Report

of

National workshop

on

"Bioinstrumentations" & Hands-on "DNA Extraction, Purification & Agarose Gel Electrophoresis (Lab Session)"

Two Days (1-2 March 2021)

Sponsored by

Govt. Of Uttar Pradesh, Lucknow

(Reference letter number -119 / सत्तर -5-2021-74 (5) / 2017, Dated 21/01/2021)

Chief Patron : Prof. (Dr.) Amit Bhardwaj Director , Department of Higher Education, U.P

Patron : Prof. (Dr.) Savita Bhardwaj Principal, GGPGC, Ghazipur

Convenor : Mr. Akbare Azam Asst. Prof. Deptt. Of Chemistry

Core Organizing Committee

Dr. Satyendra Singh

Dr. Diwakar Mishra

Mr. Md. Ekhlak Khan

Dr. B. N. Pandey

Mr. Santan Kumar Ram

Organized by

Government women P. G. College Ghazipur U.P.

(Accredited by NAAC B++)

Email ; ggpgc09@gmail.com

& MRD Life Sciences Lucknow

To,
Director ,
Department of Higher Education, U.P
Prayagraj U.P.

Letter No. : Dated:

Subject : Utilization certificate & report of National workshop on *"Bioinstrumentations" & Hands-on "DNA Extraction, Purification & Agarose Gel Electrophoresis (Lab Session)"* Two Days (1-2 March 2021) in Government Girls P. G. College Ghazipur

Sir,

I would like to bring in your notice that a sum of Rs. 80000/ (Rupees Eighty thousands rupees only) is sanctioned vide letter no. degree vikas 1507 dated 17/02/2021 for organization of National workshop on *"Bioinstrumentations" & Hands-on "DNA Extraction, Purification & Agarose Gel Electrophoresis (Lab Session)"*. Workshop report and Utilization certificate duly certified by Charted accountant are attached herewith.

Forwarded by Yours Sincerely

(Dr. Savita Bhardwaj) (Akbare Azam)

Patron & Principal Asst. Prof. & Convenor

Enclosures :

1. Workshop report
2. Utilization certificate

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1. Basic information of Workshop

A. Workshop Grant

1. Sanction letter no. : Degree Vikas 1507/2020-21 dated 17/02/2021

2. Amount sanction : Rs 80,000/ (Rs eighty thousands rupees only)

3. Name of Chief Patron : Prof. (Dr.) Amit Bhardwaj Director , Department of Higher Education, U.P

4. Patron : Prof. (Dr.) Savita Bhardwaj Principal, GGPGC, Ghazipur

5. Convenor : Mr. Akbare Azam Asst. Prof. Deptt. Of Chemistry

6. Title of workshop : *"Bioinstrumentations" & Hands-on "DNA Extraction, Purification & Agarose Gel Electrophoresis (Lab Session)"*

7. Dates : 01-02 March 2021

8. Venue : Government Girls P. G. College Ghazipur

9. No. of students Participant : 68

10. Grants received from any other agencies : Nil

11. Total expenditure incurred in workshop : Rs 80,000/ (Rs eighty thousands rupees only)

B. Need of Workshop

Nowadays, the market is very much demanding and we often come across the issue regarding the level of higher education not meeting the industry expectation. To bridge this gap and equip the students of current generation with new-age technologies, seminars and workshops play an imperative role. Ensuring a proper flow of knowledge Seminars and Workshops assist in passionate interaction and active participation boosting the skills and expertise of students. ***Importance of seminars and workshops for students*** is often acknowledged as a prime concern. Keeping in mind the ***importance of seminars for students*** and the ***benefits of workshops for students***, seminars and workshops are an innovative and welcomed step towards modern education. Nowadays ***seminars in schools*** are encouraged recognizing the ***importance of seminars for students*** at an early age.

Generally organized for either a single day or couple of days, the prime objective of seminars and workshops is to assemble the like-minded intellectuals and professionals to trade ideas, thoughts and views related to a specific topic. So, ***why workshops are important for students***? By helping in understanding more about the advantages, feature, and characteristics of seminars and workshops, the below-mentioned points depict the ***importance of seminars and workshops for students*** in higher education.

1. **Proficiency in Verbal Communication**: Most of the young graduates lack the confidence and fluency while interacting verbally. Coming either from rural or sub-urban background, many students hold good academic record and industrial skills but lack behind while expressing themselves. This small yet major drawback often hinders the achievements of students while **campus placements**. Speaking about a researched topic in seminars and workshops before a gathered audience boosts the confidence of the students preparing them precisely for interviews and group discussions.

2. **Acquirement of Knowledge in a Particular Field**: Seminars and workshops provide a chance to interact with experts from the specific field. Discussing about the relevant topics of the particular subject, students tend to learn about the latest information and new skills related to the concerned subject. As a result of genuine interest shown by the students to know and learn about the subject, they research about the particular topic with the help of expert guidance and land in their conclusion after a careful investigation, experiment, and simulation.

3. **Growth in Networking**: In seminars and workshops the students and faculties from different educational institution join to take part. Meeting new people can help the students in getting guidance and solutions related to common problems. Making new friends can not only encourage new ways of thinking and learning but might open up new opportunities as well. Even after the completion of seminar or workshop programs, these chains of networking can help the students in escalation of their professional life.

4. **Encouragement and Motivation**: Talking and learning about a new topic will encourage the students to explore new areas relevant to the topic. Students will feel motivated to research and learn new things. With proper guidance from teachers and experts, students feel motivated to publish their own **research journals,** contributing significantly to the education sector.

5. **A Different Environment than Classroom**: In a learning environment different and unique from classrooms, students learn more effectively and efficiently. Far from the textbooks and academic syllabuses, students research and learn on their own which boost their confidence, performance, and productivity.

Benefits and importance of workshops for students is immense. In higher education, where every aspect of the study is relevant to market and industrial standards, workshops and seminars are more than necessary.

2. Detail Report of workshop Session wise

Day – 1 (March 1st)

1. Inauguration

   At first with lightening the lamp Patron, Convenor , Mr. Manoj Verma Director MRD Life Sciences Lucknow, Mr. C. S. Mishra Head Buisness development, Ms Pallavi Sharma Research Scientist, Mr. Chitranshu Pandey Research Scientist and Mr. Raj Shekhar Mishra are welcomed. Saraswati vandana and welcome song were sung by students studying in B. Sc. Course. Mr. Manoj Verma told students about need of workshop. Talking and learning about a new topic will encourage the students to explore new areas relevant to the topic. Students will feel motivated to research and learn new things.

   Dr. Savita Bhardwaj Principal GGPGC encouraged for development of personality of students confidence and fluency are necessary while interacting verbally. Coming either from rural or sub-urban background, many students hold good academic record and industrial skills but lack behind while expressing themselves. This small yet major drawback often hinders the achievements of students while **campus placements**.

   Mr. Akbare Azam Convenor of workshop stated that in a learning environment different and unique from classrooms, students learn more effectively and efficiently. Far from the textbooks and academic syllabuses, students research and learn on their own which boost their confidence, performance and productivity.

2. Bio instrumentation lecture

   In this session detailed information and use of various equipments in laboratory were given. Mostly used equipments are ;

   Autoclave : a strong heated container used for chemical reactions and other processes using high pressures and temperatures, e.g. steam sterilization.

   Hot air oven ; **Hot air ovens** are electrical devices which use dry heat to sterilize.

DNA/ RNA electrophoretic apparatus : Nucleic acid molecules are separated by applying an electric field to move the negatively charged molecules through a matrix of agarose or other substances.

Besides above Incubator, Distillation Unit, Water Bath, Laminar Air Flow (Horizontal & Vertical), Digital Weighing Balance, Microscope, Power Pac, SDS-PAGE Apparatus, Southern- Northern Blotting Apparatus, Western Blotting Apparatus, -20 Deep Freezer, Vortex Mixer, Magnetic Stirrer, Hot Plate Stirrer, Non-cooling Centrifuge Machine, Refrigerated Micro Centrifuge, Orbital Shaker cum BOD Incubator, CO2 Incubator, UV Transilluminator, White Light Transilluminator, Digital pH Meter, Micro-controller pH Meter, Colorimeter, Micro-oven, Micro-pipettes, Digital UV-Visible Spectrophotometer, Thermal Cycler (PCR), Gel Documentation System, RT-PCR, ELISA Reader, Ultrasonic Bath Sonicator, HPLC & Bio-Reactor/Fermentor were also explained.

3. **DNA isolation from plant leaves**

Procedure:

- Preheat 5ml C-TAB buffer at 60^0 C for 5 min.
- Add 0.2 % BME (β mercapto ethanol).
- Take 1 gram plants leaves washed with distilled water. Air dry and grind in preheat C-TAB buffer.
- Transfer 0.5ml to a tube and incubate at 60^0 C.
- Add equal amount of $CHCL_3$:Isoamyl alcohol mixture (24:1)
- Mix gently for 15-10 min.
- Centrifuge for 10000rpm for 10 min.
- Transfer top layer to new tubes.
- Add equal volume of ice cooled isopropanol to the tubes.
- Incubate at 0^0c in a freezer for overnight.
- Centrifuge at 10000 rpm for 10 min.
- Discard supernatant and wash pellet.
- Add 200µl of 70%ethanol.

- Centrifuge at 10000rpm for 15min.
- Discard supernatant and air dry pellet.
- Dissolve the pellet in Storage TE buffer.

Day – 2 (March 2nd)

4. **Agarose Gel Electrophoresis:**

Procedure:

- TAE (Tris Acetate EDTA) BUFFER is used because it provides faster electrophoresis migration of linear DNA fragments into gel.
- Take 0.7gram of agarose and dissolve in 25ml of 1X TAE.
- Heat in microwave till solutions become transparent.
- Cool the solution at room temperature and add 0.5microlitres of EtBr.
- Mix it well by gentle swirl
- Pour it in gel casting tray.
- Wait till gel gets solidify, when gel solidified then comb was taken out from the gel.
- Wells formed in the gel then it was placed in electrophoresis tank. It should note that wells oriented towards cathode. Current moves from cathode anode.
- The electrophoresis tank was filled with electrophoresis buffer.
- DNA sample was loaded after mixing with DNA loading dye in 4:1 ratio. Voltage gradient of 70V is used for 15min.
- After electrophoresis is complete, the gel was removed from electrophoresis unit then was placed on UV transilluminator.
- DNA bands were shown.

5. **Protein Isolation:**

Procedure:

- The leaves were washed with tap water and then distilled water.
- Air dried the leaves and mid ribs were removed.
- 1 gram leaves were grinded in 5 mL RIPA buffer.
- 0.5mL slurry was transferred in micro-centrifuge tubes.

- Centrifuged at 10,000rpm for 10 min.
- Supernatant was transferred in fresh micro-centrifuge tubes.
- PerformedBradford test.
- Blue colour indicates the presence of protein.

6. Estimation of Reducing and Non-reducing Sugars

- Reddish brown colour indicates the presence of reducing sugars.

S.No.	Reducing sugar (Glucose)	Non Reducing sugar (Sucrose)	Distilled Water	Incubate at 37°C for 15min	DNS	Incubate at 100°C for 15min	Cool down	Distilled Water
1.	0.0mL	0.0mL	1.0mL		1.0mL			5.0mL
2.	0.0mL	1.0mL	0.0mL		1.0mL			5.0mL
3.	1.0mL	0.0mL	0.0mL		1.0mL			5.0mL

7. Thin Layer Chromatography

Procedure:

- Silica gel was prepared and poured on the slides. Left it for 24hrs.
- The 5µl sample was loaded in the middle at 1cm from tip of the wick.
- Air dried the sample and dipped the Slide in 50% methanol.
- Run upto 70%
- Air dried the filter paper and RF value was calculated.

8. Action of Salivary Amylase:

- Reddish brown colour indicate the presence of Salivary Amylase

S.No.	Saliva Sample	Starch	Distilled Water	Incubate at 37°C for 15min	DNS	Incubate at 100°C for	Cool down	Distilled Water
1.	0.0mL	0.5mL	0.5mL		1.0mL			5.0mL
2.	0.5mL	0.5mL	0.0mL		1.0mL			5.0mL

9. Discussions.

10. Certification

LIST OF STUDENTS SELECTED FOR WORKSHOP

B. Sc. I		B. Sc. II	
S. NO.	**STUDENT NAME**	**S. NO.**	**STUDENT NAME**
1	KIRAN YADAV	1	ANKITA SINGH
2	ANUPAM RAI	2	NIKITA
3	ANNU	3	ARPITA VISHWAKARMA
4	RANJANA YADAV	4	SUBHANSHIKA SRIVASTAV
5	ANSHU	5	SABA PARVEEN
6	PRATIMA YADAV	6	RUKHSAR BANO
7	DEEPIKA BHARDWAJ	7	RICHA PANDEY
8	REENA KUMARI	8	PRAGATI GUPTA
9	AKANSHA SINGH	9	PRANSI PANDEY
10	SONAM YADAV D/O DAYASHANKAR YADAV	10	SAZIYA KHATOON
11	EKTA MAURYA	11	SAKSHI TIWARI
12	ARCHANA	12	UMME HABIBA
13	ANKITA YADAV	13	SAIREEN BANO
14	SHIKHA JAISWAL	14	MARIYA FATMA
15	ANAMIKA PANDEY		
16	SWETA RAI		

B. Sc. III			
S. NO.	**STUDENT NAME**	**S. NO.**	**STUDENT NAME**
1	NIDHI YADAV	17	YOGITA MASIH
2	JYOTSANA	18	SWETA BHARTI
3	PRITI	19	SHRISTI RAI
4	SUPRIYA	20	PRIYA PANDEY
5	SWETA YADAV	21	NISHA YADAV
6	MAHIMA	22	ANJALI BHARTI
7	TANISHA RAWAT	23	NIDHI CHATURVEDI
8	LAXMIJI	24	SONI SHIPRA
9	DIVYANSHU KUMARI	25	SWATI KHARWAR
10	BINITA YADAV	26	ATIYA ZEHRA
11	PREETI	27	SWATI KANNAUJIYA
12	SIMRAN PARVEEN	28	RATNA YADAV
13	PRATIMA	29	POOJA OJHA
14	SUSMITA	30	SHALINI RAI
15	ANJALI		
16	NITU VERMA		

3. Importance & Future scope of workshop for students

This workshop will be emerged as one of the most popular career options among youngsters who want to explore the modern aspects of science as it is a part of biotechnology. The demand for skilled biotechnologists is high in industrial sectors like food, textiles, pharmaceutical, agriculture, animal husbandry etc. The scope of Biotechnology has expanded to diverse sciences like immunology, virology and other subjects like health, agriculture, cell biology, plant physiology, seed technology, etc.

The job of a biotechnologist is to modify or manipulate living organisms in laboratories to develop new products. A biotechnology graduate can be employed across several industries as biochemists, biophysicists or medical scientists.

Today we see amazing discoveries, new applications and innovative products on the market every day. The demand for biotechnologists is very high in various segments like industrial sector, environmental sector, medical sector, food manufacturing, health-care and pharmaceuticals. A biotechnologist can choose to specialize in one or more subfields like genomics, proteomics, and bioinformatics.

Career opportunities for Biotechnologists

A biotechnologist can work on vast disciplines and their demand is very high in various sectors such as:

- Healthcare
- Medicine
- Pharmaceutical
- Agriculture
- Animal husbandry
- Genetic engineering
- Environmental conservation
- Soil biology
- Ecology
- Textile industry
- Cosmetics




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