BOTANY NEWSLETTER

Department of Botany
Durgapur Government College

BOTANY
NEWSLETTER

Inside This Issue

Sneak Peak into Knowledge Exchange

New to learn

Cover Story

FATHER OF GREEN REVOLUTION

M S SWAMINATHAN

07/08/1925 – 28/09/2023

Mankombu Sambasivan Swaminathan, an agricultural scientist, is regarded as the founder of the agricultural movement known as the "green revolution" in India. He saved millions of people from starvation in South Asia during the 1960s. He contributed to the rise in agricultural self-sufficiency in South and Southeast Asia by making high-yielding wheat and rice cultivars popular among impoverished farmers. He was awarded the inaugural World Food Prize in 1987 for this achievement. In response, he advocated for a sustainable "green revolution" to address the possible negative effects of intensive farming on the environment. He passed away at the age of 98

Knowledge Exchange

DBT STAR COLLEGE SCHEME SPONSORED INVITED LECTURE

Government of West Bengal
Durgapur Government College
(*Accredited by NAAC with "A" Grade*)
J.N. Avenue, Durgapur, District- Paschim Bardhaman,
West Bengal, Pin-713214

DBT Star College Scheme Sponsored

AN INVITED LECTURE ON

'Effect of Climatic Amelioration on Environment, Biodiversity and Future of the Biosphere'

By
PROFESSOR ABHAYA PRASAD DAS

Jointly Organized by
Department of Botany and Zoology

26.09.2023; 12:00 pm onward; Durgapur Government College

Objectives of the Seminar

• **Education and Awareness:** Increase understanding about the importance of biodiversity, its components, and its role in sustaining life on Earth.

• **Conservation Advocacy:** Raise awareness about the threats to biodiversity, such as habitat destruction, climate change, pollution, and overexploitation of natural resources. Encourage discussions on conservation strategies and the importance of preserving biodiversity for future generations

• **Promoting Sustainable Practices:** Highlight sustainable practices and initiatives that individuals, communities, industries, and governments can adopt to reduce their impact on biodiversity and ecosystems

• **Inspiration and Motivation:** Inspire and motivate individuals to take action in their personal and professional lives to protect biodiversity, whether through lifestyle changes, advocacy, or supporting conservation efforts. : Encourage the involvement of youth in biodiversity conservation by providing educational resources, workshops, and activities to empower and inspire the next generation of environmental stewards

• **Economic and Social Perspectives:** Explore the economic and social benefits of biodiversity conservation, including ecotourism, ecosystem services, and cultural significance, emphasizing the importance of balancing conservation with human needs

The online seminar commenced on 12:00 noon at the Bidhan Prekshagriha auditorium of Durgapur Government College. Following inaugural lectures by The Coordinator, DBT College Scheme and Secretary of Teacher's Council Dr. Rajib Biswas, Assistnt Professor, Department of Conservation Biology, introduced the eminent speaker Prof. Abhaya Prasad Das and requested him for his deliberation entitled "Effect of climatic amelioration on environment, biodiversity and future of biosphere". His lecture majorly emphasized on the aggravated usage of plastics in modern day and its adverse effect on biodiversity and biosphere as well. Key points of his lecture are summarized below:

• Effects on Wildlife: Plastics harm various species through ingestion, entanglement, and habitat disruption

• Marine Ecosystem Impact: The impact of plastics on marine life, including ocean currents carrying plastics worldwide, affecting ecosystems globally

• Ecosystem Disruption: Plastics can disrupt terrestrial ecosystems, affecting soil, plants, and animals

• Human Health: The indirect impact of plastics on human health through the food chain and direct exposure to harmful chemicals

• Pollution and Microplastics: The proliferation of microplastics in the environment and their widespread impact on biodiversity

• Sustainable Solutions: Discussed potential solutions, such as recycling, reducing single-use plastics, policy changes, and innovative technologies for waste management

Outcomes of the Seminar

1. Increased Awareness: Participants gained a deeper understanding of the importance of biodiversity, its components, and the urgency of conservation efforts. This heightened awareness can extend beyond the seminar attendees as they share their knowledge and insights with others

2. Initiatives for Sustainable Practices: Participants got inspired to implement sustainable practices in their respective fields, industries, or communities, reducing their ecological footprint and contributing to biodiversity conservation

3. Documentation and Research Advancements: Insights shared during the seminar could inspire new research directions, innovative technologies, or methodologies for biodiversity assessment, monitoring, and conservation

4. Long-Term Impact: Over time, the cumulative effect of the seminar's outcomes can lead to a broader societal shift towards valuing, protecting, and restoring biodiversity, contributing to a more sustainable future for both humans and the natural world

New to Learn

DBT STAR
COLLEGE
SCHEME
SPONSORED
WORKSHOP
AND NEW
EXPERIMENTS

DBT STAR COLLEGE SCHEME SPONSORED ONE DAY WORKSHOP ON

HERBARIUM TECHNIQUES OF ANGIOSPERMS AND MODERN PROTOCOLS FOR PTERIDOPHYTIC GERMPLASM IDENTIFICATION AND CONSERVATION

31.08.2023

PTERIDOPHYTIC GERMPLASM IDENTIFICATION AND CONSERVATION

11:00- 11:30- INTRODUCTION

11:30- 12:00- PLANT DEMONSTRATION

12:00- 13:00- IDENTIFICATION TECHNIQUE

PROF. ANISH BHATTACHARYA

LUNCH BREAK (13:00- 13:30)

HERBARIUM TECHNIQUES OF ANGIOSPERMS

DR. ASHOKE BHATTACHARYA

13:30- 14:00- INTRODUCTION

14:00- 14:30- HERBARIUM SHEET DEMONSTRATION

14:30- 15:00- HERBARIUM SHEET PREPARATION BY STUDENTS

15:00- 16:00- FIELD VISIT

16:00- 16:30- PLANT SPECIMEN PASTING

No. of participants– 6
Name of the participants(their attendance was taken in feedback form and practice work given in page no. 3-8)–
1. ParijaChakraborty (6thSemHons)
2. ArpanBardhan (3rdSem Botany Program)
3. SekhTahir (1stSem UG Botany)
4. SamratSarder(1stSemHons Botany)
5. SparshaBiswas(1stSemHons Botany)
6. AshikMondal(1stSemHons Botany)

Report of the whole programme:-

Pteridophyticgermplasm identification and conservation:-

Pteirdophytes (Vascular Cryptogams) are the first vascular land plants prevailing still now being the second most diverse plant group on earth. Majority of the pteridophytes love to grow in shady areas. Few are adapted to disturbed condition. Increasing urbanization and industrialization are affecting many sensitive species of pteridophytes. So, we must conserve the plant species at least those who are locally rare or getting extinct day by day. But before conserving, the proper taxonomic identification is must needed. So, we tried to make our students knowledgeable about the identification procedure with the help of Dichotomous key. For this purpose, we used Illustrated Manual of Ferns of Assam by S.K. Borthakur. Some images of the class are given below

Harbarium techniques of angiosperm:-

Herbarium sheet is an excellent medium to preserve plant specimens. People who are interested in plant taxonomical study often follow herbarium sheets along with different dichotomous keys, flora or manual. It is frequently observed that plant populations are often get destroyed and uprooted due to various anthropogenic activities. So, it is

difficult to a taxonomist if he/she likes to make a check list of a flora. But if a plant is preserved in herbarium sheet then the task become easier.

So, our motive was to let the student know about Herbarium then the importance of Herbarium sheets and finally the procedures of making a proper herbarium sheet. Following are some pictures of the above mentioned technique demonstrated by our respected H.O.D Dr. Ashoke Bhattacharya. Dr. Bhattacharya also taught the students about making of a QR code of a herbarium sheet

Students of different semesters along with the Herbarium sheets

Durgapur, West Bengal, India
G8RG+WXX, Jawahar Lal Nehru Road, Amarabati Colony, Durgapur, West Bengal 713214, India
Lat 23.542528°
Long 87.326548°
31/08/23 02:14 PM GMT +05:30

Durgapur, West Bengal, India
G8RG+WXX, Jawahar Lal Nehru Road, Amarabati Colony, Durgapur, West Bengal 713214, India
Lat 23.542528°
Long 87.326548°
31/08/23 02:14 PM GMT +05:30

Durgapur, West Bengal, India
G8RG+WXX, Jawahar Lal Nehru Road, Amarabati Colony, Durgapur, West Bengal 713214, India
Lat 23.542536°
Long 87.326584°
31/08/23 02:48 PM GMT +05:30

Durgapur, West Bengal, India
G8RG+VX9, Amarabati Colony, Durgapur, West Bengal 713210, India
Lat 23.542208°
Long 87.327432°
31/08/23 03:43 PM GMT +05:30

Durgapur Government College

(Affiliated to Kazi Nazrul University, Asansol, West Bengal)

NAAC Accredited "A" Grade College

DBT STAR COLLEGE SCHEME *sponsored* online seminar on

"*Introduction to Biostatistics, with emphasis on Machine Learning*" and

"A one day workshop on application of the biostatistical software: Origin"

Date: 08.09.2023, Time: 11:00 a.m.

Organized by Departments of Botany, Mathematics and Physics, Durgapur Government College

Online Seminar Lecture by

Dr. Tapobrata Lahiri

Professor, Department of Applied Science Indian Institute of Information Technology, Allahabad

Hands on tutorial on ORIGIN by

Dr. Nupur Bhakta

Assistant Professor, Department of Physics Durgapur Government College, Durgapur

Objectives of the online seminar

The seminar aimed to achieve the following objectives:

☐ Understanding Statistical Methods: To familiarize students with statistical techniques relevant to analyzing biological data, such as hypothesis testing, regression analysis, and experimental design.

☐ Introduction to Machine Learning: Introduce participants to the fundamentals of machine learning techniques and algorithms applicable to biological datasets for prediction, classification, and pattern recognition.

☐ Integration of Biostatistics and Machine Learning: Show how biostatistics and machine learning complement each other, highlighting situations where one approach might be more suitable than the other in biological data analysis.

☐ Practical Applications: Demonstrate real-world applications of biostatistics and machine learning in biological research, including genomics, drug discovery, and healthcare analytics.

☐ Hands-on Experience: Provide participants with practical sessions or workshops to apply statistical and machine learning tools to analyze biological datasets, fostering skills in data interpretation and analysis.

☐ Critical Evaluation: Encourage critical thinking and assessment of the strengths and limitations of statistical and machine learning methods when applied to biological data.

Objectives of student tutorial on the software Origin

☐ Provide a comprehensive introduction to the software, acquainting students with its interface, tools, and functionalities. This includes understanding the layout, menus, and basic operations.

☐ Teach students how to import various types of data into Origin and manipulate it effectively.

☐ Enable students to perform statistical analyses using Origin, such as descriptive statistics, hypothesis testing, regression, ANOVA, and other relevant statistical procedures.

☐ Teach students how to create different types of graphs and visualizations (scatter plots, histograms, bar charts, etc.) using their imported data. This includes customization options for axes, labels, titles, and annotations.

☐ Engage students in practical exercises, case studies, or sample projects that apply the software skills learned during the tutorial to scientific analyses

The online seminar commenced on 11:00 a.m. with an attendance of 28 participants, at the computer laboratory of Durgapur Government College. Following inaugural lectures by The Coordinator, DBT College Scheme, Secretary of Teacher's Council and Coordinators/ Heads of the organizing Departments of Botany, Physics and Mathematics, the eminent resource person Prof. Tapobrata Lahiri started his deliberation. His lecture encompassed several topics which are summarized below:

1. Introduction to Biostatistics:
☐ Definition, scope, and significance of biostatistics in biological and health sciences.
☐ Basic statistical concepts and terminology.

2. Descriptive Statistics:
☐ Measures of central tendency (mean, median, mode) and dispersion (variance,
standard deviation).
☐ Graphic representations: histograms, box plots, bar charts.

3. Hypothesis Testing and Confidence Intervals:
☐ Basics of hypothesis testing: null and alternative hypotheses, p-values, significance
levels.
☐ Construction and interpretation of confidence intervals.

4. Regression Analysis:
☐ Simple and multiple linear regression: model fitting, interpretation, and diagnostics.
☐ Logistic regression: application to binary outcomes in health studies.

5. Application of Biostatistics in Research:
☐ Case studies and examples showcasing the use of biostatistics in designing studies,
analyzing results, and drawing conclusions in biology and health-related fields.

6. Introduction to Machine Learning:
☐ Definition, scope, and applications of machine learning.
☐ Historical background and evolution of machine learning algorithms.

7. Types of Machine Learning:
☐ Supervised, unsupervised, and reinforcement learning.
☐ Explanation of each type, their differences, and typical applications.

8. Data Preprocessing and Feature Engineering:
☐ Importance of data cleaning, normalization, and handling missing values.
☐ Feature selection, extraction, and transformation techniques.

9. Applications of Machine Learning:
☐ Case studies and real-world applications in various domains:
☐ Healthcare: Medical imaging analysis, disease prediction.
☐ Natural Language Processing (NLP)
☐ Image recognition, autonomous vehicles, recommendation systems, etc.

10. Future Trends and Advancements:
☐ Career opportunities and the future landscape of machine learning

The outcomes of the seminar on biostatistics and machine learning: Enhanced Understanding: Participants gain a deeper understanding of statistical methods and basic machine learning process relevant to analyzing biological data. Application Skills: Acquiring practical skills in applying statistical techniques to biological datasets, enabling effective analysis and interpretation of data. Problem-Solving Abilities: Improved ability to address biological questions by choosing appropriate statistical or machine learning approaches for data analysis and interpretation. Critical Thinking: Enhanced critical thinking skills to evaluate and select the most suitable methodologies for specific biological research problems. Research Advancements: Empowering participants to apply learned techniques in their research, potentially leading to advancements in fields such as genomics, drug discovery, disease prediction, and healthcare analytics

Following the webinar, there was lunch break from 2:00 p.m. to 2:30 p.m.
The next session on hands on tutorial on the software Origin commenced from 2:30 p.m. This technical session was conducted by Dr. Nupur Bhakta, Assistant Professor, Department of Physics, Durgapur Government College. The fundamentals of biostatistical analysis of data, preparation of

graphs and plots and importing the image files using Origin software, were described in the session. The participating students performed hands on operation of the software Origin and analysed the data provided by the resource person. The students were given assignments by Dr. Prosanta Saha, Assistant Professor, Department of Botany, Durgapur Government College

Outcomes of student tutorial on the software Origin • Students gained a comprehensive understanding of the software's interface, tools, and functionalities, becoming able in performing various tasks, such as data import, manipulation, analysis, and visualization. • Students acquire the ability to perform a range of statistical analyses within Origin, allowing them to apply appropriate statistical tests, interpret results, and draw meaningful conclusions from their data. • Students were able to create diverse and customized graphs which enabled the students to present data accurately and effectively, enhancing their ability to communicate findings visually. • Exposure to troubleshooting methods equips students with the skills to address common issues encountered while using Origin, fostering independent problemsolving capabilities. • Students can apply their acquired skills in real-world scenarios, integrating Origin into their research, projects, or academic assignments to conduct data analysis and visualization effectively

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DBT STAR COLLEGE SCHEME *sponsored* **two day's workshop on**

"RESTRICTION MAPPING OF PLASMID DNA"

Date: 28.08.2023 - 29.08.2023, Time: 11:00 a.m.

Organized by Departments of Botany, Durgapur Government College

Resource Person -

Dr. Prosanta Saha

Assistant Professor
Department of Botany
Durgapur Government College,
Durgapur

Event schedule -

Day 1 (28.08.2023)

•11:00 a.m. to 01:30 p.m. - Seminar lecture on Restriction Mapping of DNA
•01:30 p.m. to 02:00 p.m. - Lunch break
•02:00 p.m. to 05:00 p.m. - Technical session on designing a Restriction Mapping experiment

Day 2 (29.08.2023)

•11:00 a.m. to 05:00 p.m. - Hands on demonstration and tutorial of Restriction Mapping process
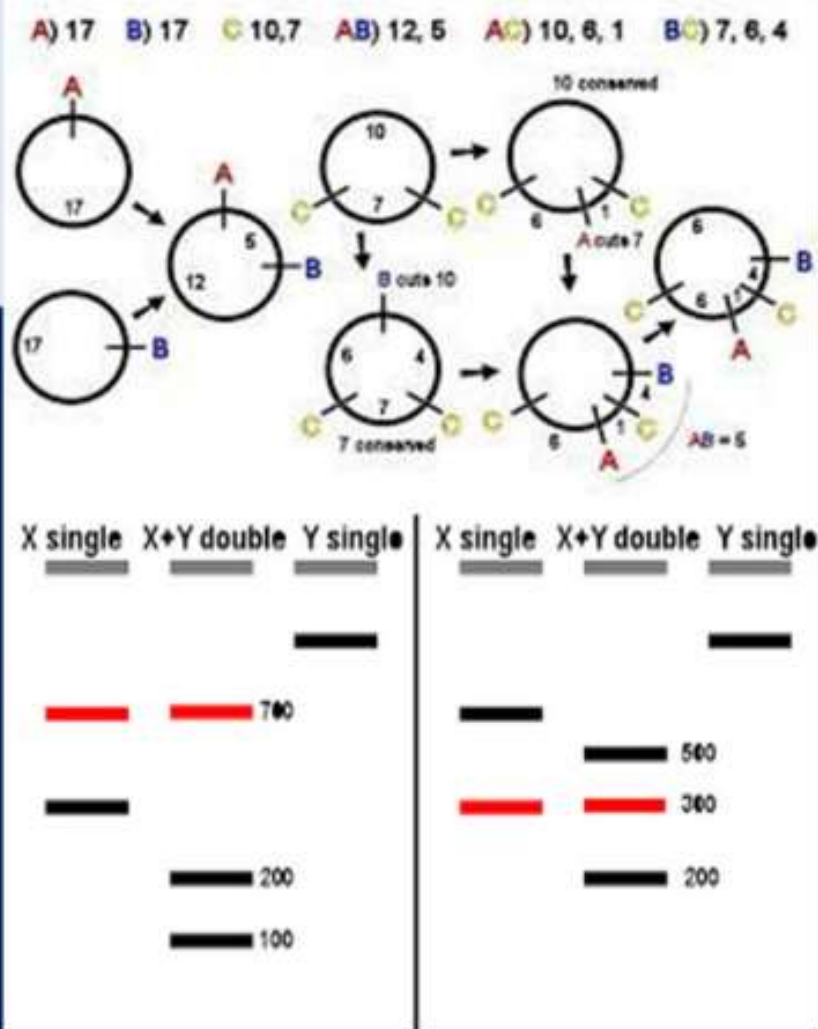
Objectives of the workshop The workshop on restriction mapping of plasmid DNA aims to teach participants how to use restriction enzymes to cut DNA at specific sequences, analyze the resulting fragments, and map the locations of these restriction sites on a DNA molecule. The objectives further include disseminating knowledge to students about the principles behind restriction mapping, identification of restriction sites from web servers and planning the restriction digestions, hands-on experience with laboratory techniques, interpreting restriction patterns, and applying this knowledge in molecular biology research or genetic engineering. Day 1 of workshop (28.08.2023) Session I Seminar Lecture on Restriction Mapping of DNA: The workshop commenced at 11:00 a.m. with the seminar lecture entitled "Restriction Mapping of Plasmid DNA" by Dr. Prosanta Saha, Assistant Professor, Department of Botany, Durgapur Government College. The session had a participation of 37 students. The seminar covered various aspects of restriction mapping from the basics, which involves the identification and mapping of restriction enzyme recognition sites in a DNA sequence. Some key topics covered in the lecture, are presented below - 1. Introduction to DNA Restriction Mapping: • Overview of the principle and history of DNA restriction mapping. • Importance and applications in molecular biology, genetics, and biotechnology. 2. Restriction Enzymes: • Explanation of restriction enzymes, their types (Type I, II, III), and specific recognition sequences. 3. Techniques for DNA Cleavage: • Mechanisms of DNA cleavage by restriction enzymes. • Gel electrophoresis and its role in separating DNA fragments based on size. 4. Mapping Strategies and Analysis: • Overview of mapping strategies (single/double digestion, partial digestion) for DNA fragments. • Analyzing restriction digests using agarose or polyacrylamide gel electrophoresis. 5. Constructing Restriction Maps: • Interpretation and assembly of restriction fragment patterns to generate complete restriction maps. 6. Challenges and Limitations: • Limitations and challenges in restriction mapping techniques,

such as resolution issues or handling complex genomes. 7. Future Directions and Technological Advances: • Use of restriction mapping in gene mapping, genome analysis, and cloning experiments.. • Emerging technologies (such as next-generation sequencing) and their impact on DNA mapping techniques. • Potential advancements or improvements in restriction mapping methodologies

Session II Technical session on Restriction Mapping: This session of the workshop commenced at 02:00 p.m. following a half hour lunch break. In this session, the resource person Dr. Prosanta Saha explained about the handling of online repositories and the web servers that are essential for retrieval of plasmid DNA sequences and designing the restriction digestion processes. The students were demonstrated the processes of plasmid sequence retrieval from NCBI databases, creating the FASTA files, and applying the later at Nebcutter V.3 server for selecting the appropriate enzymes for restriction digestion. Finally, combinatorial enzymatic digestion process and restriction map preparation was explained and demonstrated. The students were given assignments to map the restriction sites on given plasmids, using the web servers that were demonstrated

Day 2 of workshop (29.08.2023) Hands-on session on Restriction Mapping of DNA: The second day of the workshop commenced from 11:00 noon and in this day restriction digestion experiment was done using HiPer° Restriction Mapping Teaching Kit. The plasmid and the enzymes were used from the kit, following protocol of the manufacturer. Restriction digestion mixes were prepared and incubated at 37° C for 2 hours. Thereafter the digestion products were loaded into agarose gels and electrophoresis was performed. Finally the gels were visualized under UV transilluminator and the digested DNA fragments were explained to the students

Images of Seminar Lecture session of Day 1 of workshop
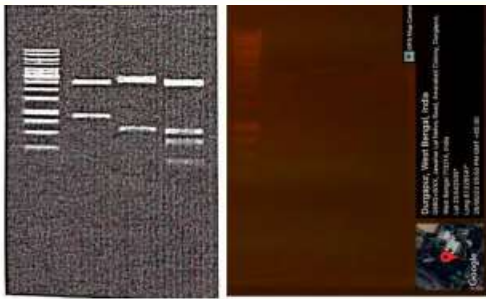
Lane 1:1 kb Ladder
Lane 2: *EcoRI* digest
Lane 3: Hind111 digest
Lane 4: *EcoRI +
Hinellil* digest

Result from Day 2 of workshop

Images of Seminar Lecture session of Day 1 of workshop

Images of Hands-on session from Day 2 of workshop

Outcome of the workshop The outcomes of this workshop on restriction mapping are listed below: • Understanding of Principles: Participants gained a deeper understanding of how restriction enzymes work, how they cut DNA at specific sites, and the principles behind restriction mapping. • Hands-on Skills: Acquiring practical skills in performing restriction digests, running agarose gel electrophoresis, and analyzing resulting DNA fragments. • Mapping DNA: Ability to interpret restriction patterns to map the locations of restriction sites on a DNA molecule. • Application in Research: Capability to apply this knowledge in various research fields, such as molecular biology, genetics, or biotechnology in the future. • Troubleshooting and Collaboration: Development of troubleshooting skills in case of unexpected results or challenges during the restriction mapping process. The workshop also encouraged collaboration and discussion among participants to enhance understanding and problem-solving in molecular biology techniques

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DBT Star College Scheme Sponsored
Two Days Workshop on
"VEGETATION MAPPING" for B.Sc. students

08/08/2023 & 10/08/2023

Organized by

Department of Botany and Geology
Durgapur Government College

Learning vegetation mapping using QGIS (Quantum Geographic Information System) is highly relevant for undergraduate students of botany and geology. Here are several reasons why:

1. Spatial Analysis: QGIS is a powerful open-source software that allows for spatial analysis and mapping. By learning how to use QGIS for vegetation mapping, students can analyze and interpret spatial patterns of vegetation distribution, species diversity, and ecological relationships. This skill is essential for understanding the spatial dynamics of plant communities and their interaction with the environment.

2. Field Data Integration: Vegetation mapping often requires the integration of field data with spatial information. By using QGIS, students can import and manage field data such as plant species inventories, vegetation plot data, and environmental parameters. They can then overlay this data onto geospatial layers such as satellite imagery, digital elevation models, or climate data. This integration of field and spatial data enhances the accuracy and comprehensiveness of vegetation mapping projects.

3. Remote Sensing Applications: QGIS supports the analysis of remote sensing data, including satellite imagery and aerial photographs. By learning how to use QGIS for vegetation mapping, students can extract meaningful information from remote sensing data, such as vegetation indices (e.g., NDVI) or land cover classification. This knowledge allows them to assess vegetation health, monitor changes over time, and detect ecological patterns and processes.

4. Ecological Research and Conservation: Vegetation mapping using QGIS is essential for ecological research and conservation efforts. By acquiring skills in QGIS, students can contribute to studies on plant community dynamics, habitat fragmentation, invasive species management, and biodiversity conservation. They can generate maps and spatial models that inform land management decisions, ecosystem restoration plans, or protected area designations.

5. Career Opportunities: Proficiency in QGIS and vegetation mapping techniques opens up various career opportunities for students in botany and geology. They can pursue careers in environmental consulting, resource management, conservation organizations, government agencies, or research institutions. Knowledge of QGIS and vegetation mapping provides a competitive advantage in these fields, as it demonstrates practical skills in spatial analysis and data visualization.

In summary, learning vegetation mapping using QGIS is relevant for undergraduate students of botany and geology as it enables spatial analysis, integrates field data, incorporates remote sensing applications, supports ecological research and conservation, and enhances career prospects. It equips students with valuable skills to understand and manage plant communities in diverse ecosystems.

Durgapur Government College

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NAAC Accredited "A" Grade College

DBT STAR COLLEGE SCHEME *sponsored* new experiment on

"*ENDOSPORE STAINING*"

Date: 25.08.2023, Time: 11:00 a.m.

Organized by Departments of Botany, Durgapur Government College

Supervised by -

Dr. Prosanta Saha

Assistant Professor
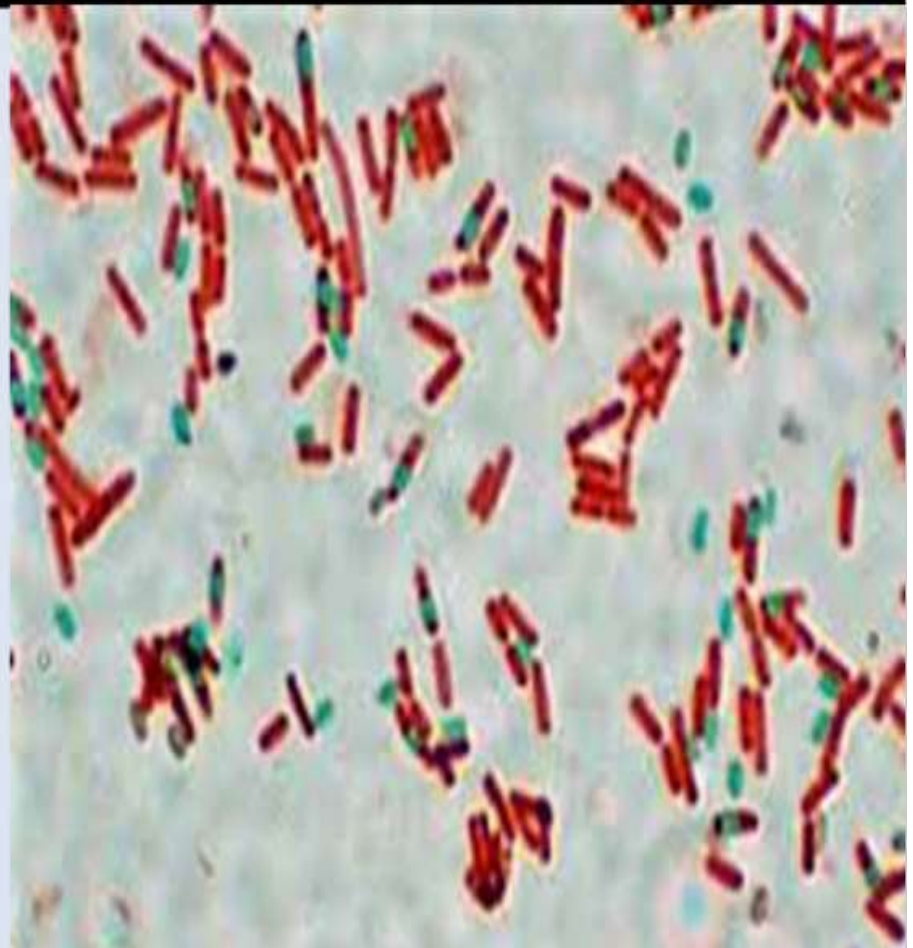Department of Botany
Durgapur Government
College, Durgapur

Mrs. Sudeshna Mitra

SACT, Department of
Microbiology
Banwarilal Bhalotia
College, Asansol

Images from the New Experiment on Endospore Staining

Durgapur Government College

(Affiliated to Kazi Nazrul University, Asansol, West Bengal)

NAAC Accredited "A" Grade College

DBT STAR COLLEGE SCHEME

sponsored new experiment on

"STUDY OF MITOTIC CHROMOSOMES OF *Allium cepa*"

Date: 25.08.2023, Time: 02:00 p.m.

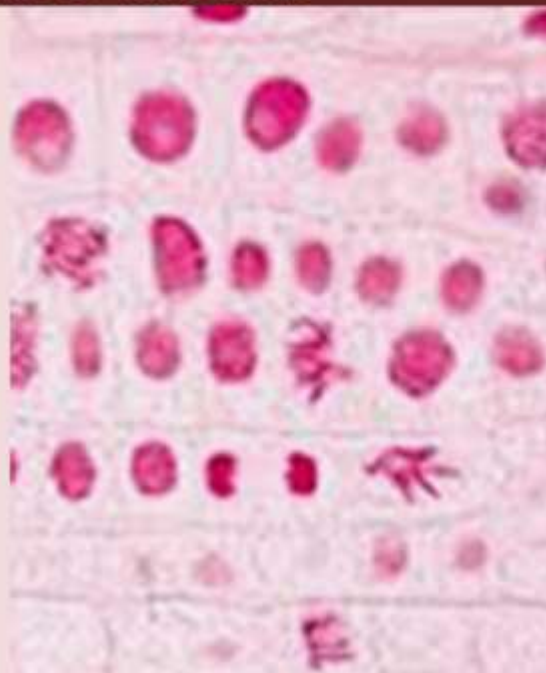**Organized by Departments of Botany, Durgapur Government College**
Supervised by –
Dr. Prosanta Saha
Assistant Professor
Department of Botany
Durgapur Government College, Durgapur

Images from the New Experiment on Study of Mitotic Chromosomes of *Allium cepa*

PLASTIDAL PIGMENTS SEPERATION BY TLC (THIN LAYER CHROMATOGRAPHY)

Fig 4: Few glimpse of the new experiment by supervisor and students

Outreach Activity

**DBT STAR
COLLEGE
SCHEME
SPONSORED**

Objectives of the outreach activity

The objectives of the campaign addressing superstitious beliefs in the context of science education for school students, are highlighted below:

- *Critical Thinking*: Encouraging students to question, analyze, and evaluate beliefs in the light of scientific evidence and reasoning.
- *Promoting Scientific Method*: Teaching students the scientific method to understand the difference between empirical evidence and unfounded beliefs.
- *Cultural Understanding*: Fostering an understanding of cultural beliefs while emphasizing the importance of empirical evidence and scientific inquiry.
- *Building Awareness*: Raising awareness about the impact of superstitions on decision-making and society's progress.
- *Empowering Decision-Making*: Equipping students with the tools to make informed, evidence-based decisions rather than relying on superstitions or myths.
- *Ethical Consideration*: Highlighting the ethical implications of perpetuating or blindly following baseless beliefs and promoting ethical behavior grounded in evidence and reason.

The outreach campaign at Bidhannagar Government Sponsored Boy's High School was organized by the Departments of Botany, Mathematics and Physics, Durgapur Government College, in joint collaboration with the Breakthrough Science Society.

The participants from Durgapur Government College include –

1. Dr. Nivedita Acharjee (Coordinator, DBT Star College Scheme, Durgapur Government College)
2. Dr. Pratikshan Mondal (Departmental Coordinator, Department of Mathematics)
3. Dr. Somenath Bhattacharya (Representative Participant, Department of Physics)
4. Dr. Prosanta Saha (Departmental Coordinator, Department of Botany)
5. Mr. Sibaji Rit (Representative Participant, Department of Mathematics)

The event was attended by the teachers and almost 200 student participants of Bidhannagar Government Sponsored Boy's High School. The program commenced from 11:00 a.m. at Bidhannagar Government Sponsored Boy's High School with the inaugural speech of Prof. Kartick Ghanta, President, Breakthrough Science Society. This was followed by lectures from Dr. Nivedita Acharjee (Coordinator, DBT Star College Scheme, Durgapur Government College) and the Head of Bidhannagar Government Sponsored Boy's High School. Subsequently, the representatives of Breakthrough Science Society took over and they demonstrated several acts and activities in front of the participants, thereby establishing the scientific foundations that underlie the common superstitious beliefs. At the end of their demonstration, Dr. Somenath Bhattacharya, Assistant Professor, Department of Physics, Durgapur Government College, demonstrated a couple of experiments of Physics, which are commonly misinterpreted as superstition. The program ended at 2:30 p.m. and got an overwhelming response from the students and other participants.

Images of the outreach activity at Bidhannagar Government Sponsored Boy's High School

Outcome of the outreach activity

The outcomes of the campaign integrating science and addressing superstitious beliefs among school students include:

- *Increased Awareness*: Students become more aware of the scientific method and its application in distinguishing between superstitions and evidence-based knowledge.
- *Critical Thinking Skills*: Improved ability to critically evaluate beliefs, separating superstitions from empirical evidence and reasoning.
- *Cultural Sensitivity*: Enhanced understanding and respect for cultural beliefs while acknowledging the importance of evidence-based knowledge.
- *Reduced Superstitious Behavior*: Encouraging students to rely on evidence rather than superstitions for decision-making and problem-solving.
- *Community Impact*: Potential for influencing family and community perspectives by sharing knowledge gained from the campaign, contributing to a more scientifically informed society.