



Durgapur Government College

J.N.Avenue,Durgapur,District-PaschimBardhaman,WestBengal,Pin-713214

Website: <https://www.durgapurgovtcollege.ac.in/>

E-mail: dpggovtcollege@gmail.com

New experiments beyond course curriculum and Hands on Training programmes conducted by Departments to enhance experiential learning experiences (Academic Session: 2023-24)

Sl No.	Organizing Department	Event	Date/Month
1	Botany	New Experiment on " Endospore Staining" under DBT STAR COLLEGE SCHEME	25-08-2023
2	Botany	New Experiment on " Study of Mitotic Chromosomes of Allium Ceba" under DBT STAR COLLEGE SCHEME	25-08-2023
3	Botany	New Experiment on "Plastidal Pigment Separation by TLC" under DBT STAR COLLEGE SCHEME	07-09-2023
4	Botany and Zoology	New Experiment on " Gram Staining of Bacteria under DBT STAR COLLEGE SCHEME "	March 2024
5	College Campus Environmental Sub-Committee in association with Department of Botany, Conservation Biology, Zoology and IQAC	Hands-on training on Nature Walk on 'Backyard Biodiversity: Click while you Walk'	06-05-2024
3	Chemistry	New Experiment on "To estimate the amount of glucose present in commercial pack" under DBT STAR COLLEGE SCHEME	August 2023
4	Chemistry	New Experiment on " Estimation of Vitamin C in fruits and vegetables" under DBT STAR COLLEGE SCHEME	April 2024
5	Chemistry	New Experiment on " Estimation of Glycine using Sorensen formol titration " under DBT STAR COLLEGE SCHEME	November 2023
6	Chemistry	New Experiment on " Isolation of Essential oil (eucalyptus oil) by Steam Distillation Method" under DBT STAR COLLEGE SCHEME	April 2024
7	Chemistry	New Experiment on " Detection of Cane Sugar, Starch and Ammonium compounds in milk" under DBT STAR COLLEGE SCHEME	April 2024



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Sl No.	Organizing Department	Event	Date/Month
8	Physics, Mathematics and Geology	Hands on training on "Digital Image Processing: An overview" under DBT STAR COLLEGE SCHEME	26-09-2023
9	Physics and Geology	Hands on training on " Resistivity meter Logging in Ground Water Exploration" under DBT STAR COLLEGE SCHEME	27-09-2023
10	Physics	New Experiment on Determination of Planck's constant using photo-electric effect" under DBT STAR COLLEGE SCHEME	29-11-2023
11	Physics	New Experiment on To find an unknown capacitance using De' Sauty's AC bridge under DBT STAR COLLEGE SCHEME	07-12-2023
12	Physics	New Experiment on To verify the Malus Law for Plane Polarized light under DBT STAR COLLEGE SCHEME	06-03-2024
13	Physics	New Experiment on "Photo-electric Effect: photo current versus intensity" under DBT STAR COLLEGE SCHEME	03-01-2024

Durgapur Government College

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

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

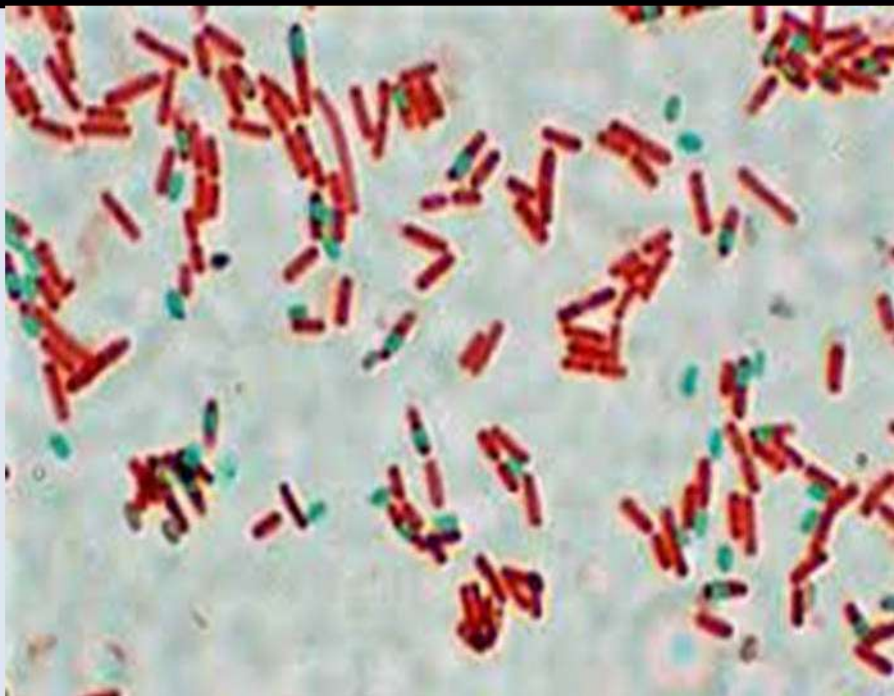
Assistant Professor

Department of Botany
Durgapur Government
College, Durgapur

Mrs. Sudeshna

Mitra

SACT, Department of
Microbiology
Banwarilal Bhalotia
College, Asansol



**OFFICE OF THE PRINCIPAL
DURGAPUR GOVERNMENT COLLEGE**

J.N. Avenue, Durgapur, Paschim Bardhaman 713214

No. 184

Date: 24-08-2023

NOTIFICATION

This is for information to all concerned that Department of Botany will conduct two new experiments on "Endospore Staining" and "Cytochemical Staining of DNA" for Honours and Program students on 25-08-2023 from 11 am onwards under the DBT STAR COLLEGE SCHEME. All students should report to the department at the scheduled date and time for the aforementioned experiments.

Nivedita Acharjee

Dr. Nivedita Acharjee

Coordinator, DBT STAR COLLEGE SCHEME
Durgapur Government College



Principal

Durgapur Government College

Copy forwarded for information and necessary action to

- 1. Departmental Coordinators of all participating departments of DBT STAR COLLEGE SCHEME*
- 2. All participating departments of DBT STAR COLLEGE SCHEME*
- 3. Notice Book, Office of the Principal*

Attendance Sheet

Sl No.	Name in BLOCK	DEPARTMENT	SEMESTER	ROLL NO./ REGN. NO.	SIGNATURE
1	PARITA CHAKRABORTY	BOTANY	5 th	KNU2010/ 3002046	Parita Chakraborty
2	PTU DEBNATH	BOTANY	5 th sem	21BOTH021	Priya Debnath
3	RAKHI SINGH	BOTANY	5 th SEM	21BOTH024	Rakhi Singh.
4	AHALA MANDI	BOTANY	1 st SEM	23BOTH04	Ahala Mandi
5	PRITI GHOSH	BOTANY	1 st SEM	23BOTU010	Priti Ghosh
6	Tiyasha Chatterjee	Botany	1 st SEM	23BOTU008	Tiyasha Chatterjee
7	Bristi Bhandari	Botany	1 st Sem	23BOTU004	Bristi Bhandari
8	Sparsha Biswas	Botany	1 st sem	23BOTH011	Sparsha Biswas
9	AYNDRILA PARAMANIK	Botany	1 st sem	23BOTH005	Ayndrila Paramanik
10	Sayantika Goswami	Botany	1 st sem	23BOTU009	Sayantika Goswami
11	Samrat Sarda	Botany	1 st sem	23BOTH008	Samrat Sarda
12	Seh Talwar	Botany	1 st Sem		Seh Talwar
13	URMILA MRIDHA	Botany	1 st sem	23BOTH007	Urmila Mridha
14	DEBJEET SHAW	BOTANY	1 st Sem	23BOTH017	Debjcet Shaw
15	Ashik Mandal	Botany	1 st Sem	23BOTH020	Ashik Mandal
16	Subham Ghosh	Botany	1 st sem	23BOTH019	Subham Ghosh
17	Payal Agarwal	Botany	1 st sem	23BOTH012	Payal Agarwal
18	Arina Bhattacharya	Botany	1 st sem	23BOTU011	Arina Bhattacharya
19	Abhinava Karanika	Botany	1 st sem.	23BOTH016	Abhinava Karanika
20					

Bacterial spore (endospore) staining

Principle

Some bacteria are capable of changing into dormant structures that are metabolically inactive and do not grow or reproduce. These structures are resistant to heat, radiation and chemicals.

The toughness and high resistance of spores has been linked to their high content of calcium and dipicolinic acid, A single bacterium forms a single spore by a process called sporulation. Sporulation takes place either by depletion of an essential nutrient or during unfavourable environmental conditions. During sporulation, a vegetative cell gives rise to a new, intracellular structure termed as endospore, that is surrounded by impermeable layer called spore coats. An endospore develops in a characteristic position within a cell, i.e. either central, subterminal or terminal. Once an endospore is formed in a cell, the cell wall disintegrates, releasing the endospore that later becomes dormant independent spore. Endospores can remain dormant for long periods of time. However, a free spore may return to its vegetative or growing state with the return of favourable conditions. Endospores are differentially stained with primary stain malachite green and counter stained with safranin, using special procedures that penetrate the spore wall. An aqueous primary stain is applied and steamed to enhance penetration of the impermeable membranes and spore coats. Once stained the endospores do not readily decolorize and remain green within the red cells.

Requirements

- 48-hour nutrient agar cultures of *Bacillus cereus* or *B. subtilis*
- Malachite green (5% aqueous)
- Safranin (0.5% aqueous)
- Staining tray
- Glass slides
- Inoculating loop
- Blotting paper
- Spirit lamp
- Microscope.

Procedure

1. Make smears of *Bacillus subtilis* on separate clean slides
2. Air dry and heat fix the smears.
3. Flood the smears with malachite green.
4. Heat the slides to steaming and steam for 5 minutes, adding more stain to the smear from time to time.
5. Wash the slides under slowly running tap water.
6. Counterstain with safranin for 30 seconds.
7. Wash smear with distilled water.
8. Blot dry slides with absorbent/blotting paper

Observations

The bacterial smears were observed under microscopic field . Vegetative cells cells stained red and the spores stained green. Few cells with endospores were observed. The endospores were both centrally and terminally located, but they were very few in number.

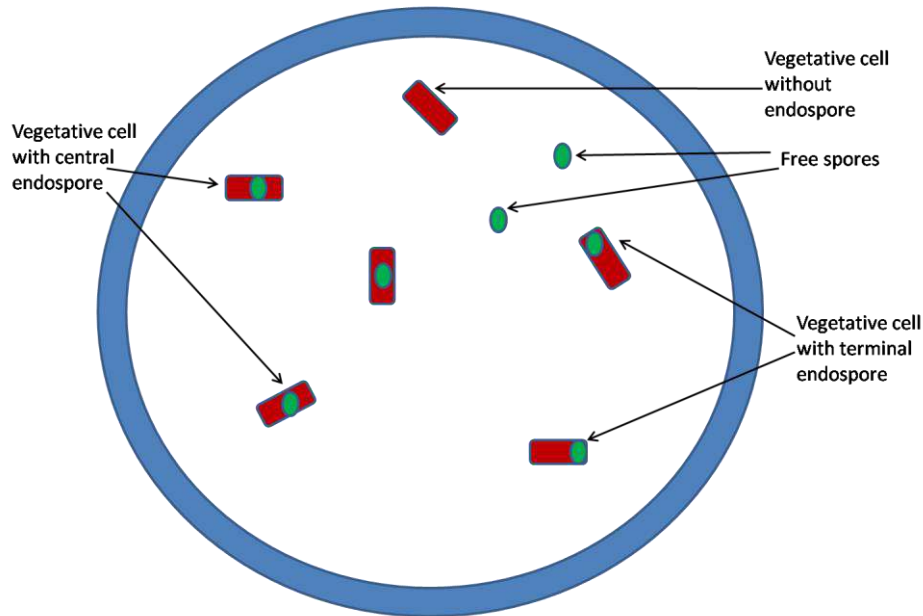
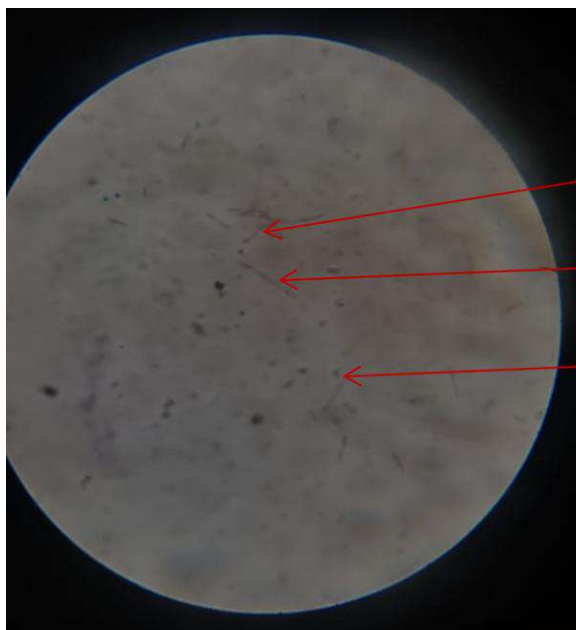


Fig: Representative image of a microscopic field at 1000X magnification showing endospores of *Bacillus subtilis*



Cell with terminal endospore

Vegetative cell

Free spore

Fig. Microscopic field under oil immersion objective (1000X magnification)

Comment

It is supposed that endospore induction was suboptimal. Additional periods of nutrient deprivation or heat stress might result in proper induction of endospores in *Bacillus subtilis*.

OBSERVATION

on microscopic examination of the slide under oil immersion object (1000 X magnification), endospores were observed in Bacillus subtilis. The endospores stained green and the vegetative cells stained red. The vegetative cells were rod shaped, many among which contained an elliptical, centrally located endospore. occasionally terminal endospores were also observed. The microscopic field also displayed some free spores, green in colour and outside the vegetative cells. A representative image of the microscopic field is shown below.

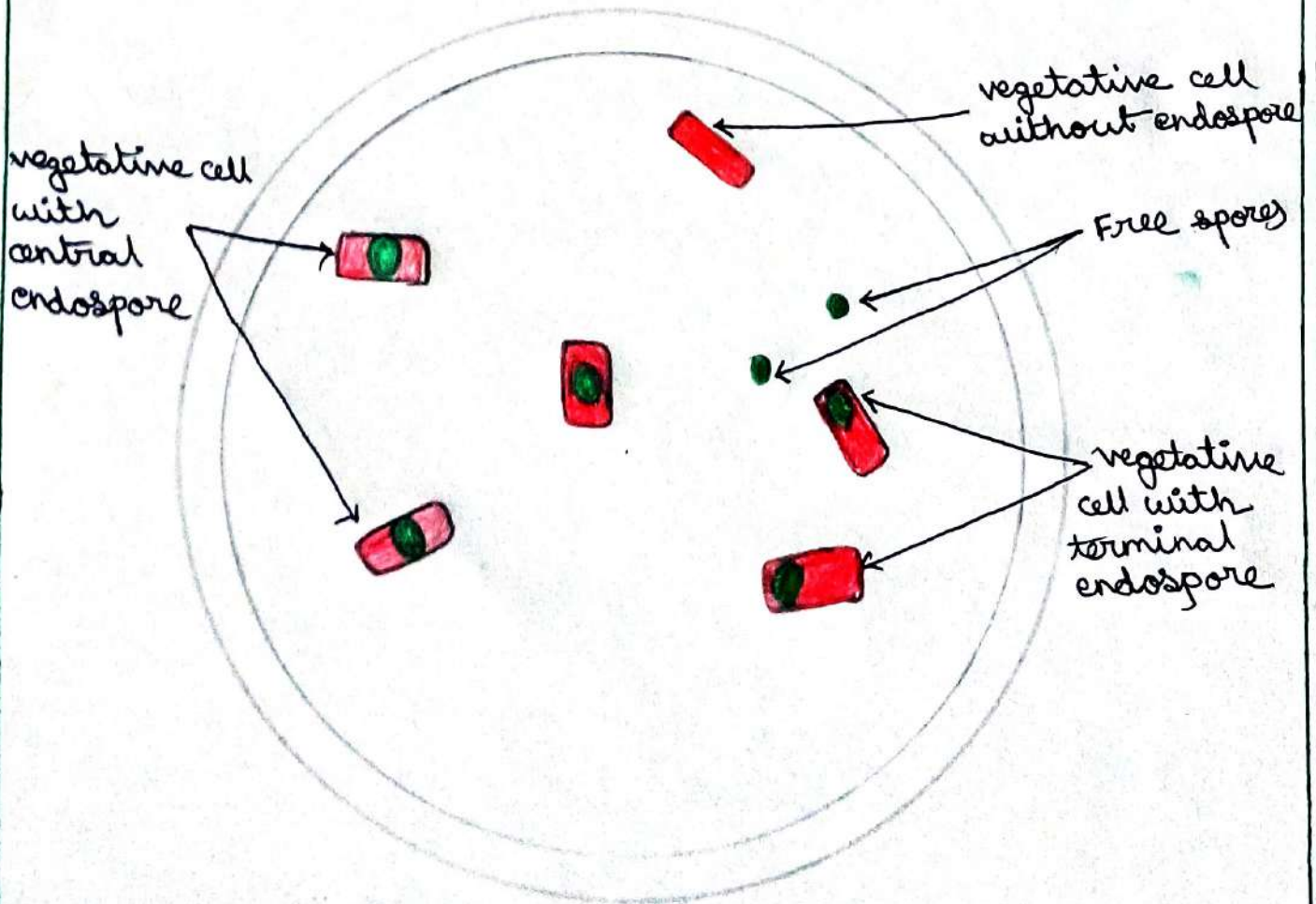


Fig: Representative image of a microscopic field at 1000x magnification showing endospores of Bacillus subtilis.

Bisham Ghosh
student's signature

Teacher's signature

Observation:

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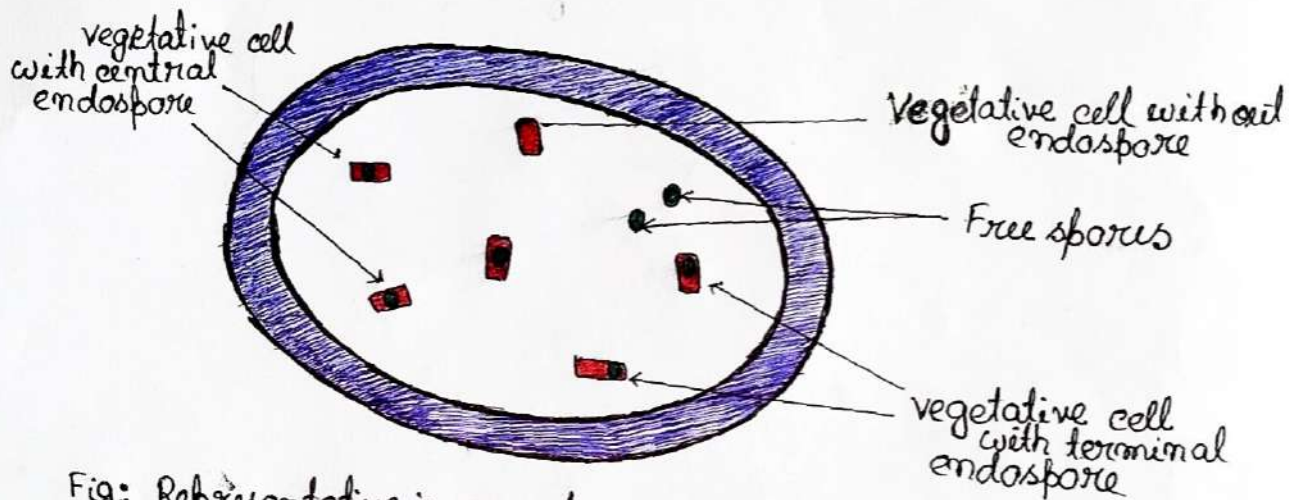


Fig: Representative image of a microscopic field at 1000x magnification showing endospores of Bacillus subtilis

Ayndrila Paramanik
Student's signature

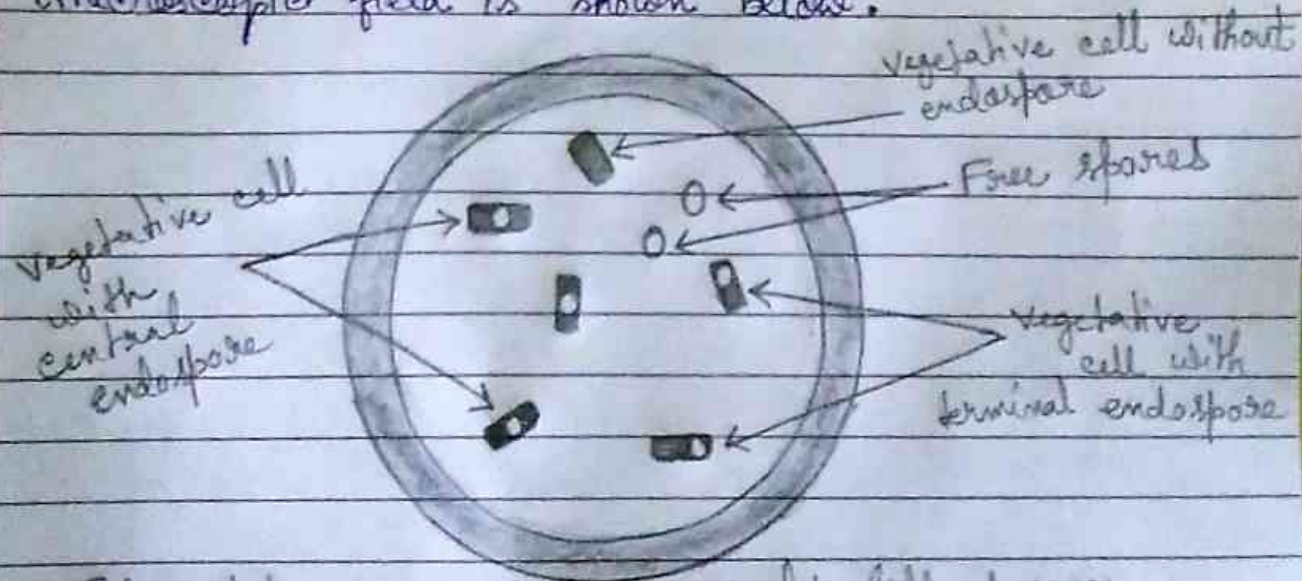
Teacher's Signature

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Occasionally terminal endospores were also observed. The microscopic field also displayed some free spores, green in colour and outside the vegetative cells. A representative image of the microscopic field is shown below.



Representative image of a microscopic field at 1000X magnification showing endospores of Bacillus subtilis.

Challenger

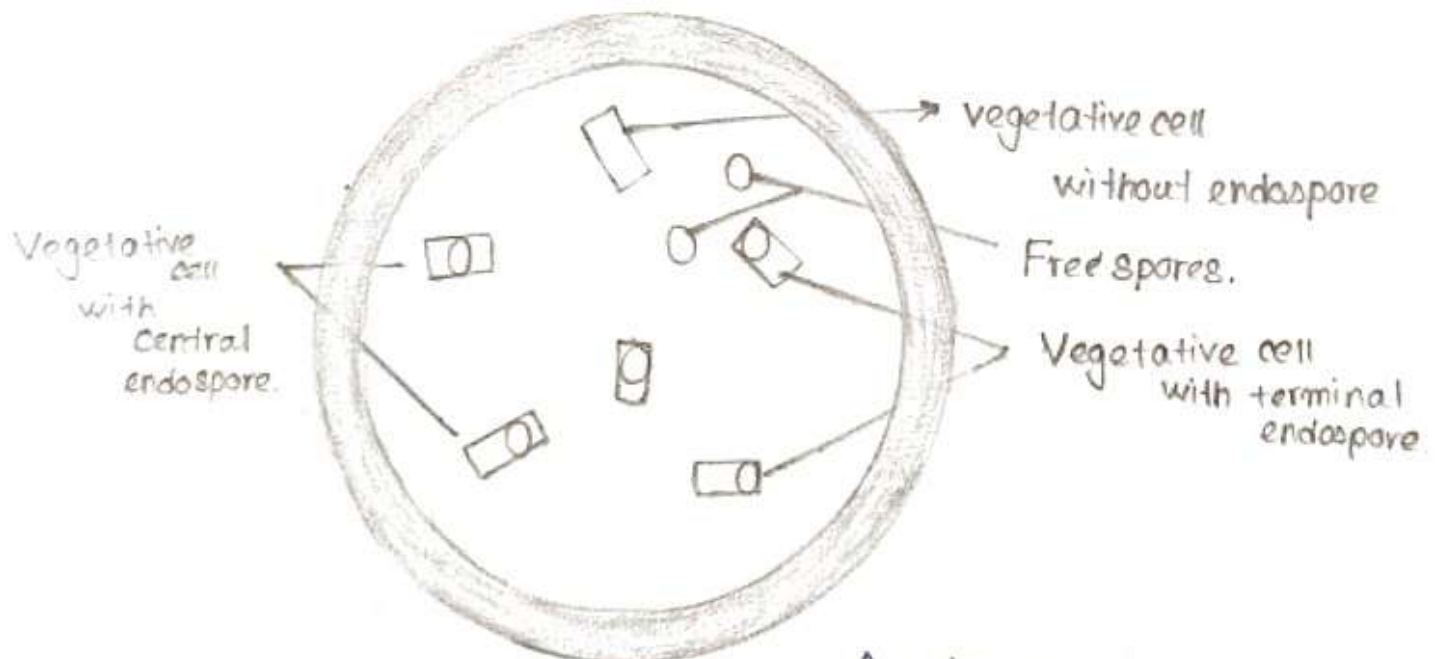
Subject Shoul
Student's signature

Teacher's signature

Teacher's Signature

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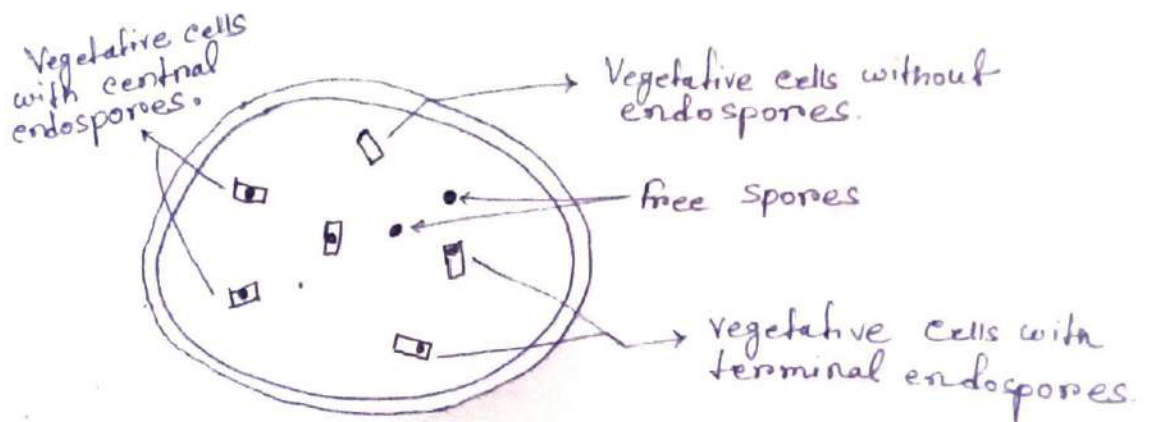
Representative image of a microscopic field at 1000x magnification showing endospores of Bacillus subtilis

Abhinav Kumar
Student's Signature.

Teacher's Signature.

Observation

On microscopic examination of the slide under oil immersion objective (1000x magnification), endospores were observed in Bacillus Subtilis. The endospores stained green and the vegetative cells stained red. The vegetative cells were rod shaped, many among which contained an elliptical, centrally located endospore. Occasionally terminal endospores were also observed. The microscopic field also displayed some free spores, green in colour and outside the vegetative cells. A representative image of the microscopic field is shown below.



Sekh Tahir

Students Signature

Teachers Signature

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 -

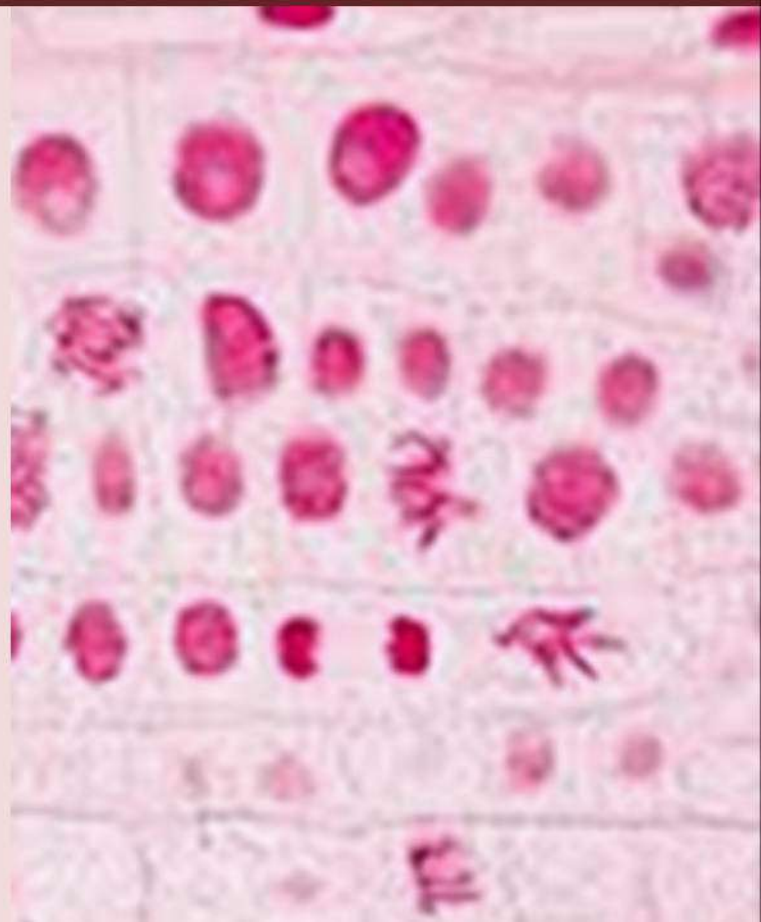
Dr. Prosanta Saha

Assistant Professor

Department of Botany

Durgapur Government College,

Durgapur



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DURGAPUR GOVERNMENT COLLEGE**

J.N. Avenue, Durgapur, Paschim Bardhaman 713214

No. 184

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Nivedita Acharjee

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Coordinator, DBT STAR COLLEGE SCHEME
Durgapur Government College



Principal

Durgapur Government College

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3	RAKHI SINGH	BOTANY	5th SEM	21BOTH024	Rakhi Singh
4	ABHINABA KARMAKAR.	BOTANY	1st SEM.	23BOTH016	Abhinaba Karmakar.
5	SAMRAT SARDER	BOTANY	1st SEM	23BOTH008	Samrat Sardar
6	Sekh Tahiri	Botany	1st Sem	23BOTU002	Sehlahi
7	Debjit Shou	Botany	1st Sem	23BOTH017	Debjit Shou
8	Subham Ghosh	Botany	1st sem	23BOTH009	Subham Ghosh
9	Ashik Mondal	Botany	1st sem	23BOTH020	Ashik Mondal
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18	Arina Bhattacharya	Botany	1st	23BOTU011	Arina Bhattacharya
19	Bristi Bhandari	Botany	1st sem	23BOTU004	Bristi Bhandari
20					
21					

Study of Mitotic Chromosomes of *Allium cepa*

Principle

The study of mitotic chromosomes involves several steps, including pretreatment, fixation, and staining. Pretreatment involves hypotonic treatment of cells to swell them, facilitating the spreading of chromosomes. Pretreating agents also function to dissolve the spindle in order to arrest the cells in metaphase state. Pretreatment is followed by fixation. Fixation stops cellular processes, preserves cellular structures, and immobilizes the chromosomes on the slide. Common fixatives include ethanol-acetic acid (3:1 ratio) or formaldehyde. Following fixation, the chromosomes are stained. There are several staining solutions like aceto orcein, aceto carmine, feulgen stain, etc. Aceto-orcein staining is a classical method used to visualize chromosomes, particularly during mitosis. The stain is composed of orcein dye dissolved in acetic acid. Aceto-orcein is acidic due to the presence of acetic acid. This acidic environment helps in the dissociation of basic proteins, facilitating the staining of chromosomes. Orcein, the basic dye component, has an affinity for chromatin, specifically binding to the DNA and proteins in the chromosomes.

Procedure

Preparation of the material: Bulbs of *Allium cepa* (onion) were allowed to germinate in sand and saw dust mixture. Following germination, healthy root tips of about 1 cm in length were taken and used for experiment.

Pretreatment: All the root tips were taken in a small microfuge tube containing para dichlorobenzene (PDB). The specimens are then placed into refrigerator (10-12° C) for 4 hours 30 mins for pretreatment.

Fixation: Pretreated root tips were thoroughly washed in distilled water and fixed in 1:3 acetic acid:ethanol in a microfuge tube and kept for 48 hours at room temperature.

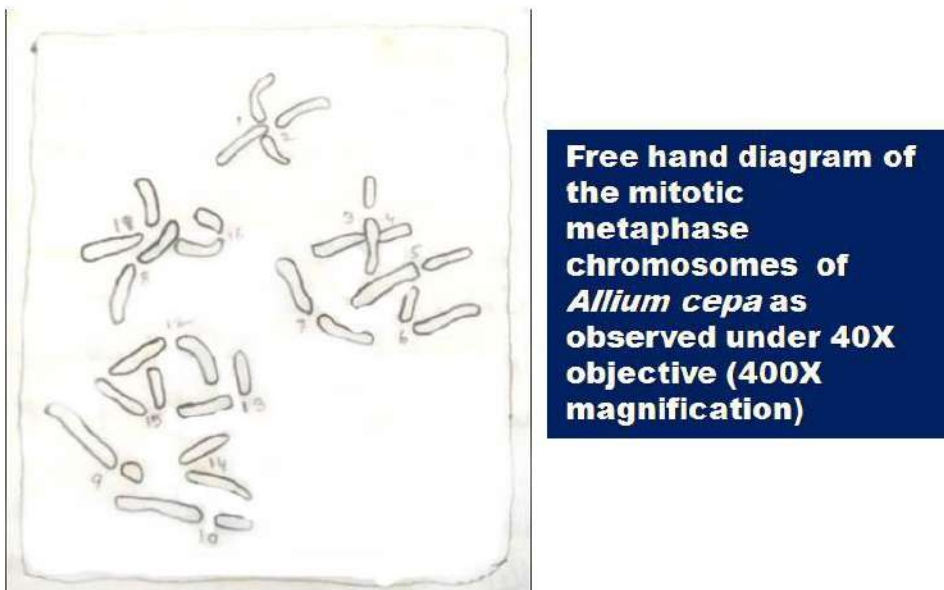
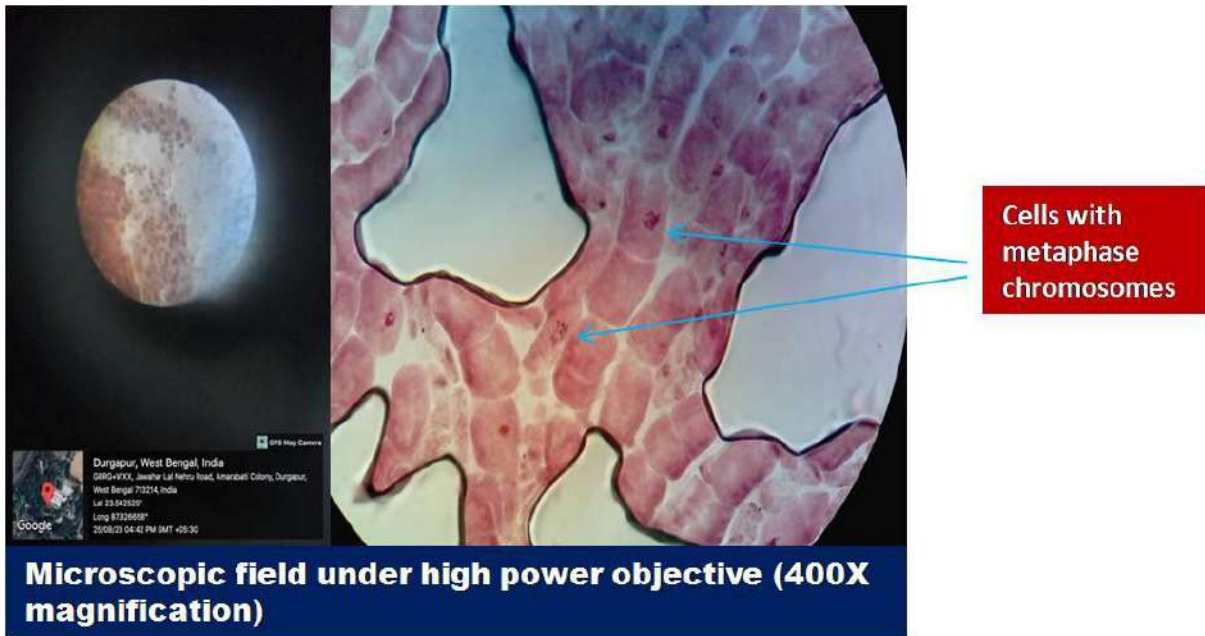
Staining: The fixed root tips were transferred from fixative solution to 45% acetic acid and kept for 10-15 mins. They were then heated gently in 2% aceto-orcein: HCl (1N) in the ratio 9:1, and incubated at room temperature for staining, for 1 hour.

Squashing: The stained root tips were taken in a clear dry slide singly and the meristematic zone was cut with a sharp blade. A drop of 45% acetic acid was put on the cut meristematic tip and cover slip was applied on it. The specimen was squashed with uniform pressure by the nail of index finger. Care was taken to prevent lateral movement of the cover slip. Uniform vertical pressure was applied on the cover slip with thumb in order to make the cells and the chromosomes lay in the same plane. Care was taken to prevent entrapment of any air bubble within the cover slip. The edges of the cover slip was sealed temporarily with molten paraffin and observed under microscope under 10X and 40X objectives.

Observation

Several cells were observed to be at metaphase stage. The observations of a particular field of microscope are as follows:

Numerous cells were observed under low magnification (100X). A number of metaphase plates with scattered chromosomes were observed. A particular metaphase plate was focused and observed under high magnification (400X). The number of chromosomes was counted and the plate was drawn with free hand. The somatic chromosome complement of *Allium cepa* was observed to consist of $2n = 16$ chromosomes.



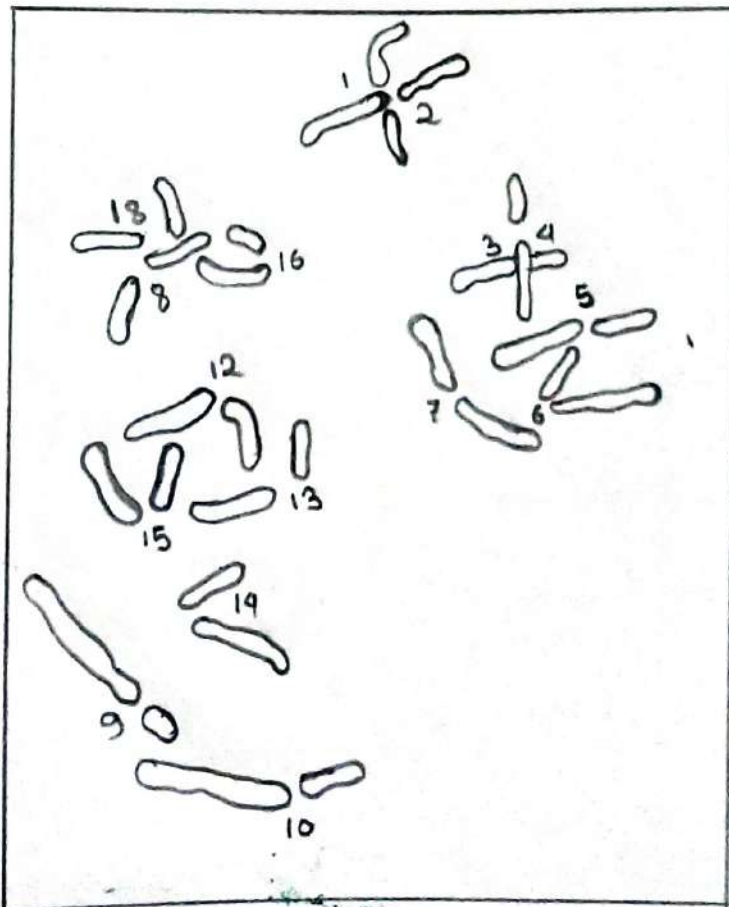
Comment

The metaphase frequency was low but few plates were observed with well scattered chromosomes, enabling the counting of the $2n = 16$ somatic chromosomes.

OBSERVATION

Numerous metaphase plates were observed. The observation of a particular field of microscope are as follows -

1. Numerous cells were observed under low power objective (100x magnification). A number of cells with scattered chromosomes were observed. A particular plate was focussed and observed under high magnification.
2. Under high power objective (400x magnification) the number of chromosomes were counted and a free hand diagram of a particular metaphase plate was done.
3. The somatic chromosome complement of the species consist of $2n = 16$ chromosome. The position of the centromere is variable, thus the chromosomes were of metacentric and sub-metacentric types. Some overlapping chromosomes were also observed.



Subham Ashish

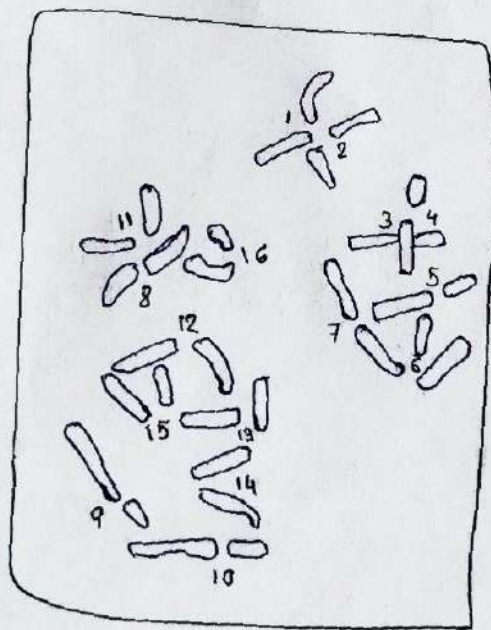
Student's signature

Teacher's signature

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Ayndrila Paramanik

Student's signature

Teacher's signature

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3. The somatic chromosome complement of the species consist of $2n = 16$ chromosome. The position of the centromere is variable, thus the chromosomes were of metacentric and sub-metacentric types. Some overlapping chromosomes were also observed.



Abhinav Karwar
Student's Signature.

Teacher's Signature.

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Sekh Tahir

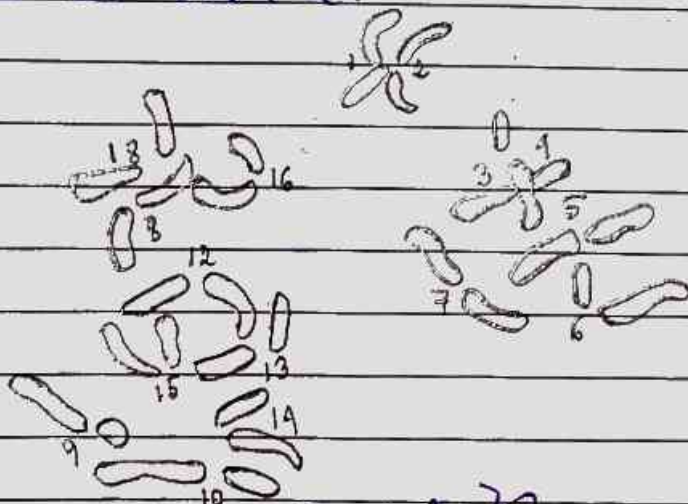
Students Signature

Teacher's Signature

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Challenger

Student's signature: Subject Frowl

Teacher's Signature _____

NEW EXPERIMENT
UNDER DBT STAR
COLLEGE SCHEME
07.09.2023

Supervised by

Dr. Sandipan Ray

Dr. Subhojit Ojha

PLASTIDAL PIGMENTS SEPERATION BY TLC (THIN LAYER CHROMATOGRAPHY)



Department of Botany

Durgapur Government College

NEW EXPERIMENT UNDER DBT STAR

COLLEGE SCHEME

**OFFICE OF THE PRINCIPAL
DURGAPUR GOVERNMENT COLLEGE**

J.N. Avenue, Durgapur, Paschim Bardhaman 713214

No. 200

Date: 04-09-2023

NOTIFICATION

This is for information to all concerned that Department of Botany will conduct new experiment on "Separation of plastidial pigments" for Honours and Program students of Department of Botany on **07-09-2023 from 11 am onwards** under the DBT STAR COLLEGE SCHEME. Attendance at the event would be considered as class attendance, during the course of the new experiment. All students should report to the department at the scheduled date and time for the aforementioned experiment.

Nivedita Acharjee

Dr. Nivedita Acharjee
Coordinator, DBT STAR COLLEGE SCHEME
Durgapur Government College



Principal
Durgapur Government College

Copy forwarded for information and necessary action to

- 1. Departmental Coordinators of all participating departments of DBT STAR COLLEGE SCHEME*
- 2. All participating departments of DBT STAR COLLEGE SCHEME*
- 3. Notice Book, Office of the Principal*

New Experiment: Separation of Plastidial Pigments by TLC

Date : 07.09.2023

<u>Sl. NO.</u>	<u>NAME</u>	<u>DEPT</u>	<u>SEM (P/H)</u>	<u>Rg NO./Roll No.</u>	<u>Sig & Date</u>
1.	Suvojit Panda	Chemistry	3rd Program (Sen)	22CEMS015	Suvojit Panda 7.9.23
2.	Arpan Baidham	Botany	3rd (P)	22BOTPO31	Arpan Baidham 7.9.23
3.	Deep Saha	Chemistry	3rd (P)	22CEMP003	Deep Saha 07.09.23
4.	Bikram Chakraborty	Chemistry	3rd (P)	22CEMP016	Bikram Chakraborty 7.9.23
5)	Debangona Das	Zoology	3rd (P)	22ZOOPO08	Debangona Das 7/9/23
6)	Sebanjana Das	Botany	3rd (P)	22BOTPO27	Sebanjana Das 7/9/23
7)	Nithi Dey	Zoology	3rd (P)	22ZOOPO17	Nithi Dey 7.9.23
8)	Sakshat Tahir	Botany	1st (UG)	23BOTU002	Sakshat Tahir 07/09/2023
9)	Sparsha Biswas	Botany	1st (Honors)	23BOTH011	Sparsha Biswas 07.09.23
10)	Ayondrila Paramanik	Botany	1st (Honors)	23BOTH005	Ayondrila Paramanik 7/9/23
11)	Susham Chosh	Botany	1st (Honors)	23BOTH019	Susham Chosh 7/9/23
12)	Abhinava Karanaka	Botany	1st (Honors)	23BOTH016	Abhinava Karanaka 7/9/23

1. An Introduction

1.1 Plant Pigments

A compound that absorbs light is called a pigment. Chlorophylls a and b are primary photosynthetic pigments that absorb light for photosynthesis. The accessory pigments carotenoids and xanthophyll absorb light and pass it to chlorophyll a. Even though chlorophyll is the primary pigment, the other pigments are essential to the plant's ability to produce colour and engage in photosynthesis because they absorb each light differently and effectively across the electromagnetic spectrum.

Other non-photosynthetic pigments, such as anthocyanins or other flavonoids, determine the colour of flowers, so their absorption spectra vary. The function of these pigments is to attract insects or birds for pollination

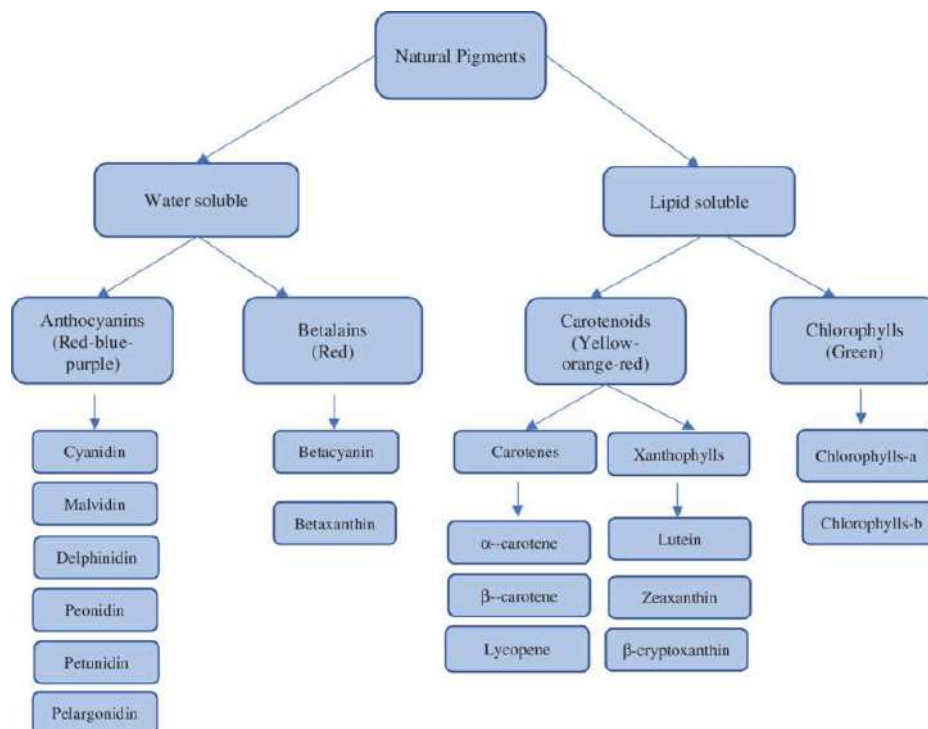


Fig 1: Classification of pigments

1.2 Chromatography

Chromatography, which means "colour writing," is a Greek term that is formed from the words "chromo" and "graph". Chromatography enables the separation of the constituent parts of a given mixture, enabling scientists to observe and produce findings and theories.

Two mutual immiscible phases are brought into contact-

1. Stationary phase
2. Mobile phase

Component in the sample undergo repeated interaction between mobile phase and stationary phase. Components are separated into bands in order of increasing interaction with stationary phase. The least retarded component emerges first. Strongly retained will elute lastly

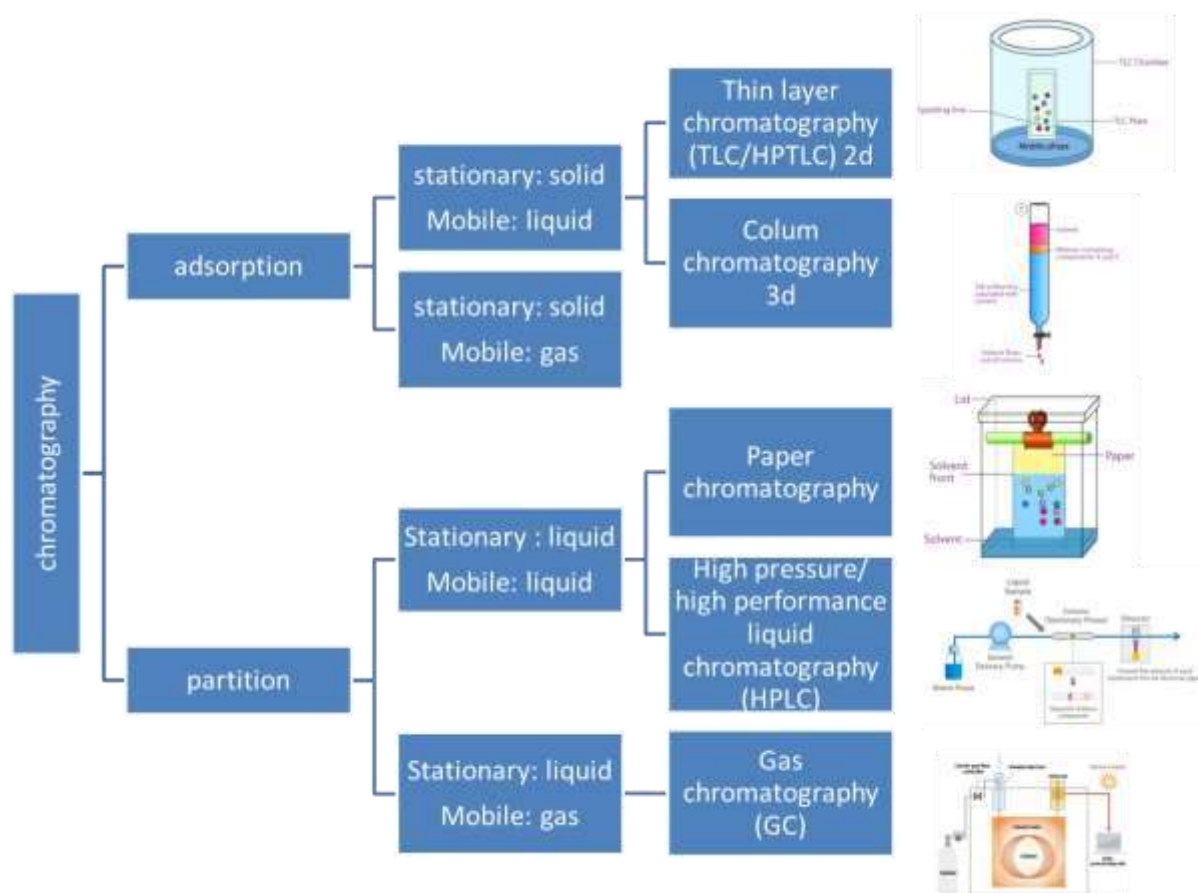


Fig 2: Classification of chromatography

Thin Layer Chromatography (TLC) is a method for classifying dissolved substances according to how soluble they are in a given solvent, such as chlorophyll, carotene, and xanthophyll. TLC can be used to separate the colours in plant cells. The stationary element in chromatography paper permits the reaction between the solute and solvent to take place and produce results

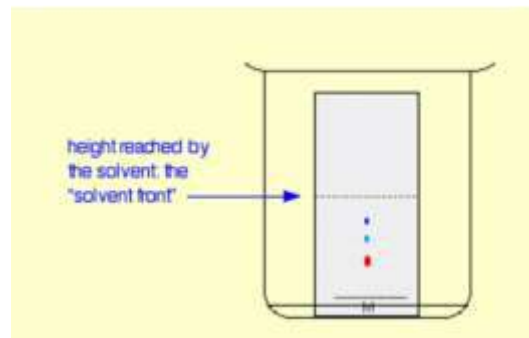
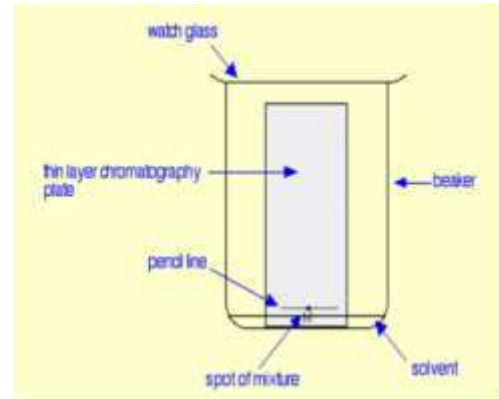
2. Material Required

- Chromatography chamber
- Spinach leaves
- Mortar and pestle
- Scissors
- Petroleum Ether 40 – 60
- Acetone
- Capillary tube
- TLC plate
- Centrifuge

- Pencil
- Spatula
- Scale

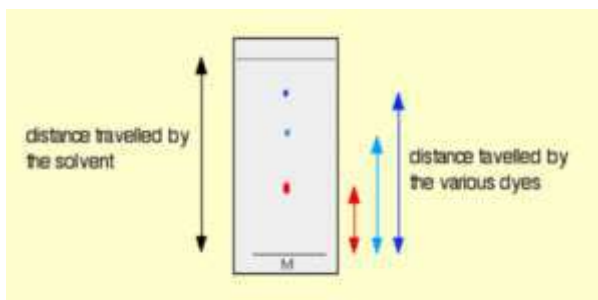
3. Procedure:

1. Sample leaves should be crushed into small pieces and put in a mortar for pestle grinding by acetone
2. Take the crushed material in a centrifuge tube and centrifuge for 5 min in 10,000 rpm
3. Then, carefully draw a pencil line 1 cm from the bottom of the TLC plate, spot a little amount of leaf extract repeatedly onto the centre of the line, and let each spot dry
4. Make sure the paper dips into the solvent (Petroleum Ether 40 – 60: acetone = 9:1) but the spot of leaf extract doesn't by suspending it
5. The solvent is allowed to run up the plate until it is close to the bung, at which point the plate is removed. The solvent's location is marked, and the paper is allowed to dry



6. The final chromatography plate is known as a chromatogram, and it may be photographed to determine the exact position of each pigment. Next, determine the R_f value for each pigment spot on the chromatogram
7. The retention factor is pronounced R_f. The retention factor is calculated by dividing the component's travel distance by the solvent's travel distance

Fig 3: Pictorial representation of TLC



The pigment's movement rate is measured by the R_f (retention factor) value. R_f value = distance transported by pigment from origin to centre of pigment spot / distance from the origin to the solvent front. By applying this formula, you can determine the R_f value

Fig 4: Pictorial representation of TLC result



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

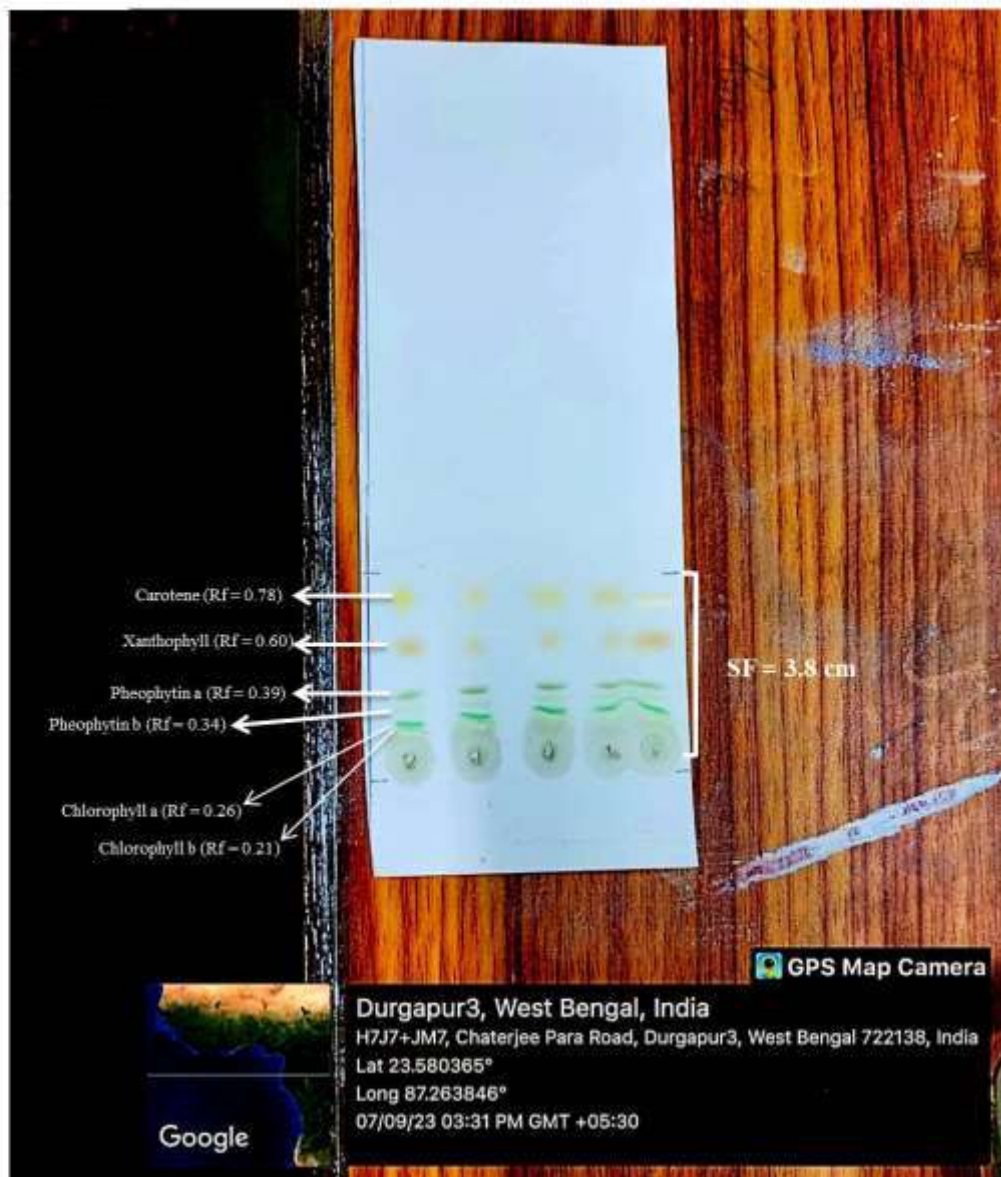


Fig 5: Result of TLC showing 6 spots identified by Rf value compared with standard Rf value from reference

DATE	PAGE NO.

EXPT. NO.

Spot	Solvent Front	Distance Travelled	Rf	Compound.
1.		3 cm.	$3/3.8 = 0.78$	Carotene.
2.		2.3 cm.	$2.3/3.8 = 0.60$	Xanthophyll.
3.	3.8 cm.	1.5 cm.	$1.5/3.8 = 0.39$	Pheophytine a.
4.		1.3 cm.	$1.3/3.8 = 0.34$	Pheophytine b.
5.		1 cm.	$1/3.8 = 0.26$	Chlorophyll a.
6.		0.8 cm.	$0.8/3.8 = 0.21$	Chlorophyll b.

Conclusion:-

The pigments are light absorbing molecules and are separated by using TLC in the lab. Altogether 6 Spot were separated and Rf value of each was calculated. The spots were identified by comparing the observed Rf of each spot with already published reference from literature study.

Abhinava Karanadar

7.09.23

Ray 08/09/2023

Signature of Supervisor /s with date.

Table 1: Result

Spot	Solvent Front	Distance Travelled	R_f	Compound
1.		3 cm	$3/3.8 = 0.78$	Carotene
2.		2.3 cm	$2.3/3.8 = 0.60$	Xanthophyll
3.	3.8 cm	1.5 cm	$1.5/3.8 = 0.39$	Phaeophytine a
4.		1.3 cm	$1.3/3.8 = 0.34$	Phaeophytine b
5.		1 cm	$1/3.8 = 0.26$	Chlorophyll a
6.		0.8 cm	$0.8/3.8 = 0.21$	Chlorophyll b

Conclusion

The pigments are light-absorbing molecules and are separated by using TLC in the lab. Altogether 6 spots were separated and R_f value of each was calculated. The spots were identified by comparing the observed R_f of each spot with already published reference from literature study.

Sparsha Biswas 07.09.2023

Ray
08/09/2023

Signature of student with date Signature of supervisor/s

Teacher's Signature.....

3. Result

Table 1: Result

Spot	Solvent Front	Distance Travelled	R _F	Compound
1		3cm	$3/3.8 = 0.78$	Carotene
2		2.3cm	$2.3/3.8 = 0.60$	Xanthophyll
3	3.8cm	1.5cm	$1.5/3.8 = 0.39$	Pheophytine a
4		1.3cm	$1.3/3.8 = 0.34$	Pheophytine b
5		1cm	$1/3.8 = 0.26$	Chlorophyll a
6		0.8cm	$0.8/3.8 = 0.21$	Chlorophyll b

4. Conclusion

The pigments are light-absorbing molecules and are separated by using TLC in the lab. Altogether 6 spots were separated and R_F value of each was calculated. The spots were identified by comparing the observed R_F of each spot with already published reference from literature study.

Usemila Mridha 07.09.2023
Student's signature with date

Teacher's Signature :

Ray
25/09/2023

March 02, 2024

New Experiment on " **Gram Staining of Bacteria** "(Organizing Department: Botany and Zoology) (2023-2024)

Participating Students:

UG Semester-VI Botany Honours, UG Semester-IV Zoology and Botany Program, UG Semester-I Chemistry Honours, UG Semester-I Zoology Undergraduate, UG Semester-I Botany Undergraduate

Outcome:

Students learnt to observe and note the shape and Gram Character of Bacillus culture and E.Coil culture. They also prepared reports and commented on the experiment observations.



May 06, 2024

Hands-on training on Nature Walk on 'Backyard Biodiversity: Click while you Walk' organized by College Campus Environmental Sub-Committee in association with Department of Botany, Conservation Biology, Zoology and IQAC

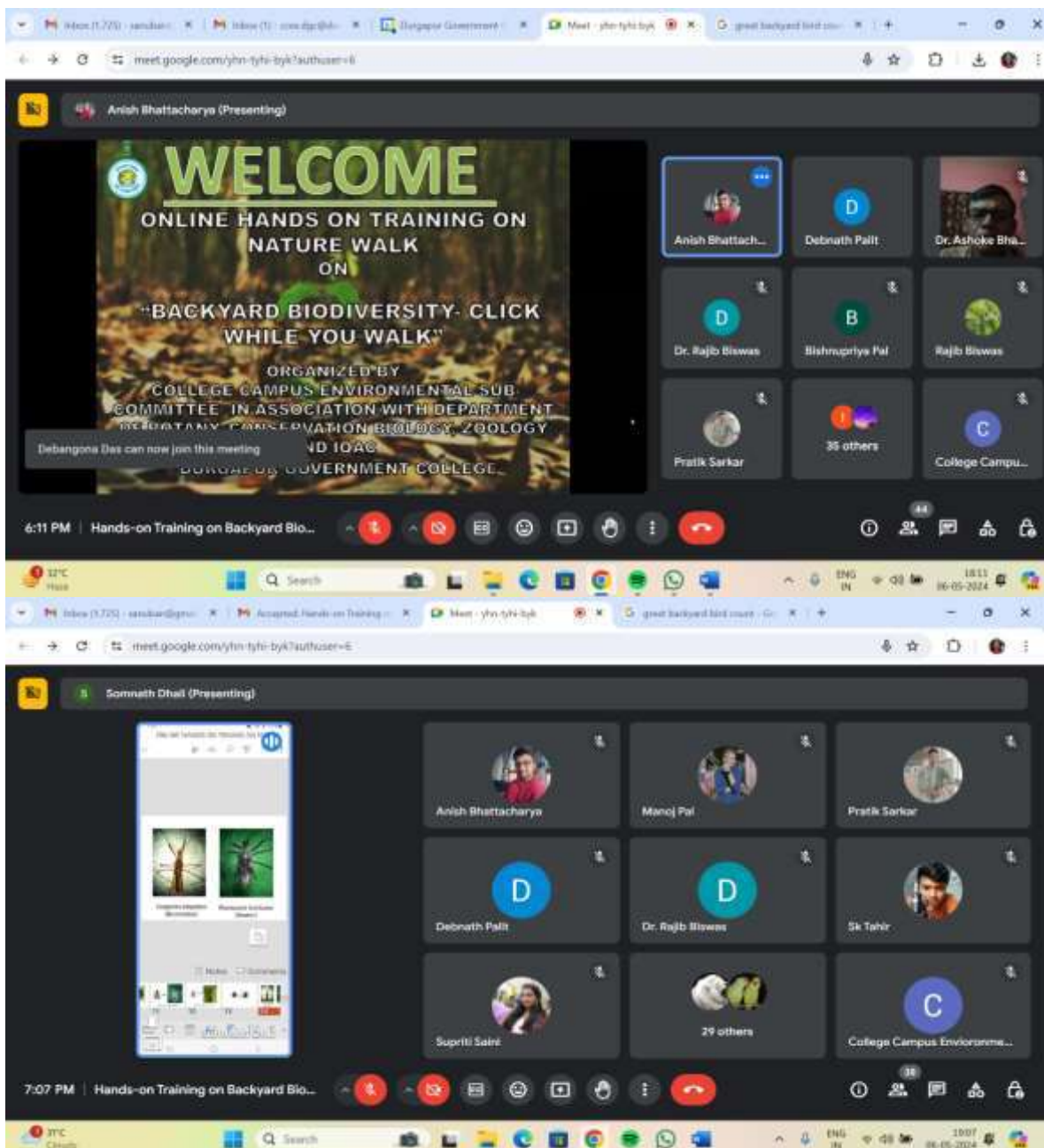
ONLINE HANDS ON TRAINING ON NATURE WALK
on
"Backyard biodiversity- Click while you walk"
06.05.2024
TIME: 06:00 PM TO 7:30PM
organized by
College Campus Environmental Sub-committee in association with Department of Botany, Conservation Biology, Zoology and IQAC
Durgapur Government College

PATRON
Dr. Debnath Palit
Principal, Durgapur Government College

VICE PATRON
Prof Subrata Ghosh, Coordinator, IQAC
and
Dr. Subhojit Ojha, Secretary, Teacher's Council
Durgapur Government College

JOINT CONVENERS
Dr. Maitreyee Chakrabarty
and
Shri Anish Bhattacharya
(Joint Conveners,
College Campus Environmental Sub-committee)

ORGANIZING TEAM
All members of College Campus Environmental Sub-committee
All faculty members and SACT of
Department of Botany
Department of Conservation Biology
and
Department of Zoology



New Experiment "To estimate the amount of glucose present in commercial pack" (Organizing Department: Chemistry) (2022-23 and 2023-24) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Semester-I and Semester-II (Chemistry Honours)

Outcome: Students estimated the amount of glucose present in Glucon D purchased from market and recorded their findings in practical notebook



New Experiment "Estimation of Vitamin C in fruits and vegetables " (Organizing Department: Chemistry) (2022-23 and 2023-24) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Semester-I and Semester-II (Chemistry Honours)

Outcome: Students estimated the amount of Vitamin C present through iodometric estimation in locally available fruits and vegetables



New Experiment "Determination of the amount of phosphate in cold drinks using spectrophotometric method" (2023-2024) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Semester-IV students of Chemistry Honours

Outcome:

Students learnt to determine the amount of phosphate in cold drinks by using the UV-Visible spectrophotometric method.

New Experiment " Estimation of Glycine using Sorensen formol titration " (2023-2024) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Semester-IV students of Chemistry Honours

Outcome:

Students learnt the process of estimation of amino acids using Sorensen formol titration

New Experiment " Isolation of Essential oil (eucalyptus oil) by Steam Distillation Method" (2023-2024) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Semester-IV students of Chemistry Honours

Outcome:

Students learnt the process of isolation of essential oil using steam distillation set up apparatus.

New Experiment "Detection of Cane Sugar, Starch and Ammonium compounds in milk" (Organizing Department: Chemistry) (2023-2024) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Semester-II students of Chemistry Honours and Chemistry Undergraduate Programme

Outcome:

Students learnt the techniques for detection of cane sugar, starch and ammonium Compounds in milk in accordance with the manual of the food safety and standards authority of India, Ministry of Health and Family Welfare, Government of India



**Hands-on Training on “Digital Image Processing: An Overview”
organized by Department of Mathematics, Geology and Physics
on 26.09.2023**

**OFFICE OF THE PRINCIPAL
DURGAPUR GOVERNMENT COLLEGE**

J.N. Avenue, Durgapur, Paschim Bardhaman 713214

No. 230

Date: 23-09-2023

NOTIFICATION

This is for information to all concerned that a Hands-on Training on “**Digital Image Processing: An Overview**” for B.Sc. students will be conducted by the Departments of Mathematics, Geology and Physics on **26-09-2023** from 2 pm onwards under the DBT STAR COLLEGE SCHEME of Durgapur Government College.

Departmental Coordinators of the DBT STAR COLLEGE SCHEME are requested to accordingly inform the respective students for participation in the aforementioned Hands on Training Program.

Nivedita Acharjee

Dr. Nivedita Acharjee
Coordinator, DBT STAR COLLEGE SCHEME
Durgapur Government College

Principal
Durgapur Government College

Copy forwarded for information and necessary action to

- 1. Departmental Coordinators of all participating departments of DBT STAR COLLEGE SCHEME*
- 2. All participating departments of DBT STAR COLLEGE SCHEME*
- 3. Notice Book, Office of the Principal*

Durgapur Government College
DURGAPUR - 713214
DIST. PASCHIM BARDHAMAN
WEST BENGAL

Attendance for participants of the event:
Hands-on Training on "Digital Image Processing: An overview- 26th September 2023
under DBT STAR COLLEGE SCHEME

Sl. No.	Name	Dept./Class	Signature
1	SUBHOJYOTI GHOSH	MATHEMATICS	<i>Subhojyoti Ghosh</i>
2	ARIJIT RAHA ROY	PHYSICS	<i>Arijit Raha Roy</i>
3	NARUNOJAL ROYDAS	Geology	<i>Narunoyal Roydas</i>
4	Subhankar Bosu	Geology	<i>Subhankar Bosu</i>
5	Anasuya Samadder	Geology	<i>Anasuya Samadder</i>
6	SKAMINUR RAHAMAN	Geology	<i>Dr. Kamrun Rahaman</i>
7	Shreya Mitra	Geology	<i>Shreyamitra</i>
8	Anita Mahata	Mathematics	<i>Anita Mahata</i>
9	PARBATI MURMU	Mathematics	<i>Parbati Murmu</i>
10	KOYEL KARMAKAR	Mathematics	<i>Koyel Karmanar</i>
11	SAYANTINI CHATTERJEE	Mathematics	<i>Sayantini Chatterjee</i>
12	RAKHI BAHADUR	Mathematics	<i>Rakhi Bahadur</i>
13	SUVOJIT DEY	Mathematics	<i>Suvojit Dey</i>
14	MAHIP KUMAR DAS	Mathematics	<i>Mahip Kumar Das</i>
15	SUPARNA PAL	Physics	<i>Suparna Pal</i>
16	BOHAN MAHATO	Physics	<i>Bohan Mahata</i>
17	Gourab Bej	Physics	<i>Gourab Bej</i>
18	PALASH DIGAR	Geology	<i>Palash Digar</i>
19	DEBJIT PANDE	Geology	<i>Debjit Pande</i>
20	SOURADIP SAM	Geology	<i>Souradip Sam</i>
21	SUHAS JASH	Geology	<i>SUHAS JASH</i>
22	Shreya Mitra	Geology	<i>Shreya Mitra</i>
23	Rudhama Akhtar	Geology	<i>Rudhama Akhtar</i>
24	Simran Singh	Geology	<i>Simran Singh</i>
25	Nivedita Ghosh	Physics	<i>Nivedita Ghosh</i>
26	Sumana Mondal	Physics	<i>Sumana Mondal</i>
27	Neha Raj	Physics	<i>Neha Raj</i>
28	Amiya Biswas	Mathematics	<i>Amiya Biswas</i>
29	Paratiksha Mondal	Faculty of Math.	<i>Paratiksha</i>
30	Pirani Roy	Faculty of Geology	<i>Pirani Roy</i>
31			

Durgapur Government College
DURGAPUR - 713214
DIST. PASCHIM BARDHAMAN
WEST BENGAL

Attendance for participants of the event:
Hands-on Training on "Digital Image Processing: An overview- 26th September 2023
under DBT STAR COLLEGE SCHEME

Sl. No.	Name	Dept./Class	Signature
34	Dhruba Mandal	B.Sc. Geology sem-I	<i>Dhruba Mandal</i>
35	Laxmirani Mahata	B.Sc. Geology sem-I	<i>Laxmirani Mahata</i>
36	Suchismita Das	B.Sc. Geology Sem-I	<i>Suchismita Das</i>
37	Shankhadeep Ghosal	Geology (Hons) Sem-I	<i>Shankhadeep Ghosal</i>
38	Ankit Sengupta	Geology (Hons) Sem-I	<i>Ankit Sengupta</i>
39	Kunal Das	Geology (Sem-I)	<i>Kunal Das</i>
40	Ishan Banerjee	B.Sc. Geology (Sem-I)	<i>Ishan Banerjee</i>
41	Koushik Sarkar	B.Sc. Geology (Sem-I)	<i>Koushik Sarkar</i>
42	Prabhat Dhibar	B.Sc. Geology (Sem-I)	<i>Prabhat Dhibar</i>
43			



Durgapur, West Bengal, India

G8RG+WXX, Jawahar Lal Nehru Road, Amarabati Colony, Durgapur, West Bengal

713214, India

Lat 23.542505°

Long 87.326773°

26/09/23 02:22 PM GMT +05:30



Durgapur, West Bengal, India

G8RG+VX9, Amarabati Colony, Durgapur, West Bengal 713210, India

Lat 23.54222°

Long 87.327421°

26/09/23 02:43 PM GMT +05:30







Report: A hands-on training on “Digital Image Processing: An Overview” was conducted jointly with the Departments of Geology and Physics on 26-09-2023. Dr Hrishikesh Mondal, Assistant Professor of Physics, Durgapur Government College conducted a lecture on this topic for the students of six participating departments.

**OFFICE OF THE PRINCIPAL
DURGAPUR GOVERNMENT COLLEGE**

J.N. Avenue, Durgapur, Paschim Bardhaman 713214

No. 222

Date: 22-09-2023

NOTIFICATION

This is for information to all concerned that a Lecture & Hands-on Training on “Resistivity Meter Logging in Ground Water Exploration (**Dr. Tapas Acharya, Associate Professor, Department of Geology, Presidency University**) for B.Sc. students will be conducted by the Departments of Geology and Physics on **27-09-2023** from 11:00 a.m. onwards under the DBT STAR COLLEGE SCHEME of Durgapur Government College.

Departmental Coordinators of the DBT STAR COLLEGE SCHEME are requested to accordingly inform the respective students and confirm the student participation details to Dr. Pinaki Roy (Departmental Coordinator of Geology, DBT STAR COLLEGE SCHEME).

Nivedita Acharjee

Dr. Nivedita Acharjee
Coordinator, DBT STAR COLLEGE SCHEME
Durgapur Government College



Principal
Durgapur Government College

Copy forwarded for information and necessary action to

- 1. Departmental Coordinators of all participating departments of DBT STAR COLLEGE SCHEME*
- 2. All participating departments of DBT STAR COLLEGE SCHEME*
- 3. Notice Book, Office of the Principal*

Durgapur Government College
DURGAPUR - 713214
DIST. PASCHIM BARDHAMAN
WEST BENGAL

Attendance for participants of the event:
Hands-on Training on "Resistivity Meter Logging in Ground Water Exploration"- 27th
September 2023 under DBT STAR COLLEGE SCHEME

Sl. No.	Name	Dept./Class	Signature
1	SK AMINUR RAHAMAN	Geology (5 th Sem)	Dr. Aminur Rahaman
2	Dhruva Mandal	Geology (1 st sem)	Dhruva Mandal
3	Tanchan Mondal	Physics (3 rd Sem)	Tanchan Mondal
4	Debjoti Mondal	Geology (3 rd Sem)	Debjoti Mondal
5	Arijit Raha Roy	Physics (3 rd Sem)	Arijit Raha Roy
6	Rohan Mahato	Physics (3 rd Sem)	Rohan Mahato
7	Gourab Bej	Physics (3 rd Sem)	Gourab Bej
8	Neha Rej	Physics (3 rd Sem)	Neha Rej
9	Suparna Pal	Physics (3 rd Sem)	Suparna Pal
10	Sumana Mondal	Physics (3 rd Sem)	Sumana Mondal
11	Nibedita Ghosh	Physics (3 rd Sem)	Nibedita Ghosh
12	Shreya Ruidas	Geology (1 st Sem)	Shreya Ruidas
13	Shreya Mitra	Geology (5 th Sem)	Shreya Mitra
14	Anasuya Samadder	Geology (5 th Sem)	Anasuya Samadder
15	Laxmirani Mahata	Geology (1 st Sem)	Laxmirani Mahata
16	Snigdha Mondal	Geology (1 st Sem)	Snigdha Mondal
17	Suchismita Das	Geology (1 st Sem)	Suchismita Das
18	Simran Singh	Geology (3 rd Sem)	Simran Singh
19	Rukhsana Akhter	Geology (3 rd Sem)	Rukhsana Akhter
20	Shreya Jaisra	Geology (3 rd Sem)	Shreya Jaisra
21	Sourik Barman	Geology (1 st Sem)	Sourik Barman
22	Sreyan Kabiraj	Geology (1 st Sem)	Sreyan Kabiraj
23	Roma Sadhu	Geology (1 st Sem)	Roma Sadhu
24	Deepnandan Goswami	Geology (1 st Sem)	Deepnandan Goswami
25	Ankit Karmakar	Geology (1 st Sem)	Ankit Karmakar
26	Kaustubh Sarkar	Geology (5 th Sem)	Kaustubh Sarkar
27	Shubhomay Bhagat	Geology (1 st Sem)	Shubhomay Bhagat
28	Ankit Sengupta	Geology (1 st Sem)	Ankit Sengupta
29	Sayan Kumar Sam	Geology (5 th Sem)	Sayan Kumar Sam
30	Aradugopal Ruidas	Geology (5 th Sem)	Aradugopal Ruidas
31	Sayanar Modak	Geology (PG-3 rd Sem)	Sayanar Modak
32	Biswajit Mahato	Geology (PG-3 rd Sem)	Biswajit Mahato
33	Paigel Mandal	Geology (PG-3 rd Sem)	Paigel Mandal

Durgapur Government College
DURGAPUR - 713214
DIST. PASCHIM BARDHAMAN
WEST BENGAL

Attendance for participants of the event:
Hands-on Training on "Resistivity Meter Logging in Ground Water Exploration"- 27th
September 2023 under DBT STAR COLLEGE SCHEME

Sl. No.	Name	Dept./Class	Signature
34	SKAMINURRAHAMAN	Geology (5 th Sem)	Dr. Aminur Rahman
35	Dhruba Mandal	Geology (1st sem)	Dhruba Mandal
36	Tanchan Mondal	Physics (3rd sem)	Tanchan Mondal
37	Debjoti Mondal	Geology (3rd sem)	Debjoti Mondal
38 X	Arijit Raha Roy	Physics (3rd sem)	Arijit Raha Roy
39	Rohan Mahato	Physics (3 rd Sem)	Rohan Mahato
40 X	Gourab Bej	Physics (3rd sem)	Gourab Bej
41	Sumana Mondal	physics (3rd sem)	Sumana Mondal
42	Albedita Ghosh	Physics (3rd sem)	Albedita Ghosh
43	Neha Rej	Physics (3rd sem)	Neha Rej
44	Suparna Narayan Pal	physics (3rd sem)	Suparna Pal
45	Shreya		
34 46	Aomita Chand	Geology (Pb-3rd sem)	Aomita Chand
35 47	Subhajit Kumar	Geology (Pb-3rd Sem)	Subhajit Kumar
36 48	Shubhadeb Biswas	Geology (Pb-3rd Sem)	Shubhadeb Biswas
37 49	SUHAS JASH	Geology (3rd sem)	SUHAS JASH
38 50	DEBJIT PANDE	Geology (3rd sem)	Debjit Pande
39 51	PALASH DIBAR	Geology (3rd sem)	Palash Dibar
40 52	KUNAL DEBI	Geology (1st sem)	Kunal Debi
41 53	Shankhadeep Ghosal	Geology (Hons) [sem-I]	Shankhadeep Ghosal
42 54	Nipa Sen	Geology (Pb-3rd Sem)	Nipa Sen
43 55	Asim Mirza	Geology (UG- Sem 5)	Asim Mirza
44 56	SAMBIT BHATTACHARYA	Geology (UG- Sem 5)	Sambit Bhattacharya
45 57	PRABHAT DHIBAR	Geology (UG- Sem 5)	Prabhat Dhibar
46 58	SUPRIYA DAS KALITRAJ	Geology (UG- Sem 5)	Supriya Das Kalitraj
47 59	BISWANATH GHOSH	Geology (PG- Sem 3)	Biswanath Ghosh
48 60			
49 61			
50 62			
51 63			
52 64			
53 65			
54 66			





Durgapur, West Bengal, India
G8VG+4RX, Amarabati Colony, Durgapur, West Bengal 713206, India
Lat 23.542822°
Long 87.327344°
27/09/23 02:20 PM GMT +05:30



Durgapur, West Bengal, India
G8VG+4RX, Amarabati Colony, Durgapur, West Bengal 713206, India
Lat 23.542812°
Long 87.327363°
27/09/23 02:21 PM GMT +05:30

New Experiment on "Determination of Planck's constant using photo-electric effect" (Organizing Department: Physics) (2023-2024) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Physics Honours and Undergraduate Students

Outcome: Students received the hands on training on the equipment and performed the experiment

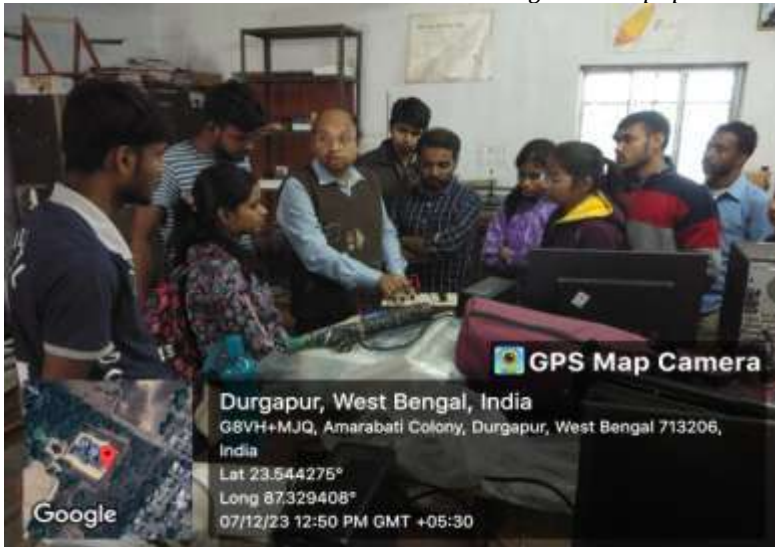


New Experiment on "To find an unknown capacitance using De' Sauty's AC bridge " (Organizing Department: Physics) (2023-2024) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Physics Honours and Undergraduate Students

Outcome: Students received the hands on training on the equipment and performed the experiment



New Experiment on "To verify the Malus Law for Plane Polarized light" (Organizing Department: Physics) (2023-2024) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Physics Honours and Undergraduate Students

Outcome: Students received the hands on training on the equipment and performed the experiment

New Experiment on "Photo-electric Effect: photo current versus intensity" (Organizing Department: Physics) (2023-2024) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Physics Honours and Undergraduate Students

Outcome: Students received the hands on training on the equipment and performed the experiment



New Experiment on " To study the series LCR circuit " (Organizing Department: Physics) (2023-2024) under DBT STAR COLLEGE SCHEME

Participating Students:

UG Physics Honours and Undergraduate Students

Outcome: Students received the hands on training on the equipment and performed the experiment

