ABSTRACT

The thesis entitled “Synthesis, Characterization and Pharmacological Evaluation of some Oxadiazole, Pyridine, Pyrimidine and Pyrazoline Derivatives” is divided into six chapters. The title of the thesis clearly reflects the objective, which is to synthesize, characterize and biological evaluation of Oxadiazole, Pyridine, Pyrimidine and Pyrazoline derivatives.

Chapter 1: Describes the general introduction of amides with heterocyclic ring system and their biological importance, synthetic procedure developed in earlier works and their pharmacological applications.

Chapter 2: Deals with the synthesis of novel substituted (4-{5-[3-(trifluoromethoxy)phenyl]-1,2,4-oxadiazol-3-yl}piperazin-1-yl)methanones. The scaffold 1,2,4-oxadiazole ring formed by the condensation reaction between tert-butyl-4-(N-hydroxycarbamimidoyl)piperazinecarboxylate and 3-trifluoromethoxybenzoic acid. Structures of the newly synthesized compounds were characterized by IR, $^1$H NMR, $^{13}$C NMR, LC-MS, HPLC spectra and CHNS elemental analysis. Structures of two intermediates were established by X-ray crystallographic study.

Chapter 3: Reveals that the strategic synthesis of novel (6-(4-chloro-2-(trifluoromethyl)phenyl)-2-methylpyrimidin-4-yl)(4-(substituted)piperazin-1-yl)methanones . Here key intermediate was prepared via Suzuki coupling and reactions were carried out under conventional method. Structures of the newly synthesized compounds were characterized by IR, $^1$H NMR, $^{13}$C NMR, LC-MS, HPLC spectra and CHNS elemental analysis.

Chapter 4: Deals about the synthesis of novel Pyrazoline derivatives containing piperazine and pyridine nucleus. In this chapter, we synthesized ten amides of pyrazolines containing flurobenzene and five amides of pyrazolines containing pyridine ring by two schemes and structures of the newly synthesized compounds were characterized by IR, $^1$H NMR, $^{13}$C NMR, LC-MS, HPLC spectra and CHNS elemental analysis.

Chapter 5: Here we present the comparative synthesis of aminated pyrimidine via Buchwald coupling by conventional and microwave irradiation. The newly
synthesized compounds were characterized by IR, $^1$H NMR, $^{13}$C NMR, LC-MS, HPLC spectra and CHNS elemental analysis. Also some aminated pyrimidine structures were established by X-ray crystallographic study.

**Chapter 6:** Reveals the biological potency of newly synthesized compounds reported in scheme 2.1 to scheme 5.1. All the synthesized compounds were tested for their *in vitro* antimicrobial activity of against *Klebsiella aerogenes*, *Escherichia. coli* and *Staphylococcus aureus* bacterial strains, *Aspergillus flavus*, *Candida albicans* fungal strains, anthelmintic activity using *Pheretima posthuma* as test model, *in vitro* anti-inflammatory activity using carrageenan induced paw edema model and *in vitro* cytotoxicity MTT assay against three cancer cell lines such as MCF-7 (Breast carcinoma cell line), H9C2 (Rat cardiomyoblast cell line) and A-549 (Human Lung adenocarcinoma epithelial cell line).