

# **EFFECT OF PESTCIDES ON NITROGEN FIXING BACTERIA**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment  
of the requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

Submitted by

**MUMTHAS C**

(Register No: EMAVMMB008)



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

Re-accredited with 'A' grade by NAAC  
(Aided, affiliated to University of Calicut),

**P.O. KUMMINIPARAMBA, MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

Aided by Govt of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A\* grade by NAAC

P.O.Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
mail@emeacollege.ac.in

## CERTIFICATE

This is to certify that the dissertation "EFFECT OF PESTICIDES ON NITROGEN FIXING BACTERIA" is a bonafide research work done by Ms. MUMTHAS C. (Register no: EMAVMMB008) at Biosino diagnostic and Research centre, Alathiyur, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

Dr. SHIJI THOMAS

(Head of the Department)

Examiners

- 1.
- 2.

Resna.N.K.

**Dr. SHIJI THOMAS**  
HOD, Dept. Of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

**ANTIMICROBIAL POTENTIAL OF EXTRACT  
FROM *PSEUDOMONAS AERUGINOSA* EMEA 2022:  
A SOIL ISOLATE**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

Submitted by

**HIBA.V**

**(Register No: EMAVMMB005)**



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A grade by NAAC

P.O.Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
[mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

**CERTIFICATE**

This is to certify that the dissertation entitled **ANTIMICROBIAL POTENTIAL OF EXTRACT FROM PSEUDOMONAS AERUGINOSA EMEA 2022:A SOIL ISOLATE** is a bonafide research work done by Ms. HIBA.V(Register no: EMAMMMB005) at EMEA College of arts and science, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

Dr. SHIJITHOMAS

(Head of the department)

Examiners

Resma N.K. 2/9/23

Dr. SHIJITHOMAS  
HOD, Dept. Of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

# **ISOLATION AND IDENTIFICATION OF FUNGAL BIOFILM FORMATION ON URETHRAL CATHETER**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by**

**HIBA.V**

**(Register No: EMAVMMB004)**



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE**

**KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with Agrade by NAAC

P.O.Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
[mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

## CERTIFICATE

This is to certify that the dissertation entitled ISOLATION AND IDENTIFICATION OF FUNGAL BIOFILM FORMATION ON URETHRAL CATHETER is a bona fide research work done by Ms. HIBA.V (Register no: EMAVMMB004) at EMEA College of arts and science, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

Dr. SHIJITHOMAS

(Head of the department)

Examiners

Dr. SHIJITHOMAS  
HOD, Dept. of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

**ISOLATION AND MOLECULAR  
CHARACTERIZATION OF LIPASE PRODUCING  
BACTERIA FROM MARINE WATER AND  
EXPLOITATION OF BACTERIAL LIPASE FOR  
DAIRY EFFLUENT TREATMENT**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfillment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

Submitted by

**SHAFI MUBARAK M T**

(Register No: EMAVMMB017)



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt. of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A grade by NAAC

P.O. Kumminiparamba,  
673638  
Malappuram(dist), Kerala  
India  
Ph : +914832712030  
E-mail: [mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

## CERTIFICATE

This is to certify that the dissertation entitled 'ISOLATION AND MOLECULAR CHARACTERIZATION OF LIPASE PRODUCING BACTERIA FROM MARINE WATER AND EXPLOITATION OF BACTERIAL LIPASE FOR DAIRY EFFLUENT TREATMENT' is a bonafide research work done by Mr. SHAFI MUBARAK M T (Register no: EMAVMMB017) at EMEA College of arts and science, during the year of 2021-2023 in partial fulfillment for the award of the degree of Master of Science in Microbiology

Date  
Place

Dr. SHIJITHOMAS

(Head of the department)

Examiners

- 1.
- 2.

*Resma N.K* *AKK*  
2/8/23

Dr. SHIJITHOMAS  
HOD, Dept. OF MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638



# **ISOLATION AND CHARACTERISATION OF BACTERIOCIN PRODUCING *BACILLUS* SPECIES FROM SOIL**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by**

**MAHADIYA.P**

**(Register No: EMAVMMB006)**



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE**

**KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**


**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt of Kerala, Affiliated to the  
University of Calicut,  
Re-accredited with A grade by NAAC

P.O. Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph: +914832712030  
E-mail:  
[mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)


## CERTIFICATE

This is to certify that the dissertation entitled Isolation and characterization of Bacteriocin producing *bacillus* species from soil is a bonafide research work done by Mr/Ms. MAHADIYA P (Register no: EMAYMMB006) at Biosino diagnostic and research Centre, Alathiyur, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

  
Dr. SHIJITHOMAS

(Head of the department)

Examiners

1. Resna. N.K.   
21/9/23
- 2.

Dr. SHIJI THOMAS  
HOD, Dept. of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

**CHARACTERIZATION OF ENDOPHYTIC  
BACTERIA ASSOCIATED WITH  
CATHARANTHUS ROSEUS AND ITS  
POTENTIAL PLANT GROWTH PROMOTING  
TRAITS**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

Submitted by

**SHAHALA K V**

(Register No: EMAVMMB012)



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

COLLEGE OF ARTS AND SCIENCE KONDOTTY  
Aided by Govt. of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A grade by NAAC

P.O. Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
[mail@emecollege.ac.in](mailto:mail@emecollege.ac.in)

### CERTIFICATE

This is to certify that the dissertation entitled 'Characterization of Endophytic bacteria associated with *Catharanthus roseus* and its potential plant growth promoting traits' is a bonafide research work done by Ms. SHAHALA K V (Register no: EMAVMMB012) at Biosino diagnostic and research Centre, Alathiyur, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

Dr. SHIJITHOMAS

(Head of the department)

Examiners

- 1.
- 2.

Resma N.K.   
12/8/23

Dr. SHIJITHOMAS  
HOD, Dept. of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

# **CHARACTERIZATION AND PROBIOTIC POTENTIAL OF LACTIC ACID BACTERIA ISOLATED FROM MILK**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by**

**ARSHA P**

**(Register No: EMAVMMB002)**



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**  
Aided by Govt. of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A grade by NAAC

P.O. Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
[mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

### CERTIFICATE


This is to certify that the dissertation entitled 'CHARACTERIZATION AND PROBIOTIC POTENTIAL OF LACTIC ACID BACTERIA ISOLATED FROM MILK' is a bonafide research work done by Ms. ARSHA P (Register no: EMAVMMB002) at Biosino diagnostic and research Centre, Alathiyur , during the year of 2021-2023 in a partial fulfillment for the award of the degree of Master of Science in Microbiology

  
Dr. SHIJITHOMAS

(Head of the department)

Examiners

1.

Resna.N.K 

2.

Dr. SHIJITHOMAS  
HOD, Dept. of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

**ISOLATION AND MOLECULAR  
CHARACTERIZATION OF URICASE PRODUCING  
BACTERIA FROM POULTRY DROPPINGS SOIL**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfillment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by  
SHANA NASRIN . V K**

**(Register No: EMAVMMB014)**



**DEPARTMENT OF MICROBIOLOGY**

**EMEA COLLEGE OF ARTS AND SCIENCE, KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**  
**COLLEGE OF ARTS AND SCIENCE KONDOTTY**  
Aided by Govt of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A<sup>+</sup> grade by NAAC

P.O. Kummilparamba,  
673638 Malappuram (dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
[mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

## CERTIFICATE

This is to certify that the dissertation entitled **isolation and molecular characterization of uricase producing bacteria from poultry droppings soil** is a bonafide research work done by **Ms. Shana Nasrin.VK** (Register no **EMAVMMB014**) at EMEA College, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology.

Dr. SHIJI THOMAS

(Head of the department)

### Examiners

- 1.
- 2.

*Resna.N.K*   
2/8/23

Dr. SHIJI THOMAS  
HOD, Dept. Of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638



**ANALYSIS OF ROLE OF GREEN SYNTHESIZED  
NANOPARTICLE INCORPORATED BIOPLASTIC IN  
FOOD PRESERVATION**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of  
the requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

Submitted by

**SHEFNA NOUSHAD**

**(Register No: EMAVMMB016)**



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of  
Calicut),**

**P.O. KUMMINIPARAMBA  
MALAPPURAM (DIST),  
PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt of Kerala, Affiliated to the University  
of Calicut),

Re accredited with A'grade by NAAC

P.O.Kumminiparamba,  
673638

Malappuram(dist)  
Kerala

India

Ph : +914832712030

E mail:

[mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

### CERTIFICATE

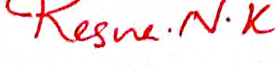
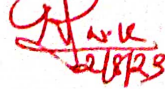
This is to certify that the dissertation entitled "ANALYSIS OF ROLE OF GREEN SYNTHESIZED NANOPARTICLE INCORPORATED BIOPLASTIC IN FOOD PRESERVATION" is a bonafide research work done by Ms. SHEFNA NOUSHAD (Register no: EMAVMMB016) at Merit Biolabs, Kochi, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

  
Dr. SHIJITHOMAS

(Head of the department)

Dr. SHIJITHOMAS  
HOD, Dept. OF MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

Examiners

1. Resma.N.K  
- 2.

**CHARACTERIZATION AND  
OPTIMIZATION OF BACTERIUM  
ISOLATED FROM RHIZOSPHERE SOIL FOR  
SIDEROPHORE PRODUCTION**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTERS IN MICROBIOLOGY**

Submitted by

**MALAVIKA M P**

**(Register No: EMAVMMB007)**



**DEPARTMENT OF MICROBIOLOGY**

**EMEACOLLEGE OF ARTS AND SCIENCE**

**KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBAM**

**ALAPPURAM (DIST)**

**PIN. 673638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

**Aided by Govt. of Kerala, Affiliated to  
the University of Calicut),**

**Re-accredited with A grade by NAAC**

**P.O.  
Kumminiparamba, 67363  
8  
Malappuram (dist) Kerala  
India  
Ph: +914832712030  
E-  
mail: [mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)**


## CERTIFICATE

This is to certify that the dissertation entitled “CHARACTERIZATION, AND OPTIMIZATION OF BACTERIUM ISOLATED FROM RHIZOSPHERE SOIL FOR SIDEROPHORE PRODUCTION” is a bonafide research work done by Ms. MALAVIKA M P (Register no: EMAVMMB007) at Biosino diagnostic and research Centre, Alathiyur, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

  
Dr. SHUJITHOMAS

(Head of the department)

Examiners

1.   
Resne. N.K
- 2.

**Dr. SHUJITHOMAS**  
HOD, Dept. Of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

**SYNERGISTIC EFFECT OF PLANT EXTRACT  
WITH ANTIBIOTICS AGAINST PATHOGENS  
CAUSING URINARY TRACT INFECTIONS**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by**

**SHAHANA SHERIN P**

**(Register No: EMAVMMB013)**



**DEPARTMENT OF MICROBIOLOGY**

**EMEA COLLEGE OF ARTS AND SCIENCE**

**KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**  
Aided by Govt. of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A grade by NAAC

P.O. Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
[mail@emecollege.ac.in](mailto:mail@emecollege.ac.in)

### CERTIFICATE

This is to certify that the dissertation entitled '**SYNERGISTIC EFFECT OF PLANT EXTRACT WITH ANTIBIOTICS AGAINST PATHOGENS CAUSING URINARY TRACT INFECTIONS**' is a bonafide research work done by Ms. **SHAHANA SHERINP** (Register no: **EMAVMMB013**) at Merit Biolabs, Kochi, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

  
Dr. SHIJITHOMAS

(Head of the department)

Examiners

1.

*Resna.N.K* 

2.

Dr. SHIJITHOMAS  
HOD, Dept. Of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

# **ISOLATION AND CHARACTERIZATION OF INDOLE ACETIC ACID PRODUCING BACTERIA FROM RHIZOSPHERE SOIL AND ITS EFFECT ON PLANT GROWTH**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by  
SAJITHA.M**

**(Register No: EMAMMMB010)**



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A'grade by NAAC

P.O.Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
[mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

## CERTIFICATE

This is to certify that the dissertation entitled ISOLATION AND CHARACTERIZATION OF INDOLE ACETIC ACID PRODUCING BACTERIA FROM RHIZOSPHERE SOIL AND ITS EFFECT ON PLANT GROWTH is a bonafide research work done by **Ms. SAJITHA .M** (Register no: EMAVMMB010) at *-Amplicon Biolab, Kinfra Techno Industrial Park* ,during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

Dr. SHIJITHOMAS

(Head of the department)

Examiners

1. Resna.N.K.

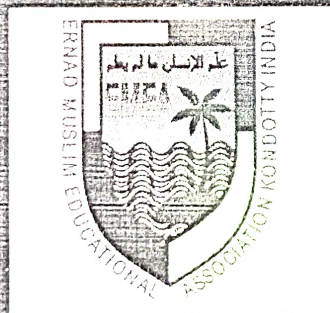
Dr. SHIJITHOMAS  
HOD, Dept. Of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638



# **USE OF MORINGA OLEIFERA SEED POWDER AS NATURAL COAGULANT AND ANTIMICROBIAL AGENT FOR GROUND WATER TREATMENT**

**Dissertation submitted to the UNIVERSITY OF CALICUT  
As partial fulfilment for award of the degree of  
MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by  
Ms. FATHIMA SHAFNA  
Reg No. EMATMMB004**



**Department of Microbiology**

**EMEA College of Arts and Science, Kondotty**

**(Affiliated to the University of Calicut)**

**Kondotty**

**Malappuram, Kerala**


CERTIFICATE

This is to certify that the project entitled "USE OF MORINGA OLEIFERA SEED POWDER AS NATURAL COAGULANT AND ANTIMICROBIAL AGENT FOR GROUND WATER TREATMENT" is a bonafide record work done by Ms. FATHIMA SHAFNA N. (Reg No: EMATMMB004), at Amplicon biolabs, kinfra, kakkanchery, during the year of 2020-2021 in a partial fulfillment for the award of the degree of Master of Science in Microbiology under the guidance of Mr. P. Younus, Assistant Professor, Department of Microbiology.

  
Dr. SHIJI THOMAS

Head, Department of Microbiology.

External Examiner

1. Resna. N. IC   
21/8/23

Dr. SHIJI THOMAS  
HOD, Dept. Of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

**"ASSESSMENT OF ANTIMICROBIAL POTENTIAL  
IN VARIOUS CITRUS FRUITS COMPONENTS  
AGAINST WOUND INFECTING BACTERIA"**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by  
SHAFNA.M.A**

**(Register No:EMAVMMB011)**



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE**

**KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A'grade by NAAC

P.O.Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
[mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

### CERTIFICATE

This is to certify that "ASSESSMENT OF ANTIMICROBIAL POTENTIAL IN VARIOUS CITRUS FRUIT COMPONENTS AGAINST WOUND INFECTING BACTERIA" is a bona fide research work done by Ms. SHAFNA M.A (Register no: EMAVMMB011) at EMEA COLLEGE ARTS AND SCIENCE KONDOTTY, during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

Dr. SHIJITHOMAS

(Head of the department)

Examiners

1. Resna.N.K. 29/8/23

2.

Dr. SHIJITHOMAS  
HOD, Dept. Of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

**BIOPROCESS OPTIMISATION FOR ENHANCED  
PRODUCTION AND PURIFICATION OF  
BACTERIAL LIPASE AND EVALUATION OF  
BIOSURFACTANT PROPERTIES**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the  
requirements for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by**

**VASEEM AKRAM P V**

**(Register No: EMAVMMB018)**



**DEPARTMENT OF MICROBIOLOGY**

**EMEA COLLEGE OF ARTS AND SCIENCE**

**KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt. of Kerala, Affiliated to the  
University of Calicut),  
Re-accredited with A grade by NAAC

P.O. Kumminiparamba,  
673638  
Malappuram(dist), Kerala  
India  
Ph : +914832712030  
E-mail: [mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

## CERTIFICATE

This is to certify that the dissertation entitled 'BIOPROCESS OPTIMISATION FOR ENHANCED PRODUCTION AND PURIFICATION OF BACTERIAL LIPASE AND EVALUATION OF BIOSURFACTANT PROPERTIES' is a bonafide research work done by Mr. VASEEM AKRAM P V (Register No: EMAVMMB018) at EMEA College of arts and science, during the year of 2021-2023 in partial fulfillment for the award of the degree of Master of Science in Microbiology

Date  
Place

  
Dr. SHIJITHOMAS

(Head of the department)

Examiners

Dr. SHIJITHOMAS  
HOD, Dept. of MICROBIOLOGY  
EMEA, COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638

# **“ INVESTIGATION OF ANTIMICROBIAL POTENTIALITY OF TITANIUM DIOXIDE NANOPARTICLES FOR WASTE WATER TREATMENT”**

*Project work submitted to the UNIVERSITY OF CALICUT in partial fulfilment of the requirements  
for the award of degree of*

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by  
FATHIMA HAMZA K.P  
(Register No: EMAVMMB003)**



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

**Re-accredited with 'A' grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST),**

**PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt of Kerala, Affiliated to the University of Calicut),

Re-accredited with A grade by NAAC

P.O.Kumminiparamba,  
673638 Malappuram(dist)  
Kerala  
India  
Ph : +914832712030  
E-mail:  
[mail@emeacollege.ac.in](mailto:mail@emeacollege.ac.in)

## CERTIFICATE

This is to certify that the dissertation entitled “**INVESTIGATION OF ANTIMICROBIAL POTENTIALITY OF TITANIUM DIOXIDE NANOPARTICLES FOR WASTEWATER TREATMENT** ” is a bonafide research work done by **Ms. FATHIMA HAMZA K.P** (Register no: **EMAVMMB003**) at Geno Bio Research Centre, Kotakkal ,during the year of 2021-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

  
Dr. SHIJITHOMAS

(Head of the department)

Examiners

1.

  
Resma N.K

2.

Dr. SHIJITHOMAS  
HOD, Dept. Of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638



**CHARACTERIZATION OF POTENTIAL  
ANTIMICROBIAL COMPOUNDS PRODUCING  
*BACILLUS CEREUS* EMEA 2022 ISOLATED  
FROM HOMEMADE CURD**

Project work submitted to the UNIVERSITY OF CALICUT in partial  
fulfilment of the requirements for the award of degree of

**MASTER OF SCIENCE IN MICROBIOLOGY**

**Submitted by  
RUSTHA**

**(Register No: EMAVMMB009)**



**DEPARTMENT OF MICROBIOLOGY  
EMEA COLLEGE OF ARTS AND SCIENCE  
KONDOTTY**

**Re-accredited with „A“ grade by NAAC (Aided, affiliated to University of Calicut),**

**P.O. KUMMINIPARAMBA**

**MALAPPURAM (DIST), PIN. 673 638**



**EMEA**

**COLLEGE OF ARTS AND SCIENCE KONDOTTY**

Aided by Govt of Kerala, Affiliated to the  
University of Calicut),

Re-accredited with A,,grade by NAAC

P.O.Kumminiparamba,  
673638 Malappuram(dist)

Kerala

India

Ph : +914832712030

E-mail:

[mail@emecollege.ac.in](mailto:mail@emecollege.ac.in)

## CERTIFICATE


This is to certify that the dissertation entitled “CHARACTERIZATION OF POTENTIAL ANTIMICROBIAL COMPOUNDS PRODUCING *BACILLUS CEREUS* EMEA 2022 ISOLATED FROM HOMEMADE CURD” is abonafide research work done by Mrs. RUSTHA (Register no:EMAVMMB009) at EMEA College of Arts and Science, Kondotty during the year of 2022-2023 in a partial fulfillment for the award of the degree of master of science in Microbiology

  
Dr. SHIJITHOMAS

(Head of the department)

Examiners

1.

Resha.N.K   
02/08/23

2.

Dr. SHIJITHOMAS  
HOD, Dept. of MICROBIOLOGY  
E.M.E.A. COLLEGE OF ARTS & SCIENCE  
KONDOTTY, MALAPPURAM, Pin: 673 638