# DEPARTMENT OF MICROBIOLOGY
# GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG

## Information Regarding Activities done in the Department Under RUSA 2.0

### Session 2024-25

| S. No. | Objective | Amount Received | Amount Consumed | Amount Left |
|---|---|---|---|---|
| 1. | Guest Lectures (Teaching and Learning) | 50,000/- | 50,000/- | Nil |
| 2. | Hands on Training (Skill Development) | 25,000/- | 25,000/- | Nil |
| 3. | National Conference (Capacity Building) | 2,00,000/- | 1,94,000/- | Nil |
| 4. | Extension Program | 10,000/- | 10,000/- | Nil |
| Total | | 2,85000/- | 270 | Nil |

Dr. Pragya Kulkarni
Head, Microbiology,
Govt. V.Y.T. PG Autonomous College, Durg

| S. No. | Activity | Date |
|---|---|---|
| 1. | **Teaching and Learning** | |
| | **Guest Lectures on Advancements in Microbiology** | **14.01.2025 to 22.01.2025** |
| | **Lecture on Medical Microbiology** | **04.03.2025** |
| | **Lecture on One Health: Zoonotic Diseases & Demonstration of Foldscope** | **24.02.2025** |
| | **Lecture on Good Manufacturing Practices (GMP)** | **12.03.2025** |
| 2. | **Skill Development Activities** | |
| | **Workshop on Mushroom Cultivation** | **2-3 January, 2025** |
| | **Workshop and Dry lab on Bioinformatics** | **11-12 January, 2025** |
| | **Field Visit to Organic Vegetable Farm** | **01.02.2025** |
| 3. | **Extension Activity** | **03.02.2025** |
| 4. | **National Conference** | **7-8 February 2025** |

# TEACHING AND LEARNING

## Organization of Guest Lectures in the Department

**Objective:**

Organizing guest lectures in the Microbiology Department under the "Teaching-Learning" head is a fantastic initiative with multiple objectives that significantly enhance the educational experience for students. Here are the key objectives:

1. **Enhancing Practical Knowledge and Skill Development:**
2. **Broadening Perspectives and Exposure:**
3. **Career Guidance and Networking Opportunities:**
4. **Updating Curriculum and Knowledge Base:**
5. **Fostering Interdisciplinary Learning:**
6. **Motivation and Engagement:**

## Guest Lecture Series on Advancements in Microbiology (14.01.2025 to 22.01.2025)

The Department organized a Lecture Series from 14th to 22nd January 2025, inaugurated with traditional lamp lighting and Saraswati Vandana. The event began with Dr. Ajay Kumar Manhar discussing career prospects in microbial sciences, followed by Dr. Loknath Deshmukh's insights on translating lab research into marketable innovations. On 16th January, Dr. Pratima Gupta spoke on clinical and industrial applications of microbes, while Dr. D.L.S.V.G.K. Kaladhar explored emerging microbial biological systems. On 21st January, Dr. Shivendra Singh Dewhare addressed genetic engineering and its ethical dimensions, and Dr. V. Shanthi highlighted the role of synthetic biology in microbiology. The series concluded on 22nd January with Dr. Swetlana Nagal's session on Actinomycetes in antimicrobial resistance and Prof. Khageswar Prasad's talk on soil bioremediation and environmental issues related to Bisphenol A.

## Lecture on One Health: Zoonotic Diseases & Demonstration of Foldscope (24.02.2025)

A lecture on *"One Health: Zoonotic Diseases"* was organized to raise awareness about the interconnected health of humans, animals, and the environment. Ms. Yogita Dhimar, Scientist at ICAR-NIBSM and a 2015 alumna of the department, delivered the session, discussing the definition, significance, and common examples of zoonotic diseases such as rabies, avian influenza,

leptospirosis, and brucellosis. She explained the various transmission routes and emphasized preventive strategies including vaccination, hygiene, and environmental care. The importance of interdisciplinary collaboration in preventing zoonotic outbreaks and future pandemics was also highlighted.

The session was followed by a live Foldscope demonstration, introducing students to this low-cost, portable microscope. Students learned how to assemble and use the Foldscope to observe microbial slides and environmental samples. The demonstration showcased its utility in microbiological studies and field research. The interactive session encouraged active participation and curiosity among students.

## Guest lecture on Medical Microbiology (04.03.2025)

A special session on *"Medical Microbiology"* was conducted to deepen students' understanding of the role of microorganisms in human health. Led by Dr. Rashmi Parihar from Govt. E.R.R. College of Science, Bilaspur, the session focused on the diagnosis, treatment, and prevention of microbial infections. Key topics included types of pathogenic microbes (bacteria, viruses, fungi, parasites), common infectious diseases, laboratory diagnostic techniques, antimicrobial resistance (AMR), and the importance of vaccination and infection control.

## Guest lecture on Good Manufacturing Practices (GMP) (12.03.2025)

A guest lecture on *"Good Manufacturing Practices (GMP)"* was conducted to familiarize students with quality assurance principles in the pharmaceutical, food, and biotechnology sectors. The session was delivered by Dr. Debashish Sahoo, Scientist at Bonneville, Bangalore, and an expert in regulatory compliance and industrial microbiology.

Dr. Sahoo discussed the fundamentals of GMP, highlighting global standards such as WHO, FDA, and ISO. Key principles like proper documentation, hygiene, quality control, and personnel training were emphasized. He elaborated on GMP’s role in ensuring product safety and consistency, the importance of Quality Risk Management (QRM), and the significance of audits and inspections in maintaining compliance

**Significance:** The activity was organized to enhanced Academic Knowledge, Career Awareness & Opportunities, to provide exposure to Emerging Fields, Practical Applications & Industry Relevance and Interactive Learning & Research Encouragement to the students.

The lecture series comprised eight sessions led by experts from various institutions, and significantly aimed at enriching participants' knowledge of emerging trends and applications in microbiology.

## Number of Students Benefitted: 48







# DEPARTMENT OF MICROBIOLOGY
## GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG

## EXTENSION PROGRAM

- Presentation on Scope and Importance of Microbiology: Highlighted various fields like medical, industrial, environmental, and agricultural microbiology, and discussed career opportunities.
- Poster Display on Common Diseases: Educated students on infectious diseases such as tuberculosis, dengue, typhoid, and influenza, including their causes, transmission, and prevention.
- Live Demonstration of Immune Reactions: A practical antigen-antibody experiment showcased immune responses, making complex concepts more understandable.
- Interactive Q&A Session: Students actively engaged, asked questions, and showed keen interest in learning more about microbiology.

Students from **classes 11th and 12th** participated with great enthusiasm in all the activities conducted by the faculty and PG students. They showed keen interest in the subject, engaging actively in discussions during both the **presentation and the live demonstration**. Their curiosity was evident as they eagerly asked questions and sought clarifications on various microbiological concepts.

The interactive session not only enhanced students' knowledge but also inspired them to consider microbiology as a **potential career path**. Many students expressed their interest in pursuing microbiology for their **undergraduate studies**, realizing its importance in healthcare, research, and industry. The session concluded with motivational words from the faculty, emphasizing the **scope, relevance, and future opportunities** in the field.

**Number of Students Benefitted: 27**

# DEPARTMENT OF MICROBIOLOGY
## GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG

## SKILL DEVELOPMENT ACTIVITIES

## Workshop and Hands on Trainings for Skill Development of Students

### Workshop on Mushroom Cultivation

**(2-3 January, 2025)**

A two-day workshop on Oyster mushroom cultivation was conducted under the guidance of Mrs. Laleeta Kurre. The workshop covered an overview of cultivable mushroom varieties, their nutritional significance, and the step-by-step process of cultivating Oyster mushrooms (Pleurotus spp.).

During the session, the resource person demonstrated the pretreatment and processing of paddy straw as a substrate for mushroom growth. The spawning process was carried out in layers, followed by substrate bag packing. The bags were then incubated in a dark environment for 15–20 days to allow mycelial growth. Once the mycelium had fully colonized the substrate, the bags were opened to facilitate mushroom sprouting.

Additionally, the workshop included practical demonstrations on product quality management, processing, and preservation techniques to ensure optimal yield and shelf life.

**Outcome and Significance:** A two-day workshop on Oyster mushroom cultivation was successfully conducted for skill enhancement of PG students of Microbiology. The session provided participants with comprehensive knowledge on the types of cultivable mushrooms, their nutritional value, and the step-by-step cultivation process of Oyster mushrooms (Pleurotus spp.)

Participants gained theoretical and practical insights into mushroom cultivation, including substrate preparation, spawning, and incubation techniques.

The workshop included a live demonstration of mushroom cultivation under controlled conditions, ensuring practical learning. Attendees learned about the mycelial spread phase and the conditions required for successful fruiting of mushrooms.

Techniques for maintaining product quality, processing, and preservation were demonstrated, equipping participants with skills to enhance the shelf life and marketability of the produce.

The workshop encouraged participants to explore mushroom cultivation as a sustainable livelihood option, fostering interest in commercial production. The workshop proved to be highly beneficial for participants, equipping them with essential skills and knowledge to start their own Oyster mushroom cultivation. The interactive demonstrations and practical sessions significantly enhanced their understanding and confidence in the process.

**Number of Students Benefitted: 54**



# Workshop and Dry lab Exercises on Bioinformatics and Applications

## (11-12 January, 2025)

The Resource Person, Dr. Anubhuti Jha from St. Thomas College, Bhilai, conducted the two days' workshop on Bioinformatics and its applications.

A bioinformatics workshop was designed to teach participants the use of computational tools for biological data analysis. The workshop was useful for students and researchers in fields like genetics, molecular biology, and biotechnology. It is time saving and providing accurate results with documentary proofs for further analysis or interpretations.

**Key Topics covered in the workshop:**

- **Introduction to Bioinformatics** – Basics and applications.
- **Biological Databases** – GenBank, UniProt, KEGG, PDB.
- **Sequence Analysis** – BLAST, Clustal Omega, MUSCLE.
- **Genomic Data Analysis** – Genome assembly, annotation tools.
- **Phylogenetics** – MEGA, RAxML, PHYLIP.
- **Protein Structure Prediction** – Swiss-Model, AlphaFold, PyMOL.
- **Gene Expression Analysis** – RNA-Seq, DESeq2, EdgeR.

**Hands-on Sessions** – Practical training with real datasets.

**Day 1 Biological database:** Shae explained that the biological data are organized for efficient storage, retrieval, and analysis. These databases store various types of biological information, including DNA sequences, protein structures, metabolic pathways, gene expression data, and more.

## Types of Biological Databases:

Biological databases can be categorized based on the type of data they store:

1. **Sequence Databases**
- **Nucleotide Sequence Databases** (store DNA and RNA sequences)
- **GenBank** (NCBI); **EMBL** (European Molecular Biology Laboratory); **DDBJ** (DNA Data Bank of Japan)
- **Protein Sequence Databases**
- **UniProt** (Universal Protein Resource); **Swiss-Prot** (manually curated, high-quality); **TrEMBL** (automatically annotated)
2. **Structure Databases** (store 3D structures of biomolecules)
- PDB (Protein Data Bank); MMDB (Molecular Modeling Database)
3. **Genomic Databases** (store whole-genome sequences and annotations)
- Ensemble; UCSC Genome Browser; NCBI Genome Database
4. **Pathway and Interaction Databases**
- KEGG (Kyoto Encyclopedia of Genes and Genomes); Reactome; BioCyc
5. **Gene Expression and Functional Genomics Databases**
- GEO (Gene Expression Omnibus), ArrayExpress
6. **Ontology and Classification Databases**
- GO (Gene Ontology); Pfam (Protein Families Database)

## Uses of Biological Databases

- **Research & Discovery:** Understanding gene function, disease mechanisms, and evolutionary relationships.
- **Drug Discovery:** Identifying potential drug targets.
- **Comparative Genomics:** Comparing genes across species.
- **Biomedical Applications:** Diagnosing genetic disorders and personalized medicine.

**Day 2 Bioinformatic tools:** Bioinformatics tools are software applications designed to analyse biological data, such as DNA sequences, protein structures, and gene expressions. These tools can be categorized based on their function.

## Types of Bioinformatics Tools:

1. **Sequence Alignment Tools:** Used to compare DNA, RNA, or protein sequences to find similarities.

- **BLAST (Basic Local Alignment Search Tool)** – Compares sequences with databases.

**Clustal Omega** – Multiple sequence alignment tool.

**MUSCLE** – Efficient multiple sequence alignment.

2. **Genome Analysis Tools:** Used for genome assembly, annotation, and comparison.

**Bowtie** – Aligns short DNA sequences to reference genomes.

**SPAdes** – Genome assembly for bacteria.

**MAKER** – Genome annotation.

3. **Phylogenetic Analysis Tools:** Used to study evolutionary relationships between organisms.

**MEGA (Molecular Evolutionary Genetics Analysis)** – Constructs phylogenetic trees.

**PHYLIP** – Suite of programs for phylogenetic analysis.

**RAxML** – Maximum likelihood-based phylogeny.

4. **Protein Structure Prediction Tools:** Used to model 3D structures of proteins.

**Swiss-Model** – Automated protein structure prediction.

**AlphaFold** – AI-based protein structure prediction.

**Phyre2** – Predicts protein structures from sequences.

5. **Functional Annotation Tools:** Used to determine the function of genes and proteins.

**InterProScan** – Predicts protein functions using domain analysis.

**GO (Gene Ontology)** – Provides functional annotations for genes.

6. **Metabolic Pathway Analysis Tools:** Used to study biochemical pathways.

**KEGG (Kyoto Encyclopedia of Genes and Genomes)** – Analyzes metabolic pathways.

**BioCyc** – Collection of pathway/genome databases.

7. **Gene Expression Analysis Tools:** Used to analyze gene expression data from microarrays or RNA-Seq.

**DESeq2** – RNA-Seq differential expression analysis.

**EdgeR** – Statistical analysis of RNA-Seq data.

**GEO2R** – Analyzes gene expression from NCBI GEO.

8. **Molecular Docking and Drug Discovery Tools:** Used to model drug-receptor interactions.

**AutoDock** – Molecular docking simulation.

**SwissDock** – Online docking tool.

**DockThor** – Predicts ligand-protein interactions.

9. **Data Visualization Tools:** Used to visualize biological data, such as phylogenetic trees, protein structures, and sequence alignments.

**PyMOL** – 3D visualization of proteins.

**Cytoscape** – Network visualization for molecular interactions.

**Jalview** – Visualizing multiple sequence alignments.

10. **Miscellaneous Tools: Bioconductor** – R-based tools for bioinformatics analysis.

**Galaxy** – Web-based platform for genomic research.

**PLINK** – Genome-wide association study (GWAS) analysis.

**Number of Students Benefitted: 54**


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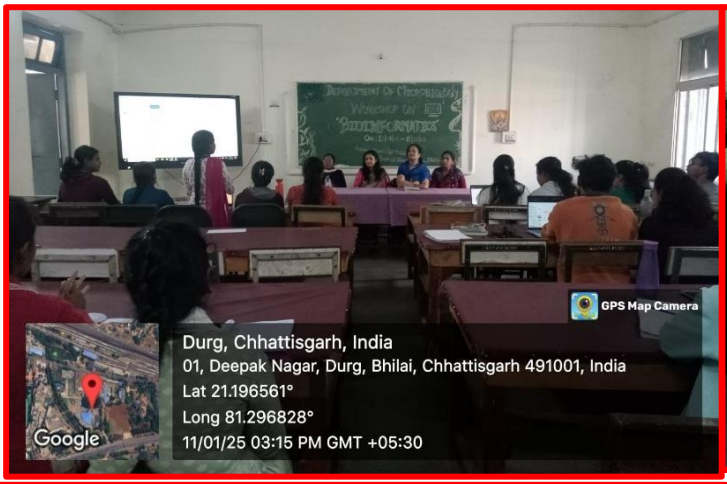
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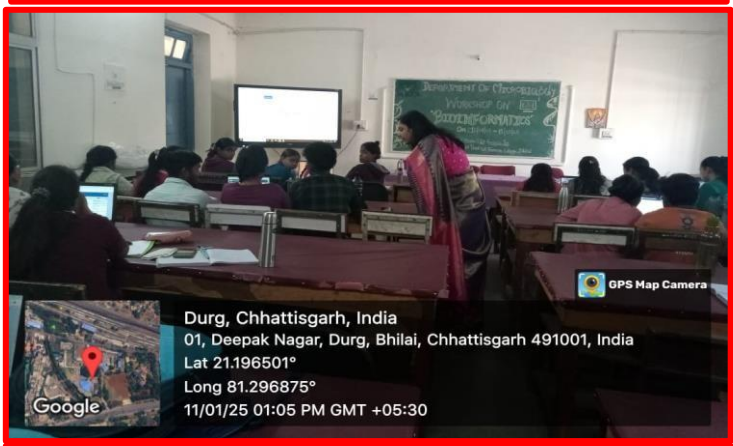
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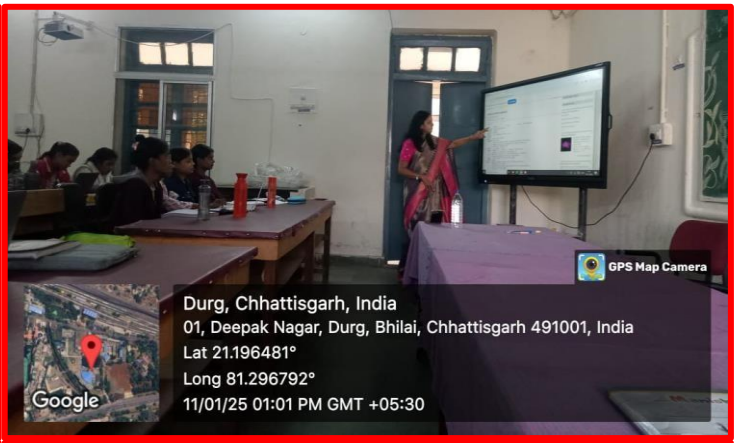
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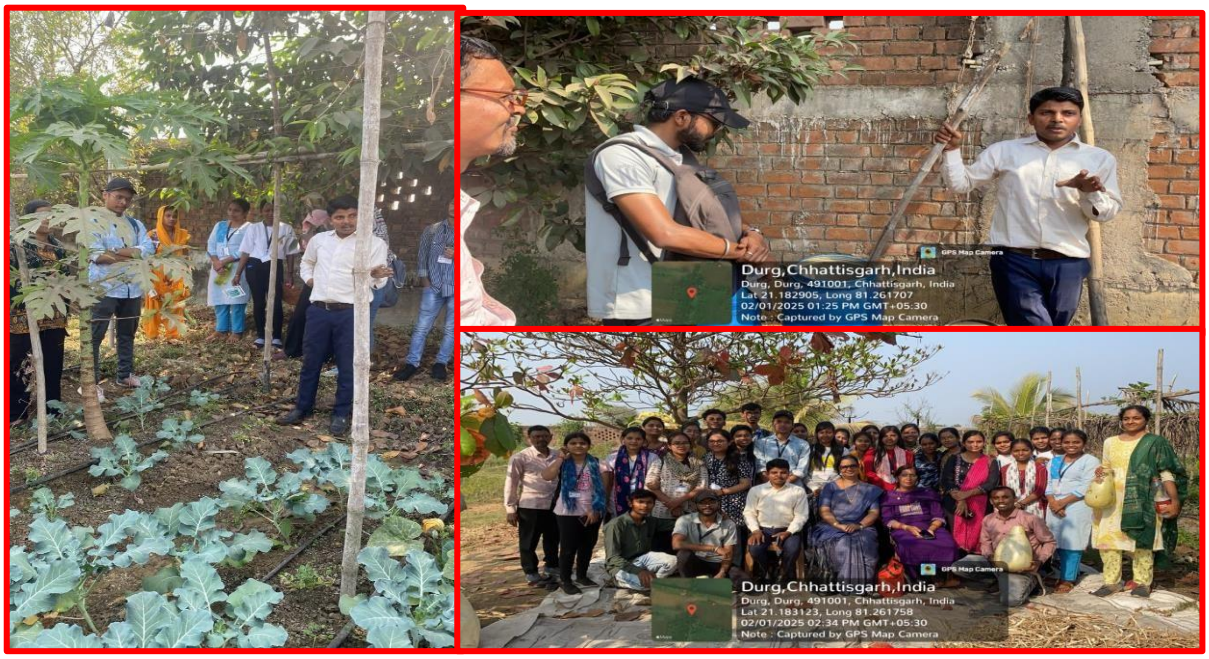
# Field Visit to Organic Vegetable Cultivation Farm

## (01.02.2025)

The postgraduate students of Microbiology, accompanied by faculty members, visited Mokshit Natural and Organic Farm in Ganj Para, Durg, on 01.02.2025. Spanning 46 acres, the farm is dedicated to organic vegetable cultivation, completely avoiding chemical fertilizers and pesticides. The owner, Shri Shashiraj Kumar, provided insights into year-round vegetable production and demonstrated multi-layered farming techniques. This method optimizes land use by incorporating underground crops, herbs, shrubs, trees, and climbers simultaneously. The farm also includes medicinal plants and relies on organic fertilizers made from agro-waste, applied through drip irrigation. Soil mulching is used to retain moisture and minimize water loss. Instead of synthetic pesticides, natural alternatives are prepared by fermenting cow urine with neem leaves, whey water, and jaggery for up to 30 days. Green manure, produced through the fermentation of green weeds, is enriched with whey water and jaggery before application. Shri Shashiraj emphasized the farm's zero-waste approach, ensuring all produce is either utilized or recycled to enhance soil fertility. Dry turmeric leaves were used to make pillows, blended with cotton, and were believed to be beneficial for individuals suffering from migraines and high blood pressure. He also introduced unique potato varieties—black, red, and white—known for their antioxidant and anti-diabetic properties.

**Outcome:** The visit provided an enriching hands-on learning experience for the students, offering valuable insights into modern farming techniques, sustainable agricultural practices, and the dedication required to cultivate organic produce. The detailed explanations and the owner's willingness to share his expertise made the visit both informative and inspiring. This experience was truly eye-opening for our students, bridging the gap between theoretical knowledge and real-world applications. The time and effort invested in educating was sincerely appreciated.

**Number of Students Benefitted: 36**

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# DEPARTMENT OF MICROBIOLOGY
## GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG

**NATIONAL CONFERENCE**
**ON**
**"EMERGING HORIZONS IN BIOLOGICAL SCIENCES"**
**(EHBS 2025)**
**7th and 8th February 2025**

Biological sciences are fundamental to life, shaping everything from our food and resources to the environment and technological advancements. They fulfil essential needs such as food, fibre, fuel, and fertilizers, relying on natural and biological processes. With a profound impact on both human well-being and ecological balance, biology remains ever-evolving, integrating new technologies to enhance sustainability and improve lives. Its continuous transformation drives innovation, ensuring a harmonious relationship between nature and human progress.

## Objectives:

**Exploration And Conservation of Microbial Biodiversity For:**

* Animal Sciences
* Bioinformatics and computational biology
* Ecology and Evolutionary Biology
* Indigenous Knowledge and Scientific Validation
* Microbial Technology
* Nanosciences
* Plant and Agricultural Biotechnology

## Chief Guest for Inauguration:

Dr. Bhuvnesh Kumar, Sharda University, Greater Noida

## Key Note Address:

**Dr. S.K. Goswami, JNU, New Delhi**

Topic: Oxidative Stress to Redox signalling: A fascinating Journey.

## Invited talks:

1. **Dr. Anupam Mittal, PGIMER, Chandigarh**
   Topic: Induced Pluripotent Stem Cell for cardiac disease modelling and drug repurposing and regeneration.
2. **Dr. Mrigya Babuta, Hyderabad University, Hyderabad**
   Topic: Dysregulated Autophagy and Lysosomal function at an intersection of increased extracellular vesicle production in alcohol associated liver disease.
3. **Dr. Arun Upadhyay, IIT, Bhilai**
   Topic: Novel Amyloid purification strategy identifies new Amyloid beta-interacting partners.
4. **Dr. Arti Shanware, LIT University, Nagpur**
   Topic: Biofertilizer and Biopesticide

5. **Dr. K.K. Sahu: Professor, SoS in Biotechnology, Pt. RSU, Raipur**
   Topic: Resuscitation of Aged seeds via Nanomaterials.
6. **Dr. Varun Chaudhary, IISHER, Bhopal**
   Topic: The importance of Drosophila rer1 in regulating protein homeostasis and competitive cell survival

The conference commenced on February 7, 2025, with Saraswati Vandana and a formal welcome of the guests. Dr. Pragya Kulkarni, the convener, delivered the welcome address and introduced the conference theme, followed by blessings from Patron Dr. Ajaya Kumar Singh.

The inaugural speech was presented by the chief guest, Dr. Bhuvnesh Kumar from Sharda University, Greater Noida. He emphasized the significance of life sciences in the current era and shared insights from his tenure at DRDO. Encouraging students and research scholars, he advocated for interdisciplinary research to drive innovation. The keynote address was delivered by Dr. S.K. Goswami from JNU, New Delhi, who provided an in-depth discussion on oxidative stress and redox signalling. He explained that free radicals and reactive species, though transient, play a crucial role in biochemical processes, influencing cell division, differentiation, metabolism, and gene regulation.

The session was seamlessly conducted by Dr. Shweta Pandey.

The first invited talk was delivered by Dr. Anupam Mittal from PGIMER, Chandigarh, who discussed the role of induced pluripotent stem cells in cardiac disease modulation. He explained how therapies based on adult and embryonic stem cells have emerged as promising strategies for regenerating damaged cardiac tissues and restoring heart function. Dr. Mrigya Babuta from Hyderabad University, Hyderabad, presented the second invited talk, focusing on the autophagy-lysosomal pathway. She highlighted its role in maintaining cellular viability by facilitating the targeted degradation of damaged organelles in autolysosomes. Additionally, she elaborated on the significance of extracellular vesicles in alcohol-associated disorders. The third invited talk was delivered by Dr. Arun Upadhyay from IIT Bhilai, who introduced a novel amyloid purification strategy for the detection of Alzheimer's disease, offering insights into advancements in neurodegenerative disease diagnostics.

The post-lunch session was dedicated to oral and poster presentations by participants. A total of 28 oral presentations were scheduled for the conference out of which, 05 were delivered on the first day. Altogether, 27 posters were evaluated by the dignitaries, with Dr. Usha Sahu, Head of the Department of Zoology, and Dr. Mrigya Babuta from Hyderabad serving as judges for the competition.

On the second day, the fourth invited talk was delivered by Dr. Arti Shanware from LIT University, Nagpur, on biofertilizer and biopesticide production and their transfer to farmers. She shared that their department maintains pure cultures of 28 beneficial microorganisms, which are used to produce both solid and liquid biofertilizers. She emphasized their commitment to transferring this technology to local farmers after successful field trials.

The fifth invited talk was presented by Dr. K.K. Sahu from Pt. R.S. University, Raipur, who discussed the resuscitation of aged seeds using nanomaterials. This was followed by the sixth invited talk by Dr. Varun Chaudhary from IISER, Bhopal, who explained the role of the Drosophila gene in regulating protein homeostasis and its relevance in comparative cell biology for maintaining tissue fitness.

The session concluded with the remaining oral presentations by research scholars and students. The conference saw active participation from 152 attendees representing various disciplines.

**Valedictory Session:**

The valedictory session was chaired by Dr. Ajaya Kumar Singh, Principal and Patron, with Dr. Varun Chaudhary from IISER, Bhopal, as the chief guest. The session was skilfully conducted by organising secretory, Dr. Shweta Pandey.

Dr. Pragya Kulkarni, the convener, opened the session with her concluding remarks, highlighting that the conference successfully met its objectives by fostering discussions on the theme and inspiring participants to explore new research horizons.

The top-ranking participants were recognized with awards, while all attendees received certificates of participation in appreciation of their contributions. The event concluded with a heartfelt address from the Principal, who extended his best wishes and blessings for the continued success of such academic endeavours.

| **Convener** | **Organizing Secretary** |
|---|---|
| Dr. Pragya Kulkarni<br>Head, Department of, Microbiology<br>Govt. V.Y.T. PG Autonomous College, Durg | Dr. Shweta Pandey,<br>Head, Dept. of Biotechnology,<br>Govt. V.Y.T. PG Autonomous College, Durg |
| **Organizing Committee** | **Advisory Committee** |
| Mrs. Rekha Gupta<br>Mrs. Neetu Das<br>Ms. Mrinalini Soni<br>Ms. Kunu Kanda Yashodha<br>Mrs. Hempushpa Urwasha<br>Mrs. Mansi Sahu<br>Mrs. Bharti Ahirwar<br>Miss. Tanya Sahu | Dr. Swaranjit Singh, Ex. Head Env. Biotech. Microbiology CSIR-IMTECH, Chandigarh<br>Dr. Nachiket Kotwaliwale, Director CIPHET, Ludhiana<br>Dr. Samlesh Kumari, CIAE, Bhopal<br>Dr. K. K. Sahu, Head SOS Biotechnology, Pt. RSU, Raipur<br>Dr. Usha Sahu, Govt. V.Y.T. PG Auto. College, Durg |


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Biological Sciences
(EHBS-2025)
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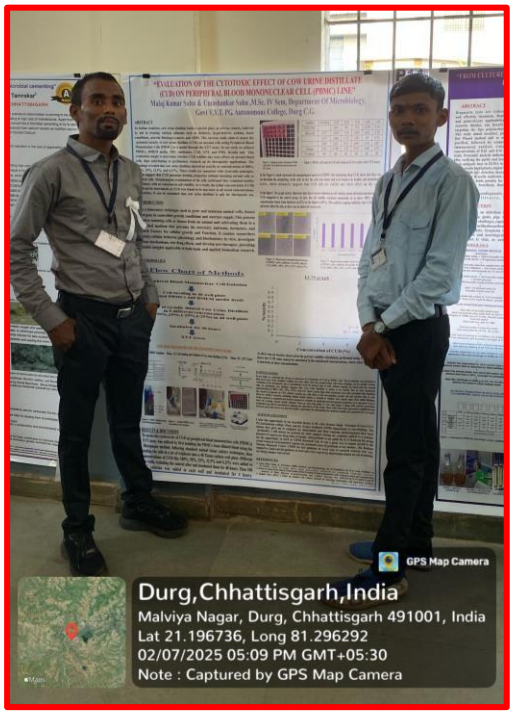
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# DEPARTMENT OF MICROBIOLOGY
# GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG

## Information Regarding Activities done in the Department Under RUSA 2.0

### Session 2023-24

| S. No. | Objective | Amount Received | Amount Consumed | Amount Left | Remark |
|---|---|---|---|---|---|
| 1 | Guest Lectures | 50,000/- | 50,000/- | Nil | |
| 2 | Internship of Students | 1,00,000/- | 1,00,000/- | Nil | - |
| 3 | Hands on Training | 75,000/- | 75,000/- | Nil | - |
| 4 | National Conference (Capacity Building) | 1,00,000/- | 1,00,000/- | Nil | - |
| 5 | Outsourcing | 15340/- | 15340/- | Nil | - |
| 6. | Maintenance of Bioresource Complex | 6000/- | 6000/- | Nil | |
| Total | | 3,46,340/- | 3,46,340/- | Nil | - |

Dr. Pragya Kulkarni
Head, Microbiology,
Govt. V.Y.T. PG Autonomous College, Durg

# DEPARTMENT OF MICROBIOLOGY
# GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG

## Organization of Guest Lectures in the Department

**Objective:**

The organization of guest lectures is a vital component of the Microbiology curriculum, aimed at enhancing the learning experience of students by providing exposure to experts and advanced research topics. These lectures enrich the academic journey, fostering connections between academia and industry while keeping students informed about current trends and research in the field. By offering insights into real-world applications of their studies, guest lectures inspire students to explore diverse career paths. Furthermore, by facilitating connections with professionals, these events not only enhance academic learning but also help build a supportive professional network for students.

**Planning Steps:**

**1. Identifying Topics:** Collaborate with faculty to identify relevant and engaging topics in microbiology, such as: Advances in microbial biotechnology, Environmental microbiology and sustainability and Recent developments in microbial sciences

**2. Guest Speakers:**

- Dr. A. K. Gupta, Rtd Prof and Head, School of Life Sciences, Pt. R.S.U., Raipur
  Topic: Scope and job prospects in Microbiology
  Dr. Ranjana Sahu, BMM Bhilai
  Topic: Bioinformatics: Tools and Techniques
- Dr. A. M. Deshmukh, Professor and national President, Microbiologist Society, Ahmadnagar
  Topic: Microbial Bioprospecting: Exploration of useful Microorganisms
  Application of microorganisms in bioleaching, Biopesticide, Bioplastic, Bio cementing and as Bioweapons
- Dr. Sanjeev Patankar: Rtd. Principal and National Coordinator, MBSI
  Topic: Probiotics: Possible role in combating malnutrition
  Study of tribal food Ambil as probiotic and discussions on prebiotic and symbiotic food material and their importance in human health
- Dr. K. Surya: Scientist, CIPHET, Ludhiana
  Topic: Unlocking Value: Protein extraction from Agro-Industrial Residues
  Types of Agro-industrial residues, biproducts, Co-products and waste for extraction of protein to address protein requirements of expanding population.
- Dr. K.K. Sahu: Professor, SoS in Biotechnology, Pt. RSU, Raipur
  Topic: Microorganisms: Bio producer, Eco-cleaner, Productivity enhancer and Nutrient Provider Application of bacterial consortium for TNT detection, remediation of industrial wastes, heavy mental contamination, plant growth promoter and in boosting the plant growth.

**3. Logistics:** Necessary equipment (projectors, microphones) and venue setup was done and technical requirements with speakers ahead of time was confirmed.

**4. Engagement Activities:** Students were encouraged to prepare questions in advance to facilitate interactive sessions.

**5. Feedback Collection:** After each lecture, feedback from students were collected to assess the effectiveness of the session and to identify areas for improvement.

Thank-you notes were given to the speakers and student feedback were shared. This was considered for establishing a network for future collaborations or lectures.



# DEPARTMENT OF MICROBIOLOGY
## GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG

## Internship
## At
## Central India Institute of Medical Sciences (CIIMS) Nagpur
## on
## "Molecular Techniques"
**(25.12.2023 to 30.12.2023)**

The PG students of Microbiology Completed their 06 Days onsite Internship at Central India Institute of Medical Sciences (CIIMS) Nagpur on Molecular techniques. The funds provided by PM-USHA scheme has been instrumental in ensuring a robust and enriching internship experience of the students.

Altogether, 15 students of M.Sc. Sem III Microbiology completed the internship at advanced instrumentation lab of CIIMS, Nagpur.

| S. No. | Name of Student | S. No. | Name of Student |
|---|---|---|---|
| 1 | Anisha | 9 | Monisha |
| 2 | Danish Vinod Patil | 10 | Pragya Sakhare |
| 3 | Esha Nag | 11 | Sanket Kumar |
| 4 | Falita Kunjam | 12 | Saroj |
| 5 | Kajal Dhritlahare | 13 | Uzma Khatoon |
| 6 | Kedarnath | 14 | Vandana Sidar |
| 7 | Madhvi Sahu | 15 | Vani Thakur |
| 8 | Mansi Shrivastava | | |

## Brief Report

**Introduction:**

The purpose of the internship in molecular techniques was to provide valuable hands-on experience to students and to create way to reaching out to research labs, biotech companies or academic institutions. This also offer to investigate into the fascinating realm of molecular techniques, motivation to pursue further education and research in molecular biology.

**Technical support provided by:**

| | |
|---|---|
| 1 | Dr. Rajpal Singh Kashyap; Director Research, CIIMS, Nagpur |
| 2 | Dr. Amit Nayak; Scientist, CIIMS, Nagpur |
| 3 | Dr. Ali Abbas Husain; Scientist, CIIMS, Nagpur |

| | |
|---|---|
| 4 | Roshni Sharma; HR, CIIMS, Nagpur |
| 5 | Jayshree, Prachi, Riddhi, Sneha; Research Scholars |

**Objectives:**

- Basics of Molecular Biology
- Methods of Nucleic acid extraction (DNA/RNA) from different body fluids
- PCR and its downstream applications
- Targeting the 16s universal gene for bacterial and viral infections
- Real time PCR, RT-PCR, Nested PCR and their applications
- Statistical data analysis in terms of clinical approach

**Lab overview:**

The internship commenced with an orientation to the well-equipped laboratory, where cutting edge instrument like Spectrophotometers, gel electrophoresis apparatus, PCR machines, gel documentation system and sequencers were utilized for diverse experiments.

**Outcome Report:**

A significant portion of the internship focused on DNA extraction from blood and other biological samples. The internship began with an introduction to the laboratory setup and essential safety protocols. This fundamental knowledge ensured a secure working environment and a clear understanding of the importance of precision in molecular experiments.

The students improved their skills in isolation of high-quality DNA, employing both manual and automated spin column extraction methods. Extraction of DNA from bacterial cultures and cerebrospinal fluids was also demonstrated by boiling method.

The application of PCR in amplifying specific DNA sequences was a key aspect and the students became proficient in designing PCR primers, setting up reactions and optimizing conditions for efficient DNA amplification.

The internship involved hands on training in gel electrophoresis techniques for visualizing and analysing DNA fragments followed by interpretation of gel results and discussions on troubleshooting.

The students gained insight in to advance technology through DNA sequencing experiments and participated in the analysis of sequencing data.

Understanding the principles of quantitative PCR and its applications in gene expression analysis for quantifying gene expressions levels was integral part of internship.

The internship emphasized the significance of proficient data analysis. Utilizing software tools for analysis of PCR and sequencing results enhance the ability to draw meaningful conclusions.

The students actively contributed to ongoing research projects, collaborating with experienced scientists and fellow interns.

This exposure provided with holistic view of how molecular techniques contribute to broader scientific events. The internship deepened the understanding of molecular techniques and instilled a sense of appreciation for the pivotal role in advanced biological research.

Exploring the realm of next generation sequencing (NGS) was a key aspect of internship. The students were familiarized with sequencing platforms, library preparation and bioinformatics pipeline used for handling large scale genomic data.

The internship also underscored the importance of quality control in molecular techniques for reliability of experimental results. The students were also expanded their communication skills by preparing reports, presenting findings to the research team and participating in group discussions. Beyond this, the internship provided opportunities for professional development of the students.

# DEPARTMENT OF MICROBIOLOGY
## GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG

## Hands on Training
## On
## "Food Microbiology and Enzyme Technology"
## In Collaboration with
## BioInnovale Lifescience Private Limited, Bengaluru
## (08th January to 14th January 2024)

### Objectives:

The objectives of the workshop were to provide information about how the microorganisms are handled for safety of food, the presence of specific microbial strains, potential contaminants and effectiveness food preservation methods. Source of enzyme to be used for industrial purposes, extraction, purification, quantification and applications.

| S.No. | Resource Persons |
|---|---|
| 1 | Dr. Devashish Sahoo, Director, Bioinnvale Lifescience Pvt. Ltd., Bhubaneswar |
| 2 | Mr. Virendra Vaishnav, Technical Assistant, Bioinnvale Lifescience Pvt. Ltd., Bhubaneswar |
| 3 | Mr. Rajesh Khatik, Technical Assistant, Bioinnvale Lifescience Pvt. Ltd., Bhubaneswar |
| **S.No.** | **Faculty Involvement**<br>**Dept. of Microbiology, Govt. VYT PG Autonomous College, Durg (CG)** |
| 1 | Dr. Pragya Kulkarni |
| 2 | Mrs. Rekha Gupta |
| 3 | Mrs. Neetu Das |
| 4 | Ms. Mrinalini Soni |
| 5 | Ms K.K. Yashoda |
| **Participants** | **52 (PG students and Research Scholars)** |

| S.No. | Name | Class | S. No. | Name | Class |
|---|---|---|---|---|---|
| 1 | Abhinav | M.Sc. Sem II | 26 | Anisha | M.Sc. Sem IV |
| 2 | Aman | M.Sc. Sem II | 27 | Archana Chandrakar | M.Sc. Sem IV |
| 3 | Ankita | M.Sc. Sem II | 28 | Bhumika Karte | M.Sc. Sem IV |
| 4 | Baby Rai | M.Sc. Sem II | 29 | Danish Vinod Patil | M.Sc. Sem IV |
| 5 | Bharti | M.Sc. Sem II | 30 | Divya Rahangdale | M.Sc. Sem IV |
| 6 | Bhavnavi | M.Sc. Sem II | 31 | Esha Nag | M.Sc. Sem IV |
| 7 | Chanchal | M.Sc. Sem II | 32 | Falita Kunjam | M.Sc. Sem IV |
| 8 | Deepshikha | M.Sc. Sem II | 33 | Heena | M.Sc. Sem IV |
| 9 | Devika | M.Sc. Sem II | 34 | Jyoti | M.Sc. Sem IV |
| 10 | Hina | M.Sc. Sem II | 35 | K. Divya Rao | M.Sc. Sem IV |
| 11 | Kanika | M.Sc. Sem II | 36 | Kajal Dhritlahare | M.Sc. Sem IV |
| 12 | Lumisha | M.Sc. Sem II | 37 | Kedarnath | M.Sc. Sem IV |
| 13 | Malaj | M.Sc. Sem II | 38 | Kunjita Deshmukh | M.Sc. Sem IV |
| 14 | Monika | M.Sc. Sem II | 39 | Madhvi Sahu | M.Sc. Sem IV |
| 15 | Naina | M.Sc. Sem II | 40 | Mansi Shrivastava | M.Sc. Sem IV |
| 16 | Parasmani | M.Sc. Sem II | 41 | Monisha | M.Sc. Sem IV |
| 17 | Pooja | M.Sc. Sem II | 42 | Pragya Bhatt | M.Sc. Sem IV |
| 18 | Sangeeta | M.Sc. Sem II | 43 | Pragya Sakhare | M.Sc. Sem IV |
| 19 | Sanjeevani | M.Sc. Sem II | 44 | Sanket Kumar | M.Sc. Sem IV |
| 20 | Shraddha | M.Sc. Sem II | 45 | Saroj | M.Sc. Sem IV |
| 21 | Shristi | M.Sc. Sem II | 46 | Sunita | M.Sc. Sem IV |
| 22 | Suman | M.Sc. Sem II | 47 | Tirishya Gota | M.Sc. Sem IV |
| 23 | T. Prakash | M.Sc. Sem II | 48 | Uzma Khatoon | M.Sc. Sem IV |
| 24 | Tanuja | M.Sc. Sem II | 49 | Vandana Sidar | M.Sc. Sem IV |
| 25 | Umashankar | M.Sc. Sem II | 50 | Vani Thakur | M.Sc. Sem IV |
| 51 | Taniya Sahu | Research Scholar | 52 | Ms. Anamika Sharma | Research Scholar |

## Brief Report:

In-House Hands-on Training was organized for PG students of Microbiology during 8th to 14th January 2024. The objectives of the workshop were to provide expanded understanding of enzymology and offering valuable insights for future applications and research in the field. The hands-on experience on food microbiology enhances understanding of microbial interactions in food contributing to a more comprehensive knowledge of food safety and quality assurance. The workshop was sponsored by PM-USHA for skill enhancement of students.

| | |
|---|---|
| **Day 1**<br>**08.01.2024** | • **Registration**<br>• **Inauguration:** Chief Guest: Dr. M.A. Siddiqui, Principal, Govt. V.Y.T. PG Autonomous College, Durg<br>• **Lecture:** General introduction about food Microbiology. Food as substrate for microorganisms (Dr. Devashish Sahoo) |

| | |
|---|---|
| | • **Practical:** Good manufacturing practices, Quality guidelines of industries, Code of federal regulations, Clinical research, Critical limits and personal hygiene<br>• **Lecture:** Properties and possible sources of Bromelain.<br>• **Practical:** Extraction and primary purification of enzyme by crushing, separation and filtration method from pineapple |
| **Day 2**<br>**09.01.2024** | • **Practical:** Enzyme purification by centrifugation and estimation of total protein, Salt precipitation of enzyme, selection of salt and its importance |
| **Day 3**<br>**10.01.2024** | • **Lecture:** What is dialysis, when and how it is done, about dialysis membrane<br>• **Practical:** Activation of Dialysis membrane, loading, preparation of magnetic steerer and standardization time for dialysis |
| **Day 4**<br>**11.01.2024** | • **Lecture:** Chromatography, types, column beds, elution and elutes<br>• **Practical:** Column packing, and collection of elute, Validation of Pharmaceutical products for microbial contamination, examination of tablets and dairy products, inoculation on different culture media |
| **Day 5**<br>**12.01.2024** | • **Practical:** Total protein estimation by Folin Lowry method and Enzyme assay, preparation of graph, Calibration curve |
| **Day 6**<br>**13.01.2024** | • **Practical:** Observation of culture plates for microbial growth, MBRT for milk samples, SDS PAGE for protein profiling for crude and purified enzyme, Application of pure enzyme for meat tenderization |
| **Day 7**<br>**14.01.2024** | ➢ **Quiz for Participants:** Through Kahoot software (25 Questions based on entire learning of workshop)<br>➢ **Feedback session for Participants**<br>➢ **Certificate distribution** |



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Department of Microbiology
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CERTIFICATE

# DEPARTMENT OF MICROBIOLOGY

## GOVT. V.Y.T. PG AUTONOMOUS COLLEGE, DURG

## NATIONAL CONFERENCE ON MICROBIAL BIOPROSPECTING: EXPLORATION AND CONSERVATION

## (5th and 6th February 2024)

The conference provided an excellent forum for Participants and students to understand and focus on emerging features of MICROBIAL BIOPROSPECTING and it was a modest attempt to generate response from all corners towards awareness of applied aspects of Microbiology.

## Objectives:

**Exploration And Conservation of Microbial Biodiversity For:**

*Agriculture, Food and Nutrition (AFN)

*Secondary Metabolite and Biofuel Production (SBP)

*Bioremediation and Waste management (BRW)

*Nanotechnology, Medicine and Cosmetology (NMC)

*Microbial Biotechnology and GMO (MBG)

*Bioinformatics and computational biology (BIC)

## Chief Guest for Inauguration:

Dr. K. Subramaniam, Member, State Planning Commission, Chattisgarh

## Key Note Address:

1. **Dr. A.M. Deshmukh, Rtd. Principal and national President, MBSI**
   Topic: Microbial Bioprospecting: Exploration of useful Microorganisms
   Application of microorganisms in bioleaching, Biopesticide, Bioplastic, Bio cementing and as Bioweapons

## Plenary Lectures:

1. **Dr. Sanjeev Patankar: Rtd. Principal and National Coordinator, MBSI**
   Study of tribal food Ambil as probiotic and discussions on prebiotic and symbiotic food material and their importance in human health
2. **Dr. K. Surya: Scientist, CIPHET, Ludhiana**
   Types of Agro-industrial residues, biproducts, Co-products and waste for extraction of protein to address protein requirements of expanding population.
3. **Dr. K.K. Sahu: Professor, SoS in Biotechnology, Pt. RSU, Raipur**

Application of bacterial consortium for TNT detection, remediation of industrial wastes, heavy mental contamination, plant growth promoter and in boosting the plant growth.

## Chair persons:

1. Dr. Rupinder Diwan: Professor, Govt. N. PG Autonomous College, Raipur
2. Dr. Vimal Kanungo: Assistant Professor, Govt. J. Yoganandam PG College, Raipur
3. Dr. Ranjana Shrivastava, Professor, Govt. V.Y.T. PG Autonomous College, Durg
4. Dr. Usha Sahu, Assistant Professor, Govt. V.Y.T. PG Autonomous College, Durg

## Chief Guest for Valedictory:

Shri Shirish Taunk, Managing Director, SRT Agrobiotech Pvt. Ltd., Funda Patan, Durg

## Participants:

| | |
|---|---|
| **Faculties** | **41** |
| **Research Scholars** | **12** |
| **UG/ PG Students** | **91** |

**States Covered: 07** (Chhattisgarh, Madhya Pradesh, Maharashtra, Gujrat, Rajasthan, West Bengal, Punjab)

The conference started on 05.02.2024 with Saraswati Vandana and formal welcome of guests.

Welcome Address and about the theme of conference was delivered by the convener Dr. Pragya Kulkarni followed by blessings of In charge Principal Dr. S. N. Jha. Inaugural Speech was delivered by chief guest Dr. K. Subramaniam. He spoke on ancient knowledge about bioprospecting and modern practices and concluded with applications of microbial bioprospecting. Dr. A. M. Deshmukh, National President, MBSI through light on MBSI initiatives and activities throughout the nation and appealed the audience to join the society for betterment of mankind. Vote of thanks was given by Mrs. Bharti Ahirwar. The session was conducted by Mrs. Rekha Gupta.

The key note address was given by Dr. A.M. Deshmukh. He demarcated the theme of Microbial bioprospecting using various examples.

The first plenary lecture was delivered by Dr. Sanjeev Patankar, Rtd. Principal and National coordinator, MBSI. He emphasised the used of probiotics in food and discussed the case study of a tribal food of Gadhchiroli, Maharashtra.

The second plenary lecture was supported by Dr. K. Surya, Scientist, CIPHET, Ludhiana, on Unlocking Value: Protein extraction from Agro-Industrial Residues. She explained the definition of Agro-residues and discussed the various uses of it.

The session after lunch was dedicated to Oral and Poster presentations of the participants. It was conducted in two parallel sessions and chaired by Dr. Rupinder Diwan, Dr. V.K. Kanungo, Dr. Ranjana Shrivastava and Dr. Usha Sahu respectively.

The presentations were further divided in to three categories as Students, Research Scholars and Faculties.

| **Oral Presentation** | |
|---|---|
| **Category** | **Number of participants** |
| Faculty | 5 |
| Student | 8 |
| Research Scholar | 5 |
| **Poster Presentation** | |
| Student | 9 |
| Research Scholar | 3 |
| Faculty | 4 |

**Results of Presentation:**

| **Oral Presentation** | |
|---|---|
| **Student** | **Result** |
| **Danish Vinod Patil**, M.Sc. Sem IV, Govt. VYT PG Autonomous College, Durg (C.G.) | I |
| **Ms. Mansi Shrivastava**, M.Sc. Sem IV, Govt. VYT PG Autonomous College, Durg (C.G.) | II |
| **Ms. Shruti Kumari**, B.Sc. III, O.P. Jindal University, Punjipathara, Raigarh (C.G.) | III |
| **Research Scholar** | |
| **Ms. Anamika Sharma,** Govt. VYT PG Autonomous College, Durg | I |
| **Dev Narayan Patel**, Govt. N.PG College of Science, Raipur (C.G.) | II |
| **Ms. Hemshikha Sahu**, Govt. N.PG College of Science, Raipur (C.G.) | III |
| **Faculty** | |
| **Mr. Yogesh Kumar**, NRC on Camel, Rajasthan | I |
| **Dr. Anindita Deb Pal**, J.D. Birla Institute, Kolkata (W.B.) | II |
| **Ms. Mausami Dey**, Govt. VYT PG Autonomous College, Durg (C.G.) | III |
| **Poster Presentation** | |
| **Student** | **Result** |
| Ms. Megha and Disha Babulkar, Nabira Mahavidyalaya, Katol (M.S.) | I |
| K Divya Rao and Anisha, Govt. VYT PG Autonomous College, Durg (C.G.) | II |
| Ms. Kashish Nag, Ms. Akansha, Ms. Shaily Prajapati and Ms. Khushi Singh, O.P. Jindal University, Punjipathara, Raigarh (C.G.) | III |
| **Research Scholar** | |
| Mrs. Mansi Sahu, Govt. VYT PG Autonomous College, Durg (C.G.) | I |
| Ms. Neha Toppo, St. Thomas College, Bhilai (C.G.) | II |
| Ms. Laleeta, Govt. VYT PG Autonomous College, Durg (C.G.) | III |
| **Faculty** | |
| Ms. Dhanashree M. Ridhorkar, Nabira Mahavidyalaya, Katol (M.S.) | I |
| Mrs. Neetu Das, Govt. VYT PG Autonomous College, Durg (C.G.) | II |

Third plenary session was started on 06th Feb with the lecture of Dr. K.K. Sahu on Microorganisms: Bio producer, Eco-cleaner, Productivity enhancer and Nutrient Provider. He explained the various applications of indigenous microorganisms in production of useful products, fertilizers, bio reclamation agent and bio nutrient producer etc.

**Valedictory Session:**

The valedictory session was presided by Dr. M.A. Siddiqui, Principal and Patron with the chief guest Mr. Shirish Taunk, Managing Director, SRT Agro biotech Pvt. Ltd., Funda Patan, Durg. The session was initiated with concluding remarks by the convener Dr. Pragya Kulkarni. She concluded that the theme and the objectives of the conference was successfully deliberated and the possibilities of application of microorganisms as bioprospecting tool has been introduced among the assembly.

Mr. Shirish Taunk addressed the gathering about huge opportunities in the microbial bioprospecting. He summarized his own experience in developing his firm starting from production of Rhizobium and Mycorhhiza based biofertilizer at small scale to present day nanotechnology based biofertilizers, biopesticides and micronutrients for national and internation supply.

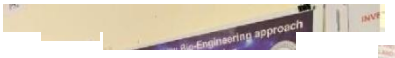
The rank holders were cherished with a token of prizes and all participants were appreciated with participation certificates at the end.

Finally, the Principal conveyed his best wishes and blessings for successful completion of the conference.

The session was conducted by Mrs. Neetu Das and Vote of thanks was given by Mrs. Rekha Gupta.

| **Convener**<br>Dr. Pragya Kulkarni<br>Head, Microbiology Department<br>Govt.V.Y.T.PG Autonomous College, Durg | **Organizing Secretary**<br>Mrs. Rekha Gupta<br>Mrs. Neetu Das |
|---|---|
| **Organizing Committee**<br>Miss. Mrinalini Soni<br>Miss. Kunu Kanda Yashodha<br>Miss. Anamika Sharma<br>Mrs. Hempushpa Urwasha<br>Mrs. Mansi Sahu<br>Mrs. Bharti Ahirwar<br>Miss. Tanya Sahu | **Advisory Committee**<br>Dr. A. M. Deshmukh, President MBSI<br>Dr. Swaranjit Singh, Ex. Head Env. Biotech. Microbiology CSIR-IMTECH, Chandigarh<br>Dr. Sanjeev Patankar, National Coordinator MBSI<br>Dr. Nachiket Kotwaliwale, Director CIPHET, Ludhiana<br>Dr. Samlesh Kumari, CIAE, Bhopal<br>Dr. A. K. Gupta, Rtd. Prof. SOS Life Science, Pt. RSU, Raipur<br>Dr. K. K. Sahu, Head SOS Biotechnology, Pt. RSU, Raipur<br>Dr. Anil Kotasthane, IGKV, Raipur |

| | |
|---|---|
| | Dr. Ranjana Shrivastava, Govt. V.Y.T. PG Auto. College, Durg<br>Dr. Anil Kumar, Govt. V.Y.T. PG Auto. College, Durg<br>Dr. Usha Sahu, Govt. V.Y.T. PG Auto. College, Durg<br>Dr. Sanju Sinha, Govt. V.Y.T. PG Auto. College, Durg |







## About Department of Microbiology

The Department of Microbiology is a unique department of Govt. V. Y. T. PG Autonomous College, Durg where multidisciplinary teaching and research have established permanent roots. The department has sufficient infrastructural facilities in terms of laboratories and classrooms for PG and UG students. The department also runs value added courses and short-term certificate course for skill development and hands

## About Durg City and Chhattisgarh

DURG CITY is the headquarters of Durg District. It is situated on the Howrah-

Eastern Central railway. The nearest airport is Swami Vivekanand Airport. Raipur. the capital of Chhattisgarh

The city is well connected by road with Nagpur and Jabalpur.

Mountain, Plateau and plain ecosystem constitute roughly a third of each of its physiography. Dence green forests cover 40% of its land and source of major rivers with exotic flora and fauna. It is a major hub of Industries accounting forest rich resource of mineral deposits including iron, limestone, bauxite and coal. The state is advancing in technical education and research together with utilization of natural resources for development of entrepreneurs.

## NATIONAL CONFERENCE

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S[st]eod G""ebrua 2024


and to undertake Project work.

Depær4-eo‹ ofMicroòîołogy

**Govt. V.Y.T. PG Autonomous College, Durg (C.G.)**

**In Association with**

Microbiologist Society, ladip

## About Microbiologist Society, India

## About The College

round the year and aims to create knowledge sharing opportunities. The MSI organizes various competitions

UG, PG and Ph.D. Programme of Science, Arts and Commerce faculties. The Focus area of college is Research, Teaching and adaption of the components of NEP – 2020 with Intention to be a specialized center of "Indian Knowledge system"

## Further Correspondence

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- Mrs. Neetu Das - 6267905

# Outsourcing for Characterization of Fungal Cultures

Molecular characterization and lectophenol cotton blue staining of three fungal cultures were outsourced to Cytogene Company Pvt. Ltd. in Lucknow. This collaboration allowed for specialized expertise and advanced techniques, ensuring accurate analysis and reliable results for our fungal cultures.

TEST REPORT Workflow • Genomic DNA wasisolated from the sample provided by the scientist. • The ~800 bp, ITS4-ITS5 fragment was amplified using high–fidelity PCR polymerase. The PCR product was sequenced Bi-directionally. • The sequence data was aligned and analyzed to identify the Bacteria and its closest neighbors.

Sample 1: 3B Aligned Sequence Data of Sample – 3B (660 bp) >3B

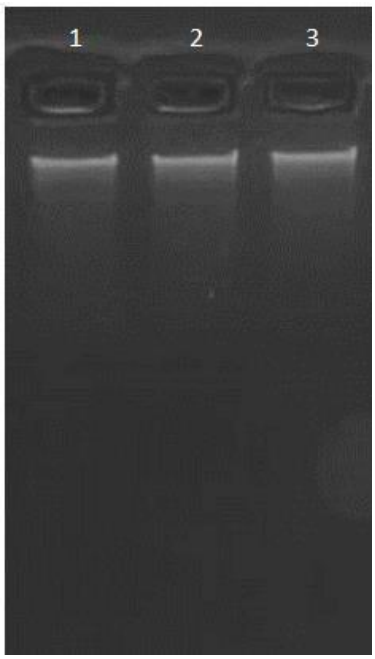
The Microbe was identified as ***Trichoderma koningii*** as it showed highest similarity of 94.39 % with Trichoderma koningii isolate APSAC 01 18S ribosomal RNA gene, partial sequence; internal transcribed spacer with accession number KY886134.1

Sample 2: 6_l Aligned Sequence Data of Sample – 6_l (599 bp) >6_l

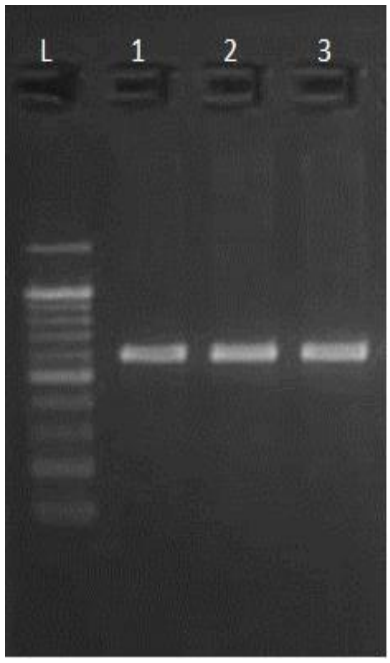
The Microbe was identified as ***Penicillium citrinum*** as it showed highest similarity of 96.97% with Penicillium citrinum strain Xia16 small subunit ribosomal RNA, internal transcribed spacer with accession no. OR346130.1

Sample 3: 17 Aligned Sequence Data of Sample – 17 (1180 bp) >17

The Microbe was identified as ***Purpureocillium lilacinum*** as it showed highest similarity of 98.55 % with Purpureocillium lilacinum isolate GZUIFR 22.269; internal transcribed spacer with accession number KT310982.1



gDNA



PCR amplified Product

# Maintenance of Bioresource Complex

**Objective:**

The grant aimed to enhance the Bioresource Complex's capacity for mass cultivation of Blue Green Algae (BGA) and VA Mycorrhiza biofertilizer through infrastructure improvements, essential material procurement, and maintenance activities. Emphasizing organic inputs and maintenance practices aligns with our sustainability goals, ensuring the long-term viability of the complex.

**1. Maintenance of Cyanobacteria and Azospirillum based Biofertilizer:**

Cyanobacterial biomass was maintained in small tanks for mass cultivation. Regular facility upkeep was conducted to ensure optimal environmental conditions for BGA growth, while additional cement trays were secured to expand the surface area for BGA and Azospirillum cultivation alongside existing pots to support ongoing operations.

Funds allocated for maintenance were effectively utilized to address wear and tear, minimizing disruption to cultivation activities.

Impact: The introduction of new trays has resulted in a substantial 30% increase in BGA production since installation.

**2. Purchase of Starter Culture:**

A high-quality starter culture of Cyanobacteria (BGA) and Azospirillum bacteria was obtained from Indira Gandhi Krishi Vishwavidyalaya, Raipur, ensuring both genetic diversity and vigor for cultivation.

This investment in starter culture has been crucial for enhancing initial growth rates and establishing a robust cultivation system.

**3. Purchase of Seeds and Fertilizers:**

Essential seeds of Sonchus grass were procured as host plants, along with some routine chemical fertilizers to support the mass multiplication of VA Mycorrhiza-based biofertilizer.

The selection emphasized organic and eco-friendly options to promote sustainable practices. Funds were wisely spent on acquiring high-quality seeds and fertilizers, contributing to the improved growth and health of BGA cultures, as well as enhancing soil health for the growth of host plants.

**Conclusion**

The grant of Rs. 6000/- has been effectively utilized to enhance the Bioresource Complex, yielding significant advancements in BGA cultivation and sustainable practices for the mass multiplication of VA Mycorrhizal biofertilizer. Ongoing efforts will be vital to sustain and build upon these accomplishments.


BIORESOURCE
COMPLEX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मृदा विज्ञान विभाग