ACKNOWLEDGEMENT

It gives me an immense pleasure to express my heart-felt indebtedness to my Research Supervisor ***Prof. (Mrs.) A. Padmaja****, Department of Chemistry, Sri Venkateswara University, Tirupati, for her meticulous guidance, encouragement, affectionate care, inspiring discussions and valuable suggestions to complete this work with confidence. I will ever remain grateful for her timely decisions, wise counsel and unfailing attention.*

I would like to express my deep appreciation and cordial gratitude to ***Prof. (Mrs.) V. Padmavathi****, Department of Chemistry, Sri Venkateswara University, Tirupati, for her constant help, active involvement, timely interaction and fruitful discussions at all stages of this work.*

I consider it as a great pleasure to express my gratitude to ***Prof. D. Bhaskar Reddy****, Retd. Professor, Department of Chemistry, Sri Venkateswara University, Tirupati and* ***Prof. G. Narayana swamy****, Retd. Professor, Department of Chemistry, Sri Krishnadevaraya University, Anantapur for their generous affection and concrete suggestions.*

I extend my gratitude to ***Prof. R. Usha****, Department of Biotechnology, Sri Padmavathi Mahila Viswavidhyalayam, Tirupati, for evaluating antimicrobial activity for some of the compounds.*

I wish to express my thanks to successive Heads of our Department ***Prof. P. Venkateswarlu, Prof. K. Seshaiah, Prof. C. Venkata Rao*** *and* ***Prof. N. Y. Sreedhar*** *for providing laboratory facilities to carry out the research work.*

I am grateful to ***UGC, New Delhi*** *for providing financial support.*

With all happiness I acknowledge the cheerful assistance rendered by my senior research colleagues ***Dr. K. Mahesh, Dr. G. Dinneswara Reddy, Dr. S. Nagi Reddy, Dr. A. Muralikrishna, Dr. B.C. Venkatesh, Dr. C. Prema Kumari, Dr. C. Rajasekhar, Dr. N.M. Basha, Dr. P. Ramachandra Reddy, Dr. T. Bhanu Prakash, Dr. L. Mallikarjuna Reddy, Dr. G. Mallikarjuna Reddy, Dr. S. Durgamma, Dr. G. Sravya, Dr. G. Lavanya, Ms. T. Sreelatha, Mr. K. Peddamalakondaiah****, my fellow research scholars*

Ms. K. Divya, Mr. U. Nagarjuna, Ms. G. Yamini, Ms. D.V. Sowmya, Mrs. T. Rekha, Ms. G. Lakshmi Teja, Mr.T. Sreenivasulu, Mr. P. Siva Sankar *and* ***Mr. K. Narendra Babu*** *for their unstinted co-operation throughout my research programme.*

My vocabulary fails to express my gratitude to my grandparents late ***Smt. M. Sankaramma & Sri. M. Govindhu****, my beloved parents,* ***Smt. M. Seshamma & Sri M. Pullaiah****, my fiance* ***S. Renu*** *my brother* ***Mr. M. Rangasami,*** *my mother-in-law* ***S. Ramulamma,*** *father-in-law* ***S. Yallappa*** *and my brother-in-law* ***S. Mahesh*** *for their unmitigated encouragement, unflinching support, love and affection, which enabled me to pursue my goal.*

It is also an appropriate time to remember all my teachers and professors who at various stages of my educational carrier encouraged me to reach this level and it all is the fruit of their teaching and blessings.

I always remember and cherish the encouragement and inspiration provided by all my friends and well wishers during the course of my research work.

(M. MADHU SEKHAR)

PREFACE

Heterocyclic chemistry is the most challenging and handsomely rewarding field of study amongst various other branches of chemistry. It holds special appeal to synthetic chemists because of its remarkable structural diversity and provide a fertile ground for developing and testing new synthetic strategies. In fact, the voluminous data available in the literature reflects its successful application as materials in applied field and in more fundamental and theoretical studies. Thus it ensures a limitless scope of structurally novel compounds with a wide range of physical, chemical and biological properties. In this perspective, the work embodied in the thesis entitled ***"Synthesis and Bioassay of New Class of Heterocyclic Compounds"*** *describes the author's contribution on the synthesis of hitherto unknown aroyl / arylsulfonylethenesulfonylmethyl-1,3,4-oxadiazoles / 1,3,4-thiadiazoles / 1,2,4-triazoles; 1,3 / 1,4-phenylene - bis(oxadiazoles / thiadiazoles / triazoles) and bis(oxadiazolyl / thiadiazolyl / triazolyl) pyrimidines adopting simple and facile synthetic strategies. The structures of the new compounds have been established by spectral parameters and microanalyses. Some of the compounds have also been assayed for their antimicrobial activity. The results thus accomplished are described in the thesis in three chapters for clear and better presentation.*

GENERAL METHODOLOGY
EXPERIMENTAL AND INSTRUMENTATION

The solvents are distilled and purified as per the procedures described in "***A Text Book of Practical Organic Chemistry***" by A. I. Vogel.

Purity of the compounds is checked by thin layer chromatography using silica gel 'G' (BDH) and hexane-ethyl acetate as eluent wherever necessary. Most of the compounds are purified by recrystallization from a suitable solvent. However, in some instances the compounds are purified by filtration through a column of silica gel (60-120 mesh) using appropriate solvents.

Melting points are recorded using Tempo Mel-Temp apparatus and are uncorrected. Microanalyses are performed using Perkin-Elmer 240c elemental analyzer. IR spectra are recorded on a Thermo Nicolet FT-IR 200 using KBr pellets and wave numbers are given in cm^{-1}. ^{1}H and ^{13}C NMR spectra are recorded in DMSO-d_6 operating at 400 MHz and 100 MHz, respectively on a Bruker Avance 400 MHz and JEOL 400 MHz spectrometers. The chemical shifts (δ, ppm) and coupling constants (Hz) are reported in the standard fashion with reference to either internal standard tetramethylsilane (for ^{1}H) or the central line (39.5 ppm) of DMSO (for ^{13}C). The mass spectra are recorded on Jeol JMS-D 300 and Finnigan Mat 1210 B at 70 eV with an emission current of 100 μA. For some of the samples liquid chromatography mass spectra are recorded on Agilent 1100 series LC / MSD. The ultrasound irradiation is carried out by using scientific ultrasonicator Bandelin Sonorex RK 102H operating at a frequency of 35kHz.

The spectral figures incorporated in the thesis are obtained by xeroxing the original spectra. All the figures, equations and schemes are drawn on Chem Draw free ware and the compounds are numbered sequentially in the respective chapters in Times New Roman fonts.