

## LABORATORY REPORT DURING THE ACADEMIC YEAR 2023-2024

### Introduction

The Laboratory is a state-of-the-art facility designed to support teaching, research, and academic excellence in the field of Life sciences. The laboratory is divided into five independent sections, catering to undergraduate and postgraduate laboratory for both microbiology and Biochemistry and a Central Instrumentation Laboratory facility for academic and scientific research. This report provides an overview of the laboratory's infrastructure, equipment, usage statistics, and academic achievements for the last year for the last year.

### Laboratory Infrastructure

The Microbiology Laboratory is equipped with a range of advanced equipment, including:

Laminar Air Flow Chamber, Autoclave, Centrifuge, Cold Centrifuge, Microfuge, PCR Instrument, Electrophoresis Apparatus, Chromatography, Gel Doc System, pH Meter, Weighing Balance, Microscope

All equipment is in good working condition, except for the cold centrifuge, which is currently under maintenance.

The list of new equipments acquired is listed in table -1

### Laboratory sections

The laboratory is divided into Five independent sections:

**1. Undergraduate Laboratory for Microbiology:** This section is designed for undergraduate students and has a total of 182 lab sessions during the academic year. The laboratory is equipped with basic microbiology equipment, including microscopes, autoclaves, and centrifuges. A total of 5 batches of students utilize this laboratory.

**2. Postgraduate Laboratory for Microbiology:** This section is designed for postgraduate students and has a total of 51 lab sessions during the academic year. The laboratory is equipped with advanced equipment, including electrophoresis apparatus, and chromatography. A total of 4 batches of students utilize this laboratory.

**3. Undergraduate Laboratory for Biochemistry:** This section is designed for undergraduate students and has a total of 122 lab sessions during the academic year. A total of 6 batches of students utilize this laboratory.

**4. Post graduate Laboratory for Biochemistry:** This section is designed for postgraduate students and has a total of 51 lab sessions during the academic year. A total of 2 batches of students utilize this laboratory.

**5. Central Instrumentation and Research Laboratory:** This section is designed for research students and has a total of 152 during the academic year. The laboratory is equipped with state-of-the-art equipment, including gel doc systems, pH meters, and weighing balances, PCR instruments, etc. A total of 14 teachers and research students utilize this laboratory.

### **Usage Statistics**

The laboratory usage statistics for the last year are as follows:

- Undergraduate Laboratory for Microbiology: 182 lab sessions
- Postgraduate Laboratory: 51 lab sessions
- Undergraduate Laboratory for Biochemistry: 122 lab sessions
- Postgraduate Laboratory for Biochemistry: 51 lab sessions
- Research Laboratory: 152 lab sessions

A total of 174 students and 14 teaching faculties from department of Microbiology and department of Biochemistry were utilized the laboratory facilities, including 6 batches (112 students) of undergraduate students, 4 batches (sixty two students) of postgraduate.

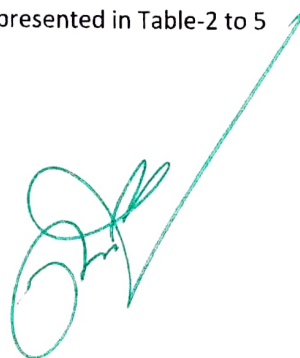
A total of 558 laboratory sessions were completed in all the five sections of the laboratory during the academic year 2023-2024.

### **Academic Achievements**

The Microbiology Laboratory has had a productive year, with several academic achievements:

1. Research Projects: A total of 37 students research projects were completed.
2. Degree Awards: A total of 67 degrees were awarded to students based on laboratory work.
3. Student Research: Several undergraduate and postgraduate students completed research projects, gaining valuable hands-on experience in microbiological techniques.

List of students projects completed during academic year 2023-2024 were presented in Table-2 to 5



**Table- 1: LIST OF EQUIPMENT PURCHASED DURING THE ACADEMIC YEAR 2023-2024**

Sl. No.	Item	Code	Name of Suppliers	Invoice number and Date/year of Purchase	Quantity	Tax including Price	Location
1	Prima Duo Thermal Cycler Himedia (LA 948-1 nos)	PRC OUS-426/23 Dated 26/12/2023	Vidya Lab Equipments and Chemicals	GST/D/2825/23-24 Dated 26 Dec. 23	1	271400.00	Central Instrumentation Laboratory
2	µPET Autoclavable Micropipette 10-100µl Himedia	PRC-29	Vidya Lab Equipments and Chemicals	GST/D/2828/23-24 Dated 26 Dec. 23	1	10530.00	B. Sc. Microbiology
3	µPET Autoclavable Micropipette 100-1000µl Himedia	PRC-30	Vidya Lab Equipments and Chemicals	GST/D/2829/23-24 Dated 26 Dec. 23	1	10524.00	B. Sc. Microbiology
4	µPET Autoclavable Micropipette 100-1000µl Himedia	PRC-31	Vidya Lab Equipments and Chemicals	GST/D/2829/23-24 Dated 26 Dec. 23	1	10524.00	B. Sc. Microbiology
5	µPET Autoclavable Micropipette 100-1000µl Himedia	PRC-32	Vidya Lab Equipments and Chemicals	GST/D/2830/23-24 Dated 26 Dec. 23	1	10524.00	B. Sc. Microbiology
6	Precision Gold Balance PGB220 Wensler	PRC/PG/E.BAL.5-Jun-23	Akshaya Associates	AA/0624 Dated 13 Jun-23	1	14500.00	M.Sc. Microbiology
7	Precision Gold Balance PGB220 Wensler	PRC/MB/e.Bal.6-Jun-23	Akshaya Associates	AA/0680 Dated 19 Jun-23	1	14500.00	B.Sc. Microbiology
8	Accupipet T-100, 10-100µl Tanson		Akshaya Associates	AA/2646 501602861704	1	6768.00	M.Sc. Microbiology

9.	Accupipet T-200, 20-200 $\mu$ l Tarson		Akshaya Associates	AA/2646 501602861704 Dated 24-Jan2024	1	6768.00	M.Sc. Microbiology		
10.	Accupipet T-20, 2-20 $\mu$ l Tarson		Akshaya Associates	AA/2646 501602861704 Dated 24-Jan2024	1	6768.00	M.Sc. Microbiology		
11.	Micropipette variable (100- 1000 $\mu$ l)		Labco scientific	KKD-433/23-24 Dated 14 Dec-23	1	1600	M.Sc. Microbiology		
12.	Micropipette variable (2-20 $\mu$ l)		Labco scientific	KKD-433/23-24 Dated 14 Dec-23	1	1600	M.Sc. Microbiology		
13.	Micropipette variable (2-200 $\mu$ l)		Labco scientific	KKD-433/23-24 Dated 14 Dec-23	1	1600	M.Sc. Microbiology		
14.	Micropipette variable (100- 1000 $\mu$ l) Liquid handling systems		Prarthana Surgicals and Chemicals	PS000270 dated 19- 06-23	1	1600	B. Sc. Biochemistry		
15.	Micropipette (1000 $\mu$ l ) Liquid handling systems		Prarthana Surgicals and Chemicals	PS000270 dated 19- 06-23	1	1600	B. Sc. Biochemistry		
16.	IFB DC 2483 Refrigerator 2221		Allwyn Stores Pulpally	No.564 Dated 19- Dec-23	1	19500.00	B. Sc. Biochemistry		

**Table -2: UG Project- Department of Microbiology (2023-2024)**

Sl. No.	Name of Guide	Name of Students	Project Topic
1.	Mrs. Smitha Chacko	Athira A V Alan Philip Alinda James Jithin Joseph Nivedhya Raj	Silver nanoparticles from soil bacteria: Green synthesis, characterization and activity evaluation
2.	Ms. Vijisha M.C.	Albin Shaji Aneeha Nushrin Gayathri Santhosh Nandana P C Shana Shirin P	Bioproduction, characterization, antioxidant and antimicrobial activities of extracellular melanin pigment produced by soil actinomycetes
3.	Mr. Abdul Bari K. K.	Aiswarya K Dinulal T S Fathima Riya Sayana Sara Sabu Sanet Celestian	Genetic profiling of blaCTX, blaTEM, and int1-1 genes in E. coli isolates across varied environmental sources
4.	Dr. Sreedevi R.	Aysha Nabla Sangeetha Sona K J	Synthesis of silver nanoparticles using fungal pigment from <i>Aspergillus</i> sp., its characterization and evaluation of antibacterial activity
5.	Mrs. Jayasudha M.	Sahad M Ayana P Mubashira P M Sanija V K	Production of PHB by <i>Bacillus</i> sp., isolated from soil
6.	Dr.Riju M.C.	Emmanuel C M Fathima Rinsha Vinitha V C	Preliminary study on production of unripened banana peel wine using inoculation of <i>Aspergillus niger</i> and <i>Saccharomyces</i> sp.,

**Table -3: PG Project- Department of Microbiology (2023-2024)**

Sl No	Name of Guide	Name Student	Title
1	Ms. Vijisha M.C.	Abhirami K A	Production of L-Asparaginase from <i>Streptomyces bikiniensis</i> -Statistical optimization using response surface methodology
2	Dr. Champa H/Mr. Abdhul Bari K.K.	Anamika P M	Virulence analysis, antimicrobial susceptibility and molecular detection of biofilm producing mrkD gene of <i>Klebsiella</i> isolates from different clinical samples
3	Mrs. Smitha Chacko	Arys P S	Soil derived <i>Klebsiella pneumoniae</i> for biocatalytic L-Glutaminase production and green synthesis of silver nano particles
4	Dr. Sreedevi R.	Femiya Thomas	Comparative molecular docking studies of chlorobornedol using autodock
5	Mr. Abdhul Bari K.K.	Hudha K T	Study of Biofilm Formation from different isolatiohn of various clinical specimen
6	Mr. Abdhul Bari K.K.	JiljinaHameed	Study on the combinatorial antibacterial and antibiofilm effect of bacitracin and antibiotics against <i>Staphylococcus aureus</i> and <i>E.coli</i>
7	Mr. Abdhul Bari K.K.	KhadeejaAnsi V A	Prevalence study of MRSA with an emphasis on biofilm production and screening of meca gene
8	Mrs. Jayasudha M.	Nanditha T R	Enhanced polyhydroxy butyrate production by isolated <i>Azotobactersp</i> from soil
9	Mrs. Jayasudha M.	Nishahina MK	Polyhydroxy butyrate based biodegradable polymer production from <i>Bacillus</i> sp isolated from soil
10	Dr. Sreedevi R.	Sibiya Wilson	Biosynthesis and characterization of silver nanoparticles using extracellular pigment from <i>Aspergillus terreus</i> : Evaluation of its antimicrobial and anthelmintic activities
11	Mr. Abdhul Bari K.K.	Smera K M	Determination of virulence factors in uropathogenic <i>E coli</i> and analysis of antibiotic sensitivity pattern with molecular detection of fimH gene
12	Mr. Abdhul Bari K.K.	Sumayya M C	Study on the combinatorial, antibacterial and antibiofilm effect of colistin and antibiotics against <i>Staphylococcus aureus</i> and <i>E coli</i>
13	Dr. Sreedevi R.	Alex lawrence	Identification and bioprospecting of 13- Docosanamide, z(Z) from <i>Penicilliumcitrinum</i>

14	Dr. Sreedevi R.	Ayda Aspin Abraham	Partial purification of n-hexadecanoic acid from <i>Penicillium citrinum</i> and its application studies
15	Dr. Sreedevi R.	Sarun T B	Partial purification of eicosane from <i>Penicillium citrinum</i> and its application studies

**Table -4: UG Project- Department of Biochemistry (2023-2024)**

S.No	Guide in Charge	Name of students enrolled	Title of the Project
1.	Mr. Jessin George	Krishnaja Sandra Kripa	Phytochemical and antimicrobial activity of <i>Pterospermum rubiginosum</i>
2.	Ms. Subhashree P.G	Gayathry S Ramesh Asmina Fathiuma Ajona jiji	Biosynthesis of silver nanoparticles and its characterization
3.	Ms. Akina Prasad	Archana P.S Adithiya Gayathry N	Extraction of Caffeine from different tea powders
4.	Ms. Vishnu Priya N.M	Akhila Devassiya Aneena Shaju Muhammed Shanil	Comparative study on phytochemical and antimicrobial activity of ethanolic and methanolic extract of <i>Centratherum punctatum</i>
5.	Dr. Jomel Sebastien	Durga T Gayathry M, Niranjana	Estimation and Comparison of total cyanogens in Cassava tubers, leaves and peel.

Table -5: PG Project- Department of Biochemistry (2023-2024)

S No	Guide in charge/Co-Guide	Name of the student	Topic
1	Dr N.M Krishnakumar/Dr Sri Rashmy M	Amana Fathima	Biosynthesis and characterization of silver nanoparticles using Hibiscus HispidissimusGriff.and evaluation of its antibacterial and antioxidant effects
2	Dr. Krishnasree Dr. Sri Rashmy M	Aswathy T.P	Physiochemical and Biochemical Dynamics of Eleusine coracana Fermentation
3	/Dr. Krishnasree Dr. Sincy Varghese	Abhira Thomas	Exploring probiotics in fermented foods:Isolation,characterization and identification of GABA producers
4	Dr Sams Juliet/Dr. Sincy Varghese	Jhana Thasnoom K. P	Chemoprofiling of Embelliaribesburm f. From tropical evergreen deciduous forest of south Wayanad division.Isolation of Embelin and its antioxidant property
5	Dr. Sincy Varghese	Khalocla T P	Effect of Bisphenol a on oxygen consumption behavioural modification in fresh water fish
6	Dr.Krishnasree /Ms.Shobitha Joseph	Nandhana P S	Revealing the efficiency of bioprocessing on nutrient availability and antinutrient reduction in pennisetum glaucum
7	Dr. Anu Augasteine /Dr. Sincy Varghese	Rasmina T M	Characterization of salinity associated traits in asiatic mangrove
8	Dr.Krishnasree /Ms.Shobitha Joseph	Safreena P	Jackfruit valorization: Formulatingtraditional fermented food batters with emphasis on biochemical composition and nutrient profiling
9	Dr Anu Augasteine/Dr Sri Rashmy M	Sahala Sherm V K	Comparative analysis of germination efficiency and biochemical assays under salinity stress in Cashew roots and leaves
10	Dr. Sri Rashmy M	Staniya Francis	Ethanobotanical survey of indigenous medicinal plants for cancer treatment in muthanga forest range of Wayanad district,Kerala,India
11	Dr.Krishnasree /Ms.Shobitha Joseph	Swathy V.V	Exploring probiotics in fermented foods:isolation,characterization and identification of EPS producers

## Conclusion

The Microbiology Laboratory is a well-equipped facility that supports teaching, research, and academic excellence in the field of microbiology. The laboratory's infrastructure and equipment are of high quality, and the usage statistics demonstrate its importance in supporting student learning and research. The Microbiology Laboratory has had a successful year, with significant academic achievements and a high level of laboratory usage. The laboratory's infrastructure and equipment are well-maintained, except for the cold centrifuge, which is currently under maintenance. We look forward to another productive year, supporting teaching, research, and academic excellence in the field of microbiology.

## Recommendations

1. Regular maintenance of equipment to ensure optimal performance.
2. Upgradation of the cold centrifuge to ensure its optimal functioning.
3. Increased funding to support research projects and student research initiatives.

## Acknowledgments

We acknowledge the support of the Management and college administration, faculty members, and laboratory staff in procuring and maintaining the laboratory's infrastructure and equipment.



Dr. Riju. M.C  
Convenor  
Laboratory Committee



ASSISTANT PROFESSOR  
IN-CHARGE OF PRINCIPAL  
PAZHASSIRAJA COLLEGE  
PULPALLY - 673579

