Synthesis and Evaluation of different 3-substituted chalcone with Screen their biological properties

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Abstract:

Within the realm of medicinal chemistry, synthesis plays a pivotal role in any drugs research and development endeavor. Diabetes Mellitus is associated with impaired glucose metabolism that leads to increases blood gl ucose level and free radicals production. Unfortunately none of the present drug in management of metabolic disorder is unimpeachable. Metaformin increases the risk of lactic acidosis, Sulphonylureas result in hypoglycemia and Acarbose increases flatulence and bloating. A new series of chalcone was prepared. The reaction of substituted benzaldehyde with different acetophenone and alcoholic KOH. The purity of new compound was cheak by TLC and their structure confirmed by IR and H^1NMR.The target compound evaluated for their biological properties.

Keywords: Antidiabetic activity, chalcone, diabetes mellitus.

Introduction

Sulphur/Nitrogen containing heterocycles play's pivotal role in nature in and they are well explored as clinical agents. Recently more attention has been directed on the synthesis of five/six membered heterocycles bearing sulphuryl urea and heterylpharmacophoresand their biological evaluation. Chalcones are included dimer, oligomer, Diels-Alder adducts and different conjugates. At the same time because of being precursors of all of other flavonoid groups, chalcones are very important biosynthetic compounds and found in fruits and vegetables, that attracted attention because of their pharmacological activities such as antibacterial[1-4], Anti-inflammatory[5-10], Antiviral[11-15], Antineoplastic[16-23], Antifungal[24-27], Antioxidant [28-35]. Aurone derivatives situates in flavonoids by having benzofuranone structure [36-38].

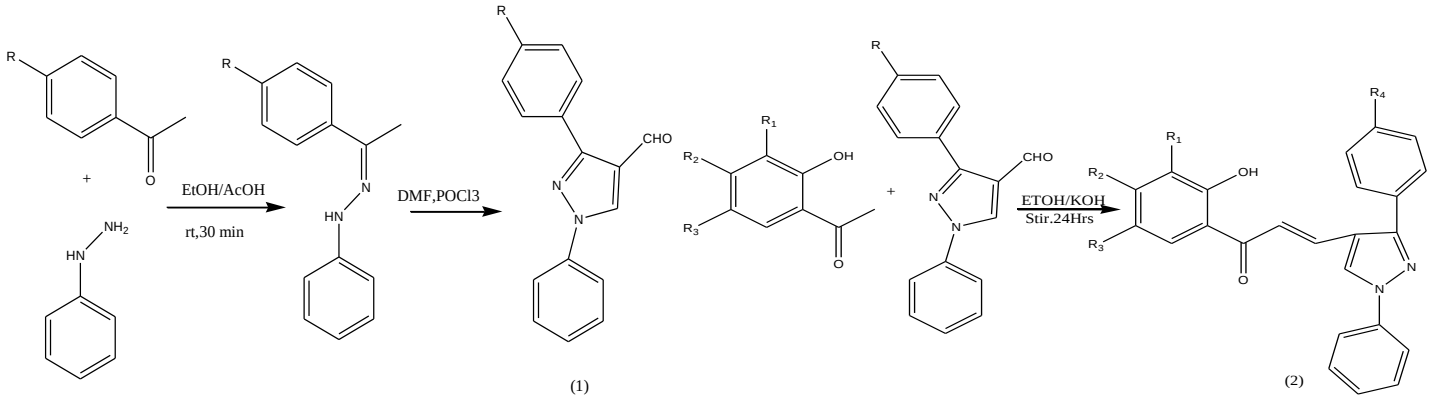
Experimental

General procedure for synthesis of compound: 1

In RBF 1.62 Moles DMF was taken cooled at 0^0C. Then (0.27Eq.) $POCl_3$ was added drop wise and mixture stirred for 10-15 min until pink colour appeared. In this cooled formulating agent hydrazine was added drop wise by dissolving in minimum quantity of DMF and reaction mixture stirred for 15-18 hrs at RT. After compilation of reaction the reaction mixture was poured on crushed ice solid filtered and recrystalised by proper solvent (Table -1).

General procedure for synthesis of compound: 2

KOH (2.9 Eq.) were added to the suspension of Acetophenon (1.07 Eq.) and appropriate aldehyde (1.05 Eq.) in ethyl alcohol. This reaction and mixture stirred at 50^0C for three hours After compilation of reaction the reaction mixture was poured in water and acidified with HCL solid filtered and recrystalised by proper solvent (Table -2).



(Table -1)

Compound No.	R	M.P.	% Yield
1a	H	146	78
1b	CH_3	190	81
1c	NO_2	158	72

(Table -2)

Compound No.	R_1	R_2	R_3	R_4	M.P.	% Yield
2a	H	H	CH_3	NO_2	160	78
2b	H	H	Cl	H	229	81
2c	Cl	H	Cl	H	174	85
2d	CH_3	H	CH_3	NO_2	230	88

Result and Discussion:

UV spectra of chalcones :

The major absorption band in chalcones usually occurs in the range 340-390 nm, chalcones containing a free 4"-hydroxyl group, the addition of NaOMe causes a 60-100 nm bathochromic shift of Band I with an increase in peak intensity. Chalcones without a 4"-hydroxyl group but with either a free 2" or 4'- hydroxyl group also give, in the presence of NaOMe, a 60-100 nm bathochromic shift of Band I but without an increase in peak intensity

IR spectra of Chalcones :

chalcone having α, β-unsaturated carbonyl group, characteristic usually appear as a prominent band of IR 1645 i.e. in between 1625-1650 cm-1. And C=C at 1505 cm-1 Other region of IR absorption bands appear depends on the type of aromatic hetero rings as well as the substituents present on these rings.

NMR spectra of Chalcones :

The H-α and H-β protons of chalcones occur as two doublets (J= 17 Hz) in the ranges 6.7 - 7.4 ppm (H- α) and 7.3 -7.7 ppm (H- β) in the 1H NMR spectra .The other aromatic protons usually appear in between δ 6.9-8.0, depending on the type of hetero aromatic ring and also based on the electronic effects of the substituents present on these rings. The large J value (17 Hz) clearly reveals the *trans* geometry at the double bond. The carbonyl carbon of the chalcones usually appears between δ 188.6 and 194.6 in its 13C NMR spectrum The α and β- carbon atoms with respect to the carbonyl group give rise to characteristic signals in between δ 116.1-128.1 and δ 136.9-145.4 respectively, which can also be readily identified by their characteristic appearance as a six-line multiplet in the half resonance decoupled [(39)].

Biological importance:

Devaux, Nuhrich and Dargelos synthesized some nitrofurylchalcones and tested for their antibacterial activity. The Chalcones most efficient was, which inhibited *Staphylococcus landon* at concentration 1 µg. Male albino 20 g were used in the study.±SD rats weighing 140 Streptozotocin (STZ; Sigma, USA) was dissolved in 100 mM citrate buffer (pH 4.5) and a calculated amount of fresh solution of STZ was injected to overnight fasted rats at 45 mg/kg intraperitoneally. FBG level of each animal was checked 48 h later using the glucometer. Animals showing blood glucose levels between 8.0 and 12 mM were finally included in the

experiments and named as STZ-induced diabetic animals. [40]. Saxena and co-workers grafted chalcone derivatives on estradiol framework some of which showed potent anticancer activity against some human cancer cell lines [41].The Liquorice extracts contains a chalcone, viz. Isoliquritigenin, which is currently in use as a phosphodiesterase III inhibitor for the treatment of cardiovascular diseases [42]. The fluorinated chalcones tested by Nakamura *et al*. showed 5-lipoxygenase inhibition on rat basophilic leukemia-1 (RBL-1) cells and inhibitory action on Fe3+-ADP induced NADPH-dependent lipid peroxidation in rat liver Microsomes [43].The presence of α,β-unsaturated carbonyl system of chalcone makes it biologically active. They have shown antibacterial activity against *S. aureus,E. coli, C. albicans, T. utilis, S. sake, W. anomala*and some other organisms [44].Future perspectives: Synthesis of Chromones by using different Chalcone, Complete characterization of synthesized Compounds, Optimization of synthesis by all aspects.

Author are great thankful to Dr. C H Gill, Dr. Dipak Nagargoje and Anant Gavalkar

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