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Antimicrobial Activities of Some Chromone Derivatives.

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Abstract:present investigations are aimed around the synthesis of chromone derivatives with utilization of aldehyde group to liberated a Schiff bases in high yield, which provides a significant antibacterial activity against *Bacillus subtilius*.

Keywords: Chromone, Anti-bacterial, *Bacillus subtilius*, Zinc perchlorate

Introduction:

Benzopyrans are the polycyclic organic compound synthesized by the fusion of two cyclic rings as benzo and pyran together, a structural variation in the positioning of the oxygen atom in the pyran ring leads to the formation of two different isomers of benzopyarans which have distinguishable properties form one another. [1-3] among the many naturally occurring flavone derivatives, chromones is a class of compounds which contains a benzopyran nucleus having presence of keto group at γ-position.

These chrome derivatives possess some of the important characteristic properties as antioxidants [4], adenosine receptor antagonists [5],antimalarial [6], anti-funga [7], antiviral [8], antigiardial [9], cytotoxic [10], neuroprotective [11].

Some of the important chromone derivatives used for can be classified as sakuranetin **1**, maringenin **2** and hesperetin **3**.

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Recently some of the chromone derivatives as bridge structures have been reported to possess some of the significant properties which ranges from the physic chemical measurements to biological activities with significant contribution of chromone ring nucleus.

These bisbenzopyrans have been reported to join through 3, 3' linkage leading to the generation of molecular species which act as non-peptide HIV-I protease inhibitors (**4**) [12]. Similarly bichromophoric molecules having carbonyl group present in conjugation with double bond show a good photochemical activities where presence of carbonyl group is an essential feature for the activity which may be identified as sodium comoglycate (**5**) used for the treatment of allergic asthma and allergic conjunctivitis.

Some other bischromone used for the biological activities with bridge structures include combination of chromone nucleus to exhibit antiallergic properties along with their utilization in identification of functioning of immune system in human body. [13-14]

Experimental:

General procedure for synthesis:

To a stirred solution of respective 3-formylchromone (2.0eq) in dry methanol was added thiosemicarbazide (1.2eq) in the presence of $Zn(ClO_4)_2$ as a catalyst. The solution was continuously stirred at room temperature and progress of reaction was monitored using TLC. After the completion of reaction the residual solvent was evaporated under reduced pressure to afford solid product which was triturated with diethyl ether to afford the pure product in quantitative yields.

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Entry	R	Reaction time (hr)	Yield %
8a	H	2.5	85
8b	CH_3	3.0	70
8c	F	2	65
8d	Cl	2	78
8e	Br	2	75

Antibacterial Activity

To study the antibacterial activity of theses synthesized compounds, the purified products were used, the solution of respective compounds were prepared by dissolving in DMSO and further dilutions of required concentration were prepared by addition of DMSO to stock solution which resulted in the preparation of 10ppm, 50 ppm and 100ppm concentration.Compounds **8 a-e** were used to check the antibacterial activity against *Bacillus subtilius* and *Streptococcus aureus*. In order to check the antibacterial activity of these compounds solutions of respective concentration were introduced by the disc diffusion method under sterile conditions and activity of each of the compound was estimated by the measurement of zone of inhibition measured as an average value of all the diameters.

These compounds show significant antibacterial activities, these compound exhibit a moderate activity at a concentration of 50ppm and further increasing the concentration to 100ppm these compound exhibit a significant activity against bacterial cell growth. Result of antibacterial against *Bacillus subtilius*are summarized in Table 1,and Figure 1.

Zone of inhibition (Cm)			
Entry	**10ppm**	**50ppm**	**100ppm**
8a	0.5	0.8	1.0
8b	0.5	0.7	0.9
8c	0.5	0.7	0.9
8d	0.8	1.0	1.2
8e	0.5	0.8	1.0

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Table-1: Antibacterial activity of compounds **8 a-e** against *Bacillus subtilius* measured as zone of inhibition

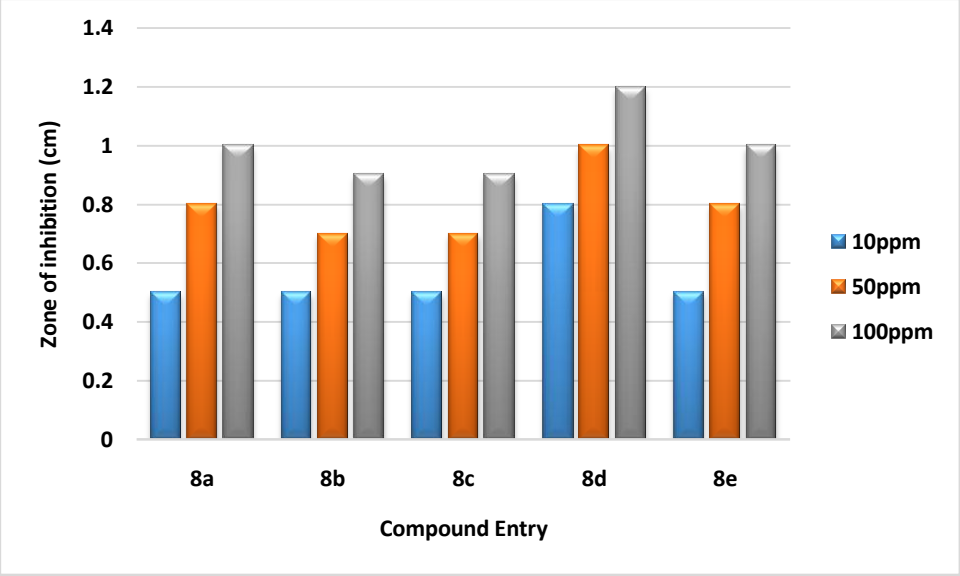

Fig-1: A comparative analysis for the antibacterial activity of compounds **8 a-e** measured against *Bacillus subtilius* measured as zone of inhibition

Conclusion:

Investigations provides an access for the synthesis of compounds in high yield purity, Compound so obtained have been investigated for their antibacterial activity against *Bacillus subtilius*. Study provides some basic leads for the synthesis of new chromone based hydrazones which can be further developed to get better results as antimicrobials.

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