

# ABSTRACT

Synthesis of heterocyclic compounds is an important part of the synthetic organic chemistry that constitutes a considerable part of the modern researches that are occurring presently throughout the world. Heterocycles also play an important role in the design and discovery of new physiologically and pharmacologically active compounds. The five membered heterocyclics bearing two and three hetero atoms (O, N & S) are found to be highly significant due to their immense biological applications. Thus, in this thesis the investigations have been focused upon the syntheses of new bithiadiazolines, bithiazolidinones, bispyrazolines and bischromones. Chapter-I contains many observations from the literature regarding the various types of heterocyclic compounds. Major emphasis has been laid down upon the synthesis and pharmaceutical significance of the five and six membered heterocyclic products. Chapter-II has been divided into three parts IIa, IIb and IIc which describe the synthesis of bithiadiazolines and bithiazolidinones. Here the bithiosemicarbazones built around the alkyl chains of varying lengths undergo cyclization reactions with acetic anhydride and ethyl bromoacetate. Chapter-III which is also subdivided into three parts IIIa, IIIb and IIIc contains the chemical transformation of various bischalcones to yield bispyrazolines built around the varying length aliphatic chains. In chapter IIIa, 1,3,5-triphenyl-bispyrazolines linked via 3-aryl ring have been synthesized while the chapter IIIb describes the synthesis of 1,3-diphenyl-5-thienyl bispyrazolines. The chapter IIIc deals with the synthesis of 1,3,5-triphenyl-bispyrazolines linked via 5-aryl ring. The last chapter IV describes the synthesis of bischromones linked via 2-aryl ring with the varying length alkyl chains. These bisheterocyclics has been prepared from the cyclization reactions of bischalcones with iodine in the presence of DMSO. The structures of the prepared compounds (intermediates & symmetrical bisheterocyclics) are characterized from the rigorous analysis of their various spectroscopic parameters. The antibacterial and antifungal examinations of the prepared compounds have also been carried out to investigate their antimicrobial properties.