

## DECLARATION

I, **P. SELVAKUMAR** hereby declare that the thesis entitled **“PHYTOCHEMISTRY AND *IN VITRO* BIOLOGICAL ACTIVITY STUDIES OF *ALOCASIA SPECIES*”** submitted to Periyar University in partial fulfilment of the requirements for the award of the degree of Doctor of Philosophy in Chemistry is a record of original research work carried out by me under the guidance and supervision of **Dr. M. DEVI KANIAKUMARI M.Sc.,Ph.D., PGDCA.**, Department of chemistry, Quaid-E-Millath Government College for Women, Chennai and that it has not formed before the basis for the award of any Degree / Diploma / Associateship / Fellowship or any other similar titles in this or any other University or Institution of higher learning.

Place:

Date:

Signature of the Candidate

## ACKNOWLEDGEMENT

First of all, I thank and praise the Almighty God and my parents from the depth of my heart who has blessed me with good knowledge and strength to complete this thesis successfully.

I convey my thanks to the Vice Chancellor and the Registrar of Periyar University, Salem for their support and providing necessary facilities.

It is with immense pleasure that I wish to express my deep and profound sense of gratitude, indebtedness and sincere regards to my research supervisor **Dr. M. DEVI KANIAKUMARI M.Sc., Ph.D., PGDCA.**, Department of Chemistry, Quaid-E-Millath Government College for Women, Chennai for suggesting the problem, valuable guidance and constant encouragement throughout the research endeavour. It would never have been possible for me to complete this research without her valuable suggestions.

I express my sincere thanks to my Doctoral and research validation committee members Professor **Dr. V. RAJ M.Sc., Ph.D.**, Head of the department of Chemistry, Periyar University, Salem and **Dr. VIDHYA M.Sc., Ph.D.**, department of Chemistry, Kavry college of arts and science, Chennai.

Thanks to all the Faculty members, Research Scholars, Department of Chemistry, Periyar University, Salem for their prompt help and words of encouragement at various phases of the experimental work.

This thesis might not have come to this shape without the generous help and support provided valuable comments. I sincerely thanks to **Dr.S.S. ILANGO M.Sc., M.Phil., Ph.D.**, Associate Professor in Department of Chemistry, Anna University, Coimbatore and **Dr.V. MAHALINGAM M.Sc., Ph.D.**, Assistant professor, Department of Chemistry, Bharathiyar University, Coimbatore for his invaluable assistance, discussion and support rendered.

This thesis might not have come to this shape without the generous help and support provided valuable comments and spectral data. I must make special thanks to Research Associate of **Mr.S. SATHESHKUMAR**, Biocon Ltd, Bangalore and Sophisticated Analytical Instrumentation Facility (SAIF), IIT, Chennai - 600 036, India.

I am extremely thankful to **Dr. P. VADIVEL., M.Sc.,M.Phil.,Ph.D.**, Assistant Professor, Department of Chemistry, Salem Sowdeswari College, Salem for his suggestions, constant encouragement and valuable help throughout my study.

I express my thanks to **Dr. PAULRAJ MOSAE SELVAKUMAR M.Sc., Ph.D.**, Assistant Professor, Department of Chemistry, Karunya University, Coimbatore for help and words of encouragement at various phases of the experimental work.

I also thank the teaching and non-teaching staff members of Quaid-E-Millath Government College for Women and Periyar University for their timing help during the research work.

Words are inadequate to express my heartfelt thanks to my beloved wife G. SudhaAnanthi, my daughter S. Haashni, Parents, Relatives and friends for their constant encouragement, support blessings and prayers to complete my research work successfully.

**P. SELVAKUMAR**

## ABBREVIATIONS

DPPH	-	2, 2-diphenyl-1-picrylhydrazyl
ABTS	-	2, 2' azino-bis (3-ethylbenzothiazoline-6-sulphonic acid)
cfu/ml	-	Colony Forming Unit per millilitre
DMSO	-	Dimethyl Sulphoxide
DNS	-	3,5-dinitrosalicylic acid
h	-	Hour
mg/ml	-	Milligram per Millilitre
mL	-	10 <sup>-3</sup> liter(s) or milliliter(s)
min	-	Minutes
mm	-	Millimetre
°C	-	Degree Celsius
%	-	Percentage
rpm	-	Revolution per minute
SD	-	Standard Deviation
SDA	-	Sabouraud Dextrose Agar
µg	-	Microgram
nm	-	nanometers or 10 <sup>-9</sup> meters
NA	-	Nutrient Agar
LD <sub>50</sub>	-	Lethal Dosage 50
MTCC	-	Microbial Type Culture Collection and Gene Bank
IC	-	Inhibition concentration
TLC	-	Thin Layer Chromatography
UV	-	Ultra violet
FTIR	-	Fourier Transform Infra Red
NMR	-	Nuclear Magnetic Resonance
MS	-	Mass Spectroscopy
pH	-	Potential of Hydrogen
WHO	-	World Health Organization
<i>A.Sanderiana</i>	-	<i>Alocasia Sanderiana</i>

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## **PREFACE**

In recent times, focus on plant research has increased all over the world and a large volume of evidence has been grooming together illustrating the immense potentiality of medicinal plants explored in various traditional systems. Research in traditional medicine has led to the development of many modern medicines. The thesis entitled “Phytochemistry and *in vitro* biological activity studies of *Alocasia* species” is an attempt to isolate and characterize the phyto constituents from the bioactive extracts of plant (*Alocasia Sanderiana* leaves, stem and root tubers) selected for these studies to unfold the antioxidants, anti-inflammatory and anti-diabetic properties.

### **Chapter-I**

Comprises a general introduction, importance of herbal products in health care aspects explaining the extensive use of herbal medicine including screening natural sources such as plant extracts and microbial fermentation has led to the discovery of many clinically useful drugs. It also explains usage of herbal medicines for liver diseases. Breakthrough in the field of research on natural products. Role of natural products as antioxidants, anti-inflammatory and anti-diabetic activity.

### **Chapter-II**

Describes the basic information regarding introduction about the plant *Alocasia Sanderiana.*, vernacular names, taxonomical classification, geographical distribution, plant description and historical usage along with the past the review of literature upto current date *Alocasia sanderiana* plant regarding the phytochemical analysis and isolation of secondary metabolites.

### **Chapter-III**

Describes the research objectives of *Alocasia sandariana*. To study about the phytochemical screening, antimicrobial, antioxidant, anti-inflammatory, anti-diabetic activity and isolation of new fractions of ethanolic extracts of leaf, stem and root tubers of *Alocasia sandariana*.

### **Chapter-IV**

Discussed about collection of plant parts and authentication. Phytochemical screening of various parts like plant leaf, stem and root tubers of *A.Sanderiana* were carried out using ethanol by adopting standard procedures. Antimicrobial activity, antioxidant activity, reducing power assay, anti-inflammatory activity and anti-diabetic activity of leaf, stem and root tubers of *A. Sanderiana* was determined by *in vitro* methods. New compound were isolated from leaf and characterized by various spectral techniques like IR, 1D NMR, 2D NMR and Mass spectrometry.

### **Chapter-V**

Discussed about the results of phytochemical screening, biological activity (Antimicrobial, antioxidant, anti-inflammatory and anti-diabetic activity) of plant leaf, stem and root tubers of ethanolic extracts of *A.Sanderiana*. Isolation and characterization of the new compounds using analytical and spectral techniques such as elemental analysis, IR, <sup>1</sup>H -NMR, <sup>13</sup>C- NMR, EI-MS techniques.

### **Chapter-VI**

Discussed about the summary and conclusion of phytochemical screening, biological activity (Antimicrobial, antioxidant, anti-inflammatory and anti-diabetic activity) of plant leaf, stem and root tubers of ethanolic extracts of *A.Sanderiana*. Isolation and characterization of the new compounds using analytical and spectral techniques.