



Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bengaluru - 560 012

Telephone: 080-23341652, 23348848, 23348849 ♦ Telefax: 080-23348840

Email: office@kscst.iisc.ernet.in, office@kscst.org.in ♦ Website: www.kscst.iisc.ernet.in, www.kscst.org.in

Mr. H. Hemanth Kumar
Executive Secretary

27th March 2019

Ref: 7.1.01/SPP/1333

The Principal,
Sapthagiri College of Engineering,
#14/5, Chickasandra,
Hesaraghatta Main Road,
Bengaluru - 560 057.

Dear Sir/Madam,

Sub : Sanction of Student Project - 42nd Series: Year 2018-2019

Your Project Proposal Reference No. : 42S_BE_0279


Ref : Your Project Proposal entitled " **AGROBOT**

I am happy to inform that your student project proposal referred above, has been approved by the Council for "Student Project Programme - 42nd Series" and has been sanctioned with a budgetary break-up as detailed below:

| Student / s | Ms. Anusha B and others | Budget | Amount (Rs) |
|--|---|-----------------------|-----------------|
| | | Materials/Consumables | 6,000.00 |
| Guide/s | Mr. A.Dhamodaran | Labor | - |
| | | Travel | 500.00 |
| Department | Electrical And Electronics Engineering | Miscellaneous | 500.00 |
| | | Report | 500.00 |
| | | TOTAL | 7,500.00 |
| SEVEN THOUSAND FIVE HUNDRED RUPEES ONLY | | | |

The following are the guidelines to carryout the project work :

- The project should be performed based on the objectives of the proposal sent by you.
- The project should be completed in all respects and one copy of the hardbound report along with softcopy of the full report in a CD (.pdf format) should be submitted to KSCST.
- Any change in the project title and objectives, etc., or students is liable to rejection of the project and the amount sanctioned needs to be returned to KSCST.
- Please quote your **project reference number printed above** in all your future correspondences.
- Important:** After completing the project, 2 to 3 page write-up (synopsis) needs to be sent by e-mail [spp@kscst.iisc.ernet.in] and should include following :
 - Title of the project
 - Name of the College & Department
 - Name of the students & Guide(s)
 - Keywords


Principal
Sapthagiri College of Engineering
Chickasandra, Hesaraghatta Road,
Bengaluru-560 057

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**VISVESVARAYA TECHNOLOGICAL UNIVERSITY,
BELAGAVI-590018, KARNATAKA**



A Project Report On

AGROBOT

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

BACHELOR OF ENGINEERING IN ELECTRICAL AND ELECTRONICS

For the academic year 2018-2019

Submitted By

ANUSHA B (ISG15EE008)

C S MOHANA (ISG15EE017)

JEEVITHA A (ISG15EE038)

KEERTHANA R (ISG15EE041)

Under The Esteemed Guidance Of:

Mr. A DHAMODARAN, Asst. Professor



Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

Department of Electrical and Electronics Engineering

SAPTHAGIRI COLLEGE OF ENGINEERING

14/5 Chikkasandra, Hesaraghatta Main Road, Bangalore-560057



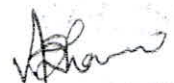
SAPTHAGIRI COLLEGE OF ENGINEERING

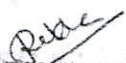
#14/5, Chikkasandra, Hessarghatta Main Road, Bangalore-560057


Department of Electrical and Electronics Engineering

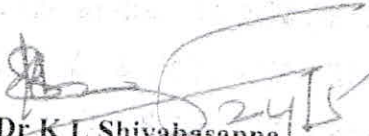
CERTIFICATE

Certified that the project work entitled **AGROBOT** is carried out collectively by **ANUSHA B (ISG15EE008)**, **C S MOHANA (ISG15EE017)**, **JEEVITHA A (ISG15EE038)**, **KEERTHANA R (ISG15EE041)**, bonafide students of 8th semester EEE Dept. in partial fulfillment for the award of degree in **Bachelor of Engineering** at Sapthagiri College of Engineering affiliated to **Visvesvaraya Technological University, Belagavi** for the Academic year **2018-2019**. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.


Mr. A Dhamodaran
Assistant Prof.
Guide


Mrs. Rekha S N
Associate Prof.
Project Coordinator


Dr. K N Ravi
Prof & HOD
EEE Dept.


Dr. K L Shivabasappa
Principal


Principal
Sapthagiri College of Engineering
Chikkasandra, Hessarghatta Road
Bangalore-560 057

External Viva

Name of the examiners

- 1.
- 2.

Signature with date

ABSTRACT

This project strives to develop a robot capable of performing operations like ploughing, fruit picking, testing of the atmospheric parameters like temperature, humidity, pH level and moisture content of the soil. The main component here is the Arduino Uno ATmega328P microcontroller that supervises the entire process. On the field the robot operates on automated mode, but outside the field is strictly operated in manual mode. For manual control the robot uses the Bluetooth pairing application as control device and helps in the navigation of the robot outside the field. The robot is incooperated is fitted with various sensors that continuously monitor the environment parameters. It checks these levels with the set point of the sensor and alerts the farmer. The alerting mechanism is Bluetooth module that sends a text message to the farmer informing him about the breach in set point. The concept of fruit picking is described under the process domain. Farmers today spend a lot of money on machines that help them decrease labor and increase yield of crops but the profit and efficiency are very less. Hence automation is the ideal solution to overcome all the shortcomings by creating machines that perform one operation and automating it to increase yield on a large scale.




Principal

Sapthagiri College of Engineering
Chikkasandra, Hesarghatta
Bangalore-560 037

ENDORSEMENT

(From College, endorsement to be taken in the institution / Department Letter head)

This is to certify that 1) Ms. ANUSHA B. 2) Ms. C S MOHANA 3) Ms. JEEVITHA A 4) Ms. KEERTHANA R, are bonafide students of Department of Electrical and Electronics Engineering, in the B.E. degree program of our institution. If the project proposal submitted by these students under the 42nd Series of Student Project Programme is selected by KSCST, we will provide the requisite laboratory / Computer / infrastructure support in our college / Institution. Further we also take necessary steps to see that the project team will exhibit / demonstrate their project in the nodal centre and in the State Level Seminar and Exhibition (if selected). If the student team fails to send the completed project report or fails to attend the evaluation in nodal centre or fails to attend the State Level Seminar and Exhibition, the supported project amount will be returned back to KSCST.


 (A. DHAMODARAN)
 (Name & Signature of
 Project Guide with Seal)


Email id:
 adhamodaran@sapthagiri.edu.in

Contact No.: 9620540352


 (Signature of HOD with
 Seal)

Email id:
 hodeee@sapthagiri.edu.in

Contact No.: 9449940873


 (Signature of the Principal
 with Seal)

Email id:
 principalsce@sapthagiri.edu.in

Contact No.: 9880703600

Principal

Sapthagiri College of Engineering
 Chikkasandra, Hesaraghatta Road
 Bangalore-560 057

Professor & HOD
 Department of Electrical &
 Electronics Engineering
 Sapthagiri College of Engineering
 BANGALORE - 560 057


 Principal
 Sapthagiri College of Engineering
 Chikkasandra, Hesaraghatta Road
 Bangalore-560 057

KSCST : Student Project Programme : 42nd Series : 2018 – 2019 – Stream C : Student Project Proposal

9

Principal
Sreegiri College of Engineering
Chikmagalur, Hesaraghatta Road,
Bangalore-560 057

[Handwritten signature]

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|--|--|--|--|--|--|---|--|
| Canara Bank | | के.एल.ई. सोसायटी, राजाजी नगर II ब्लॉक, बेंगलूर - 560 010 KLE SOCIETY, RAJAJI NAGAR II BLOCK, BANGALORE - 560 010 (8418) | | SECRETARY KSCST | | 841813020824 825551 DDMMYY 14012019 | |
| On Demand Pay | | ONE THOUSAND ONLY | | को या उनके आदेश पर Or Order प्राप्त मूल्य के लिए | | | |
| NOT OVER Rs 1000 | | Purchaser Name: E BASAVARAJU | | ₹ 1000/- | | | |
| क Canara Bank | | BANGALORE ACCOUNTS SECTION (469) | | कृते केनरा बैंक For Canara Bank | | | |
| प्राधिकृत हस्ताक्षर कर्ता AUTHO SIGNATORY | | नाम NAME | | पदनाम DESIGNATION | | ह.अ.सं. S.P. No. | |
| प्राधिकृत हस्ताक्षर कर्ता AUTHO SIGNATORY | | नाम NAME | | पदनाम DESIGNATION | | ह.अ.सं. S.P. No. | |
| र एक लाख और उससे अधिक डीमांड ड्राफ्ट के लिए दो प्राधिकृत हस्ताक्षरकर्ता की हस्ताक्षर चाहिए। Demand Drafts of ₹ 1 Lakh and above require signature of two authorised signatories. Please sign above | | | | | | | |

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KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Indian Institute of Science Campus, Bengaluru – 560 012

Website: <http://www.kscst.iisc.ernet.in/spp.html> || Email: spp@kscst.iisc.ernet.in || Phone: 080-23600978

42nd Series of Student Project Programme: 2018-19

List of Projects Sanctioned Under Stream B - Innovative Projects

14. SAPTHAGIRI COLLEGE OF ENGINEERING, BENGALURU

| Sl. No. | PROJECT REFERENCE NO. | PROJECT TITLE | BRANCH | DEGREE | NAME OF THE GUIDE | NAME OF THE TEAM LEADER | TOTAL (in Rs.) |
|---------|-----------------------|--|--|--------|-------------------|-------------------------|----------------|
| 1. | 42S_BE_1473 | DEVELOPMENT OF ENERGY MANAGMENT SYSTEM (EMS) FOR SOLAR PHOTOVOLTAIC POWER PLANTS TO SUPPLY POWER FOR COTTAGE INDUSTRIES WITHOUR USING BATTERY BANK | ELECTRICAL AND ELECTRONICS ENGINEERING | | Mrs. REKHA S N | Ms. NITHYA J | 8000.00 |

Note:

1. The sanctioned amount will be sent by KSCST to the College by crossed Cheque in the name of the Principal.
2. The evaluation of above projects will be conducted in the Nodal Centre in the month of May / June 2019. During nodal centre evaluation projects will be selected for state level Seminar & Exhibition which will be conducted during July / August 2019.
3. After completion of the projects, the hard copy of the report and soft in .pdf format needs to be sent to KSCST without fail.

Sapthagiri College of Engineering
Chikkasandra, Hesarghatta Main Road
Bangalore-560 057

Principal

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesarghatta Main Road
Bangaluru - 560 057

VISVESVARAYA TECHNOLOGICAL UNIVERSITY

BELAGAVI-590018, KARNATAKA



A Project Report On

**"DEVELOPMENT OF ENERGY MANAGEMENT SYSTEM
(EMS) FOR SOLAR PHOTO VOLTAIC POWER PLANT TO
SUPPLY POWER FOR COTTAGE INDUSTRIES WITHOUT
USING BATTERY BANK"**

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

BACHELOR OF ENGINEERING IN ELECTRICAL AND ELECTRONICS

For the academic year 2018-2019

Submitted By

NITHYA.J (ISG15EE060)

PRIYA J SHANKAR (ISG15EE067)

SURABHLM (ISG15EE090)

MEGHANA.M S (ISG15EE422)

Under The Esteemed Guidance Of

Dr. K N Ravi, Professor & HOD.

Mrs. Rekha S N, Associate Professor.

Mr. Rukmangada R, Senior Lecturer.



Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560 057

Department of Electrical and Electronics Engineering

SAPTHAGIRI COLLEGE OF ENGINEERING


14/5 Chikkasandra, Hesaraghatta Main Road, Bangalore-560057

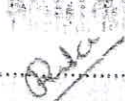



SAPTHAGIRI COLLEGE OF ENGINEERING
#14/5, Chikkasandra, Hesarghatta Main Road, Bangalore-560057
Department of Electrical and Electronics Engineering

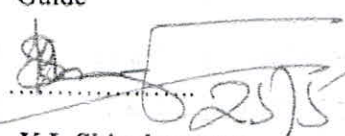
CERTIFICATE

Certified that the project work entitled "DEVELOPMENT OF ENERGY MANAGEMENT SYSTEM (EMS) FOR SOLAR PHOTO VOLTAIC POWER PLANT TO SUPPLY POWER FOR COTTAGE INDUSTRIES WITHOUT USING BATTERY BANK" is carried out collectively by NITHYA.J (1SG15EE060), PRIYA. J (1SG15EE067), SURABHI.M (1SG15EE090), MEGHANA.M S (1SG15EE422) bonafide students of 8th semester EEE Dept. in partial fulfillment for the award of degree in Bachelor of Engineering at Sapthagiri College of Engineering affiliated to Visvesvaraya Technological University, Belagavi for the Academic year 2018-2019. It is certified that all corrections/suggestions indicated for internal assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the said degree.



Dr K.N Ravi
Prof. & HOD
EEE, Dept


Mrs. Rekha. S N
Associate Prof.
Guide


Mr. Rukmangada. R
Senior lecturer.
Guide


Dr. K.L Shivabasappa
Principal

External Viva


Principal
Sapthagiri College of Engineering
Chikkasandra, Hesarghatta Road
Bangalore-560 057

Name of the examiners.

Signature with Date.

- 1.
- 2.

KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Indian Institute of Science Campus, Bengaluru – 560 012

Website: <http://www.kscst.iisc.ernet.in/spp.html> || Email: spp@kscst.iisc.ernet.in || Phone: 080-23600978

42nd Series of Student Project Programme: 2018-19

List of Projects Sanctioned Under Stream C

105. SAPTHAGIRI COLLEGE OF ENGINEERING, BENGALURU

| Sl. No. | PROJECT REFERENCE NO. | PROJECT TITLE | BRANCH | DEGREE | NAME OF THE GUIDE | NAME OF THE TEAM LEADER | TOTAL (in Rs.) |
|---------|-----------------------|---|--|--------|-------------------|-------------------------|----------------|
| 1. | 42S_BE_0279 | AGROBOT | ELECTRICAL AND ELECTRONICS ENGINEERING | BE | Mr. A.DHAMODARAN | Ms. ANUSHA B | 7500.00 |
| 2. | 42S_BE_1589 | DESIGN AND FABRICATION OF ARTICULATED 3D PRINTER | MECHANICAL ENGINEERING | BE | Mr. ULLAS C S | Mr. CHETAN GOWDA H S | 8000.00 |
| 3. | 42S_BE_2339 | POWER GENERATION BY ENGINE EXHAUST GAS FOR AIR BRAKE SYSTEM | MECHANICAL ENGINEERING | BE | Mr. PADMANABHA G | Mr. KUSHAL S | 7000.00 |
| 4. | 42S_BE_3333 | ANTI-KRAIT VENOM ACTIVITY OF FOLK MEDICINAL PLANTS | BIOTECHNOLOGY | BE | Dr. VEENA S MORE | Ms. SAHANA N M | 6500.00 |

Note:

1. The sanctioned amount will be sent by KSCST to the College by crossed Cheque in the name of the Principal.
2. The evaluation of above projects will be conducted in the Nodal Centre in the month of May / June 2019. During nodal centre evaluation projects will be selected for state level Seminar & Exhibition which will be conducted in the month of July / August 2019.
3. After completion of the projects, the hard copy of the report and soft in .pdf format needs to be sent to KSCST without fail.

Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

KSCST : 42nd Series of Student Project Programme : Stream C : List of Projects Sanctioned : 2018 - 2019

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
JNANA SANGAMA, BELAGAVI -590018



A Project Report On

“DESIGN AND FABRICATION OF ARTICULATED 3-D PRINTER”

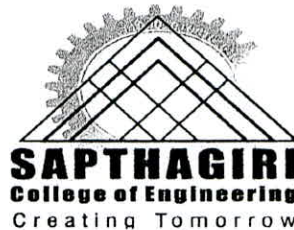
Submitted in partial fulfilment of the requirement for the award of

BACHELOR OF ENGINEERING
In
MECHANICAL ENGINEERING

Submitted By

| | |
|-----------------------------|---------------------|
| Mr. CHETAN GOWDA H S | (1SG16ME402) |
| Mr. MANISH RAO S | (1SG16ME416) |
| Mr. POORVIK S | (1SG16ME426) |
| Mr. ROHITH J | (1SG16ME434) |

Under the Guidance Of
Dr. M ELANGO VAN
Professor



DEPARTMENT OF MECHANICAL ENGINEERING
SAPTHAGIRI COLLEGE OF ENGINEERING
14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057
[AFFILIATED TO VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI]

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

SAPTHAGIRI COLLEGE OF ENGINEERING

14/5, Hesaraghatta, Main Road, Chikkasandra, Bengaluru-560057

DEPARTMENT OF MECHANICAL ENGINEERING



CERTIFICATE

Certified that the project work entitled "Design and Fabrication of Articulated 3-D Printer" carried out by Chetan Gowda H S (1SG16ME402), Manish Rao S (1SG16ME416), Poorvik S (1SG16ME426), Rohith J (1SG16ME434) Bonafide students of 8th semester, Department of Mechanical Engineering at Sapthagiri College of Engineering, Bengaluru in partial fulfilment of the award of Bachelor of Engineering in Mechanical Engineering of the Visvesvaraya Technological University, Belagavi during the year 2018-19. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the Report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of Project work prescribed for the said Degree.

Dr. M Elangovan

Signature of the Guide

Dr. P Mahadevaswamy

Signature of the HOD

Dr. K L Shivabasappa

Signature of the Principal

Name of the Reviewer

Examiner

Signature with date

1. Dr. Mahadevaswamy

2. Dr. Kiran T.S.

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bengaluru-560 057

DECLARATION

We the students of 8th semester, Mechanical Engineering do here by declare that project report entitled **"DESIGN AND FABRICATION OF ARTICULATED 3-D PRINTER"** has been compiled by us under the esteemed guidance of **Dr. M Elangovan**, professor, Mechanical engineering, Sapthagiri College of Engineering, Bangalore.

Mr. CHETAN GOWDA H S

Chetan Gowda H S

(1SG16ME402)

Mr. MANISH RAO S

Manish R. S.

(1SG16ME416)

Mr. POORVIK S

Poorvik S.

(1SG16ME426)

Mr. ROHITH J

Rohith J.

(1SG16ME434)

12
Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

ABSTRACT

This project introduces the implementation of a low-cost 3D printing Robotic Arm. Articulated Robotic Arms made up of several joints and actuated by motors are generally used in industrial field for lifting and manufacturing purposes. 3D printers are machines used for converting digital 3D model into physical 3D object. 3D object can be build by using Additive Manufacturing process. In AM process successive layers of material are laid one upon another and the process repeats until the final object is obtained. The additive process used in this project is Fused Filament Fabrication. By using this method, it is able to print object more accurately and smoothly. FFF model uses thermoplastic filament that is wound on a coil and unreel to supply material through cold end of an extrusion nozzle, which turns the flow on and off. The hot end of the extruder melts the material and can be moved in both horizontal and vertical directions. Both the movement of robotic arm and extruder is directed by a numerically controlled mechanism that is directly controlled by a computer-aided manufacturing software package. The model or part is produced by successively layering the thermoplastic material that is extruded from the nozzle. Movement of extruder is controlled by stepper motor. By combining Robotic arm with 3D printing technology, it is capable for increasing range of operation and it is comparatively more flexible than commercially available desktop 3D printers.



Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

SCE-2016-17

Payment Voucher

No. : 444

Dated : 20-Jun-2019

| Particulars | Amount |
|--|------------|
| Account : KSCST(Project Work) | 8,000.00 |
| Through : SBI- 30263521464 | |
| On Account of : being towards re imbursement of the KSCST grants to Chetan Gowda (Grants received towards approval for the project under 42nd series SPP Program 2018-2019) | |
| Bank Transaction Details: Chetan Gowda.H.S Cheque 727753 20-Jun-2019 8,000.00 | |
| Amount (in words) : INR Eight Thousand Only | |
| | ₹ 8,000.00 |

Chetan Gowda.H.S [15616ME02]
Receiver's Signature:

Authorised Signatory

Principal
Sapthagiri College of Engineering
14/5, CHIKKASANDRA, Hesaraghatta Main Road
Bengaluru - 560 057

From,

Dr. M Elangovan

Professor

Sapthagiri college of engineering

Bengaluru

Date: 17/06/2019

Place: Bengaluru

To,

Principal

Sapthagiri college of engineering

Bengaluru

Through,

Dr. P Mahadevaswamy

Professor & Head

Sapthagiri college of engineering

Bengaluru

Respected sir ,

Sub: Reimbursement of the KSCST grant

As I mentioned in the above subject, we got the approval for the project under 42nd series SPP program 2018-19 (project No: 42S_BE_1589) Karnataka State Council for Science and Technology. So we carried out our project on our own expense. Kindly requesting you to reimburse the sanctioned amount **8000/-** (EIGHT THOUSAND RUPEES ONLY). Please do the needful.

Thanking you sir,

Forwarded to
Cen. Panchayat
18/6/19

Your's faithfully

M Elangovan

Dr. M. Elangovan

Project Guide.

RAVISHANKAR. S. S.
18/6/19
Coordinator
KSCST - SPP project

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Indian Institute of Science Campus, Bengaluru - 560 012

Website: <http://www.kscst.iisc.ernet.in/spp.html> || Email: spp@kscst.iisc.ernet.in || Phone: 080-23600978

42nd Series of Student Project Programme: 2018-19

List of Projects Sanctioned Under Stream C

105. SAPTHAGIRI COLLEGE OF ENGINEERING, BENGALURU

| Sr. No. | PROJECT REFERENCE NO. | PROJECT TITLE | BRANCH | DEGREE | NAME OF THE GUIDE | NAME OF THE TEAM LEADER | TOTAL (in Rs.) |
|---------|-----------------------|---|--|--------|-------------------|-------------------------|----------------|
| 1 | 42S_BE_0279 | AGROBOT | ELECTRICAL AND ELECTRONICS ENGINEERING | BE | Mr. A.DHAMODARAN | Ms. ANUSHA B | 7500.00 |
| 2 | 42S_BE_1589 | DESIGN AND FABRICATION OF ARTICULATED 3D PRINTER | MECHANICAL ENGINEERING | BE ✓ | Mr. ULLAS C S | Mr. CHETAN GOWDA H S | 8500.00 |
| 3 | 42S_BE_2339 | POWER GENERATION BY ENGINE EXHAUST GAS FOR AIR BRAKE SYSTEM | MECHANICAL ENGINEERING | BE | Mr. PADMANABHA G | Mr. KUSHAL S | 7000.00 |
| 4 | 42S_BE_3333 | ANTI-KRAIT VENOM ACTIVITY OF FOLK MEDICINAL PLANTS | BIOTECHNOLOGY | BE | Dr. VEENA S MORE | Ms. SAHANA N M | 6500.00 |

29000

Note:

1. The sanctioned amount will be sent by KSCST to the College by crossed Cheque in the name of the Principal.
2. The evaluation of above projects will be conducted in the Nodal Centre in the month of May / June 2019. During nodal centre evaluation projects will be selected for state level Seminar & Exhibition which will be conducted in the month of July / August 2019.
3. After completion of the projects, the hard copy of the report and soft in .pdf format needs to be sent to KSCST without fail.

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

Original



Address: # 114, 6th Cross, 3rd Main BHCS Layout Uttarahalli,
Subramanyapura Bangalore-560061

E - Mail: emmotionmodules@bsnl.in/emechdrives@gmail.com

Telephone No: 9686143312/8762388637/080-26395978

GSTIN : 29ATCPR1884N1ZW

| | | |
|-------|---|--------|
| PO No | : | Verbal |
|-------|---|--------|

Serial no. of Invoice : 026

PO Date: 23/04/2018

Date of Invoice : 23/04/2018

Place of Supply : Bangalore

Details of Receiver (Billed to)

| Details of Consignee (Shipped to) | |
|-----------------------------------|-----|
| Company Name | ... |
| Address | ... |
| City | ... |
| State | ... |
| Zip | ... |
| Phone | ... |
| Fax | ... |
| E-mail | ... |
| Notes | ... |

Name : Chethan Gowda

Name : Chethan Gowda

Address : 11/24, Jayaramanna Building

Address : 11/24, Jayaramanna Building

Chikkabidarakallu, Bangalore-73

Chikkabidarakallu, Bangalore-73

Phone : 9591155877

Phone: 9591155877

GSTIN:

GSTIN:

| S.No | Description of Goods | HSN/SAC Code | Qty | Rate | Total | CGST | | SGST | |
|------|---------------------------|--------------|-----|--------|---------|------|--------|------|--------|
| | | | | | | Rate | Amount | Rate | Amount |
| 1 | Stepper Motor 10 Kg-Cm | 8503 | 3 | 980.00 | 2940.00 | 9% | 264.60 | 9% | 264.60 |

Invoice Total (In Words) :

| | |
|-----------------|---------|
| Taxable Value : | 2940.00 |
|-----------------|---------|

Three Thousand Four Hundred And Sixty Nine Only

| | | |
|-----------|---|--------|
| Tax Value | : | 529.00 |
|-----------|---|--------|

Tax is payable under RCM? Yes/No : NO

| | | |
|-------------|---|---------|
| Total Value | : | 3469.00 |
|-------------|---|---------|

Declaration:

For EM Motion Modules

We declare that this invoice shows the actual price of the goods described and that all particulars are true and correct

Correct

Authorised Signatory

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 067

online invoice


[Print](#) [Back](#)

Account Statement for the period 4/5/2019 to 4/5/2019

| | | | |
|---------------------------|---|-------------------|---------------------------------------|
| Account Number | 00000030263521464 | Description | CA-GEN-PUB OTH-NONRURAL- INR |
| Name | SAPTHAGIRI COLLEGE OF ENGINEERING | Currency | INR |
| Corporate Address | no.14/5,chikkasandra, hessaraghatta main road Bangalore, Karnataka - 560057 | Branch | HESARGATTA ROAD, BANGALORE (10499) |
| Rate of Interest (% p.a.) | 16.7% | IFS Code | SBIN0010499 |
| Book Balance | 13,90,273.28 | Available Balance | 13,90,273.28 |
| Hold Value | 0.00 | Uncleared Amount | 0.00 |
| Balance as on | 9,52,585.23 | | |

| Date (Value Date) | Narration | Ref / Cheque No. | Branch Code | Debit | Credit | Balance |
|----------------------------|--|---|-------------|-----------|-----------|-------------|
| 04-May-19 (04-May-2019) | TO CLEARING CAB AISHWARAYAS 727363 | 727363 | 40743 | 17,170.00 | | 9,35,415.23 |
| 04-May-19 (04-May-2019) | BY TRANSFER NEFT*CNRB0000683*P19050409544439*KARNATAKA STATE C | TRANSFER FROM 3199678044303 / | 4430 | | 8,000.00 | 9,43,415.23 |
| 04-May-19 (04-May-2019) | BY TRANSFER NEFT*CNRB0000683*P19050409544528*KARNATAKA STATE C | TRANSFER FROM 3199675044306 / | 4430 | | 29,000.00 | 9,72,415.23 |
| 04-May-19 (04-May-2019) | CASH DEPOSIT CASH DEPOSIT SELF | | 10499 | | 8,880.00 | 9,81,295.23 |
| 04-May-19 (04-May-2019) | CHEQUE WDL WITHDRAWAL TRANSFER BY CHEQUE 727728 | TRANSFER FROM 54003362309 / 727728 | 10499 | 4,240.00 | | 9,77,055.23 |

**This is a computer generated statement and does not require a signature.

[Print](#) [Back](#)

EE - 7500
 NE - 8000 ✓
 NE - 7000
 BT - 6500
 29000


 Principal
 Sapthagiri College of Engineering
 14/5, Chikkasandra, Hesaraghatta Main Road
 Bengaluru - 560 057

KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Indian Institute of Science Campus, Bengaluru – 560 012

Website: <http://www.kscst.iisc.ernet.in/spp.html> || Email: spp@kscst.iisc.ernet.in || Phone: 080-23600978

42nd Series of Student Project Programme: 2018-19

List of Projects Sanctioned Under Stream C

105. SAPTHAGIRI COLLEGE OF ENGINEERING, BENGALURU

| Sl. No. | PROJECT REFERENCE NO. | PROJECT TITLE | BRANCH | DEGREE | NAME OF THE GUIDE | NAME OF THE TEAM LEADER | TOTAL (in Rs.) |
|---------|-----------------------|---|--|--------|-------------------|-------------------------|----------------|
| 1. | 42S_BE_0279 | AGROBOT | ELECTRICAL AND ELECTRONICS ENGINEERING | BE | Mr. A.DHAMODARAN | Ms. ANUSHA B | 7500.00 |
| 2. | 42S_BE_1589 | DESIGN AND FABRICATION OF ARTICULATED 3D PRINTER | MECHANICAL ENGINEERING | BE | Mr. ULLAS C S | Mr. CHETAN GOWDA H S | 8000.00 |
| 3. | 42S_BE_2339 | POWER GENERATION BY ENGINE EXHAUST GAS FOR AIR BRAKE SYSTEM | MECHANICAL ENGINEERING | BE | Mr. PADMANABHA G | Mr. KUSHAL S | 7000.00 |
| 4. | 42S_BE_3333 | ANTI-KRAIT VENOM ACTIVITY OF FOLK MEDICINAL PLANTS | BIOTECHNOLOGY | BE | Dr. VEENA S MORE | Ms. SAHANA N M | 6500.00 |

Note:

1. The sanctioned amount will be sent by KSCST to the College by crossed Cheque in the name of the Principal.
2. The evaluation of above projects will be conducted in the Nodal Centre in the month of May / June 2019. During nodal centre evaluation projects will be selected for state level Seminar & Exhibition which will be conducted in the month of July / August 2019.
3. After completion of the projects, the hard copy of the report and soft in .pdf format needs to be sent to KSCST without fail.

Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

Principal


KSCST - 42nd Series of Student Project Programme - Stream C - List of Projects Sanctioned : 2018 - 2019

SCE-2016-17

Payment Voucher

No. : 1074

Dated : 7-Sep-2019

| Particulars | Amount |
|-----------------------------------|----------|
| Account : KSCST(Project Work) | 7,000.00 |

Through :

SBI- 30263521464

On Account of :

Being funds released towards completion of project work (amount received rom KSCST)

Bank Transaction Details:

KUSHAL.S

Cheque

499737

7-Sep-2019

7,000.00

Amount (in words) :

INR Seven Thousand Only

₹ 7,000.00

[Signature]

Receiver's Signature:

(15G15ME067)



[Signature]

Authorised Signatory

[Handwritten mark]

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

From,

Date 10/8/19
Bangalore.

Kushal S (9845 719252)

Manjunath M (9591809049)

Pratheek S

Raghavashunya. M

M.E. Dept

SCF, Bangalore.

To,

The Principal.

Sapthagiri College of Engineering
Bangalore

Respected Sir,

the release of

Subject: Request for KSCST Sanctioned Amount
for the project.

Our project has been sponsored by KSCST for an Amount of ₹ 7,000/- under 42nd series of student project programme by KSCST. The project has been successfully completed and project report has been submitted to KSCST SPP coordinator along with CD. In regard we request you to release the amount received for our project from KSCST.

Thanking you,

Yours obediently



(Kushal S)

Manjunath M
HOD-ME



10/08/2019

project report
and CD is
received
RAVISHANKAR M.M
SPP Coordinator

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hosuraghatta Main Road
Bengaluru - 560 057



xtreme computer
EDUCATION

2/E, 2nd Floor, 14th Main Road
Vijayanagar, Bangalore - 40
PH : 080 - 40924989

RECEIPT / BILL

No. 037

Bill No: B161

Date: 10/5/19

Mr. Mr.

Mangunath

Paid Rs.

Eight thousand only

towards

Project

Project Consultation

by Cash / Cheque / D.D.

Rs. 8000

Cash
Haseph Sim

Authorised Signatory

Amount Paid Shall Not Be Refunded

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057



2/E, 2nd Floor, 14th Main Road
Vijayanagar, Bangalore - 40
Ph : 080 - 40924989, 9945421355

RECEIPT / BILL

No. 303

Date: 20/3/19

Batch No.

B167

Mr/Ms

MANTHANA M

Paid Rs.

6000/-

Towards

R E MECH SAPTA GIFT 6000/- Project Consultation

by Cash / Cheque / D.D.

9591809049.
7259755061

Rs.

6000/-

Authorised Signatory

Amount Paid Shall Not Be Refunded

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057



Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bengaluru - 560 012

Telephone: 080-23341652, 23348848, 23348849 ♦ Telefax: 080-23348840

Email: office@kscst.iisc.ernet.in, office@kscst.org.in ♦ Website: www.kscst.iisc.ernet.in, www.kscst.org.in

Mr. H. Hemanth Kumar
Executive Secretary

27th March 2019

Ref: 7.1.01/SPP/1333

The Principal,
Sapthagiri College of Engineering,
14/5, Chickasandra,
Hesaraghatta Main Road,
Bengaluru - 560 057.

Dear Sir/Madam,

Sub : Sanction of Student Project - 42nd Series: Year 2018-2019

Project Proposal Reference No. : 42S_BE_2339

Ref : Your Project Proposal entitled " **POWER GENERATION BY ENGINE EXHAUST GAS FOR AIR BRAKE SYSTEM**

I am happy to inform that your student project proposal referred above, has been approved by the Council for "Student Project Programme - 42nd Series" and has been sanctioned with a budgetary break-up as detailed below:

| Student / s | Mr. Kushal S and others | Budget | Amount (Rs) |
|----------------------------|----------------------------|-----------------------|-------------|
| | | Materials/Consumables | 6,000.00 |
| Guide/s | Mr. Padmanabha G | Labor | - |
| | | Travel | - |
| Department | Mechanical Engineering | Miscellaneous | 500.00 |
| | | Report | 500.00 |
| | | TOTAL | 7,000.00 |
| SEVEN THOUSAND RUPEES ONLY | | | |

The following are the guidelines to carryout the project work :

- The project should be performed based on the objectives of the proposal sent by you.
- The project should be completed in all respects and one copy of the hardbound report along with softcopy of the full report in a CD (.pdf format) should be submitted to KSCST.
- Any change in the project title and objectives, etc., or students is liable to rejection of the project and the amount sanctioned needs to be returned to KSCST.
- Please quote your **project reference number printed above** in all your future correspondences.
- Important:** After completing the project, 2 to 3 page write-up (synopsis) needs to be sent by e-mail [spp@kscst.iisc.ernet.in] and should include following :

- Title of the project
- Name of the College & Department
- Name of the students & Guide(s)
- Keywords

Principal
Sapthagiri College of Engineering
14/5, Chickasandra, Hesaraghatta Main Road
Bengaluru - 560 057

RAVISHANKARA.M.N
14/08/2019

KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY

Indian Institute of Science Campus, Bengaluru – 560 012

Website: <http://www.ksct.iisc.ernet.in/spp.html> || Email: spp@ksct.iisc.ernet.in || Phone: 080-23600978

42nd Series of Student Project Programme: 2018-19

List of Projects Sanctioned Under Stream C

105. SAPTHAGIRI COLLEGE OF ENGINEERING, BENGALURU

| Sl. No. | PROJECT REFERENCE NO. | PROJECT TITLE | BRANCH | DEGREE | NAME OF THE GUIDE | NAME OF THE TEAM LEADER | TOTAL (in Rs.) |
|---------|-----------------------|---|--|--------|-------------------|-------------------------|----------------|
| ✓ 1. | 42S_BE_0279 | AGROBOT | ELECTRICAL AND ELECTRONICS ENGINEERING | BE | Mr. ADHAMODARAN | Ms. ANUSHA B | 7500.00 |
| 2. | 42S_BE_1589 | DESIGN AND FABRICATION OF ARTICULATED 3D PRINTER | MECHANICAL ENGINEERING | BE | Mr. ULLAS C S | Mr. CHETAN GOWDA H S | 8000.00 |
| 3. | 42S_BE_2339 | POWER GENERATION BY ENGINE EXHAUST GAS FOR AIR BRAKE SYSTEM | MECHANICAL ENGINEERING | BE | Mr. PADMANABHA G | Mr. KUSHAL S ✓ | 7000.00 ✓ |
| 4. | 42S_BE_3333 | ANTI-KRAIT VENOM ACTIVITY OF FOLK MEDICINAL PLANTS | BIOTECHNOLOGY | BE | Dr. VEENA S MORE | Ms. SAHANA N M | 6500.00 |

29000

Note:

1. The sanctioned amount will be sent by KSCST to the College by crossed Cheque in the name of the Principal.
2. The evaluation of above projects will be conducted in the Nodal Centre in the month of May / June 2019. During nodal centre evaluation projects will be selected for state level Seminar & Exhibition which will be conducted in the month of July / August 2019.
3. After completion of the projects, the hard copy of the report and soft in .pdf format needs to be sent to KSCST without fail.

Ravishankara
RAVISHANKARA

Sapthagiri
Principal
Sapthagiri College of Engineering
145, Chikkasandra, Hosanghatta Main Road
Bengaluru - 560 057


[Print](#) [Back](#)

Account Statement for the period 4/5/2019 to 4/5/2019

| | | | |
|---------------------------|---|-------------------|---------------------------------------|
| Account Number | 00000030263521464 | Description | CA-GEN-PUB OTH-NONRURAL- INR |
| Name | SAPTHAGIRI COLLEGE OF ENGINEERING | Currency | INR |
| Corporate Address | no.14/5,chikkasandra, hessaraghatta main road Bangalore, Karnataka - 560057 | Branch | HESARGATTA ROAD, BANGALORE (10499) |
| Rate of Interest (% p.a.) | 16.7% | IFS Code | SBIN0010499 |
| Book Balance | 13,90,273.28 | Available Balance | 13,90,273.28 |
| Hold Value | 0.00 | Uncleared Amount | 0.00 |
| Balance as on | 9,52,585.23 | | |

| Date (Value Date) | Narration | Ref / Cheque No. | Branch Code | Debit | Credit | Balance |
|----------------------------|--|---|-------------|-----------|-----------|-------------|
| 04-May-19 (04-May-2019) | TO CLEARING CAB AISHWARAYAS 727363 | 727363 | 40743 | 17,170.00 | | 9,35,415.23 |
| 04-May-19 (04-May-2019) | BY TRANSFER NEFT*CNRB0000683*P19050409544439*KARNATAKA STATE C | TRANSFER FROM 3199678044303 / | 4430 | | 8,000.00 | 9,43,415.23 |
| 04-May-19 (04-May-2019) | BY TRANSFER NEFT*CNRB0000683*P19050409544528*KARNATAKA STATE C | TRANSFER FROM 3199675044306 / | 4430 | | 29,000.00 | 9,72,415.23 |
| 04-May-19 (04-May-2019) | CASH DEPOSIT CASH DEPOSIT SELF | | 10499 | | 8,880.00 | 9,81,295.23 |
| 04-May-19 (04-May-2019) | CHEQUE WDL WITHDRAWAL TRANSFER BY CHEQUE 727728 | TRANSFER FROM 54003362309 / 727728 | 10499 | 4,240.00 | | 9,77,055.23 |

**This is a computer generated statement and does not require a signature.

[Print](#) [Back](#)

GE - 7500 ✓ Paid.
 NE - 8000 ✓ Paid
 NE - 7000 ✓
 BT - 6500 ✓ Paid
29000


 Principal
 Sapthagiri College of Engineering
 14/5, Chikkasandra, Hesaraghatta Main Road
 Bengaluru - 560 057



Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bengaluru - 560 012

Telephone: 080-23341652, 23348848, 23348849 ♦ Telefax: 080-23348840

Email: office@kscst.iisc.ernet.in, office@kscst.org.in ♦ Website: www.kscst.iisc.ernet.in, www.kscst.org.in

Mr. H. Hemanth Kumar
Executive Secretary

27th March 2019

Ref: 7.1.01/SPP/1333

The Principal,
Sapthagiri College of Engineering,
#14/5, Chickasandra,
Hesaraghatta Main Road,
Bengaluru - 560 057.

Dear Sir/Madam,

Sub : Sanction of Student Project - 42nd Series: Year 2018-2019

Your Project Proposal Reference No. : **42S_BE_3333**

Ref : Your Project Proposal entitled " **ANTI-KRAIT VENOM ACTIVITY OF FOLK MEDICINAL PLANTS**

I am happy to inform that your student project proposal referred above, has been approved by the Council for "Student Project Programme - 42nd Series" and has been sanctioned with a budgetary break-up as detailed below:

| Student / s | Ms. Sahana N M and others | Budget | Amount (Rs) |
|--|------------------------------|-----------------------|-----------------|
| | | Materials/Consumables | 5,000.00 |
| Guide/s | Dr. Veena S More | Labor | - |
| | | Travel | 500.00 |
| Department | Biotechnology | Miscellaneous | 500.00 |
| | | Report | 500.00 |
| | | TOTAL | 6,500.00 |
| SIX THOUSAND FIVE HUNDRED RUPEES ONLY | | | |

The following are the guidelines to carryout the project work :

- The project should be performed based on the objectives of the proposal sent by you.
- The project should be completed in all respects and one copy of the hardbound report along with softcopy of the full report in a CD (.pdf format) should be submitted to KSCST.
- Any change in the project title and objectives, etc., or students is liable to rejection of the project and the amount sanctioned needs to be returned to KSCST.
- Please quote your **project reference number printed above** in all your future correspondences.
- Important:** After completing the project, 2 to 3 page write-up (synopsis) needs to be sent by e-mail [spp@kscst.iisc.ernet.in] and should include following :
 - Title of the project
 - Name of the College & Department
 - Name of the students & Guide(s)
 - Keywords

Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta
Bangaluru - 560 057

DECLARATION

(From Project Students)

We, the project team hereby declare that the details enclosed in the project proposal are true and correct to the best of our knowledge and belief and we undertake to inform KSCST of any changes therein in the project tile, students name will be intimated immediately. In case any of the above information is found to be false or untrue or misleading, we are aware that we may be held liable for it. We hereby authorize sharing of the project information with this project proposal with the Karnataka State Council for Science and Technology, Bangalore.

We are aware that the project team has to exhibit / demonstrate the project in the nodal centre and interact regarding project with the experts and to exhibit the project in the State Level Seminar and Exhibition (if selected). If the student team fails to attend the evaluation in nodal centre or fails to attend the State Level Seminar and Exhibition, the supported project amount will be returned back to KSCST.

We also hereby, enclose the endorsement form to KSCST, Bengaluru.

Name of the students

1. Harshitha G

2. Sahana N M

3. Sahana R

4. Sindhoora Rao B


Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

Signature with date

Harshitha G
16/01/19

Sahana N M
16/01/19

Sahana R
16/01/19

Sindhoora
16/01/19

ENDORSEMENT

This is to certify that 1) Ms **SAHANA N M.**, 2) Ms. **HARSHITHA G**, 3) MS. **SAHANA R**, 4) Ms. **SINDHOORA ROA B**, are bonafide students of Department of BIOTECHNOLOGY, in the degree program of our Institution. If the project proposal submitted by these students under the 42nd Series of Student Project Programme is selected by KSCST, we will provide the requisite laboratory / Computer / infrastructure support in our college / Institution. Further we also take necessary steps to see that the project team will exhibit / demonstrate their project in the nodal centre and in the State Level Seminar and Exhibition (if selected). If the student team fails to send the completed project report or fails to attend the evaluation in nodal centre or fails to attend the State Level Seminar and Exhibition, the supported project amount will be returned back to KSCST.

Head of the Department
Dept. of Bio - Technology
Sapthagiri College of Engineering
No. 57/1, Chikkasandra
Hesaraghatta Main Road
Bangalore - 560 057

Dr. VEENA S MORE

(Name & Signature of
Project Guide with Seal)

Email id:

veenasmore@gmail.com

Contact No.:9480491608

Head of the Department
Dr. VEENA S MORE
Dept. of Bio - Technology
Sapthagiri College of Engineering
(Signature of HOD with Seal)
No. 57/1, Chikkasandra
Hesaraghatta Main Road
Bangalore - 560 057

Email id:

hodbt@sapthagiri.edu.in

Contact No.:9480491608

Dr. K L SHIVABASAPPA

(Signature of the Principal
with Seal)
Principal
Sapthagiri College of Engineering

Chikkasandra, Hesaraghatta Road
Bangalore-560 057

principal@sapthagiri.edu.in

Contact No.:08028372800

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560 057

जारी करने वाली शाखा भारतीय स्टेट बैंक
Issuing Branch: PESARAKATTA ROAD BR, BANGALORE
कोड नं / CODE No: 10499
Tel No. 090-25943291

बैंकर्स चेक
BANKERS CHEQUE

Key: QUDCON
Sr. No: 844280

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | 4 | 0 | 1 | 2 | 0 | 1 | 9 |
| D | D | M | M | Y | Y | Y | Y |

PAY SECRETARY KSCST, BENGALURU - 12*****

क्रे या उनके आदेश पर

OR ORDER

रुपये RUPEES

One Thousand Only

अदा करें

₹

1000.00

IOI 000504142057
Name of Applicant

Key: QUDCON Sr. No: 844280
DR. VEENA SUNIL MORE

AMOUNT BELOW 1001(1/4)

कुते भारतीय स्टेट बैंक
For STATE BANK OF INDIA

अहस्तांतरणीय / NOT TRANSFERABLE

प्राधिकृत हस्ताक्षरकर्ता
AUTHORISED SIGNATORY

शाखा प्रबंधक
BRANCH MANAGER

कम्प्यूटर द्वारा मुद्रित होने पर ही वैध
VALID ONLY IF COMPUTER PRINTED

केवल 3 महीने के लिए वैध
VALID FOR 3 MONTHS ONLY

₹ 1,50,000/- एवं अधिक के लिखत दो अधिकारियों द्वारा हस्ताक्षरित होने पर ही वैध है।
INSTRUMENTS FOR ₹ 1,50,000/- & ABOVE ARE NOT VALID UNLESS SIGNED BY TWO OFFICERS

11 11 2057 0000020001 000504 16

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560 057

42S_BE_3333

Anti-Krait Venom Activity Of Folk Medicinal Plants

**A Project Report submitted to the Karnataka State Council For
Science And Technology
(KSCST-2018-19)**

Sponsored By



**KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY
INDIAN INSTITUTE OF SCIENCE CAMPUS,
BENGALURU - 560012
Karnataka**

Submitted By

Sahana N M

Department of Biotechnology,
Sapthagiri College of Engineering.

Harshitha G

Department of Biotechnology,
Sapthagiri College of Engineering.

Under the guidance of

Dr Veena S More

Professor and H.O.D,
Department of Biotechnology,
Sapthagiri College of Engineering.




Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

SAPTHAGIRI COLLEGE OF ENGINEERING
#14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560 057
DEPARTMENT OF BIOTECHNOLOGY

SAPTHAGIRI COLLEGE OF ENGINEERING

#14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560 057.

DEPARTMENT OF BIOTECHNOLOGY



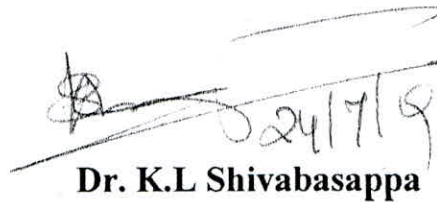
CERTIFICATE

This is to certified that the project work entitled “**Anti-Krait Venom Activity Of Folk Medicinal Plants**” has been carried out by **Ms.Sahana N M** and **Ms.Harshitha G**, bonafide students of VIII semester B.E in Biotechnology of Sapthagiri College of Engineering, underscheme of The **Karnataka State Council For Science And Technology** during the academic year 2018-2019. The research is a record of original work carried out by them, in Department of Biotechnology, Sapthagiri College of Engineering, Bangalore, Karnataka, under our guidance and supervision and it has not formed the basis for the award of any Degree.


24/07/19

Dr. Veena S More

Guide and H.O.D,
Department of Biotechnology


24/7/19

Dr. K.L Shivabasappa

Prinicpal,
Sapthagiri College of Engineering


Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

Payment Voucher

No. 753

Dated 26-Jul-2019

| Particulars | Amount |
|--------------------------------|----------|
| Account : KSCST (Project Work) | 6,500.00 |

Through :

SBI- 30263521464

On Account of :

Being amount paid to Sahana N.M towards expenses incurred towards project work by EEE department students

Bank Transaction Details

Sahana.N.M

Cheque/DD

499715

26-Jul-2019

6,500.00

Amount (in words) :

INR Six Thousand Five Hundred Only

2019
27/7/19

₹ 6,500.00

Receiver's Signature

Authorised Signatory

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

24-07-2019

From,

Dr. Veena S More

Professor and H.O.D.,

Department of Biotechnology,

Sapthagiri College of Engineering,

Bangalore -560057

Date : 24-07-19

To,

The Principal,

Sapthagiri College of Engineering,

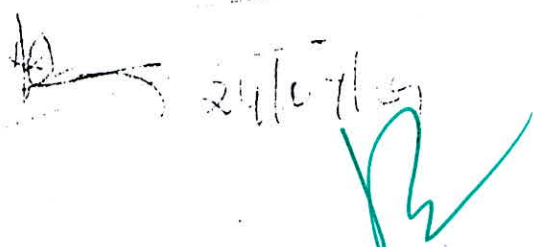
Bangalore -560057

Respected sir,

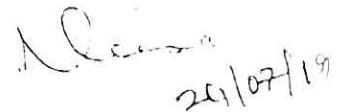
Sub: Requisition for release of fund provided for SPP Projects by KSCST, IISc

I, Dr. Veena S More, Department of Biotechnology, hereby request you to release the fund provided by KSCST, IISc for the completion of projects under 42nd SPP series. The details of expenditure borne during course of work are attached along with the bills. Kindly oblige.

Thanking You,

24/07/19


Yours faithfully,


24/07/19

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesarghatta Road,
Bangalore-560 057

(Dr. Veena S. More)

Bengaluru

from,

Sahana NM,
Department of Biotechnology,
Sapthagiri college of Engineering

To,

Principal,
Sapthagiri college of Engineering
Bengaluru - 057.

Respected Sir,

Subject: Request to release fund sanctioned by KSCST.

I, Sahana NM and my team mates has worked on a project entitled "Anti-Krait Venom Activity of Folk Medicinal Plants and thus a fund of Rs. 6,500/- was sanctioned by KSCST for getting selected under SPP 42nd Series. I have submitted a complete report hard copy and CD to Ravishankar sir. Now, I request you to please release the fund.

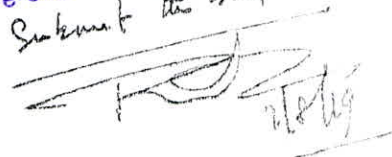
Thanking you,

Yours Sincerely,

Sahana NM

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

Subscribed to bill



Obanked
RAVISHANKAR. M.N
SPP coordinator
SCE B'he
03/08/2019

Students have completed the project and submitted the report along with CD.



DAYANANDA SAGAR UNIVERSITY

Shavige Malleshwara Hills, Kumaraswamy Layout, Bangalore - 560 078.

Date: 08/05/19

Vr. No. DSU/BAS/008/19

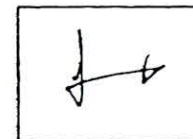
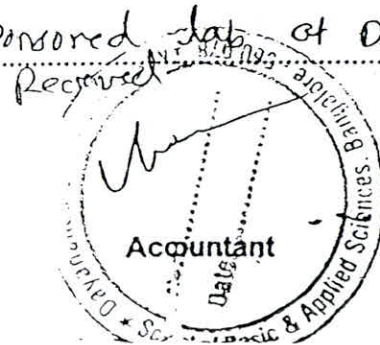
A/C MS. Harshita G. - of Dept of Biotechnology

Sapthagiri College of Eng Bangalore - 57

on account of Summer Internship Project under Dr. Sunil S. More

for his DST - sponsored lab at DSU

Rs. 6000/-



Receiver

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057



Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bengaluru - 560 012

Telephone: 080-23341652, 23348848, 23348849 ♦ Telefax: 080-23348840

Email: office@kscst.iisc.ernet.in, office@kscst.org.in ♦ Website: www.kscst.iisc.ernet.in, www.kscst.org.in

Mr. H. Hemanth Kumar
Executive Secretary

29
27th March 2019

Ref: 7.1.01/SPP/1333

The Principal,
Sapthagiri College of Engineering,
#14/5, Chickasandra,
Hesaraghatta Main Road,
Bengaluru - 560 057.

Dear Sir/Madam,

Sub : Sanction of Student Project (Biofuel) - 42nd Series: Year 2018-2019

Your Project Proposal Reference No. : **42S_B_BE_003**

Ref : Your Project Proposal entitled " **BIOPLASTIC EXTRACTION FROM WASTE GREASE PRODUCED IN INDUSTRIES USING AS GLYCEROL AS A SUBSTRATE**

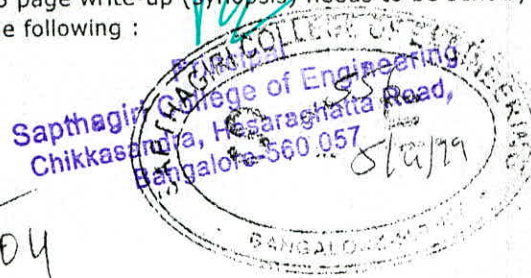
I am happy to inform that your student project proposal referred above, has been approved by the Council for "Student Project Programme (Biofuel)- 42nd Series" and has been sanctioned with a budgetary break-up as detailed below:

| Student / s | Ms. Debika Chakrabarty and others | Budget | Amount (Rs) |
|--|---|-----------------------|-------------|
| | | Materials/Consumables | 3,500.00 |
| Guide/s | Mr. Prashanth Kumar H P Ms. Shobha G | Labor | - |
| | | Travel | 500.00 |
| Department | Biotechnology | Analysis | 500.00 |
| | | Miscellaneous | 500.00 |
| | | Report | 500.00 |
| | | TOTAL | 5,500.00 |
| RUPEES FIVE THOUSAND FIVE HUNDRED ONLY | | | |

The following are the guidelines to carryout the project work :

- The project should be performed based on the objectives of the proposal sent by you.
- The project should be completed in all respects and one copy of the hardbound report along with softcopy of the full report in a CD (.pdf format) should be submitted to KSCST.
- The project report shall mention the name of "**Karnataka State Bioenergy Development Board and Karnataka State Council for Science and Technology**" as sponsored organisations in the title page. Project Title or the objectives can be altered only with prior permission of KSCST. Any change in the project are strictly prohibited and liable for rejection and the amount sanctioned has to be returned back to KSCST. The fund is to be utilised only for the activities to which it has been released.
- Please quote your **project reference number printed above** in all your future correspondences.
- Important:** After completing the project, 2 to 3 page write-up (synopsis) needs to be sent by e-mail [biofuelcell.kscst@gmail.com] and should include following :

- Title of the project
- Name of the College & Department
- Name of the students & Guide(s)
- Keywords



Payment Voucher

No. 1073

Dated 7-Sep-2019

| Particulars | Amount |
|-----------------------------------|----------|
| Account : KSCST(Project Work) | 5,500.00 |

Through :

SBI- 30263521464

On Account of :

Being funds released towards KSCST Project
work on Bio Plastic Extractin of waste Grease
using Glyceral as substrate


Bank Transaction Details:

Debika Chakraborty
Cheque 499736 7-Sep-2019 5,500.00

Amount (in words) :

INR Five Thousand Five Hundred Only

₹ 5,500.00


R. S. AKASH (1591085023)
Receiver's Signature


Authorised Signatory




Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

From,

14/08/19

Bangalore

Debika.C 7019226230

Department of Biotechnology

Sapthagiri College of Engineering

Bangalore - 560057

To,

The Principal

Sapthagiri College of Engineering

Bangalore - 560057

Respected Sir,

Subject: To release the fund
sanctioned from KSCST

I, Debika C and one groupmate Dishu D B, Kceethna N, B Vaishini have successfully completed the project on "Bioplastic extraction from waste grease using glycerol as substrate". We have submitted the report and CD to SPP Coordinator Ravishankar M N. I hereby request you to release the sanctioned amount for the project.

Thanking You,

Yours faithfully,

Debika.C


Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

The above project was funded by KSCST
The students have completed the project
and submitted the report.

Ravishankar M N 14/08/19
RAVISHANKAR M N
KSCST-SPP Coordinator
SCE Block

DETAILS ARE FURNISHED AS BELOW:

| Sl. No | Items | Cost (in Rupees) |
|--|---|---------------------|
| 1 | Raw materials | 300 |
| 2 | Chemicals | 1000 |
| 3 | Glass wares | 250 |
| 4 | Demand draft | 2000 |
| 5 | Project Report | 1200 |
| 6 | Miscellaneous (Transportation, Xerox, writing materials etc.,) | 750 |
| | Total Sum | 5500 ✓ |
| <u>Amount in words</u> : Five thousand five hundred only | | |


Principal
Sapthagiri College of Engineering
Chikkasandra, Hesareghatta Road,
Bangalore-560 057


Principal
Sapthagiri College of Engineering
Chikkasandra, Hesareghatta Road,
Bangalore-560 057


14/08/19

Mob : 9945754390

MAHESH CYBER WORLD

103/2, Rukmini Nagar, Nagasandra (P), Bangalore - 73

No.

Date 24/11/19

M/s

Deleka C

| No. | Particulars | Qty. | Amount |
|-----|------------------|------|--------|
| 1 | INTERNET | 1 | 100 |
| 2 | PRINT OUT | | 800 |
| 3 | XEROX | | 100 |
| 4 | DTP | | 50.0 |
| 5 | COMPUTER SERVICE | | |
| 6 | RENT AGREEMENT | | |
| | TOTAL | | 1500/- |

MAHESH CYBER WORLD
Sapthagiri Engg. College
Chikkasandra, Bangalore-560057

Kov
Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

B
Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

(ORIGINAL FOR RECIPIENT)



| | |
|--------------------------------------|---|
| Invoice No. 0535 | Dated 17-Jul-2019 |
| Delivery Note | Mode/Terms of Payment Immediate |
| Supplier's Ref. 0535 | Other Reference(s) |
| Buyer's Order No. Verble | Dated 17-Jul-2019 |
| Despatch Document No. | Delivery Note Date |
| Despatched through By Hand | Destination |
| Terms of Delivery | |

Miss, Keerthana (Sapthagirl College of Engineering)
No 14/5, Chikkasandra, Heasaragatta Main
Road, Bangalorre-560057
State Name : Karnataka, Code : 29

Principal
Sapthagiri College of Engineering
Hikkasandra, Hesaraghatta Road
Bangalore-560 057

42S_B_BE_003 Bioplastic Extraction from waste grease produced in industries using as glycerol as a substrate

COLLEGE:Sapthagiri College Of Engineering, Bangalore

DEPARTMENT:Biotechnology

GUIDE:Mr Prashanth Kumar and Mrs Shobha G

STUDENTS:Debika Chakrabarty, Disha DB, Keerthana N, B Varshini

INTRODUCTION

The used cooking oil and trap grease can contain much more than 15% FFAs. These feedstock need additional processing before they can undergo traditional alkali-catalysed transesterification to form glycerol and Biodiesel.

This process converts triacylglycerol and methanol into glycerol and fatty acid methyl esters (namely biodiesel) using alkali or acid catalysts. The amount of crude glycerol produced from this transesterification reaction accounts for approximately 10% of the final weight of biodiesel. Conversion of crude glycerol into higher-value products improves the economic viability of biofuel industry by coupling the production of value-added products to the production of biodiesel and eliminating the cost of treatment for crude glycerol disposal. Fermentation of glycerol has been reported to produce many value-added by-products, such as 1,3-propanediol, dihydroxyacetone, succinic acid, propionic acid, ethanol, butanol, hydrogen, citric acid, lactic acid, glyceric acid, bio surfactants, pigments, and PHAs. Among these by-products, 1,3-propanediol, 75 succinic acid, lactic acid, and glyceric acid, have been used as bio monomers for production of plastics, i.e. polyesters, polyethers, and polyurethanes, through chemical synthesis. In the present work glycerol obtained after transesterification will be used for bio plastic formation.

Materials and methodology:

Production of Glycerol:

Transesterification of waste grease using alkaline catalyst was carried out using a two-step process. The two-step reaction utilized 100% excess methanol, 6:1 molar ratio of alcohol to oil and 1% KOH as a catalyst. In each step, 3 mol of alcohol and 0.5% KOH were used and reaction was carried out at 25 °C

Principal
Sapthagiri College of Engineering
Bangalore-560 057
Hesaraghatta Road,
Chikkabandra

for 30 min. After the first step the waste grease having a high free fatty acid formed a thick soap which interfered with the glycerol separation (Issariyakul *et al.*, 2006).

Test for Glycerol:

Acrolein test

Acrolein test is used to detect the presence of glycerol or fat. When fat is treated strongly in the presence of a dehydrating agent like potassium bisulphate (KHSO_4), the glycerol portion of the molecule is dehydrated to form an unsaturated aldehyde, acrolein that has a pungent irritating odour.

Dichromate test:

In a dry test tube 3 or 4 ml of glycerol solution, to it add a few drops of 5% potassium dichromate solution and 5 ml of conc. HNO_3 , mix well and note that the brown colour is changed to blue.

Dunstan's test :

A drop of phenolphthalein is added to approximately 5 mL of borax solution . The pink color appears. On adding 2-3 drops of glycerol, the pink color disappears on heating and disappears on cooling again.

Bioplastic production from grease:

Preparation of bioplastic was done by modifying the agar and the glycerol concentration.

1.5%, 3%, 4.5% of bioplastic was prepared. According to the concentration required amount of glycerol.

Moisture Absorption Test:

The moisture absorption test identified the ability of bioplastics to absorb water (H_2O) as determined by standard ASTM D 570. Bioplastics, which had been previously dried for 24 hours in an oven at 50°C , cooled in a desiccator, and weighed, were cut into 2mm x 2mm. The moisture absorption data of bioplastics was obtained by soaking them in water for 24 hours. After that, the bioplastics were dried with a cloth and immediately weighed.

$$\text{Moisture Content (\%)} = \frac{(\text{Post-BrakeWeight}) - (\text{InitialWeight})}{\text{InitialWeight}} \times 100$$

InitialWeight

Biodegradability

Biodegradable behaviour of bioplastics was determined using soil burial degradation test, i.e. bioplastics were buried in the soil, so that it would be degraded completely.[Degradation testing serves to determine the extent of damage of bioplastics. The damage can be seen from the mass reduction of respective specimens buried in the ground. Bioplastics were cut into 10 mm x 10 mm. Then, they were buried into the ground at 8-cm depth; the burial duration varied (3, 6, 9, and 12 days). Prior to burial, the initial mass (mass before degradation) was determined. The final mass (mass after degradation) of the bioplastics was measured afterwards. Any changes in mechanical properties due to degradation process were observed and when the bioplastics were completely degraded, the biodegradability was measured.

Principal
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Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

$$\text{Microbial Resistance (\%)} = \frac{\text{Final Mass} - \text{Initial Mass}}{\text{Initial Mass}} \times 100$$

Results

Production of Glycerol:

Transesterification of waste grease was carried out and glycerol was obtained.

Test for Glycerol:

Acrolein test

Acrolein test is used to detect the presence of glycerol or fat. When fat is treated strongly in the presence of a dehydrating agent like potassium bisulphate (KHSO_4), the glycerol portion of the molecule is dehydrated to form an unsaturated aldehyde, acrolein that has a pungent irritating odour was observed.

Dichromate test:

In a dry test tube 3 or 4 ml of glycerol solution, to it a few drops of 5% potassium dichromate solution was added and 5 ml of conc. HNO_3 , was mixed well and there was a colour change from brown colour is changed to blue.

Dunstan's test :

A drop of phenolphthalein was added to approximately 5 ml of borax solution . The pink colour appears. On adding 2-3 drops of glycerol, disappearance of pink colour on addition of glycerol.

Bioplastic production from grease:

Preparation of bioplastic was done by modifying the agar and the glycerol concentration.

1.5%, 3%, 4.5% of bioplastic was prepared. According to the concentration required amount of glycerol.

Moisture Absorption Test:

The moisture absorption test identified the ability of bioplastics to absorb water (H_2O) as determined by standard ASTM D 570. Bioplastics, which had been previously dried for 24 hours in an oven at 50°C , cooled in a desiccator, and weighed, were cut into 2mm x 2mm. The moisture absorption data of bioplastics was obtained by soaking them in water for 24 hours. After that, the bioplastics were dried with a cloth and immediately weighed.

$$\text{Moisture Content (\%)} = \frac{(\text{Post-Brake Weight}) - (\text{Initial Weight})}{\text{Initial Weight}} \times 100$$

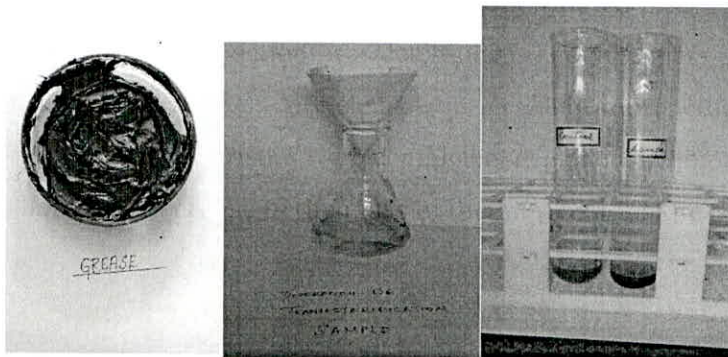
72.15% was moisture absorption was observed.

Biodegradability

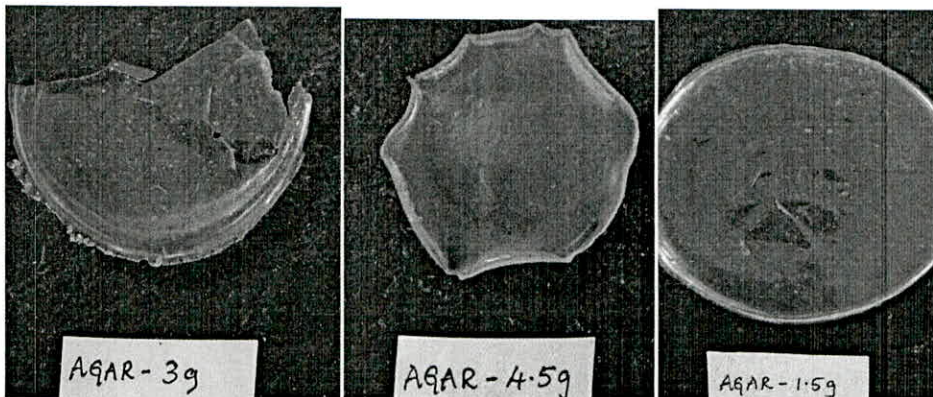
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Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

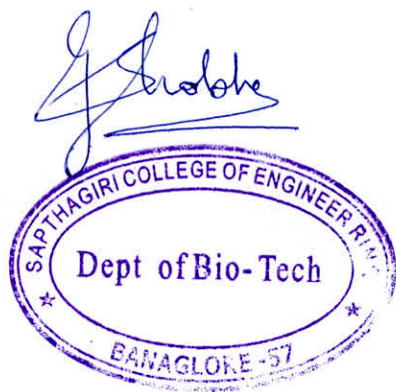
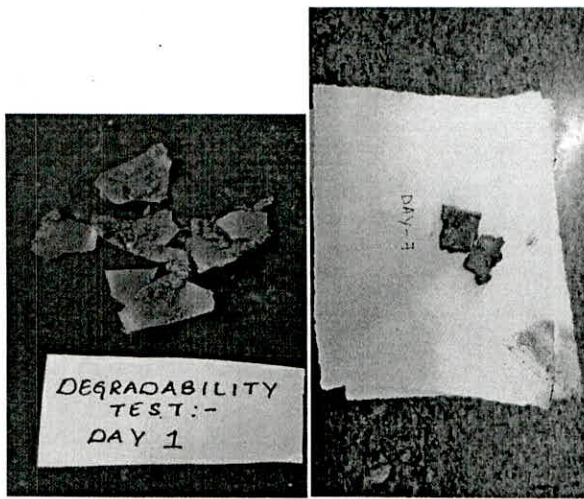
the extent of damage of bioplastics. The damage can be seen from the mass reduction of respective specimens buried in the ground. Bioplastics were cut into 10 mm x 10 mm. Then, they were buried into the ground at 8-cm depth; the burial duration varied (3, 6, 9, and 12 days). Prior to burial, the initial mass (mass before degradation) was determined. The final mass (mass after degradation) of the bioplastics was measured afterwards. Any changes in mechanical properties due to degradation process were observed and when the bioplastics were completely degraded, the biodegradability was measured. There was decrease in the mass of the bioplastic as the time was increased.



Dunstans test




Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057




Principal
Sapthagiri College of Engineering
Chikkasandra, Hesarghatta Road,
Bangalore-560 057

Sapthagiri College of Engineering

(Affiliated to Visvesvaraya Technological University, Belagavi & Approved by AICTE, New Delhi)

#14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru - 560057

Phone: 08C-28372830/1/2

www.sapthagiri.edu.in

Fax: 080-28372797

Date: 30/05/2018

To,
The Principal,
Sapthagiri College of Engineering
Bangalore-560057

Sub- Sanction of Research grant for the research project "Characterization of Tensile and Hardness Properties of Silicon Dioxide and Boron Carbide Particulate Reinforced with Aluminum 6061 Based Hybrid Metal Matrix Composite"

With reference to the letter dated 20/5/2018 regarding the research funding, the management of Sapthagiri college of engineering has sanctioned the Research grant of **Rs.2,16,000 (Rupees two lakh sixteen thousand only)** for the research project "Characterization of Tensile and Hardness Properties of Silicon Dioxide and Boron Carbide Particulate Reinforced with Aluminum 6061 Based Hybrid Metal Matrix Composite" to be carried out by the department of Mechanical Engineering.



Executive Director

Sri G.D. MANOJ

Executive Director

**Sapthagiri College of Engineering
BENGALURU - 560 057.**



Principal

**Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057**

Sapthagiri College of Engineering

(Affiliated to Visvesvaraya Technological University, Belagavi & Approved by AICTE New Delhi)

#14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru - 560057

Phone: 080-28372800/1/2

www.sapthagiri.edu.in

Fax: 080-28372797

Date: 31/05/2018

To,

The Convener,

R&D, Entrepreneurship Committee & Incubation Center (RDECI),

Sapthagiri College of Engineering

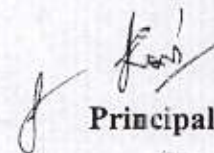
Bangalore-560057

Sub- Sanction of Research grant Reg.,

The management of Sapthagiri college of engineering has sanctioned the Research grant of **Rs.2,16,000 (Rupees two lakh sixteen thousand only)** for the research project "Characterization of Tensile and Hardness Properties of Silicon Dioxide and Boron Carbide Particulate Reinforced with Aluminum 6061 Based Hybrid Metal Matrix Composite" to be carried out by the department of Mechanical Engineering.

Copy To,

All Departments



Principal

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057




Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

Date: 20/05/2018

To,

The Principal
Sapthagiri College of Engineering
Bangalore-560057

Through HOD 

From

Madhukumar.Y.C
Assistant Professor,
Department of Mechanical Engineering
Sapthagiri College of Engineering
Bangalore-560057


Respected Sir,

Subject: Requisition for the financial assistance for the project


With respect to above subject, I request your kind self to provide financial assistance to carry out the project entitled "Characterization of Tensile and Hardness properties of Silicon Dioxide and Boron Carbide particulate reinforced with aluminium 6061 based Hybrid metal matrix composite". The research proposal and budget split-up has been enclosed along with this letter. Kindly consider the requisition and do the need full.

Thanking you

Your's sincerely


(Madhukumar.Y.C)

RDECI :


Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bangalore - 560 057


Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bangalore - 560 057

All bills ✓
Invoice ✓

RESEARCH PROPOSAL

A. GENERAL INFORMATION

| | | |
|---|---------------------------------------|--|
| 1 | About the project | |
| A | Title of the project | : Characterization of Tensile and Hardness properties of Silicon Di oxide and Boron Carbide particulate reinforced with aluminium 6061 based Hybrid metal matrix composite |
| B | Subject area as per instruction | : Material Science and Metallurgy MSM |
| 2 | Details of Principal Investigator | |
| A | Name | : Madhukumar.Y.C |
| B | Qualification | : M.Tech (Ph. D) |
| C | Designation | : Assistant Professor |
| D | Department | : Mechanical Engineering |
| E | Years of teaching/research experience | : 08 |
| F | Email ID | : madhukumar@sapthagiri.edu.in |
| G | Cell Number | : 8970906721 |
| H | Details of the Head of the Department | |
| I | Name of the Head of the Department | Dr. P. Mahadevaswamy |
| J | Email ID | : hodmech@sapthagiri.edu.in |
| K | Cell Number | : 9620094498 |


Signature of the Investigator

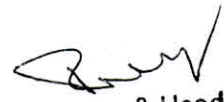

Signature of Head of the Department
Professor & Head
Department of Mechanical Engineering
Sapthagiri College of Engineering
Bengaluru - 560 057.



Principal
Sapthagiri College of Engineering
14/5, Chikkaandra, Hesaraghatta Main Road
Bengaluru - 560 057

B. DETAILS OF THE PROJECT PROPOSAL

| | | | |
|----|--|---|--|
| 1. | Title of the Project Proposal | : | Characterization of Tensile and Hardness properties of Silicon Di oxide and Boron Carbide particulate reinforced with aluminium 6061 based Hybrid metal matrix composite |
| 3. | Objectives of the proposal (Not more than six points) | : | <p>1. To Prepare Aluminium alloy metal matrix composites reinforced with Silicon dioxide and boron carbide particles in varying percentage by weight.</p> <p>2. To characterize the Hardness & Tensile properties of Silicon Boron carbide Particulate reinforced with aluminium 6061 based Hybrid metal matrix composit...</p> |
| 4. | Background of the project | : | Present aerospace & automobile industries are replacing conventional materials with Aluminum metal matrix composites due to their high strength to weight ratio. Addition of controlled percentage of Boron carbide and Silicon oxide can lead to the improvement in tensile strength. |
| 5. | Methodology (Please include flow sheet, if required) | : | <p>1. By stir casting technique Aluminium alloy is added with Boron carbide and Silicon oxide.</p> <p>2. Casting prepared is machined to prepare tensile test specimen.</p> <p>3. Hardness test is conducted by Brinell Hardness test.</p> <p>4. Values obtained by the test are analyzed to understand the improvement in the properties of alloy</p> |
| 6. | Milestones with time schedule & work plan | : | <p>Literature review – 15 days</p> <p>Material Procurement – 15 days</p> <p>Casting of alloy - 10 days</p> <p>Tensile test - 05 days</p> <p>Hardness test : 05 days</p> <p>Analysis of results – 10 days</p> <p>Preparation of report -10 days</p> |

| | | |
|-----|--|--|
| 8. | List of equipment required for Phase-I & Phase-II for Project Implementation (as per the instruction Sl.No.27 under Annexure-II) | Phase –I Stir casting System. Phase – II Optical Microscope Rs.2,16,000 apprx |
| 9. | Relevance, importance & application of the project | : The project aims at deriving the benefits of adding Boron carbide and Silicon oxide to Aluminium 6061 alloy. The project aims to find the improvements in Mechanical properties Aluminium 6061 Alloy by conducting hardness and Tensile tests. The application of the above mentioned composite in aerospace and automobile industries. |
| 10. | Novelty/Uniqueness of the project proposal | : The alloying elements are added through Stir casting technique in controlled varying percentages to get the expected benefits. |



 Professor & Head
 Department of Mechanical Engineering
 Sapthagiri College of Engineering
 Bengaluru - 560 057.


 Principal
 Sapthagiri College of Engineering
 14/5, Chikkasandra, Hesaraghatta Main Road
 Bengaluru - 560 057


 Principal
 Sapthagiri College of Engineering
 14/5, Chikkasandra, Hesaraghatta Main Road
 Bengaluru - 560 057

Date: 12/06/2018

From,

Research and Development cell,
Sapthagiri College of Engineering
Bangalore-560057

To,

Principal investigator
Sapthagiri College of Engineering
Bangalore-560057

Subject: Sanction of research grants Reg.,

The committee hereby informed that following projects have been approved for the academic year. The report and the outcome of the project as to be submitted to the committee after the completion of the project. The utilization certificate shall be given along with the final report.

| Sl. No | Principal Investigator | Department | Project entitled | Amount Sanctioned |
|--------|------------------------|------------------------|--|-------------------|
| 1 | Mr.Madhukumar.Y.C | Mechanical Engineering | Characterization of Tensile and Hardness properties of Silicon Di oxide and Boron Carbide particulate reinforced with Aluminium 6061 based Hybrid metal matrix composite | Rs. 1,00,000/- |
| 2 | Mr.Ramesh.N.G | Mechanical Engineering | Fabrication and characterization of Boron Carbide and Glass Fibre reinforced polymer composites | Rs.1,00,000/- |

Copy To,
Principal

All Departments

IQSC

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bangalore - 560 057

Convener

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bangalore - 560 057

Date: 25/06/2018

To,

Principal,

Sapthagiri College of Engineering

Bangalore-560057

From,

Madhukumar Y.C

Assistant Professor,

Department of Mechanical Engineering

Sapthagiri College of Engineering

Bangalore-560057

Through HOD

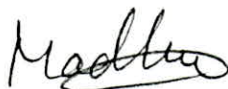


Sub: Procurement of Instruments Reg.,


With reference to the letter received from R& D committee regarding approval of research project, we are here by requesting the procurement of the following equipments/Instruments for the research project entitled "Characterization of Tensile and Hardness properties of Silicon Di oxide and Boron Carbide particulate reinforced with Aluminium 6061 based Hybrid metal matrix composite" to carry out. Kindly considered and do the need full.

Thanking you,

Yours Faithfully,



Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bangaluru - 560 057



Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bangaluru - 560 057

6


Date :10/09/2018

To,

R and D

Sapthagiri College of Engineering

Bangalore-560057

Through HOD 

From

Madhukumar Y.C

Assistant Professor,


Department of Mechanical Engineering

Sapthagiri College of Engineering

Sub: Submission of report and utilization details

With reference above cited subjected I am hereby enclosing project report entitled "Characterization of Tensile and Hardness properties of Silicon Di oxide and Boron Carbide particulate reinforced with Aluminium 6061 based Hybrid metal matrix composite"- and utilization certificate. This for your kind information, please.

| Sl No | Particulars | Quantity | Amount | Remarks |
|-------|--|----------|----------|---------|
| 1 | Dead weight pressure gauge tester | 1 | 28200/- | |
| 2 | Double disc polishing machine | 1 | 35000/- | |
| 3 | Metallurgical microscope & Image Analyzer system | 1 | 152500/- | |
| | Total Amount | | 215700/- | |

Thanking You, 

Copy,

Principal 


Principal
Sapthagiri College of Engineering
14/6, Chikkaandra, Hesaraghatta Main Road
Bangalore - 560 057

Technician - 80 73419952,

TECH-ED

TECH-ED EQUIPMENT COMPANY

Sales Off: No.#146, Teachers Layout, 6th Cross, Off. University Road Nagarbhavi, Bangalore-560072

Fac: Site No.18, Survey No.131, 17th KM, Magadi Road, Bangalore-560 091 Ph:080-28536501, 65997342, M:9243065580 e-mail: tech_ed55@yahoo.co.in

techedequipment@gmail.com,

Regd. Office: # 118, Garden Villas, Nagarbhavi Road, Bangalore-560 072,

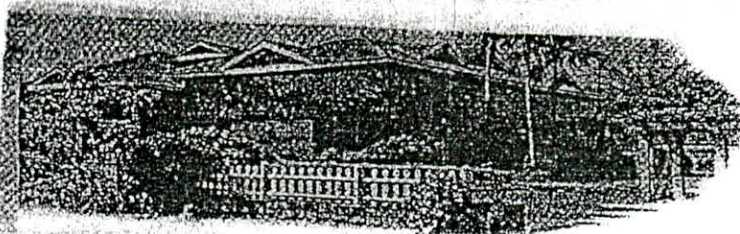
GST No.: 29AAAPR0131M1ZP

| The Principal, Sapthagiri College of Engineering Hesaraghatta Main Road, Chikkasandra, Bangalore - 560073 GSTIN:2900000000000000 | | INVOICE NO: G53 Date: 14.08.2018 | | | |
|---|--|---|---|------------|-------------|
| | | Your Order :SSCET:SCE:HO:011:Tech-Ed:ME:Lab:Inw:6170:2018 Date:11.07.2018 | | | |
| | | DELIVERY : By Road Transport | | | |
| | | DOCUMENTS THROUGH : Direct | | | |
| SL. No. | Description | HSN Code | Qty | Unit Price | Amount |
| 1. | Dead Weight Pressure Gauge Tester – Range:0.25kg/sq. cm | 90 | 1No. | 28,200 | 28,200.00 |
| 2. | Double Disc Polishing Machine | | 1No. | 35,000 | 35,000.00 |
| 3. | Metallurgical Microscope & Image Analyzer System | | 1No. | 1,52,500 | 1,52,500.00 |
| | | | | | 2,15,700.00 |
| | | | | | 43,140.00 |
| | Less Discount @20%:- | | | | 1,72,560.00 |
| | | | | | 15,530.40 |
| | SGST@9%:- | | | | 15,530.40 |
| | CGST@9%:- | | | | 15,530.40 |
| | Total:- | | | | 2,03,620.80 |
| E.O. & E | Unloading by the Purchaser (Rs. Two Lakh Three Thousand Six Hundred Twenty & Eighty Paise Only) | | | | |
| Goods once sold cannot be taken back Our responsibility ceases immediately after Goods are delivered to the carriers Interest @ 24% p.a. will be charged extra if bill is not paid within 7 days of presentation Subject to Bengaluru Jurisdiction only Certified that the Goods on which the GST has been charged are not exempted under the GST Act or the Sales Tax Act or the rules made thereunder & the amount charged on account of Sales Tax on these goods are not more than what is payable under the provision of relevant act or the rules made thereunder | | | For TECH-ED EQUIPMENT CO. <i>Venudhara K.M.</i> | | |

Bank Details: Allahabad Bank, Branch: Basavanagudi, Bangalore-560 004.
 A/c no.:20022904842 IFS Code: ALLA0210326

Kai
 Principal
 Sapthagiri College of Engineering
 14/5, Chikkasandra, Hesaraghatta Main Road
 Bengaluru - 560 057

Vh
 Principal
 Sapthagiri College of Engineering
 14/5, Chikkasandra, Hesaraghatta Main Road
 Bengaluru - 560 057



| PURCHASE ORDER | | | | | | | | | | | | | |
|--|----------------------|---|---------------------------------------|-----|---|-----------|------------|--------|----------|------------------------|-------|---------|--------------|
| SUPPLIER REF NO: TEC:Q17:745 | | | | | ORDER NO: SSCET:SCE: HO:011:Tech-ED: ME:Lab:Inw:6170:2018 DATE:- 11.07.2018 | | | | | | | | |
| DATE: 31.01.2018, Verbal on 10.07.2018 | | | | | | | | | | | | | |
| CDDP: IED | | | | | BILLING and DESPATCH To: | | | | | | | | |
| TECH-ED EQUIPMENT COMPANY | | | | | Sapthagiri College of Engineering | | | | | | | | |
| No.146, Teachers Layout, | | | | | Hesaraghatta Main Road, | | | | | | | | |
| 6th Cross, Off University Road, | | | | | Chikkasandra, | | | | | | | | |
| Nagarbhavi, Bangalore - 560 072 | | | | | Bangalore 560073 | | | | | | | | |
| Contact Person : Mr. A Bhaskara Roa | | | | | Contact Person : Principal/HOD Dept. of Mech.Engg. | | | | | | | | |
| Ph: +91-9448384205 / 080-23186574 / 9243065580 / 9632149412 | | | | | Ph: 080 2837 2800 / 2837 2801 | | | | | | | | |
| We are pleased to place the order to supply the following equipments | | | | | | | | | | | | | |
| HO ACCOUNTING | | | | | | | | | | | | | |
| Sl | Dept | DESCRIPTION OF GOODS | CODE | UoM | QTY | UNIT RATE | UNIT Value | Disc % | Disc Amt | Total value after Disc | GST % | GST AMT | TOTAL AMOUNT |
| EQUIPMENTS FOR MATERIAL TESTING LAB (Dept. Of Mech.Engg) | | | | | | | | | | | | | |
| 1 | Measurment Lab | Dead Weight Pressure Guage Tester - Precision Model:TM11, Range:0-25Kg / Sq. CM | TM11 | No. | 1 | 28200 | 28200 | 20% | 5640 | 22560 | 18% | 4061 | 26621 |
| 2 | Material Testing Lab | Double Disc Polishing Machine: Double disc polishing machine for metallographic samples. Two independent polishing units mounted on common MS Frame, Disc dia 200mm, made of brass, Rating-0.25HP single phase 220 volt AC provided with sink & swing type laboratory water tap with waterproof formica table top | | No. | 1 | 35000 | 35000 | 20% | 7000 | 28000 | 18% | 5040 | 33040 |
| 3 | Material Testing Lab | Metallurgical Microscope & Image Analyzer System for Microstructure Studies Consisting of: | | No. | 1 | 152500 | 152500 | 20% | 30500 | 122000 | 18% | 21960 | 143960 |
| | | a METZER-M Co-Axial Inverted Trinocular Metallurgical Microscope Vision Plus-5000 ITM: Suitable for Microphotography of computer imaging system. The Trinocular Observation head has a light path selector lever which directs eighere full light to the binocular observation head which enables simultaneous viewing whille preparing for Microphotography Four (DIN) Achromatic objectives: M4x, M10x, M40x (SL) Extra wide field eye pieces:10x paired, Illumination:12V-50W (halogen lamp), Filters: Green & Blue, Magnification: 40x - 400x | | | | | | | | | | | |
| | | b LCD Digital Display Camera: Sony/Nikon/Cannon 12/14 Megapixel. Complete with Battery Charger, Rechargeable battery pack, USB A/V cable for Multi use terminal software CD & Microscope adaptor | | | | | | | | | | | |
| | | c Image Analysis Software (Capture, Process, Analyze of Image), Measurement Tools: Calibration, Length, Angle, Perimeter, Width, Radius, Area, Color, Counting. Metallography Tools: Grain Size, Phase, Decrabization, Coating thickness, nodularity, porosity, inclusion, particle measurement, density, amalgamation. Image Processing Tools: Filters, Invert, Annotation, Back Ground Removal | | | | | | | | | | | |
| GRAND TOTAL | | | | | 3 | 215700 | 215700 | | 43140 | 172560 | | 31061 | 203621 |
| Rupees: Two lakh three thousand six hundred & twenty one only | | | FOR SAPTHAGIRI COLLEGE OF ENGINEERING | | | | | | | | | | |
| | | | Authorised Signatory | | | | | | | | | | |

TERMS AND CONDITIONS

- Please mention PO No & Indent No in your Invoice
 - Delivery Period : Immediate or 4 to 6 weeks from the date of receipt of the order
 - Payment: 15 days after delivery and subject to receipt of satisfactory installation report from our College
 - If the items supplied are not acceptable by our Engg College authorities or defective it should be replaced immediately
 - Rates are also inclusive of GST, Transportation, Delivery and Installation at our Engg College
 - Required drawings if need be provided to our College to enable us to start the Civil/Electrical works and proper guidance also be given to execute the civil works
 - Warranty: 12 months from the date of installation and after warranty service support must be provided
 - Please forward scan copy of invoice to our RajaInagar Office
 - Supplies should be only against the PO Issued from Head Office
 - Please send RTGS details of your firm, if already sent, ignore this.
- CC 1)HOD Mech: Engg / Civil/Lab Incharge, Engg College to verify, follow up and confirm the receipt of all the products as per this PO through mail to this Office
- 2) Verify and certify the bills and send the bills in original to HO with due certification as per this PO conditons for arranging payment as per the FORMAT sent on 02.08.2016.
- 3)Discrepancy if any against the Indented items be informed to HO immediately
- 4) Indentor should follow up with the supplier as per this PO and intimate about non-delivery of the items if there is any abnormal delay

14/7/18

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 067

32

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI - 590018, KARNATAKA



PROJECT REPORT
ON

**“CHARACTERIZATION OF TENSILE AND HARDNESS PROPERTIES OF
SILICON DI OXIDE AND BORON CARBIDE PARTICULATE
REINFORCED WITH ALUMINIUM 6061 BASED HYBRID METAL
MATRIX COMPOSITE ”**

Submitted in partial fulfillment of the requirement as prescribed by Visvesvaraya
Technological University for the award of degree of

BACHELOR OF ENGINEERING
In
MECHANICAL ENGINEERING
For the academic year 2018-19

Submitted by

ROHAN.A
HANUMANTHA REDDY.S
SAURABH RAJESH PARAVE
SUKRUTH.C

1SG15ME079
1SG15ME080
1SG15ME084
1SG15ME095

Under the guidance of
Mr. MADHU KUMAR Y.C
Assistant Professor
Department of Mechanical Engineering



DEPARTMENT OF MECHANICAL ENGINEERING
SAPTHAGIRI COLLEGE OF ENGINEERING
Bengaluru-560057


Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

32


SAPTHAGIRI COLLEGE OF ENGINEERING
DEPARTMENT OF MECHANICAL ENGINEERING


14/5, Chikkasandra, Hesaraghatta Main Road, Benagluru-560057, Karnataka

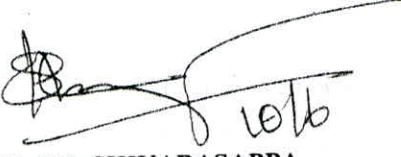


CERTIFICATE

This is to certify that project entitled "**CHARACTERIZATION OF TENSILE AND HARDNESS PROPERTIES OF SILICON DI OXIDE AND BORON CARBIDE PARTICULATE REINFORCED WITH ALUMINIUM 6061 BASED HYBRID METAL MATRIX COMPOSITE**" has been satisfactorily completed by **ROHAN.A (1SG15ME079)** , **HANUMANTHA REDDY.S (1SG15ME080)**, **SAURABH RAJESH PARAVE (1SG15ME084)**, **SUKRUTH.C (1SG15ME095)** students of 8th semester of Department of Mechanical Engineering in partial fulfillment of requirements for the award of Bachelor's degree in Mechanical Engineering presented by Visvesvaraya Technological University, Belagavi during academic year 2018-2019.


Mr.MADHU KUMAR Y.C
Assistant Professor


Dr.P.MAHADEVASWAMY
Professor and HOD

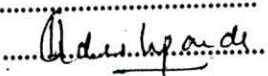

Dr.K.L.SHIVABASAPPA
Principal, SCE

Name of Examiners

1.
2. Dr. R. A. Deshpande

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

Signature with Date

 13/6/19

UTILIZATION CERTIFICATE

| Sl No | Particulars | Quantity | Amount |
|-------|--|----------|---------------|
| 1 | Dead weight pressure gauge tester | 1 | 28200 |
| 2 | Double disk polishing machine | 1 | 35000 |
| 3 | Metallurgical microscope and image analyzer system | 1 | 152500 |
| | Total | | 215700 |

Certified that Sapthagiri college of Engineering has provided partial financial support of **RS 215700/-** (Two lakh fifteen thousand seven hundred only) towards Characterization Of tensile and hardness properties of silicon dioxide and boron carbide particulate reinforced with aluminium 6061 based hybrid metal matrix composite project conducted by Mechanical Department of Sapthagiri college of Engineering

Certified that I have satisfied myself that condition on which the grant in aid sanctioned has been duly fulfilled and that I have excised the following check to see that the money was actually utilized for the purpose for which it was sanctioned. .

Kinds of check exercised**1. Bills****Signature of the Principal with seal**

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

Signature of Auditor with seal

Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

Sapthagiri College of Engineering

(Affiliated to Visvesvaraya Technological University, Belagavi & Approved by AICTE, New Delhi)

#14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru - 560057

Phone: 080-28372800/1/2

www.sapthagiri.edu.in

Fax: 080-28372797

Date: 04/09/2018

To,


The Principal,

Sapthagiri College of Engineering

Bangalore-560057

Sub- Sanction of Research grant for the research project "Gene Expression Study On Anti-Oxidant Enzyme Sod And Gpx "

With reference to the letter dated 23/8/2018 regarding the research funding, the management of Sapthagiri college of engineering has sanctioned the Research grant of Rs.47,633/- (Rupees forty seven thousand six hundred thirty three only) for the research project "Gene Expression Study On Anti-Oxidant Enzyme Sod And Gpx "to be carried out by the department of Biotechnology.


Executive Director

Sri G.D. MANOJ

Executive Director
Sapthagiri College of Engineering
BENGALURU - 560 057.


Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057



Sapthagiri College of Engineering

(Affiliated to Visvesvaraya Technological University, Belagavi & Approved by AICTE, New Delhi)

#14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru - 560057

Phone: 080-28372800/1/2

www.sapthagiri.edu.in

Fax: 080-28372797

Date: 05/09/2018

To,

The Convener,

R&D, Entrepreneurship Committee & Incubation Center (RDECI),

Sapthagiri College of Engineering


Bangalore-560057

Sub- Sanction of Research grant for the research project "Gene Expression Study On Anti-Oxidant Enzyme Sod And Gpx "

The management of Sapthagiri college of engineering has sanctioned the Research grant of Rs.47,633/- (**Rupees forty seven thousand six hundred thirty three only**) for the research project "Gene Expression Study On Anti-Oxidant Enzyme Sod And Gpx "to be carried out by the department of Biotechnology.

Copy To,

All Departments


Principal
Principal
Sapthagiri College of Engineering


Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

Date: 23/08/2018

To,

The Principal,
Sapthagiri College of Engineering,
Bangalore-560057,

Through HOD & RDECI

From

Shobha G and Soumya C
Department of Biotechnology
Sapthagiri College of Engineering
Bangalore-560057

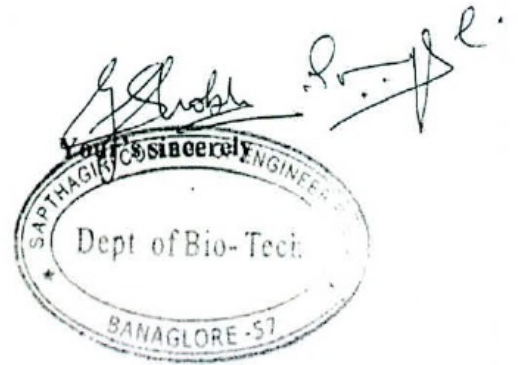
Respected Sir,


Subject: Requisition for the financial assistance for the project


With respect to above subject, I request your kind self to provide financial assistance to carry out the project entitled "**Gene expression study Antioxidant Enzyme SOD and GPX**". The research proposal and budget split up has enclosed along with this letter. Kindly consider the requisition and do the need full.

Thanking you

RDECI :




Head of the Department
Dept. of Bio -Technology
Sapthagiri College of Engineering
No. 57/1, Chikkasandra
Hesaraghatta Main Road
Bangalore -57

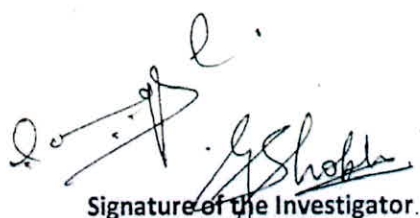

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bangalore - 560 057

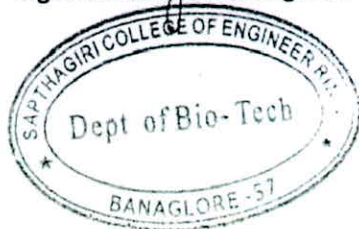

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bangalore - 560 057

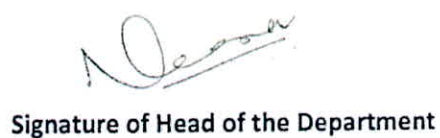
RESEARCH PROPOSAL

A. GENERAL INFORMATION

| | | |
|---|---------------------------------------|---|
| 1 | About the project | |
| a | Title of the project | : Gene expression study Antioxidant Enzyme SOD and GPX |
| b | Subject area as per instruction | : Biological & Agricultural Sciences |
| 2 | Details of Principal Investigator | |
| a | Name | : Mrs Shobha G And Mrs Soumya C |
| b | Qualification | : M.Sc, M.Phil, (Ph.D) |
| c | Designation | : Assistant Professor |
| d | Department | : Biotechnology |
| e | Years of teaching/research experience | : 10 & 14 |
| f | Email ID | : shobhag@sapthagiri.edu.in/ soumyac@sapthagiri.edu.in |
| g | Cell Number | : 9964591024/9538819506 |
| h | Details of the Head of the Department | |
| i | Name of the Head of the Department | : Dr. Rohit KC |
| j | Email ID | : hodbt@sapthagiri.edu.in |
| k | Cell Number | : 9900833873 |


Signature of the Investigator.




Signature of Head of the Department

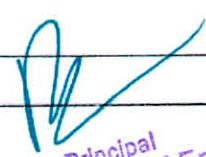
Head of the Department
Dept. of Bio -Technology
Sapthagiri College of Engineering
No. 57/1, Chikkaiahalli
Hesaraghatta Main Road
Bangalore -57


P. Lalitha
Sapthagiri College of Engineering
14/5, Chikkaiahalli, Hesaraghatta Main Road
Bangalore - 560 057


Principal
Sapthagiri College of Engineering
14/5, Chikkaiahalli, Hesaraghatta Main Road
Bangalore - 560 057

A. DETAILS OF THE PROJECT PROPOSAL

| | |
|----|---|
| 1. | Title of the Project Proposal: |
| | Gene expression study Antioxidant Enzyme SOD and GPX |
| 2. | Objectives of the proposal: |
| | <ul style="list-style-type: none"> • DNA quantification • mRNA isolation • Genotoxicity assay of SOD and GPX |
| 3. | Background of the project: |
| | <p>Nanotechnology has transformed many frontages of the current society with its widespread applications in field of agriculture. Nanoparticles, in view of their intrinsic physico-chemical traits, are among likely contenders for modulating redox status there by altering the performance, quality and development of plant. Interactions amongst ecological influences and seed inner mechanisms control the capacity of a plant to germinate effectively. Hence germination is critical for deciding the plant density at the end, whenever planted, seeds should be able to germinate entirely and vigorously.</p> <p>Tomato (<i>Lycopersicon esculentum</i>) is a common vegetable crop of economic significance further, it is recognized as a classical plant as it contains a variety of secondary metabolites that can encourage biological, chemical and physiological examinations in expansion to an elective typical plant <i>Arabidopsis thaliana</i>. Tomato plant likewise is a perfect plant for numerous studies as it can proliferate in laboratories with least structure as compared to what is used for <i>A. thaliana</i>. The examination of antioxidants enzymes and its gene expression often tells about biotic and abiotic stress that occurs in the plant. The increased and decreased level of antioxidant enzymes tell about the development of reactive oxygen species (ROS) which tells about the DNA damage in plant.</p> <p>Thus, the goal was to gain a better understanding regarding the Antioxidant Enzyme and of Tomato Plant against copper nanoparticle. Ultimately to develop recommended exposure limits for the plant development.</p> |
| 4. | Methodology : |


 Principal
 Sapthagiri College of Engineering
 14/5, Chikkasandra, Hesaraghatta Main Road
 Bengaluru - 560 057

DNA extraction and Laddering

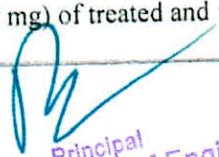
For DNA isolation, fresh leaf (100mg) was collected from treated and untreated control tomato plant and preserved at 20°C for further study. The leaf was macerated in 500µL of extraction buffer (100mM Tris-HCl buffer pH 8.0, 25mM EDTA, 2M NaCl, 3% CTAB, 3% PVP, RNase) and proteinase K (20µl) was added to the plant extract. The samples were kept at 65°C for 30min with occasional mixing for every 10min. After the period of incubation, samples were centrifuged for 5 min at 10,000rpm at room temperature and pellet was discarded. An equal quantity of isoamyl alcohol-chloroform (1:24 v/v) and supernatant were taken and incubated overnight at -4°C followed by centrifugation at 12,000rpm for 10min. To the supernatant 1ml of 3M NaCl and 150µl silica matrix (1mg/ml) was added. The mixture was thoroughly vortexed and incubated for 5min at room temperature followed by centrifugation at 10,000rpm for 2 minutes at 4°C. The pellet is then washed twice using washing buffer (50% ethanol, 10mM Tris-HCl, 100mM NaCl, 1mM EDTA, pH 7.5) of 500µl and centrifuged at 10,000rpm for 2min. Under a sterile laminar hood, DNA was dissolved in 50µl of TE buffer (10mM Tris buffer pH 8, 1mM EDTA) and centrifuged for 10,000 rpm for 10min, supernatant was retained and stored at 4°C until used. The DNA purity was measured by recording the optical density at 260nm and 280nm and integrity of DNA was observed by resolving on agarose gel (2.5%) in 1X TAE (Tris acetate EDTA) buffer.

Huanca-Mamani et al [275] protocol was followed for size-fractionalization of silica particles. The silicon dioxide was allowed to settle overnight after blending in 50ml of dH₂O. After discarding the supernatant, the pellet was re-suspended in 50ml dH₂O and allowed to settle overnight. After two-three repetition, the silica was used for DNA extraction.

2.2 Expression pattern of genes for SOD and GPX to Cu₂O NPs treatment

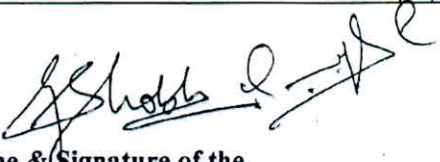

Total RNA extraction and cDNA preparation

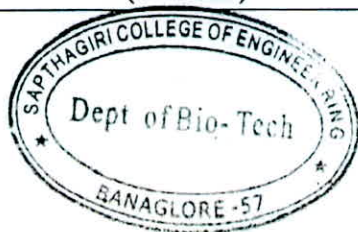
Procedure: Total RNA were isolated from fresh leaf (100 mg) of treated and untreated control tomato


Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

| | | | |
|---|--|---|---|
| | <p>plant with the total RNA isolation Mini Kit-Plant. Residual DNA was removed from the RNA samples with DNase-I. The quantity and quality of RNA was assessed with a Nano view spectrometer at 260nm and 280nm, whose ratio provides an estimate of RNA purity. RNA quality was confirmed by gel electrophoresis, containing 1.8% agarose and formaldehyde. The RNA is reverse transcribed into cDNA using M-MuLV RT-PCR Kit with Oligo (dT) according to the manufacturer's guidelines. The transcription levels of genes were analysed using qRT-PCR and the PCR System (Eppendorf). The PCR reaction mixture of a final volume of 25 μL consisting of 12.5μL of SYBR green master mix, 1μL of cDNA, dH₂O, and 1μL of each primer. The reaction mixtures in the beginning denatured for 10 min at 95°C and exposed to 40 cycles of 95°C for 15s and 58°C for 45s and 72°C for 30sec. The relative expression level was determined using the $\Delta\Delta$Ct method. It is then normalized to the Ct data relative to the transcript level of the ACTIN gene as an internal control. Electrophoresis was later performed in tris-EDTA buffer for 30min at 100 volts and 3μL of EtBr in 120ml of TBA buffer is used to stain the gel. The bands stained in the gel were observed and documented using a gel documentation system.</p> | | |
| 5. | Milestones with time schedule & work plan: 6 Months | | |
| 6. | <table border="1"> <tr> <td data-bbox="221 1111 754 1211">List of equipment required for Phase-II for Project Implementation</td><td data-bbox="754 1111 1382 1211">Kits Rs.47,633 apprx</td></tr> </table> | List of equipment required for Phase-II for Project Implementation | Kits Rs.47,633 apprx |
| List of equipment required for Phase-II for Project Implementation | Kits Rs.47,633 apprx | | |
| 7. | Relevance, importance & application of the project: | | |
| | <p>Researchers are now working to bridge a gap between agriculture and nanotechnology, so that of agri-nanotechnology can revolutionize the sector with new tools for disease detection, targeted treatment, enhancing the ability of plants to absorb nutrients, fight diseases, delivering nutrients or pesticides as appropriate, improve our understanding of the biology of different crops and thus potentially enhance yields. At a same time nanoparticles and their increased use have raised concerns about their possible harmful effects within the environment.</p> | | |
| 10. | <table border="1"> <tr> <td data-bbox="221 1552 754 1742">Novelty/Uniqueness of the project proposal</td><td data-bbox="754 1552 1382 1742">: Over time, the results explains, nanomaterial in the agricultural inputs which may shows the positive and negative impact on growth of <i>Lycopersicon esculentum</i> and may contribute to the controversial</td></tr> </table> | Novelty/Uniqueness of the project proposal | : Over time, the results explains, nanomaterial in the agricultural inputs which may shows the positive and negative impact on growth of <i>Lycopersicon esculentum</i> and may contribute to the controversial |
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Principal
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 Bengaluru - 560 057

| | | |
|--|--|--|
| | | debate on plant toxicity of nanoparticles. |
| <div style="display: flex; justify-content: space-around; align-items: flex-end;"> <div style="text-align: center;">  Name & Signature of the Principal Investigator (with seal) </div> <div style="text-align: center;">  Name & Signature of Head of the Department (with seal) </div> </div> | | |



Sapthagiri College of Engineering
 Dept. of Bio-Technology
 No. 57/1, Chikkasandra
 Hesaraghatta Main Road
 Bangalore - 57 .


 Principal
Sapthagiri College of Engineering
 14/5, Chikkasandra, Hesaraghatta Main Road
 Bengaluru - 560 057


 Principal
Sapthagiri College of Engineering
 14/5, Chikkasandra, Hesaraghatta Main Road
 Bengaluru - 560 057

Date : 06/09/2018

From,

Research and Development cell,
Sapthagiri College of Engineering,
Bangalore-560057.

Through: HOD

To,

Principal investigator,
Sapthagiri College of Engineering,
Bangalore-560057.

Subject: Sanction of research grants Reg.,

The committee hereby informed that following projects have been approved for the academic year. The report and the outcome of the project as to be submitted to the committee after the completion of the project. The utilization certificate shall be given along with the final report.

| Sl. No | Principal Investigator | Department | Project entitled | Amount Sanctioned |
|--------|-----------------------------|------------|--|-------------------|
| 1 | MrsShobha G/ MrsSoumya C | BT | Gene expression study Antioxidant Enzyme SOD and GPX | 50,000/- |


Convener

Copy To,
Principal
All Departments
IQSC


Principal
Sapthagiri College of Engineering
14/5, Chikkaeandra, Hesarghatta Main Road
Bengaluru - 560 057

Date: 20/10/2018

To,

Principal,
Sapthagiri College of Engineering
Bangalore-560057

Through HOD

From,

Shobha G,
Department of Biotechnology,
Sapthagiri College of Engineering
Bangalore-560057

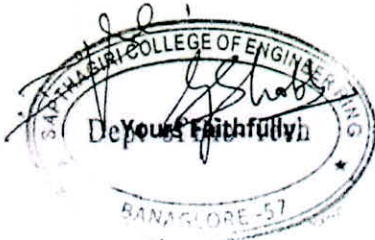
Respected Sir,

Sub: Procurement of Teaching Kits Reg.,

With reference to the letter received from R& D committee regarding approval of research project, we are here by requesting the procurement of teaching kits (RNA isolation kit for plant, qPCR Master mix, RT PCR Kit) which cost around Rs 50, 000/- (Fifty thousand) for the research project entitled "Gene expression study Antioxidant Enzyme SOD and GPX" to carry out. This will enhance the research potential to contribute for the improvement in the field of biotechnology.

Thanking you,

Yours faithfully,



Kari

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesareghatta Main Road
Bangalore - 560 057

Principal

Sapthagiri College of Engineering
14/5, Chikkasandra, Hesareghatta Main Road
Bangalore - 560 057

Head of the Department
Dept. of Bio - Technology
Sapthagiri College of Engineering
No. 57/1, Chikkasandra,
Hesareghatta Main Road
Bangalore - 57

Date : 15/04/2019

To,

Research and Development cell,
Sapthagiri College of Engineering
Bangalore-560057

Through HOD

From

Shobha G,
Department of Biotechnology
Sapthagiri College of Engineering
Bangalore-560057

Sub: Submission of report and utilization details

With reference above cited subjected I am hereby enclosing project report entitled "Gene expression study Antioxidant Enzyme SOD and GPX". The item number (10 - RT PCR Kit, 11 - qPCR Master mix, 12-, RNA isolation kit for plant) mentioned in the invoice SE/1819/565 Dated 23/10/2018 were utilized for research work. This for your kind information, please.

| Sl No | Particulars | Quantity | Amount | |
|--------------|--------------------------------|----------|---------|--|
| 1 | RT PCR KIT | 2 | 12813/- | |
| 2 | QPCR MASTER MIX | 2 | 17523/- | |
| 3 | RNA ISOLATION KIT FOR PLANT | 2 | 17297/- | |
| TOTAL AMOUNT | | | 47633/- | |

Thanking You,

Copy,

Principal

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14/5, Chikkasandra, Hesarghatta Main Road
Bangalore - 560 057

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Sapthagiri College of Engineering
14/5, Chikkasandra, Hesarghatta Main Road
Bangalore - 560 057

Head of the Department
Dept. of Bio-Technology
Sapthagiri College of Engineering
No. 57/1, Chikkasandra
Hesarghatta Main Road
Bangalore - 57

2018-0



Sakhala Enterprises

#966, "Shreeyaa" II Phase, V Stage, BEML layout, R.R. Nagar, Bengaluru-560098.
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Supplier & Channel Partner of Laboratory Consumables, Instruments, Research Services & Stationery Items.
PAN No.: ACGFS9635M, GSTIN: 29ACGFS9635M1Z8, Service Tax: ACGFS9635MSD001

"WE SERVE THE QUALITY"

Tax Invoice

Duplicate Copy

To
The Principal
Sapthagiri College of Engineering
14/5, Chikkasandra
Hesaraghatta Main Road
Bangalore - 560057

No. : SE/1819/565
Date: 23.10.2018

PO No.: SCE/ADM/357/18-19
Date: 15th Oct 2018

| SLNo. | Product Description | Pack | Price | GST | Disc. | Amount | Qty | Sub Total | SGST | CGST | Total |
|-------|------------------------------|--------|--------|-----|-------|--------|-----|-----------|------|------|--------|
| 1 | DOT ELISA | 15pr* | 2,900 | 12% | 1,015 | 1,885 | 6 | 11,310 | 679 | 679 | 12,667 |
| 2 | ROCKET IEP | 5pr* | 4,300 | 12% | 1,505 | 2,795 | 2 | 5,590 | 335 | 335 | 6,261 |
| 3 | RADIAL IMMUNODIFFUSION | 20pr* | 3,600 | 12% | 1,260 | 2,340 | 1 | 2,340 | 140 | 140 | 2,621 |
| 4 | OUCHTERLONY DOUBLE DIFFUSION | 10pr* | 2,800 | 12% | 980 | 1,820 | 1 | 1,820 | 109 | 109 | 2,038 |
| 5 | BLOOD GROUP AGGLUTINATION | 100pr* | 800 | 12% | 280 | 520 | 3 | 1,560 | 94 | 94 | 1,747 |
| 6 | WIDAL TEST | 20pr* | 800 | 12% | 280 | 520 | 3 | 1,560 | 94 | 94 | 1,747 |
| 7 | COUNTER CURRENT IEP | 10pr* | 2,700 | 12% | 945 | 1,755 | 2 | 3,510 | 211 | 211 | 3,931 |
| 8 | RNA ISOLATION KIT | 10pr* | 4,900 | 12% | 1,715 | 3,185 | 3 | 9,555 | 573 | 573 | 10,702 |
| 9 | WESTERN BLOT | 5pr* | 7,600 | 12% | 2,660 | 4,940 | 1 | 4,940 | 296 | 296 | 5,533 |
| 10 | RT PCR KIT | 5pr* | 8,800 | 12% | 3,080 | 5,720 | 2 | 11,440 | 686 | 686 | 12,813 |
| 11 | qPCR MASTER MIX | 20pr* | 12,035 | 12% | 4,212 | 7,823 | 2 | 15,646 | 939 | 939 | 17,523 |
| 12 | RNA ISOLATION KIT FOR PLANT | 20pr* | 11,880 | 12% | 4,158 | 7,722 | 2 | 15,444 | 927 | 927 | 17,297 |

| Taxable Value | Central Tax | | State Tax | | Total Tax Amount |
|---------------|-------------|--------|-----------|--------|------------------|
| | Rate(%) | Amount | Rate(%) | Amount | |
| - | 9% | - | 9% | - | - |
| 84,715 | 6% | 5,083 | 6% | 5,083 | 10,166 |
| - | 2.5% | - | 2.5% | - | - |

Grand Total 94,880

Rs. Ninty Four Thousand Eight Hundred and Eighty Only.

HSN/SAC : 38220090

Our Bank Details:

Account Name: SAKHALA ENTERPRISES

Account No.: 34422344190

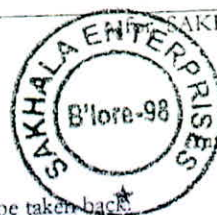
IFSC Code: SBIN0017780

Bank Name: State Bank of India

Bank Address: Channasandra, Rajeshwari Nagar, Bengaluru - 560098

*Order once placed cannot be cancelled or materials once sold will not be taken back

Subject to Bengaluru Jurisdiction



Authorised Signatory

SECURITY IN CHECKED
Date: 23/10/18
Time: 11:00
Signature: [Signature]
No. 1104 AE 6928

Received in good condition
23/10/18

Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bangalore - 560 057

Gene expression study Antioxidant Enzyme SOD and GPX

Submitted By
Mrs. ShobhaG and MrsSoumya C
Assistant Professor
Department of Biotechnology

To



DEPARTMENT OF BIOTECHNOLOGY
SAPTHAGIRI COLLEGE OF ENGINEERING
BENGALURU-560057
KARNATAKA, INDIA
2018


Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

1. INTRODUCTION

Nanotechnology has transformed many frontages of the current society with its widespread applications in field of agriculture. Nanoparticles, in view of their intrinsic physico-chemical traits, are among likely contenders for modulating redox status there by altering the performance, quality and development of plant. Interactions amongst ecological influences and seed inner mechanisms control the capacity of a plant to germinate effectively. Hence germination is critical for deciding the plant density at the end, whenever planted, seeds should be able to germinate entirely and vigorously.

Tomato (*Lycopersicon esculentum*) is a common vegetable crop of economic significance further, it is recognized as a classical plant as it contains a variety of secondary metabolites that can encourage biological, chemical and physiological examinations in expansion to an elective typical plant *Arabidopsis thaliana*. Tomato plant likewise is a perfect plant for numerous studies as it can proliferate in laboratories with least structure as compared to what is used for *A. thaliana*. The examination of antioxidants enzymes and its gene expression often tells about biotic and abiotic stress that occurs in the plant. The increased and decreased level of antioxidant enzymes tell about the development of reactive oxygen species (ROS) which tells about the DNA damage in plant.

2. Materials and Methodology

2.1 DNA extraction and Laddering

Principle: The silica binding procedure and CTAB-PVP method are collectively used in DNA extraction protocol. During extraction, CTAB separates polysaccharides from DNA. Polyphenols forms hydrogen bonds with the PVP and precipitates in cell debris upon lysis of cell. In the existence of chaotropic salt silica helps in binding DNA. The RNase and proteinase enzymes present in the lysis buffer will eliminate the RNA and protein from samples through selective precipitation.

Procedure: For DNA isolation, fresh leaf (100mg) was collected from treated and untreated control tomato plant and preserved at 20°C for further study. The leaf was macerated in 500µL of extraction buffer (100mM Tris-HCl buffer pH 8.0, 25mM EDTA, 2M NaCl, 3% CTAB, 3% PVP, RNase) and proteinase K (20µl) was added to the plant extract. The samples were kept at 65°C for 30min with occasional mixing for every 10min. After the period of incubation, samples were centrifuged for 5 min at 10,000rpm at room


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UTILIZATION CERTIFICATE

| Sl No | Particulars | Quantity | Amount |
|-------|-------------------|----------|--------------|
| 1 | RTPCR kit | 2 | 12813 |
| 2 | QPCR master mix | 2 | 17523 |
| 3 | RNA isolation kit | 2 | 17297 |
| | Total | | 47633 |

Certified that Sapthagiri college of Engineering has provided partial financial support of **RS 47633/-** (Forty seven thousand six hundred and thirty three only) towards Gene expression study of antioxidant enzyme SOD and GPX project conducted by Biotechnology Department of Sapthagiri college of Engineering

Certified that I have satisfied myself that condition on which the grant in aid sanctioned has been duly fulfilled and that I have excised the following check to see that the money was actually utilized for the purpose for which it was sanctioned. The items are mentioned in the invoice SE/1819/565 dated 23/10/2018.

Kinds of check exercised

1. Bills

Signature of the Principal with seal

[Signature]
Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

Signature of Auditor with seal



[Signature]
Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057

KSCST PROJECTS

UTILIZATION CERTIFICATE

KSCST Student project program 42nd series - 2018-19

| Sl No | Lettered NO and Date | Amount | Certified that KSCST has provided partial financial support of RS 42500/- towards Biofuel and SPP student project program 38th series Sum of Rs 42500/- only has been utilize for the purpose Biofuel and SPP student project program for which it was sanction |
|-------|----------------------|--------|--|
| 1 | 7.1.01/SPP/1333 | 7500/- | |
| 2 | 7.1.01/SPP/1333 | 8000/- | |
| 3 | 7.1.01/SPP/1333 | 8000/- | |
| 4 | 7.1.01/SPP/1333 | 7000/- | |
| 5 | 7.1.01/SPP/1333 | 6500/- | |
| 6 | 7.1.01/SPP/1333 | 5500/- | |

Certified that I have satisfied myself that condition on which the grant in aid sanctioned has been duly/are be fulfilled and that I have excise the following check to see that the money was actually utilized for the purpose for which it was sanctioned.

Kinds of check exercised

1. Cash book
2. Vouchers

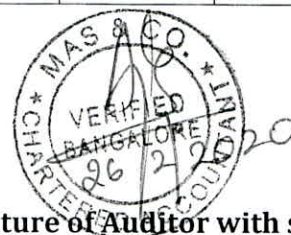

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Chikkasandra, Hesaraghatta Road,
Bangalore- 560 057

| Sl. No | Project proposal ref no | Title of the project | Dept./Guide | Amount Sanction by KSCST | Amount utilized by the college | Balance if any to be refunded to KSCST |
|--------|-------------------------|---|---|--------------------------|--------------------------------|--|
| 1 | 42S_BE_0279 | AGROBOT | EEE/ Mr.Dhamodaran | 7500/- | 7500/- | 0 |
| 2 | 42S_BE_1473 | Development of Energy Management System (EMS) for Solar Photovoltaic Power Plants to Supply Power for Cottage Industries without using Battery Bank | EEE/ Mrs. Rekha S N | 8000/- | 8000/- | 0 |
| 3 | 42S_BE_1589 | Design and Fabrication of Articulated 3D Printer | ME/ Mr. Ullas CS | 8000/- | 8000/- | 0 |
| 4 | 42S_BE_2339 | Power generation by engine exhaust gas for air brake | ME/ Mr. Padmanabha | 7000/- | 7000/- | 0 |
| 5 | 42S_BE_3333 | Anti-Krait venom activity of flok medical plants. | BT/ Dr. Veena S More | 6500/- | 6500/- | 0 |
| 6 | 42S_B_BE_003 | Bio plastic Extraction from waste grease produce in industries using as Glycerol as a substrate. | BT /Mr.prashanth kumar HP/ Ms. Shobha G | 5500/- | 5500/- | 0 |

Signature of the Principal with seal

Signature of Auditor with seal

Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560 057



Date:

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560 057