ABSTRACT

The work presented in the Thesis entitled “Studies on chalcone based novel heterocyclic compounds and their antimicrobial activity” can be abstracted as below.

A heterocyclic compound is one which possesses a erity structure with at least two different kinds of atoms in the ring. The most common types contain largely carbon atoms. Nitrogen, oxygen and sulphur are the most common heteroatoms, but many other elements, including even bromine, can also serve.

The variety of heterocyclic compounds is enormous, their chemistry is complex and synthesizing them requires great skill. Among large number of heterocycles found in nature, nitrogen hetero cycles are the most abundant than those containing oxygen or sulfur owing to their wide distribution in nucleic acid instance and involvement in almost every physiological process of plants and animals.

Taking in view of the applicability of heterocyclic compounds, we have undertaken the preparation of different types of five and six membered heterocycles have been designed, generated and characterized using spectral studies. The placement of a wide variety of substituents of these nuclei have been designed in order to evaluate the synthesized products for their pharmacological profile against several strains of bacteria and fungi.

The entire thesis (both synthesis and application) is divided into four chapters.

Chapter 1 briefly introduces importance of chalcones, pyrazolines and pyrimidine heterocycles in drug discovery as well as concept of “privileged structures”.

Chapter 2 deals with the review of literature of the proposed heterocyclic derivatives and also describe biological importance of chalcones, pyrazolines and pyrimidine heterocycles.

Chapter 3 is divided in to three sections.

In section 1, synthesis of novel chalcone derivatives are reported, which draw a special attention for their wide spectrum biological activities along with their importance and utility as intermediates in preparing variety of heterocyclic compounds. The synthesis was achieved by the condensation of an aromatic aldehydes with corresponding acetophenone in basic medium.

In section 2, different types of pyrazoline derivatives were synthesized and brief review of the reported synthetic strategies for the synthesis of pyrazoline derivatives.
Section 3 includes synthesis of novel pyrimidines. Pyrimidines have aroused increasing from the standpoint of biological activity, due to their diverse pharmacological activities. It includes synthesis of various pyrimidine derivatives by the reaction of chalcones with urea and substituted thiourea in ethanol as solvent.

Chapter - 4 describes biological results and discussion. Synthesized compounds were evaluated for better drug potential against different panels of bacterial spices and their antimicrobial activities were compared with standard drugs.

All the synthesized compounds were characterized by spectral studies and elemental analyses.