

KARNATAKA STATE COUNCIL FOR SCIENCE AND TECHNOLOGY
Indian Institute of Science Campus, Bengaluru - 560012


LIST OF B.E. PROJECTS SANCTIONED UNDER 39th SERIES OF STUDENT PROJECT PROGRAMME : 2015-2016

93) SAPTHAGIRI COLLEGE OF ENGINEERING, BENGALURU

Sl No.	Project proposal Ref. No.	TITLE OF THE PROJECT	BRANCH	NAME OF THE GUIDE/S	STUDENT1 & TEAM LEADER	SANCTIONED AMOUNT (Rs.)
405.	39S_BE_1911	NEXT GENERATION E-VOTING SYSTEM FOR ELDERLY AND BLIND USERS	ELECTRONICS AND COMMUNICATION ENGINEERING	MR. KARTHIK N C	ANURAG GOSH	4,000.00
406.	39S_BE_1916	IDENTIFICATION OF ARTIFICIALLY RIPENED FRUITS USING PROBABILISTIC NEURAL NETWORK	COMPUTER SCIENCE AND ENGINEERING	PROF.KAMALAKSHI NAGANNA	MS.NALINAKSHI K	3,000.00
407.	39S_BE_1920	DETECTION OF ABANDONED OBJECTS AND RAISE A VISUAL ALARM IN PUBLIC PLACES	COMPUTER SCIENCE AND ENGINEERING	PROF.KAMALAKSHI NAGANNA	MR.KARTHIK	3,000.00
408.	39S_BE_1924	AGGREGATE CRYPTOSYSTEM FOR SCALABLE DATA SHARING IN CLOUD STORAGE	INFORMATION SCIENCE AND ENGINEERING	PROF.PRERANA CHAITHRA	MS ROOPASHREE A	3,000.00
409.	39S_BE_1925	POLLUTION STUDY ON POLYMERIC SURGE ARRESTER	ELECTRICAL AND ELECTRONICS ENGINEERING	DR.K.N RAVI	MR. V NAVEEN	3,000.00
410.	39S_BE_1928	STUDY ON THE CHEMICAL COMPOSITION AND IN-VITRO EVALUATION OF THEIR PHARMACOLOGICAL ACTIVITY	BIOTECHNOLOGY ENGINEERING	DR ANANDA S	NETHRAVATHI M	6,000.00

KSCST : 39th Series of Student Project Programme : List of Projects sanctioned : 2015-2016

99


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

5

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
JNANASANGAMA, BELGAUM-590018



**PROJECT REPORT
ON
"POLLUTION STUDY ON POLYMERIC HOUSED SURGE
ARRESTER"**

Submitted in the partial fulfillment for the award of the degree of
**BACHELOR OF ENGINEERING
IN
ELECTRICAL AND ELECTRONICS**

Submitted by

VAISHAK CHANDRAN

ISG12EE053

V NAVEEN

ISG12EE052

UMAKARTHIK H.S.

ISG12EE051

HARIKISHOR M.G.

ISG12EE019

Under the supervision of

Mrs.A.M.Leela
Associate Prof. of EEE

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



For the academic year of
2015-16

**DEPARTMENT OF ELECTRICAL AND ELECTRONICS
ENGINEERING**

SAPTHAGIRI COLLEGE OF ENGINEERING

No. 14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057

SAPTHAGIRI COLLEGE OF ENGINEERING

No. 14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057


Principal
Sapthagiri College of Engineering
14/5, Chikkasandra, Hesaraghatta Main Road




Department of
ELECTRICAL AND ELECTRONICS ENGINEERING

CERTIFICATE


Certified that the project work entitled "**Pollution study on Polymeric Housed Arrestor**" carried out by **VAISHAK CHANDRAN** bearing USN [ISG12EE053], **V NAVEEN** bearing USN [ISG12EE052], **UMAKARTHIK H.S.** bearing USN [ISG12EE051], **HARIKISHOR M.G.** bearing USN [ISG12EE019], bonafied students of **Sapthagiri College Of Engineering** in partial fulfilment for the award of **Bachelor of Engineering** in department of **Electrical and Electronics Engineering** of **Visvesvaraya Technological University, Belagavi** during the academic year 2015-2016. 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 Bachelor of Engineering Degree.


Signature of the Guide

Mrs. A.M. Leela
Associate Professor
(Guide & Seminar Coordinator)


Signature of the HOD

Dr. K.N. Ravi
Professor & H.O.D
(Guide & Head of the Dept.)


Signature of the Principal

Dr. Aswatha Kumar M
Principal
Sapthagiri College of Engineering
No. 14/5, Chikkasandra,
Hesaraghatta Main Road,
Bangalore-560 057

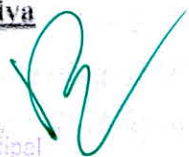
External Viva

Name of the examiners

1.

2.

Signature with date


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

INTRODUCTION

Electric power supply should ensure reliability and continuity to the utility concerns. Hence the power lines and substations are to be protected and operated against over voltages such that the numbers of failures are as few as possible. At the same time the cost involved in the design, installation and operation of the protective devices should not be too high. Hence a gradation of system insulation and protective device operation is to be followed, keeping in view the importance of the various equipment involved.

Generally, substation contains transformers, switchgears, and other valuable equipment with non-self-restoring insulation, which have to be protected against failures and internal destruction. Surge arrester are widely used in power distribution and transmission network to protect system against atmospheric surges as well as over voltages due to switching or other mechanical operations. Usually these protection devices have a useful life that varies from 20 to 25 years, even in critical operation conditions.

Polymeric housed arresters composed of zinc oxide (ZnO) arresters are usually subjected to environmental and electrical stress. In tropical regions, these devices are subjected to high moisture levels, high temperature and high isokeraunic indices which emphasizes the moisture infiltration is the principle cause of failures in porcelain surge arrester.

Polymers have been in use for high voltage insulation applications, such as, line insulators and cable terminators, for the last 20 years. Their use as zinc oxide arrester housing for outdoor electrical system is very recent. The advantages of choosing polymer instead of porcelain as the housing material for arresters are, light weight, shorter length of arrester possible due to the use of an insulated mounting bracket reduced risk of shattering and explosion of the housing during arrester failure, improved resistance to moisture ingress due to the close fitting provided by the polymer, etc. Currently available arresters use either an EPM or an EPDM polymer, and it is expected that silicone rubber housed arresters will be available shortly.



KSCST

Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bangalore - 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

Dr. S. G. Sreekanteswara Swamy
Executive Secretary

23rd March 2016

Ref: 7.1.03/SPP/1148

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

Dear Sir,

Sub: Sanction of Student Project - 39th Series, Year 2015-2016

Your Project Proposal Reference No. : 39S_BE_1911

Ref : Your Project Proposal entitled: **NEXT GENERATION E-VOTING SYSTEM FOR ELDERLY AND BLIND USERS**

I am happy to inform that your project proposal referred above, has been approved by the Secretary, KSCST for "Student Project Programme - 39th Series" and has been sanctioned with a budgetary break-up as detailed below:

Student / s	Anurag Gosh and others	Budget	Amount (Rs)
Guide/s	Mr. Karthik N C	Materials/Consumables	3,000.00
		Labor	-
		Travel	-
Department	Electronics And Communication Engineering	Miscellaneous	500.00
		Report	500.00
		TOTAL	4,000.00
Rupees	FOUR THOUSAND	ZERO HUNDRED	

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 (including coverpages, abstract and preliminary pages) and 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 proposal 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
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

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

39S_BE_1911

- 5) Introduction / background
(with specific reference to the project, work done earlier, etc) - about 20 lines
 - 6) Objectives (about 10 lines)
 - 7) Methodology (about 20 lines)
(materials, methods, details of work carried out, including drawings, diagrams etc)
 - 8) Results and Conclusions
(about 20 lines with specific reference to work carried out)
 - 9) Scope for future work (about 20 lines).
- (Note: The write-up (Synopsis) should be sent with the approval of project guide. The softcopy of the write-up, in MS Word format, should be sent by e-mail (spp@kscst.iisc.ernet.in). In your e-mail, please also include project proposal reference number and title of the project.)**

e) Projects selected for Seminar / Exhibition will be awarded.

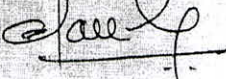
The sanctioned amount will be sent separately by our Accounts Department.

The sponsored projects evaluation will be held in the Nodal Centre and the details of the nodal centre will be intimated shortly.

Please visit our website for further announcements / information and for any clarifications please email to spp@kscst.iisc.ernet.in

Thanking you and with best regards,


Yours sincerely



(SGS Swamy)

Copy to:

- 1) The Head of the Department of
Electronics And Communication Engineering
Sapthagiri College Of Engineering
14/5, Chickasandra,
Hesaraghatta Main Road
Bengaluru - 560 057
- 2) **Mr. Karthik . N . C**
Department of Electronics And Communication Engineering
Sapthagiri College Of Engineering
14/5, Chickasandra,
Hesaraghatta Main Road
Bengaluru - 560 057
- 3) The Finance Officer, KSCST, Bangalore



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



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

Dr. S. G. Sreekanteswara Swamy
Executive Secretary

Ref: 7.1.03/SPP/ 1148

23rd March 2016

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

Dear Sir,

Sub : Sanction of Student Project - 39th Series: Year 2015-2016
Your Project Proposal Reference No. : **39S_BE_1928**

Ref : Your Project Proposal entitled: **STUDY ON THE CHEMICAL COMPOSITION AND IN-VITRO EVALUATION OF THEIR PHARMACOLOGICAL ACTIVITY**

I am happy to inform that your project proposal referred above, has been approved by the Secretary, KSCST for "Student Project Programme - 39th Series" and has been sanctioned with a budgetary break-up as detailed below:

Student / s	Nethravathi M and others		Budget	Amount (Rs)
			Materials/Consumables	5,000.00
Guide/s	Dr Ananda S		Labor	-
			Travel	
Department	Biotechnology Engineering		Miscellaneous	500.00
			Report	500.00
			TOTAL	6,000.00
Rupees	SIX	ZERO		
	THOUSAND	HUNDRED		

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 (including coverpages, abstract and preliminary pages) and 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 proposal 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
Bangalore-560 057

Date: 20/05/2016

From,
The HOD,
Department of Biotechnology
Sapthagiri College of Engineering
Bangalore-57

To,
The Principal
Sapthagiri College of Engineering
Bangalore-57

Respected Sir,

Subject: **Requisition for the release of project fund sanctioned by KSCST.**

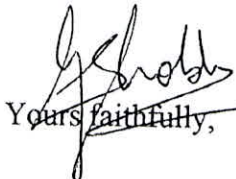
With respect to the above subject, we request you to kindly release the fund in order to complete the objectives of the project accepted by KSCST. We request you to release the fund in the name of the guide mentioned below. Kindly do the needful.


Thanking You,

Guide: Dr. Ananda S / Shobha G

Title: *Laurus nobilis* L. and *Melaleuca quinquenervia* (Cav.) S.T.Blake: Study on the chemical composition and *in-vitro* evaluation of their Pharmacological activity

Amount: Rs 6000/-



Yours faithfully,


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
Chikkasandra, Hesaraghatta Road,
Bangalore-560 057

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500 Regn fee by SCT

6500

Voucher
G H raised
6,500/- 

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BRANCH MANAGER

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Principal

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

20/5/16

UNIVERSITY OF AGRICULTURAL SCIENCES, BANGALORE

Acknowledgement for Receipt of Cash/Draft/Cheque

No 9005

Office of the Dean (Agri)
College of Agriculture,
UAS, GKVK, Bangalore - 560 065

Dated 22.1.16 19

RECEIVED from ① Ms. Nethravathi, ② Ms. Divya K. H. Rs. 12000/-
Rs. 12000/- Sapthagiri

College of Engg. B'lore. Rs. 24000/-
(Rupees DD No. 560747/11.1.14 Rs. 10,000/- Cash for Rs. 14000/- only)

by Cash/Demand Draft/Cheque No. _____ dated _____

on account of Project to be from 22.1.16 to 31.4.16

(3 months)

CASHIER

NOTE: This receipt is issued subject to realisation of D.D./Cheque.

Dr. Vasundhara
Assistant Controller
Agricultural College,
GKVK, Bangalore-560 065.

Sapthagiri College of Engineering
Chikkasandra, Hesarghatta Road,
Bangalore-560 067

Attested copy
M. Mahesh

28/5/16

Payment Voucher

No. : 724

Through : SBI-30263521464

Dated : 2-Jun-2016

Particulars

Account :

Amount

KSCST (Project Work)

6,500.00

On Account of :

Being amount paid towards expenses towards
KSCST (Project Work)

Bank Transaction Details:

Shobha G

Cheque

651742

2-Jun-2016

6,500.00

Amount (in words) :

INR Six Thousand Five Hundred Only

₹ 6,500.00

Receiver's Signature

8/6/16

Authorised Signatory

Checked by:

03/06



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

SAPTHAGIRI COLLEGE OF ENGINEERING
DEPARTMENT OF BIOTECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum, Approved by AICTE, New Delhi)
14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057



A PROJECT REPORT ON

“Laurus nobilis L. and Melaleuca quinquenervia (Cav.)
S.T.Blake: Study on the Chemical Composition and *In-Vitro*
Evaluation of their Pharmacological Activity”

Report of 39S_BE_1928 submitted to Karnataka State Council for Science and Technology –
Student Project Programme – 39series

Submitted by

NETHRAVATHI. M
DIVYA. K. H

1SG12BT016
1SG12BT009

Internal Guide

Dr ANANDA. S
The HOD,
Department of Biotechnology,
Sapthagiri College of Engineering

External Guide

Dr M. VASUNDHARA
Professor,
Medicinal and Aromatic section,
Department of horticulture;
UAS (B), GKVK

Submitted To



Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560057

ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರವಿದ್ಯಾ ಮಂಡಳಿ
Karnataka State Council for Science and Technology
Indian Institute of Science Campus, Bengaluru 560 012
2015- 2016

Abstract

Nethravathi. M and Divya. K. H
Department of Biotechnology, Sapthagiri College of Engineering
Email Id: nethram6kan@gmail.com

Essential oils are the highly concentrated volatile oils which are extracted from flowers, leaves, bark, stem, roots and seeds of aromatic plants. These oils are known to possess antimicrobial, antioxidant, anti-diabetic, anti-helminthic and anti-inflammatory potential. In the present work, two major aromatic trees were considered namely, *Laurus nobilis* L. and *Melaleuca quinquenervia* (Cav.) S.T.Blake. The essential oils extracted through hydro-distillation were assessed for the quality through Physico-Chemical parameters and chemical composition was evaluated through Gas Chromatography-Mass Spectrometry. The extracted essential oils were tested for their Antimicrobial potentiality against pathogenic strain by Disc diffusion method and for their Antioxidant potentiality through various *in-vitro* assays. The results revealed that both *Laurus nobilis* L. and *Melaleuca quinquenervia* (Cav.) S.T.Blake essential oils displayed antimicrobial activity against disease causing microorganism such as *Escherichia coli* and *Staphylococcus aureus*. Also, the results revealed that both the plants essential oils are promising alternatives to the synthetic antioxidants that are in use currently in the food industries.

Keywords: Volatile oil, Antimicrobial, Antioxidant, disc diffusion method.



Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560057
Chikkasandra, Hesaraghatta Road
Sapthagiri College of Engineering
Principal



Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bangalore - 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

Dr. S. G. Sreekanteswara Swamy
Executive Secretary

7th April, 2016

Ref: 7.1.03/SPP/17

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

Dear Sir,

Sub : Sanction of Student Project (Biofuel)-39th Series : Year 2015-2016

Your Project Proposal Reference No. :

39S_B_BE_050

Ref : Your Project Proposal entitled "

SIMAROUBA OIL CAKE: THE SOLID LOW VALUE SUBSTRATE TO
PRODUCE LIPASE WITH POTENTIAL APPLICATION IN
BIODIESEL EXTRACTION AND TO ASSAY THE TOXICITY OF
PHYTOCHEMICAL IN INHIBITION OF LIPASE ACTIVITY

I am happy to inform that your project proposal referred above, has been approved by the Secretary, KSCST for "Student Project Programme (Biofuel) 39th Series" and has been sanctioned with a budgetary break-up as detailed below:

Students	Ms. Vinitha N. and others	Budget		Amount (Rs)
		Materials/Consumables		12,000.00
Guide/s	Prof. Shobha G.	Labor		-
		Travel		500.00
Department	Biotechnology	Analysis		-
		Miscellaneous		-
		Report		500.00
		TOTAL		13,000.00
Rupees	THIRTEEN THOUSAND	ZERO 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 a) **One copy** of the hardbound report b) Softcopy of the full report (including coverpages, abstract & preliminary pages in a CD (.doc and .pdf format) c) A Poster in Flex (2 x 3') for display should be submitted to KSCST.
- The project report shall mention the name of "Karnataka State Biofuel 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 needs to be returned back to KSCST. The fund is to be utilised only to the activities to which it has been released.
- Please quote your project sanction 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 points:
 - Title of the project
 - Name of the College & Department
 - Name of the students & Guide(s)
 - Keywords

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

From,
Shobha G /Saranya D
Assistant Professor
Department of Biotechnology
Sapthagiri College of Engineering
Bangalore-57

Date: 20/06/2016

To,
The Principal
Sapthagiri College of Engineering
Bangalore-57

Respected Sir,

Subject: Requisition for the release of project fund sanctioned by KSCST.

With respect to the above subject, we request you to kindly release the fund towards completion of the objectives of the project accepted by KSCST. We request you to release the fund in the name of the guides mentioned below. The expenditures done during the course of project, bill has been enclosed. Kindly do the needful.

Guide: Shobha G (Rs 13,000)
Saranya D (Rs 9,000)

Thanking You,

AKS

@21/6/16

Shobha

Yours faithfully

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

From,
Shobha G
Assistant Professor
Department of Biotechnology
Sapthagiri College of Engineering
Bangalore-57

Bill No	Product Description	Amount
1	Chemicals	5725
2	Sample analysis	2863
3	DD – Sample analysis Including courier charges	650
4	Sample analysis	1500
5	Report	2040
6	Olive oil	115
7	Miscellaneous (Travel + Simarouba oil Cake)	500
	Total	13393


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



Sakhala Enterprises

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Date: 17.06.2016

Sl.No.	Pro. No.	Product Description	Pack Size	Price Rs.	Qty	Amount
1	SE460090T	Petridish with triple vent Radiation Sterile - 90 x 14	100Nos.	1000	1	1,000
2	SETC287	Tween-20®	100ml	1750	1	1,750
3	SEGRM682	Gum acacia, powder	500gm	750	1	750
4	SEMV157	Tributyrin HiVeg™ Agar Base w/o Tributyrin	100gm	1500	1	1,500
						Sub Total 5,000
						VAT 14.5% 725
						Grand Total R/C 5,725

Rupees.: Five Thousand Seven Hundred and Twenty Five Only .
Grand Total Inclusive all.

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* Subject to Bengaluru Jurisdiction

for SAKHALA ENTERPRISES.



Authorised Signatory

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

R3 dt. 01.09.2015

INVOICE

Format No. BTH/QF/19

**BANGALORE TEST HOUSE**

D-36, 4th Main, KSSIDC Industrial Estate, Rajajinagar,
Bengaluru - 560 044. INDIA

Ph.: 23356415, 23385979, 23502684, 23388895, Fax: 080-23502689
e-mail: bthr@bthindia.com bthindia@hotmail.com
website: www.bthindia.com

Certifications/Approval
ISO:9001-2008
ISO:18001-2007
FSSAI

M/s.: **Shobha.G**
Sapthagiri Engineering College,
Hesarghatta Main Road,
Bangalore

Phone : 9964591024

Invoice No: FC-0102

Date : 26/04/2016

Area Code: General

Ref.No. : RFA Dt:22.04.16

Sl.	Name of sample	Report No.	Batch No.	Amount
1	Seeds	FC/2016/04/0753	Mkd-01	500.00
2	Seeds	FC/2016/04/0802	Mkd-0.1	500.00
3	Seeds	FC/2016/04/0803	Mkd-0.4	500.00
4	Seeds	FC/2016/04/0804	Mkd-0.8	500.00
5	Seeds	FC/2016/04/0805	Mkd-Control	500.00
Total Amount				2500.00
Gross Amount				2500.00
Collection Charges				0.00
Boarding & Lodging Charges				0.00
Transportation Charges				0.00
Service Tax 14.00%				350.00
Swachh Bharat Cess 0.50%				12.50
H.S.E.C. 0.00%				0.00
Rounded Off				0.00

(IN WORDS): Rs. TWO THOUSAND EIGHT HUNDRED SIXTY THREE ONLY

Service Tax NO.: STC/TIC/AAZPC8617L/ST001

- * Service Tax Category : Technical Testing and Analysis
- * The sample is accepted by us subject to our general conditions of services which is available on request
- * The testing has been performed to the best of our ability & total liability of our laboratory is limited to the invoice charges/testing charges only. The test certificate does not relieve the parties from their contractual obligations etc.
- * All disputes are subject to BANGALORE Jurisdiction

Prepared By

Kaipana

For BANGALORE TEST HOUSE

Authorised Signatory

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesarghatta Road
Bangalore - 560 057
PAN-NO: AAZPC861

From,

Shobha G,
Assistant professor,
Dept. of Biotechnology,
Sapthagiri college of Engineering,
Bangalore-560057.

Miscellaneous Expenses Details

Sl No.	Particulars	Amount
1	Paper prints	150/-
2	Stationary	100/-
3	Seed oil cake	250/-
	TOTAL	500/-





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



BANGALORE TEST HOUSE

D-36, 4th Main, KSSIDC Industrial Estate, Rajajinagar, Bangalore - 560 044.

Ph.: 23356415, 23388895, 23502689 Fax : 080-23385979

e-mail : bthr@bthindia.com bthindia@hotmail.com

website : www.bthindia.com

Certifications/Approval

ISO:9001-2008

ISO:18001-2007

FSSAI

Format No. BTH/QF/116

CASH RECEIPT No. 224

Date 5/5/16

Received an amount of Rs. 1500/- (Amount in words) Rs.

One thousand five hundred Only.

PARTY'S NAME	BILL NO.	DATE	AMOUNT Rs.	BILL NO.	DATE	AMOUNT Rs.
Rajeev Rohan. B Bangalore				Advance		1500.-

For BANGALORE TEST HOUSE

Authorised Signatory

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

SNEHA PRINTS
CASH BILL
No. 18892170591

Opp. Sapthagiri Engineering College, Hanumanthe Gowda Main Road
Chikkasandra, Bangalore - 560 057

Date: 20/6/16

M/S: Shobha. G.

No.	SI.	Description	Qty.	Amount
6		Report	3	2000
				400
				2040

For SNEHA PRINTS

3

ಜಮಾ ಬಾಟ / जमापत्री / PAY-IN-SLIP / नकद / अंतरण
CASH / TRANSFER
ಭಾರತೀಯ ಸ್ಟೇಟ್ ಬ್ಯಾಂಕ್ / भारतीय स्टेट बैंक / State Bank of India

ಹೆಸರು / नाम / Name: Shobha. G.
ಶಾಖೆ / शाखा / Branch: Chikkasandra

APPLICATION FOR DRAFT / BANKER'S CHEQUE
ಇದರಲ್ಲಿ ದಾಖಲೆ ಮಾಡಿದ ಅಧಿಕಾರಿ / अधिकृत का नाम / Name: Shobha. G.
ಇದರಲ್ಲಿ ದಾಖಲೆ ಮಾಡಿದ ಅಧಿಕಾರಿ / अधिकृत का पता / Address: Chikkasandra

Amount in words: Hundred and seventy only

ರೂ. / Rs.	ಪೈ. / P.
570	00
570	00

FOR OFFICE USE
Cash Officer / Passing Officer

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

Payment Voucher

No. 965

Dated 23-Jun-2016

Through : SBI-30263521464

Particulars	Amount
Account : KSCST (Project Work)	13,000.00

On Account of :

being amount received from Shoba.G towards
KSCST Project work

Bank Transaction Details:

Shobha.G
Cheque 651734 23-Jun-2016 13,000.00

Amount (in words) :

INR Thirteen Thousand Only

₹ 13,000.00

Receiver's Signature

Authorised Signatory

Checked by



29/7
Checked By

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

SAPTHAGIRI COLLEGE OF ENGINEERING
DEPARTMENT OF BIOTECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum, Approved by AICTE, New Delhi)
 14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057



A PROJECT REPORT ON

**“Simarouba Oil cake: The solid low value substrate to produce lipase
 with potential application in Biodiesel extraction and to assay the
 toxicity of phytochemical in inhibition of lipase activity”**

Report of 39S_BE_050 submitted to Karnataka State Council for Science and
 Technology – Biofuel Project Programme – 39series

This project has been supported by Karnataka State Council for Science and
 Technology, Indian Institute of Science, & Karnataka State Bio energy
 Development Board, Government of Karnataka.

Submitted by

Usha Rani S D (1SG12BT028)
Vinitha N (1SG12BT030)

Under the Supervision of

Mrs Shobha G
 Assistant Professor
 Department of Biotechnology
 Sapthagiri college of Engineering

Submitted To



ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರವಿದ್ಯಾ ಮಂಡಳಿ
Karnataka State Council for Science and Technology
 Indian Institute of Science Campus, Bengaluru 560 012

2015- 2016

SAPTHAGIRI COLLEGE OF ENGINEERING

(Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi)


14/5, Hesaraghatta Main Road BENGALURU-560057

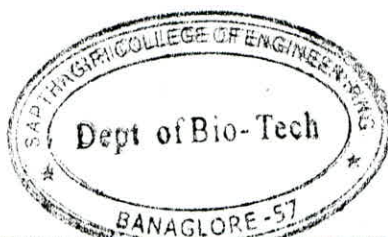


DEPARTMENT OF BIOTECHNOLOGY


CERTIFICATE

This is to certified that the Project Report entitled "Simarouba Oil cake: The solid low value substrate to produce lipase with potential application in Biodiesel extraction and to assay the toxicity of phytochemical in inhibition of lipase activity" has been carried out by Usha Rani S D (1SG12BT028) and Vinitha N (1SG12BT030) under the scheme of The Karnataka State Council For Science And Technology during the academic year 2015-2016 are bonafide students of Eight Semester, Sapthagiri College of Engineering. 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.


Mrs. Shobha G
(Guide)




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


Dr. Aswatha Kumar
(Principal)
Dr. Aswatha Kumar. M
Principal
Sapthagiri College of Engineering
No. 14/5, Chikkasandra,
Hesaraghatta Main Road,
Bangalore-560 057

DECLARATION

This is to certify that Project report entitled "Simarouba Oil cake: The solid low value substrate to produce lipase with potential application in Biodiesel extraction and to assay the toxicity of phytochemical in inhibition of lipase activity" which is submitted by us to The Karnataka State Council For Science And Technology is a record of original research work carried out by me during academic year 2015-2016 under the supervision and guidance of Mrs Shobha G, Department of Biotechnology, Sapthagiri College of Engineering, Bangalore, Karnataka.



Name: Usha Rani S D

USN: 1SG12BT028



Name: Vinitha N

USN: 1SG12BT030

Date: 7/7/16

Place: Bangalore



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

ACKNOWLEDGEMENT

We are grateful to The Karnataka State Council for Science and Technology, Bangalore, Karnataka for considering and accepting our project proposal and giving us a chance to begin our research journey, thereby for all financial assistances. Without this, it would have been impossible to carry out the project.

*We take this opportunity to thank our Project Guide **Mrs. Shobha G** for her immense support and guidance.*

*We express our most sincere salutation to **Sapthagiri College of Engineering, Department of Biotechnology**, which gave us opportunity to have a sound base of engineering knowledge hereby helping us to fulfill our cherished desire of becoming Biotechnology Engineers.*

*We wish to express our sincere thanks to our Principal **Dr. Aswatha Kumar M**, and Director **Dr.N.Srinivasan**, Chairman **Sri Dayanand G** and Executive director **Sri Manoj G.D**, Sapthagiri College of engineering, Bangalore for providing us with excellent facilities in the college.*

*We are thankful to **Dr. Ananda S**, Head of the Department of Biotechnology. We would like to extend our deepest gratitude to all of the **Department faculty members** for their insightful comments and encouragement, non-teaching staff, one and all, who directly or indirectly, have let their hand in this venture.*

Usha Rani S D

Vinitha N


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



Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bangalore - 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

Dr. S. G. Sreekanteswara Swamy
Executive Secretary

7th April, 2016

Ref: 7.1.03/SPP/17

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

Dear Sir,

Sub : Sanction of Student Project (Biofuel)-39th Series : Year 2015-2016

Your Project Proposal Reference No. : **39S_B_BE_088**

Ref : Your Project Proposal entitled " **DUAL BIOFUEL PRODUCTION FROM MICROALGAE**

I am happy to inform that your project proposal referred above, has been approved by the Secretary, KSCST for "Student Project Programme (Biofuel) 39th Series" and has been sanctioned with a budgetary break-up as detailed below:

Students	Ms. Meghana Rao and others	Budget	Amount (Rs)
		Materials/Consumables	8,000.00
Guide/s	Mr. Prashanth Kumar H.P., Dr. Rohith K.C., Ms. Saranya D.	Labor	-
		Travel	-
Department	Biotechnology	Analysis	-
		Miscellaneous	500.00
		Report	500.00
		TOTAL	9,000.00
Rupees	NINE THOUSAND	ZERO 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 **a) One copy** of the hardbound report b) Softcopy of the full report (including coverpages, abstract & preliminary pages in a CD (.doc and .pdf format) **c) A Poster in Flex (2 x 3')** for display should be submitted to KSCST.
- The project report shall mention the name of "**Karnataka State Biofuel 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 needs to be returned back to KSCST. The fund is to be utilised only to the activities to which it has been released.
- Please quote your **project sanction 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 points:
 - Title of the project
 - Name of the College & Department
 - Name of the students & Guide(s)
 - Keywords

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

From,
Shobha G /Saranya D
Assistant Professor
Department of Biotechnology
Sapthagiri College of Engineering
Bangalore-57

Date: 20/06/2016

To,
The Principal
Sapthagiri College of Engineering
Bangalore-57

Respected Sir,

Subject: Requisition for the release of project fund sanctioned by KSCST.

With respect to the above subject, we request you to kindly release the fund towards completion of the objectives of the project accepted by KSCST. We request you to release the fund in the name of the guides mentioned below. The expenditures done during the course of project, bill has been enclosed. Kindly do the needful.

Guide: Shobha G (Rs 13,000)
Saranya D (Rs 9,000)

Thanking You,

ALG

@21/6/16

Shobha

Yours faithfully

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

Date: 20/06/2016

From,
Saranya D
Assistant Professor
Department of Biotechnology
Sapthagiri College of Engineering
Bangalore-57

Bill No	Product Description	Amount
1	Chemicals	3917
2	Microalgae	573
3	DD – Sample analysis Including courier charges	650
4	Methanol	1240
5	Report	2040
6	Miscellaneous	500
7	Travel	500
	Total	9420


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

TAX INVOICE

Original - Buyer's Copy



SAKHALA ENTERPRISES

966, "SHREEYAA",
II PHASE, V STAGE,
BEML LAYOUT,
RAJARAJESHWARI NAGAR,
BENGALURU-560 098.
M: 9845156415/9845717528
E-Mail :sakhala13@gmail.com

Invoice No.

SE/1617/068

Dated

1-Jun-2016

Buyer's Order No.

Dated

e-Mail

16-May-2016

Buyer

Sapthagiri College of Engineering

Prof. Sharnya

#14/5, Chikkasandara

Hesarghatta Main Road

Bangalore - 560057

Description of Goods	Quantity	Rate	per	Amount
SE39231SD (Methy-4-HydroxyBenzoate(Paraben) 500gm)	1 No.	951.00	No.	951.00
SEATB250 (Isochrysis galbana microalgae)	1 No.	750.00	No.	750.00
SE54023SD (CYANOCOBALAMIN (vitamin B12) - 250mg)	1 No.	450.00	No.	450.00
SE22645FS (Cobaltous - 500gm)	1 No.	550.00	No.	550.00
SE25165FS (Magnesium Chloride - 500gm)	1 No.	314.00	No.	314.00
SE36186FS (Sodium Silicate - 500gm)	1 No.	406.00	No.	406.00
				3,421.00
		14.50	%	496.05
				(-0.05)
Total	6 No.			₹ 3,917.00

Less :

Out Put VAT - 14.5%
Round Off

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

Amount Chargeable (In words)

INR Three Thousand Nine Hundred Seventeen Only

E. & O.E

Company's VAT TIN : 29171119444
Company's CST No. : 29171119444-C
Company's Service Tax No. : ACGFS9635MSD001
Company's PAN : ACGFS9635M

Company's Bank Details

Bank Name : State Bank of India

A/c No. : 34422344190

Branch & IFS Code : Channasandra Branch, Bangalore & SBIN0017780

Declaration

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

for SAKHALA ENTERPRISES

Authorised Signatory

SUBJECT TO BANGALORE JURISDICTION

This is a Computer Generated Invoice





Sakhala Enterprises

#966, "Shreeyaa" II Phase, V Stage, BEML layout, R.R. Nagar, Bengaluru-560098
Email: sakhala13@gmail.com M: 09845156415 / 09845717528

ONE TO ONE SOLUTION

Supplier & Channel Partner of Laboratory Consumables, Instruments, Research Services & Stationery Items.

VAT TIN.: 29171119444, PAN No.: ACGFS9635M

"WE SERVE THE QUALITY"

INVOICE

Original Buyer's Copy

To
Prof. Sharanya
Sapthagiri College of Engineering
#14/5, Chikkasandra
Hesaraghatta Nain Road
Bangalore - 560057

No. : SE/1617/090
Date: 17.06.2016

Sl.No.	Pro. No.	Product Description	Pack Size	Price Rs.	Qty	Amount
1	SETB125	Isochrysis galbana microalgae	1No.	500	1	500
						Sub Total 500
						VAT 14.5% 73
						Grand Total R/O 573

Rupees.: Five Hundred and Seventy Three Only .
Grand Total Inclusive all.

Our Bank Details:

Account Name: SAKHALA ENTERPRISES

Account No.: 34422344190

IFSC Code: SBIN0017780

Bank Name: State Bank of India

Bank Address: Channasandra, Rajarajeshwari Nagar, Bengaluru - 560098

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

Payment: Please make your DD/Cheque in the Name of "SAKHALA ENTERPRISES" Payable at Bengaluru.

* Subject to Bengaluru Jurisdiction

for SAKHALA ENTERPRISES.



Authorised Signatory

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

BLR/MVM 01		DATE 17.6.16		CONSIGNEE'S DETAILS		DESTN.:		DX ND		NO. OF PIECES: 1	
MESSERS: Saguna Dpt. ADDRESS: Bar. L. Choley Ch. H. Banarjee		MESSERS: Vellore ADDRESS: for early delivery Sophisticated Instrument for early VIT University Vellore		WEIGHT Kg. Gms.		CHARGES Rs. 50/- Service Tax Rs.		TOTAL Rs. 50/- CASH		This is a non-negotiable consignment note and is subject to standard conditions of carriage. Carrier's liability is limited to Rs. 100/- per consignment for any cause.	
DEPT: Beng. Hvy. Tel No. [] [] [] [] [] [] [] [] [] []		DESCRIPTION OF CONTENTS:		DECLARED VALUE: Rs.		PIN CODE [] [] [] [] [] []		ATTN OF:		No claims/complaints will be accepted after 30 days of booking. Kindly provide full address and telephone numbers of the addressee for early delivery. Landmarks mentioned in the address will help us for early delivery. Track your consignment at www.tpcindia.com	
We certify that this consignment does not contain personal mail of any kind contrabands (Gst, Jewellery, mobile phones etc.,)		ENDERS NAME:		SIGN:		Received by TPC/BLR		TIME: 10		a.m. / p.m.	



BLR625068706



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ROAD, OPP. KALIKAMBA TEMPLE, THIMMAIAH GARDEN, R.I.NAGAR POST, BANGALORE - 560 032.
 23542994, 64509305 Mobile No: 98443 06730. Track at: www.tpcindia.com

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

From,

Saranya D,
Assistant professor,
Dept. of Biotechnology,
Sapthagiri college of Engineering,
Bangalore-560057.

Miscellaneous Expenses Details

Sl No.	Particulars	Amount
1	Paper prints	150/-
2	Stationary	100/-
3	Petrol charge	170/-
4	Courier charges	100/-
	TOTAL	520/-


4/7/16
Z


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

TIN No.:29070469890 CASH BILL Phone : 23345

ಶ್ರೀ ರಂಗನಾಥ ಸ್ಟೋರ್ಸ್

Sri Ranganatha Stores

396/1, Oolga Complex, After 8th Cross, Sampige Road,
Malleshwaram, BANGALORE - 560 003.

No. 2298

Name : Sharanaya D

Date : 11-4

SI No.	PARTICULARS	AMOUNT
	Menthol 18	1240
		1240



SPS

CASH BILL

Mobile : 88921308

SNEHA PRINTS

Opp. Sathagiri Engineering College, Hanumanthe Gowda Main Road,
Chikkasandra, Bangalore - 560 057.

No.

Date : 25/3/20

M/s.

Sharanaya D

SI No.	Description	Qty.	Amount
	Reprt	6	2040
		3	46
			2040

For SNEHA PRINTS

Principal

Sathagiri College of Engineering
Chikkasandra, Hesarghatta Road,
Bangalore-560 057

Payment Voucher

No : 966

Dated : 23-Jun-2016

Through : SBI- 30263521464

Particulars	Amount
Account : KSCST(Project Work)	9,000.00

On Account of :

being expenses incurred towards from Saranya D
Bank Transaction Details:

Saranya.D
Cheque 651750 23-Jun-2016 9,000.00

Amount (in words) :

INR Nine Thousand Only

₹ 9,000.00

[Signature]
Receiver's Signature
26/7/16

Authorised Signatory

Checked by:

[Signature]
29/7

[Signature]
29/7



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

SAPTHAGIRI COLLEGE OF ENGINEERING
DEPARTMENT OF BIOTECHNOLOGY

(Affiliated to Visvesvaraya Technological University, Belgaum, Approved by AICTE, New Delhi)
14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057



A PROJECT REPORT ON

“DUAL BIOFUEL PRODUCTION FROM MICROALGAE”

Report of 39S_B_BE_088 submitted to Karnataka State Council for Science and Technology – Biofuel Project Programme – 39series

This project has been supported by Karnataka State Council for Science and Technology, Indian Institute of Science, & Karnataka State Bio energy Development Board, Government of Karnataka.

Submitted by

MEGHANA RAO (1SG12BT012)
GAUTHAMI RAVI (1SG12BT019)

Under the Supervision of

Mr. PRASHANTH KUMAR H P

Ms. SARANYA D

Dr. ROHITH K.C

Department of Biotechnology
Sapthagiri college of Engineering.

Submitted To



ಕರ್ನಾಟಕ ರಾಜ್ಯ ವಿಜ್ಞಾನ ಮತ್ತು ತಂತ್ರವಿದ್ಯಾ ಮಂಡಳಿ
Karnataka State Council for Science and Technology
Indian Institute of Science Campus, Bengaluru 560 012

2015- 2016

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

SAPTHAGIRI COLLEGE OF ENGINEERING

(Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi)

14/5, Hesaraghatta Main Road BENGALURU-560057



DEPARTMENT OF BIOTECHNOLOGY

CERTIFICATE

This is to certified that the Project Report entitled **"DUAL BIOFUEL PRODUCTION FROM MICROALGAE"** has been carried out by **Meghana Rao (1SG12BT012)** and **Gauthami Ravi (1SG12BT019)** under the scheme of The Karnataka State Council For Science And Technology during the academic year 2015-2016 are bonafide students of Eight Semester, Sapthagiri College of Engineering. 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.

Mr. Prashanth Kumar H P

Ms. Saranya D

Dr. Rohith K.C

(Guides)

Dr. Aswatha Kumar


(Principal)

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

ABSTRACT

Petroleum usage and petroleum sourced fuels is considered as unsustainable because of the enormous contribution of petroleum for the accumulation of carbon dioxide in the environment. Release of carbon dioxide to the environment is a problem which will have a very bad effect on the environment and human population. An alternative for the usage of petroleum is a trend in today's world. Various methodologies and innovative solutions have been developed and are in development for the alternative source of petroleum. This current work deals with the production of biodiesel from a commonly grown microalgae namely *Isochrysis galbana*. This microalga was used as food for fish and now can be applied for the production of fuels. The principles of gas chromatography are used for the separation of compounds having fuel potential for the production of fuels.

Keywords: petroleum usage; fish food; *Isochrysis galbana*; gas chromatography



Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560057



Karnataka State Council for Science and Technology

Indian Institute of Science Campus, Bangalore - 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

Dr. S. G. Sreekanth Swamy
Executive Secretary

23rd March 2016

Ref: 7.1.03/SPP/ 1148

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

Dear Sir,

Sub: Sanction of Student Project - 39th Series: Year 2015-2016
Your Project Proposal Reference No.: 39S_BE_1924

Ref: Your Project Proposal entitled: **AGGREGATE CRYPTOSYSTEM FOR SCALABLE DATA SHARING IN CLOUD STORAGE**

I am happy to inform that your project proposal referred above, has been approved by the Secretary, KSCST for "Student Project Programme - 39th Series" and has been sanctioned with a budgetary break-up as detailed below:

Student / s	Ms Roopashree A and others	Budget	Amount (Rs)
Guide/s	Prof. Prerana Chaitra	Materials/Consumables	2,000.00
		Labor	-
		Travel	-
Department	Information Science And Engineering	Miscellaneous	500.00
		Report	500.00
		TOTAL	3,000.00
Rupees	THREE THOUSAND ZERO HUNDRED		

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 (including coverpages, abstract and preliminary pages) and 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 proposal 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
Department of Information Science & E.
Sapthagiri College of Engineering
14/5, Chickasandra, Hesaraghatta Main Road,
BANGALORE - 560 057.

VISVESVARAYA TECHNOLOGICAL UNIVERSITY
BELAGAVI, KARNATAKA, INDIA



A PROJECT REPORT

ON

**AGGREGATE CRYPTOSYSTEM FOR
SCALABLE DATA SHARING IN CLOUD
STORAGE**

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

*Bachelor of Engineering
in
Information Science & Engineering*

Submitted by

ROOPASHREE A.	(1SG12IS042)
SUMITHRA T.	(1SG12IS055)
SUNAINA B.G.	(1SG12IS056)
THEJASHREE M.S.	(1SG12IS057)

Under the guidance of

Prof. PRERANA CHAITHRA
Head of the Department,
Dept. of I.S.E., S.C.E.



DEPARTMENT OF INFORMATION SCIENCE & ENGINEERING
SAPTHAGIRI COLLEGE OF ENGINEERING

Bengaluru-57

2015-16

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bangalore-560 067

SAPTHAGIRI COLLEGE OF ENGINEERING

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

[AFFILIATED TO VISVESWARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI]



Department of Information Science & Engineering

CERTIFICATE

Certified that the project work entitled AGGREGATE CRYPTOSYSTEM FOR SCALABLE DATA SHARING IN CLOUD STORAGE carried out by Ms. ROOPASHREE A. (1SG12IS042), Ms. SUMITHRA T. (1SG12IS055), Ms. SUNAINA B.G. (1SG12IS056) and Ms. THEJASHREE M.S. (1SG12IS057) bonafide students of 8th semester, department of Information Science & Engineering carried out at our college Sapthagiri College of Engineering, Bengaluru in partial fulfillment of the award of Bachelor of Engineering in Information Science & Engineering of the Visvesvaraya Technological University, Belagavi during the year 2015-16. 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.

Rec
22/8/16

Signature of the Guide
Prof. Prerana Chaithra
HOD, I.S.E., S.C.E

Rec
21/8/16

Signature of the HOD
Prof. Prerana Chaithra
HOD, I.S.E., S.C.E

Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bengaluru-560057

Dr. Aswatha Kumar. M
Principal
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road,
Bengaluru-560057

External Viva

Name of the Examiners

1. *Prof. Prerana Chaithra*
2. *Dr. Aswatha Kumar*

Signature of the Examiners with date

1. *Rec*
2. *Dr. Aswatha Kumar*

Pan No. : ACLPB8371Q

Date : 20.02.16

KITHA ENTERPRISES

Bill No. 591

ers Binders and Library Stationary Suppliers)
 - 12, A.G.B Layout, Chikkabanavara Post,
 ear Janapriya Apartment),
 ingalore - 90. Ph. 65962990,
 ob : 9243096071, 9916851985

To. Roopa Shree - A
Sapthagiri College of Engineering
Bangalore - 86

Ref. Order No.

Delivery Challan No.

No.	PARTICULARS	Qty.	RATE	AMOUNT	
				Rs.	Ps.
1.	Materials - colour print out and - book binding	2	2400 600	2400-00 600-00	
				3000-00	

For KITHA ENTERPRISES

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

Scanned by CamScanner

Date: 22/08/16

To,

The principal,

Sapthagiri College of Engineering,

Bengaluru.

Respected Sir,

Subject: Permission to issue the KSCST's granted amount. (Ref. No: 395-BE-1924).

KSCST had selected and granted funds for our project named Aggregate Cryptosystem for Scalable Data sharing in Cloud storage. The team consists of Roopashree A, Sumithra T, Thejashree M.S. and Sumaina B.L. under the guidance of Prof. Prerana Chaitra. KSCST had funded us with Rs 3,000/- . We request you to Permit for the issue of granted amount and oblige.

Thanking You.

Please do the needful

Department of
Information Science &
Sapthagiri College of Engineering
145, Chikkasandra, Hesaraghatta Road,
BANGALORE - 560 057

ALCS (KSCST Project)

22/8/16

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

Yours faithfully,

Thejashree M.S.

Ph. No.

→ 8105773462
→ 9620814078

Scanned by CamScanner



GOVERNMENT OF KARNATAKA

Vision Group on Science and Technology

Department of Information Technology, Biotechnology and Science & Technology
Karnataka Government Secretariat, 7th Floor, 4th Stage, M. S. Building, Dr. Ambedkar Veedhi, Bangalore-560 001
Phone: 080-2203 2013, E-mail: visiongroup.st@gmail.com Website: www.vgst.in

Dr. S. Ananth Raj
Consultant

No. VGST/TRIP/2015-16/

Date: 05.03.2016

VGST - GRANT SANCTION LETTER

To,
The Principal,
Sapthagiri College of Engineering,
Bangalore

Dear Sir/Madam,

Greetings from Vision Group on Science and Technology (VGST)

Sub: Sanction letter of VGST, DST, Gok for the release of TRIP
Support grant (FY: 2015-16).

- The Vision Group on Science and Technology (VGST) was constituted in October 2008 under the chairmanship of distinguished Scientist Bharat Ratna Prof. C.N.R. Rao, FRS., Chairman, National Research Professor and Honorary President and Linus Pauling Research Professor. The VGST is functioning under the aegis of Department of Information Technology, Biotechnology and Science and Technology (Dept. IT, BT and S&T), Government of Karnataka (GoK). The main objective of VGST is to promote Science Education and Research activities among students, teachers and researchers of Karnataka State.

In this context, Technology Related Innovative Projects (TRIP) was introduced as one of the flagship programmes of VGST in the FY 2010-11. The objective of TRIP programme is to identify & explore the innovative abilities of students to encourage research work on frontier areas of Science & Technology.

- I am here with enclosing a crossed cheque for Rs. 40,000=00 (Forty Thousand only) vide cheque No. 351748 dated 5/3/16 to the TRIP project. Kindly acknowledge the receipt of this grant. The acknowledgement letter is enclosed.

Sl. No.	Name of the College & Place	Name of the Student	Project Title
1	Sapthagiri College of Engineering, Bangalore	1) Soundaryasri .S 2) Spoorthy . N	Ayurvedic Medicinal Kit

Ref: CRT/01/2016-17

Date: 31st August 2016**UTILISATION CERTIFICATE**

Program Name: VGST_TRIP

Project Title: Ayurvedic Medical Kit

Sl. No.	Details	Amount in ₹
1	Previous year Balance (Opening balance (OB), if any)	0
2	Grants Received	40,000
3	Bank Interest (If any)	0
4	Total Available Grants (1+2+3)	40,000
5	Actual Grants Utilised (Statement of Expenditure Enclosed)	42,080
6	Unspent Balance (4-5)	0

Certified that ₹ 40,000/- of grant-in-aid under VGST_TRIP (Program Name) was released by Karnataka Science and Technology Promotion Society (KSTePS) in favour of **The Principal, Sapthagiri College of Engineering, Bengaluru - 560 057** vide letter as stated above during the year 2015-16. The above grant was sanctioned towards Project Title "Ayurvedic Medical Kit". Out of the sanctioned grants, a sum of ₹ 40,000/- has been utilised for the purpose of which it was sanctioned and ₹ 0/- remained unutilised at the end of the financial year 2015-16, to be carried forward (if the program is continued) or to be refunded (if the program is completed) whichever the case is applicable. Expenditure incurred for the purpose for which the grant was sanctioned is verified with the vouchers/bills produced before me.

Certified that I have satisfied myself that the conditions on which the grant-in-aid was sanctioned have been fulfilled and that I have exercised the following checks to see that the money was actually utilised for the purpose for which it was sanctioned.

For Venkat Narayan & Associates
Chartered Accountants
Registration No. 139754W
Venkat Narayan, ACA
Proprietor
Membership No. 153482

Bengaluru, 31st August 2016

Signature and Address of the Project Coordinator

Signature of the Head of Institution and Seal

Dr. Aswatha Kumar, M
Principal
Sapthagiri College of Engineering
No. 14/5, Chikkasandra,
Hesaraghatta Main Road,
Bangalore-560 057

1. Sanyas R [Dept of BT,
Sapthagiri College of Eng.
2. PRASHANTH KUMAR, H.P [D.
SCE, B'lore-57.

Statement of Expenditure for the Project Title "Ayurvedic Medical Kit"

Sl. No.	Particulars	Amount in ₹
1	Total Grants Received (Including Opening balance and Bank interest)	40,000
Expenditure Break Up (Item wise as approved and sanctioned)		
A	Equipments	12,080
B	Fabrication	4,870
C	Chemicals	4,685
D	Glasswares	10,161
E	Others (Publication + Print outs + Travel + Stationery)	10,284
2	Total Expenditure (A+B+C+D)	42,080
3	Unspent balance (1-2)	0

Kinds of checks exercised:

1. Verification of supporting bills

CERTIFICATE

Certified that we have verified the disbursement of ₹ 42,080/- (Rupees Forty Two Thousand and Eighty Only) towards VGST-TRIP as mentioned above.

We have exercised the verification of vouchers and supporting documents to see that the money was actually utilized for the purpose for which it was sanctioned.

For Venkat Narayan & Associates
Chartered Accountants

Firm Registration No. 139754W



Venkat Narayan, ACA
Proprietor

Membership No. 153482

Bengaluru, 31st August 2016

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

Signature and Address of the Project Coordinator

1. Saranya D [Dept of BT, Sapthagiri College of Eng, B'lore]
2. PRASHANTH KUMAR. H.P [Dept of BT, SCE, B'lore - 57]


Signature of the Head of Institution and Seal

Dr. Aswath Kumar, M
Principal
Sapthagiri College of Engineering
No. 14/5, Chikkasandra,
Hesaraghatta Main Road,
Bangalore-560 057



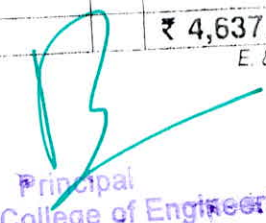
TAX INVOICE

Extra Copy

 SAKHALA ENTERPRISES # 966, "SHREEYAA", II PHASE, V STAGE, BEML LAYOUT, RAJARAJESHWARI NAGAR, BENGALURU-560 098. M: 9845156415/9845717528 E-Mail :sakhala13@gmail.com	Invoice No.	Dated	
	SE/1617/069	2-Jun-2016	
Buyer Sapthagiri College of Engineering Prof. Sharnya #14/5, Chikkasandara Hesarghatta Main Road Bangalore - 560057	Buyer's Order No.	Dated	
	Verbal	1-Jun-2016	

Description of Goods	Quantity	Rate	per	Amount
SESS125 (Soxhlet Extraction Apparatus with Heating Mantal125)	1 U	4,500.00	U	4,500.00
Less : DISCOUNT				(-)450.00
Out Put VAT - 14.5%		14.50 %		587.25
Less : Round Off				(-)0.25
Total	1 U			₹ 4,637.00


Amount Chargeable (in words)
INR Four Thousand Six Hundred Thirty Seven Only


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

Company's VAT TIN : 29171119444 Company's CST No. : 29171119444-C Company's Service Tax No. : ACGFS9635MSD001 Company's PAN : ACGFS9635M	Company's Bank Details Bank Name : State Bank of India A/c No. : 34422344190 Branch & IFS Code : Channasandra Branch, Bangalore & SBIN0017780 for SAKHALA ENTERPRISES
---	---

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

SUBJECT TO BANGALORE JURISDICTION
 This is a Computer Generated Invoice


 Authorised Signatory



Sakhala Enterprises

#966, "Shreeyaa" II Phase, V Stage, BEML layout, R.R. Nagar, Bengaluru-560098
Email: sakhala13@gmail.com M: 09845156415 / 09845717528

Supplier & Channel Partner of Laboratory Consumables, Instruments, Research Services & Stationery Items.
VAT TIN.: 29171119444, PAN No.: ACGFS9635M

INVOICE

Original Buyer's Copy

To
Prof. Sharanya
Sapthagiri College of Engineering
#14/5, Chikkasandra
Hesaraghatta Nain Road
Bangalore - 560057

No. : SE/1617/160A
Date: 30.07.2016

Sl.No.	Pro. No.	Product Description	Pack Size	Price Rs.	Qty	Amount
1	SEMP05	Micropipette - 0.5 - 10ul	1Unit	3,250	1	3,250
2	SEMP200	Micropipette - 20 - 200ul	1Unit	3,250	1	3,250


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

		6,500
	Sub Total	6,500
	VAT. 14.5%	943
	Grand Total R/O	7,443

Rupees Seven Thousand Four Hundred and Forty Three Only

Our Bank Details:

Account Name: SAKHALA ENTERPRISES
Account No.: 34422344190
IFSC Code: SBIN0017780
Bank Name: State Bank of India

Bank Address: Channasandra, Rajarajeshwari Nagar, Bengaluru - 560098


*Order once placed will not be cancelled or materials once sold will not

Payment: Please make your DD/Cheque in the Name of "SAKHALA ENTERPRISES" Payable at Bengaluru.

* Subject to Bengaluru Jurisdiction

for SAKHALA ENTERPRISES.




Authorised Signatory

B

PRABHAKARA GIFT PALACE

No.154 - 158,
Sampige Road, 9th Cross,
Mallashwara, Bangalore - 3
Ph. 23444328 41552011

Tax Invoice

TIN : 29140014388

Bill No. 89347

Date : 02/04/2016 Time: 12:28:57 PM

SNo	Item Name	Qty	MRP	WS Rate	Amt
1	MISCELLANEOUS F	1.00	75.00	75.00	75.00

69.50 Vat @ 14.5% 9.50
Total : 79.00

You Have Saved: 0.00

Cash
75.00

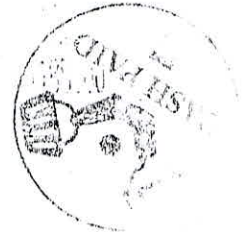
Goods Once Sold Cannot be exchanged or refunded.
Please check the items before you leave
!!! THANK YOU VISIT AGAIN !!!

Prabha
SUPERMARKET

Grand Total

4795.00

PAID RS.



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



Sakhala Enterprises

#966, "Shreeyaa" II Phase, V Stage, BEML layout, R.R. Nagar, Bengaluru-560098
Email: sakhala13@gmail.com M: 09845156415 / 09845717528

Supplier & Channel Partner of Laboratory Consumables, Instruments, Research Services & Stationery Items.
VAT TIN.: 29171119444, PAN No.: ACGFS9635M

WE SERVE THE QUALITY

INVOICE

Original Buyer's Copy

To
Prof. Sharanya
Sapthagiri College of Engineering
#14/5, Chikkasandra
Hesaraghatta Nain Road
Bangalore - 560057

No. : SE/1617/161A
Date: 30.07.2016

Sl.No.	Pro. No.	Product Description	Pack Size	Price Rs.	Qty	Amount
1	Q25265	Manganous Chloride ER	500gm	639	1	639


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

639

Sub Total 639

VAT. 14.5% 93

Grand Total R/O 732

Rupees Seven Hundred and Thirty Two Only.

Our Bank Details:

Account Name: SAKHALA ENTERPRISES

Account No.: 34422344190

IFSC Code: SBIN0017780

Bank Name: State Bank of India

Bank Address: Channasandra, Rajarajeshwari Nagar, Bengaluru - 560098


*Order once placed will not be cancelled or materials once sold will

Payment: Please make your DD/Cheque in the Name of "SAKHALA ENTERPRISES" Payable at Bengaluru.

* Subject to Bengaluru Jurisdiction

for SAKHALA ENTERPRISES.




Authorised Signatory



Sakhala Enterprises

#966, "Shreeyaa" II Phase, V Stage, BEML layout, R.R. Nagar, Bengaluru-560098
Email: sakhala13@gmail.com M: 09845156415 / 09845717528


Supplier & Channel Partner of Laboratory Consumables, Instruments, Research Services & Stationery Items.
VAT TIN.: 29171119444, PAN No.: ACGFS9635M

INVOICE

Original Buyer's Copy

To
Prof. Sharanya
Sapthagiri College of Engineering
#14/5, Chikkasandra
Hesaraghatta Nain Road
Bangalore - 560057

No. : SE/1617/161A
Date: 30.07.2016

Sl.No.	Pro. No.	Product Description	Pack Size	Price Rs.	Qty	Amount
1	Q25265	Manganous Chloride ER	500gm	639	1	639
 Principal Sapthagiri College of Engineering Chikkasandra, Hesaraghatta Road, Bangalore-560 057						639
						Sub Total 639
						VAT. 14.5% 93
						Grand Total R/O 732

Rupees Seven Hundred and Thirty Two Only.

Our Bank Details:

Account Name: SAKHALA ENTERPRISES
Account No.: 34422344190
IFSC Code: SBIN0017780
Bank Name: State Bank of India

Bank Address: Channasandra, Rajarajeshwari Nagar, Bengaluru - 560098

*Order once placed will not be cancelled or materials once sold will

Payment: Please make your DD/Cheque in the Name of "SAKHALA ENTERPRISES" Payable at Bengaluru.

* Subject to Bengaluru Jurisdiction

for SAKHALA ENTERPRISES.



Authorised Signatory



Sakhala Enterprises

#966, "Shreeyaa" II Phase, V Stage, BEML layout, R.R. Nagar, Bengaluru-560098
Email: sakhala13@gmail.com M: 09845156415 / 09845717528

Supplier & Channel Partner of Laboratory Consumables, Instruments, Research Services & Stationery Items.
VAT TIN.: 29171119444, PAN No.: ACGFS9635M

INVOICE

Original Buyer's Copy

To
Prof. Sharanya
Sapthagiri College of Engineering
#14/5, Chikkasandra
Hesaraghatta Nain Road
Bangalore - 560057

No. : SE/1617/161A
Date: 30.07.2016

Sl.No.	Pro. No.	Product Description	Pack Size	Price Rs.	Qty	Amount
1	Q25265	Manganous Chloride ER	500gm	639	1	639
						639
						Sub Total 639
						VAT. 14.5% 93
						Grand Total R/O 732

Rupees Seven Hundred and Thirty Two Only.

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

Our Bank Details:

Account Name: SAKHALA ENTERPRISES
Account No.: 34422344190
IFSC Code: SBIN0017780
Bank Name: State Bank of India
Bank Address: Channasandra, Rajarajeshwari Nagar, Bengaluru - 560098

*Order once placed will not be cancelled or materials once sold will

Payment: Please make your DD/Cheque in the Name of "SAKHALA ENTERPRISES" Payable at Bengaluru.

* Subject to Bengaluru Jurisdiction

for SAKHALA ENTERPRISES.



[Signature]
Authorised Signatory

CASH BILL

Phone : 23446886

Indian Drugs & Provision Stores

Dealers in : Provision, Herbs & Ayurvedic Medicines
395, Sampige Road, Malleswaram, Bangalore-3

No. 230

Date 23/4/2016

M/s.

Sl. No.	PARTICULARS	Qty.	Rate	AMOUNT Rs. Ps.
1/	Kanta Kani Sg			700 00
TOTAL				700 00

E.&O.E.

TIN : 29240027622

Goods once sold will not be taken
back or exchanged

For Indian Drugs & Provision Stores

Indian Drugs & Provision Stores

Dealers in : Provision, Herbs & Ayurvedic Medicines
395, Sampige Road, Malleswaram, Bangalore-3

No. 229

Date 23/4/2016

M/s.

Sl. No.	PARTICULARS	Qty.	Rate	AMOUNT Rs. Ps.
1/	Mint Sg			300 00
2/	Pg Sg			200 00
3/	SALP			750 00
TOTAL				1250 00

E.&O.E.

TIN : 29240027622

Goods once sold will not be taken
back or exchanged

For Indian Drugs & Provision Stores

TIN No.: 29070469890 CASH BILL Phone : 23345171
ಶ್ರೀ ರಂಗನಾಥ ಸ್ಟೋರ್ಸ್

Sri Ranganatha Stores

396/1, Ooliga Complex, After 8th Cross, Sampige Road,
Malleshwaram, BANGALORE - 560 003.

No. 766

Date : 4-7-16.

Name	PARTICULARS	AMOUNT
SI No.		
	chakke pothu 3p	270 00
	Badamai 1 3R	780 00
	Olina 1 3R	153 00
	Kantaka Hani Sg	600 00
TOTAL		1803 00

Principal

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

No. CASH BILL Ph: 9945666518

GANESH DIGITALS
#40/6, GBR COMPLEX, MSR ROAD,
MATHIKERE Extn, BENGALURU - 560054.

Date: 26/07

Sri Sharanaya

PARTICULARS	AMOUNT	
	Rs.	Ps.
B/W Print outs	1450	1
Digital Colour Prints	900	1
Colour Xerox		
Digital Xerox		
Binding	2250	1
canning, Lamination etc	500	1
Others		
Total	5100	1
Advance		
Amount	5100	00

Payment Receiver by Sh Thanking you
Manager

Cash Bill Mob : 97368733937

KODAK EXPRESS
DIGITAL COLOUR LAB & STUDIO
Opp. N.R.R. Hospital, Near Janapriya Apartment,
Hesaraghatta Main Road, Bangalore- 560090

No. 1204 Date: 31/7/16

M/s.....

Qty.	PARTICULARS	Amount	
		Rs.	Ps.
	Print out 42x2		
	Total	84	
	Advance	84	
	Balance		

For Kodak Express
Digital Lab & Studio

Delivery Date.....
Collect your Photo within 10 days

Signature

Ph: 25999053 CASH BILL

TRIVENI
PETRO OUTLET

1, Grape Garden,
Ayyappa Temple Road,
Peenya Dasarahalli,
Bangalore-560 057.

No. 16234 Date: 27/05/16

M/s.....

Particulars	Litres	Rate	Rs.	Ps.
Petrol			100	
H.S.D.				
Oil				
Others				
Total			100	

Vehicle No.....
VAT: 29240406019

Thanking you Q Signature

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

SCIBAY PUBLICATIONS
#7, 3rd cross, SRM Nagar,
Thorapadi, Vellore,
Tamilnadu-632002
Email: info@scibay.org
www.scibay.org



INVOICE/BILL

Bill No: Jul/003/16
Date: 25/07/2016

To:

Prof. D. Sharanya
Assistant Professor
Dept. of Biotechnology
Sapthagiri engineering college
Bangalore

S.No	Item	Amount (Rs)
1	Publication of book titled "Ayurvedic medical kit"	5000/-
Total		5000/-

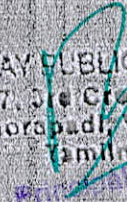
Ruppes in words Five thousand only

For Scibay Publications




Director

SCIBAY PUBLICATIONS PVT. LTD.
#7, 3rd cross, SRM Nagar,
Thorapadi, Vellore - 632002
Tamilnadu, India.


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

Payment Voucher

No. : 2044

Dated : 27-Sep-2016

Particulars	Amount
Account : KSCST(Project Work)	20,000.00

Through :

SBI- 30263521464

On Account of :

being balance amount paid towards KST
Project work

Amount (in words) :

INR Twenty Thousand Only

₹ 20,000.00

Receiver's Signature:

Authorised Signatory



Signature and date 24/10/16

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

SAPTHAGIRI COLLEGE OF ENGINEERING
DEPARTMENT OF BIOTECHNOLOGY
(Affiliated to Visvesvaraya Technological University, Belgaum, Approved by AICTE, New Delhi)
14/5, Chikkasandra, Hesaraghatta Main Road, Bengaluru-560057



A PROJECT REPORT ON

“AYURVEDIC MEDICINAL KIT”

Report submitted to Vision Group on Science and Technology under the Technology
Related Innovative Projects (TRIP) - 2015-16

Submitted by

Soundaryasri .S
Spoorthy. N

Under the Supervision of

Ms. SARANYA D
Mr. PRASHANTH KUMAR H P
Department of Biotechnology
Sapthagiri college of Engineering.

Submitted To



Government of Karnataka
VISION GROUP ON SCIENCE AND TECHNOLOGY
Department of Information Technology, Biotechnology and Science and Technology

2015- 2016

[Handwritten signature]
Sapthagiri College of Engineering
Chikkasandra, Hesaraghatta Road
Bangalore-560 057

SAPTHAGIRI COLLEGE OF ENGINEERING

(Affiliated to VTU, Belagavi, Approved by AICTE, New Delhi)

14/5, Hesaraghatta Main Road BENGALURU-560057



DEPARTMENT OF BIOTECHNOLOGY

CERTIFICATE

This is to certify that the Project Report entitled “**AYURVEDIC MEDICINAL KIT**” has been carried out by **Soundaryasri .S** and **Spoorthy. N** under the scheme of **Technology Related Innovative Projects (TRIP)** during the academic year **2015-2016** are bonafide students of Sapthagiri College of Engineering. 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.

Ms. Saranya D

Mr. Prashanth Kumar H P

(Guides)

Dr. Aswatha Kumar

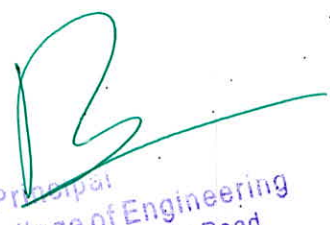
(Principal)

Chikkasandra, Hesaraghatta Road
Bangalore- 560 057

ABSTRACT

In the face of the increasing use and fast-growing market of herbal medicines and other herbal healthcare products, in both developing and developed countries of the world, policy-makers, health professionals and the public are increasingly expressing concerns about the safety, efficacy, quality, availability, preservation, and further development problems of these herbal products. Public demand has also grown for evidence on the safety, efficacy and quality of these products. An effort is made to increase the flavor and ease of availability for the people under the poverty line. Care is also taken to increase the durability of the product. Maximum interest is taken in producing cost effective product where present drugs are not reachable for majority of the people.

Keywords: herbal medicines; public demand; maximum interest; drugs



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

Phone: 080-28372800/1/2

www.sapthagiri.edu.in

Fax: 080-28372797

Date: 30/12/2015

To,


The Principal,

Sapthagiri College of Engineering

Bangalore-560057

Sub- Sanction of Research grant for the research project "Study of Antioxidant Enzyme and Antioxidant Properties of Tomato Plant"

With reference to the letter dated 20/11/2015 regarding the research funding, the management of Sapthagiri College of Engineering has sanctioned the Research grant of **Rs.300,000 (Rupees three lakhs only)** for the research project "Study of Antioxidant Enzyme and Antioxidant Properties of Tomato Plant" 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 A CTE, New Delhi)

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

Phone: 080-28372800/1/2

www.sapthagiri.edu.in

Fax: 080-28372797

Date: 31/12/2015

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.300,000 (Rupees three lakhs only)** for the research project "Study of Antioxidant Enzyme and Antioxidant Properties of Tomato Plant" to be carried out by the department of Biotechnology.

Copy To,

All Departments


Principal

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


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

Date: 20/11/2015

To,

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

Through HOD & RDECI

From

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

Respected Sir,

Subject: Requisition for the financial assistance for carrying out research project

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

Thanking you


Yours sincerely

RDECI :


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


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

RESEARCH PROPOSAL

A. GENERAL INFORMATION

1	About the project	
a	Title of the project	: Study of Antioxidant Enzyme and Antioxidant Properties of Tomato Plant
b	Subject area as per instruction	: Biological & Agricultural Sciences
2	Details of Principal Investigator	
a	Name	: MrsShobha G And MrsSoumya C
b	Qualification	: M.Sc, M.Phil, (Ph.D)
c	Designation	: Assistant Professor
d	Department	: Biotechnology
e	Years of teaching/research experience	: 08& 11
f	Email ID	: shobhag@sapthagiri.edu.in
g	Cell Number	: 9964591024
h	Details of the Head of the Department	
i	Name of the Head of the Department	: Dr. Ananda S
j	Email ID	: hodbt@sapthagiri.edu.in
k	Cell Number	: 9900833873


Signature of the Investigator

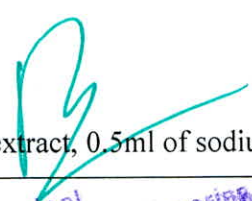

Signature of Head of the Department


Principal
Sapthagiri College of Engineering
14/6, Chikkasandra, Hesaraghatta Main Road
Bengaluru - 560 057


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

A. DETAILS OF THE PROJECT PROPOSAL

1.	Title of the Project Proposal:
	Study of Antioxidant Enzyme and Antioxidant Properties of Tomato Plant
2.	Objectives of the proposal:
	<ul style="list-style-type: none"> Assessment of antioxidant enzyme SOD, Peroxidase, GPX, Catalase, in tomato plant by invitro method Assessment of antioxidant properties in tomato plant by invitro method
3.	Background of the project:
	<p>The innovation relies on copper, a red metal valued for centuries for its antibiotic properties and used in potting soil. Copper a microelement required for the development of plant and electron transferring enzymes, deficiency have showed leaves curled, and their petioles bend downward, chlorosis with loss of turgor in the young leaves.</p> <p><i>Lycopersicon esculentum</i>, the second largest crop in global agricultural production, and the second producer in India. Diagnosis to detect copper deficiency in plants is an extremely important management tool because copper deficiency can produce devastating yield losses, often with little evidence of the characteristic symptoms. However a Cu concentration higher than 5 mg has showed toxicity in uptake of nutrients. Hence more research is needed to understand possible long-term impacts of nanotechnology in agriculture.</p> <p>Thus, the goal was to gain a better understanding regarding the Antioxidant Enzyme and Antioxidant Properties of Tomato Plant against copper nanoparticle. Ultimately to develop recommended exposure limits for the plant development.</p>
4.	Methodology :
	<p>1. Antioxidant Enzyme Assays</p> <p>The antioxidants enzymes such as superoxide dismutase (SOD), glutathione peroxidase (GPX), catalase (CAT), polyphenol oxidase (PPO) and phenylalanine ammonia lyase (PAL) activity were studied.</p> <p>Preparation of Enzyme Extract</p> <p>Super Oxide Dismutase (SOD: EC 1.15.1.1)</p> <p>The total 2.6ml volume reaction mixture of was made up of 0.1ml of extract, 0.5ml of sodium</p>


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 Bangalore-560 057

phosphate buffer, 1ml of Na_2CO_3 , 0.4ml of NBT and 0.2ml of EDTA. The response was started by including 0.4ml of $\text{H}_3\text{NO}\cdot\text{HCl}$ and exposing reaction mixture to white light for 15min at RT. The absorbance was measured at 560nm using spectrophotometer. The SOD activity is defined as the amount of photochemical reduction of NBT in one minute using molar extinction coefficient of $4020 \text{ M}^{-1} \text{ cm}^{-1}$ [Mirsa and Fridovich 1977 and Kono 1978].

Glutathione Peroxidase (GPX: EC1.6.4.2)

The activity of enzyme was measured as per Mohandas et al [Mohandas et al 1984]. The total 2ml reaction volume contained sodium phosphate buffer, EDTA, sodium azide, 0.1 ml of enzyme extract, glutathione, NADPH, 0.1ml of PMS and H_2O_2 . The disappearance of NADPH at 340nm was recorded. The enzyme activity was calculated using molar extinction coefficient of $6220 \text{ M}^{-1} \text{ cm}^{-1}$.

Catalase (CAT: EC 1.11.1.6)

The CAT activity was assayed as described by Aebi [Aebi1984], the reaction volume consist of 1.5ml sodium phosphate buffer, 0.5ml H_2O_2 and 0.1ml of enzyme extract. The volume is made to 3ml by adding dH_2O . The activity was estimated by the reduction in absorbance at 240nm against blank phosphate buffer and unit was calculated using molar extinction coefficient of $43.6 \text{ M}^{-1} \text{ cm}^{-1}$.

Polyphenol Oxidase (PPO: EC 1.10.3.1)

According to Mahadevan and Sridhar [Mahadevan and Sridhar 1982] protocol, the activity of enzyme was measured using catechol as a substrate. The reaction volume consists of 3.0ml of sodium phosphate buffer, 1.0ml of catechol in the buffer and 0.5ml of enzyme extract. Increase in absorbance was measured at 495nm. Activity was estimated using a molar absorption of $1010 \text{ M}^{-1} \text{ cm}^{-1}$.

Phenyl Alanine Aminolyase (PAL: EC 4.3.1.24)

The reaction volume contains 0.1ml enzyme extract with 0.5ml of sodium phosphate buffer and 0.2ml of L-phenylalanine and distilled water was added to make the final volume 3ml. PAL activity was measured by an increase in the absorbance at 290nm against blank phosphate buffer and units was calculated using a molar absorption at the rate of $19.73 \text{ mM}^{-1} \text{ cm}^{-1}$ [Goldson et al 2008].

Soluble Proteins

Lowery et al [Lowery et al 1951] method was followed for protein estimation using BSA as a standard. In brief, 0.2ml of protein extract was incubated for 10min at RT in dark condition after addition of 5ml alkaline copper solution followed by addition of 0.5ml FC reagents. The tubes were vortexed and

allowed to stand for 30min at room temperature. The absorbance was recorded at 660nm against blank without protein extract.

2. Antioxidant Properties Assays

Determination of Malondialdehyde (MDA) content

Seedlings/Fresh leaf (500 mg) of treated and untreated control tomato plants were homogenized in 6ml TCA. The homogenate was centrifuged at 10,000rpm for 10min. The supernatant was used as a sample for analysis. For 2ml extract, 2ml of 0.6% TBA solution prepared in 20% TCA was added. The reaction mixture was mixed thoroughly and placed in the boiling water for 30min and cooled rapidly, followed by centrifugation for 15min at 10,000rpm. The reaction mixture was read at 532nm, 450nm and 600nm against TCA blank. The MDA concentration was determined by its molar extinction coefficient of 155 mM/cm and expressed as nmoles/ml of fresh weight [MadhavaRao and Stresty, 2000].

$$A = [(Abs_{532}+TBA) - (Abs_{600}+TBA) - (Abs_{532}-TBA-Abs_{600}-TBA)]$$

$$B = [(Abs_{440}+TBA-Abs_{600}+TBA) \times 0.0571]$$

$$MDA \text{ equivalents (nmol/ml)} = (A-B/157000) \times 106$$

Determination of Free Radical Scavenging Activity by Diphenylpicrylhydrazyl method

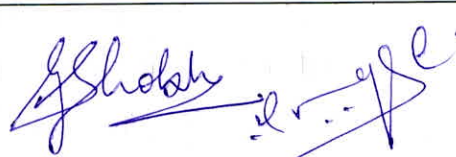
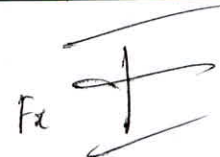
The assay was conducted according to Lee et al [Lee et al 1981] with some adjustments, according to which the 0.5ml of methanolic extracts of seedlings/leaf and 1.5ml of DPPH methanol solution was taken and allowed to stand in dark for 30min at room temperature. The absorbance was recorded at 515nm against methanol blank.

Determination of Total Antioxidant Capacity (TAC) by Phosphomolybdenum Method

Briefly, 0.5ml of the seedling/leaf extract was mixed with a 3ml phosphomolybdic acid reagent solution. The reaction mixture is then incubated in water bath at 95°C for 90min. After cooling, the absorbance of reaction mixture was measured at 695nm against methanol blank [Prieto et al 1999]. The TAC was expressed as the number of gram equivalent of ascorbic acid (GAE) per gram of fresh weight.

5.	Milestones with time schedule & work plan: 6-12 Months	
6.	List of equipment required for Phase-I & Phase-II for Project Implementation	UV-Spectrometer Kits Rs.3,00,000 approximately
7.	Relevance, importance & application of the project:	
	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,	

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Sapthagiri College of Engineering
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Bangalore-560 057

	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.	
10.	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>Lycopersiconesculentum</i> and may contribute to the controversial 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>		


 Principal
Sapthagiri College of Engineering
 14/6, Chikkasandra, Hesarghatta Main Road
 Bengaluru - 560 057


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

Date: 11/01/2016

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 project have been approved for the academic year 2015. The report and the outcome of the project have 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	Study of Antioxidant Enzyme and Antioxidant Properties of Tomato Plant	3,00,000

Copy To,

Principal
All Departments
IQSC

Kari
Convener

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

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

Date :25/01/2016

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 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 Instruments PC based double beam UV-VIS Spectrophotometer for the research project entitled "**Study of Antioxidant Enzyme and Antioxidant Properties of Tomato Plant**" to carry out. This will enhance the research potential to contribute for the improvement in the field of biotechnology.

The instrument cost around **Rs 3, 00, 000/- (Three lakh fifty thousand)**. Kindly consider the request and do the need full.

Thanking you,

Yours Faithfully,


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


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

12/

Date: 25/03/2016

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 “**Study of Antioxidant Enzyme and Antioxidant Properties of Tomato Plant**” and utilization certificate. This for your kind information, please.

Sl No	Particulars	Quantity	Amount	Remarks
1	PC Based Double Beam UV-VIS Spectrophotometer	1	284625/-	Purchased

Thanking You,

Copy,

Principal


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



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

STUDY OF ANTIOXIDANT ENZYME AND ANTIOXIDANT PROPERTIES OF TOMATO PLANT

Submitted By
Mrs. Shobha G and Mrs Soumya C
Assistant Professor
Department of Biotechnology

To



DEPARTMENT OF BIOTECHNOLOGY
SAPTHAGIRI COLLEGE OF ENGINEERING
BENGALURU-560057
KARNATAKA, INDIA
2016-2017


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

INTRODUCTION

The green revolution in the agriculture sector in past decades has resulted in a great increase in the quantity and quality of agricultural products leading into the transition from traditional agriculture to commercial agriculture and the success was accompanied with the overuse of agricultural resources, in spite of all this the global food shortage is not yet resolved. According to the United Nations, about 800 million people in the world are suffering from a shortage of food and number of people below the poverty line who are unable to afford food has dramatically increased [ZenuJha et al 2011]. This is due to the gap that exists between potential yield of crop and final yield observed in farmer's plots which is largely owed too many abiotic and biotic stress causes in field affecting the crop [JaggalSomappa et al 2013]. Every year there is a significant crop yield loss due to nutritional deficiency in soil and devastating diseases worldwide [Wani 2011]. Scientific study over the years is trying to fill the gap, between engineering of agriculture and science with innovative science-based technologies and the nanotechnology makes the best answer here. Many fields like materials science, electronics and medicine, have seen the considerable use of nanotechnology and from past few decades since they applied nanotechnology in research. However, unlike researchers from other disciplines, it is only during recent years that we have started to see the potential applications of nano-science in agriculture [Eduardo Corredor et al 2009].

Agriculture system can be revolutionized by the use of nanotechnology in various ways. Engineered nanomaterial has several applications in agriculture field such as induction of faster germination of seed, crop production, crop protection from pests and diseases, nutrition and water supply management, disease treatment delivery system, new material for pathogen detection, the modern tools for molecular biology, protection of environment, delivering nutrients and hence in turn enhancing the yields or nutritional values potentially [Remya Nair et al 2010]. In addition to this, it can also offer directions for environmental remediation or adds value to crops, thereby our understanding of the crop biology can be improved. Nanoparticles (NPs) commonly used in the agricultural field fall into the following categories viz., metal, metal oxide nanoparticles, and non-metal nanoparticles, all belonging to the family of nanomaterials. The nanomaterials are nowadays receiving increasing attention in a vast variety of field as it is transitional between individual molecules and bulk materials and hence exhibit unique optical, electronic, magnetic properties that which otherwise in their bulk forms, they normally will not display [Nelet et al 2006, Ruffini Castiglione Monica et al 2009, Elena Masarovičová and Katarína Kráľová et al 2013, Srivastava and Dwivedi KN, 2012]. These nanoparticles are in various shapes such as nano-powder, nano-wires, nano-cluster or nano-crystals and are of different sizes varying from 1nm to 100nm ranges. It has been reported that both favourable and non-favourable influence on crop rely upon the properties of nanomaterials for example surface area,

diameter, reactivity and concentration of NPs and its uptake, translocation, and transportation by the plants to different tissues, and also the type of plant [Jie Yang et al 2013].

MATERIALS AND METHODS

Antioxidant Enzyme

The antioxidants enzymes such as superoxide dismutase (SOD), glutathione peroxidase (GPX), catalase (CAT), polyphenol oxidase (PPO) and phenylalanine ammonia lyase (PAL) activity were studied.

Preparation of Enzyme Extract

The 5ml of 50mM sodium phosphate buffer (pH 7) containing 5mM EDTA and chilled mortar with pestle was used to create homogenized seedlings/ fresh leaf (500 mg) extract of treated and untreated control samples. The homogenate was centrifuged at 10,000rpm for 20min at 4°C and supernatant was collected. The residues were re-extracted with 5ml buffer, the two supernatant were merged and used for the enzyme assay. The enzyme activity was measured by recording absorbance at particular absorbance for 1min and was expressed as $\mu\text{M}/\text{min}/\text{mg}$ of protein (Activity (IU)/mg of protein).

Super Oxide Dismutase (SOD: EC 1.15.1.1)

Principle

The radical formed will be detoxified by the enzyme which converts more toxic superoxide anion radicals into hydrogen peroxide (H_2O_2) and elemental oxygen (O_2). The superoxide ion (O_2^-) converts Nitrobluetetrazolium (NBT) to NBT-diformazan, which absorbs light at 560nm.

Reagents

Sodium phosphate buffer (50mM, pH 7.6), 125mM Sodium carbonate, 25 μM Nitrobluetetrazolium, 0.1mM Ethylene diamine tetra acetic acid, 1mM Hydroxylamine hydrochloride

Procedure

The total 2.6ml volume reaction mixture of was made up of 0.1ml of extract, 0.5ml of sodium phosphate buffer, 1ml of Na_2CO_3 , 0.4ml of NBT and 0.2ml of EDTA. The response was started by including 0.4ml of $\text{H}_3\text{NO}\cdot\text{HCl}$ and exposing reaction mixture to white light for 15min at RT. The absorbance was measured at 560nm using spectrophotometer. The SOD activity is defined as the amount of photochemical reduction of NBT in one minute using molar extinction coefficient of 4020 $\text{M}^{-1} \text{cm}^{-1}$ [Mirsa and Fridovich 1977 and Kono 1978].

Glutathione Peroxidase (GPX: EC1.6.4.2)

Principle

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Bangalore-560 057

SYSTRONICS (INDIA) LIMITED

SYSTRONICS Division, An ISO 9001 : 2008 Co.

89-92, Naroda Industrial Area, Naroda, Ahmedabad - 382 330.
Phone : 79-2281 3017, 2281 3117 Fax : 91-79-2281-1592.

TIN No. 24073101396
Dated 31/08/2007
CST No. 24573101396
Dated 31/08/2007

Name of Exiable Commodity :
Scientific & Electronics Analytical
Instruments and Test & Measuring
Instruments & Oscilloscopes, Parts &
Accessories thereof.

F/SALES
REV : 00

RETAIL INVOICE

Billing Party

THE PRINCIPAL,
SAPTHAGIRI COLLEGE OF ENGINEERING.,
CHIKKASANDRA HESARAGATTA MAIN ROAD,
BANGALORE - 560 073

Consignee Party :

THE PRINCIPAL,
SAPTHAGIRI COLLEGE OF ENGINEERING.,
CHIKKASANDRA HESARAGATTA MAIN Mode of Despatch:
BANGALORE - 560 073

Invoice No. 211611987
Invoice Date 25.02.2016

Despatch Date:

Freight:
BRI/AWB/BB/BB N
No of Packages 1

Item
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Item Type/ Code	Item Description	PO NO: SSCET:HO:4730COMP:84 PO DT: 23/02/2016	QTY	Rate PER Unit	
2202 SP.	PC BASED DOUBLE BEAM UV-VIS SPECTROPHOTOMETER	Asses Rate 284,625.00 Tot. Ass. Value 284625.00	1	284,625.00	28
SR NO	738				

ALCS
@ 20%
Postpaid for US land need for

Instrument received with good condition, Demo save taken by application specialist from Systronics and Equipment taken in Stock book page no: 31,

Total Item Value 21
Less Dis @ 20% 5
Assessable Value 2:

CST @ 5%

Mode of Payment
Rs: TWO LAKH THIRTY NINE THOUSAND EIGHTY FIVE ONLY

Entered in Stock - Instrument - B.No: 31
* Unit, was also test with sample, working satisfactory

Pre authenticated
For Systronics (India) Limited
Systronics Division

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Ashram Road, Ahmedabad-9.
Range Office : Range III, Divn. I
Jivabhai Chambers,
Ashram Road, Ahmedabad-380 009.
Commissionerate : Ahmedabad-II
E.C.C. / Reg. No. AADCS2709JEM001

E.C.C. / Reg. No. AADCS2709JEM001
Monthly payment scheme as per Rule 8 of C.E.
(No. 2) Rules, 2001
Date and Time of Issue of Invoice-Cum Challan :
Date & Time of Removal of Goods

CERTIFICATE
Certified that the particu
above are true and corre
amount indicated represents
actually charged and that t
flow additional consideration
indirectly from the buyer
For Systronics (India) Limi
Systronics Division
N. Juna Wadaj
Bengaluru - 560 073
Authorised Signatory

Principal
Sapthagiri College of Engineering
14/8 Chikkasandra, Hesaragatta Main Road
Bengaluru - 560 073

UTILIZATION CERTIFICATE

Sl No	Particulars	Quantity	Amount
1	UV spectrometer		2,84,625
		Total	2,84,625

Certified that Sapthagiri college of Engineering has provided partial financial support of **RS 2, 84,625/-** (Two lakh eighty four thousand six hundred twenty five only) towards Study of Anti-Oxidant Enzyme and Anti-Oxidant Properties of Tomato Plant project 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.

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 39th series - 2015-2016

Sl No	Lettered NO and Date	Amount	Certified that KSCST has provided partial financial support of RS 38000/- towards Biofuel and SPP student project program 38th series
1	7.1.03/SPP/17	3000/-	Sum of Rs 38000/- only has been utilize for the purpose Biofuel and SPP student project program for which it was sanction
2	7.1.03/SPP/17	6000/-	
3	7.1.03/SPP/17	13000/-	
4	7.1.03/SPP/17	9000/-	
5	7.1.03/SPP/17	4000/-	
6	7.1.03/SPP/1148	3000/-	

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



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

SAPTHAGIRI COLLEGE OF ENGINEERING

(Affiliated to Visveswaraya Technological University, Belgaum & Approved by AICTE - New Delhi)

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	39S_BE_1925	Pollution study on polymeric surge arrestor	EEE/ Dr. K N Ravi	3000/-	3000/-	0
2	39S_BE_1928	Study on the Chemical composition and invitro evaluation of their Pharmacological activity	BT/ Dr. Anand S	6000/-	6000/-	0
3	39S_BE_050	Simarouba oil-Cake: The solid low value substrate to produce Lipase with potential application in Bio-Diesel extraction and to assay the toxicity of Phytochemical in inhibition of Lipase activity	BT/ Prof. Shobha G	13000/-	13000/-	0
4	39S_BE_088	Dual biofuel Production From Microalgae	BT/ Prof. Saranya D	9,000	9,000	0
5	39S_BE_1911	Next Generation E-Voting System For Elderly And Blind Users	EC/ Prof. Karthik N. C.	4000	4000	0
6	39S_BE_1924	Aggregate Crypto system for Scalable data sharing in cloud Storage	IS/Prof. Prerana Chaitra	3000	3000	0

Signature of the Principal with seal

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Signature of Auditor with seal



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