

## DECLARATION

I hereby declare that the thesis entitled "Isolation of Bioactive Compounds from *Curcuma zedoaria* and *Tragia involucrata* and their Biological Evaluation" submitted by me, for the award of the degree of *Doctor of Philosophy* to Vellore Institute of Technology, is a record of bonafide work carried out by me under the supervision of Dr. (Mrs). M. HIMAJA, Professor, Department of Chemistry, School of Advanced Sciences, Vellore Institute of Technology, Vellore.

I further declare that the work reported in this thesis has not been submitted and will not be submitted, either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university.

Place: Vellore

Date: 28.11.2018

  
Signature of the Candidate

## CERTIFICATE

This is to certify that the thesis entitled "Isolation of Bioactive Compounds from *Curcuma zedoaria* and *Tragia involucrata* and their Biological Evaluation" submitted by Mrs.VINODHINI.V (12PHD0152), Department of Chemistry, School of Advanced Sciences, Vellore Institute of Technology, for the award of the degree of *Doctor of Philosophy*, is a record of bonafide work carried out by her under my supervision, as per the Vellore Institute of Technology code of academic and research ethics.

The contents of this report have not been submitted and will not be submitted either in part or in full, for the award of any other degree or diploma in this institute or any other institute or university. The thesis fulfills the requirements and regulations of the VIT and in my opinion meets the necessary standards for submission.

Place: Vellore

Date: 28/11/2018



Signature of the Guide

Dr. M. Himaja

## ABSTRACT

The authenticated rhizomes of *Curcuma zedoaria* and the leaf of *Tragia involucrata* were selected for the study. Extractions were carried out using soxhlet and qualitative phytochemical screening for the extracts was performed. A novel 6-ethoxy-3a-methoxyazulen-1(3aH)-one molecule was isolated from the rhizomes of *C. zedoaria* and characterized using  $^1\text{H}$  NMR,  $^{13}\text{C}$  NMR, 2D NMR and Mass spectroscopy. The extracts were examined for various biological activities using diverse *in vitro* and *in vivo* models. The ethyl acetate extract of rhizomes of *C. zedoaria* exhibited potent anti-diabetic and anti-urolithiatic activity wherein, the chloroform extract showed better antimicrobial property. *In vivo* anti-urolithiasis study results recommended the rhizomes of *C. zedoaria* contained potent urolithiasis preventive activity.

The qualitative and quantitative phytochemical screening results leaf extracts of *Tragia involucrata* suggested the leaf extract to be rich in terpenoids and moderate of phenols and flavonoids. Six molecules were identified from *T. involucrata* using GC-MS analysis and were reported for the first time. The petroleum ether extract of *T. involucrata* demonstrated potent anti-inflammatory activity in both *in vitro* and *in silico* methods. Wherein, ethyl acetate extract demonstrated good antioxidant activity. The correlation study reports suggested the phenol and flavonoid contents of ethyl acetate extracts of *T. involucrata* were responsible for the antioxidant activity and terpenoid content of petroleum ether extract was responsible for the anti-inflammatory activity.

Silver nanoparticles (AgNPs) were synthesized from the leaf extracts of *Tragia involucrata* and characterized using UV-Vis, TEM, XRD, FTIR and zeta potential and PSA. *In vitro* and *in vivo* anti-urolithiasis activity of the aqueous extract of *T. involucrata* and its AgNPs were performed and the results recommended both the extract and its AgNPs possessed potent urolithiasis preventive activity. The comparative report of the study suggested the AgNPs to possess potent anti-urolithiatic activity compared to the aqueous extract of *Tragia involucrata*.