

Date: 25/05/2022

Ref: MSRASC/MB/21-22/008

CIRCULAR
DEPARTMENT OF MICROBIOLOGY

The Department of Microbiology is organizing Value added on Programme on "Biofertilizer Production Technology from 09/06/2022. Kindly find the attached brochure and details are also available in the college website.

Register your names through the link provided:

<https://forms.gle/hHAVsJlmmxReFw5u46>

Note Only 30 students per batch; selection based on first come first served basis.

Name of the Co-ordinator: Dr Pushpa H

Resource persons: Dr Puspha H and Dr Triveni A G

Venue: Louis Pasteur Laboratory, RCASC.


Head of the Department
Head of the Department
MICRO BIOLOGY
Ramaiah College of Arts,
Science & Commerce
Bangalore - 560 054


Principal,
M.S. Ramaiah College of Arts, Science & Commerce
MSRIT Post, MSR Nagar
Bangalore - 560 054

Department of Microbiology

Valued-added Programme

Biofertilizer Production Technology

Total: 30 hours

Theory:

I. Biofertilizers: (10 hrs)

Introduction, types of biofertilizers- *Rhizobium*, *Azospirillum*, *Azotobacter*, Cyanobacteria, *Azolla*, Phosphate solubilising microorganism.

Production, quality control and applications of biofertilizers.

III Practicals: (10 units)- 20 hours

1. Isolation and identification of symbiotic (*Rhizobium* sp.), Non symbiotic (*Azotobacter* sp.) and Associative (*Azospirillum* sp.) nitrogen fixing microorganism.

2. Production and assay of *Rhizobium* sp., *Azotobacter* sp., and *Azospirillum* sp.

3. Isolation, identification and mass production of Cyanobacteria.

4. Isolation and identification of Phosphate solubilising microorganisms.

5. Mass production of *Azolla* sp.

6. Production of vermicompost.

7. Industrial visit

8. Dissertation/Record

List of equipment required

1. Autoclave-1
2. Incubator-1
3. Hot Air Oven-1
4. Laminar Air Flow apparatus-1
5. Centrifuge-1
6. Refrigerator-1
7. Orbital shaker-1
8. Algae growth chamber-1
9. Fermentor-1
10. Micropipettes of different capacities
11. Weighing Balance-01
12. Green house (Exclusively for Microbiology experiments)



Course outcome:

- Understand the role of microorganism in improving the fertility of soil and also in control the pest and other pathogens.
- Will know the techniques involved in mass production, quality control and application of Bioinoculants in organic farming
- Students will have an opportunity to work in research laboratory, biofertilizer industry and can also be an bio-entrepreneurs.

Course Coordinators: Dr. Pushpa. H. Professor and HOD, Microbiology Department
Dr. Triveni. AG, Assistant Professor, Microbiology

Value added course- Biofertilizer Production Technology

About the course:

The unselective use of synthetic chemical fertilizers during past four decades for increasing the agricultural yield has affected soil fertility, the water retention capacity and micronutrients content in the soil. Hence, the concept of biofertilizers is being promoted all over the world. The biofertilizers nothing but tiny beneficial microbes that enhances availability of plant nutrients to host plant and protect plants from pathogen challenges when applied. Application of biofertilizers is being advocated by the environment for sustainable agriculture. However, both availability and quantity with quality biofertilizers is confined to limited areas. Besides, there is a need to popularize the biofertilizer use among the farmers. In spite of the efforts, well trained skilled manpower to start-up small biofertilizer production units is not much available in the country. In this regard we have proposed to start this skill development certificate course.

Objectives:

- To promote organic farming in the region through technical capacity building of all stake holders
- To facilitate the students to understand basics of biofertilizers
- To impart training to develop skill both handling, cultivation and propagation of quality microbial inoculants
- To make students ready for industry as entrepreneurs
- To improve the professional competencies and upgrade the knowledge and develop technical skills of biofertilizer production

Eligibility:

- Start-up entrepreneurs willing to undertake biofertilizer business
- UG/PG Students looking forward to research and development work in biofertilizer industry after completion of program

Course duration:

3 months (30 hours); start from 9th June 2022

Intake: 50 only First come first served basis

Plan of action:

- The course has been designed taking the inputs from experts from industries of various domains.
- The course will be conducted both online and offline mode (Hands on skills).
- Guest Lectures by Industrial experts and successful entrepreneurs..
- Hands-on practical exposures, case studies, industrial visits and live project works.

DEPARTMENT OF MICROBIOLOGY

Report on

Value added Programme on "Biofertilizer Production Technology"

Under DBT-Star College Scheme

09-06-2022 to 19-08-2022

Name of the Co-Ordinator: Dr Puspha H

Resource Persons: Dr Pushpa. H and Dr Triveni A G

Venue: Louis Pasteur Laboratory, MSRCASC

Number of Participants: 29

Food security and sustainable agriculture are now on top of the global development agenda. Growing population, shrinking cultivable land, biotic and abiotic stress, climate change, excessive use of synthetic fertilizers, pesticides and scarcity of groundwater etc. are creating new challenges for the global agricultural research system.

In this fast-changing scenario world over, there is a need for new-age technologies and practices that could increase agricultural productivity at various levels of the supply chain. Moreover, there is a huge interest in industry to use sustainable agricultural technologies to help yield healthier crops, control pests, monitor soil, and growing conditions to support for the farmer in reducing the workload, and improve a wide range of agriculture-related tasks in the entire food supply chain.


Objectives of the program:

- To promote organic farming in the region through technical capacity building of all stake holders
- To facilitate the students to understand basics of biofertilizers
- To impart training to develop skill both handling, cultivation and propagation of quality microbial inoculants

M S Ramaiah Nayar
MCRIT Road
Bangalore 560 054

T +91 80 2360 0966/0987
+91 80 2360 0905
F +91 80 2360 6215

E practical@msrcasc.orgmail.com
W www.msraia.ac.edu


Head of the Department
MICRO BIOLOGY
Ramaiah College of Arts,
Science & Commerce
Bangalore - 560 054

- To make students ready for industry as entrepreneurs
- To improve the professional competencies and upgrade the knowledge and develop technical skills of biofertilizer production

Twenty-seven students of II and III BSc registered for the course. The sessions were divided into 4 modules for 30 hours which included theory and hands on exposure.

First week the programme was inaugurated by Dr Pushpa H HOD, Microbiology, MSRCASC welcomed and addressed the students for the value-added programme and gave an overview of the same. The course was conducted in blended mode all the theory classes was online, the recorded video lecture with assignment was given to the students and the interaction on the topics were done during laboratory sessions.



To give an industrial and research exposure, industrial/institutional visit was organized to Department of Agricultural Microbiology, University of Agricultural Sciences, GKVK on 15th



Head of the Department
MICRO BIOLOGY
Ramaiah College of Arts,
Science & Commerce
Bengaluru - 560 054

Principal,
S. Ramaiah College of Arts, Science & Commerce
MSRIT Post, MSR Nagar
Bengaluru - 560 054

June 2022. There Dr. Maya, Senior Research Fellow, explained the process isolation, production, mass multiplication, carrier-based inoculum production, quality control process, marketing, dispatch and application of biofertilizers and biopesticides in detail. Through this student got an exposure to the mass production and entrepreneurship of Biofertilizer.

Later on every Saturday and after 4 pm during weekdays students were exposed for hands on training of isolation of Rhizobium from various leguminous plants, Azotobacter, Azospirillum, Azolla, Phosphate Solubilizers, Blue Green Algae, identification, mass production etc. Students also learnt about the process of compost preparation, Vermicompost preparation, Bioenzyme production using domestic kitchen waste and these process were also processed in our garden. The program was just to given an exposure to the process. How ever our students are in the process of the production of these fertilizers and are being used in the garden of our college campus. Finally, the course was ended on 8th August 20



Azotobacter



Rhizobium



Microscopic observation



Azospirillum

Sulima.H
 Head of the Department
 MICRO BIOLOGY
 Ramiah College of Arts,
 Science & Commerce
 Bangalore - 560 054

Vasanthi

Principal,
 M.S. Ramiah College of Arts, Science & Commerce
 MSRIT Post, MSR Nagar

Bangalore - 560 054



MASS PRODUCTION OF BIOFERTILIZERS



Shubra H
 Head of the Department
 MICRO BIOLOGY
 Ramaiah College of Arts,
 Science & Commerce
 Bangalore - 560 054

Katbala Y
 Principal,
 M.S. Ramaiah College of Arts, Science & Commerce
 MSRIT Post, MSR Nagar
 Bangalore - 560 054

Course Outcome:

- Students could understand the role of microorganism in improving the fertility of soil and also in control the pest and other pathogens.
- Will know the techniques involved in mass production, quality control and application of Bioinoculants in organic farming
- Students will have an opportunity to work in research laboratory, biofertilizer industry and can also be a bio-entrepreneurs

Srinivas.H

Head of the Department
MICRO BIOLOGY
Ramaiah College of Arts,
Science & Commerce
Bangalore - 560 054

Vasanthi

Principal,
M.S. Ramaiah College of Arts, Science & Commerce
MSRT Post, MSR Nagar
Bangalore - 560 054



UNIVERSITY OF AGRICULTURAL SCIENCES, BANGALORE
College of Agriculture, GKVK, Bengaluru-560 065

Dr.N.B.Prakash, Dean(Agri.)

No.D (Agri.)B/Visit/M.S.R-B/2022-23 / 984

04.07.2022

Dear Sir,

Sub: Visit by students and staff of M.S.Ramaiah, Bangalore.....reg.

Ref: Your e-mail letter No. Nil dated 30.07.2022

B.Sc. Microbiology students (50 Nos.) and faculty / staff (02 Nos.) of M.S.Ramaiah, College of Horticulture are permitted to visit the Department of Agril. Microbiology, College of Agriculture, GKVK, Bengaluru on 15.07.2022 at 9.00 AM.

In this regard, you are required to remit Rs. 1,400/- (Rupees One thousand four hundred only) by cash, on the day of your visit as fee, towards the visits to Assistant Comptroller, College of Agriculture, GKVK, Bangalore.

Arrangements have been made for the visit.

It is the discretion of the University to cancel the visit without prior intimation at any time due to unforeseen circumstances.

With regards,

Yours Sincerely,

[Signature]
4-7-2022

Dean(Agri.)
Dean (Agri.)
College of Agriculture
UAS, GKVK, Bengaluru-560 065

To

Dr.Pushpa.H
Program Coordinator, DBT-Star College
Scheme, Professor and Head of Department,
Microbiology, MSRCASC,
Bangalore.
(e-mail: pushpa_microbio@msrcase.edu.in)

To follow CAB (Covid appropriated
behavior) for Covid -19 prevention
as per the guidelines of UGC /
ICAR

Copy to: 1. Prof. & Head, Depts. of Agril. Microbiology, CoA, GKVK with a request to
arrange for the visit on the above mentioned date.

2. Asst. Comptroller, Accts. Sec., CoA, GKVK to collect the requisite fee.

3. File.

List of students enrolled of Biofertilizer Production Technology

Organized by Department of Microbiology

| Sl No. | Name of the Students | Registration Number | Course | Semester | Date | Attendance |
|--------|----------------------|---------------------|----------------------|-------------|----------|------------|
| 1 | SA VISHRUTHA | S1914562 | BSc MB, BT, Chem | VI Semester | 15.06.07 | present |
| 2 | Nehal Subha | S1914536 | BSc MB, BT, Chem | VI Semester | 16/7/22 | absent |
| 3 | Ramzana Banu S | S1914554 | BSc MB, BT, Chem | VI Semester | 12.10 | present |
| 4 | Deekshitha BK | S2014486 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 5 | Shreyas M | S1914576 | BSc MB, BT, Chem | VI Semester | 12.10 | present |
| 6 | T N RAMYASHREE | S1914593 | BSc MB, BT, Chem | VI Semester | 12.10 | present |
| 7 | Shwetha B R | S1914578 | BSc MB, BT, Chem | VI Semester | 12.10 | present |
| 8 | HARSHITH REDDY C K | S2014503 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 9 | D S SHREYAS | S2014485 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 10 | Madhu shree M | S2014532 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 11 | bhavana.S | S2014475 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 12 | Harshitha Shree B.S | S2014422 | BSc MB, Gen, Biochem | IV Semester | 12.10 | present |
| 13 | Madhuri r | S2014531 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 14 | HARINI A KHEMKAR | S2014500 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 15 | Vidya shree m | S2014455 | BSc MB, Gen, BC | IV Semester | 12.10 | present |
| 16 | Monisha G | S2014429 | BSc MB, Gen, Biochem | IV Semester | 12.10 | present |
| 17 | Mudith Kumar R | S2014538 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 18 | Yoshitha.k | S2014458 | BSc MB, Gen, Biochem | IV Semester | 12.10 | present |
| 19 | Preetham A Rao | S2014562 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 20 | Pratheeksha | S2014437 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 21 | Tejaswini Lokesh | S2014454 | BSc MB, Gen, Biochem | IV Semester | 12.10 | present |
| 22 | Swarupa Banerjee | S1914591 | BSc MB, BT, Chem | VI Semester | 12.10 | present |
| 23 | Prajwal NS | S2014559 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 24 | Hemalatha K | S2014505 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 25 | Deepika S | S2014488 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 26 | Dushyanth R | S2014496 | BSc MB, BT, Chem | IV Semester | 12.10 | present |
| 27 | Ritamkar Mukherjee | S1914556 | BSc MB, BT, Chem | VI Semester | 12.10 | present |
| 28 | Sakshi N Ullal | S2014580 | BSc MB, BT, Chem | IV Semester | 12.10 | present |

29 Nishal Kumar S2014550

BSc BT, MB, Chem

IV Semster

Present

12.10

19/10/22

12.10

12.10

12.10

Signature: 19/10/22

Principal, Government College of Arts, Science & Commerce, Bangalore - 560 054

Department of Microbiology

Valued-added Programme

Under DBT-Star College Scheme

Biofertilizer Production Technology

Assessment Marks

| Sl No. | Registration Number | Name of the Students | Course | Semester | Demonstration of technique and viva voce 30 Marks |
|--------|---------------------|----------------------|----------------------|-------------|---|
| 1 | S1914562 | SA VISHRUTHA | BSc MB, BT, Chem | VI Semester | 25 |
| 2 | S1914536 | Nehal Subba | BSc MB, BT, Chem | VI Semester | 30 |
| 3 | S1914554 | Ramzana Banu S | BSc MB, BT, Chem | VI Semester | 23 |
| 4 | S2014486 | Deekshitha BK | BSc MB, BT, Chem | IV Semester | 29 |
| 5 | S1914576 | Shreyas M | BSc MB, BT, Chem | VI Semester | 25 |
| 6 | S1914593 | T N RAMYASHREE | BSc MB, BT, Chem | VI Semester | 21 |
| 7 | S1914578 | Shwetha B R | BSc MB, BT, Chem | VI Semester | 20 |
| 8 | S2014503 | HARSHITH REDDY C K | BSc MB, BT, Chem | IV Semester | 30 |
| 9 | S2014485 | D S SHREYAS | BSc MB, BT, Chem | IV Semester | 30 |
| 10 | S2014532 | Madhu shree M | BSc MB, BT, Chem | IV Semester | 28 |
| 11 | S2014475 | bhavana.S | BSc MB, BT, Chem | IV Semester | 30 |
| 12 | S2014422 | Harshitha Shree B.S | BSc MB, Gen, Biochem | IV Semester | 25 |
| 13 | S2014531 | Madhuri | BSc MB, BT, Chem | IV Semester | 20 |
| 14 | S2014500 | HARINI A KHEMKAR | BSc MB, BT, Chem | IV Semester | 21 |
| 15 | S2014455 | Vidya shree m | BSc MB, Gen, BC | IV Semester | 25 |
| 16 | S2014429 | Monisha G | BSc MB, Gen, Biochem | IV Semester | 26 |
| 17 | S2014538 | Mudith Kumar R | BSc MB, BT, Chem | IV Semester | 30 |
| 18 | S2014458 | Yoshitha.k | BSc MB, Gen, Biochem | IV Semester | 25 |
| 19 | S2014562 | Preetham A Rao | BSC MB, BT, Chem | IV Semester | 30 |
| 20 | S2014437 | Pratheeksha | BSc MB, BT, Chem | IV Semester | 29 |
| 21 | S2014437 | Tejaswini Lokesh | BSc MB, Gen, Biochem | IV Semester | 27 |
| 22 | S1914591 | Swarupa Banerjee | BSC MB, BT, Chem | VI Semester | 24 |
| 23 | S2014559 | Prajwal NS | BSc MB, BT, Chem | IV Semester | 21 |
| 24 | S2014505 | Hemalatha K | BSc MB, BT, Chem | IV Semester | 25 |
| 25 | S2014488 | Deepika S | BSc MB, BT, Chem | IV Semester | 21 |
| 26 | S2014496 | Dushyanth R | BSc MB, BT, Chem | IV Semester | 25 |
| 27 | S1914556 | Ritanekar Mukherjee | BSc MB, BT, Chem | VI Semester | 30 |
| 28 | S2014580 | Sakshi N Ulla l | BSc MB, BT, Chem | IV Semester | 25 |
| 29 | S2014550 | Nishal Kumar | BSc MB, BT, Chem | IV Semester | 25 |

Anil H
Head of the Department
MICRO BIOLOGY
Ramaiah Nagar
Ramaiah College of Arts,
Science & Commerce
Bangalore - 560 054

T: +91 80 2360 0966/3537
+91 80 2360 6901

F: +91 80 2360 6212

E: principal@mscasc.org.in
W: www.msacsc.org

Vatshala Y
Principal,
M.S. Ramaiah College of Arts, Science & Commerce
MSRIT Post, MSR Nagar
Bangalore - 560 054



RAMAIAH
College of Arts, Science
& Commerce



DEPARTMENT OF BIOTECHNOLOGY
MINISTRY OF SCIENCE & TECHNOLOGY,
GOVERNMENT OF INDIA

Certificate

This is to Certify that _____

of _____

has participated in Value Added Program on

"Biofertilizer Production Technology" held from 9th July to 19th August 2022

**Organized by The Department of Microbiology, M.S. Ramaiah College of Arts,
Science and Commerce, Bangalore**

Dr. Pushpa H

Vice Principal & Head, Department of Microbiology
MSRCASC, Bangalore

Dr. Vatsala G

Principal
MSRCASC, Bangalore