

Annual Report from the Microbiology Department-2021-2022

The last academic year was an unusual for us; we have encountered a lot of unforeseen especially in the backdrop of CoVid19 pandemic leading to changes in many ways of teaching learning processes particularly the introduction of online classes for both theory and practical papers. Majority of the academic activities of the year 2021 year went fully online as per the directions of the UGC and University of North Bengal. The Department continued its digitalization in the methods of online teaching, continuous evaluation and conduct of theory and practical examinations during the academic year 2021. Apart from the Google Meet platform, faculty members extensively used Zoom and other Microsoft platforms for the purpose of curriculum delivery. Special lectures and webinar were also conducted to make the classes interesting, effective and more interactive. These approaches in teaching learning process really improved the quality of curriculum delivery during the pandemic period. The resumption of offline classes from the Month of November, 2021 added newer responsibilities to understand the psychological elements, mentoring needs of the students as well as to complete the practical syllabus affected by the pandemic which started from March 2020. Although with share of highs and lows, the pandemic has not weakened the enrollment ratio of the Department. In fact, in order to accommodate more students during the pandemic period the college under the leadership of the Principal Rev. Fr. Dr. Donatus Kujur S.J., has increased the number of seats in the Department as per the direction of the University of North Bengal. We could enroll 40 diverse students from different corners of India in the first semester. We didn't anticipate that most students actually had a first choice for Microbiology, however, they responded well to meet our expectations by frequently surpassing them. Although unusual, we had a particularly enjoyable time teaching, laboratory experiments with a substantially different schedule from the usual. We are glad that we were able to complete, altogether the theory and practical papers within the stipulated time period. Whatever the situation, the collegiality and spirit of the faculty members, staff and students in the Department have helped us to beat the odds.

The year-end report from the microbiology department provides an essential aspect of information about what has been done in 2021-22 academic year, and what is planned for the session 2022-23. Underneath, this report also sets forth our vision for the Department of Microbiology. No matter the situation, I hope the year 2021 has been a productive, eventful and a positive one for the department.

Highlights of the Year 2021-2022

Induction Programme

The Department has organized a four days induction Programme for the first semester UG students in Microbiology Honours course during 16-19th November 2021. The CoVid protocols were followed mandatorily throughout the programme. The induction programmes included activities and interaction as suggested in the college guidelines for conducting induction programmes. Induction programmes consisted of both institutional orientation and departmental level curriculum induction sessions. In the programme, Head of the Department Mr. Abhijit Chhetri addressed the students and gave a talk on the topic “Why Microbiology Matters”. The programme also featured the talks of Dr. Dorjay Lama, Ms. Sweta Mukhia and Mr. Rounak Lama.

The sessions for the first year students started after a parent’s teacher meeting on 20th November, it was organized under the patronage of Principal, St. Joseph’s College in the general classroom of the Department. Welcome address and introductory speech was proposed by senior faculty Dr. Dorjay Lama, he explained the main purpose of meet and how SJC can offer the best possible higher learning experiences for the students. Then all faculty members were introduced to parents. We all had an overwhelming experience through conversation with our dear students and their parents and it was nice to understand that how parents come together to enrich the student’s academic experiences and to discuss the number of issues regarding the wholesome development of students particularly dealing and finding effective solutions to problems in the hypercompetitive world.

Performance in Honours Examination

Since its inception in 2004, our students are persistently doing well in each academic session. In the even semester examination 2021-2022, the pass percentage was around 100% inclusive of second, fourth and sixth semester. In the UG results announced for 2021, the Department bagged 30 first class positions and for 2022, 31 first class positions. Apart from this, Ms. Kritika Zimba was the department topper scoring CGPA -O (Outstanding) in her final semester examination 2021-2022.

Training on Mushroom Cultivation at Mushroom Cultivation and Research Center

After a long wait the establishment of mushroom cultivation and research center (MCRC) is a significant milestone achievement of the college without which a research culture and skill based

entrepreneurial learning on campus cannot be realized. The center is mainly focus on providing a platform for scale-up learning on Mushroom cultivation with an aim of training students to become more employable. The trend towards mushroom cultivation in Darjeeling Hills at the undergraduate level not only has implications for the importance of higher learning that strongly benefits academic ecosystem. It also provides valuable opportunity to understand practical applied research problems and in the process of trying to accomplish certain objectives during their training tenure; helps an individual engaged in such process to develop a sense of scientific identity. Skills developed through such hands on training also provide a launching pad for the exploration of areas of start-up whereby an individual can be motivated to become an entrepreneur that may not be foreseen at present but which will definitely be important in the future.

Outreach Programme

We are very aware that the value of science and technology to the country comes when the providers of high quality scientific work force are in contact with end users in a way that informs and benefits both parties. Each group has its own responsibilities, but each is enriched and challenged by understanding the other. The department have been active in building closer links with students and many groups both inside and outside of the society with the aim of encouraging each to think more widely – to see entrepreneurial possibilities where there were none and to develop channels for putting these to work. We have been working with many groups through outreach programme where we are trying to generate ideas and bring them forward for discussion and action as well as to put them to work as an example and inspiration to the people of Himalayan region. The thrust area for our outreach programme includes; to impart knowhow of mushroom cultivation in higher altitudinal region, quality assessment of potable drinking water in Darjeeling Town and to provide knowhow on high value medicinal plants. In November, 2021, Ms. Sweta Mukhia has received in house grant for carrying out phytochemicals, antimicrobial, antioxidant and antidiabetic assessment of potent high value medicinal plants of Darjeeling Hills with a aim to document the findings of the same. The survey, collection and experiment are being carried out by UG students under her able guidance.

UG Research Project Internship at Padmaja Naidu Himalayan Zoological Park, Darjeeling

It is no secret that it takes a lot of talent and drive to succeed in academic research. Only a small fraction of the students who enter honours graduate degree course in the microbiological

sciences eventually become independent researchers. Internship UG Research Project is specifically targeted to this particular group of students. The in-house project provides our students with a realistic research experience, and a host of additional benefits. Keeping these things in perspectives and in collaboration with the PNHZP Darjeeling, we had an opportunity to carry out inter-institutional undergraduate research projects to encourage and engage the future Microbiologists to think creatively. In this instance, students are also included as co-authors and are involved in the writing and editing of the manuscript along with project writing. Our UG researchers Mr. Siddharth Zimba, Mr. La Tshering Sherpa, Ms. Trishna Giri, Ms. Khushi Chettri Ms. Shakshi Thulung and Ms. Sanstripti Chettri are characterizing the fungal flora based on the research project *“Study of coprophilous fungi of the enclosure of Padmaja Naidu Himalayan Zoological Park, Darjeeling”* approved by West Bengal Zoo Authority. They are mainly working with the herbivore and lesser carnivore enclosures dung samples and helping in the identification of microorganisms thereby also determining the coprophilous fungal diversity of the dung samples. After completion of the project all the researchers will be certified by the Director, PNHZP. We hope that initiatives like this will go a long way in motivating and encouraging young eager minds to undertake research as a career. Finally, our students continue to make outstanding contributions to practical and applied aspects of Microbiology.

Inauguration Ceremony – Microbiologists Society of India (MBSI), Student Unit at St. Joseph’s College

A new initiative was taken to promote Microbiology education by establishing student unit of Microbiologist Society of India by the Department of Microbiology. Students unit of Microbiologist Society India inauguration ceremony was organized on 10th December 2021 in the Department of Microbiology. Reverend Father Dr. Donatus Kujur S.J., was the patron of the inaugural ceremony. Professor Dr. Arvind M. Desmukh, President, Microbiologist Society of India, inaugurated the student unit at St. Joseph’s College and the platform adopted was Google Meet. He also gave a talk on the recent trend in microbiology in which he talked about the various microbiology topics such as bioremediation, bioleaching, bio-cement, bio-steel and said that in many such areas of applied microbiology students as well as microbiology can bring the best innovation. All the microbiology students and faculty members were invited for the same.

National webinar on the theme “ONLY ONE EARTH”

The Department of Microbiology St. Joseph's College in Collaboration with Department of Microbiology, Darjeeling Government College and Microbiologists Society of India (MBSI) has organized a national webinar on the topic "Only One Earth" on 6th June 2022. Prof. Dr. Ranadhir Chakraborty, Department of Biotechnology, University of North Bengal was the key note speaker. The other speakers were Dr. Rituraj Darnal, Range Officer, Government of West Bengal, Dr. Ravi Prasad, Botanist, Botanical Survey of India, Rajasthan and Mr. Roshan Rai, Coordinator DLR-Prerna Darjeeling. The webinar was conducted through Google Meet platform. The event could attract more than 90 participants having MBSI membership from various colleges.

The Best Student Award of Microbiological Society India (MBSI)

From the Department perspective, the biggest event of the year 2021 has been the selection of Mr. Barun Rai for best student merit award of Microbiological Society, India. The award recognizes excellence in both the curricular and co-curricular fields. Mr. Rai is a charismatic, vivacious and engaging person committed to his work and an individual more deserving of this award. We appreciate his hard work and success as they bring the most enthusiasm and passion to the department for self-reflection to numerous emerging microbiologists.

Students Participation in International and National Webinar

Scientific research is of utmost importance for India's rapid economic and social development. An endeavor to encourage the scientific minds to make breakthroughs and discoveries will drive the nation forward in the years to come. To advance and promote scientific innovation in India, the International and National webinar organized by various institute of repute, provided a good platform for a productive additional skilled based learning. The teachers and students have been continually participating in various webinar and workshops to broaden their knowledge. Many of our odd/even semester students have participated in diverse types of webinar on online platforms, to name a few; International webinar on "Cancer and cell lineage commitment- A journey between oncogenesis and normal development and their therapeutics" organized by Department of Microbiology Acharya Prafulla Chandra College, New Barrackpore, Kolkata, "Prof B.K Bachhawat Memorial Seminar Series" organized by Department of Biochemistry, University of Delhi, New Delhi; "National Seminar cum workshop on recent trends in Bioinformatics: with special reference to Life sciences" Organized by Department of Botany

Kurseong College; “Health: for all by all” organized by Department of Microbiology Ananda Chandra College, Jalpaiguri.

Off – Campus student activities

With the approval of Director for SFC an off campus activities for the students of fourth semester BSc (Hons.) microbiology was organized. In this regard, 15 students escorted by two faculty members Mr. Rounak Lama and Ms. Sweta Mukhia visited Tonglu and Tiger Hill areas to carry out off-campus activities. Off–Campus student’s activities involve the active participation as well as training of students thereby enhancing their interpersonal and networking skills with multicultural awareness in the societal realm. Thrust areas for our outreach programme include imparting knowhow of ethno biological use of medicinal plants and various types of lichens. In 2021-22, we have gathered interesting information on the usage of traditional medicinal flora of Tonglu and Tiger Hill region.

Workshop on Spring Water Analysis and its Management in the Darjeeling Himalaya

At a time when rampant uses of solid and liquid wastes along with the fecal waste are ravaging the pristine natural environment of the spring water resources and there is no doubt that wastes related damaging consequences are substantial in Darjeeling Himalaya. Similarly, the importance of dealing with these wastes related problem is widely acknowledged by various workers. However, awareness and good intentions are not enough to protect the environment from real time spring water pollutions. An effective sustainable action is desirable to the future of the Darjeeling Himalaya. Moreover at this instance, we can either become untroubled or more and more troubled and exhausted from our attempts to manage and get to outcomes that are harder to achieve, or we can choose to become conscious about our motivations and conditional motives. Generally, no one can force or ask someone to become conscious of the prevailing situation that someone does not want to relate oneself with the situation. When we become conscious and when we start to care and feel about the place that we live in, we CHOOSE. Not surprisingly, most of the students from the Department of Microbiology choose to do their bit in managing the absolute nuisance called solid liquid wastes in the Himalaya. In order to achieve this aspiration, a workshop was organized to give hands on training on infield and laboratory setup for the assessment of spring water. The training was organized by the teacher Coordinator Mr. Rounak Lama with student volunteers Ms. Nisha Goyal and Ms. Akangsha Pradhan on 7-16th December, 2021. This hand on training was beneficial to all participants.

Competitive Examinations

The Department is involved in imparting skills to the students for making them capable of clearing competitive examinations such as CUCET, ICAR, and IIT-JAM etc. This specific training is mainly given on Saturday. For the academic session 2021-2022 fifteen students of the final semester have attended training on competitive examination for a period of six months.

Performance at the National Level Entrance Exams

Our students, like every year did exceptionally well at the National Level Competitive Exams in 2021-2022. To name a few, Mr. Prabal Khesong, Mr. Momim Adhikari, Mr. Shubham Thapa Ms. Mandrita Ghosh, Ms. Kritika Paswan, Ms. Shalini J Singh and Ms. Saloni Basu got through CUCET examination, conducted for admission in Postgraduate courses in various Central Universities of India. At the international level Ms. Swikriti Thapa got admission to MSc course in Infection and Immunity at University of Leicester, U.K.

Contributions to knowledge

Contribution by faculty members has been made through journal publications in the wider area of science.

In 2021-22:

- i. Banerjee S., Kar P., Sarkar I., **Chhetri A.**, and Sen A (2021). Structural elucidation and chemical characterization of underutilized fruit silverberry (*Elaeagnus puyifomis*) silver nanoparticles playing a dual role as anti-cancer agents by promoting apoptosis and inhibiting ABC transporters. *South African Journal of Botany*. 145 (1) 243-257.
- ii. Kar P., Banerjee S., **Chhetri A.**, and Sen A. (2021). Synthesis, physicochemical characterization and biological activity of synthesized Silver and Rajat Bhasma nanoparticles using *Clerodendrum inerme*. *Journal of phytology*. 13(1) 64-071.

In sum, the basis of all virtue is gratitude and humility; we are grateful and humble to acknowledge Mr. Puran Sarki, Lab Bearer and College Administration for their cooperation which is essential to ensure the success and sustainability of our efforts. Last, I owe great deal to the Principal, Vice-Principal, Director SFC, Estate Manager and the faculty members of the department for assisting me in decision-making and purchase process in the department.