted imidazole derivatives:

2,4,5 triphenyl-1-H-imidazole: these were prepared by mixing 1,2 diketone with benzaldehyde and ammonium acetate (2.5 m mol) in presence of a catalytic amount of iodine (15 mol%) where ground together in mortar with a pestle room temperature for about 60 minutes. After completion of reaction confirmed by TLC and purified by column chromatography. 2,4,5 triphenyl substituted imidazole derivative where obtained in excellent yield.

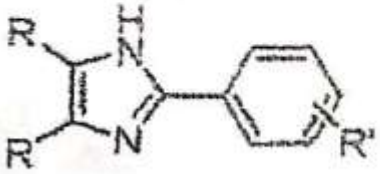
Scheme-1



Ph=	**R=**
a- Phenyl, b- Phenyl, c- Phenyl,	a- H, b- p-OMe, c- m-OMe
d- Phenyl, e- Phenyl, f- Phenyl,	d-p-Br,e-p-Cl, f-p-NH_2
g-Furyl, h-Furyl, i-Furyl,	g-H h-p-OMe i-m-OMe
j-Furyl, k-Furyl, l-Furyl	j-p-Br, k-p-Cl l-p-NH_2

The Lewis acidic nature of molecular iodine makes it capable of binding with the carbonyl oxygen of aromatic aldehyde increasing the reactivity of the parent carbonyl compound.

Table – 1 : **Synthesis of 2,4,5-trisubstituied Imidazoles using (15 mol%) Molecular Iodine.**

Entry	 3		Time (min.)	Yield[a] (%)
	R	R′		
3a	Ph	H	10	90
3b	Ph	p-OMe	15	85
3c	Ph	m-OMe, p-OH	15	87
3d	Toluene	H	10	82
3e	Toluene	p-OMe	14	85
3f	Toluene	p-Br	18	90
3g	Toluene	m-OH	20	83
3h	Furan	H	10	90
3i	Furan	p-OMe	12	90

[a]Isolated yield after column chromatography

2-(4-Methoxy-phenyl)-4,5-diphenyl-D-glucopyranosylimidazole (4b).

IR(KBr^{cm-1}) 3428, 2893, 2465, 1636, 1216. ^{1}H- NMR (CDCl$_3$ / DMSO-d$_6$): dH 3.85 (s, 3H), 12.52(1H, brs), 8.02-8.05 (2H, d), 7.25-7.59 (14H, m, Ar-H), 6.93-6.96 (2H, d),5.25(bs, 3H, OCH$_3$) 3.85 (3H, s). ^{13}C NMR(CDCl3/ DMSO-d6): dC 159.1, 145.7, 132.8, 127.6, 126.5, 126.3, 122.7, 113.2, 54.6.

2-(3-Methoxy-phenyl)-4,5-diphenyl-D-glucopyranosylimidazole (4c).

IR(KBr^{cm-1})3611, 3412, 2923, 1652, 1253,; 1H NMR (CDCl3/ DMSO-d6): d 3.86 (s, 3H), 6.82-6.85 (m, 3H),7.29-7.32 (m, 5H), 7.53-7.55 (m, 5H), 12.5 (brs, 1H); 5.25(bs, 3H, OCH$_3$) 13C NMR (CDCl3/ DMSO-d6) d 126.3,126.7, 127.3, 127.4, 129.8, 147.3, 146.1, 145.3, 129.8, 127.4,, 127.3,, 126.7, 126.3,, 117.1,,155.6,, 112.1, 110.9,, 54.7

2-(4-bromo-phenyl)-4,5-diphenyl-D-glucopyranosylimidazole (4d).

IR(KBr^{cm-1}) 3432, 2998,2465, 1638, 1216, ; 1H NMR (CDCl3/ DMSO-d6) d 2.36 (s, 6H), 7.14-7.18 (m, 8H), 7.34-7.39(m, 5H), 12.58 (brs, 1H); 13C NMR (CDCl3/ DMSO-d6) d 135.1. 128.3, 129.2, 129.1, 127.7,127.5, 127.1, 126.6, 124.1, 19.7,

2-(4-chloro-phenyl)-4,5-diphenyl-D-glucopyranosylimidazole (4e).

IR(KBr^{cm-1}),3430, 2988, 2475,1638, 1216,; 1H NMR (CDCl3/ DMSO-d6) d 2.37 (s, 6H), 3.86 (s, 3H), 6.94-6.96 (d, 2H), 7.13-7.15 (m, 4H), 7.46-7.48 (m, 4H), 8.03-8.05 (d, 2H), 12.59 (brs, 1H).

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