***Departmental Report Life Sciences 2023-24***

**Preliminary information**

**I Department profile**

| **Names** | **Designation** |
|---|---|
| Dr. Sree Nair | Assistant Professor, Head of Department |
| Dr.Tressa Jacob | Lecturer (Ad-hoc) (resigned in Oct 2023) |
| Dr. Geetanjali Ganguli | Lecturer (Ad-hoc) |
| Mr. Mayur Gaikwad | Lecturer (Ad-hoc) |
| Ms.Rhea Nawalkar | Lecturer (Ad-hoc) |
| Ms.Archana Jethwa | Lecturer (Ad-hoc) ( from Nov onwards) |

**II Courses/Papers taught**

**FIRST YEAR PAPERS - Syllabus Under NEP**

| | SEMESTER I | | | |
|---|---|---|---|---|
| | Major Paper | VSC-I | VSC-II | IKS |
| TITLE | Fundamentals of Cell and Microbial Biology | Principle and Analytical Techniques of Biomolecules | Introductory laboratory skills and techniques in Biology | History of Forests and Agriculture in India |
| TYPE OF COURSE DSE/DSC | DSC | VSC | VSC | IKS |
| CREDITS | 4 | 2 | 2 | 2 |

| | SEMESTER II | | | |
|---|---|---|---|---|
| | Major Paper | SSEC-I | SSEC-II | OE |
| | Eukaryotic | Science of | Bioecology | Concepts of |

| TITLE | cell Biology | Genetics | | Evolution |
|---|---|---|---|---|
| TYPE OF COURSE DSE/DSC | DSC | SEC1 | SEC2 | OE |
| CREDITS | 4 | 2 | 2 | 2 |

| SECOND YEAR PAPERS | | | |
|---|---|---|---|
| SEMESTER 3 | Comparative physiology- I | SBSLSC301 and SBSLSCP301 | 06+02 |
| | Life processes at the tissue, organ and organism levels: A Biochemical Approach- I | SBSLSC302 and SBSLSCP302 | 06+02 |
| | Population approach: population and communities as regulatory unit-I | SBSLSC303 and SBSLSCP303 | 06+02 |
| SEMESTER 4 | Comparative physiology- II | SBSLSC401 and SBSLSCP401 | 06+02 |
| | Life processes at the tissue, organ and organism levels: A Biochemical Approach- II | SBSLSC402 and SBSLSCP402 | 06+02 |
| | Population approach: population and communities as regulatory unit-II | SBSLSC403 and SBSLSCP403 | 06+02 |

| Class | Course Title | Course Code | Credits |
|---|---|---|---|
| THIRD YEAR PAPER | | | |
| SEMESTER 5 | Genetics and Immunology I | SBSLSC501 and SBSLSCP501 | 2.5+1.5 |
| | Developmental Biology and Neurobiology I | SBSLSC502 and SBSLSCP502 | 2.5+1.5 |
| | Biotechnology and Genetic Engineering I | SBSLSC503 and SBSLSCP503 | 2.5+1.5 |

| | | | |
|---|---|---|---|
| | Environmental Biology I | SBSLSC504 and SBSLSCP504 | 2.5+1.5 |
| | Applied Environmental Sciences | SBSAPC502 and SBSAPCP502 | 02+ 02 |
| SEMESTER 6 | Genetics and Immunology II | SBSLSC601 and SBSLSCP601 | 2.5+1.5 |
| | Developmental Biology and Neurobiology II | SBSLSC602 and SBSLSCP602 | 2.5+1.5 |
| | Biotechnology and Genetic Engineering II | SBSLSC603 and SBSLSCP603 | 2.5+1.5 |
| | Environmental Biology II | SBSLSC604 and SBSLSCP604 | 2.5+1.5 |
| | Environmental Management | SBSAPC602 and SBSAPCP602 | 02+ 02 |

POST GRADUATE: Syllabus Under NEP

| | SEMESTER I | | | |
|---|---|---|---|---|
| | Major Paper I | Major Paper II | ELECTIVE PAPER | RESEARCH METHODOLOGY |
| TITLE | Cell Biology and Macromolecules | Systems Biology I | Bioinformatics, Biostatistics, & Toxicology | Research Methodology & Scientific communication |
| TYPE OF COURSE DSE/DSC | Major | Major | Elective | Research Methodology |
| CREDITS | 6 | 6 | 4 | 4 |

| | SEMESTER II | | | |
|---|---|---|---|---|
| | Major Paper I | Major Paper II | Elective Paper | Field Project/Internship |
| TITLE | Molecular Genetics | Cell and System Biology II | Evolution & Population Biology | Research project/internship in laboratory/industry. |
| TYPE OF COURSE DSE/DSC | Major | Major | Elective | Field Project |
| CREDITS | 6 | 6 | 4 | 4 |

| Class | Course Title | Course Code | Credits |
|---|---|---|---|
| POST GRADUATE | | | |
| SEMESTER 3 | Cellular Organization of the Nervous System | SMSLSC301 and SMSLSCP301 | 04+02 |
| | Organization and functional modification of the nervous system | SMSLSC02 and SMSLSCP302 | 04+02 |
| | Systems approach to Neurosciences I | SMSLSC303 and SMSLSCP303 | 04+02 |
| | Systems approach to Neurosciences II | SMSLSC304 and SMSLSCP304 | 04+02 |
| SEMESTER 4 | Developmental Neurobiology | SMSLSC401 and SMSLSCP401 | 04+02 |
| | Behavioral Neurobiology I | SMSLSC402 and SMSLSCP402 | 04+02 |
| | Behavioral Neurobiology II | SMSLSC403 and SMSLSCP403 | 04+02 |
| | Molecular Neurobiology and Disease pathology | SMSLSC404 and SMSLSCP404 | 04+02 |

Courses offered (Add on)

| Add-on/ Certificate Course |
|---|
| Diploma in Nutrition, Diet & Fitness<br>(Collaboration -Sophia Centre for Women's Studies & Development) |

**III BOS composition**

| **Name** | **Designation** |
|---|---|
| Dr. Sree Nair | **Chairperson:**<br>Assistant Professor and Head, Department of Life Sciences, Sophia College (Autonomous), Mumbai |

| | |
|---|---|
| Dr. Priya Sundarrajan | **Vice Chancellor's Nominee:**<br>Associate Professor, Department of Life Sciences and Biochemistry, St. Xavier's College (Autonomous), Mumbai |
| Dr. Indu Anna George | **Subject Expert:**<br>Associate Professor and Head, Department of Life Sciences, University of Mumbai |
| Dr. Krishanu Ray | **Subject Expert**(from outside the parent university):<br>Professor and Chairperson, Department of Biological Sciences, TIFR, Mumbai. |
| Dr. Swati Patankar | **Subject Expert**(from outside the parent university):<br>Professor, Department of Biosciences and Bioengineering<br>IIT-Mumbai. |
| Dr. Aditee Ghate | **Representative from the Industry or the Corporate Sector/ Allied Area:**<br>General Manager -Compliance and Commercial Excellence<br>Integrace Health |
| Dr. Radhika Tendulkar | **Post-Graduate Meritorious Alumnus**<br>Assistant Professor, Department of Life Sciences and Biochemistry, St. Xavier's College (Autonomous), Mumbai |

**IV Dates of BOS meetings**

XI & XII BoS meetings

The XI BoS Meeting of the Board of Studies was held on 28th October 2023 as an online meeting using a zoom platform.The members who attended the meeting were Dr Swati Patankar, Dr Radhika Tendulkar, Dr Priya Sundarajan, Dr Indu George, Dr Sree Nair, Mr.Mayur Gaikwad, Ms.Rhea Nawalkar and Dr Tressa Jacob.

The XII Meeting of the Board of Studies on 28$^{th}$ October 2023 as an online meeting using a zoom platform.The members who attended the meeting were Dr Swati Patankar, Dr Priya Sundarajan, Dr Indu George, Dr Sree Nair, Mr.Mayur Gaikwad, Dr.Geetanjali Ganguli, Ms.Rhea Nawalkar and Ms.Archana Jethwa.

The NEP Syllabus of UG Semester 1,2,3 &4 and PG Semester 1,2 & 3 got deliberated and ratified in the BoS meetings.

**Report**

**Activities Conducted by the department:**

1. National Scientific Temperament Day Talk
**Classes: TY BSc,SYBSc, FYBSc, MSc (Part 1 and 2)**
**Date:**
**On:** 25th August 2023
**Name of the Teachers**

1. Dr Sree Nair (Incharge)
2. Mr Myur Gaikwad
3. Dr Geetanjali Ganguli
4. Dr Tressa Jacob
5. Ms. Rhea Nawalkar

The rise in Anti-science and misinformation is a grave threat facing our society today. To raise awareness about and in hopes to combat its rise, The Department of Life Sciences organized a talk on 25th August, 2023 which is regarded as National Scientific Temper Day.

The guest speaker, Dr. Aniket Sule, an Associate Professor at HBCSE spoke to students of the Junior and Senior (Bachelors and Masters) of Sophia College and those in attendance from various colleges across Mumbai.The resource person took the time to present some group studies on common myths and countered superstition with fact, busting each one. He emphasized the distinction between faith and fact. Later on the students in the audience presented their doubts and opinions on the topic.The event was attended by the UG & PG students of our college along with 22 students from KC College.

Overall, the young minds of the students were alerted to the crucial importance of a Scientific Temper not only applied to scientific research but to their daily life too.


**2.‘Seminar on Scientific Temper: An Antidote to Superstitious Beliefs’**

**Type of hours:** Campus Hours

**Venue:** AV Hall, Sophia College

**Date:** 18th August 2023

**Time:** 11:00 AM TO 1:00PM

**Number of NSS Volunteers:** 158

**Number of Beneficiaries:** 158

**A Brief Report of the event:**

The “Scientific Temper: An Antidote to Superstitious Beliefs” seminar was held on Friday, 18th August, 2023, in the AV Hall at Sophia College. This seminar was conducted by the NSS Unit of Sophia College in collaboration with the Department of Hindi & Life Sciences. The event was a huge success as the AV Hall which has a capacity of 200 chairs was filled entirely by the students. The event started with the felicitation and welcoming of the speakers and guests present. Then Lecturer Incharge of Hindi Department and NSS Coordinator Dr. Vaishali Pachunde welcomed Mrs. Pushpa Tapole & Mrs. Prachi Sawant. After the initial introduction, Dr. Vaishali addressed the audience and informed everyone about Andhashraddha Nirmoolan Samiti and their work for the society, everyone present there gave Shraddhanjali to the late Mr. Narendra Dhabolkar by keeping two minutes of silence. Then the students of the Hindi Department presented the street play on the topic of Superstitious Beliefs that are still plaguing the minds of so many people and the trust in religious lies over trusted doctors. It was very well written and beautifully enacted by the students and achieved its aim of delivering its message to the audience. It was directed by Dr. Vaishali Pachunde and written by Mrs. Priyanka Chauhan, it was very well received & appreciated by all the viewers. Mrs. Shinde in her session showed the students a lot of tricks, she started with lighting up a diya with water without any oil, this was followed by a magic of karni, or bhootbhadha by putting Trishul in a pot full of rice, which she was able to pick up just by holding onto the Trishul. One more trick was pulling out a black ribbon from an intact coconut. She also showed magic of the God’s entry in a human body and held a lit Kapur in her hand and then also on her tongue that was even tried by our students. Mrs. Vandana Shinde also laid down on a bed of nails and then one bed was kept on top of her and made a student stand on top of it. She even asked one of the students to do the same and proved how black magic is not true. Mr. Prakash Parkhe in his session explained the calendar, nakshatra and position of stars and also explained how to calculate days. In the end Ms. Amaysikirti Khurasiya, TYBA Hindi department student representative ended the session with a vote of thanks. The feedback from the students was very positive, they said that the session was very informative and would now help them make smarter decisions. Also, they were absolutely enthralled by the way Mrs. Vandana Shinde and Mr. Prakash Parkhe explained the concepts and how people use basic scientific principles to fool simple people and feed on their religious beliefs using God’s name. The seminar was delightful, interactive and informative as so many participants participated in the seminar.

**3. Harnessing the best practice of gamification student centered learning of stem subjects**

A FDP was held with science faculty on 15 Sep 2023 at 12.30 pm. Dr.Manita Pavel, a tenured lecturer in Biology from BMCC,Cuny,New York was the resource person.She shared her experience dealing with students at City University, New York.She instructed us about used a variety of learning modalities and support materials to facilitate the learning process and accentuate presentations.She emphasized the importance of evaluating and revising course curriculum and course content to achieve student-centered learning. She suggested having sessions with struggling students one-on-one and that in her experience it has led to an increase in grades.She also shared her experience with mentoring diverse student populations to promote cultural diversity for ethnic and racial groups and disabled students.
It was an enriching experience for the faculty members.



5.XXII ANNUAL SOPHIA - NOBEL ORATION

Leading the way to next generation vaccines: how base modifications in mRNA turned foe to friend

by Dr. Akanksha Chaturvedi

On December 8th 2023, the Life Science Department of Sophia College organised the XXII Annual Sophia Nobel Oration talk on the 2023 Nobel Prize in Physiology Or Medicine which was jointly awarded to Katalin Karikó and Drew Weissman for their discoveries concerning nucleoside base modifications that enabled the development of effective mRNA vaccines against COVID-19. We received a total number of 88 registrations including the students from other colleges along with faculty members. Over 48 participants submitted feedback for the talk and are willing to attend more such talks.

The speaker Dr. Akanksha Chaturvedi (Scientist D, The National Centre for Cell Science, Pune) spoke to the Bachelor's and Master's students in the college about mRNA vaccines and their profound impact on combating the COVID-19 pandemic.

The talk initiated with the very basics, delving into the fundamentals of immune system functionality and providing insights into the essential concepts surrounding vaccines. She further went on to talk about the major approaches of making vaccines, diverse functions of TLRs,

ranging from the identification of viral and bacterial components to their involvement in inflammatory responses and immune modulation and the pivotal role TLRs play in recognizing pathogen-associated molecular patterns (PAMPs). The focus then shifted to the intriguing world of pseudouridines, exploring their prevalence in RNA molecules and the role they play in RNA modification. The speaker also addressed concerns about virus variants and elucidated how mRNA vaccine platforms can be adapted to address emerging variants.

The talk concluded with an interactive question-and-answer session, during which attendees had the opportunity to seek clarification on various aspects of mRNA vaccines and engage in meaningful discussions with the speaker. The event was concluded with a Vote of Thanks and a roaring applause for the speaker. Overall the talk was an enlightening afternoon for the students and leaving attendees with a heightened appreciation for the transformative potential of mRNA vaccines in shaping the future of global healthcare.





4."**Change of Curricula in Light of National Education Policy."**

In collaboration with March for Science, Sophia College for Women organized a panel discussion at Sophia College on December 9, 2023, with the theme "**Change of Curricula in Light of National Education Policy."**

**Prof. M S Raghunathan, Padma Bhushan,** a distinguished mathematician from CEBS Mumbai, **Prof. Karen Haydock,** a former HBCSE TIFR professor, **Dr. Sudhakar Sannakki,** a former CGHS Mumbai CMO, and **Prof. Soumitro Banerjee**, general secretary of Breakthrough Science Society and an IISER Kolkata physical sciences professor, were among the distinguished individuals on the panel. Prominent mathematician **Prof. S G Dani of CEBS**, Mumbai, mediated the conversation.

The panelists discussed their viewpoints on the subject. Professor Karen Haydock's main point was that Darwin's theory of evolution was taken out of the curriculum. She underlined the need of teaching evolution and the ways in which it is being overlooked in the curriculum.

Professor M. S. Raghunathan expressed disapproval towards the overall development of the National Education Policy (NEP) 2020. Concerning the underrepresentation of educators on the policy committee, he opposed the implementation of a comprehensive undergraduate course on Indian knowledge systems and topics such as Vedic mathematics, arguing that it would be a waste of money.

Dr. Sudhakar Sannakki talked about how the NEP 2020 would hurt the medical industry. He suggested that the strategy is insufficient in its practical application.

Prof. Soumitro Banerjee drew attention to a trend that has emerged with the introduction of NEP 2020: the promotion of superstitions and pseudoscience, which endangers the foundational ideas of science. He stated that he was concerned about the rollback of educational changes introduced by individuals like Ishwarchandra Vidyasagar and that the policy will impede pupils from developing a scientific temper.

About 50 people joined in the discussion following the presentations, where panelists answered questions from the audience. The conversation continued informally over tea even after the formal conclusion of the session.



**5.“Science Education through Experiments & Demonstration”**

**i) SEED 2023 - OUTREACH PROGRAM**

The Department of Life Sciences conducted a two day workshop for Academia and Researchers on 15th and 16th December 2023. It was an outreach program - Science Education through Experiments and Demonstration (SEED 2023) workshop supported by RUSA 2.0. This outreach program is aimed at developing research skills among the faculty members. The primary goal of this outreach program is to provide science teachers with innovative resources, professional development opportunities, and a supportive community to enhance their teaching methods, foster a passion for science in students, and ultimately contribute to the advancement of STEM education.

The program was headed by Dr. Sree Nair, HOD Life Sciences. Dr. Yasmin Khan, Mr. Mayur G, Dr. Geetanjali G were resource persons, and Ms. Rhea N and Mrs. Archana J as experts. TYBSc and MSc Life sciences students were also involved in the program as volunteers.

Nine participants attended the workshop on day 1 and sixteen participants attended on day 2. The program started with a welcome speech and a brief introduction. Day 1 started with the first session on *Drosophila* conducted by Mr. Mayur Gaikwad. Participants were introduced to the model system followed by experiments like Drosophila Larval Olfactory assay, Drosophila Adult Phototactic assay Science Lab, Drosophila Adult Climbing Assay, Larval Brain / Imaginal Disc dissection. Day 1 continued with session 2 on cell culture conducted by Dr. Geetanjali Ganguli. Maintenance of N2A neuroblastoma cell and To check for cell morphology post limonene treatment using giemsa stain, were the experiments done by participants.

Day 2 started with Zebra Fish. Dr. Yasmin Khan introduced the system and the maintenance of it to the participants and performed Toxicity assays. The second session for day 2 was on *C.elegans*, conducted by Dr. Sree Nair. She explained to them the maintenance of *C.elegans* in lab conditions and performed experiments like Single worm assays-Pharyngeal pumping rate and Body Bend Frequency. The last session for day 2 was on Hydra. Mr. Mayur Gaikwad introduced the system to the participants and showed some experiments on Regeneration and explained Hydra Culturing.

The workshop was a great success. The participants were very happy with the successful completion of their experiments and were very impressed by the research facility and the work done by the Department. from the workshop and would utilize it in the future.




**ii)SEED 2024 - SCHEDULE OF THE EVENT**

The Department of Life Sciences conducted a two day workshop for Academia and Researchers on 24th and 25th, February 2024 at Ratnam College, Bhandup.. It was an outreach program - Science Education through Experiments and Demonstration (SEED 2024)—workshop supported by RUSA 2.0. This outreach program was aimed at developing model organism based research skills among undergraduates.

The event was designed to provide students with hands-on experience with science concepts through experiments and demonstrations.

The resource persons for the events were Dr. Sree Nair, Mr. Mayur Gaikwad and Ms. Rhea Nawalkar along with MSc Life Sciences students as volunteers.

Day 1 started with a talk on *C.elegans* by Dr. Sree Nair, covering Maintenance of *C.elegans* in lab conditions and experiments like Single worm assays-Pharyngeal pumping rate, Body Bend Frequency. Session 2 was on Zebra Fish by Ms. Rhea Nawalkar. Topics covered by her were, Maintenance of Zebrafish in lab conditions and Some stages in the life cycle of zebrafish & toxicity assays. Approximately 45 Undergraduate students were benefited with this hands on training workshop.

Day 2 had 1st session on Hydra, covering topics like Hydra Culturing and Regeneration Assay, followed by the second session on Drosophila, explaining the Larval Olfactory Assay and the Adult Phototactic Assay, both headed by Mr. Mayur Gaikwad. The previous day, students attended day 2 of the workshop. Student participants were able to do hands-on with all the assays demonstrated to them.

In the evening session of Day 2 of the workshop, approximately 20 students from nearby by school visited to observe and learn about the various model organisms. At last there was small informal quiz organised by rantam college students on the topics discussed in the workshop, Undergraduate and School students participated with full enthusiasm.

The workshop was a great success. The participating students were very happy with the successful completion of their experiments and were very impressed by knowing about model organism based biological assays. Hopefully, they were able to take away a large amount of knowledge from the workshop and would utilize it in the future.



6.Event Report: Ananya – Exploring Careers in Life Sciences and Camelids Poster Presentation*

On January 18, the auditorium of Sophia College buzzed with anticipation as “Ananya,” an event designed to delve into the realms of life sciences, unfolded its inaugural session at 9:00 am. The morning commenced with an enlightening talk on careers in life sciences, specifically focusing on diverse fields in nutrition such as fitness nutritionist and onconutritionists. The speakers shed light on the evolving scope of this field and its various dimensions.

*Ms. Jyoti Agarwal* took the stage as the first speaker, bringing a wealth of knowledge and experience. Armed with a bachelor’s and master’s degree in home science, and certified in nutrition counseling, Ms. Agarwal serves as a Visiting faculty member at Byramjee J P College, Mumbai. She also holds the position of Program Incharge for the Postgraduate Diploma in Diet Nutrition and Fitness Course at Sophia Women Centre. Ms. Agarwal’s extensive involvement in organizing nutrition workshops, awareness sessions, and consultancy for CSR projects with corporates showcased her commitment to community and clinical nutrition projects.

The second speaker, *Dr. Ratnaraje Krishna Thar*, an eminent nutritionist with over 30 years of experience, shared her insights. Currently serving as the Honorary Police Nutritionist for Maharashtra Police at Police Hospital Nagpada, Dr. Thar's roles extend to being a Research Director at College of Home Science Nirmala Niketan Mumbai, an Advisor on Clinical Governance Council, and Senior Nutritionist for Connect and Heal Primary Care Pvt. Ltd. Additionally, she manages a private clinical practice in South Mumbai and plays diverse roles, including being a course creator, visiting faculty, academic advisor, and guide for research thesis at various institutions.

Following these enlightening talks, the event transitioned into a captivating poster presentation by FYBSc and SYBSc students. Aligned with the UN's declaration of 2024 as the International Year of Camelids, the topics covered a spectrum of subjects, including "Camel Contrast," "Camels of Ladakh," "Camel Products," "Camel Dynasty," "Llama and Alpaca," "Conservation of Camelids," "Llamas and Alpacas in Sustainable Farming," "Adaptation of Camelids," "Products in the Market," and "Genetic Studies on 2 Species of Camelids," among others.

The culmin"tion of the event saw the distribution of three prizes, with two awarded to FYBSc groups and one to SYBSc. The students presented their posters passionately, explaining the intricate details to a panel of esteemed guests who diligently judged their efforts.

"Ananya" successfully combined insightful talks on career paths in life sciences with a visually stimulating exploration of the world of camelids, leaving the students enriched and inspired.

7. **Quest-wider than the sky—Thirteenth, UG, PG students & Faculty Research Meet (supported by DBT Star College Scheme)**

In celebration of National Science day, the science departments held a conference called " QUEST – WIDER THAN THE SKY". This was planned as meet of the UG,PG students and staff on 28th Feb 2024 (11 am – 3.30pm) at different venues.

The day started by a visit from young curious minds from a nearby school. These students were from the 7th and 8th stds who were here to share the joy of science. They visited the different labs exposing them to the various streams of science. The UG and PG students demonstrated

small experiments related to the subjects of Life Sciences, Zoology, Physics, Chemistry and microbiology.
A talk was also organised to bring out the importance of the day. The talk was delivered by Dr. Nivethida Thirugnanasanbandam, Assistant professor, Department of Biosciences and Bio-Engineering, IIT Bombay, on “Brain- The Master Puppeteer". The venue was the Convention Centre and the timing was from 11.00 a.m. to 12:30 pm.

Research is increasingly entering the interdisciplinary mode. This meet was proposed to be a common platform for exchange and interaction among the students and faculties of all UG, PG departments of the Sophia College. The meet got a good response from students and staff. The posters were exhibited by the PG, UG students and staff of Life Science, Zoology, Microbiology, Physics and Chemistry. The topics on which models were exhibited covered a wide range of subjects, from physics to environmental conservation. The posters were exhibited of research work done by the UG and PG students.

A talk was also organised to bring out the importance of the day. The talk was delivered by Dr. Nivethida Thirugnanasanbandam, Assistant professor, Department of Biosciences and Bio-Engineering, IIT Bombay, on “Brain- The Master Puppeteer". The venue was the Convention Centre and the timing was from 11.00 a.m. to 12:30 pm.


**2. Field trips done by the department, should include**:

**1.Annual Khandala Retreat - 4 & 5 Aug 2023**

**Department:** Life Sciences
**Activity:** Annual Khandala Retreat
Activity No.: 1
**Classes: TY BSc, MSc (Part 1 and 2)**

**Date:**
**On:** 4th August 2023
**To:** 5th August 2023
**Mode of Transport:** Bus
**Time and Place of Departure:** 11:00am and Sophia College for Women
**Place of Stay:** Kune Mission, Kune Village Khandala
Phone No:, +91 9702435923
**Name of the Teachers and Contact Numbers**

1. Dr Sree Nair (Incharge)
2. Dr Tressa Jacob
3. Mr Myur Gaekwad
4. Dr Geetanjali Ganguli
5. Ms. Rhea Nawalkar and
6. Dr Yasmin Khan

**Mode of Transport:** Bus

**Detailed Program**

| **04/08/2023** | |
|---|---|
| 10:30 am | Assemble and Report at Science building , Ground floor . |
| 10:45 am | Departure |
| 3:00 pm | Arrival and check- in at Kune Mission, Khandala. |
| 3:30 pm | Tea |
| 4:00 pm | Assemble in Conference room |
| 4:05 pm | Introduction to Khandala retreat |
| 4:05 - 8:00 pm | M.Sc Students Research Presentation ( Slot 1 ) |
| 8:00 - 8:30 pm | Dinner |
| 8:30 - 9:00 | Guest Speaker Talk |
| 9:00 - 10:00 | M.Sc Students Research Presentation ( Slot 2 ) |

| | |
|---|---|
| 10:00- 10:30 pm | A short nature trail. |
| **05/08/2023** | |
| 8:00 - 9.00 am | Breakfast |
| 9:00 - 11:30 | Nature trail |
| 12:00 | Lunch and checkout |


The Department of Life Sciences had planned their annual educational visit to Kune Mission at Khanadala on 4th and 5h of August 2023. The objective of this visit was to introduce the TYBSc and MSc I students to the research projects conducted by MSc II students. Dr Deepa Subramanyam, Welcome Trust DBT India Alliance Intermediate Fellow, National Centre for Cell Science, Pune was the resource person who gave valuable inputs to the students and facilitated the presentations. Additionally, the students got exposure to the research work carried out by the respective invited speakers.

The trip also included a Nature trail. A night walk in the dense vegetation was arranged post dinner and was headed by a nature expert Mr. Sachin Rane. The students experienced the silence of the forest and the insect biodiversity on the night trail. The morning next day began with a pleasant nature walk wherein the students explored and studied the flora of the area around.A total of **31 students** lead by 5 faculty members participated in the event. The trip was just not limited to academics and Science, it was indeed beyond. The trip was fun filled and a memorable one.

2. MAHARASHTRA NATURE PARK

On 20th December 2023, the TYBSc Life Sciences students along with the Head of Department Dr Sree Nair reported at Maharashtra Nature Park at 9am. We had Ms. Neha as our guide during the course. Starting with an introductory video showing the history and vast collection of the Park, the trail started, identifying and knowing about each flora and fauna in the park. The main OBJECTIVES of this trip were as follows:

To learn about the different species present in the park, by going on a nature trail, and sighting fauna and flora

To learn about the sustainable practices that take place in the park, and how they limit the use of resources, instead, substituting it for natural methods.

Maharashtra Nature Park is located in bustling metropolis of Mumbai. The initiative was taken by the Mumbai Metropolitan Region Development Authority (MMRDA) in collaboration with the World Wildlife Fund (WWF) and several other organizations.

The park's journey began in the late 1970s when a vast expanse of land, once a landfill site, became a symbol of environmental degradation. However, the visionaries recognized the potential of this neglected landscape to be reborn as a place for biodiversity and ecological conservation. Thus, the ambitious project to rejuvenate this wasteland was set in motion.

The first step involved the toughest task of reclaiming the contaminated soil and restoring its fertility. Through innovative techniques such as bio-remediation and afforestation, the once-barren land gradually sprouted with indigenous flora. Central to the park's design was the preservation of the region's natural ecosystems. Wetlands, marshes, and mangroves were meticulously restored to provide habitats for diverse species of plants and animals. Additionally, the park features walking trails, educational exhibits, and recreational areas, making it an invaluable resource for environmental education.

Today, Maharashtra Nature Park stands as a living testament to the power of conservation and collective action. It serves as a green lung amidst the concrete jungle, offering respite to city dwellers and serving as a sanctuary for native flora and fauna. More than just a park, it is a symbol of hope and resilience, reminding us of our responsibility to nurture and protect the natural world. We visited Maharashtra nature park on 20$^{th}$ December 2023 to learn about species in this park

**Vermicompost pit -** Vermicomposting, the process of composting organic waste with the help of worms, is an environmentally friendly method of waste management. The vermicomposting process in Maharashtra Nature Park involves the introduction of millipedes alongside composting worms such as red wigglers (*Eisenia fetida*). Millipedes are well-suited for breaking down tough plant materials due to their ability to consume a wide variety of organic matter. millipedes help aerate the compost pile through their burrowing activities, improving oxygen levels and promoting microbial activity.

All the species that were encountered were remarkable and played an important role in our ecosystem. Through the walk, we have gained a deeper understanding of its biology, habitat, behavior, and conservation status. Efforts to protect and conserve must be collaborative and multidisciplinary. Conservation strategies should be prioritized while also considering the involvement of local communities. In conclusion, our report emphasizes the urgency of preserving those beautiful species and its habitat. It is our collective responsibility to ensure that future generations have the privilege of experiencing and benefiting from the presence of those extraordinary species in the natural world.



**3. Special pedagogical tools used, other than the lecture method**

**4. Any special programs conducted for either /both slow learners and advanced learners.**

We conducted a remedial cum mentorship programme for our TY, SY and FY students.

Third Year BSc students
Remedial Sessions for practicals were conducted for students (specifically dissection experiments and microbiology techniques)

Second Year BSc students
Remedial Sessions for practicals were conducted for students
Multiple worksheets for Biostatistic were solved as part of remedial sessions for 7 students

First Year BSc students
Remedial Sessions for practicals were conducted for students (specifically microbiology techniques)

There were trouble shooting sessions for tough papers by PG students. The students did well in the subsequent Semester End Exams and passed.

**5. Mentor Mentee programs conducted by the department.**

Dr.Sree R Nair was assigned 18 students belonging to FYBSc.There were two documented meetings among several informal interactions.


**6. Research Papers Presented**

Conference Presentations

IAN Presentations

| Name of the Student | Name of the Mentor | Title of your research work | Name of the conference attended | Date(DD-MM-YYYY) | Host institute |
|---|---|---|---|---|---|
| Duhita Jadhav | Dr. Geetanjali Ganguli | Understanding the role of phytochemicals and Notch 1 in C6 glioma cells: An In silico and in vitro validation | XLI Annual Meeting of Indian Academy of Neurosciences,International Conference on "BRAIN: CHEMISTRY TO COGNITION" | 4th-6th October, 2023 | Jiwaji University |
| Deepanjali Ghadge | Mr. Mayur Gaikwad | Studying larval olfactory responses of *park13* Mutant, A Parkinson's Disease Model of *Drosophila melanogaster* | XLI Annual Meeting of Indian Academy of Neurosciences,International Conference on "BRAIN: CHEMISTRY TO COGNITION" | 4th-6th October, 2023 | Jiwaji University |

| | | | | | |
|---|---|---|---|---|---|
| Mrunmayee Rade | Dr. Sree Nair | Effect of Curcumin on Hyperglycaemic *Caenorhabditis elegans* | XLI Annual Meeting of Indian Academy of Neurosciences,International Conference on "BRAIN: CHEMISTRY TO COGNITION" | 4th-6th October, 2023 | Jiwaji University |
| Saidabano Sayyed | Dr. Tressa Jacob | Unraveling the Timeline: Neuronal and Skin Regeneration Dynamics After injury in Zebrafish | XLI Annual Meeting of Indian Academy of Neurosciences,International Conference on "BRAIN: CHEMISTRY TO COGNITION" | 4th-6th October, 2023 | Jiwaji University |
| Irshikaa Sharma | Dr. Tressa Jacob | Diving into Anxiety | XLI Annual Meeting of Indian Academy of Neurosciences,International Conference on "BRAIN: CHEMISTRY TO COGNITION" | 4th-6th October, 2023 | Jiwaji University |
| Muqadas Wani | Dr. Geetanjali Ganguli | Deciphering the anti-tumour activity of Limonene and Azelaic acid in Neuroblastoma cells | XLI Annual Meeting of Indian Academy of Neurosciences,International Conference on "BRAIN: CHEMISTRY TO COGNITION" | 4th-6th October, 2023 | Jiwaji University |

| | | | | | |
|---|---|---|---|---|---|
| Riddhesh Ahire | Mr. Mayur Gaikwad & Ms. Rhea Nawalakar | Effect of HDACi Sodium Valproate (VPA) on the light- sensing ability of Hydra viridissima | XLI Annual Meeting of Indian Academy of Neurosciences,International Conference on "BRAIN: CHEMISTRY TO COGNITION" | 4th-6th October, 2023 | Jiwaji University |
| | | | | | |
| Sonia Joshi | Mr. Mayur Gaikwad | Effects of Methyl Cinnamate on GMR-Aβ42 _D. melanogaster_ larvae. | 19th NATIONAL RESEARCH SCHOLARS MEET | 7th-8th October | ACTREC |
| Mrunmayee Rade | Dr. Sree Nair | Evaluation of Curcumin as A Protective Agent for Caenorhabditis elegans Exposed to High Glucose Diet | 19th NATIONAL RESEARCH SCHOLARS MEET | 7th-8th October | ACTREC |

**7. Research Grants Received - NIL**

**8. Research Guide for MSc students**

MSc Dissertation Projects

| Project Title | Student name | Roll no. | Mentor Name |
|---|---|---|---|
| Effect of Methyl Cinnamate on GMR-Aβ42 _D. melanogaster_ larvae | Sonia Joshi | P22011 | Mr. Mayur Gaikwad |
| Understanding the role of phytochemicals and notch 1 protein in C6 glioma cells and N2a neuroblastoom cell: An In silico and In vitro Validation | Duhita Jadhav | P22012 | Dr. Geetanjali Ganguli |
| Characterizing olfactory behavior of park$^{13}$ mutant, A Parkinson's Disease model of *Drosophila melanogaster* | Deepanjali Ghadge | P22014 | Mr. Mayur Gaikwad |
| Investigating the Protective effect of Curcumin on *Caenorhabditis elegans* under High Glucose Diet. | Mrunmayee Rade | P22015 | Dr. Sree Nair |
| Role of Actin Binding Protein in Neuron and Skin Regeneration | Saida Sayyed | P22016 | Dr. Sree Nair |
| Anxiolytic Potential of Ethanol After Predatory Attack in Zebrafish | Irshikaa Sharma | P22017 | Dr. Sree Nair |
| Deciphering the Effect of Limonene and Azelaic Acid in C6 and N2a cells | Muqadas Wani | P22019 | Dr. Geetanjali Ganguli |

| | | | |
|---|---|---|---|
| Effect of HDACi Sodium Valproate on behaviour and Regeneration abilities of *Hydra viridissima* | Riddhesh Ahire | P22020 | Mr. Mayur Gaikwad |

**9. National or International awards/fellowships received.**

**NIL**

**10. Department/ lecturers having research projects funded by Government (include RUSA), Non-Government agencies, college during the year.**

**NIL**

**11. Workshops/seminars/ Conferences conducted during the year.**

Already Mentioned in the activities

**12. Workshops/seminars/ Conferences conducted on Intellectual Property Rights (IPR), during the year.**

**NIL**

**13. Workshops/seminars/ Conferences conducted on Gender related issues (IPR), during the year.**

**NIL**

**14. Extension activities carried out in the neighborhood sensitizing students to social issues for their holistic development**

**Done as a part of SEED activities. Already mentioned in the activities.**

**15. E-content development.**

**NIL**

**16. Capacity Development and Skill Enhancement activities organised for improving students' capabilities; like Soft Skills, Language and Communication Skills, Life Skills (Yoga, Physical fitness, Health and Hygiene) & Awareness of Trends in Technology.**

**NIL**

**17. Guidance/coaching for competitive examinations and career counselling offered to students.**

**NIL**