



# Holy Cross College (Autonomous) Nagercoil – 629 004

Affiliated to Manonmaniam Sundaranar University, Tirunelveli  
Nationally Accredited with A+ Grade (CGPA 3.35) by NAAC IV Cycle  
An ISO 9001:2015 Certified Institution

SSR  
2019-2020  
to  
2023-2024

3.3.1 Institution has created an ecosystem for innovations, Indian Knowledge System (IKS), including awareness about IPR, establishment of IPR cell, Incubation centre and other initiatives for the creation and transfer of knowledge/technology and the outcomes of the same are evident

## IKS in Research Projects

### Department of Mathematics

#### Applications of Vedic Mathematics

#### **A STUDY ON VEDIC MATHEMATICS AND ITS APPLICATION**

Project report submitted to Holy Cross College (Autonomous), Nagercoil in partial fulfilment of the requirements to the award of the degree of

#### **BACHELOR OF SCIENCE IN MATHEMATICS**

By

<b>S. Heama</b>	<b>Reg No: 2017019</b>
<b>B. Primmiya</b>	<b>Reg No: 2017039</b>
<b>S.J. Sigithra</b>	<b>Reg No: 2017044</b>
<b>S.M. Sugitha</b>	<b>Reg No: 2017045</b>

Under the guidance of

**Dr. S. Sujitha, M.Sc., M.Phil., B.Ed., Ph.d.,**

**Assistant Professor**



**DEPARTMENT OF MATHEMATICS (AIDED)  
HOLY CROSS COLLEGE (AUTONOMOUS)  
(RE-ACCREDITED WITH A+ GRADE (CGPA 3.35))  
(AFFILIATED TO MANONMANIAM SUNDARANAR UNIVERSITY)**

**NAGERCOIL – 629004**

**OCTOBER 2019**



## **PREFACE**

Vedic Mathematics is the name given to a supposedly ancient system of calculation which was "rediscovered" from the Vedas between 1911 and 1918 by Sri Bharati Krishna Tirthaji Maharaj (1884-1960). This is a very interesting topic. This project gives information about the first seven vedic sutras of the Vedic Mathematics. Vedic mathematics is very easy and is important in our day to day life. It makes our calculations easier and faster. It not only helps us to do calculations like addition, subtraction, multiplication and division. But also helps us to solve algebraic problems easier. The main thing is, these ancient sutras are widely used in the designing of the microchips. This project contains five chapters which provides information on Vedic mathematics namely,

- 1) History of Vedic Mathematics
- 2) Vedic Sutras
- 3) Algebraic proof for Sutras
- 4) Application of Vedic Mathematics
- 5) Conclusion.

The first chapter deals with the introduction part, history and the development of Vedic mathematics.

The second chapter deals with the meaning, working procedure and proper examples of the Sutras namely Ekadhikena Purvena, Navatashcaramam Dasatah, Urdhwa Tiryagbhyam, Paravartya Yojayat, Shunyam Saamya Samuccaye, (Anurupyena) Shunyamanyat, Sankalana Vyavakalanabhyam.

The third one deals with the algebraic proofs of the sutras which we have discussed in the previous chapter.

The fourth chapter deals with the application and the uses of these vedic sutras.

The final chapter gives the overall conclusion which we have discussed in the previous chapters.



Department of Physics

Sl. No	Name of the student	Title of the Project	Outcome of the Project
1	M. Abisha	Characterization Study of Novel <i>Butea Parviflora</i> Fiber	It emphasizes sustainability and ecological harmony, aligning with traditional Indian values of respect for nature and balance with the environment and thereby to promote sustainable and biodegradable product in the society
2	C. Ansi Ajitha Rani	Physico-chemical, Structural, Thermal and Mechanical Characterization of the Natural Fibres from the sprout of <i>Borassus flabellifer</i>	It emphasizes sustainability and ecological harmony, aligning with traditional Indian values of respect for nature and balance with the environment and thereby to promote sustainable and biodegradable product in the society
3	A. Asha Rani & Jewincy S. Raj	Effect of Potassium Permanganate on Physico-chemical and Structural Characterization of Natural Fibres Extracted from Stems of <i>Eichhornia crassipes</i>	It emphasizes sustainability and ecological harmony, aligning with traditional Indian values of respect for nature and balance with the environment and thereby to promote sustainable and biodegradable product in the society
4	Hylynn Rowena. A and Prema. S	Effect of steam bath treatment on structural, morphological, thermal and mechanical aspects of underground tuber of palmyra sprout fibre	It emphasizes sustainability and ecological harmony, aligning with traditional Indian values of respect for nature and balance with the environment and thereby to promote sustainable and biodegradable product in the society
5	Mridula Pearly J	Eco-Friendly Concrete Reinforcement: Enhancing Sustainability with Sodium Acetate treated coir fibre	It facilitates knowledge sharing and collaboration between modern scientific approaches and traditional Indian wisdom. By integrating modern material science with insights from the Indian knowledge system, develop innovative solutions that are both technologically advanced and culturally relevant.
6	Sahaya Reena. V	Structural and Mechanical Characteristics of Sodium Acetate treated Coir Fibre	It facilitates knowledge sharing and collaboration between modern scientific approaches and traditional Indian wisdom. By integrating modern material science with insights from the Indian knowledge system, develop innovative solutions that are both technologically advanced and culturally relevant.
7	Subi. S	Physico-Chemical and Thermal Analysis of Sodium Acetate treated <i>Cocos nucifera</i> fibre	It facilitates knowledge sharing and collaboration between modern scientific approaches and traditional Indian wisdom. By integrating modern material science with insights from the Indian knowledge system, develop innovative solutions that are both technologically advanced and culturally relevant.

9	R. Reyani and A.S. Shalfia Judit	Synthesis and Characteristics of Solanum Nigrum and Manihot Esculenta Bionanoparticles	Bionanoparticles are synthesized from Solanum nigrum and Manihot esculenta, showcasing their effective antimicrobial properties. This eco-friendly approach, rooted in the Indian Knowledge System, emphasizes sustainability and the utilization of natural resources.
10	E. Blessy Nirupa and K. Rumisha	Synthesis and Characteristics of Few Millet Bionanoparticles	Millet bionanoparticles are synthesized using green approach, rooted in the Indian Knowledge System, which emphasizes sustainability and the utilization of natural resources for advanced nanotechnological applications.
11	J Jenisha	Facile Green Synthesis of Carbon Nanoparticles from Medicinally potent <i>Lawsonia inermis</i> Leaves	Carbon nanoparticles synthesized from henna leaf using green synthesis method inspired by the Indian Knowledge System, demonstrates a sustainable and cost-effective method for advanced material synthesis.
12	G. Mary Griffika	Facile Green Synthesis Of Carbon Nanoparticles From Medicinally Potent Azadirachta Indica Leaf	Carbon nanoparticles synthesized from neem leaf using green synthesis method inspired by the Indian Knowledge System, demonstrates a sustainable and cost-effective method for advanced material synthesis.
13	S. Sebastiammal	Green and chemical synthesis of monovalent and divalent metal ion doped nano hydroxyapatite (nHAp): Remediation towards human pathogens and cancer cells	Curcumin, derived from turmeric, providing a root to synthesize bioactive hydroxyapatite and exhibiting potent anticancer effects against cervical cancer. This integration underscores the importance of validating traditional knowledge through rigorous scientific methodologies to develop effective and safe therapeutic interventions.



# **CHARACTERISATION STUDY MADE ON A NEW NOVEL BUTEA PARVIFLORA FIBER**

*Submitted to*

Holy Cross College (Autonomous), Nagercoil affiliated to  
Manonmaniam Sundaranar University in partial fulfillment of the  
requirement for the award of the degree of

**MASTER OF PHILOSOPHY IN PHYSICS**

*By*

**M. ABISHA  
Reg.No : 21901**

*Under the guidance of*

**Dr. R. Krishna Priya**



**DEPARTMENT OF PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL-4  
2019-2020**



**Dr. R. Krishna Priya,**  
**Assistant Professor of Physics,**  
**Holy Cross College (Autonomous),**  
**Nagercoil- 629 004.**

**CERTIFICATE**

This is to certify that this project report entitled “**Characterisation study made on a New Novel Butea parviflora Fiber**” is a record of original work done by Miss **M.Abisha (Reg.No:21901)**, in partial fulfillment of the requirements for the award of the Degree of Master of Philosophy in Physics, Holy Cross College (Autonomous), Nagercoil affiliated to Manonmaniam Sundaranar University, Tirunelveli during the academic year 2019-2020. It has not formed the basis for the award of any degree or diploma of any other university or institution.

*R. Dirmaladewi*

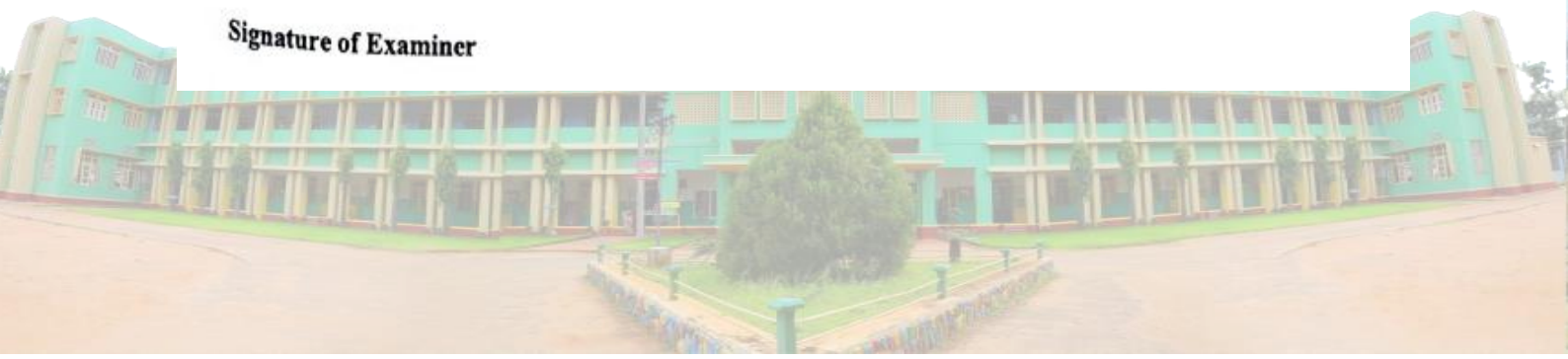
**Head of Department of Physics,**  
**Holy Cross College (Autonomous),**  
**Nagercoil Department of Physics**  
**HOLY CROSS COLLEGE,**  
**Nagercoil-4.**

*Priya*

**Signature of project guide**

**Dr. R. KRISHNA PRIYA,**  
**M.Sc., M.Phil., Ph.D.,**  
**ASSISTANT PROFESSOR OF PHYSICS,**  
**HOLY CROSS COLLEGE (AUTONOMOUS),**  
**NAGERCOIL - 629 004.**

**Signature of Examiner**



M.Abisha

(Reg.No:21901),

Physics Research Centre,

Holy Cross College (Autonomous),

Nagercoil – 629 004.

### DECLARATION

I hereby declare that this project report entitled “**Characterisation study made on a New Novel Butea parviflora Fiber**” is a record of my original work done by me for the award of the Degree of Master of Philosophy in Physics during the academic year **2019-2020** under the guidance of **Dr. R. Krishna Priya**, Assistant Professor in Physics, Holy Cross College (Autonomous), Nagercoil affiliated to Manonmaniam Sundaranar University, Tirunelveli and it has not formed the basis for the award of any Degree / Diploma / Fellowship or other similar title to any candidate of any university.

Place: Nagercoil,

Date: 14 - 8 - 2020

*M. Abisha*  
Signature of the candidate



**PHYSICO-CHEMICAL, STRUCTURAL, THERMAL AND MECHANICAL  
CHARACTERISATION OF THE NATURAL FIBRES TAKEN FROM THE  
UNDERGROUND SPROUT OF BORASSUS FLABELLIFER (BF)**

*Submitted to*

*Holy Cross College (Autonomous), Nagercoil affiliated to  
Manonmaniam Sundaranar University in partial fulfillment of  
the requirement for the award of the degree of*

**MASTER OF PHILOSOPHY IN PHYSICS**

*By*

**ANSI AJITHA RANI .C**

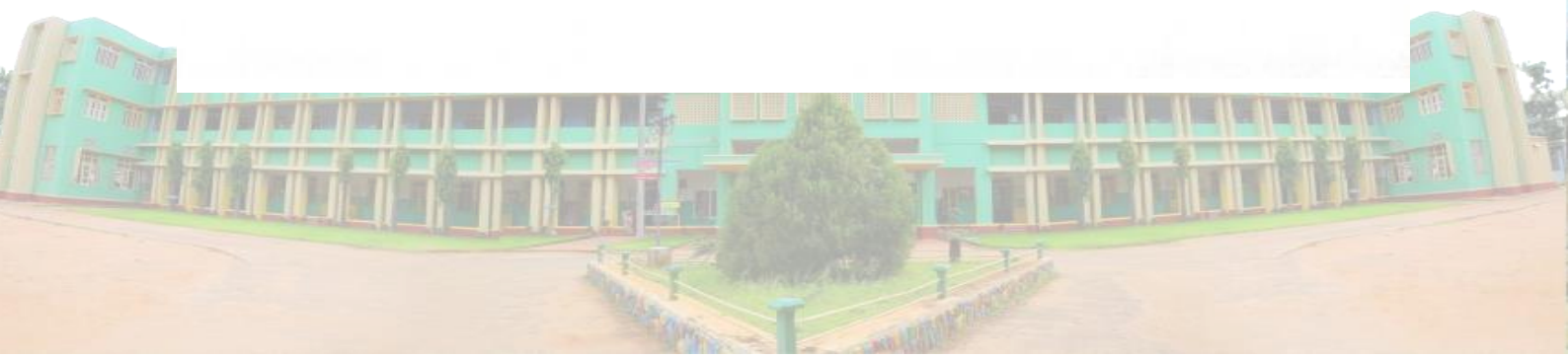
**Reg. No: 2020SMP443**

*Under the guidance of*

**Dr. R. Krishna Priya**



**DEPARTMENT OF PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL-4  
2020-2021**





Dr. R. Krishna Priya,  
Assistant Professor of Physics,  
Holy Cross College (Autonomous),  
Nagercoil- 629 004.

CERTIFICATE

This is to certify that this project report entitled “**Physico-Chemical, Structural, Thermal and Mechanical characterisation of the natural fibres taken from the underground sprout of Borassus flabellifer (Bf)**” is a record of original work done by Miss **ANSI AJITHA RANI .C** (Reg. No: 2020SMP443) in partial fulfillment of the requirements for the award of the Degree of Master of Philosophy in Physics, Holy Cross College (Autonomous), Nagercoil affiliated to Manonmaniam Sundaranar University, Tirunelveli during the academic year 2020-2021. It has not formed the basis for the award of any degree or diploma of any other university or institution.



Head of Department of Physics,

Dr. C. NIRMALAKISHOREN,  
B.Sc., M.Sc., Ph.D., PGDCA.,  
Head & Assistant Professor,  
PG & Research Department of Physics,  
Holy Cross College (Autonomous),  
Nagercoil, Kanyakumari District,  
Tamil Nadu. PIN: 629 004.

Signature of Examiner



Signature of project guide



**ANSI AJITHA RANI .C**

**Reg. No: 2020SMP443**

Physics Research Centre,

Holy Cross College (Autonomous),

Nagercoil – 629 004.

### DECLARATION

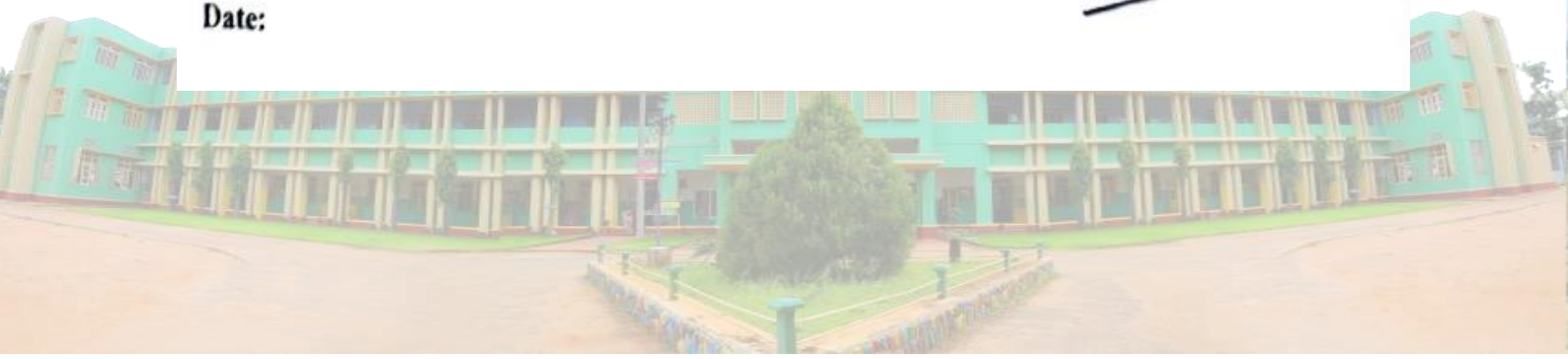
I hereby declare that this project report entitled **“Physico-Chemical, Structural, Thermal and Mechanical characterisation of the natural fibres taken from the underground sprout of Borassus flabellifer (Bf)”** is a record of my original work done by me for the award of the Degree of Master of Philosophy in Physics during the academic year **2020-2021** under the guidance of **Dr. R. Krishna Priya**, Assistant Professor in Physics, Holy Cross College (Autonomous), Nagercoil affiliated to Manonmaniam Sundaranar University, Tirunelveli and it has not formed the basis for the award of any Degree / Diploma / Fellowship or other similar title to any candidate of any university.

**Place: Nagercoil,**

**Signature of the candidate**

**Date:**

Ansi



**EFFECT OF POTASSIUM PERMANGANATE ON  
PHYSICO-CHEMICAL & STRUCTURAL  
CHARACTERIZATION OF NATURAL FIBRES  
EXTRACTED FROM STEMS OF EICHHORNIA  
CRASSIPES**

Submitted to

Holy Cross College (Autonomous), Nagercoil affiliated to Manonmaniam  
Sundaranar University in partial fulfillment of the requirement for the award of the  
degree of

**MASTER OF SCIENCE IN PHYSICS**

By

**A. ASHA RANI**

**JEWINCY.S.RAJ**

Reg no:(2020APP434, 2020APP445)

Under the Guidance of

**Dr. R. Krishna Priya**

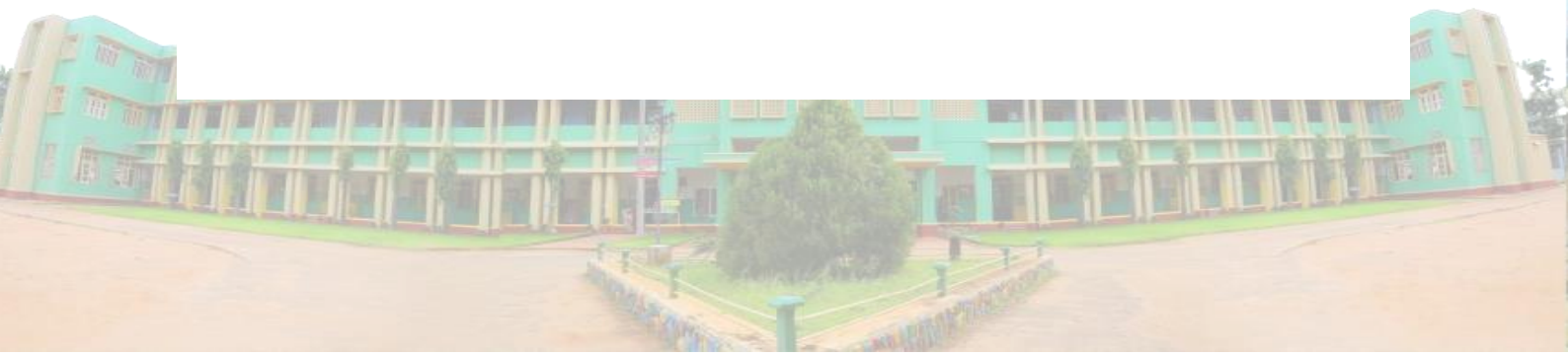


**DEPARTMENT OF PHYSICS**

**HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL-4**

**2021-2022**



**Dr. R. Krishna Priya**

Assistant Professor of Physics,  
Holy Cross College (Autonomous),  
Nagercoil – 629004.

## **CERTIFICATE**

This is to certify that this project report entitled “**EFFECT OF POTASSIUM PERMANGANATE ON PHYSICO-CHEMICAL & STRUCTURAL CHARACTERIZATION OF NATURAL FIBRES EXTRACTED FROM STEMS OF EICHHORNIA CRASSIPES**” is a bonafide record of work done by **Miss. A. Asha Rani** and **Miss. Jewicy.S.Raj** of **II M.Sc Physics** in partial fulfillment of the degree of Master of Science in Physics, Holy Cross College (Autonomous), Nagercoil affiliated to Manonmanium Sundaranar University during the academic year 2021-2022 under my supervision.



**A. Asha Rani,**

**Jewincy.S. Raj**

II M.Sc Physics,

Holy Cross College (Autonomous),

Nagercoil - 629004.

## **DECLARATION**

We hereby declare that this project report entitled **“EFFECT OF POTASSIUM PERMANGANATE ON PHYSICO-CHEMICAL & STRUCTURAL CHARACTERIZATION OF NATURAL FIBRES EXTRACTED FROM STEMS OF EICHHORNIA CRASSIPES”** is a record of original work done by us under the guidance of Dr. R. Krishna Priya, Holy Cross College (Autonomous), Nagercoil during the academic year 2021-2022

Place: Nagercoil

Signature of the candidate

Date:

A. Asha Rani, Jewincy .S. Raj



**EFFECT OF STEAMBATH TREATMENT ON STRUCTURAL,  
MORPHOLOGICAL, THERMAL AND MECHANICAL ASPECTS OF  
UNDERGROUND TUBER OF PALMYRA SPROUT FIBRE**

**PROJECT REPORT**

*Submitted to Holy Cross College (Autonomous), Nagercoil affiliated to Manonmanium Sundaranar University in partial fulfillment of the requirement for the award of the degree of*

**MASTER OF SCIENCE IN PHYSICS**

by

**HYLYNN ROWENA. A (2021APP339)**

**PREMA. S (2021APP349)**

Under the Guidance of

**Dr. R. Krishna Priya**

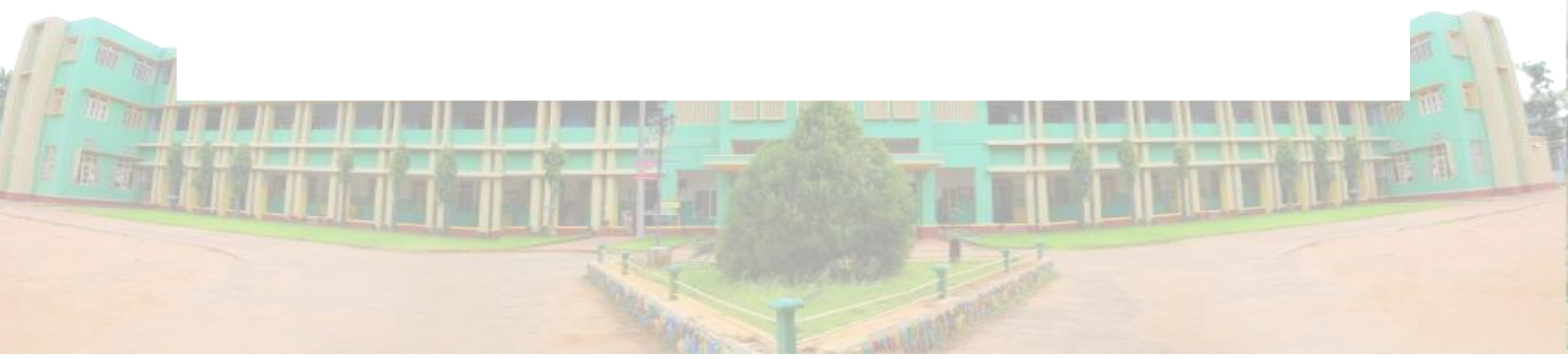


**DEPARTMENT OF PHYSICS**

**HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL-6290044**

**November-2022**



**Dr. R. Krishna Priya**  
Assistant Professor of Physics,  
Holy Cross College (Autonomous),  
Nagercoil – 629004

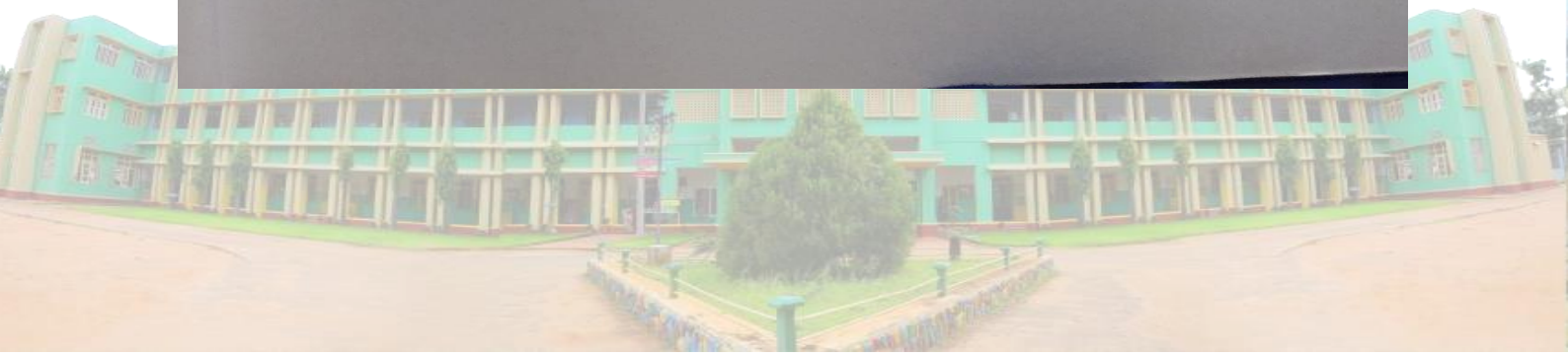
**CERTIFICATE**

This is to certify that this project report entitled “EFFECT OF STEAMBATH TREATMENT ON STRUCTURAL, MORPHOLOGICAL, THERMAL AND MECHANICAL ASPECTS OF UNDERGROUND TUBER OF PALMYRA SPROUT FIBRE” is a bonafide record of work done by Miss. A. Hylynn Rowena and Miss. S. Prema of II M.Sc Physics in partial fulfillment of the degree of Master of Science in Physics, Holy Cross College (Autonomous), Nagercoil affiliated to Manonmanium Sundaranar University during the academic year 2022-2023 under my supervision.

*Priya*  
Signature of the Project guide

Signature of the Head of the Department

*S. S. S. S.*  
18.11.22  
Signature of the Examiner



**A. Hylynn Rowena,**

**S. Prema**

**II M.Sc. Physics**

**Holy Cross College (Autonomous),**

**Nagercoil - 629004.**

## **DECLARATION**

We hereby declare that this project report entitled **“EFFECT OF STEAMBATH TREATMENT ON STRUCTURAL, MORPHOLOGICAL, THERMAL AND MECHANICAL ASPECTS OF UNDERGROUND TUBER OF PALMYRA SPROUT FIBRE”** is a record of original work done by us under the guidance of **Dr. R. Krishna Priya**, Department of Physics, Holy Cross College (Autonomous), Nagercoil during the academic year 2022-2023.

**Place: Nagercoil**

**Date:**

**Signature of the candidate**

**A. Hylynn Rowena, S. Prema**





**ECO-FRIENDLY CONCRETE REINFORCEMENT:  
ENHANCING SUSTAINABILITY WITH SODIUM ACETATE  
TREATED COIR FIBRE**

**PROJECT REPORT**

*Submitted to Holy Cross College (Autonomous), Nagercoil affiliated to  
Manonmanium Sundaranar University in partial fulfillment of the requirement for  
the award of the degree of*

**MASTER OF SCIENCE IN PHYSICS**

by

**MRIDULA PEARLY J (2022APP336)**

Under the Guidance of

**Dr. R. Krishna Priya**



**DEPARTMENT OF PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL-629004**

**October-2023**

**2023-2024**



**Dr. R. Krishna Priya**  
Assistant Professor of Physics,  
Holy Cross College (Autonomous),  
Nagercoil – 629004

**CERTIFICATE**

This is to certify that this project report entitled “ECO-FRIENDLY CONCRETE REINFORCEMENT: ENHANCING SUSTAINABILITY WITH SODIUM ACETATE TREATED COIR FIBRE” is a bonafide record of work done by Miss. MRIDULA PEARLY J of II M.Sc Physics in partial fulfillment of the degree of Master of Science in Physics, Holy Cross College (Autonomous), Nagercoil affiliated to Manonmanium Sundaranar University during the academic year 2023-2024 under my supervision.

*Priya*  
Signature of the Project guide

*C. Nirmala Louis*  
Signature of the Head of the Department  
Dr. C. NIRMALA LOUIS, M.Sc., Ph.D., PGDCA.,  
Head & Assistant Professor,  
PG & Research Department of Physics,  
Holy Cross College (Autonomous),  
Nagercoil, Kanyakumari District,  
Tamil Nadu, Pin: 629 004.

Signature of the Examiner

*[Signature]*  
31/10/23



MRIDULA PEARLY J

II M.Sc. Physics

Holy Cross College (Autonomous),

Nagercoil - 629004.

### DECLARATION

I hereby declare that this project report entitled “ECO-FRIENDLY CONCRETE REINFORCEMENT: ENHANCING SUSTAINABILITY WITH SODIUM ACETATE TREATED COIR FIBRE” is a record of original work done by myself under the guidance of Dr. R. Krishna Priya, Department of Physics, Holy Cross College (Autonomous), Nagercoil during the academic year 2023-2024.

Place: Nagercoil

Date: 31-10-2023

*J. Mridula Pearly*  
Signature of the candidate

Mridula Pearly J



## ACKNOWLEDGEMENT

First of all, I thank God Almighty, for his constant blessings throughout this work.

I prompt genuine thanks to our Secretary **Dr. Sr. Mary Hilda** for her inspiration and motivate us to do novel products, which are useful to our society.

I express sincere thanks to our Principal **Dr. Sr. S. Sahaya Selvi** for her support and encouragement.

I acknowledge heartfelt thanks to beloved Head of the Department of Physics **Dr. C. Nirmala Louis**, who availed all the facilities in the department.

I extent our deep sense of gratitude and respect to our guide **Dr. R. Krishna Priya** for her valuable suggestions and constant help all over this work, which would not have been completed without her guidance.

I express our thankfulness to our loving parents and friends for their constant prayers which assisted us to complete this project work successfully.

I also thank the Lab Assistants, Department of Physics for the help they have rendered.

*J. Mridula Pearly*  
Signature of the candidate

Mridula Pearly J



**STRUCTURAL AND MECHANICAL  
CHARACTERISTICS OF SODIUM ACETATE TREATED  
COIR FIBRE**

**PROJECT REPORT**

Submitted to Holy Cross College (Autonomous), Nagercoil affiliated to  
Manonmanium Sundaranar University in partial fulfillment of the requirement for  
the award of the degree of

**MASTER OF SCIENCE IN PHYSICS**

by

**SAHAYA REENA. V (2022APP338)**

Under the Guidance of

**Dr. R. Krishna Priya**



**DEPARTMENT OF PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL-6290044  
OCTOBER-2023  
2023-2024**



**Dr. R. Krishna Priya**  
Assistant Professor of Physics,  
Holy Cross College (Autonomous),  
Nagercoil – 629004

**CERTIFICATE**

This is to certify that this project report entitled “STRUCTURAL AND MECHANICAL CHARACTERISTICS OF SODIUM ACETATE TREATED COIR FIBRE” is a bonafide record of work done by Miss. V. SAHAYA REENA of II M.Sc. Physics in partial fulfillment of the degree of Master of Science in Physics, Holy Cross College (Autonomous), Nagercoil affiliated to Manonmanium Sundaranar University during the academic year 2023-2024 under my supervision.

*Dr. C. Nirmala Louis*

**Signature of the Head of the Department**

Dr. C. NIRMALA LOUIS, M.Sc., Ph.D., PGDCA.,  
Head & Assistant Professor,  
PG & Research Department of Physics,  
Holy Cross College (Autonomous),  
Nagercoil, Kanyakumari District,  
629 004.

**Signature of the Examiner**

*VP*  
31/10/23

*VP*  
**Signature of the Project guide**



V. SAHAYA REENA

II M.Sc. Physics

Holy Cross College (Autonomous)

Nagercoil - 629004

### DECLARATION

I hereby affirm that the project report titled "STRUCTURAL AND MECHANICAL CHARACTERISTICS OF SODIUM ACETATE TREATED COIR FIBRE" is a record of the original work completed by myself during the academic year 2023–2024 under the supervision of Dr. R. Krishna Priya, Department of Physics, Holy Cross College (Autonomous), Nagercoil.

Place: Nagercoil

Date: 31 - 10 - 2023

*V. Sahaya Reena*  
Signature of the candidate

V. Sahaya Reena



**PHYSICO-CHEMICAL AND THERMAL ANALYSIS  
OF SODIUM ACETATE TREATED COCOS  
NUCIFERA FIBRE**

**PROJECT REPORT**

Submitted to Holy Cross College (Autonomous), Nagercoil affiliated to Manonmanium Sundaranar University in partial fulfillment of the requirement for the award of the degree of

**MASTER OF SCIENCE IN PHYSICS**

by

**SUBLS (2022APP423)**

Under the Guidance of

**Dr. R. Krishna Priya**



**DEPARTMENT OF PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL-629004**

**OCTOBER-2023**

**2023-2024**

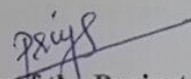


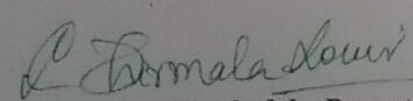


**Dr. R. Krishna Priya**  
Assistant Professor of Physics,  
Holy Cross College (Autonomous),  
Nagercoil – 629004

**CERTIFICATE**

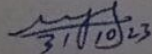
This is to certify that this project report entitled “**PHYSICO-CHEMICAL AND THERMAL ANALYSIS OF SODIUM ACETATE TREATED COCOS NUCIFERA FIBRE**” is a bonafide record of work done by Miss. SUBI. S of II M.Sc. Physics in partial fulfilment of the degree of Master of Science in Physics, Holy Cross College (Autonomous), Nagercoil affiliated to Manonmanium Sundaranar University during the academic year 2023-2024 under my supervision.

  
**Signature of the Project guide**

  
**Signature of the Head of the Department**

**Dr. C. NIRMALA LOUIS, M.Sc., Ph.D., PGDCA.,**  
Head & Assistant Professor,  
PG & Research Department of Physics,  
Holy Cross College (Autonomous),  
Nagercoil, Kanyakumari District,  
629 004.

**Signature of the Examiner**

  
31/10/23



SUBI. S,

II M.Sc. Physics

Holy Cross College (Autonomous),

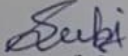
Nagercoil - 629004.

### DECLARATION

We hereby affirm that the project report titled "PHYSICO-CHEMICAL AND THERMAL ANALYSIS OF SODIUM ACETATE TREATED COCOS NUCIFERA FIBRE" is a record of the original work completed by myself during the academic year 2023–2024 under the supervision of Dr. R. Krishna Priya, Department of Physics, Holy Cross College (Autonomous), Nagercoil.

Place: Nagercoil

Date: 31.10.2023

  
Signature of the candidate

Subi. S



**SYNTHESIS AND CHARACTERIZATION OF  
SOLANUM NIGRUM AND MANIHOT ESCULENTA  
BIONANOPARTICLES**

Submitted to Holy Cross College (Autonomous) in partial  
fulfillment of the requirements for the award of degree of

**Master of Science in Physics**

*Under the guidance of*

**Ms. P. Aji Udhaya, M.Sc., M.Phil., SET., PGDCA.**

*Submitted by*

**Miss. R. Reyani**

**Reg. No. 219066**

**Miss. A.S. Shalfia Judit**

**Reg. No. 219067**



**DEPARTMENT OF PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL-629 004  
(2020-2021)**



DEPARTMENT OF PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL-629 004  
(2020-2021)

### CERTIFICATE

This is to certify that the project entitled “SYNTHESIS AND CHARACTERIZATION OF SOLANUM NIGRUM AND MANIHOT ESCULENTA BIONANOPARTICLES” is the bonafide record of the work independently done by

Miss. R. Reyani

Reg. No. 219066

Miss. A.S. Shalfia Judit

Reg. No. 219067

under my guidance the year 2020-2021 in partial fulfillment for the award of Master of Science in Physics of HOLY CROSS COLLEGE (AUTONOMOUS) NAGERCOIL.

I further certify that this dissertation or any part of it has not been submitted by her elsewhere for any other to the best of my knowledge.

  
Signature of Head of the Department

  
Signature of Project Guide

EXAMINERS



## DECLARATION

Miss. R. Reyani

Reg. No. 219066

Miss. A.S. Shalfia Judit

Reg. No. 219067

M.Sc. Physics,  
Holy Cross College (Autonomous),  
Nagercoil-629 004.

I hereby declare that this project work entitled is “SYNTHESIS AND CHARACTERIZATION OF SOLANUM NIGRUM AND MANIHOT ESCULENTA BIONANOPARTICLES” an original work done by them in the Department of Physics, HOLY CROSS COLLEGE (AUTONOMOUS) NAGERCOIL during the academic year 2020-2021.

Place:

Date:

Signature of the candidate

*R Reyani*  
*shalfia judit A.S.*



9. Synthesis And Characteristics Of Solanum Nigrum And Manihot Esculenta Bionanoparticles

**SYNTHESIS AND CHARACTERIZATION OF COPPER  
ZINC FERRITE NANOCOMPOSITES VIA AUTO  
COMBUSTION METHOD USING EGG WHITE**

*Submitted to Holy Cross College [Autonomous],  
Nagercoil affiliated to Manonmaniam Sundaranar  
University in partial fulfillment of the requirement  
for the award of the*

Degree of

**MASTER OF SCIENCE IN PHYSICS**

By

S.A.DHARSANA

Reg.No:218057

R.ISWARYA RANI

Reg.No:218059

N.SIVASANKARI

Reg.No:218074

Under the Guidance of

**Mrs. P. Aji Udhaya, M.Sc., M.Phil., SET**



**DEPARTMENT OF PHYSICS,  
HOLY CROSS COLLEGE (AUTONOMOUS),  
NAGERCOIL-629 004.  
2019-2020**



## BONOFIDE CERTIFICATE

This is to certify that the dissertation, entitled “**SYNTHESIS AND CHARACTERIZATION OF COPPER ZINC FERRITE NANOPARTICLES VIA AUTO COMBUTION METHOD USING EGG WHITE**” is a record of original project work done by **S.A.DHARSANA, R.ISWARYA RANI and N.SIVASANKARI** in the department of Physics, Holy Cross College, Nagercoil-4, in partial fulfillment of the requirement for the award of degree of **MASTER OF SCIENCE IN PHYSICS**, during the period of 2019-2020.

*S. M. Delphine*

Head of the Department of Physics,

**Dr.S.MARY DELPHINE,**  
HEAD & ASSOCIATE PROFESSOR OF PHYSICS  
HOLY CROSS COLLEGE  
NAGERCOIL-629004

*P. J. Uthaya*  
Signature of project guide

*Uthaya*  
Signature of Examiner



## DECLARATION

**S.A.DHARSANA**

**R.ISWARYA RANI**

**N.SIVASANKARI**

M.Sc. Physics,

Holy Cross College (Autonomous),

Nagercoil-4.

We hereby declare that the project work entitled **“SYNTHESIS AND CHARACTERIZATION OF COPPER ZINC FERRITE NANOCOMPOSITES VIA AUTO COMBUSTION METHOD USING EGG WHITE”** is an original work done by us under the guidance of Mrs.P.Aji Udhaya, M.Sc., M.Phil, SET, Department of Physics, Holy Cross College (Autonomous), Nagercoil during the academic year 2019-2020.

Place: *Nagercoil*

Date:

signature of the candidates:

*S.A. Dharsana*

*R. Iswarya Rani*

*N. Sivasankari*





**SYNTHESIS AND CHARACTERISTICS OF FEW MILLET  
BIONANOPARTICLES**

Submitted to Holy Cross College (Autonomous), Nagercoil in partial  
fulfillment of the requirements for the award of degree of

**Master of Science in Physics**

Under the guidance of

**Ms. P. Aji Udhaya, M.Sc., M.Phil., SET., PGDCA.,**

Submitted by

**Miss. E. Blessy Nirupa**

**Reg. No. 2020APP438**

**Miss. K. Rumisha**

**Reg. No. 2020APP449**



**DEPARTMENT OF PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL - 629 004  
(2021-2022)**




Ms. P. AJI UDHAYA, M.Sc., M.Phil., SET., PGDCA.,  
ASSISTANT PROFESSOR IN PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL - 629 004  
(2021-2022)

### CERTIFICATE


This is to certify that the project entitled “SYNTHESIS AND CHARACTERISTICS OF FEW MILLETS BIONANOPARTICLES” is the bonafide record of the work independently done by Miss. E. Blessy Nirupa (2020APP438), Miss. K. Rumisha (2020APP449) under my guidance the year 2021-2022 in partial fulfillment for the award of Master of Science in Physics of Holy Cross College (Autonomous) Nagercoil.

I further certify that this dissertation or any part of it has not been submitted by her elsewhere for any other to the best of my knowledge.

  
Dr. C. NIRMALA LOUIS, M.Sc., Ph.D., PGDCA.,  
Signature of Head of the Department,  
PG & Research Department of Physics,  
Holy Cross College (Autonomous),  
Nagercoil, Kanyakumari District,  
Tamil Nadu. PIN: 629 004.

  
Signature of Project Guide

#### EXAMINERS

- 1)   
20/12/21.
- 2)



## DECLARATION

Miss. E. Blessy Nirupa

Reg. No. 2020APP438

Miss. K. Rumisha


Reg. No. 2020APP449

M.Sc. Physics,  
Holy Cross College (Autonomous),  
Nagercoil - 629 004.

I hereby declare that this project work entitled is “SYNTHESIS AND CHARACTERISTICS OF FEW MILLETS BIONANOPARTICLES” an original work done by them in the Department of Physics, Holy Cross College (Autonomous) Nagercoil during the academic year 2021-2022.

Place: Nagercoil.

Date: 15.12.2021

  
K. Rumisha  
Signature of the candidate



**Facile Green Synthesis of Carbon  
Nanoparticles from Medicinally potent  
Lawsonia inermis Leaves**

*Submitted to Holy Cross College (Autonomous), Nagercoil in partial fulfillment of the  
requirements for the award of the degree of*

**Master of Science in Physics**

Under the guidance of

**Dr. P. Aji Udhaya, M.Sc., M.Phil, SET, PGDCA., PhD.**

Submitted by

**Ms. J. Jenisha**

**Reg. No. 2022APP330**



**DEPARTMENT OF PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL-629004  
(2022-2024)**



**Dr. P. AJI UDHAYA,  
ASSISTANT PROFESSOR IN PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL - 629 004**

**CERTIFICATE**

This is to certify that the project entitled “**FACILE GREEN SYNTHESIS OF CARBON NANOPARTICLES USING MEDICINALLY POTENT LAWSONIA INERMIS LEAF**” is the bonafide record of the work independently done by Ms. J. Jenisha under my guidance in the year 2022-2024 in partial fulfillment for the award of Master of Science in Physics of Holy Cross College (Autonomous), Nagercoil.

I further certify that this dissertation or any part of it has not been submitted by her or others elsewhere for any other purpose to the best of my knowledge.



**DECLARATION**

**Ms. J. Jenisha  
M.Sc. Physics,  
Holy Cross College (Autonomous),  
Nagercoil – 629 004.**

**Reg. No. 2022APP330**

I hereby declare that this project work entitled “**FACILE GREEN SYNTHESIS OF CARBON NANOPARTICLES FROM MEDICINALLY POTENT LAWSONIA INERMIS LEAF**” an original work done by me in the Department of Physics, Holy Cross College (Autonomous) Nagercoil during the academic year 2022-2024.



**FACILE GREEN SYNTHESIS OF CARBON NANOPARTICLES FROM  
MEDICINALLY POTENT AZADIRACHTA INDICA LEAF**

Submitted to Holy Cross College (Autonomous), Nagercoil in partial fulfillment of the requirements for the award of degree of

**Master of Science in Physics**

**Under the guidance of**

**Dr. P. Aji Udhaya, M.Sc., M.Phil., SET., PGDCA., PhD.,**

**Submitted by**

**Ms. G. Mary Giriffika**

**Reg. No. 2022APP335**



**DEPARTMENT OF PHYSICS**

**HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL-629004**

**(2022-2024)**

**Dr. P. AJI UDHAYA,  
ASSISTANT PROFESSOR IN PHYSICS  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL - 629 004**

**CERTIFICATE**

This is to certify that the project entitled “**FACILE GREEN SYNTHESIS OF CARBON NANOPARTICLES FROM MEDICINALLY POTENT AZADIRACHTA INDICA**” is the bonafide record of the work independently done by **Ms. G. Mary Giriffika** under my guidance in the year 2022-2024 in partial fulfillment for the award of Master of Science in Physics of Holy Cross College (Autonomous), Nagercoil.

I further certify that this dissertation or any part of it has not been submitted by her or any others elsewhere for any other purpose to the best of my knowledge.



**DECLARATION**

**Ms. G. Mary Giriffika**  
**M.Sc. Physics,**  
**Holy Cross College (Autonomous),**  
**Nagercoil - 629 004.**

**Reg. No. 2022APP335**

I hereby declare that this project work entitled “**FACILE GREEN SYNTHESIS OF CARBON NANOPARTICLES FROM MEDICINALLY POTENT AZADIRACHTA INDICA**” is an original work done by me in the Department of Physics, Holy Cross College (Autonomous) Nagercoil during the academic year 2022-2024.



**GREEN AND CHEMICAL SYNTHESIS OF MONOVALENT AND  
DIVALENT METAL ION DOPED NANO HYDROXYAPATITE  
(nHAp): REMEDIATION TOWARDS HUMAN PATHOGENS  
AND CANCER CELLS**

**A THESIS**

*Submitted by*

**SEBASTIAMMAL S**

Reg. No. 17213042132003

**PHYSICS**

*in partial fulfillment of the requirements for the award of degree of*

**DOCTOR OF PHILOSOPHY**



**MANONMANIAM SUNDARANAR UNIVERSITY  
TIRUNELVELI - 627 012**

**AUGUST - 2020**





**MANONMANIAM SUNDARANAR UNIVERSITY  
TIRUNELVELI - 627 012**

**CERTIFICATE**

The research work embodied in the present Thesis entitled **“GREEN AND CHEMICAL SYNTHESIS OF MONOVALENT AND DIVALENT METAL ION DOPED NANO HYDROXYAPATITE (nHAp): REMEDIATION TOWARDS HUMAN PATHOGENS AND CANCER CELLS”** has been carried out in the Department of Physics, Holy Cross College (Autonomous), Nagercoil. The work reported herein is original and does not form part of any thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion or to any other scholar.

I understand the University’s policy on plagiarism and declare that the thesis and publications are my own work, except where specifically acknowledged and has not been copied from other sources or been previously submitted for award or assessment.

*S. Sebastianmal*  
**S. SEBASTIAMMAL**  
RESEARCH SCHOLAR

*A. Lesly Fathima*  
**Dr. A. LESLY FATHIMA**  
SUPERVISOR  
Assistant Professor  
Department of Physics  
Holy Cross College (Autonomous)  
Nagercoil-629 004

**Dr.A. LESLY FATHIMA, M.Sc. M.Phil. Ph.D.,**  
**ASSISTANT PROFESSOR OF PHYSICS,**  
**HOLY CROSS COLLEGE,**  
**NAGERCOIL-629 004.**

Place: Tirunelveli

Date: 19-08-2020



## ABSTRACT

Biomaterials in nanoscale is the topic of interest in latest biomedical research in which bioceramic materials have been used for biomedical applications due to their unique physical, mechanical and biological properties. Specifically in biomedicine, the biomaterials have been extensively studied due to their unique properties and high human osseous tissue similarity. A revolution has risen in using bioceramics to enhance the quality of human life during the last fifty years. The biocompatibility of calcium phosphate based bioceramics such as hydroxyapatite (HAp) is the key factor for dental and orthopedic applications. Hydroxyapatite (HAp) based bioceramic materials have excellent biocompatibility and osteoconductivity. HAp has a specific composition,  $\text{Ca}_{10}(\text{PO}_4)_6(\text{OH})_2$  and its crystal structure is hexagonal with a space group of  $P6_3/m$ . The suitability of apatite for substitution with other cations can be used to modify the hexagonal symmetry and obtain changes in the degree of crystallinity or in the crystallite size which are associated with the increase of stability of the structure.

The synthesis and characterization of pure and doped hydroxyapatite nanomaterials is an emerging field of nanotechnology with an extensive application in the fields of physics, chemistry, biology and medicine. As a novel synthesis approach, green route has crossed a milestone in biomedical field due to its ecofriendly nature. The present study is one such attempt with a novel green approach for the synthesis of pure, surfactant assisted, metal doped and curcumin encased hydroxyapatite nanoparticles under ambient conditions and also study its biomedical applications particularly remediation towards human pathogens and cancer cells. The present study also aims at forming nontoxic and ecofriendly HAp nanoparticles. Extensive qualitative and quantitative comparisons of the synthesized hydroxyapatite nanoparticles were measured.



Crystalline phase formation and structure were confirmed using X-ray diffraction analysis, Fourier Transform Infrared spectroscopy and Raman spectroscopy. EDAX results exhibited the qualitative elemental composition and stoichiometric ratio of synthesized HAp nanoparticles. The optical properties were determined using UV-DRS and PL studies. The toxicity assay was performed and antibacterial activity was tested against five different human bacterial pathogens such as one gram-positive (*Staphylococcus aureus* (MTCC-3123)), four gram-negative (*Shigella flexneri* (MTCC-2197), *Escherichia coli* (MTCC-4213), *Pseudomonas aeruginosa* (MTCC-3131), *Klebsiella pneumoniae* (MTCC-1214)) bacterial strains and all the hydroxyapatite nanoparticles exhibited good antibacterial activity. Further, extended study was carried out to evaluate the zone of inhibition against fungal pathogens such as *Odium caricae*, *Aspergillus niger* and *Aspergillus flavus*. The DPPH assay is a potent way to predict the antioxidant activity by analyzing the scavenging capability of HAp nanoparticles. *In vitro* cytotoxicity of biosynthesized hydroxyapatite nanoparticles was performed with HeLa cancer cell line and all the hydroxyapatite nanoparticles showed high anticancer activity. The implications of the study have been fully discussed and the scope for future research has been suggested. The results and findings are presented in this thesis which consists of *Six Chapters* along with a brief summary and conclusion.

**Chapter 1** deals with the brief introduction related to the importance, applications and properties of nanotechnology, importance of hydroxyapatite and a brief review of Hydroxyapatite (HAp) nanostructures related to the present research problem. Furthermore, it provides a literature related to the pure, metal doped and green synthesis of Hydroxyapatite nanoparticles. The structure, properties and potential applications of Hydroxyapatite (HAp) is also discussed in this chapter. Various text books, monographs and research publications have been liberally referred to in developing the subject matter of this chapter.



## DEPARTMENT OF CHEMISTRY

The Indian knowledge system continues to influence contemporary thought and practice. Integrating traditional knowledge with modern science can offer innovative solutions to current global challenges, such as sustainable development, holistic health, and intercultural understanding. Additionally, the preservation and revitalization of these traditions through education, research, and cultural initiatives are essential for maintaining their relevance and promoting a comprehensive worldview.

The synthesis of nanoparticles has emerged as a pivotal aspect of nanotechnology, offering immense potential in various fields, including medicine, agriculture, and environmental science. Among the various methods of nanoparticle synthesis, green synthesis using plant extracts has gained significant attention due to its eco-friendliness and cost-effectiveness. In this context, the Indian Knowledge System (IKS) plays a crucial role, particularly through the use of traditional medicinal plants, which have been a cornerstone of Ayurvedic and other indigenous medical practices for centuries. The bioactive compounds present in the medicinal plants facilitate the synthesis of nanoparticles. This method not only reduces the need for toxic chemicals but also enhances the biocompatibility of the nanoparticles, making them suitable for medical applications.

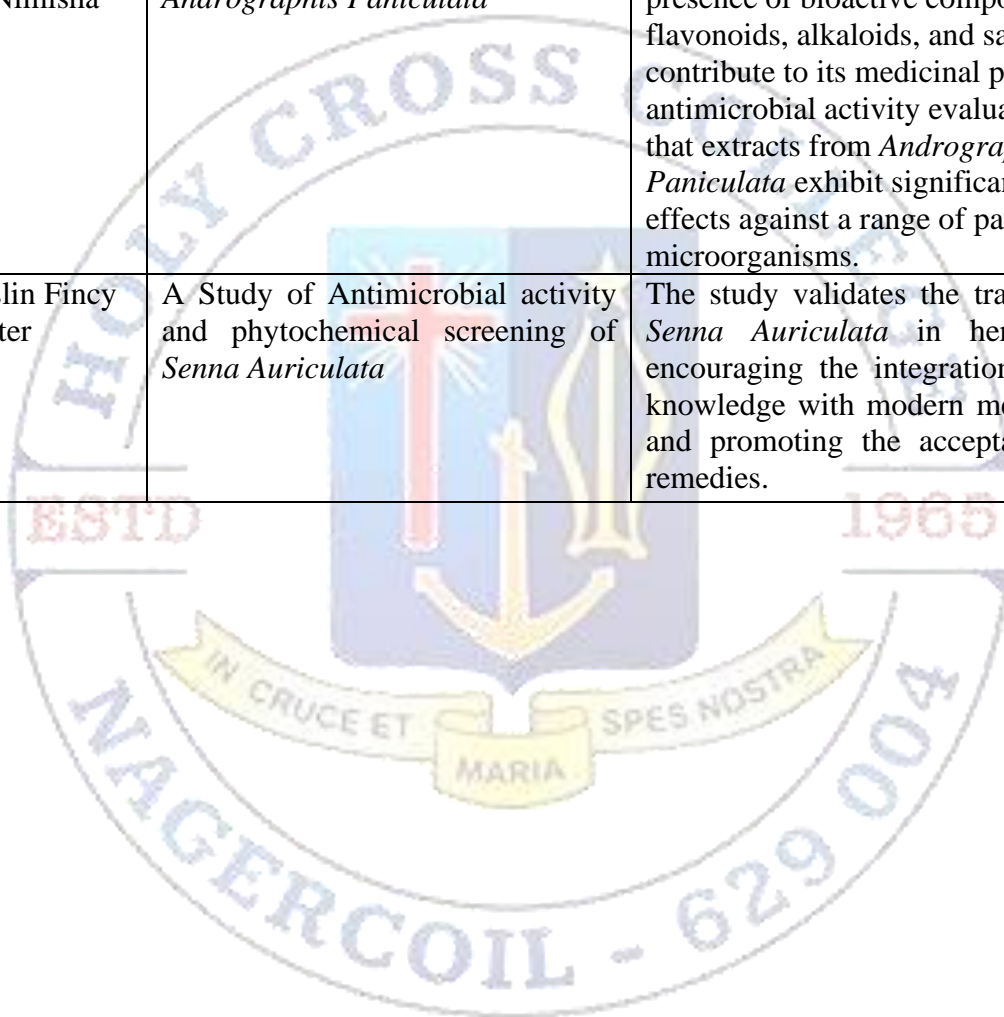
Incorporating traditional medicinal plants in nanoparticle synthesis offers several advantages. Nanoparticles synthesized using plant extracts are often more biocompatible, making them suitable for biomedical applications. The integration of IKS in the synthesis of nanoparticles is a blend of ancient wisdom and modern science.

The faculty, research scholars and students are doing research on green synthesis of nanomaterials using various medicinal plants. The use of natural plant extracts eliminates the need for harmful chemicals and thus reduces the environmental pollution.

S. No	Name of the Faculty/Scholar /Students	Title of the Project	Outcome of the Project
1.	Sr. K. Francy	Extraction of natural products from <i>Annona Muricata</i> leaves and augmenting its pharmacological properties on inclusion alpha CD	<i>Annona Muricata</i> is a locally available medicinal plant possess high pharmacological property. Stigmasterol, a well-known phytosterol present in the leaves has enhanced anti-cancerous, anti-inflammatory and anti-oxidant properties which is utilized to cure diseases as homemade remedy.
2.	Ms. L. Deva Vijila	Green Synthesis, Characterisation and applications of nanometal oxide doped Chitosan	Indian traditional medicinal plants such as <i>Euphorbia Hirta</i> , <i>Ecbolium Ligustrinum</i> , <i>Acalypha Indica</i> , <i>Cassia Occidentalis</i> and <i>Cleome Viscosa</i> are widely used in Siddha, Ayurvedha and Unani medicine. Green synthesis of metal oxide nano

			particles using alcoholic extracts of these plant leaves proved enhanced antibacterial activity as well as anticancer activity.
3.	B. Jone Magadelin	Green Synthesis and Characterisation and application of Novel metal nanoparticles using Leaf extract	Nanoparticles synthesized using medicinal plant leaf extracts exhibited better biocompatibility, making them more suitable for medical applications such as drug delivery, imaging, and antibacterial treatments.
4.	S. Ashwini	Facile synthesis, characterization and corrosion inhibition of copper-doped zinc oxide nanoparticles using fruit extract of <i>Azadirachta Indica</i>	The facile synthesis of copper-doped zinc oxide nanoparticles using fruit extract of <i>Azadirachta Indica</i> is a sustainable and biocompatible approach for producing antimicrobial agents. Characterization studies confirmed the successful incorporation of copper into the zinc oxide nanoparticles, enhancing their antimicrobial properties.
5.	J.S. Blessy	Phyto-mediated synthesis of copper oxide nanoparticles using <i>Carissa Carandas leaf extract</i> -characterization and evaluation of its antimicrobial screening efficacy	The intrinsic medicinal properties of <i>Carissa Carandas</i> leave extract can impart additional therapeutic benefits to the nanoparticles, such as improved antimicrobial and anti-inflammatory activities.
6.	J. Jenifa Heartlin	<i>Sansevieria zeylanica</i> based silver nanoparticles for the degradation of Crystal violet and Gongo red	The biosynthesized silver nanoparticles using <i>Sansevieria zeylanica</i> exhibited potent antimicrobial activity against a variety of bacterial and fungal pathogens, indicating their potential application in developing new antimicrobial agents.
7.	P. Kavena	An investigation on the green synthesis of zinc oxide nanoparticles using leaf extracts of <i>Pimento Diocia</i> and its antimicrobial potential	The synthesized zinc oxide nanoparticles using leaf extracts of <i>Pimento Diocia</i> exhibited significant antimicrobial activity, demonstrating their potential as effective agents against a range of microbial pathogens.
8.	J. Ramya	Green synthesis of zinc oxide nanoparticles using <i>Cleome Gynandra</i> extracts and its antimicrobial activity	Locally available medicinal plants <i>Cleome Gynandra</i> , can reduced the overall cost of nanoparticle production. The antimicrobial activity evaluation revealed the potent inhibitory effects of these nanoparticles against a range of pathogenic microorganisms, suggesting their potential application in combating microbial infections.

9.	S. Varshetha Rismo Sherin	Biogenic mediated synthesis of silver nanoparticles from <i>Ixora Finlaysoniana</i> and evaluate their antimicrobial activity	The biogenic synthesis of silver nanoparticles using <i>Ixora Finlaysoniana</i> leaves results in eco-friendly nanoparticles with enhanced antimicrobial properties. This green synthesis method leverages the natural bioactive compounds in the plant to produce nanoparticles that are effective against a broad spectrum of microbial pathogens.
10.	M. Anie Jenifer A. Anto Nimisha	Phytochemical screening and antimicrobial activity of <i>Andrographis Paniculata</i>	The phytochemical screening of <i>Andrographis Paniculata</i> revealed the presence of bioactive compounds such as flavonoids, alkaloids, and saponins, which contribute to its medicinal properties. The antimicrobial activity evaluation showed that extracts from <i>Andrographis Paniculata</i> exhibit significant inhibitory effects against a range of pathogenic microorganisms.
11.	F. D. Jerslin Fincy Divya Peter	A Study of Antimicrobial activity and phytochemical screening of <i>Senna Auriculata</i>	The study validates the traditional use of <i>Senna Auriculata</i> in herbal medicine, encouraging the integration of traditional knowledge with modern medical practices and promoting the acceptance of herbal remedies.



**GREEN SYNTHESIS, CHARACTERIZATION  
AND APPLICATIONS OF NANOMETAL  
OXIDE DOPED CHITOSAN**

**A THESIS**

*Submitted by*

**L. DEVA VIJILA**

**(Reg. No. 11089)**

**CHEMISTRY**

*in partial fulfilment of the requirements for the award of the degree of*

**DOCTOR OF PHILOSOPHY**



**MANONMANIAM SUNDARANAR UNIVERSITY**

**TIRUNELVELI – 627 012**

**NOVEMBER – 2022**





**MANONMANIAM SUNDARANAR UNIVERSITY  
TIRUNELVELI – 627 012**

---

**CERTIFICATE**

The research work embodied in the present and thesis entitled “**GREEN SYNTHESIS, CHARACTERIZATION AND APPLICATIONS OF NANOMETAL OXIDE DOPED CHITOSAN**” has been carried out in the Department of Chemistry and Research Centre, Women’s Christian College, Nagercoil. The work reported here is original and does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion or to any other scholar.

I understand the University’s policy on plagiarism and declare that the thesis and publications are my own work, except where specifically acknowledged and has not been copied from other sources or been previously submitted for award or assessment.

**L. DEVA VIJILA**  
RESEARCH SCHOLAR

**Dr. S. AVILA THANGA BHOOSAN**  
JOINT-SUPERVISOR  
Associate Professor of Chemistry (Rtd),  
Women’s Christian College,  
Nagercoil.

**Dr. G. LEEMA ROSE**  
SUPERVISOR  
Associate Professor of Chemistry  
(Rtd)  
Holy Cross College (Autonomous),  
Nagercoil.





## ABSTRACT

Chitosan is a biodegradable polymer obtained by deacetylation of chitin. Shrimp, *Pandalus borealis* is used as a source for chitin. Chitosan obtained by deacetylation of chitin is converted into nanochitosan. Synthesis of nanoparticles (NPs) by chemical methods pollute the environment and lead to its degradation, hence eco-friendly green methods are used in this study. Ethanolic extract obtained from the leaves of medicinal plants namely, *Acalypha indica* (*A. indica*), *Cassia occidentalis* (*C. occidentalis*), *Cleome viscosa* (*C. viscosa*), *Echolium ligustrinum* (*E. ligustrinum*) and *Euphorbia hirta* (*E. hirta*) are used as green reducing agents for the synthesis of cobalt oxide, chromium oxide, iron oxide, manganese oxide and nickel oxide NPs from their chloride salts. UV-Vis, FT-IR, XRD, SEM and TGA techniques are used for the characterization of NPs and their composites. The metal oxide NPs are incorporated into nanochitosan, and its biomedical applications are studied. Antibacterial studies showed that the incorporation of metal oxide NPs into chitosan improve their antibacterial activity. Anticancer studies done by choosing metal oxide chitosan nanocomposites obtained using *E. hirta* as reducing agent against SKMEL cell line showed improved anticancer activity. The study reveals that chitosan can be modified as a good antibacterial and anticancer agent by incorporating it with metal oxide NPs.



**FACILE SYNTHESIS, CHARACTERIZATION AND CORROSION  
INHIBITION OF COPPER-DOPED ZINC OXIDE NANOPARTICLES  
USING FRUIT EXTRACT OF AZADIRACHTA INDICA**

*Project report submitted to Holy Cross College (Autonomous), Nagercoil affiliated*

*to the Manonmaniam Sundaranar University in partial fulfillment*

*of the requirements for the award of the Degree of*

**MASTER OF SCIENCE**

**IN**

**CHEMISTRY**

**Submitted by**

**S. ASHWINI**

**(Reg. No: 2022SPG143)**



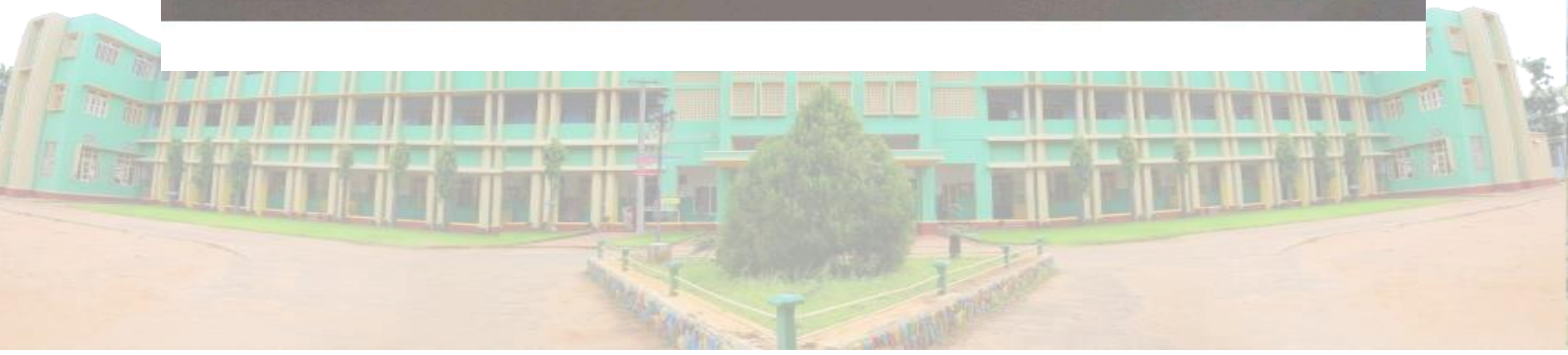
**DEPARTMENT OF CHEMISTRY**

**HOLY CROSS COLLEGE (AUTONOMOUS)**

**[ACCREDITED WITH A+ GRADE (CGPA 3.35)]**

**NAGERCOIL-629004**

**OCTOBER 2023**



Dr. M. Shirly Treasa  
Assistant Professor  
Department of Chemistry  
Holy Cross College (Autonomous), Nagercoil

CERTIFICATE

This is to certify that the project work entitled "FACILE SYNTHESIS, CHARACTERIZATION AND CORROSION INHIBITION OF COPPER-DOPED ZINC OXIDE NANOPARTICLES USING FRUIT EXTRACT OF AZADIRACHTA INDICA" submitted by S. Ashwini (Reg. No. 2022SPG143) of II M.Sc. Chemistry, Holy Cross College (Autonomous), Nagercoil in partial fulfillment of the requirement for the award of the Degree of Master of Science in Chemistry is a bonafide record of the work done by her under my supervision.

*Shirly*

Dr. M. SHIRLY TREASA  
(Supervisor)

*M. Anitha Malbi*

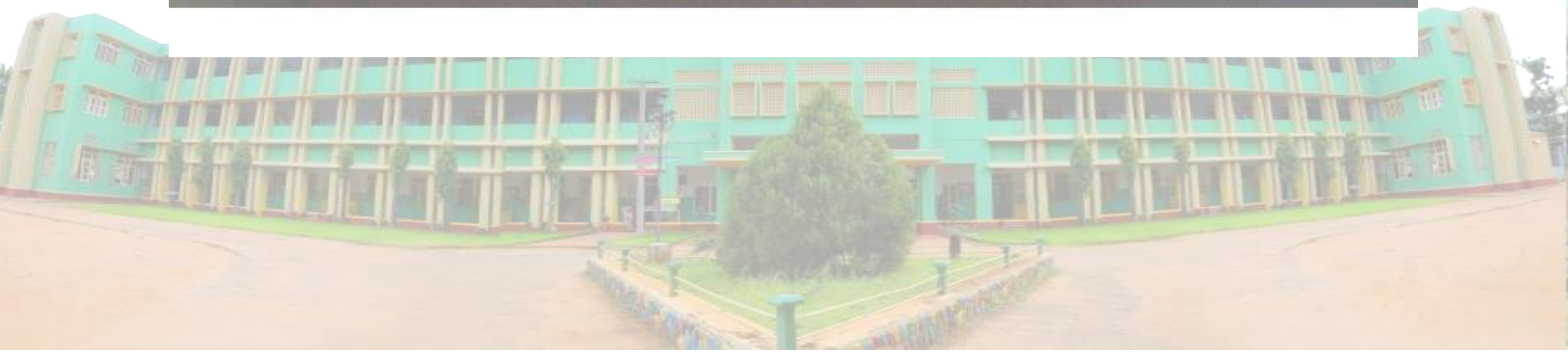
Dr. M. Anitha Malbi  
(Head of the Department)

Submitted for Viva-Voce Examination held on 31/10/2023

*J. Malaviya*  
31/10/23

External Examiner

*Aj. S*  
31/10/2023



**DECLARATION**

I hereby declare that the project work entitled "FACILE SYNTHESIS, CHARACTERIZATION AND CORROSION INHIBITION OF COPPER-DOPED ZINC OXIDE NANOPARTICLES USING FRUIT EXTRACT OF AZADIRACHTA INDICA " submitted by me for the award of the degree of Master of Science in Chemistry is the record of my original and independent project work carried out under the supervision of Dr. M. Shirly Treasa, Assistant Professor, Department of Chemistry, Holy Cross College (Autonomous), Nagercoil and it has not been submitted elsewhere for the award of any other degree or diploma, associateship or fellowship of any University or Institution.

Place: Nagercoil

Date: 31/10/2023

*Ashwini S*  
Ashwini S

(Reg. No: 2022SPG143)



**PHYTO-MEDIATED SYNTHESIS OF COPPER OXIDE  
NANOPARTICLES USING *CARISSA CARANDAS* LEAF  
EXTRACT- CHARACTERIZATION AND EVALUATION OF ITS  
ANTIMICROBIAL SCREENING EFFICACY**

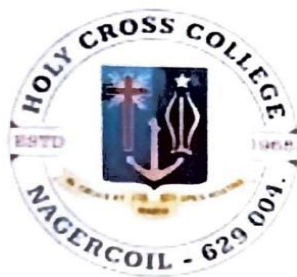
*Project report submitted to Holy Cross College (Autonomous), Nagercoil  
affiliated to Manonmaniam Sundaranar University, Tirunelveli in partial  
fulfilment of the requirements for the award of the Degree of*

**MASTER OF SCIENCE  
IN  
CHEMISTRY**

*Submitted by*

**J.S. BLESSY**

**Reg. No. : 2022SPG145**



**DEPARTMENT OF CHEMISTRY  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL - 629004  
OCTOBER 2023**



**DECLARATION**

I hereby declare that this project work entitled "**PHYTO- MEDIATED SYNTHESIS OF COPPER OXIDE NANOPARTICLES USING *CARISSA CARANDAS* LEAF EXTRACT-CHARACTERIZATION AND EVALUATION OF ITS ANTIMICROBIAL SCREENING EFFICACY**" being submitted to Holy Cross College (Autonomous) Nagercoil, affiliated to the Manonmaniam Sundaranar University, Tirunelveli in partial fulfilment of the requirement for the **Degree of Master of Science in Chemistry** is a record of the project work done by us during the period of study under the supervision and guidance of **Dr. S. LIZY ROSELET**, Assistant Professor, Department of Chemistry, Holy Cross College (Autonomous) Nagercoil. This dissertation or any part has not been submitted elsewhere for any other degree.

Place: Nagercoil

Date: 30.10.2023

  
J.S. Blessy

(Reg.No. 2022SPG145)



**SANSEVIERIA ZEYLANICA BASED SILVER NANO PARTICLES FOR  
THE DEGRADATION OF CRYSTAL VIOLET AND CONGO RED**

*Project work submitted to Holy Cross College (Autonomous) affiliated to  
the Manonmaniam Sundaranar University in partial fulfilment  
of the requirement of the award of the degree of*

**MASTER OF SCIENCE  
IN CHEMISTRY**

Submitted by

**J. JENIFA HEARTLIN**

**(Reg. No:2022SPG148)**



**DEPARTMENT OF CHEMISTRY**

**HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL-629004**

**OCTOBER 2023**



Dr.Y.Christabel Shaji

Assistant Professor

Department of Chemistry

Holy Cross College (Autonomous), Nagercoil

CERTIFICATE

This is to certify that the project work entitled "**SANSEVIERIA ZEYLANICA BASED SILVER NANO PARTICLES FOR THE DEGRADATION OF CRYSTAL VIOLET AND CONGO RED**" submitted by **J. Jenifa Heartlin** (Reg.No. 2022SPG148) of II M. Sc. Chemistry, Holy Cross College (Autonomous) Nagercoil in partial fulfilment of the requirement for the award of the Degree of Master of Science in Chemistry is a bonafide record of the work done by her under my supervision.

Place: Nagercoil

Date: 31.10.2023



Dr.Y. Christabel Shaji  
(Guide and supervisor)



External Examiner



Head of the Department





**DECLARATION**

I hereby declare that this project work entitled "*SANSEVIERIA ZEYLANICA* BASED SILVER NANO PARTICLES FOR THE DEGRADATION OF CRYSTAL VIOLET AND CONGO RED" being submitted to Holy Cross College (Autonomous) Nagercoil, affiliated to the Manonmaniam Sundaranar University, Tirunelveli in partial fulfillment of the requirement for the Degree of Master of Science in Chemistry is a record of the project work done by us during the period of study under the supervision and guidance of Dr.Y. CHRISTABEL SHAJI, Assistant Professor, Department of Chemistry, Holy Cross College (Autonomous) Nagercoil. This dissertation or any part has not been submitted elsewhere for any other degree.

Place: Nagercoil

Date : 31.10.2023

J. JENIFA HEARTLIN

**J. JENIFA HEARTLIN**

**(Reg no: 2022SPG148)**



AN INVESTIGATION ON THE GREEN SYNTHESIS OF ZINC OXIDE  
NANOPARTICLES USING LEAF EXTRACTS OF PIMENTA  
DIOICIA AND ITS ANTIMICROBIAL POTENTIAL

*Project work submitted to Holy Cross College (Autonomous) affiliated  
to the Manonmaniam Sundaranar University in partial fulfillment  
of the requirement of the award of the degree of*

MASTER OF SCIENCE

IN

CHEMISTRY

*Submitted by*

P. KAVENA

Reg. No:2022SPG151



DEPARTMENT OF CHEMISTRY

HOLY CROSS COLLEGE (AUTONOMOUS)

NAGERCOIL-629004

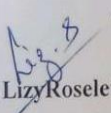
OCTOBER 2023

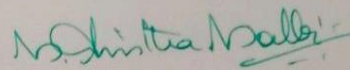


Dr. S. LizyRoselet  
Assistant Professor  
Department of Chemistry  
Holy Cross College (Autonomous), Nagercoil

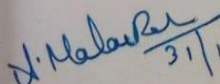
**CERTIFICATE**

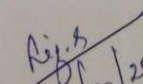
This is to certify that the project work titled "AN INVESTIGATION ON THE GREEN SYNTHESIS OF ZINC OXIDE NANOPARTICLES USING LEAF EXTRACTS OF PIMENTA DIOICIA AND ITS ANTIMICROBIAL POTENTIAL" submitted by P.KAVENA (Reg. No. 2022SPG151) of II M.Sc Chemistry, Holy Cross College (Autonomous), Nagercoil in partial fulfilment of the requirement for the award of the Degree of Master of Science in Chemistry is a bonafide record of the work done by her under my supervision.

  
Dr. S. LizyRoselet  
(Supervisor)

  
Dr. M. AnithaMalbi  
(Head of the Department)

Submitted for Viva-Voce examination held on 31/10/2023

  
31/10/23  
External Examiner

  
31/10/2023



**DECLARATION**

I hereby declare that this project work entitled "AN INVESTIGATION ON THE GREEN SYNTHESIS OF ZINC OXIDE NANOPARTICLES USING LEAF EXTRACTS OF PIMENTA DIOICIA AND ITS ANTIMICROBIAL POTENTIAL" submitted by me for the award of the degree of Master of Science in Chemistry is the record of my original and independent project work carried out under the supervision of **Dr. S. Lizy Roselet**, Assistant Professor, Department of Chemistry, Holy Cross College, Nagercoil and it has not been submitted elsewhere for the award of any other degree or diploma, associateship or fellowship of any University or Institution.

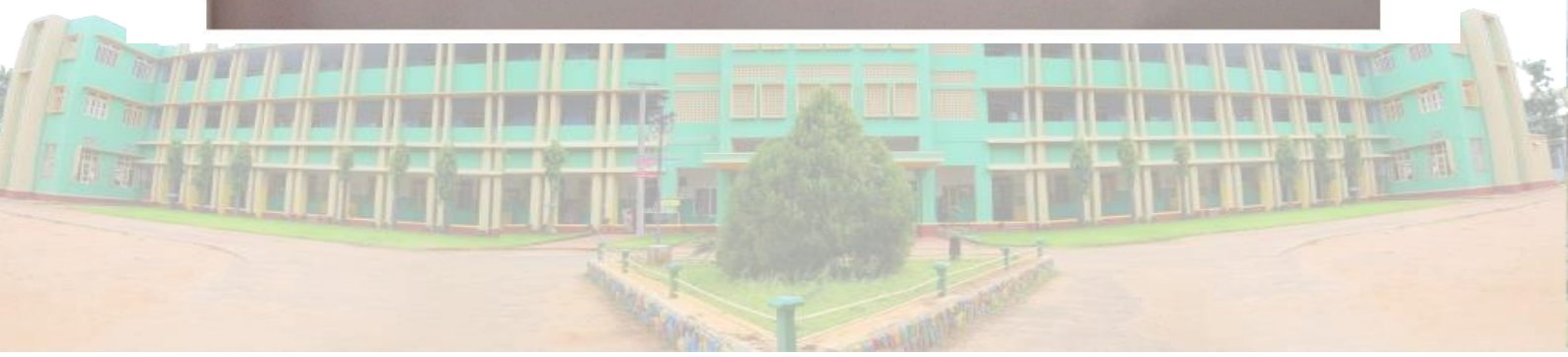
Place: Nagercoil

Date: 31.10.2023

*P. Kavena*

P.KAVENA

(Reg. No: 2022SPG151)



**GREEN SYNTHESIS OF ZINC OXIDE NANOPARTICLES USING  
CLEOME GYNANDRA EXTRACTS AND ITS ANTIMICROBIAL  
ACTIVITY**

*Project work submitted to Holy Cross College (Autonomous) affiliated  
to the Manonmaniam Sundaranar University, Tirunelveli in partial fulfilment  
of the requirements of the award of the degree of*

**MASTER OF SCIENCE  
IN  
CHEMISTRY**

*Submitted by*

**J. RAMYA**

**Reg. No: 2022SPG286**



**DEPARTMENT OF CHEMISTRY  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL-629004  
OCTOBER 2023**



**Dr.M. Antilin Princela**

**Assistant Professor**

**Department of Chemistry**

**Holy Cross College (Autonomous), Nagercoil**

**CERTIFICATE**

This is to certify that the project work entitled "GREEN SYNTHESIS OF ZIN OXIDE NANOPARTICLES USING *CLEOME GYNANDR* EXTRACTS AND ITS ANTIMICROBIAL ACTIVITY" submitted by **J. Ramya** (Reg. No. 2022SPG286) of H. M.Sc. Chemistry, Holy Cross College (Autonomous), Nagercoil, in partial fulfilment of the requirement for the award of the Degree of Master of Science in Chemistry is a bonafide record of the work done by her under my supervision.



**Dr.M. Antilin Princela**

(Supervisor)



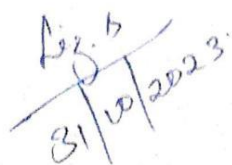
**Dr. Anitha Malbi**

(Head of the Department)

Submitted for Viva-Voce Examination held on 31.10.2023



External Examiner



31/10/2023



**DECLARATION**

I hereby declare that this project work entitled “ Green Synthesis Of Zinc Oxide Nanoparticles using *Cleome Gynandra* Extracts and it's Antimicrobial Activity” is being submitted to Holy Cross College (Autonomous) Nagercoil, affiliated to the Manonmaniam Sundaranar University, Tirunelveli in partial fulfillment of the requirement for the degree of **Master of Science in Chemistry** is a record of the project work done by me during the period of study under the supervision and guidance of **Dr. M. ANTILIN PRINCELA**, Assistant Professor, Department of Chemistry, Holy Cross College (Autonomous) Nagercoil. This dissertation or any part has not been submitted elsewhere for any other degree.

Place: Nagercoil

J. Ramya.  
J. RAMYA

Date: 31.10.2023

( Reg no: 2022SPG286)



**BIOGENIC MEDIATED SYNTHESIS OF SILVER NANOPARTICLES  
FROM IXORA FINLAYSONIANA AND EVALUATE THEIR  
ANTIMICROBIAL ACTIVITY**

**Project work submitted to Holy Cross College (Autonomous), Nagercoil  
affiliated to the *Manonmaniam Sundaranar University*, Tirunelveli in partial fulfilment  
of the requirement of the award of the degree of**

**MASTER OF SCIENCE**

**IN**

**CHEMISTRY**

Submitted by

**S. VARSHETHA RISMO SHERIN**

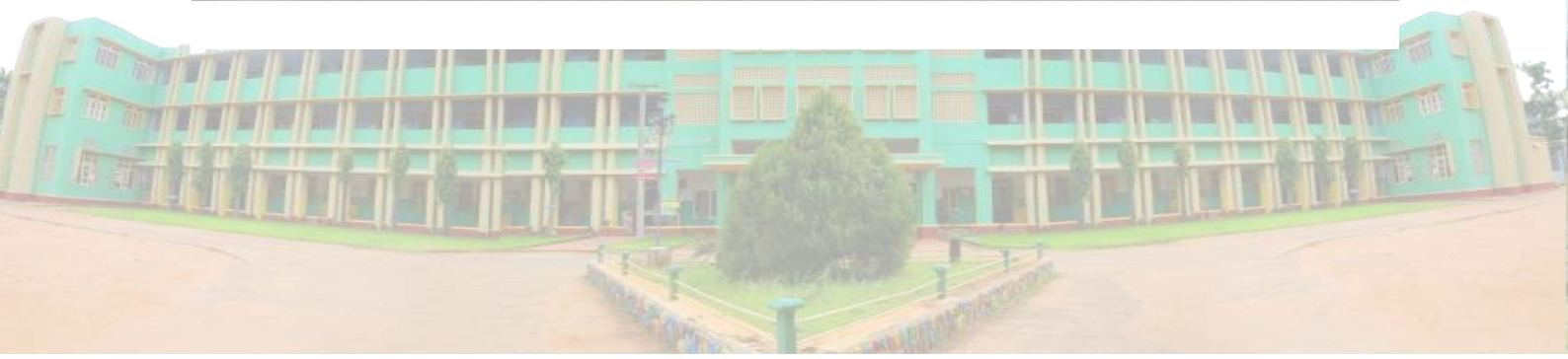
**(Reg. No:2022SPG287)**



**DEPARTMENT OF CHEMISTRY  
HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL-629004**

**OCTOBER 2023**

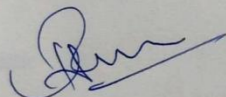




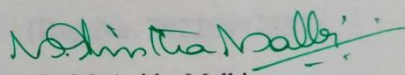
**Dr. M. Antilin Princela**  
**Assistant Professor**  
**Department of Chemistry**  
**Holy Cross College (Autonomous), Nagercoil**

**CERTIFICATE**

This is to certify that the project work entitled **“BIOGENIC MEDIATED SYNTHESIS OF SILVER NANOPARTICLES FROM IXORA FINLAYSONIANA AND EVALUATE THEIR ANTIMICROBIAL ACTIVITY”** submitted by **S. Varshetha Rismo Sherin** (Reg.No. 2022SPG287) of II M. Sc. Chemistry, Holy Cross College (Autonomous) Nagercoil in partial fulfilment of the requirement for the award of the Degree of Master of Science in Chemistry is a bonafide record of the work done by her under my supervision.

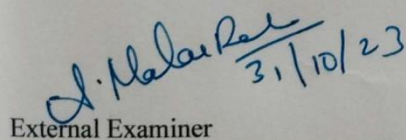


Dr. M. Antilin Princela  
(Supervisor)

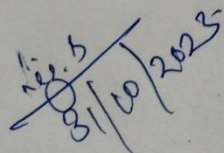


Dr.M. Anitha Malbi  
( Head of the Department)

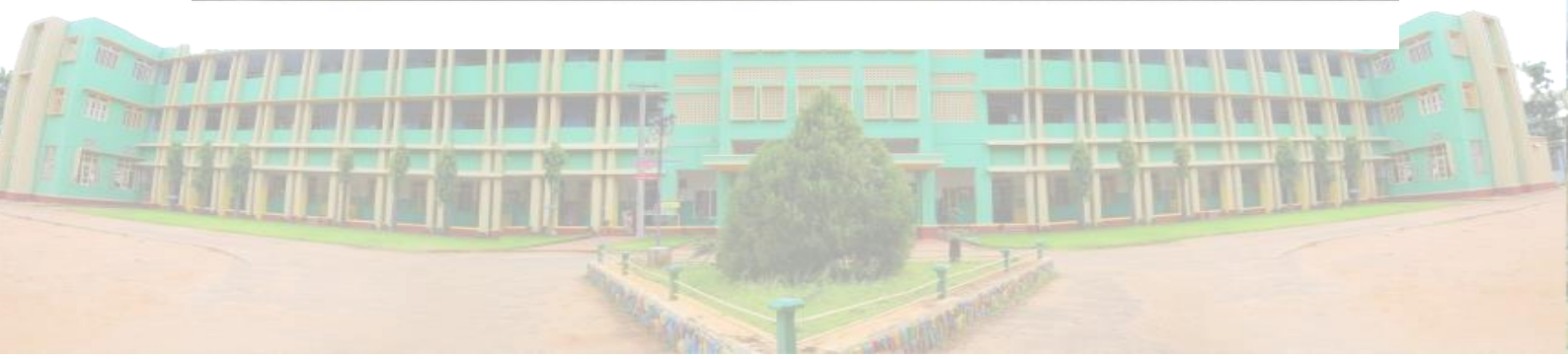
Submitted for Viva-Voce Examination held on 31.10.2023



External Examiner



31/10/23

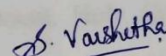


### DECLARATION

I hereby declare that the project work entitled “**BIOGENIC MEDIATED SYNTHESIS OF SILVER NANOPARTICLES FROM IXORA FINLAYSONIANA AND EVALUATE THEIR ANTIMICROBIAL ACTIVITY**” submitted by me for the award of degree of Master of Science in Chemistry is the record of my original and independent project work carried out under the supervision of **Dr. M. Antilin Princela**, Assistant Professor, Department of Chemistry, Holy Cross College (Autonomous) Nagercoil and it has not been submitted elsewhere for the award of any other degree or diploma, associateship or fellowship of any University or Institution.

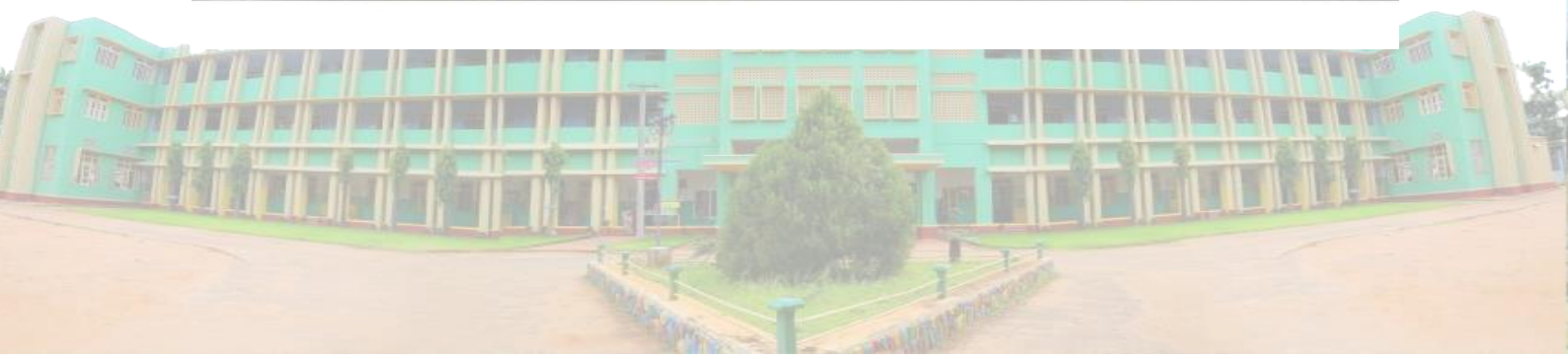
Place: Nagercoil

Date: 31.10.2023



**S. Varshetha Rismo Sherin**

**(Reg.No. 2022SPG287)**



**PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL  
ACTIVITY OF ANDROGRAPHIS PANICULATA LEAF**

*Project report submitted to Holy Cross College (Autonomous), Nagercoil  
affiliated to Manonmaniam Sundaranar University, Tirunelveli in partial  
fulfilment of the requirements for the award of the degree of*

**MASTER OF SCIENCE**

**in**

**CHEMISTRY**

*Submitted by*

**M. ANIE JENIFER      2021SPG239**

**A. ANTO NIMISHA      2021SPG379**



**DEPARTMENT OF CHEMISTRY  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL  
NOVEMBER 2022**




## CERTIFICATE

This is to certify that the project entitled “**PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITY OF ANDROGRAPHIS PANICULATA LEAF**” is a bonafide record of work done by Ms. M. ANIE JENIFER (2021SPG239) and Ms. A. ANTO NIMISHA (2021SPG379) under the guidance and supervision of **Dr. M. ANTILIN PRINCELA**, during the academic year 2022-2023 for the partial fulfillment of the requirement for the degree of Master of Science in Chemistry at Holy Cross College (Autonomous), Nagercoil, affiliated to Manonmaniam Sundaranar University, Tirunelveli.



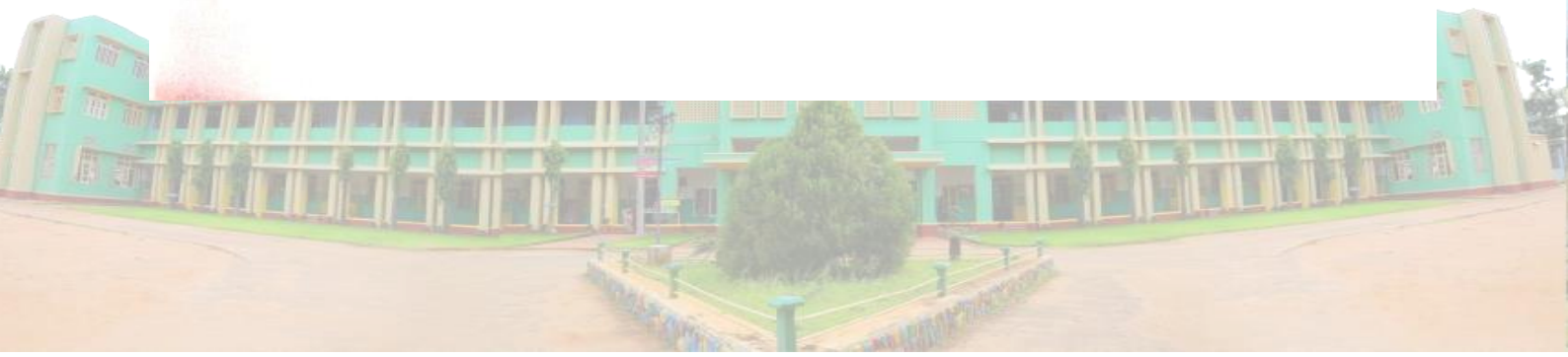
**Dr. M. Antilin Princele**  
(Supervisor)



**Dr. M. Anitha Malbi**  
(Head of the Department)

Submitted by viva Voice Examination held on

**External Examiner**



**DECLARATION**

We hereby declare that the dissertation entitled “**PHYTOCHEMICAL SCREENING AND ANTIMICROBIAL ACTIVITY OF ANDROGRAPHIS PANICULATA LEAF**” being submitted to Manonmaniam Sundaranar University, for the award of the degree of Master of Science in Chemistry is the record of our original and independent research work carried out under the guidance of **Dr. M. Antilin Princela**, Assistant Professor, Department of Chemistry, Holy Cross College (Autonomous), Nagercoil and it has not been submitted elsewhere for the award of any other degree or diploma, associateship or fellowship of any university or Institution.

Place: Nagercoil

Date: 18-11-2022

*M. Anie Jenifer.*

M. ANIE JENIFER (2021SPG239)

*A.A.*

A. ANTO NIMISHA (2021SPG379)



**A STUDY OF ANTIMICROBIAL ACTIVITY AND PHYTOCHEMICAL  
SCREENING OF SENNA AURICULATA**

*Project report submitted to Holy Cross College (Autonomous), Nagercoil affiliated to  
Manonmaniam Sundaranar University, Tirunelveli in partial fulfilment of the requirements  
for the award of the Degree of*

**MASTER OF SCIENCE  
IN  
CHEMISTRY**

*submitted by*

**F.D.JERSLIN FINCY (Reg.No: 2021SPG360)**

**DIVYA PETER (Reg.No: 2021SPG406)**



Department of Chemistry  
Holy Cross College (Autonomous)  
Nagercoil  
November 2022




**CERTIFICATE**

This is to certify that this dissertation entitled "A STUDY OF ANTIMICROBIAL ACTIVITY AND PHYTOCHEMICAL SCREENING OF SENNA AURICULATA" is a record of bonafide work done by Ms. F.D.Jerslin Fincy (2021SPG360) and Ms. Divya Peter (2021SPG406) during the academic year 2022 – 2023 under my guidance and supervision and it has not been submitted for the award of any degree, diploma, associateship or fellowship of any University or institution.

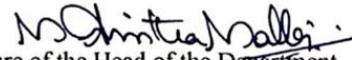
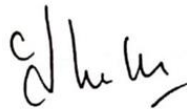
Place: Nagercoil

Date: 18-11-2022



Signature of the guide

Signature of the Examiner



Signature of the Head of the Department



## DECLARATION

We hereby declare that the dissertation entitled “A STUDY OF ANTIMICROBIAL ACTIVITY AND PHYTOCHEMICAL SCREENING OF SENNA AURICULATA” being submitted to Manonmaniam Sundaranar University, for the award of the degree of Master of Science in Chemistry is the record of our original and independent research work carried out under the guidance of **Dr.M. Shirly Treasa , M.Sc, M.Phil., Ph.D,** Asst. Professor, Department of Chemistry, Holy Cross College, Nagercoil and it has not been submitted elsewhere for the award of any other degree or diploma, associateship or fellowship of any University or Institution.

F.D.JERSLIN FINCY 

(Reg.No. 2021SPG360)

DIVYA PETER 

(Reg.No. 2021SPG406)

Place: Nagercoil

Date: 13-11-2022





## Department of Botany

23213042262011\_commencement

<http://www.qec.msupayment.in/admission/phdcounsel/payment/print...>



**MANONMANIAM SUNDARANAR UNIVERSITY**

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

**CENTRE FOR RESEARCH**

ABISHEKAPATTI, TIRUNELVELI – 627 012, TAMILNADU, INDIA

Phone : 0462 - 2333741, 9467907000, Intercom: 2563073, Mail: cfmsu@msuniv.ac.in, web: msuniv.ac.in



**DR. G.BALASUBRAMANIA RAJA**  
Director

REF : MSU/RES/Admn/July 2023 Session

Date : November 28, 2023

**Ph.D., Programme Commencement Order**

To

R AISHWARYA  
13 34 A, North street, Neyyoor  
Kanniyakumari, Tamil Nadu, Pincode - 629802  
Mobile No. : 7339454771, Email ID : lamalshwarya98@gmail.com



Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation - reg.  
Ref: Counselling attended by the candidate for July 2023 session.

\*\*\*\*\*

With reference to the above, you are provisionally registered for Ph.D., Programme as detailed below :

Name of the Scholar	R AISHWARYA
Registration No.	<b>23213042262011</b>
Discipline	Botany
Inter Disciplinary Detail	-
Gender & Community	Female & BC
Nationality	Indian
PWD Status	Not Applicable
Admission Based On	PG
Mode	FULL TIME
Research Centre	Holy Cross College (Autonomous), Nagercoil
Name of the Supervisor with Address	Dr. A. Anami Augustus Arul, Assistant Professor Department of Botany, Holy Cross College (Autonomous), Nagercoil, 629004 Mobile No. : 9159933882, Email ID : anamiaugustus@gmail.com
Name of the Co-Supervisor with Address	NIL
RAC Members	<ol style="list-style-type: none"> <li>DR T CITARASU, ASSOCIATE PROFESSOR M S UNIVERSITY RAJAKAMANGALAM 629502 Mobile No. : 9994273822, Email ID : citarasu@gmail.com</li> <li>DR M REGINALD APPAVOO, ASSOCIATE PROFESSOR SCOTT CHRISTIAN COLLEGE NAGERCOIL - 3 Mobile No. : 9443281255, Email ID : regihelen7@gmail.com</li> </ol>
Proposed Title	TAXONOMIC STUDIES ON THE COASTAL GRASSES OF KANNIYAKUMARI DISTRICT, TAMILNADU, INDIA
Date of Commencement	28.11.2023 (Fees: Rs. 16000 , Pay ID: 18633208309 , Dt: 28.11.2023)

ASSISTANT

SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR

Note : The Scholars are asked to submit the copy of Commencement order to Supervisor, Co-Supervisor (If applicable) / Research Centre / RAC Members



மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகம்  
**MANONMANIAM SUNDARANAR UNIVERSITY**  
(A State University, Re-Accredited with 'A' Grade by NAAC)  
Abishekapatti Tirunelveli – 627 012, Tamil Nadu, India

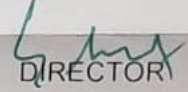


Dr. G. BALASUBRAMANIA RAJA  
DIRECTOR – CENTRE FOR RESEARCH

Date: 02.05.2023

**TITLE CHANGE ORDER**

Change of Title has been granted to Mr/Ms. S. Ani Besant,  
Reg.No. 18113042262003 as “Floristic Documentation and Mapping of Velimalai  
Reserved Forest, Kanniyakumari District, Tamil Nadu Using Remote Sensing and  
Geographical Information System”.

  
DIRECTOR

Copy to:

1. Dr. A. Anami Augustus Arul - Guide  
Assistant Professor  
Department of Botany  
Holy Cross College (Autonomous)  
Nagercoil – 629 004
2. Ms. S. Ani Besant - Candidate  
572A Main Road, Arumanalloor  
Arumanalloor Post  
Kanniyakumari – 629 853  
Mobile: 9940468012
3. Online copy

2/5



## DEPARTMENT OF ZOOLOGY

Borassus flabellifer (Palmyra palm), Cocos nucifera (Coconut), Nephelium lappaceum (Rambutan), Rauvofia tetraphyll (devil pepper), *Senna auriculata* (Avaram), *Cardiospermum calicacabum* (Balloon vine), and *Clerodendrum phlomisids* (Bharangi) are extensively used in traditional Indian medicine. The Palmyra palm, has been used in Ayurvedic medicine for its antimicrobial properties. Coconut has been a staple in Ayurvedic practices, with various parts used for their healing properties. *Rauvolfia tetraphylla* is a significant plant in both traditional and modern medicine, valued for its alkaloid content that can treat various conditions. *Senna auriculata* (Avaram) is a well-known plant in traditional Indian medicine, particularly in Siddha and Ayurveda, for its use in treating skin diseases, diabetes, and as an antimicrobial agent. *Cardiospermum halicacabum* is valued for its anti-inflammatory and analgesic properties. *Clerodendrum phlomidis* is used extensively in Ayurvedic medicine for its wide range of therapeutic effects.

These studies tap into ethno botanical knowledge, which is a crucial component of IKS. It involves understanding the use of plants by indigenous cultures, including their application in treating diseases and their role in maintaining health. By conducting a comparative study of the *in vitro* antimicrobial activity of these plants, our research integrates traditional knowledge with modern scientific methods. These works promote the use and conservation of indigenous plants that are part of India's heritage. Indian Knowledge Systems have always emphasized holistic health and wellness. Our research contributes to this by exploring natural remedies for pathogenic bacteria and fungi, aligning with the traditional Indian emphasis on natural and holistic health solutions. Our study helps in documenting and potentially reviving traditional practices by providing scientific validation. This is crucial for the preservation and continuation of IKS, ensuring that valuable traditional knowledge is not lost.

S. No	Name of the Students	Title of the project	Outcome of the Project
1	Anushya s, Devi I, Karthika J, Moniha Rabi M, Sahaya Resolin S, Subha S	A comparative study of <i>in-vitro</i> antimicrobial activity of endocarp of <i>Borassus flabellifer</i> and <i>Cocos nucifera</i> and different parts of the plant, <i>Senna auriculata</i> against pathogenic bacteria and fungi	The traditional use of <i>Borassus flabellifer</i> , <i>Cocos nucifera</i> , and <i>Senna auriculata</i> showcases the depth and richness of the Indian knowledge system in utilizing natural resources for medicinal purposes.
2	Shalin M	Evaluation of antibacterial activity of in edible parts of <i>Nephelium lappaceum</i> fruits	In this study, we explored the medicinal uses of <i>Nephelium lappaceum</i> (rambutan) fruits within the Indian Knowledge System (IKS) and examined their antibacterial properties through scientific analysis.
3	Bhahima Muruzitha S	Evaluation of antibacterial activity of ripe and unripe fruit extracts <i>Rauvofia tetraphylla</i>	In this study, we evaluated the antibacterial activity of ripe and unripe fruit extracts of <i>Rauvolfia tetraphylla</i> within the framework of the Indian Knowledge System

4	Anantha Lekshmi S, Arul Deepika A, Denno E, Preethi S and Rosari Jenifer S	The antimicrobial activity of <i>Cardiospermum calicacabum</i> , and <i>Clerodendrum phlosmids</i>	This study evaluated the antimicrobial activity of extracts from <i>Cardiospermum halicacabum</i> and <i>Clerodendrum phlomidis</i> within the Indian Knowledge System
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**A COMPARATIVE STUDY OF *IN VITRO* ANTIMICROBIAL ACTIVITY OF ENDOCARP OF *BORASSUS FLABELLIFER* AND *COCOS NUCIFERA* AND DIFFERENT PARTS OF THE PLANT, *SENNA AURICULATA* AGAINST PATHOGENIC BACTERIA AND FUNGI**

*Project report submitted to Holy Cross College (Autonomous), Nagercoil, affiliated to Manonmaniam Sundaranar University, Tirunelveli in partial fulfillment of the requirements for the award of the degree of*

**BACHELOR OF SCIENCE  
in  
ZOOLOGY**

Submitted By

NAME	REGISTER NUMBER
Anushya, S.	2017224
Devi, L.	2017230
Karthika, J.	2017236
Moniha Rabi, M.	2017242
Sahaya Resolin, S.	2017249
Suba, S.	2017254



**HOLY CROSS COLLEGE (AUTONOMOUS)**

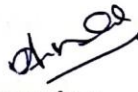
**NAGERCIOIL - 629 004**


**MARCH - 2020**




**BONAFIDE CERTIFICATE**

This is to certify that the project report entitled "A comparative study of *in vitro* antimicrobial activity of endocarp of *Borassus flabellifer* and *Cocos nucifera* and different parts of the plant, *Senna auriculata* against pathogenic bacteria and fungi" submitted by Anushya, S (Reg. No: 2017224), Devi, L (Reg. No: 2017230), Karthika, J (Reg. No: 2017236), Moniha Rabi, M (Reg. No: 2017242), Sahaya Resolin, S (Reg. No: 2017249) and Suba, S (Reg. No: 2017254) to Holy Cross College (Autonomous), Nagercoil, affiliated to Manonmaniam Sundaranar University, Tirunelveli towards the partial fulfillment of the requirements for the degree of Bachelor of Science in Zoology, is a bonafide record of the work carried out by them under the guidance and supervision of Dr. C. Anitha, Asst. Professor, Department of Zoology, Holy Cross College (Autonomous), Nagercoil.

  
Supervisor

  
Head of the Department  
Dr. S. MARY METTILDA BAI  
Head, Department of Zoology  
Holy Cross College (Autonomous)  
Nagercoil - 629 004

Submitted for Viva Voce Examination held on ...26/09/20

  
(E. Brisca Renuga)  
External Examiner



**Dr. C. Anitha, M.Sc., M.Phil, B. Ed., Ph.D**  
**Assistant Professor,**  
**Department of Zoology,**  
**Holy Cross College (Autonomous)**  
**Nagercoil – 629 004**

**CERTIFICATE**

This is to certify that the project report entitled “A comparative study of *in vitro* antimicrobial activity of endocarp of *Borassus flabellifer* and *Cocos nucifera* and different parts of the plant, *Senna auriculata* against pathogenic bacteria and fungi” is a bonafide record of work done by Anushya, S (Reg. No: 2017224), Devi, L (Reg. No: 2017230), Karthika, J (Reg. No: 2017236), Moniha Rabi, M (Reg. No: 2017242), Sahaya Resolin, S (Reg. No: 2017249) and Suba, S (Reg. No: 2017254) under my supervision during their tenure towards partial fulfillment of the requirement for the degree of Bachelor of Science in Zoology at Holy Cross College (Autonomous), Nagercoil, affiliated to Manonmaniam Sundaranar University, Tirunelveli. This dissertation or any part of this has not been submitted elsewhere for any other degree.

Place: Nagercoil

Date: 26.09.2020



(Dr. C. Anitha)

Supervisor



**DECLARATION**

We do hereby affirm that the project report entitled “A comparative study of *in vitro* antimicrobial activity of endocarp of *Borassus flabellifer* and *Cocos nucifera* and different parts of the plant, *Senna auriculata* against pathogenic bacteria and fungi” being submitted to Holy Cross College (Autonomous), Nagercoil, affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfillment of the degree of Bachelor of Science in Zoology is based on our Anushya, S (Reg. No: 2017224), Devi, L (Reg. No: 2017230), Karthika, J (Reg. No: 2017236), Moniha Rabi, M (Reg. No: 2017242), Sahaya Resolin, S (Reg. No: 2017249) and Suba, S (Reg. No: 2017254) studies carried out under the guidance of Dr. C. Anitha, Assistant Professor in the Department of Zoology, Holy Cross College, (Autonomous), Nagercoil and this work has not been submitted elsewhere for any other degree.

Place: Nagercoil

Date: 26.09.2020

NAME	REGISTER NUMBER	SIGNATURE
Anushya, S.	2017224	S. Anushya
Devi, L.	2017230	L. Devi
Karthika, J.	2017236	J. Karthika
Moniha Rabi, M.	2017242	M. Moniha
Sahaya Resolin, S.	2017249	S. Sahaya Resolin
Suba, S.	2017254	S. Suba



**EVALUATION OF ANTIBACTERIAL ACTIVITY OF INEDIBLE PARTS OF  
*NEPHELIUM LAPPACEUM* (RAMBUTAN) FRUITS**

Dissertation submitted to Holy Cross College (Autonomous), Nagercoil  
Affiliated to Manonmaniam Sundaranar University, Tirunelveli  
in partial fulfilment of the requirements for the award of the degree of

**MASTER OF SCIENCE**

**in**

**ZOOLOGY**

**by**

**SHALIN M (Reg. No.: 2022APZ354)**



**DEPARTMENT OF ZOOLOGY  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL 629 004  
NOVEMBER 2023**



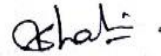


**DECLARATION**

I do hereby affirm that the dissertation entitled “**Evaluation of antibacterial activity of inedible parts of *Nephelium lappaceum* (Rambutan) fruits**” being submitted to Holy Cross College (Autonomous), Nagercoil, affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfilment of the award of the degree of **Master of Science in Zoology** is based on my, **Shalin M (Reg. No.: 2022APZ354)** research work carried out by us under the guidance of **Dr. C. Anitha**, Department of Zoology, Holy Cross College (Autonomous), Nagercoil during the academic year 2023-2024 and this work has not been submitted elsewhere for any other degree.

Place: Nagercoil

Date: 31/10/23



**Shalin M (Reg. No.: 2022APZ354)**




**Dr. C. Anitha,**  
**Assistant Professor,**  
**Department of Zoology,**  
**Holy Cross College (Autonomous),**  
**Nagercoil – 629 004.**

**CERTIFICATE**

This is to certify that the dissertation entitled “**Evaluation of antibacterial activity of inedible parts of *Nephelium lappaceum* (Rambutan) fruits**” is a bonafide record of the research work done by **Shalin M (Reg. No.: 2022APZ354)** under my supervision during their tenure towards the partial fulfilment of the requirement for the award of the degree of **Master of Science in Zoology** at Holy Cross College (Autonomous), Nagercoil, affiliated to Manonmaniam Sundaranar University, Tirunelveli during the academic year 2023-2024. This dissertation or any part of this has not been submitted elsewhere for any other degree.

**Place: Nagercoil**

**Date: 31/10/23**

  
**Dr. C. Anitha**  
**Research Supervisor**



**BONAFIDE CERTIFICATE**

This is to certify that the dissertation entitled “**Evaluation of antibacterial activity of inedible parts of *Nephelium lappaceum* (Rambutan) fruits**” submitted by **Shalin M (Reg. No.: 2022APZ354)** towards the partial fulfilment of the requirements for the award of the degree of Master of Science in Zoology, is a bonafide record of the research work carried out by them during the academic year 2023-2024 under the guidance and supervision of **Dr. C. Anitha** , Assistant Professor, Department of Zoology, Holy Cross College (Autonomous), Nagercoil and that this project has not been previously formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or any other similar title.



**Head of the Department of Zoology**

**Dr. A. SHYLA SUGANTHI, M.Sc., Ph.D.,**  
**HOD, Department of Zoology**  
**Holy Cross College (Autonomous)**  
**Nagercoil-629 004**

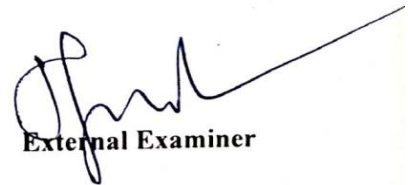


**Dr. C. Anitha**

**Research Supervisor**

Submitted for Viva Voice Examination held on .....

31/10/23



**External Examiner**



**EVALUATION OF ANTIBACTERIAL ACTIVITY OF RIPE AND UNRIPE FRUIT  
EXTRACTS OF *RAUVOLFIA TETRAPHYLLA***

Dissertation submitted to Holy Cross College (Autonomous), Nagercoil  
Affiliated to Manonmaniam Sundaranar University, Tirunelveli  
in partial fulfilment of the requirements for the award of the degree of

**MASTER OF SCIENCE  
IN  
ZOOLOGY**

by  
**BHAHIMA MURUZITHAS**  
(Reg. No.: 2022APZ346)



**DEPARTMENT OF ZOOLOGY  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL-629004  
NOVEMBER 2023**

## DECLARATION

I do hereby affirm that the dissertation entitled “**Evaluation of antibacterial activity of ripe and unripe fruit extracts of *Rauvolfia tetraphylla***” being submitted to Holy Cross College (Autonomous), Nagercoil, affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfilment of the award of the degree of **Master of Science in Zoology** is based on my, **Bhahima Muruzitha S (Reg. No.: 2022APZ346)** research work carried out by us under the guidance of **Dr. C. Anitha**, Department of Zoology, Holy Cross College (Autonomous), Nagercoil during the academic year 2023-2024 and this work has not been submitted elsewhere for any other degree.

**Place: Nagercoil**

**Date: 31-10-2023**

*Bhahima Muruzitha S*

**Bhahima Muruzitha S (Reg. No.: 2022APZ346)**



**BONAFIDE CERTIFICATE**

This is to certify that the dissertation entitled “**Evaluation of antibacterial activity of ripe and unripe fruit extracts of *Rauvolfia tetraphylla***” submitted by **Bhahima Muruzitha. S (Reg. No.: 2022APZ346)** towards the partial fulfilment of the requirements for the award of the degree of Master of Science in Zoology, is a bonafide record of the research work carried out by them during the academic year 2023-2024 under the guidance and supervision of **Dr. C. Anitha** Assistant Professor, Department of Zoology, Holy Cross College (Autonomous), Nagercoil and that this project has not been previously formed the basis for the award of any Degree, Diploma, Associateship, Fellowship or any other similar title.



Head of the Department of Zoology

**Dr.A. SHYLA SUGANTHI, M.Sc., Ph.D.**  
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Dr. C. Anitha

Research Supervisor

Submitted for Viva Voice Examination held on ..31.10.2023



External Examiner



**Dr. C. Anitha**

**Assistant Professor**

**Department of Zoology**

**Holy Cross College (Autonomous)**


**Nagercoil – 629 004.**

**CERTIFICATE**

This is to certify that the dissertation entitled “**Evaluation of antibacterial activity of ripe and unripe fruit extracts of *Rauvolfia tetraphylla***” is a bonafide record of the research work done by **Bhahima Muruzitha S (Reg. No.: 2022APZ346)** under my supervision during their tenure towards the partial fulfilment of the requirement for the award of the degree of **Master of Science in Zoology** at Holy Cross College (Autonomous), Nagercoil, affiliated to Manonmaniam Sundaranar University, Tirunelveli during the academic year 2023-2024. This dissertation or any part of this has not been submitted elsewhere for any other degree.

**Place: Nagercoil**

**Date: 31.10.2023**



**Dr. C. Anitha**

**Research Supervisor**



**THE ANTIMICROBIAL ACTIVITY OF *CARDIOSPERMUM*  
*HALICACABUM* AND *CLERODENDRUM PHLOSMIDS***

Project report submitted to Holy Cross College (Autonomous), Nagercoil  
affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfilment of  
the requirements for the award of the Degree of

**BACHELOR OF SCIENCE**

**IN**

**ZOOLOGY**

Submitted by

Name	Reg. No
Anantha Lakshmi S	2019231
Arul Deepika A	2019234
Denno E	2019242
Preethi S	2019253
Rosari Jenifer S	2019253



**DEPARTMENT OF ZOOLOGY**  
**HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL - 629004**

**May – 2022**



**THE ANTIMICROBIAL ACTIVITY OF *CARDIOSPERMUM HALICACABUM* AND *CLERODENDRUM PHLOSMIDS***

Project report submitted to Holy Cross College (Autonomous), Nagercoil affiliated to Manonmaniam Sundaranar University, Tirunelveli, in partial fulfilment of the requirements for the award of the Degree of

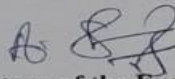
**BACHELOR OF SCIENCE  
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ZOOLOGY**

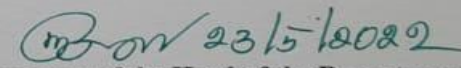
Submitted by

Name	Reg. No
Anantha Lakshmi S	2019231
Arul Deepika A	2019234
Denno E	2019242
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Rosari Jenifer S	2019253



**DEPARTMENT OF ZOOLOGY  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL - 629004  
May - 2022**

  
Signature of the Examiner

  
Signature of the Head of the Department

**Dr. F. BRISCA RENUGA  
HOD - Department of Zoology  
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Nagercoil - 629 004**



Dr. S. Prakash Shoba, M.Sc., M. Phil., Ph.D., PG Dip. HRM

Assistant Professor in Zoology

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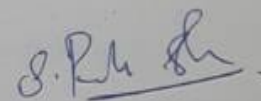
Nagercoil – 4

### CERTIFICATE

This is to certify that the dissertation entitled “The antimicrobial activity of *Cardiospermum halicacabum* and *Clerodendrum phlosmids*.” submitted to Holy Cross College (Autonomous), Nagercoil affiliated to Manonmanium Sundaranar University, Tirunelveli in partial fulfilment of the requirements for the award of the degree of Bachelor of Science in Zoology is a bonafide work done by Anantha Lakshmi S, Arul Deepika A, Denno E, Preethi S and Rosari Jenifer S at the Department of Zoology, Holy Cross College (Autonomous), Nagercoil during the academic year 2021-2022 under my guidance and supervision. This dissertation or any part of this has not been submitted elsewhere for any other degree.

Place: Nagercoil

Date: 23.05.2022



(Dr. S.PRAKASH SHOBA)



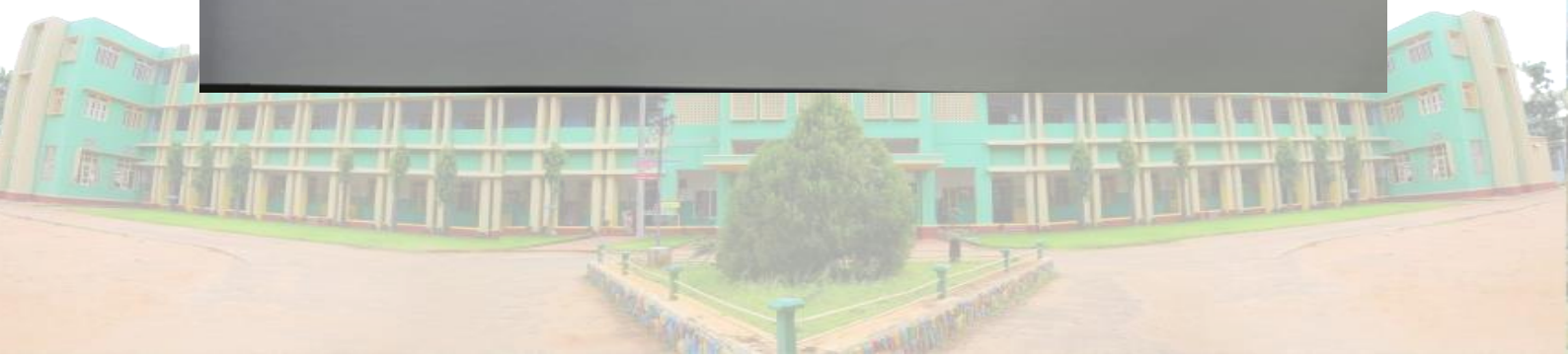
**DECLARATION**

We hereby declare that the dissertation entitled "The antimicrobial activity of *Cardiospermum halicacabum* and *Clerodendrum phlosmids*:" submitted by us for the partial fulfilment of the requirements for the award of the Degree of Bachelor of Science in Zoology is the results of our original work carried out between the period 2021-2022 under the guidance and supervision of Dr. S. Prakash Shoba, Assistant Professor, Department of Zoology, Holy Cross College (Autonomous), Nagercoil. This dissertation or any part of this has not been submitted elsewhere for any degree.

Place: Nagercoil

Date: 23.05.2022

	Name	Reg. No
S. Anantha Lakshmi	Anantha Lakshmi S	2019231
Arul	Arul Deepika A	2019234
Denno E	Denno E	2019242
Preethi S	Preethi S	2019253
Rosari Jenifer S	Rosari Jenifer S	2019253



**IDENTIFICATION, ISOLATION AND PURIFICATION  
OF NONTOXIC PHYTOCHEMICALS WITH  
THROMBOLYTIC POTENTIAL**

**A THESIS**

*Submitted by*

**LATHA N**

Reg. No. 17213042012002

**ZOOLOGY**

*in partial fulfilment of the requirements for the award of degree of*

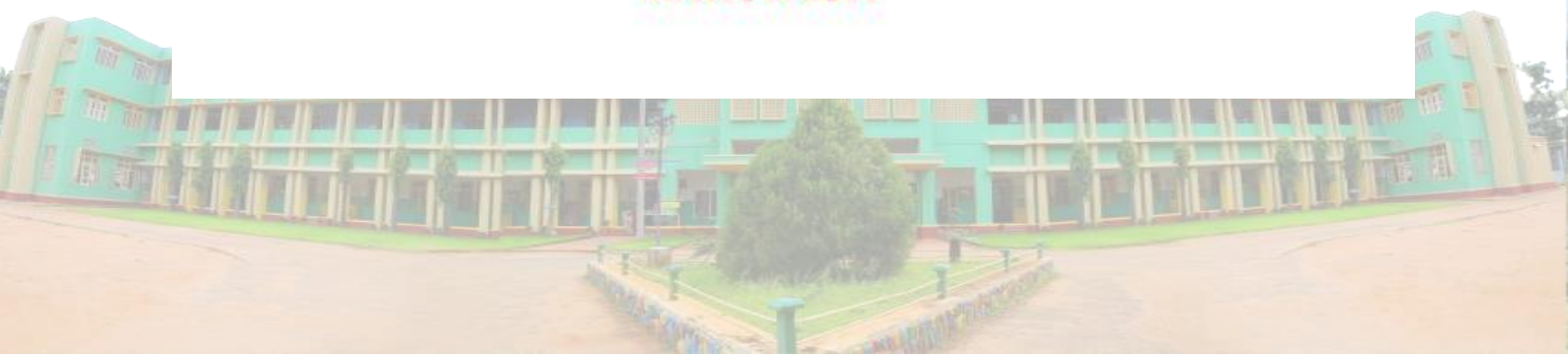
**DOCTOR OF PHILOSOPHY**



**MANONMANIAM SUNDARANAR UNIVERSITY**

**TIRUNELVELI – 627 012**

**MARCH 2021**





**MANONMANIAM SUNDARANAR UNIVERSITY**

**TIRUNELVELI - 627 012**

---

### **CERTIFICATE**

The research work embodied in the present Thesis entitled **“IDENTIFICATION, ISOLATION AND PURIFICATION OF NONTOXIC PHYTOCHEMICALS WITH THROMBOLYTIC POTENTIAL”** has been carried out in the Department of Zoology, Holy Cross College (Autonomous), Nagercoil. The work reported herein is original and does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion or to any other scholar.

I understand the University’s policy on plagiarism and declare that the thesis and publications are my own work, except where specifically acknowledged and has not been copied from other sources or been previously submitted for award or assessment.

**LATHA N**  
RESEARCH SCHOLAR

**Dr. Sr. M.R. BASIL ROSE**  
SUPERVISOR  
Department of Zoology  
Holy Cross College (Autonomous),  
Nagercoil.



Department of Tamil (S.F)

S.No	Name of the Student	Title of the Project	Outcome of the Project
1	N.Safrin Nisha S.Saranya S.Udhaya S.Abinaya	Bharathi Dhasanin Kudumba Vilakkil Pengalin Kudumba Vazhviyal Sitharippu	This Study delves into the cultural, social, and familial dynamics specific to Indian society (IKS). By examining the roles and responsibilities of women within the family structure through the lens of Indian thought and tradition, it contributes to a deeper understanding of indigenous knowledge systems and their influence on societal norms and values.
2	M. Durga Devi E. Sakthi M. Maria Abisha V. Muthu Subha	Susindram Thanumalayan Kovil Varalaru (Sushindiram Thanumalayan Temple History)	The history of temples intertwines with various aspects of Indian culture, religion, architecture, art, and societal structures, making it a significant part of IKS. Studying the history of such temples provides insights into the rich cultural and religious heritage of India, reflecting the socio-cultural dynamics and historical developments of the region.
3	D. Ashika G. Jafini Rose A. Libisha S.T. Saki	Kaivinai Tholilum Pengalin Vazhkai Nilaium (Life and Status of Women in Work and Family)	Studying and understanding the intricacies of women's lives in work and family contexts contribute to a broader understanding of Indian culture, social structures, and historical developments, thus aligning with the scope of IKS.



பாரதிதாசனின் குடும்ப விளக்கில் பெண்களின் குடும்ப வாழ்வியல் சித்தரிப்பு

மனோன்மனியம் சுந்தரனார் பல்கலைக்கழக இளங்கலை

பட்டத்திற்காக அளிக்கப்படும் திட்ட ஏடு

திட்டக் குழுவின்

ஆய்வாளர்கள்

பதிவு எண்

நா.சபின் நிஷா

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ச.சரண்பா

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செ.அபிநயா

2021SUT416

மேற்பார்வையாளர்

முனைவர் செ.ஐடா



தமிழ்த்துறை (சுயநிதி)

திருச்சிலுவைக் கல்லூரி (தன்னாட்சி)

நாகர்கோவில் - 629004.

அக்டோபர் - 2023

மேற்பார்வையாளர் சான்றிதழ்

"பாரதிதாசனின் குடும்ப விளக்கில் பெண்களின் குடும்ப வாழ்வியல் சிந்தரிப்பு" எனும் நலையில் அமைந்த இத்திட்ட ஏடு மனோன்மனியம் சுந்தரனா பல்கலைக்கழக இளங்கலைப் பட்டப்படிப்பிற்காகத் திருச்சிலுவை கல்லூரி, நாகர்கோவில் தமிழ்த்துறையில் பயிலும் மூன்றாம் ஆண்டு மாணவிகள் நா.சப்ரின் நிஷா, ச.சரண்யா, ச.உதயா, செ.அபிநயா ஆகியோர்கள் குழுவாகச் செய்யப்பட்ட ஆய்வினால் உருவானது எனச் சான்று அளிக்கிறேன்.

  
துறைத்தலைவர்

முனைவர் சி.ஆன்சி மோள்

Department of Tamil (S.F.)  
Holy Cross College (Autonomous)  
Nagercoil - 629 004.

இடம்: நாகர்கோவில்,  
நாள்: 31/10/2023

  
மேற்பார்வையாளர்

முனைவர் செ.ஐடா  
BA., Blit., Bed., M.A., M.Phil., Phd.

  
அகமதிப்பீட்டாளர்

  
31/10/2023  
புறத்திட்டாளர்





ஆய்வாளர் உறுதிமொழி

"பாரதிதாசனின் குடும்ப விளக்கில் பெண்களின் குடும்ப வாழ்வியல் சித்தரிப்பு" என்னும் தலைப்பில் மனோன்மணியம் சுந்தரனார் பல்கலைக் கழகத்தின் இளங்கலைப் பட்டத்திற்காக எழுதப்பட்ட இத்திட்ட ஏடு, எங்களின் முழு முயற்சியால் உருவானது ஆகும். இத்திட்ட ஏடு இதற்கு முன் வேறு எந்தப்பட்டத்திற்கும் அளிக்கப்படவில்லை என்று உறுதியளிக்கிறோம்.

ஆய்வாளர்கள்

கையொப்பம்

நா.சப்ரின் நிஷா

நா. சப்ரின் நிஷா

ச.சரண்யா

ச.சரண்யா

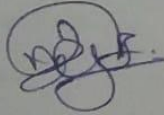
ச.உதயா

ச. உதயா

செ.அபிநயா

செ. அபிநயா

மேற்பார்வையாளர் கையொப்பம்



பொருளடக்கம்

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1.1 திட்ட முன்னுரை:

உலக மொழிகளின் தாயாக விளங்கும் தமிழ் மொழியில் சிறப்புக்குரிய பல இலக்கியங்கள் எழுந்துள்ளன. பாரதிதாசன் படத்தருளிய குடும்ப விளக்கு தமிழுக்குப் பெருமைச் சேர்த்துள்ளது. சமூகக் கட்டமைப்பின் குடும்பவாழ்வை சிறப்பாக எடுத்துரைத்தோடு பெண்களின் பங்களிப்பு குடும்பத்தில் அச்சாணி போல் உள்ளதைப் படம் பிடித்துக் காட்டுகிறது.

1.2 திட்ட நோக்கம்:

சமூகத்தில் பெண்கள் அவர்களின் குடும்பத்திற்காகச் செய்யும் தொண்டுகளையும், சூழ்நிலைகளையும், பராமரிப்பது பற்றி விளக்குவது இத்திட்ட நோக்கம்.

1.3 திட்டத் தலைப்பு:

பாரதிதாசனின் குடும்ப விளக்கில் பெண்களின் குடும்ப வாழ்வியல் சித்தரிப்பு என்பது ஆய்வு தலைப்பாக அமைந்துள்ளது.

1.4 திட்டக் காரணம்:

குடும்ப விளக்கில் ஒரு பெண் வீட்டிற்கு வரும் விருந்தினரை எவ்வாறு வரவேற்று உபசரிக்க வேண்டும் என்றும், குடும்பத்தில் அவளின் பங்களிப்பும், அவள் குழந்தைகளையும், பெரியவர்களையும் எவ்வாறு பராமரிக்கிறாள் என்றும் பண்பையும் வைத்து "பாரதிதாசனின் குடும்ப விளக்கில் பெண்களின் குடும்ப வாழ்வியல் சித்தரிப்பு" என்றத் தலைப்புத் தேர்ந்தெடுக்க காரணம் ஆகும்.

1.5 திட்ட அணுகு முறை:

பகுப்பாய்வு அணுகு முறையும், விளக்கியல் அணுகு முறையும் பயன்படுத்தப்பட்டுள்ளது.

இளங்கலை மூன்றாம் ஆண்டு தமிழ் இலக்கியம்  
சுற்றுச்சூழல் கல்வி

திட்டக் கட்டுரை

கட்டுரையாளர்கள்	பதிவுஎண்
மு.துர்கா தேவி	2020SUT004
இ.சக்தி	2020SUT132
அ.மரிய அபிஷா	2020SUT158
வெ.முத்து சுபா	2020SUT162

முனைவர் சி ஆன்சிமோள்  
தமிழ்துறை (சுயநிதி)



திருச்சிலுவைக் கல்லூரி

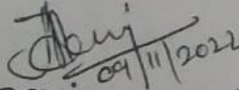
நாகர்கோவில் 629004

நவம்பர் 2022

மேற்பார்வை யாளர் சான்றிதழ்

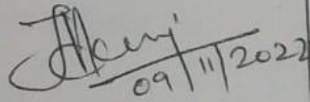
கிராமங்கலை மூன்றாமாண்டு தரவரிதழ்

இலக்கியம் சிற்றஞ்சகூழல் கல்விக்காக 'சசீந்திரம்'  
தூண்புமாவயன் கோவிதின் வரலாறு' என்கும்  
தலையயில் பிணைந்த தியக்கபுரை மு.சூர்கா தெவி,  
சி.சக்தி, சி.மரிய பிணைவு, வ.கிஞ்சு சபா  
சூகியோர்க்களால் சிணைவாக சிணையப்பபு. என்கும்  
சான்றளிக்கிறேன்.

  
09/11/2022  
சூணைத்தலையவர்

சினையவர். சி.சூண்சி மூணர்

மேற்பார்வை யாளர்

  
09/11/2022  
சினையவர். சி.சூண்சி மூணர்

இயம் : நாகிர்க்கையில்,  
09/11/2022

நாள் : 09-11-2022.



கூடுதலாயினார்கள் உறுதியொழி

எழுச்சியூழல் கல்விக்கான 'சீர்திரம்  
தூண்டலாயின் கௌரவின் வரலாறு' எனும்  
தீவிரம் எழுப்பிய இத்தியக்கூடுதலான தாங்களின்  
மிகு முயற்சியில் உறுதியானது எனும்  
உறுதியளிப்புகளும்.

கூடுதலாயினார்கள்

கூடுதலாயினார்கள்

பி. சூர்ணா சேவி

பி. சூர்ணா சேவி.

பி. சேவி

பி. சேவி

பி. மரிய சிவசுந்தரி

பி. மரிய சிவசுந்தரி

பி. சிவசுந்தரி

பி. சிவசுந்தரி



பொருளடக்கம் :

முன்னுரை

வரலாறு

பெயர்க் காரணம்

மாண்புமிகு

விழாக்கள்

சிறப்புகள் சிலை

சிறப்புகள்

பொருள் வரலாறு

மாநில முக்கியத்துவம்

நிர்வாகம்

முடிவுரை



எசீந்திரம் தாணுமாவயன் கோவிலின் வரலாறு  
முன்னுரை :

கண்ணியாகாமி மாவயம் , எசீந்திரம் ராமம்  
உணர்வில் திணைநகரத்தாது . தாணுமாவயன் கோவில்  
சிவன் , விஷ்ணு , பிரம்மா ஆகிய முப்புகழ்க்கடவுள்களும்  
ஆன்றின் மூலம் ஆன்றாக திணைநகரத்தாது இக்கோயில்  
தாணுமாவயன் கோயில் என திணைக்கடவுள்களாக  
வரலாறு :

சித்திரி முனிவரும் , திவகாடைய கில்லத்தரசியும்  
கற்புக்கரசியுமான திணையாவும் துணைநகரம்  
ராமம் பூலம்பயர்வற்ற எசீந்திரத்தில் தமம்  
பிசய்தனர் . திந்நிலையின் , சித்திரி முனிவர்  
கிமயமவைக்கிச் சிசன்றார் . சிப்பாகாது சிவபுகழ்மான் ,  
விஷ்ணு , பிரம்மா ஆகிய முப்புகழ்க்கடவுள்களும்  
திணையாவின் கற்பை சேரதிக்க எண்ணி  
பிரமணர் வேயம் திணைநகர் , திவகாடைய  
நகரத்திந்நி வற்கு உணவு படைக்கத்  
திடைந்கினார் . சிப்பாகாது முவகாம் , " திடை திணைநகர்





கைவினைத் தொழிலும் பெண்களின் வாழ்க்கை  
நிலையும்

மனோன்மணியம் சுந்தரனார் பல்கலைக்கழகத்தின் இளங்கலை (பி.ஏ)  
பட்டத்திற்காக அளிக்கப்படும் திட்ட ஏடு

திட்டக்குழுவினர்

து. ஆஷிகா	-	2020SUTI52
ஜா. ஜா.பிணி நோஸ்	-	2020SUTI54
அ. லிபிஷா	-	2020SUTI57
சி. த. சகி	-	2020SUTI63

மேற்பார்வையாளர்

முனைவர் சா. டெய்சிபாய்

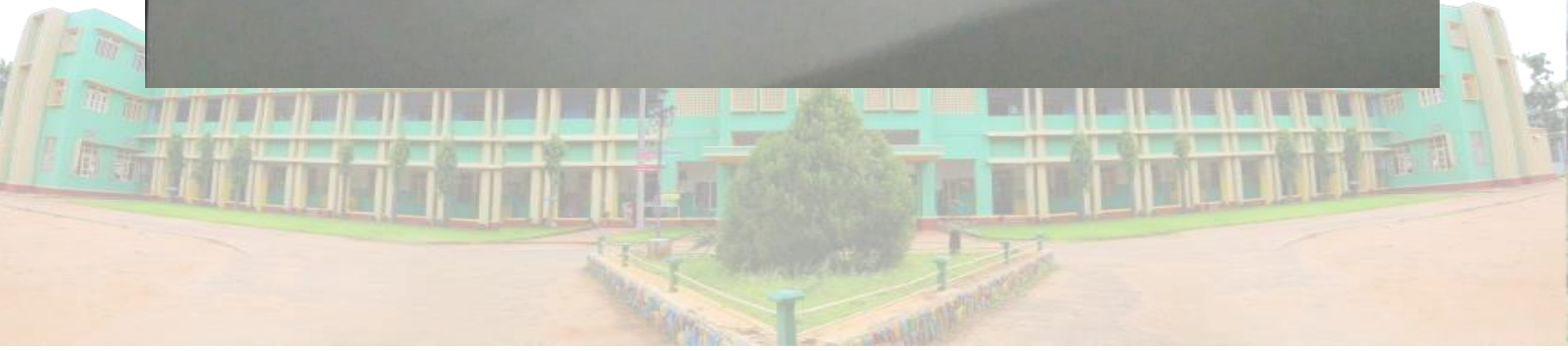


தமிழ்த்துறை (சுயநிதி)

திருச்சிலுவை கல்லூரி

நாகர்கோவில்

நவம்பர் - 2022

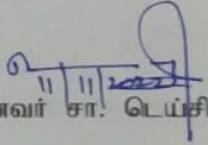


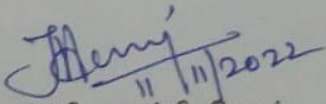
முனைவர் சா. டெய்சிபாய்,  
உதவிப்பேராசிரியர்,  
தமிழ்த்துறை (சுயநிதி),  
திருச்சிலுவை கல்லூரி,  
நாகர்கோவில்.

நாகர்கோவில்,  
11.11.2022

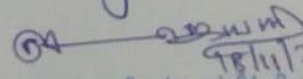
மேற்பார்வையாளர் சான்றிதழ்

“கைவினைத் தொழிலும் பெண்களின் வாழ்க்கை நிலையும்” என்னும் தலைப்பில் இத்திட்ட ஏடு மனோன்மணியம் சுந்தரனார் பல்கலைக்கழக இளங்கலை (பி.ஏ) பட்டப்படிப்பிற்காகத் திருச்சிலுவை கல்லூரி நாகர்கோவில் தமிழ்த்துறையில் பயிலும் முன்றாம் ஆண்டு மாணவிகள் து. ஆஷிகா, ஜா. ஜா.பினி ரோஸ், அ. லிபிஷா, சி.த. சகி ஆகியோர்கள் குழுவாகச் செய்யப்பட்ட ஆய்வினால் உருவானது என்றும் இக்கட்டுரைக்காக கட்டுரையாளர்களுக்கு வேறு எந்தப் பட்டமும் இதுவரை அளிக்கப்படவில்லை என்றும் சான்றளிக்கிறேன்

  
முனைவர் சா. டெய்சி பாய்  
(மேற்பார்வையாளர்)

  
முனைவர் சி. ஆன்சி மோள்  
(தமிழ்த்துறைத் தலைவர், சுயநிதி)

Dr. S. Ancy Mole  
Head of the Department of Tamil (S.F)  
Holy Cross College (Autonomous)  
Nagercoil - 629 004

Internal: Dr. S. Daisy Bai  
External:   
முனைவர் சி. ஆன்சி மோள்,  
தமிழ்த்துறைத் தலைவர்,  
திருச்சிலுவை கல்லூரி,  
நாகர்கோவில் - 629 802.



இளங்கலை மூன்றாம் ஆண்டு மாணவிகள்,  
தமிழ்த்துறை (கயந்தி),  
திருச்சிலுவை கல்லூரி,  
நாகர்கோவில்.

நாகர்கோவில்,  
11.11.2022

கட்டுரையாளர்கள் உறுதிமொழி

“கைவினைத் தொழிலும் பெண்களின் வாழ்க்கை நிலையும்” என்னும் தலைப்பில் மனோமணியம் சுந்தரனார் பல்கலைக்கழக பி.ஏ. பட்டத்திற்காக எழுதப்பட்ட இத்திட்ட ஏடு எங்களுடைய சொந்த முயற்சியில் உருவானது ஆகும். இந்தத் திட்ட ஏடு இதற்கு முன் வேறு எந்த ஆராய்ச்சிப்பட்டத்திற்கும் அளிக்கப்படவில்லை என்றும் உறுதியளிக்கிறோம்.

கட்டுரையாளர்கள்

து. ஆஷிகா

ஜா. ஜா. பி.வி ரோஸ்

அ. லிபிஷா

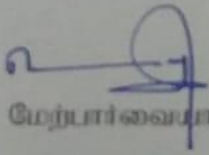
சி. த. சகி

து. சீஷிகா

ஜா. ஜா. பி.வி ரோஸ்

அ. லிபிஷா

சி. த. சகி



மேற்பார்வைப்பாளர்

(முனைவர் சா. டெய்சி பாய்)



பொருளடக்கம்

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### முன்னுரை

போட்டியும் சவால்களும் நிறைந்த இன்றைய சூழ்நிலையில் வசிக்கும் பெண்களின் வாழ்கை நிலையானது கோள்விக்குறியாக உள்ளது. எனவே “கைத்தொழில் ஒன்றைக் கற்றுக் கொள் கவலை உனக்கில்லை ஒத்துக்கொள்” என்னும் பாடல் வரிகளுக்கேற்ப கைத்தொழில் செய்யும் பெண்களின் வாழ்கை நிலையை விவரிப்பதாக இக்கட்டுரை அமைந்துள்ளது.

### திட்டக்கட்டுரைத் தலைப்பு

“கைவினைத் தொழிலும் பெண்களின் வாழ்க்கை நிலையும்” என்ற தலைப்பு கட்டுரையாளர்களால் கட்டுரைத் தலைப்பாகத் தெர்ந்தேடுக்கப்பட்டுள்ளது.

### நோக்கம்

“கைவிதைத் தொழிலும் பெண்களின் வாழ்க்கை நிலையும்” என்னும் தலைப்பின் மூலம் இன்றைய சூழ்நிலையில் பெண்கள் சந்திக்கும் சவால்களையும், பிரச்சனைகளையும் அதனை எதிர்கொள்வதற்கான சிந்தனையையும் வளர்ப்பதே இக்கட்டுரையின் நோக்கமாகும்.

### ஆதாரங்கள்

ஆய்வுத் தொடர்பான செய்திகளைத் தருவன அனைத்தும் ஆதாரங்கள் ஆகும். ஆதாரங்கள் இரு வகைகளாகப் பிரிக்கப்பட்டுள்ளன.

1. முதன்மை ஆதாரம்
2. துணை ஆதாரம்

### முதன்மை ஆதாரம்

கைத்தொழில் செய்யும் பெண்கள் முதன்மை ஆதாரமாக கொள்ளப்பட்டது.

### துணை ஆதாரம்

இலக்கியங்கள் மற்றும் கைத்தொழில் பற்றிய செய்திகளை விவரிக்கும் நாற்கள் மற்றும் பத்திரிகைகள் துணை ஆதாரமாக கொள்ளப்பட்டன.

### திறனாய்வும் அணுகுமுறையும்:

இக்கட்டுரையில் பாராட்டுமுறைத் திறனாய்வும் படைப்புச் சார்ந்த அணுகுமுறையும் மேற்கொள்ளப்பட்டுள்ளன. இத்திறனாய்வு ரசனை



**DEPARTMENT OF HISTORY**

Sl. No.	Name of the Scholar	Title of the Project	Outcome of the Project
1.	K. Sherly	Origin, Growth and Societal Impact of Kalaripayattu and the Art of Varmam in Travancore	Preserving and perpetuating traditional martial arts and healing practices rooted in local cultural heritage and ancient wisdom.
2.	P. Vellaisamy	Socio-Cultural Development of Sankarankovil Taluk – A Study	Documenting and preserving local traditions, customs, and social practices unique to the region.
3.	P. Ashmi Jenex	History of the Aye Kingdom	Preserving and interpreting the traditional narratives, historical records, and cultural heritage of the Aye people.
	Reshma U.R.	Emergence and the development of press in Travancore	Exploring how traditional knowledge, local languages, and cultural narratives were disseminated and preserved through early print media.
4.	Shamini R.	A Historical Study on the Development of Marthandam as a Trade Centre in Kanyakumari District	Traditional economic practices, local trade networks, and cultural interactions that have historically contributed to Marthandam's development as a trade center.



**ORIGIN, GROWTH AND SOCIETAL IMPACT OF  
KALARIPAYATTU AND THE ART OF  
VARMAM IN TRAVANCORE**

**A THESIS**

Submitted by

**K. SHERLY**

Reg. No : 18213041052013

**HISTORY**

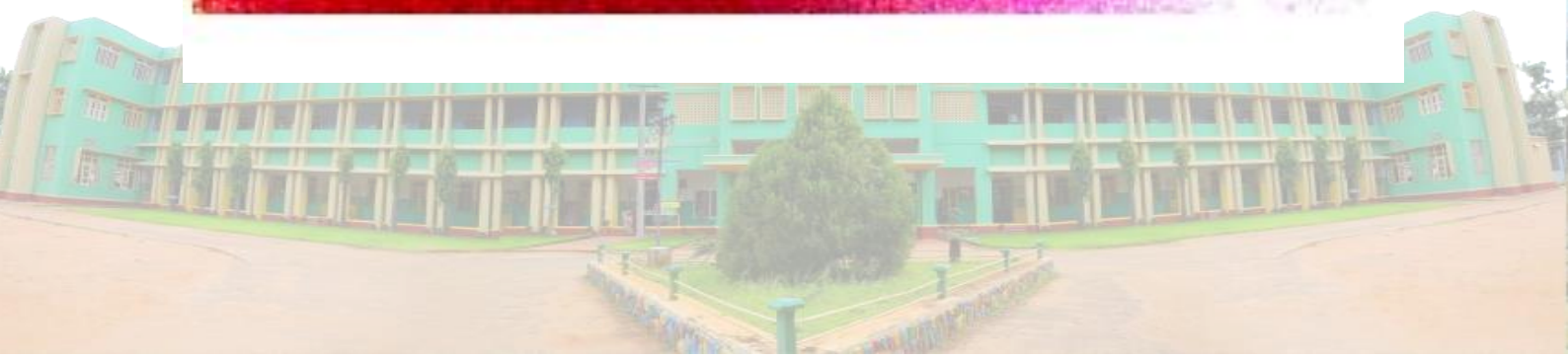
*in partial fulfillment of the requirements for the award of degree*

**DOCTOR OF PHILOSOPHY**



**MANONMANIAM SUNDARANAR UNIVERSITY  
TIRUNELVELI - 627 012**

**JANUARY - 2021**



**ORIGIN, GROWTH AND SOCIETAL IMPACT OF  
KALARIPAYATTU AND THE ART OF  
VARMAM IN TRAVANCORE**

A THESIS

*Submitted by*

**K. SHERLY**

Reg.No:18213041052013

**HISTORY**

*In partial fulfillment of the requirements for the award of degree of*

**DOCTOR OF PHILOSOPHY**



**MANONMANIAM SUNDARANAR UNIVERSITY**

**TIRUNELVELI - 627 012**

**JANUARY- 2021**







**MANONMANIAM SUNDARANAR UNIVERSITY**

**TIRUNELVELI - 627 012**

---

## **CERTIFICATE**

The research work embodied in the present Thesis entitled **ORIGIN, GROWTH AND SOCIETAL IMPACT OF KALARIPAYATTU AND THE ART OF VARMAM IN TRAVANCORE** has been carried out in the Department of History and Research Centre, Holy Cross College (autonomous) Nagercoil. The work reported herein is original and does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion or to any other scholar.

I understand the university's policy on plagiarism and declare that the thesis and publications are my own work, except where specifically acknowledged and has not been copied from other sources or been previously submitted for award or assessment.

**K. SHERLY**

Reg. No.: 18213041052013

Research Scholar

**Dr. K.S. SOUMYA, M.A., B.Ed., M.Phil., Ph.D.**

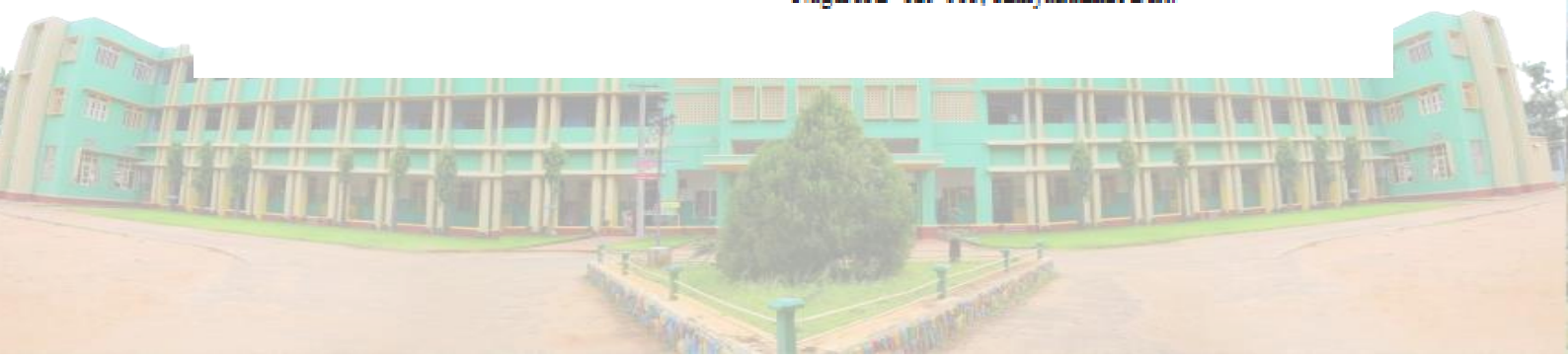
Supervisor,

Assistant Professor,

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**SOCIO – CULTURAL DEVELOPMENT OF SANKARANKOVIL  
TALUK – A STUDY**

**A THESIS**

*Submitted by*

**P. VELLAISAMY**

**Reg.No:18213041051012**

**HISTORY**

*In partial fulfillment of the requirements for the award of degree of*

**DOCTOR OF PHILOSOPHY**



**MANONMANIAM SUNDARANAR UNIVERSITY**

**TIRUNELVELI – 627 012**

**OCTOBER - 2021**



**SOCIO – CULTURAL DEVELOPMENT OF SANKARANKOVIL  
TALUK – A STUDY**

A THESIS

*Submitted by*

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**OCTOBER- 2021**





**MANONMANIAM SUNDARANAR UNIVERSITY**

**TIRUNELVELI – 627 012**

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## **CERTIFICATE**

The research work embodied in the present Thesis entitled **SOCIO – CULTURAL DEVELOPMENT OF SANKARANKOVIL TALUK – A STUDY** has been carried out in the Department of History and Research Centre, Holy Cross College (Autonomous) Nagercoil-4. The work reported here in is original and does not form part of any other thesis or dissertation on the basis of which a degree or award was conferred on an earlier occasion or to any other scholar.

I understand the university's policy on plagiarism and declare that the thesis and publications are my own work, except where specifically acknowledged and has not been copied from other sources or been previously submitted for award or assessment.

**P. VELLAISAMY**  
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**HISTORY OF THE AYE KINGDOM**

A THESIS

*Submitted by*

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**HISTORY**

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**DOCTOR OF PHILOSOPHY**



**MANONMANIAM SUNDARANAR UNIVERSITY**

**THIRUNELVELI - 629 012**

**OCTOBER 2021**



**EMERGENCE AND THE DEVELOPMENT OF PRESS  
IN TRAVANCORE**

**A THESIS**

*Submitted by*

**RESHMA. U.R.**

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**HISTORY**

*in partial fulfilment of the requirements for the  
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**DOCTOR OF PHILOSOPHY**



**MANONMANIAM SUNDARANAR UNIVERSITY**

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**JANUARY 2021**





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ABISHEKAPATTI, TIRUNELVELI - 627 012, TAMILNADU, INDIA  
Centre for Research



Dr.K.SENTHIAMARAI KANNAN  
DIRECTOR

REF:MSU/RES/R1/JULY 2018

Date : 05-July-2018

**Ph.D., Programme Commencement Order**

To

SHERLY K  
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Sir/Madam,

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9. Name of the Supervisor : DR.K.S. SOUMYA
- 10.Name of the Co-Supervisor : NIL
- 11.Mode : FULL TIME
- 12.Research Centre : HOLY CROSS COLLEGE , NAGERCOIL
- 13.Date of Commencement : 05.07.2018
- 14.Proposed Title : ORIGIN GROWTH AND SOCIETAL IMPACT OF KALARIPAYATTU AND THE ART OF VARMAM IN TRAVANCORE
- 15 Doctoral Committee Members Details :
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  2. DR. B. SHEERA KUMARI  
ASSISTANT PROFESSOR, DEPARTMENT OF HISTORY, ST HINDU COLLEGE, NAGERCOIL-629004

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SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR



## Genesis and Growth of Silambam

<sup>1</sup>K. Sherly and <sup>2</sup>K.S. Soumya

<sup>1</sup>Ph.D Research scholar, Department of History, Holy Cross College , Nagercoil, Manonmaniam Sundaranar University, Thirunelveli.

<sup>2</sup>Assitant Professor, Department of History, Holy Cross College Nagercoil.

### ABSTRACT

*Silambam, is a traditional Dravidian martial art based on stick fighting. This style supposedly originates from the Kurinji hills in present day Tamilnadu 5,000 years ago, where natives used bamboo staves to defend themselves against wild animals. The per sangam literature, states that the Kurinji Hills was one of the five physiographic divisions within Tamilakam, which became known as Keralam after the arrival of Brahmins. The Kuravar of the Kurinji Hills used a staff called Silambam as a weapon to defend themselves against wild animals, and also to display their skill during their religious festivals. The Hindu scholars and yogies who went to the Kurinji mountains to meditate got attracted by the display of this highly skilled spinning Silambam.*

### Introduction

Silambam is a mainly a form of stick or walking staff fighting. The length of the staff is roughly 1.68 meters (five and a half feet). Size of the staff is related to the height of the silambam player. It should just touch the forehead about three fingers from the head, although different lengths were used in different situations. The 3 feet stick called "sedikutchi" can be carried covertly. Separated practice is needed for staves of different lengths. The usual stance includes holding the staff at one end, right hand close to the back, left hand about 40 centimeters (16 inches) away. This position allows a wide array of stick-and-body movements, including complex attacks and blocks. Unarmed Silambam utilizes several routines based on the movements of animals, primarily snake and eagle forms.

### Origin of Silambam

Silambam is an age-old art of patronized by the Chera, Chola and Pandiya kings who ruled Tamilnadu in ancient India. It received Royal Patronage from all kings of Tamilnadu beginning before the Sangam Era (B.C. 2000). The origin and historical development of Silambam may have being with the early Dravidians of ancient Tamilnadu.

Silambam is a weapon – Hasal marital art of India more specifically in the state of Tamil Nadu where it originated around 1000 BC. The word "Silampam" means either mountain or merely to sound oral folklore traces Silampam back several thousand years to the siddhar (Enlightened age) Agastya while on his way to vellimalar, Agastiya discussed Hindhu philosophy within old man lemet, said old man taught him of Kundalini yoga and nadi (channels) Agastya practiced compiled three texts on plam leaves based on the god's teachings. One of these texts was the Kampu sutra (Staff classic) which was said fore cord advanced fighting theories in verse. Those poems and the art





Study of Historical Places in Kanyakumari District



**MANONMANIAM SUNDARANAR UNIVERSITY**

Reaccredited with 'A' Grade by NAAC (3rd Cycle)

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**DR. G.BALASUBRAMANIA RAJA**  
Director

REF : MSU/RES/Admn/July 2023 Session

Date : November 30, 2023

**Ph.D., Programme Commencement Order**

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Sir/Madam,

Sub: Registration for doing Ph.D., programme - Date of Commencement of Research work - Intimation - reg.  
Ref: Counselling attended by the candidate for July 2023 session.

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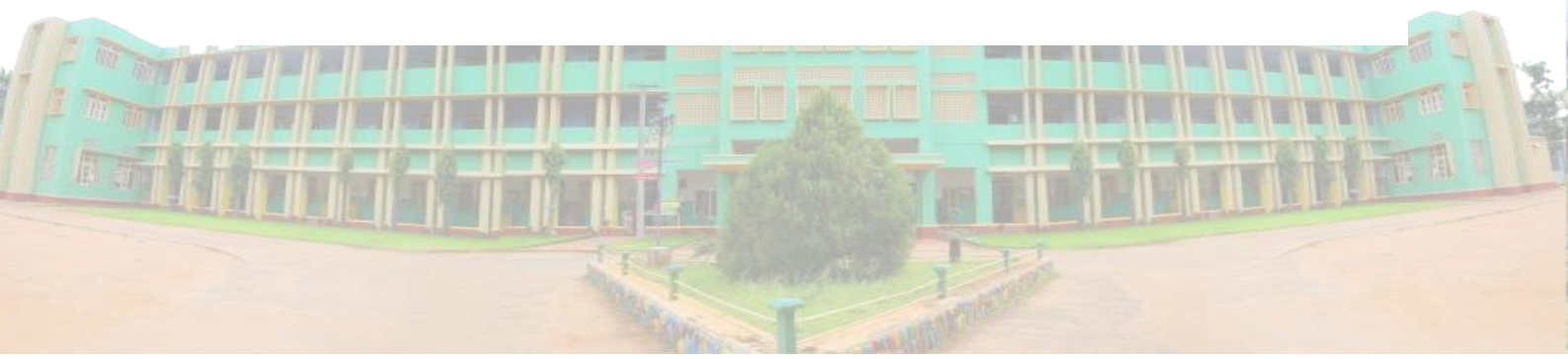
Name of the Scholar	JENIFER J
Registration No.	<b>23213041082001</b>
Discipline	History
Inter Disciplinary Detail	-
Gender & Community	Female & BC
Nationality	INDIAN
PWD Status	Not Applicable
Admission Based On	PG
Mode	FULL TIME
Research Centre	Holy Cross College (Autonomous), Nagercoil
Name of the Supervisor with Address	Dr. K. S. Soumya, Assistant Professor Department of History/History and Tourism, Holy Cross College (Autonomous), Nagercoil, 629004 Mobile No. : 9965255724, Email ID : soumya.kholycrossngl.edu.in
Name of the Co-Supervisor with Address	NIL
RAC Members	<ol style="list-style-type: none"> <li>DR S REGI , ASSOCIATE PROFESSOR HISTORY HOLY CROSS COLLEGE (AUTONOMOUS) NAGERCOIL 629004 Mobile No. : 9442481991, Email ID : regisam.emmanuel@gmail.com</li> <li>DR C KALAI ARASU , ASSOCIATE PROFESSOR HISTORY ARINJAR ANNA COLLEGE ARALVAI MOZHI 629301 Mobile No. : 9443390594, Email ID : skarasu93@gmail.com</li> </ol>
Proposed Title	AN ENCYCLOPEDIA STUDY OF MARAMALAIS HISTORICAL CONTINUITY AND EVOLUTION
Date of Commencement	30.11.2023 (Fees: Rs. 13000 , Pay ID: 18648761861 , Dt: 30.11.2023)

ASSISTANT

SUPERINTENDENT

ASSISTANT REGISTRAR

DIRECTOR



Department of Economics

S. No.	Name	Title of the Project	Outcome of the Project
1	X. Nishali I. Subhashini	An Economic study of Agricultural workers in Putheri of Kanyakumari District	Study the income and expenditure of agricultural workers in Putheri
2	Rabiya B.R. Sahaya Veshiba M. Abila Reshma E.	A study on problems and prospect of Agriculture Workers in Thirupathusoram during COVID – 19	Able to analyse the problems and prospects of Agricultural workers in Thirupathysaram
3	C.B. Jeny Dani	An Economic Study on Women Agricultural workers in Seethapal in Kanniyakumari District	Know the income and expenditure, debt of the women agricultural workers in Seethapal
4	Dhan Lekshmi. G Elizabeth Lipna. S Epshipa. J Fathima Safna. M Jainish. J.	An Economic study of Agricultural Cultivators in Devakulam Village of Kanyakumari District	Evaluate the economic things of agricultural cultivators in Devakulam
5	Femina. P Gayathri. K Gnana Abitha. M Howsika. P Jenifer Loorthu Mary	An Economic study on Modernization of Agriculture Farming in Parakkai Village of Kanyakumari District	Understand the modernisation technique and agriculture farming of Parakkai village
6	Angelin Shinu L.M Anish Ofiya R. Anitha K. Arockiya Alish R. Arthi A. Brindha G.	A study on Agricultural Production in India	Able to analyse the agricultural production in India
7	Saranya A. Seetha Lakshmi. M P. Suruthi V. Swathiga B.S. Aarthi S.K. Abisha	An Economic study of Agricultural workers in Karaiyiruppu in Tirunelveli District	Understand the income and spending of agricultural workers in Karaiyirupu of Tirunelveli District



**AN ECONOMIC STUDY OF AGRICULTURAL WORKERS IN PUTHERI  
OF KANYA KUMARI DISTRICT**

Dissertation submitted by Holy Cross College (Autonomous), Nagercoil in partial  
fulfillment for the award of the Degree of

**MASTER OF ECONOMICS**

Under the Guidance of

**Ms. M. Sahaya Vennila M.A., M.Phil. B.Ed., DIT, SET**

Submitted by,

<b>X. NISHALI</b>	<b>218181</b>
<b>I. SUBHASHINI</b>	<b>218184</b>



**DEPARTMENT OF ECONOMICS**

**HOLY CROSS COLLEGE (Autonomous)  
NAGERCOIL-629004**

**2019-2020**

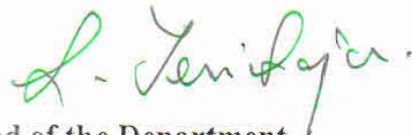


**CERTIFICATE**

I hereby certify that the project report entitled "AN ECONOMIC STUDY OF AGRICULTURAL WORKERS IN KANYA KUMARI DISTRICT" - submitted by X. NISHALI and I. SUBHASHINI to Holy Cross (Autonomous), Nagercoil, for the award of Master of Economics is a bonafide record work done by under my supervision. The report represents entirely an independent original work of the candidate.

Place: Nagercoil  
Date: 18.10.2019

  
Supervisor

  
Head of the Department  
**Dr. S. JENI SANJANA**  
Head of the Department  
Department of Economics  
Holy Cross College (Autonomous)  
Nagercoil.

External examiner



## DECLARATION

We hereby state that this project titled “AN ECONOMIC STUDY OF AGRICULTURAL WORKERS IN KANYA KUMARI DISTRICT” being submitted to Holy Cross College (Autonomous), Nagercoil is an original work. We hereby declare that the facts are genuine and not based on any other research project.

Place: Nagercoil.  
Date: 18.10.2019.

Signature of the Candidates

X. Nishali

I. Subhashini



**A STUDY ON PROBLEMS AND PROSPECTS OF AGRICULTURE  
WORKERS IN THIRUPATHISARAM VILLAGE DURING COVID19**

*Dissertation submitted by Holy Cross College (Autonomous), Nagercoil in  
Partial fulfilment for the award of the Degree of*

**MASTER OF ECONOMICS**

**GUIDED BY**

**Dr. M.SAHAYA VENNILA M.A., M.Phill, MED.SET**

***SUBMITTED BY***

<b>ABILA RESHMA.E</b>	<b>191332</b>
<b>RABIYA.B.R</b>	<b>191338</b>
<b>SAHAYA VESHIBA.M</b>	<b>191340</b>



**DEPARTMENT OF ECONOMICS  
HOLY CROSS COLLEGE (Autonomous)  
NAGERCOIL-629004**

**2020-2021**



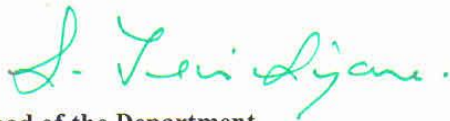
**CERTIFICATE**

I hereby certify that the project report entitled “A STUDY ON PROBLEMS AND PROSPECTS OF AGRICULTURE WORKERS IN THIRUPATHISARAM DURING COVID19” submitted by ABILA RESHMA.E, RABIYA.B.R and SAHAYA VESHIBA.M to Holy Cross College (Autonomous), Nagercoil, for the award of Master of Economics is a bonafide record work done by under my supervision. The report represents entirely an independent original work of the candidate.

Place: Nagercoil

Date: Supervisor

20-11-2020



Head of the Department

**Dr. S. JENI SANJANA**  
Head of the Department  
Department of Economics  
Holy Cross College (Autonomous)  
Nagercoil.



External examiner



## DECLARATION

We hereby state that this project titled “**A STUDY ON PROBLEMS AND PROSPECTS OF AGRICULTURE WORKERS IN THIRUPATHISARAM DURING COVID19**” being submitted to Holy Cross College (Autonomous), Nagercoil is an original work. We hereby declare that the facts are genuine and are not based on any other research project.

Place: Nagercoil,

Date: 20-11-2020

Signature of candidates

1. *E. Athila Reshona*,
2. *Rabiga . B . R .*
3. *Sahaya Vashiba . M*





**AN ECONOMIC STUDY ON WOMEN AGRICULTURAL WORKERS IN  
SEETHAPAL VILLAGE IN KANNIYAKUMARI DISTRICT**

*Dissertation submitted to Holy Cross College (Autonomous) Nagercoil in*

*Partial fulfillment for the award of the degree of*

**MASTER OF ECONOMICS**

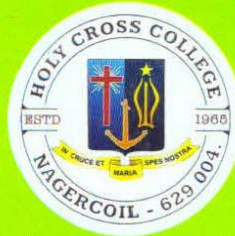
Under the guidance of

**Ms.M. SAHAYA VENNILA M.A., M.Phil., M.Ed., DIT,SET**

Submitted By,

**Ms C.B. Jency Dani**

**2021SPF394**



**DEPARTMENT OF ECONOMICS**

**HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL – 629004**

**2022-2023**



**CERTIFICATE**

I hereby certify that the project report entitled "AN ECONOMIC STUDY ON WOMEN AGRICULTURAL WORKERS IN SEETHAPAL VILLAGE OF KANNIYAKUMARI DISTRICT" submitted by **C.B.JENCY DANI** to Holy Cross College (Autonomous), Nagercoil for the award of Master of Arts in Economics is a bonafide, record work done by under my supervision. The report represents entirely an independent original work of the candidate.

Place: Nagercoil

Date: 16.11.2022

**Supervisor**

**Head of the Department**

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Head of the Department  
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**External Examiner**  
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Assistant Professor of Economics  
Post Graduate and Research Centre,  
Holy Cross College, Nagercoil - 629 002,  
Kanniyakumari District,



**DECLARATION**

I hereby declare that the project work entitled “AN ECONOMIC STUDY ON WOMENS AGRICULTURAL WORKERS IN SEETHAPAL VILLAGE IN KANNIYAKUMARI DISTRICT” bring submitted to Holy cross college (Autonomous) Nagercoil is an original work. I hereby declare that the fact is genuine & not on any other research project.

**Place: Nagercoil**

**Date: 16.11.2022**

*C.B. Fancy Dani*  
**Signature of candidate**



AN ECONOMIC STUDY OF AGRICULTURAL CULTIVATORS IN  
DEVAKULAM VILLAGE OF KANIYAKUMARI DISTRICT

*A project report submitted to Holy Cross College (Autonomous) affiliated to Manonmaniam  
Sundaranar University in partial fulfilment of the degree of Bachelor of Arts.*

Under the Guidance of

Dr. S. Jeni Sanjana. MA., M.Phil., MBA, Ph.D, HDCA.

Submitted by

Name	Reg. No
G. Dhanaleksmi	2017346
S. Elizabeth Lipna	2017347
J. Epshipa	2017348
M. Fathima shafna	2017349
J. Jainisha	2017350



Department of Economics,  
Holy Cross College (Autonomous)  
Nagercoil-629004

2019-2020




CERTIFICATE

I hereby certify that the project report entitled **AN ECONOMIC STUDY OF AGRICULTURAL CULTIVATORS IN DEVAKULAM VILLAGE OF KANYAKUMARI DISTRICT**. Submitted by **G.Dhanalekshmi, S.Elizabeth Lipna, J.Epshipa, M.Fathima shafna, J. Jainisha** to Holy Cross College affiliated to Manonmaniyam Sundaranar University, for the III year under graduate study is a bonafide of research work done by them under my supervision during 2019-2020. It has never been submitted for the award any other similar title. The report represents entirely an independent original of candidate.

Place: Nagercoil  
Date: 18/10/2019

  
Supervisor

  
18/10/19  
Head of the department

**Dr.S.JENI SANJANA**  
Head of the Department  
Department of Economics  
Holy Cross College (Autonomous)  
Nagercoil.

  
25/10/19  
External Examiner

**Dr. D.G.M. VICTORIA, M.A., M.Phil., Ph.D.,**  
Assistant Professor of Economics,  
Post Graduate and Research Centre,  
S T Hindu College, Nagercoil  
K.K. Dist., Tamilnadu - 629 002.



DECLARATION

We hereby declare that the project work done original work done **A STUDY ON AGRICULTURAL CULTIVATORS IN DEVAKULAM VILLAGE SPECIAL REFERENCE TO CULTIVATORS IN DEVAKULAM VILLAGE BY OUR TEAM.** We hereby declare that the facts are genuine and are not based on any research project.

Place: Nagercoil

Date: 18/10/2019

Names	Signature
G. Dhanalekshmi	G. Dhanalekshmi
S.Elizabeth Lipna	S. Elizabeth Lipna
J.Epshipa	J. Epshipa
M.Fathima shafna	M. Fathima Shafna
J.Jainisha	J. Jainisha



**AN ECONOMIC STUDY ON MODERNIZATION OF AGRICULTURE  
FARMING IN PARAKKAI VILLAGE OF  
KANYAKUMARI DISTRICT**

*A project report submitted to  
Holy cross college (Autonomous) Nagercoil  
Affiliated to Manonmaniam Sundaranar University  
In partial Fulfilment of the requirements of the degree of*

**BACHELOR OF ARTS**

*Under the Guidance of*

**Dr.S.VIMAL DOLLI, M.A.,M.Phil.,Ph.D**

**Project Team**

<b>NAMES</b>	<b>REGISTER NO</b>
<b>P.FEMINA</b>	<b>2019383</b>
<b>K.GAYATHRI</b>	<b>2019384</b>
<b>M.GNANA ABITHA</b>	<b>2019385</b>
<b>P.HOWSIKA</b>	<b>2019386</b>
<b>J.JENIFER LOORTHU MARY</b>	<b>2019387</b>



**DEPARTMENT OF ECONOMICS  
HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL-629004**

**2021-2022**



CERTIFICATE



I hereby certify that the project report entitled “**An Economic study on Modernization of Agriculture Farming in Parakkai Village of Kanyakumari District**” submitted by P.Femina, K.Gayathri, M.Gnan Abitha, P. Howsika, J.Jenifer Loorthu Mary to Holy Cross College (Autonomous), Nagercoil affiliated to Manonmaniam Sundaranar University for the III year Undergraduate students is a bonafide record of research work done by them under my supervision during 2021-2022. It has never been submitted for the award of any other similar titles. The report represents entire independent and original work of the candidates.

Place: Nagercoil

Date: 15-12-2021

Supervisor

Head of the department

**Dr. S.JENI SANJANA**  
Head of the Department  
Department of Economics  
Holy Cross College (Autonomous)  
Nagercoil.

External Examiner

**Dr. C. SELVA SMILEY, Ph.D.**  
Assistant Professor  
PG & Research Centre in Economics  
Scott Christian College (Autonomous)  
Nagercoil - 629 003





DECLARATION

We hereby declare that the project work done on “An Economic Study on Modernization of Agriculture Farming in Parakkai Village of Kanyakumari District” is original work done by our team. We hereby declare that the facts are genuine and are not based on any research project.

Place: Nagercoil

Date: 15-12-2021

P.FEMINA *P. Femina*

K. GAYATHRI *K. Gayathri*

M.GNANA ABITHA *M. Gnana Abitha*

P.HOWSIKA *P. Howsika*

J.JENIFER LOORTHU MARY *J. Jenifer*



## A STUDY ON AGRICULTURAL PRODUCTION IN INDIA

*A project report submitted to  
Holy Cross College (Autonomous), Nagercoil  
Affiliated to Manonmaniam Sundaranar University, Tirunelveli  
in partial fulfillment of the requirements of the degree of*

### BACHELOR OF ARTS

Under the guidance of

**Dr. S.PANIMAYA MERCY.M.A, M.Phil, SET, Ph.D**

#### Project Team

Name	Reg. No
L.M. Angelin shinu	2019371
R. Anish ofiya	2019372
K. Anitha	2019373
R. Arockiya Alish	2019374
A. Arthi	2019376
G. Brindha	2019377



Department of Economics,  
Holy Cross College (Autonomous),  
Nagercoil – 629004,

2021-2022



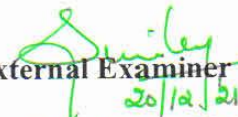
**CERTIFICATE**



I hereby certify that the project report entitled 'A STUDY ON AGRICULTURAL PRODUCTION IN INDIA' Submitted by L.M Angelin Shinu, R.Arockiya Alish, R. Anish Ofiya, K.Anitha, A.Arthi, and G.Brindha to Holy Cross College (Autonomous) affiliated to Manonmaniyam Sundaranar University, Tirunelveli is the bonafide record of research work done by them under my supervision during 2021-2022. It has not been previously submitted for any other degree, diploma or any other similar title. The report represents an original and independent work of the candidates.

Place: Nagercoil

Date: 15/12/2021

  
External Examiner  
20/12/21  
Dr. C. SELVA SMILEY, Ph.D  
Assistant Professor  
PG & Research Centre in Economics  
Holy Cross College (Autonomous)  
Nagercoil - 629 003

Head of the department

**Dr.S.JENI SANJANA**  
Head of the Department  
Department of Economics  
Holy Cross College (Autonomous)  
Nagercoil.

Supervisor



## DECLARATION

We hereby declare that the project work done entitled 'A STUDY ON AGRICULTURAL PRODUCTION IN INDIA' is Submitted by by L.M Angelin Shinu, R.Arockiya Alish, R. Anish Ofiya, K.Anitha, A.Arthi, and G.Brindha to Holy Cross College (Autonomous), Nagercoil, for the third year undergraduate study. It is an original work done by us under the guidance of Dr. S. Panimaya mercy M.A, M.PHIL. SET, Ph.D Assistant professor of Economics, Holy Cross College (Autonomous), Nagercoil. It has not been previously submitted for the award of any degree, fellowship or diploma or any other similar titles.

Place: Nagercoil

Date: 15/12/2021

L.M. Angelin shinu *L.m. Angelin Shinu*

R. Arockiya Alish

R. Anish ofiya *R. Anish ofiya.*

K. Anitha *K. Anitha*

A. Arthi *A-Arthi*

G. Brindha *G-Brindha*



**AN ECONOMIC STUDY OF AGRICULTURAL WORKERS IN  
KARAIYIRUPPU IN TIRUNELVELI DISTRICT**

**A project report submitted to  
Holy Cross College (Autonomous) Nagercoil  
Affiliated to Manonmaniam Sundaranar University  
In partial fulfilment of the requirements of the degree of**

**BACHELOR OF ARTS**

**Under the Guidance of**

**DR.S.JENI SANJANA M.A., M.Phil., M.B.A.,H.D.C.A., Ph.D.**

**Project Team**

<b>Names</b>	<b>Register No</b>
1.A.Saranya	2021AUF176
2.M.Seetha Lakshmi	2021AUF177
3.P.Suruthi	2021AUF178
4.V.Swathiga	2021AUF179
5.B.S.Aarthi	2021AUF413
6.S.K.Abisha	2021AUF414



**Holy Cross College(Autonomous)**

**Nagercoil-629 004**

**2023-2024**

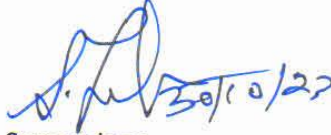


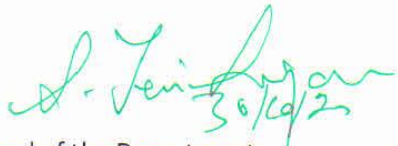
**CERTIFICATE**

I here the certify that the project report entitled **“An Economic study of Agricultural workers in karaiyiruppu in Tirunelveli District”** submitted by A. Saranya, M.Seethalakshmi, P.Suruthi, V.Swathiga, B.S.Aarthi S.K.Abisha to Holy CrossCollege(Autonomous),affiliated to Manonmaniam Sundaranar University for the III year under graduate students is a bonafide record of research work done by them under my supervision during 2023-2024. It has never been submitted for the award of any other similar titles. The report represents entire independent and original work of the candidates.

Place: Nagercoil

Date: 30/10/23

  
Supervisor

  
Head of the Department  
**Dr.S.Jeni Sanjana**  
Head of the Department  
Department of Economics  
Holy Cross College (Autonomous)  
Nagercoil.

  
External examiner



## DECLARATION

We here by declare that the project work done on “ **An Economic Study of Agricultural Workers in Karaiyiruppu in Tirunelveli District** ” is original work done by our team. We here by declare that the facts are genuine and are not based on any research project.

Place : Nagercoil

Date: 30/10/23

### Signature of the Candidates

A.SARANYA

A. Saranya

M.SEETHA LAKSHMI

M. Seetha Lakshmi

P.SURUTHI

P. Suruthi

V.SWATHIGA

V. Swathiga

B.S.AARTHI

B. S. Aarthi

S.K.ABISHA

S.k. Abisha



### Department of Commerce (Aided)

Coir work is an ancient craft in India, dating back to centuries when it was primarily practiced in the coastal regions of Tamil Nadu, especially in Kanyakumari District. Coir industry provides employment to millions, especially in rural and coastal areas. It offers a source of livelihood for a large section of the population, including many women, contributing significantly to rural development and poverty alleviation. Efforts to document traditional coir techniques and provide training to new generations ensure that this valuable knowledge is preserved and passed on. This helps in maintaining the cultural identity and continuity of traditional crafts.

Green food products, referring to organic, sustainable, and environmentally friendly food items, have a profound connection to the Indian knowledge system. India has a rich history of traditional agricultural practices that emphasize sustainability and harmony with nature. Organic foods for maintaining health and wellness. The production of green food products can provide economic benefits to rural communities by creating markets for organic and sustainably grown produce. This can enhance the livelihoods of small and marginal farmers.

Value-added edible fish products hold significant importance within the Indian knowledge system. India has a long history of traditional fishing practices, particularly in coastal communities. These practices are an integral part of the cultural heritage and have been passed down through generations, incorporating sustainable fishing methods and the use of local knowledge. Value-added fish products can serve as cultural ambassadors, showcasing India's traditional knowledge, culinary diversity, and commitment to sustainability on the global stage. The establishment of fish processing units in rural and coastal areas can lead to community development by creating local employment opportunities and fostering economic growth.

India has a long history of traditional agricultural practices that align with the principles of organic farming. Combining traditional farming knowledge with modern scientific research enhances organic farming practices, making them more efficient and productive while retaining their ecological and cultural value. Organic farming often involves the use of indigenous crop varieties that are well-adapted to local conditions and resistant to pests and diseases, promoting biodiversity. India's commitment to organic farming positions it as a global leader in promoting sustainable agricultural practices. This can influence global food systems and policies towards greater sustainability.

Green packaging involves the use of environmentally friendly materials and practices in packaging, is significantly connected to the Indian knowledge system. India has a rich history of using natural materials for packaging. Traditional methods include using banana leaves, jute sacks, and clay pots, which are biodegradable and eco-friendly. These practices reflect a deep understanding and respect for the environment. Green packaging often involves the use of locally sourced materials such as jute, bamboo, and banana leaves. This can boost local economies and create jobs in rural areas, supporting artisans and small-scale industries.





## NAAC V Cycle Self Study Report (SSR)

Sl.No	Name of the students	Title of the project	Outcome of the Project
1.	Anitha Rani J Arokiya Faustina A Jerlin Joshi S.F Nittheesha E Rabina Malini M Sarumathi K U	A study on Consumers Knowledge, Attitude and Purchase Intention Towards Green Food Products	Students gained a deeper understanding on how their choices impact the environment and eco system.
2.	Abisha D Agusta Jerlyn P Ashbell Rinisha S M Megan Bertil C Rose Raja Sibitha S Safrina R	Consumer's Perception and Awareness Towards Organic Cosmetics	Students were motivated to use organic cosmetics and also aware of the benefits of eco-friendly alternatives.
3.	Manju Sharmee S R	A Study on Consumer Knowledge, Awareness and Perception Towards Organic Food Products	Organic foods for maintaining health and wellness. This ancient system of medicine promotes the use of locally grown, seasonal, and minimally processed foods. Organic farming practices, for instance, avoid the use of synthetic pesticides and fertilizers, reducing soil and water pollution and promoting biodiversity.
4.	Hesil Jerda G	Green Packaging: An Eco-friendly Approach towards Sustainable Development in Coastal Villages of Kanyakumari District	Green packaging, which involves the use of environmentally friendly materials and practices in packaging, is significantly connected to the Indian knowledge system. India has a rich history of using natural materials for packaging. Traditional methods include using banana leaves, jute sacks, and clay pots, which are biodegradable and eco-friendly. These practices reflect a deep understanding and respect for the environment.



**A STUDY ON CONSUMER'S KNOWLEDGE, ATTITUDE AND  
PURCHASE INTENTION TOWARDS GREEN FOOD PRODUCTS**

**A Study Report Submitted to  
Holy Cross College (Autonomous), Nagercoil  
in partial fulfillment of the degree of  
BACHELOR OF COMMERCE**

**Submitted by**

2021AUA250	Anitha Rani. J
2021AUA253	Arockiya Faustina. A
2021AUA270	Jerlin Joshi.S.F
2021AUA283	Nitheesha. E
2021AUA287	Rabina Malini. M
2021AUA297	Sarumathi. K.U

**Under the Guidance of  
Dr. G.Hesil Jerda, M.com., M.Phil., Ph.D.**



**DEPARTMENT OF COMMERCE  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL - 629004  
OCTOBER - 2023**



**Dr. G. Hesil Jerda, M.Com., M.Phil., Ph.D.**

Assistant Professor of Commerce,  
Holy Cross College (Autonomous),  
Nagercoil-629004.

**CERTIFICATE**

This is to certify that the project work entitled '**A STUDY ON CONSUMER'S KNOWLEDGE, ATTITUDE AND PURCHASE INTENTION TOWARDS GREEN FOOD PRODUCTS**' is a bonafide record of work done by Anitha Rani.J, Arockiya Faustina.A, Jerlin Joshi.S.F, Nitheesha.E, Rabina Malini., M Sarumathi.K.U under my supervision and guidance and submitted in partial fulfillment of the requirement for the Degree of Bachelor of Commerce. It has not formed the basis for the award of any degree, diploma, or any other similar title.

Place: Nagercoil

Date: 31.10.2023

*Hesil Jerda*  
31/10/2023  
SUPERVISOR

*M.S.*

**HEAD OF THE DEPARTMENT**

**Dr.S.MARY PEARLY SUMATHI, M.Com.,B.Ed.,M.Phil.,Ph.D.**  
HEAD OF THE DEPARTMENT  
PGAND RESEARCH DEPARTMENT OF COMMERCE  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL - 629 004

*Joshi*  
31/10/23  
**EXTERNAL EXAMINER**



**DECLARATION**

We, Anitha Rani. J, Arockiya Faustina.A, Jerlin Joshi.S.F, Nitheesha. E, Raina Malini.M, Sarumathi.K.U.declare that the project work and 'A STUDY ON CONSUMER'S KNOWLEDGE, ATTITUDE AND PURCHASE INTENTION TOWARDS GREEN FOOD PRODUCTS' Submitted to Holy Cross College (Autonomous), Nagercoil for the third year under graduate study is an original work done under the guidance of Dr. G. Hesil Jerda Assistant Professor in commerce, Holy Cross College (Autonomous). It has not been previously done for the award of the any other degree.

**Project team members**

Anitha Rani. J

Arockiya Faustina. A

Jerlin Joshi.S.F

Nitheesha. E

Rabina Malini. M

Sarumathi. K.U

**Signature**

J. Anitha Rani

A. Faustina

S.F. Jerlin Joshi

Nitheesha E

Sarumathi K.U

Place: Nagercoil

Date: 31.10.2023



**CONSUMER'S PERCEPTION AND AWARENESS  
TOWARDS ORGANIC COSMETICS**

**A Study Report**

**Submitted to Holy Cross College (Autonomous), Nagercoil**

**Affiliated to Manonmaniam Sundaranar University Tirunelveli,**

**In partial fulfillment of the requirement for the Degree of**

**BACHELOR OF COMMERCE**

**Submitted by**

D. ABISHA	2021AUA242
P. AGUSTA JERLYN	2021AUA245
S.M. ASHBELL RINISHA	2021AUA254
C. MEGAN BERTIL	2021AUA281
S. ROSE RAJA SIBITHA	2021AUA290
R. SAFRINA	2021AUA293

**Under the Guidance of**

**Dr. G. SAHAYA SHINY, M.com., M.Phil., Ph.D.**



**DEPARTMENT OF COMMERCE  
HOLY CROSS COLLEGE (AUTONOMOUS)**

**NAGERCOIL – 629004**

**OCTOBER - 2023**



**Dr. G. SAHAYA SHINY, M.Com., M.Phil., Ph.D.**

Assistant Professor in Commerce,

Holy Cross College (Autonomous),

Nagercoil-629004.

**CERTIFICATE**

This is to certify that the project work entitled 'A STUDY ON CONSUMER'S PERCEPTION AND AWARENESS TOWARDS ORGANIC COSMETICS ' is a bonafide record of work done by **D.ABISHA, P.AGUSTA JERLYN, S.M.ASHBELL RINISHA, C.MEGAN BERTIL, S.ROSE RAJA SIBITHA, R.SAFRINA** under my supervision and guidance and submitted in partial fulfillment of the requirement for the Degree of Bachelor of Commerce. It has not been submitted for the award of any degree, diploma, or any other similar title.

Place: Nagercoil

Date: 31-10-2023

*G. Sahaya Shiny*  
SUPERVISOR 31/10/23

*[Signature]*

**HEAD OF THE DEPARTMENT**

*[Signature]*  
31/10/2023

**EXTERNAL EXAMINER**

**Dr.S.MARY PEARLY SUMATHI, M.Com. B.Ed. M.Phil. Ph.D.**  
HEAD OF THE DEPARTMENT  
PG AND RESEARCH DEPARTMENT OF COMMERCE  
HOLY CROSS COLLEGE (AUTONOMOUS)  
NAGERCOIL - 629 004



DECLARATION

We, D.ABISHA, P.AGUSTA JERLYN, S.M.ASHBELL RINISHA, C.MEGAN BERTIL, S.ROSE RAJA SIBITHA, R.SAFRINA here by declare that the project work entitled 'A STUDY ON CONSUMER'S PERCEPTION AND AWARENESS TOWARDS ORGANIC COSMETICS' Submitted to Holy Cross College (Autonomous), Nagercoil for the third year under graduate study is an original work done under the guidance of Dr. G. Sahaya Shiny Assistant Professor in commerce. Holy Cross College (Autonomous). It has not been previously done for the award of the any other degree.

PROJECT TEAM MEMBERS	REGISTER NO	SIGNATURE
D. ABISHA	2021AUA242	DAbisha
P. AGUSTA JERLYN	2021AUA245	Agusta Jerlyn P.
S. M. ASHBELL RINISHA	2021AUA254	S.M.Ashbell Rinisha
C. MEGAN BERTIL	2021AUA281	C.Megan Bertil
S. ROSE RAJA SIBITHA	2021AUA290	S. Sibitha
R.SAFRINA	2021AUA291	Safrina.R/..

Place: Nagercoil

Date: 31/10/2023



**A STUDY ON CONSUMER'S KNOWLEDGE,  
AWARENESS AND PERCEPTION TOWARDS  
ORGANIC FOOD PRODUCTS**

**A THESIS**

*Submitted by*

**MANJU SHARMEE S R**  
Reg. No. 19223041012002

**COMMERCE**

*in partial fulfillment of the requirements for the award of degree of*

**DOCTOR OF PHILOSOPHY**



**MANONMANIAM SUNDARANAR UNIVERSITY**

**TIRUNELVELI – 627 012**

**SEPTEMBER - 2023**





## ABSTRACT

Organic food is produced by organic farming and which are cultivated without using any harmful chemicals, fertilizers and pesticides. Organic foods are safe and good for human health. It is short – lived in nature. The food consumption patterns of the consumers are changed and individuals are go for organic food because of health consciousness. In this turning point, the study analysed the consumers knowledge, awareness and perception towards organic food products. The purposive sampling technique is adopted to select the sample respondents. The sample size was calculated by Cochran's formula. The response rate for this study and final sample respondents are 420 from the study area of Kanyakumari district and a well-structured questionnaire is prepared based on the objectives of the study. The data were analysed with the help of SPSS version 26. The primary data were analysed with Percentages, Mean rank, Chi-square, Friedman ranking, One way ANOVA, Factor analysis and Gap analysis.

In awareness towards organic food products in the market the overall analysis shows that health mix, oil, honey and dry fruits & nuts are well known and mostly preferred by the respondents. 'Health and safety', 'Nutritional' and 'Guaranteed quality' are the first three ranked factors about which the respondents have knowledge with reference to organic food products. The overall analysis shows that food with nutrients, safer to consume and shorter shelf life are the first three ranks in consumers perception in organic food products. The analysis shows that consumers expectations are more than their experience regarding the usage of organic food products. Based on the findings, the researcher gives recommendations to the manufactures to fulfill the consumers expectations on organic food products and government can take efforts to promote the organic food products in the study area. If the consumers are well informed about the benefits of organic food products the demand and consumption will increase.





**MANONMANIAM SUNDARANAR UNIVERSITY**  
**TIRUNELVELI – 627 012**

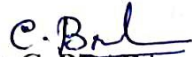
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**CERTIFICATE**

The research work embodied in the present thesis entitled “**A STUDY ON CONSUMER’S KNOWLEDGE, AWARENESS AND PERCEPTION TOWARDS ORGANIC FOOD PRODUCTS**” has been carried out in the Research Centre of Commerce, Holy Cross College (Autonomous), Nagercoil. The work reported herein is original and does not form a part of any other thesis or dissertation on the basis of a degree or award was conferred on an earlier occasion or to any other scholar.

I understand the University’s policy on plagiarism and declare that the thesis and publications are my own work, except where specifically acknowledged and has not been copied from other sources or been previously submitted for award or assessment.

  
**MANJU SHARMEE S R**  
RESEARCH SCHOLAR

  
**Dr. C. BRABA**  
RESEARCH SUPERVISOR,  
Assistant Professor,  
Department of Commerce,  
Holy Cross College (Autonomous),  
Nagercoil - 629 004.  
**Dr. C. BRABA**, M.Com., M.Phil., Ph.D., NET.,  
Assistant Professor & Research Supervisor,  
Research Department of Commerce,  
Holy Cross College (Autonomous),  
Nagercoil - 629 004, Tamil Nadu.



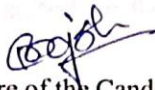
**MANJU SHARMEE S R**  
Research Scholar,  
Register No. 19223041012002,  
Department of Commerce,  
Holy Cross College (Autonomous),  
Nagercoil-629 004.

### DECLARATION

I do hereby declare that this work has been originally carried out by me under the guidance and supervision of **Dr. C. BRABA**, Assistant Professor, Department of Commerce, Holy Cross College (Autonomous), Nagercoil and that this work has not been submitted elsewhere for any other degree.

Place: Nagercoil

Date: 11/09/2023

  
Signature of the Candidate  
(**MANJU SHARMEE S R**)



DEPARTMENT OF MATHEMATICS

Visit to Solar Observatory Centre - Kodaikanal





Solar Observatory Centre- Kodaikanal  
09.03.2024 10:08  
10.23344, 77.46347 (±144m)  
Altitude: 2286m  
Unnamed Road, Kodaikanal 624103

Demonstration of Astronomy



Astronomy - Demonstration  
23.01.2024 10:10  
8.15415, 77.41424



DEPARTMENT OF BOTANY

Webinar on Indian Knowledge System – Tribal Medicine

**HOLY CROSS COLLEGE  
(AUTONOMOUS),  
NAGERCOIL-4**

Filiated to Manonmanium Sundaranar University, Tirunelveli  
Internationally Re-Accredited with A+ Grade (CGPA-3.35) by NAA

**INSTITUTION INNOVATION COUNCIL**

Invites you for a webinar  
on  
**Indian Knowledge System  
– Tribal Medicine**  
Chief Guest  
**Dr. A. Anami Augustus Arul**  
Assistant Professor  
Department of Botany  
Holy Cross College, Nagercoil  
Date: 18/11/2020  
Time: 10:00 – 11:00 AM  
Patron: Dr. Sr. Gerardin  
Jayam  
Chairperson: Dr. Sr. Anne  
Perpet Sophy  
IIC Convenor  
Dr. A. Anami Augustus Arul  
Organizing Secretary  
Ms. P. Aji Udhaya  
Email: [iic\\_mhrd@holycrossngl.edu.in](mailto:iic_mhrd@holycrossngl.edu.in)

Sp Adobe

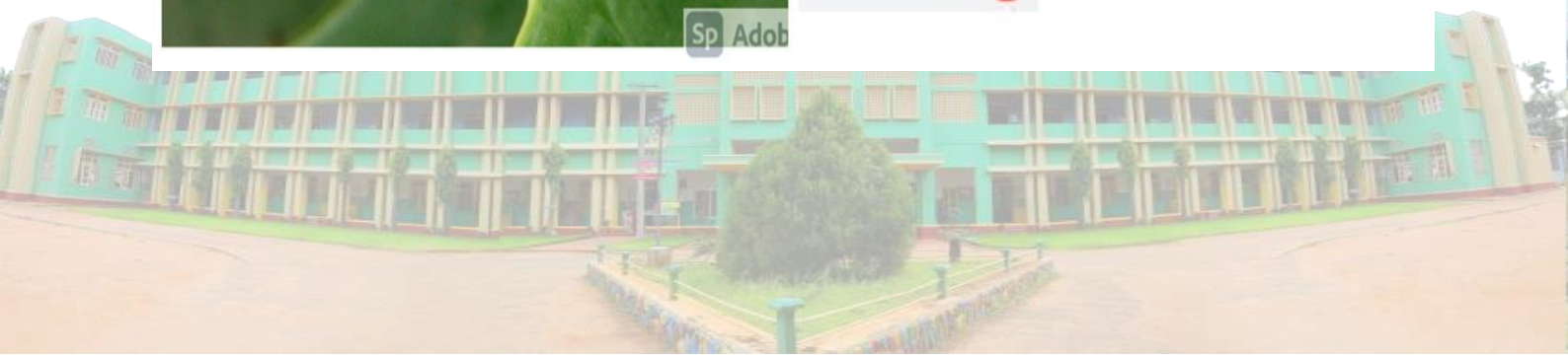


(30)

Gowsalya .k (You)

Anami Augustus

MICHEAL SAHAYA VINSL...

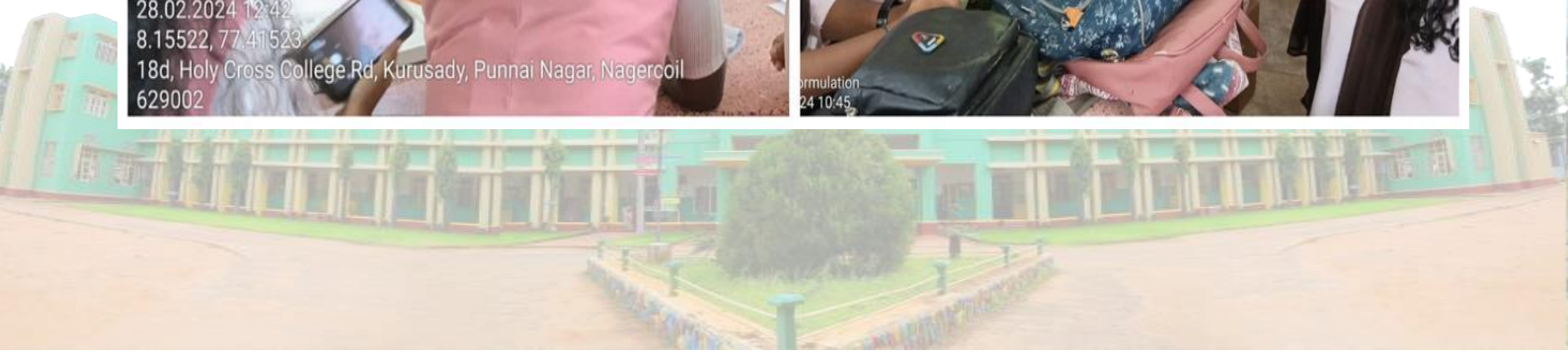


Hands on Training on Herbal Formulations

  
**Holy Cross College (Autonomous), Nagercoil - 4**  
Affiliated to Manonmaniam Sundaranar University, Tirunelveli  
Accredited with A<sup>+</sup> Grade (CGPA 3.35 - IV Cycle) by NAAC

  
**Department of Botany**  
in Collaboration with   
**Department of Botany, Vivekananda College,**  
**Agastheeswaram**  
organizes  
**Hands on Training on Herbal Formulations**  
**Resource Person**  
**Mrs. Saritha Jothi, Varma Aasan, Kottaram**  
Date : 28.02.2024  
Time : 10.00 am. to 1.00 pm.  
Venue : Botany Lab

  
Inauguration - Dr. Sr. S. Sahayaselvi, Principal  
Patron: Dr. Sr. Mary Hilda, Secretary  
President: Dr. Sr. S. Sahayaselvi, Principal  
Convener



Field Visit - Traditional Plant Collection



Taxonomy Field Visit  
Department Of Botany  
17.10.2023 11:04  
8.28222, 77.414  
7CJ8+X89, Chiramadam

ESTD

1965







Taxonomy Field Visit-Herbarium  
Department Of Botany  
17.10.2023 10:44  
8.28235, 77.41469  
7CJ8+X89, Chiramadam



DEPARTMENT OF HISTORY

MoU with Government Museum, Tirunelveli



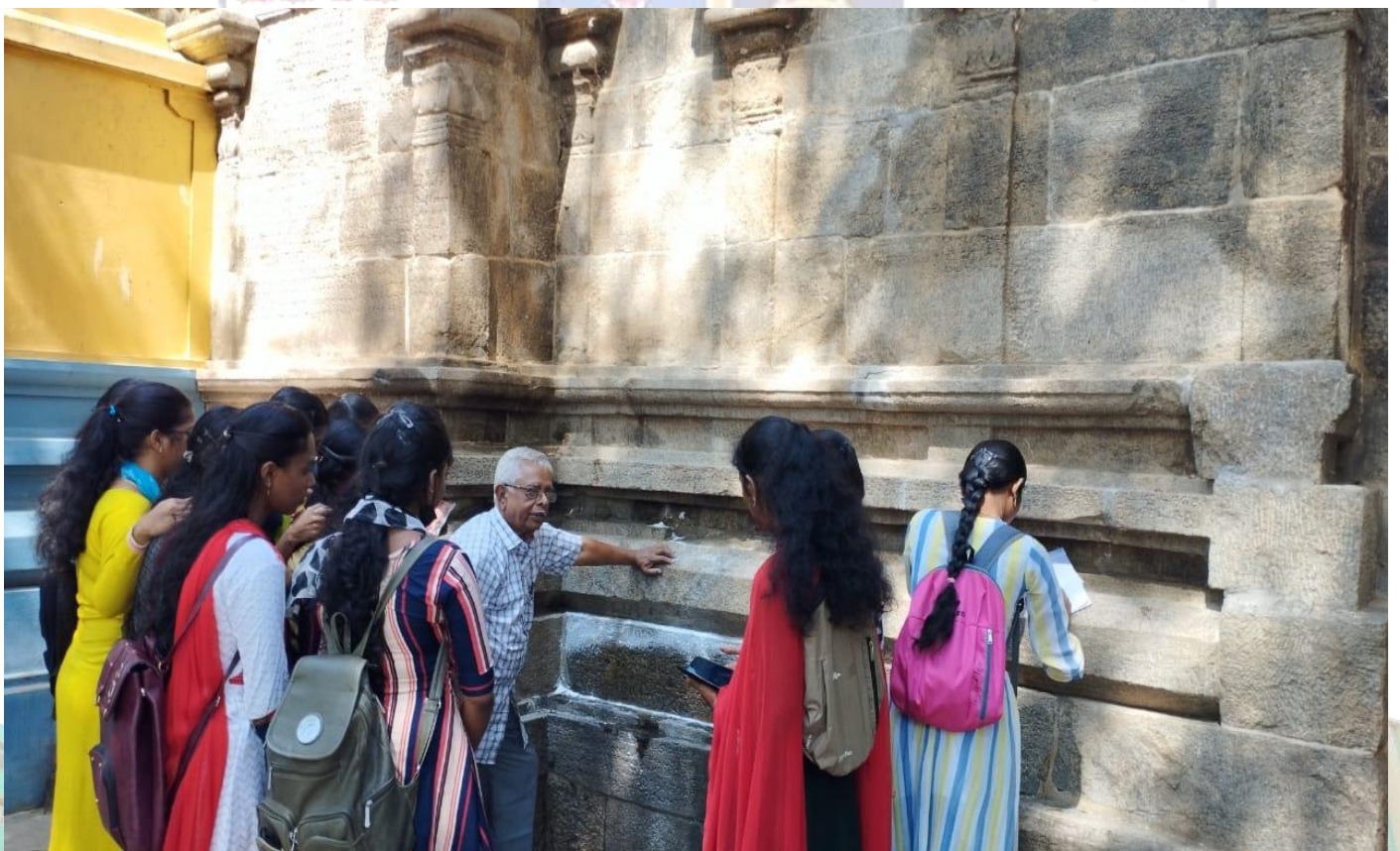
MoU Signing  
Government Museum Tirunelveli  
06.03.2024 09:52  
8.72178, 77.74145  
PPCR+PMW, Water Tank Rd, Jansi Rani Nagar, Palayamkottai,  
Tirunelveli 627002

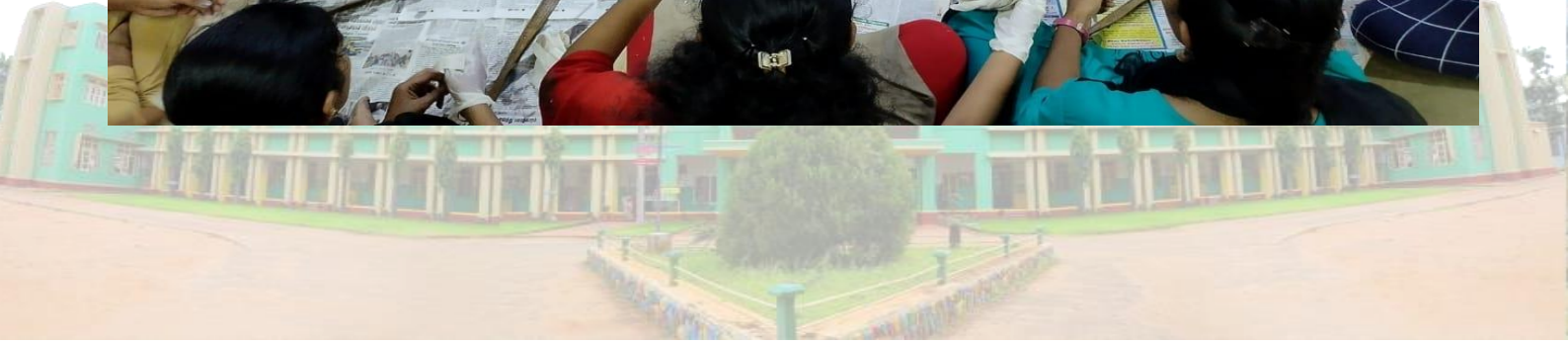




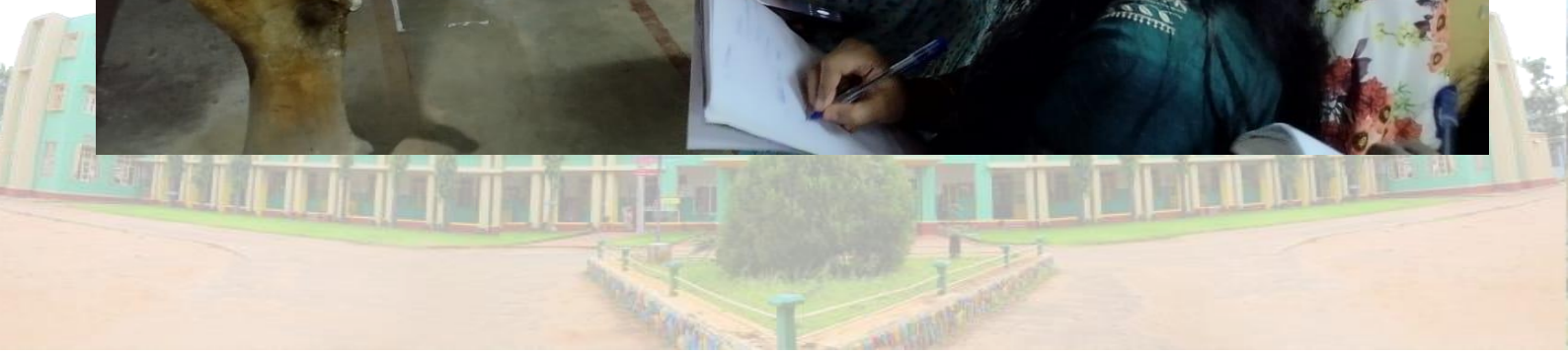


Internship Training Programme – Government Museum, Kanniyakumari











ESTD

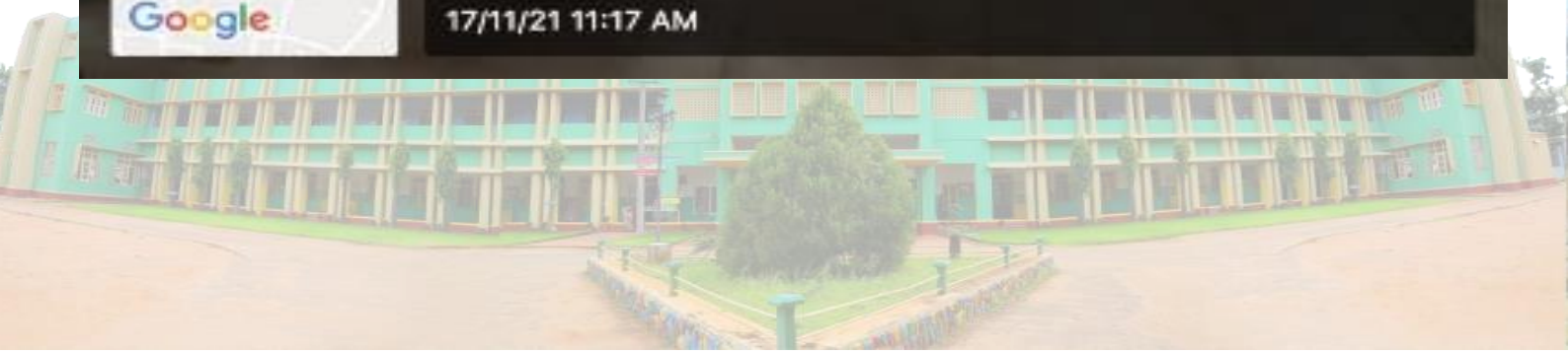
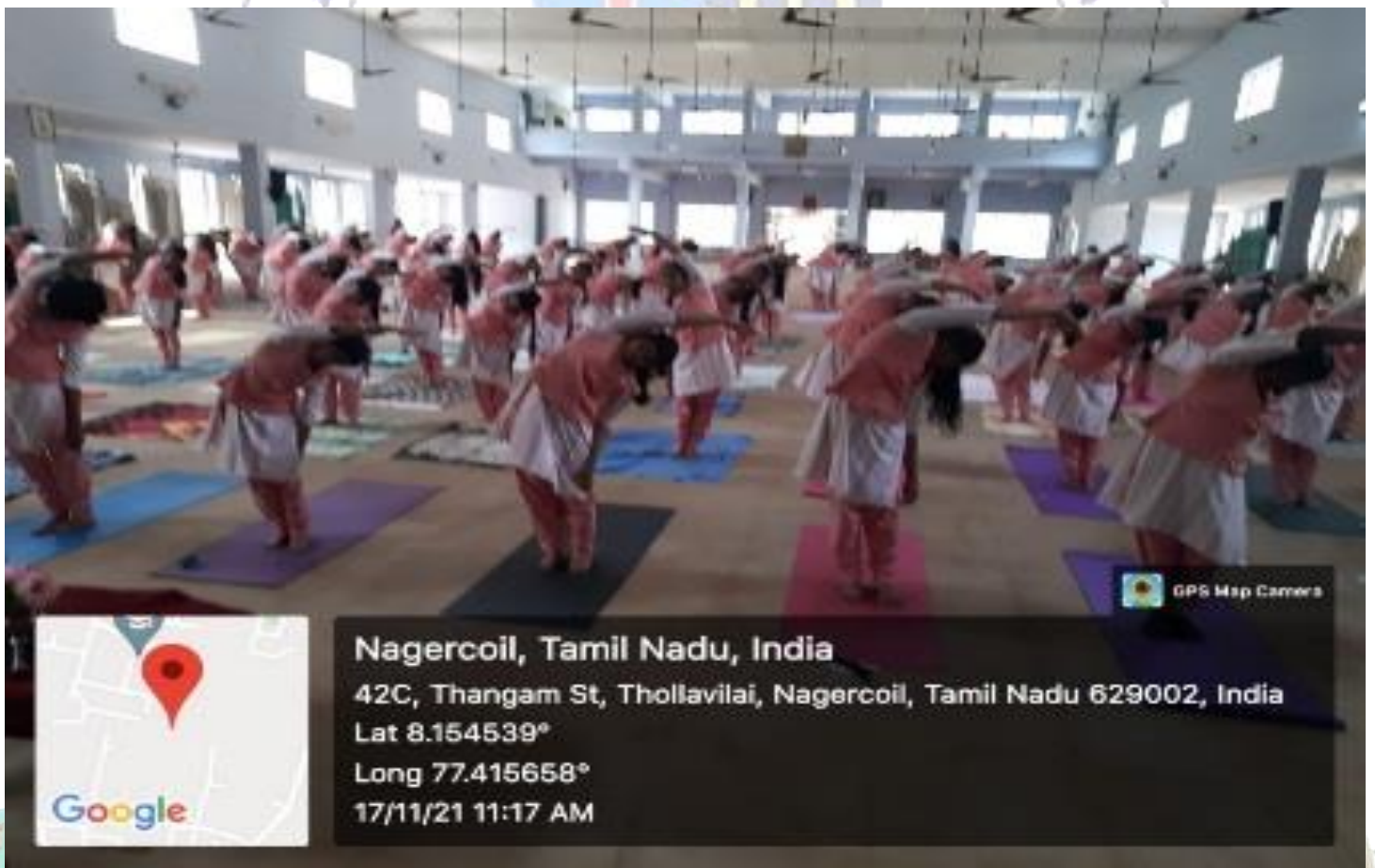
Yoga

1965











Latitude: 8.154431  
Longitude: 77.415679  
Elevation: 29.48m  
Accuracy: 8.6m  
Time: 16-11-2021 10:09  
Note: yoga Practicals







GPS Map Camera



**Nagercoil, Tamil Nadu, India**

42C, Thangam St, Thollavilai, Nagercoil, Tamil Nadu 629002, India

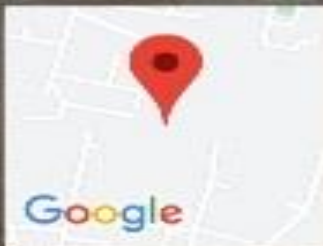
Lat 8.154462°

Long 77.415748°

20/04/22 11:32 AM



GPS Map Camera



**Nagercoil, Tamil Nadu, India**

6C36+R66, Holy Cross College Rd, Thollavilai, Nagercoil, Tamil Nadu 629002, India

Lat 8.154539°

Long 77.415642°

19/10/22 12:13 PM

Notes : I PG group discussion

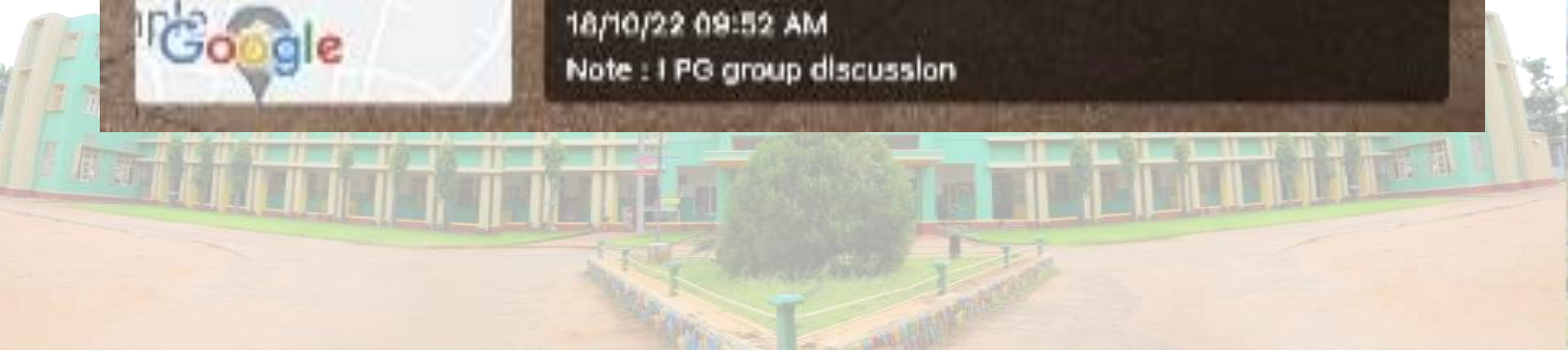




QPS Map Camera



**Nagercoil, Tamil Nadu, India**  
5C38+R68, Holy Cross College Rd, Thollavilai, Nagercoil,  
Tamil Nadu 629002, India  
Lat 6.18451°  
Long 77.415502°  
18/10/22 09:52 AM  
Note : I PG group discussion





GPS Map Camera



**Nagercoil, Tamil Nadu, India**

5C38+R68, Holy Cross College Rd, Thollavilai,  
Nagercoil, Tamil Nadu 629002, India

Lat 8.154412°

Long 77.415579°

21/10/22 10:10 AM GMT +05:30







