ST. XAVIER'S
COLLEGE
Mapusa - Goa

MICROSCOPE...SEE THE UNSEEN!

Department of Microbiology

Newsletter

2023-2024

Volume 19

STUDENT PERFORMANCE FOR 2022-23

T. Y. B.Sc. UNIVERSITY EXAM

STUDENTS APPEARED: 56

GRADE A+ (EXCELLENT): 32

GRADE A (VERY GOOD): 18

GRADE B+ (GOOD): 5

GRADE B (ABOVE AVERAGE): 1

PASS PERCENTAGE: 100%

Words of Wisdom from

The Administrator…

It is a great pleasure to pen these few words for the Microbiology newsletter, '*Microscope-See the Unseen*.' As the name of the newsletter suggests, Microbiology deals with microbes that are too small to be seen by naked eyes, and if they had not invented the microscope, perhaps we would never had known about these tiny living organisms that play a big role in our life. Someone describes the study of microbiology as 'where every day is a germ-azing adventure.'

Indeed, microbiology helps us to understand the role these microbes play. While browsing the internet, I came across these two authors, Luciana Cristina Vitoria, and Layara A. Bessa, from the Laboratory of Agricultural Microbiology, Goiano Federal Institute, Goias, Brazil. This is what they say: "Over thousands of years, modernisation could be predicted for the use of microorganisms in the production of food and beverages. However, the current accelerated pace of new food production is due to the rapid incorporation of biotechnological techniques that allow rapid identification of new molecules and microorganisms..... At no other time in history have microorganisms been so present in areas such as agriculture and medicine." This only goes to prove the role that microbes play in our life.

This is a subject that is proving to be very popular with the students, as it has many opportunities for employment. But those blessed with the talents, especially the members of the staff, should think of going ahead and launch into research. God only knows what surprises could emerge from such studies, and the benefits that may accrue to the society!

My hearty congratulations to the Head of the Department of Microbiology, Associate Professor, Ms Ursula Barreto, the staff and students for the work that goes on in this department, and for their dedication. May their labour bear abundant fruits.

God bless you all.

Fr Tony Salema

Administrator

Musings from the Head of the Department…

The learning environment of an educational Institution is sensed from the activities engaged on campus. The Department of Microbiology is always buzzing with activity and the academic year 2023-24 too had a plethora of opportunities that were made available for learners. From honing microbiological skills and learning new techniques, to engaging in research activities and internships, our budding microbiologists had plenty to choose from. Besides, display of talent through healthy competition, organization of intercollegiate events by the students and outreach activities for school students, boosted confidence levels and organizational skills.

The National Level Seminar cum Meeting of Microbiologists of India hosted at St. Xavier's College and the 5 Day Interdisciplinary Workshop organized in collaboration with WRIC, Mumbai, strengthened collaboration and helped faculty and staff to keep abreast with current trends in the subject.

This newsletter chronicles all the above and provides a glimpse of the vibrant 'microbial world' at St. Xavier's. Sincere appreciation to the Editor, Ms Katelyn Gonsalves, and Team for bringing together all the happenings of the department in this issue making it an interesting read.

Microbiology is an exciting field that offers countless opportunities for exploration, discovery, and prospects. The dedication and hard work of our staff is the backbone of our department's success. The tireless efforts in maintaining the facilities and equipment in our department, and practicing a responsible work culture is deeply appreciated. Kudos to our faculty members who passionately support student's academic and personal growth and consistently work to improve student outcomes and employability.

Our TY Batch of 2023-24 has excelled at the University Exams and many have secured seats at various Institutes of higher learning within the country as well as abroad. I congratulate and wish them much success in all their endeavours.

My warm greetings to the current FY, SY and TY students. Hard work brings success, there is no substitute to that. Aim high and work for it. I urge you to read, participate in activities, attend all departmental seminars and events, form buddy groups, join the MBSI Unit, and share your ideas. Have an enjoyable experience in our fascinating world of microbiology!

My sincere appreciation to the Management, the Administrator, and the former Principal for the constant encouragement and whole hearted support rendered in all our initiatives.

We look forward to this academic year with the aim of enhancing our research profile, strengthening industry collaborations, and fostering a culture of excellence.

God bless all our efforts.

Ursula Barreto

Acting Principal

From The Editor's Desk …

It is my pleasure to present to you the 19th edition of the Microbiology Newsletter, *Microscope…See the unseen*! which chronicles the events, highlights, and achievements of the Department of Microbiology during the academic year 2023-24.

While our 40th Jubilee celebrations ended in October 2023; this is by no means a reason to rest on our laurels, we continue to stride towards our quest for knowledge and acquisition of skills in Microbiology and allied fields.

In addition to the teaching-learning experience, enhanced through diverse competitions and activities, the department notably organized a first of its kind national hands-on workshop on maintenance and operation of laboratory equipment in collaboration with WRIC, Mumbai. The National-Level Seminar cum MBSI meet was an endeavour to foster industry-academia interaction to benefit the microbiology student and teaching community.

My sincere thanks to all those who have contributed to the creation of this newsletter. I do hope it makes for an enjoyable read!

Katelyn Gonsalves
Editor, Assistant Professor

MICROSCOPE . . . SEE THE UNSEEN!

Department of Microbiology Newsletter

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CONTENTS

Food and Mood: The Gut-Brain Connection

Ever had a "gut feeling" so strong it could guide your life? Research shows a significant link between the gut and brain. This article explores how our digestive system and food, especially prebiotics, affect mood and cognition.

First, let's briefly look at the GI tract. From the mouth to the large intestine, it breaks down food and influences our health. The stomach's low pH and the intestines' varying pH levels affect the microorganisms living there, impacting digestion and overall health.

Recent research has uncovered a fascinating concept known as the gut-brain axis, revealing a bidirectional communication pathway between our gut microbiome and our brain. This axis influences their respective functions and our behaviour, impacting various aspects of our health. Understanding this complex network sheds light on how gut microbes can affect brain function and vice versa, highlighting the gut-brain axis's crucial role in maintaining overall well-being.

The gut-brain axis is a key concept in biomedical and neuroscience research, highlighting a bidirectional communication system between the gut microbiome, the vagus nerve, and the brain. This network uses neural, hormonal, and immune signals to communicate.

Understanding this axis is vital as it impacts digestion, nutrient absorption, immune responses, and mood regulation. The gut microbiome produces metabolites and neurotransmitters that affect brain function, and the brain can influence gut microbes.

Disruptions in the gut-brain axis are linked to disorders like IBS, anxiety, depression, and neurodegenerative diseases. Grasping this axis is crucial for developing therapies to address these health issues.

Imagine the gut-brain axis as a relay race. The gut microbiome starts the race, passing essential information (like a baton) to the brain. The brain then directs the body's functions, ensuring everything runs smoothly. Just like in a relay race, clear communication between the gut microbiome and the brain is essential for maintaining peak performance and overall health.

A thriving gut is fundamental to our health and well-being, driven by the diverse community of microbes residing in our digestive system. When the gut is balanced, microbes produce important chemicals like serotonin and dopamine, keeping us happy and mentally sharp. However, imbalances, known as dysbiosis, can lead to harmful invaders entering the bloodstream, causing inflammation, and affecting brain health. Dysbiosis can cause mood swings, anxiety, cognitive issues, and disrupt the body's stress response. Healthy microbes produce Short-Chain Fatty Acids (SCFAs) crucial for brain health, while imbalances can lower levels of Brain-Derived Neurotrophic Factor (BDNF), leading to memory loss and cognitive decline.

99% of the genes in our body come from microbial cells rather than human cells. Given this high proportion of microbial genes, it's often said that a healthy gut is vital for a healthy mind. Ensuring a balanced gut through proper nutrition, especially with prebiotic and probiotic foods, is essential for maintaining both gut health and overall mental well-being.

Prebiotics are non-digestible fibers that cannot be broken down by human digestive enzymes. They pass through the digestive tract largely intact until they reach the colon, where they serve as food for beneficial bacteria. These bacteria produce beneficial compounds like short-chain fatty acids, contributing to gut health and overall well-being.

Probiotics are live microorganisms that, when consumed in adequate amounts, provide health benefits to the host. They are typically bacteria, although some types of yeast can also act as probiotics. Both prebiotics and probiotics are essential for maintaining a healthy gut microbiome but serve different functions.

Research, particularly highlighted in the paper "The Gut Microbiota and Mental Health in Adults" by Jarbrink-Sehgal and Andreasson, underscores the profound impact of prebiotics and probiotics on mental health. The study explores how prebiotics (non-digestible fibers in foods like garlic and bananas) and probiotics (live microorganisms in fermented foods like yogurt and sauerkraut) influence the gut microbiota and mental well-being.

Key findings indicate that these dietary interventions play crucial roles in neurotransmitter production, inflammation regulation, and maintaining intestinal barrier integrity, all of which affect mental health. Individuals with depression and anxiety have shown significant symptom relief and improved mood stability with prebiotics and probiotics.

The study highlights the potential of these dietary strategies as complementary therapies in mental health management, alongside traditional treatments, proposing a promising approach to improving overall mental health and quality of life in adults.

Understanding the gut-brain axis reveals a crucial link between our gut and mental health. While stress, sleep, and environmental factors are often out of our control, diet remains within our power to manage. Prebiotic and probiotic foods are essential for maintaining a healthy gut microbiome and have been shown to benefit mental health significantly. By incorporating these dietary choices, we can potentially alleviate mental health symptoms and enhance overall wellness. In essence, a balanced diet rich in prebiotics and probiotics is key to achieving optimal health and vitality.

Namrata K Kole (S. Y. B.Sc. 2023-24)

7 INTERESTING FACTS IN MICROBIOLOGY

- Blowing birthday candles increases bacteria up to 1,400% on the cake.
- There isn't enough water in honey for microorganisms to live on, which is why honey never goes bad.
- The average belly button is home to 60-100 species of bacteria, fungi, and yeasts.
- Cell phones have more bacteria and germs than public restroom toilet seats.

- Diamonds are thought to be made from carbon and dead bacteria.
- Genetically altered bacteria can be used to create an environment on Mars that is similar to earth's environment.
- A single housefly can carry more than 1 million (10, 00,000) germs on its body and transfer them onto our food.

Seiran da Costa (S. Y. B Sc 2023-24)

Autobiography Of A Microbe

I am *Pyrococcus furiosus*, a prokaryote who is commonly known as "Rushing Fireball" and this is my autobiography. I am commonly found in the depths of deep-sea hydrothermal vents where I thrive at temperatures exceeding 100^{o}C. I find solace in the anaerobic conditions of these harsh environments in the absence of oxygen. I am known as a hyperthermophile as I can grow at temperatures that would prove fatal to most living organisms. As an obligate heterotroph, I can ferment sugars producing carbon dioxide and hydrogen. I am spherical in shape and hence named coccus. I possess numerous flagella, due to which I can swim at rapid speeds, adhere to surfaces, connect to other cells like me and form biofilms. I have an outer covering called S layer, which is a type of glycoprotein and it helps in giving me protection. My ancestors were first discovered by the human race in geothermally heated marine sediments in Volcano Island, Italy in 1986. Since then, our species has played an important role in genetic engineering, as our heat-stable DNA Polymerase enzyme has been used in Polymerase Chain Reaction (PCR). Humans call this enzyme Pfu Polymerase and it has revolutionized the process of PCR. I am known as a model species of Archaea and I am glad that I was able to make my mark in this world. I will soon divide into 2 daughter cells and this will be the end. Farewell!!

Walusha Silveira (T.Y. B.Sc. 2023-24)

Yours Negatively Typhi

The earth has been a shelter or a home to me and my ancestors since time immemorial. My family has been an inhabitant of this planet, so to say you can find my cousins at every tiny bit of the earth sphere Oh how could I forget?… let me introduce myself I'm *Salmonella typhi* and I belong to the family *Enterobacteriaceae*. All microbiologists who have seen me have all been in awe of my rod-shaped physique with flagella embellishment. I'm a Gram-negative bacterium and like described before I'm very negative in my character, you can put it this way I am a villain in many of these humans' lives. Why am I a villain? The answer lies in the story of my life.

As mentioned, I existed on earth always but I was first visualized in the year 1880 by Karl Eberth in Peyer's patches and spleens of typhoid patients. This was my first interaction with the humans and since it was our first, we did not quiet have an opinion about each other. Until the day arrived when Sir Salmon, accused me of being the pathogen causing hog cholera. This accusation on me disheartened me and my trust in humans was destroyed. Though I did not cause that disease my urge to seek revenge from these supreme earthlings led to my move of being the Pathogen to cause typhoid. The story of me being the one and only antagonist of the humans being and the answer to being a villain also lies here. "Actions speak louder than words "very rightly said my action or urge for a revenge on the human race was the reason of my popularity. Now just to share a little insight I am found in contaminated water and food and I invade and destroy the cell that line your intestine. This makes it hard for your body to absorb water, which can give you stomach cramps. The water leaves your body in the form of diarrhoea. As can be deciphered the reason for my popularity was my negative behaviour and as the fire of revenge kept burning, I started attacking more and more humans in my trap. Some humans survived my attack while some succumbed to it and my vengeful fire kept getting fuelled. As we all know humans can never let anyone surpass them so I too couldn't do it. Just as I felt, I had taught them a lesson they were back at me with the typhoid vaccine in the year 1896 by British and German scientist Almroth Edward Wright, Richard Pfeiffer and Wilhelm Kolle. This so-called warriors of the human world to a large extent became the reason for my reign to end.

My reign came to an end and so did my revenge but did it really.NO the humans did stop the havoc wrecked by my existence but I still exist and maybe I am looking at you from the glass of water you are about to sip or the sandwich you are about to bite. You never know. On this note I would like to end by saying to the humans I could never be yours truly to you guys and so I would like to say signing off yours negatively *typhi*….

Shanaika Pires (S. Y. B.Sc. 2023-24)

Flesh Eating Bacteria

Necrotizing fasciitis more commonly known as "flesh-eating disease" is a rare illness that causes a great deal of tissue damage and can lead to death. Polymicrobial necrotizing fasciitis is an infection caused by more than one type of bacteria, usually mixed anaerobic and aerobic bacteria. Monomicrobial necrotizing fasciitis is usually caused by Group A *Streptococcus* or *Staphylococcus aureus*. Certain strains of group A *Streptococcus* sometimes cause a serious illness in some people but not in others. Some strains of group A strep may produce chemicals that create serious reactions in the body, and can cause necrotizing fasciitis. Canadian researchers are working on new strategies to help in the treatment of flesh-eating disease.

Certain people are at greater risk of developing necrotizing fasciitis. These are people who

have: cuts in their skin or mucous membranes, including those made during surgical procedures, problems with immune system or vascular system, Cancer, and during pregnancy.

Necrotising fasciitis throughout history: The condition that we now know as necrotising fasciitis has been described for thousands of years. Perhaps the first mention was by Hippocrates in the fifth century B.C. He linked it to erysipelas, a bacterial infection that causes red patches on the skin. The next notable mention of necrotising fasciitis was in 1764 by Baurienne, who described a soft-tissue infection in the male genitalia. Just over a century later in 1871, the same disease was recorded by a man called Joseph Jones, who was an army surgeon for the Confederate Army (in the American Civil War). He called it 'hospital gangrene', and 46% of his patients who suffered the condition died.

Eventually in 1952, Wilson coined the term 'necrotising fasciitis' to denote the condition. 'Necrotising' is the medical way of describing tissue death, while 'fasciitis' refers to the fascia the tissue that connects muscles and is often affected by necrotising fasciitis.

Rini Fernandes (S. Y. B. Sc 2023-24)

WORD SEARCH

A	M	C	A	L	R	S	K	Q	H	R	P	O	G	P
T	N	M	Q	O	U	P	X	F	U	N	G	I	K	S
H	G	B	H	E	X	I	B	E	Z	G	H	A	I	U
Y	F	Y	L	T	G	R	E	B	D	E	V	S	T	R
M	I	C	N	U	Z	D	T	O	T	G	U	U	S	I
I	U	N	D	O	V	X	P	J	J	L	I	U	U	V
N	L	U	K	R	D	U	S	P	L	N	L	C	W	O
E	H	P	P	Z	E	O	T	I	R	E	M	O	V	R
S	N	S	R	T	Y	R	C	M	C	S	W	C	L	E
A	Y	G	S	O	L	A	T	E	S	O	V	O	R	T
R	B	Z	A	E	B	T	N	D	Q	B	J	T	Z	N
T	K	P	J	O	S	I	P	L	R	I	B	P	S	E
B	I	V	T	B	S	Q	O	P	Z	R	V	E	Y	E
M	O	C	S	Y	E	A	S	T	J	C	Y	R	X	L
W	A	N	L	O	H	U	G	W	I	I	T	T	K	T
L	O	A	E	L	I	S	A	B	X	C	S	S	D	F

1) THYMINE

2) CODON

3) LACTOBACILLUS

4) NUCLEUS

5) RIBOSE

6) STREPTOCOCCUS

7) ELISA

8) YEAST

9) ENTEROVIRUS

10) LYSINE

11) SVEDBERG

12) PROBIOTIC

13) FUNGI

Poem on Microbes

Invisible to the naked eye,
Microbes are all around us, oh so sly.
They live in the air we breathe,
And on the surfaces we touch with ease.

Bacteria, viruses, fungi too,
These tiny organisms are nothing new.
They can make us sick or keep us well,
Their impact on our health is hard to tell.

Some microbes are good, some are bad,
But they all play a role, it's not a fad.
In our bodies, they help us digest,
And in the soil, they help plants to rest.

Microbes are everywhere, in soil and in water,
They're in our food, and even on our daughter.
They're in the ocean, and in the sky,
They're in every corner, you can't deny.

So next time you wash your hands,
Remember the microbes, they have plans.
To keep us healthy, or make us ill,
Microbes are here, and they always will.

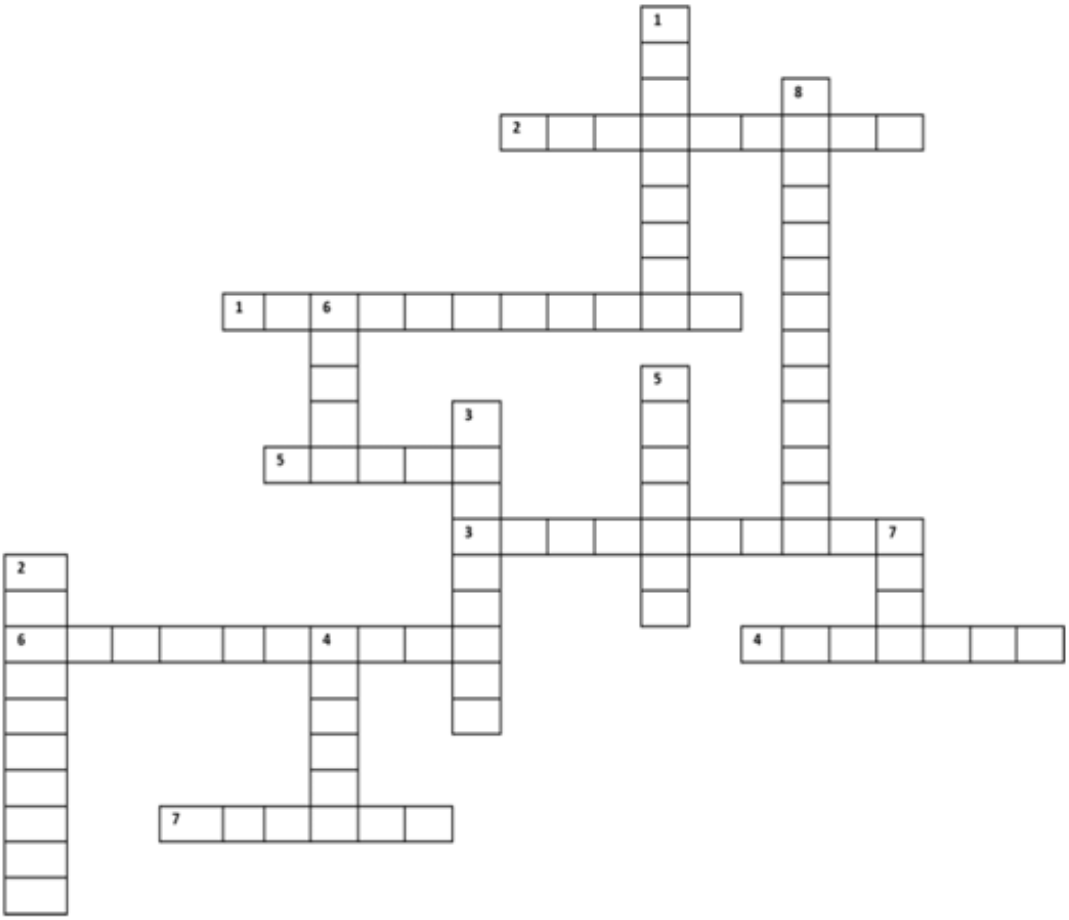
Vaibhavi Shetgaonkar
(S. Y. BSc 2023-24)

Microbial warriors for a better earth

In the unseen world of the microbes, are hidden solutions
So let's fulfill the dream of a sustainable future
By unravelling these suggestions
That are shouldered by microbes to maneuver
From effective bioremediation
To fostering waste management
The microbial marvels paving the way for a better situation
And moving in the direction of compassionate arrangement
From pioneers in the production of Biofuel
And unsung heroes of soil fertility
Our unseen guardian are protecting Earth
With utmost care and making it free from cruelty
In today's world of drastic climate change
The microbes help in fixing the bio cycles deep beneath
And try their bit to calm it in exchange
And weaving for the earth a sustainability wreath
With newness and awareness of sustainability
The microbial realm holding the beam
For marching forward with their ability
And uplifting mother earth as a team

Shanaika Pires
(S. Y .BSc 2023-24)

Crossword



CLUES

Across	Down
1: Reffered to as Father of Microbiology	1: Instrument used for Sterilizing equipments.
2: Microorganisms that thrive at high pressuers	2: Causitive agent of Malaria
3: Known as Father of Virology	3: Close prolonged association between 2 organisms of different species
4: Disease caused by salmonella	4: Father of food science
5: Reffered to as Mother of Microbiology	5: Demonstrated "Swan Neck Flask"
6: Disease caused by Entamoeba histolytica	6: Diseases caused by Filovirus
7: A mixer used for rapid mixing of samples	7: Inventor of Hanging drop method
	8 : A process which uses naturally occurring microorganisms to enhance normal biological breakdown

Seminar on 'Expanding the Horizons of Microbiology' Organised by St. Xavier's College, Goa and Microbiologists' Society, India

St. Xavier's College, Mapusa, Goa and the Microbiologists' Society, India (MBSI) organised a two-day **National-Level Seminar cum MBSI meet** on the theme '*Expanding the Horizons of Microbiology*' in association with Government College of Arts, Science & Commerce, Khandola, Goa, P.E.S.'s R.S.N. College, Farmagudi, Goa, and St. Joseph Vaz College, Cortalim, Goa on 06th and 07th October, 2023 at St. Xavier's College, Goa. The aim of the event was to provide a robust platform for microbiologists to come together, discuss various aspects of Microbiology, share research findings, deliberate on emerging trends, and explore entrepreneurship avenues in the field. The Seminar garnered the participation of over 150 attendees from various states across India including Goa, Maharashtra, Karnataka, Andhra Pradesh, Tamil Nadu, Telangana, and Delhi. The audience comprised students, researchers, faculty members, education professionals, eminent scientists, and industry experts, including officials from Encube Ethicals, and Himedia Laboratories, Ltd.

Dr. N. Ramaiah, Scientist Emeritus, National Institute of Oceanography, Dona Paula, Goa was the Chief Guest and Keynote Speaker at the inaugural function. The Guests of Honour were Dr. Arvind Deshmukh, MBSI National President, and Mrs. Marina Monteiro, Ex. Vice Principal and Former Head of Microbiology, St. Xavier's College, Goa. Rev. Dr. Ramiro Louis welcomed the delegates, expressing gratitude to all the dignitaries, speakers, participants, and attendees for being a part of the event. Ms. Ursula Barreto, Vice-principal and Head of Microbiology, St. Xavier's College highlighted the significance of the event as an addition to the ruby jubilee celebration of the Department of Microbiology at St. Xavier's, followed by the e-release of the Departmental Newsletter cum Ruby Jubilee Souvenir "*Microscope - See the Unseen*".

Dr. Dilecta D'Costa, MBSI State President, Goa and Maharashtra and Head of Microbiology, Government College of Arts, Science & Commerce, Khandola, Goa, spoke about the importance of the seminar. Dr. Trelita de Sousa, MBSI State Coordinator and Assistant Professor in Microbiology, St. Xavier's College, Goa briefly enlightened the audience about the purpose and progression of the seminar and called for the e-release of the Book of Abstracts. The Chief Guest highlighted the role of such a seminar in fostering the study of the microbial world and emphasised the evolution in Microbiology and allied fields. He also appreciated Dr. Arvind Deshmukh for his dedication to connecting microbiologists across the country. Dr. Deshmukh was felicitated at the hands of Dr. Ramaiah. Dr. Deshmukh expressed his gratitude

and addressed the audience motivating them to act in their own spheres of influence to promote microbiological research. Renowned Mycologist, Prof. D. J. Bhat was also one of the eminent witnesses to this event. The inaugural ceremony concluded with a vote of thanks delivered by Dr. Aureen Gomes, Assistant Professor, St. Joseph Vaz College, Cortalim, Goa.

In his keynote address, Dr. Ramaiah illustrated a vivid portrayal of Microbiology as a million-dollar industry. He added a valuable dimension to the event by showcasing the latest advancements and contributions of eminent scientists in microbiological and biotechnological research. Through interactive technical sessions, the seminar allowed deliberations from renowned scientists with profound experience. Prof. Savita Kerkar, Ex-Dean, School of Biological Sciences and Biotechnology, Goa University spoke on "Fascinating Organisms in Unlimited Marine Horizons". Her session was a mesmerizing dive into the marine world and focused on novel marine microbial resources. Ms. Heena Momin, Assistant General Manager of Quality Control and Head of the Microbiology Section at Encube Ethicals Ltd. presented a session on "Bridging the Gap between Industry and Academia" which provided a detailed visual of advanced state-of-the-art technologies. Capt. Dr. Mahindra K. Ranjekar, Consultant and Rtd. Professor in Biology, delivered a captivating session on "Biofertilisers: Entrepreneurship Opportunities" and rendered thought-provoking insights to urge students to prioritise involvement in start-ups and innovative thinking. The sessions were chaired by Dr. Aparna Pathade and Dr. Snehal Masurkar. The MBSI meeting comprised engaging sessions on the National Education Policy and Entrepreneurship by Dr. Prashant Wakte and Dr. Girish Patade which led to extremely fruitful discussions.

The participants presented their novel ideas and exciting research through vivid artistic posters and interactive scientific poster and oral presentations. For the artistic poster competition, 1st place was bagged by Mr. Pratham Tarkar and Mr. Shantanu Govekar, PES College, Goa, 2nd place by Ms. Kanishka Rane and Mr. Assad Shaikh, St. Xavier's College, Goa, and 3rd place by Mr. Vernon Fernandes and Mr. Cenon Andrade, PES College, Goa. For the scientific poster presentation, Ms. Priya Sharma, Bhaskaracharya College of Applied Sciences, Delhi bagged 1st place, Ms. Poojashree Nagappa Kummur, Karnataka University, Dharwad bagged 2nd place, and Ms. Divya Raghuvanshi, Krishna Institute of Allied Sciences, Karad bagged 3rd place. Best oral presentations were won by Dr. Sanket Gaonkar, PES College, Goa, Dr. Aparna Pathade, Krishna Institute of Allied Sciences, Karad, and Ms. Arti Zende, Krishna Institute of Allied Sciences, Karad. The winners were awarded cash prizes, trophies, and merit certificates at a grand valedictory function at the hands of the Chief Guest, Mr. Sandip Jacques (IAS), an

Alumnus of St. Xavier's College, Goa in the presence of the Administrator, Rev. Fr. Antonio Salema and the Principal, Prof. Blanche Mascarenhas of St. Xavier's College.

The students of the four organising colleges also showcased Goa's rich and vibrant Indo-Portuguese culture through a spectacular cultural programme comprising a mix of folk songs and traditional dances culminating into a thematic fashion show on extremophilic microorganisms which left the audience spellbound.

The Seminar turned out to be an enriching learning experience for all the participants allowing collaborations, networking, and an exchange of innovative ideas in the field of microbiology.

Workshop on "Operation and Maintenance of Lab Equipment" In Collaboration with Western Regional Instrumentation Centre (WRIC), Mumbai

The Department of Microbiology, St. Xavier's College, organized a five-day **National Level Workshop** on 'Operation and Maintenance of Laboratory equipment,' in collaboration with the Western Regional Instrumentation Centre (WRIC), Mumbai. The program was supported by the Directorate of Higher Education, Government of Goa. The objective of the workshop was to equip participants with practical skills and comprehensive training in the calibration, operation, and maintenance of a wide array of laboratory instruments and equipment.

The dignitaries present at the Inaugural Program were Mr. N.N. Rao - Program Co-ordinator, WRIC, Dr. Keshav Dhuri - DHE Observer, Fr. Antonio Salema – Administrator, Prof. Dr. Blanche Mascarenhas - Principal, Vice Principal and Program Convenor Ms. Ursula Barreto and Vice- Principal Ms. Sandra Fernandes, Organizing Secretaries Ms Katelyn Gonsalves and Ms Nadine de Souza. A total of 40 participants including faculty members, researcher scholars, laboratory assistants and laboratory attendants from various colleges in Goa and Hyderabad participated in the workshop.

The training comprised of technical sessions interspersed with lectures conducted by Mr. N.N. Rao and his team of 8 members, each expert in their own field. The topics covered were 'Basic Electronic Components', 'Power supply', 'Signal Generator', Cathode Ray Oscilloscope (CRO), working and maintenance of pH meters, spectrophotometers, colorimeters and microscopes. Participants had hands-on experience in handling digital multimeters, checking diodes, transistors and LED displays, soldering components on the vegaboard, working of the Digital Storage Oscilloscope (DSO), maintenance of centrifuges and colorimeters. The participants were taught to open and clean lenses of compound microscopes. The need for proper handling and regular maintenance of laboratory instruments for longer life was emphasized. During the workshop instruments requiring repairs were serviced at no additional cost. All participants were awarded certificates at the valedictory session.

Installation of Student Unit of Microbiologists Society, India (MBSI) of St. Xavier's College, Mapusa for 2023-24

The MBSI student Unit of St. Xavier's College, held its Investiture ceremony on 15th September 2023 to install its office bearers. The faculty coordinator, Dr. Valerie Gonsalves welcomed the audience and made a brief introduction about MBSI and its activities. Further, The Principal, Dr. Blanche Mascarenhas installed the office bearers by pinning badges to Ms. Sydelle Pereira (President), Ms. Shantashri Sinai Gaitonde (Secretary), and Mr. Ayush Narvekar (Treasurer); followed by the office bearers taking the pledge to uphold the objectives of the society during their tenure. Dr. Valerie Gonsalves ended the program with the vote of thanks.

The Office Bearers along with the Principal and faculty of the Department of Microbiology.

The Principal pinning the badge to the Office Bearers student Unit 2023-2024

Celebration of Days of Importance in Microbiology

Bulletin Board Display

The Department of Microbiology, St. Xavier's College, Mapusa Goa organized a bulletin board display through the year. The objective was to commemorate days of importance in Microbiology and its allied fields, as well as to raise awareness on various topics to the students and faculty of the college. The bulletin boards were designed with relevant information organized in a creative manner and was made interactive to draw participation while learning and having fun. The days celebrated through the bulletin board display included **World Cancer Day**, **International Microorganism Day**, **World Polio Day**, **World Antimicrobial Awareness Day**, **World Soil Day,** and **World Kombucha Day**. This activity was organized by Dr. Valerie Gonsalves.

Food For Thought!!

The Department of Microbiology, St. Xavier's College Mapusa, Goa celebrated **World Food Day**, by organising a quiz, "*Food for Thought*" for its SEC students on Food and Dairy Microbiology on 18th October, 2023 under the DBT Star College Scheme in association with the Microbiologists' Society, India (MBSI). In totality, 53 students participated (2 groups). The

quiz comprised 3 rounds: Round 1 (Flashback) was a memory game; round 2 (Pic Peek) displayed pictures on the screen which had to be identified correctly; and round 3 was a question-and-answer session prepared by the students themselves. The quiz was designed to be a revision for the students as they prepared for their upcoming semester-end exams. It garnered a lot of interest and enthusiasm from the students and was enjoyed by everyone. All participants were given prizes. The event was coordinated by Dr. Trelita de Sousa.

'Microchef' 2023 – The Second Helping!!

In commemoration of **World Food Day,** the Department of Microbiology, St. Xavier's College Mapusa, Goa organised a competition on fermented foods "MicroChef 2023 – The Second Helping!!" on 19th October, 2023 under the DBT Star College Scheme in association with MBSI. 10 groups comprising 53 students participated; wherein each group had to introduce their dish, state its benefits, display a reel of its preparation, and present the final dish to the judges for tasting. The students exhibited an array of delicious food and drink, from traditional dishes to exotic ones, savoury to sweet, hot, and spicy to cool and refreshing!

The winning dish was Idli Chaat prepared Ms. Dipali Chari (S. Y. B.Sc.), Ms. Ethika Gaonkar (S. Y. B.Sc.), Ms. Kajal Gaunthankar (S. Y. B.Sc.), and Ms. Padmaja Pinge (S. Y. B.Sc.). The event was coordinated by Dr. Trelita de Sousa.

National Science Day 2024 Celebrations

"Hand Painting Competition"

On the 28th February 2024, the Department of Microbiology conducted a Hand painting competition for students of St. Xavier's College as part of the **National Science Day** celebrations on the theme "*Climate Change Impacting Our Future*". A total of 27 students participated in the competition. The brushstrokes on their hands were so dynamic which added depth to the overall competition. The first, second and third place was won by Ms. Janice Noronha (F.Y.B.Com), Ms. Alisha Rodrigues (F.Y.B.A.) and Ms. Selina De Souza (F.Y.B.Com.), respectively. This was organized under the DBT STAR College Scheme and MBSI, and was coordinated by Dr. Alisha Malik.

'Microbe Masterpieces' - Pebble Painting Competition

As part of the **National Science Day** celebrations, a pebble painting competition on the theme "*Microbiology for a Sustainable Future*" was also held on 28th February 2024. This competition provided the students with a different medium to express their idea in a creative yet concise manner. A total of 17 teams participated in the competition, each team comprising of 2 members. The first placed was bagged by Ms. Nupur Bandekar and Ms. Diya Malik, second place by Ms. Snela Almeida and Ms. Sajal Mardolkar, and third place was awarded to Ms. Avanee Govekar and Ms. Megan Menezes, all belonging to Second Year Microbiology. The winners were awarded Merit certificates and prizes. This competition was organized by Dr. Valerie Gonsalves.

"Microwizards"

The **Science Day** celebrations included an event entitled 'Microwizards' organized for the students of First Year Microbiology. This activity held in collaboration with MBSI was a microbe-aided product making competition. The students prepared at home various products involving microbial processes. On the day of the competition participants briefly explained the microbial process; as well as the benefits and utility of the product prepared by them. Students displayed their culinary skills with products like sauerkraut, pizza, kaju feni, grape wine, dhokla, cheese, cake, kombucha, shrikhand, vinegar etc. Non-food products such as biocleansers, and biofertilizers were also displayed.

The first place was bagged by Michele Barreto, second place by Anushka Nagvekar and Lensa Lobo bagged the third place. The competition was a fun filled learning experience. The event was co-ordinated by Dr. Sheryanne Velho Periera.

Open Lab Day at the Microbiology Department

School students visited the Microbiology laboratory as part of the **Xavier's Open Lab Day**, organized under the DBT Star College Scheme. 3D models of DNA structure, bacterial cell, viruses, central dogma, protein sorting, as well as microbial products like bioenzymes and fermented drinks like kvaas were exhibited for the students. Working models demonstrating the principle of water filtration, plates showing the efficacy of sterilisation were the other highlights of the event. The programme effectively nurtured curiosity, innovation, and collaboration among participants, reaffirming the college's dedication to advancing scientific literacy and excellence in education. The event was co-ordinated by Dr. Sheryanne Velho-Pereira and Ms. Arina Frank.

‘Science Superhero’ Competition

St. Xavier’s College, Mapusa commemorated National Science Day 2024 with an imaginative competition held on 28th February 2024. The ‘**Science Superhero’** Competition was held for the eight Science departments, where each Department had to present a mascot or superhero showcasing their subject. It was met with lots of enthusiasm and excitement from both the coordinating teacher and students. The winners were the Department of Computer Science. The event was coordinated by Ms. Nadine de Souza.

Department of Botany

Department of Microbiology

Department of Chemistry

‘Science for a Sustainable Future’ Skit Competition

St. Xavier’s College, Mapusa commemorated **National Science Day** 2024 with an interdepartmental skit competition held on 6th March 2024. The competition was on the theme ‘Science for a Sustainable Future’ and aimed to promote awareness and interest in the subject, to develop creativity and encourage innovative ideas and to explore science for a sustainable future. Students put up skits showcasing the role of their respective science subjects as a means for a sustainable future. Students designed costumes, produced the script, and directed their

acting to convey the theme. A total of 80 participants from 8 different Science Departments participated in this competition. The event was coordinated by Ms. Ursula Barreto.

Health Camp

The Department of Microbiology in collaboration with the Urban Health Centre Mapusa organized a Health Camp on the 13th of December 2023. Teaching and nonteaching staff members of the college had the opportunity to benefit from a variety of services, including dental examinations, ophthalmological assessments, nutrition consultations, breast cancer screenings, gynaecological evaluations, homeopathic consultations, general health check-ups, blood tests, and ayurvedic consultations.

the success of this Health Camp stands as a testament to the collective dedication to fostering a culture of health consciousness and comprehensive well-being within the St. Xavier's College community. The total number of beneficiaries were 79. The event was coordinated by Dr. Alisha D. Malik.

Orientation Session for Final Year Students Appearing for Competitive Exams

In the pursuit of academic excellence, competitive exams stand as instrumental forces shaping the trajectory of one's career. A session for the T.Y. B. Sc. Microbiology students was conducted by Ms. Rachel D'Souza, an alumnus of St. Xavier's College, Mapusa, on 16th February, 2024. Rachel offered insights into the dynamics of competitive exams, focusing particularly on GU-ART, MHSET and NET exams. She skilfully guided the students through a comprehensive roadmap, elucidating crucial strategies and resources. Addressing the GU-ART exam, she broke down the exam format into three components - Syllabus, Reading/Reference Material, and Answering the Exam - she methodically navigated the students through each phase. Time management emerged as a pivotal aspect, with advice to peruse the entire paper carefully and trust one's instincts. Transitioning to a broader perspective encompassing NET, MH-SET and CSIR-UGC NET exams, Rachel emphasized the significance of reviewing previous years' question papers. Given the multidisciplinary nature of these exams, she encouraged candidates to exchange notes with peers from diverse specializations, ensuring a comprehensive preparation strategy. To enliven the learning environment, Rachel organized a mini pop quiz session, actively engaging students and fostering interaction.

The session ended with a vote of thanks and presentation of a token was presented to Rachel, in appreciation for her time and efforts to make the session successful.

"PROTEUS 2.0"

On 6th and 7th March 2024, the Department of Microbiology, St. Xavier's College, Mapusa – Goa, in collaboration with MBSI organised '*Proteus 2.0'* - an all-Goa Intercollegiate Event in Life Science, a sequel to the previous year's Proteus 1.0.

The competitions at '*Proteus 2.0*' were designed to provide students with a platform to showcase their talents and skill together with applying their conceptual knowledge in life sciences, whilst simultaneously making it a learning opportunity.

The unveiling of the coveted *Proteus 2.0* trophy took place amidst great excitement, at the hands of the Administrator, Rev. Fr. Antonio Salema, Principal, Prof. Blanche Mascarenhas, Vice-Principal, Ms. Sandra Fernandes, Vice-Principal and Head of Microbiology Department, Ms. Ursula Barreto, Faculty co-ordinator for the event, Dr. Valerie Gonsalves and Student co-ordinator of the event, Ms. Sydelle Pereira.

The event comprised of 16 competitions which were centralised around the theme of Life Science. The event saw onstage competitions like *MicroVocal* - singing competition, *Dancillix* – dance competition, *MicroGala*- fashion show and *Microtank* -marketing of life-science inspired products, as well as off-stage events like *Enigma*- quiz, *MicroRang*- rangoli, *The Culinary Clash* and *Mr. and Ms. Proteus* along with events like *Microbial Quest*- treasure hunt and *Kick-off* – tie breaker.

A total of 103 students from various colleges across Goa put forth their best in this two-day event and stood toe to toe with their competitors in a spirit of friendly yet serious participation to take home the dazzling Trophy. Nirmala Institute of Education, Altinho, Panaji, Goa emerged the clear victors of *Proteus 2.0.*

It was an enriching time with science filled with fun and with lasting memories!!

'Microbial Chronicles'

On the 11th of March 2024, the Department of Microbiology, St. Xavier's College, Goa in collaboration with the Microbiologists Society, India organized a competition 'Microbial Chronicles' - an autobiography of a microbe; on the theme '*Microbiology for a sustainable future*'. This competition was designed to enable students to create microbiology-based content with an opportunity to enhance and express their writing skills through storytelling, narratives, and language proficiency. 13 participants registered for the competition. The first place was awarded to Ms. Walusha Silveira (T.Y. B.Sc.), the second place to Ms. Shantashri Gaitonde (S.Y. B.Sc.) and the third place to Ms. Avanee Govekar (T.Y. B.Sc.). The winners were awarded merit certificates and prizes. The competition was coordinated by Dr. Valerie Gonsalves.

'Microverse'

On the 11th of March 2024, the Department of Microbiology, St. Xavier's College, Goa in collaboration with the Microbiologists Society, India organized a competition '*Microverse*' – a poem writing competition. The theme for the competition was '*Microbiology for a sustainable future*'. This competition provided the student a platform to create microbiology-based poems with an opportunity to explore power of language and rhythm to create unique literary pieces of art. A total of 06 participants registered for the competition. The first place was bagged by Ms. Shanaika Pires (S.Y. B.Sc.), the second place by Ms. Ana Merlyn Fernandes (T.Y. B.Sc.) and in third place was Ms. Malaika Govekar (S.Y. B.Sc.). The winners were awarded Merit certificates and prizes. The competition was coordinated by Dr. Valerie Gonsalves.

'Tiny Toons'

The Department of Microbiology, St. Xavier's College, Goa in collaboration with the Microbiologists Society, India organized a competition '*Tiny Toons*' - Comic Strip Creating competition on the 11th of March 2024. The theme for the competition was 'Microbiology for a sustainable future'. This competition encouraged creative expression of microbiology-based content through visual communication. A total of 10 teams registered for the competition, each comprising of 2 members. The first place was bagged by Ms. Tanaya Bhagat and Ms. Jhislaine

Fernandes from T.Y. B.Sc., the second place was awarded to Ms. Jazlynn D' Souza and Ms. Shruti Chodankar from T.Y. B.Sc. and in third place were Ms. Esha Dabholkar and Ms. Amira Fernandes from S.Y. B.Sc. The winners were awarded Merit certificates and prizes. The competition was coordinated by Dr. Valerie Gonsalves.

Microbiological Kitchen Waste Composting using Bokashi

The kitchen waste composting project for the academic year 2023-2024 was conducted with the students of Second Year (Divisions I and II), under the DBT Star College Scheme. The students collected fruit and vegetable waste from their homes and brought to the microbiology laboratory where the waste was then mixed with bokashi and placed in 2 composters on 15th September 2023. The waste was kept for anaerobic fermentation for about a month. The pickled waste was mixed with garden soil on 14th October, 2023 and further allowed to cure for approximately 3 ½ months in a plastic drum in which tiny holes were drilled to maintain aerobic conditions. The students carefully monitored the entire process of composting and learned the ropes of composting. The final product obtained was a uniform, dark, amorphous humus-like matter. This was then used as a soil conditioner for the college garden.

Through this co-curricular activity students were able to integrate theoretical knowledge gained by them in class to effectively reduce wet waste in their homes.

94 students participated in the composting workshop. The teachers coordinating this project were Ms. Linette de Souza and Ms. Katelyn Gonsalves.

Commencement of Composting – 15th September 2023

End of Aerobic Composting – 5th February 2024

‘Hands On Activity’- Preparing and Testing Compost

Students of the Third year Microbiology had a ‘Hands on activity - preparing and testing compost’ wherein they had to use different methods of composting kitchen waste and convert it into manure. Among the methods of composting done by the students were Traditional Backyard Composting, Vermicomposting, Bokashi Composting, which were carried out in pots, pits and Khambas. The compost was then utilised to study the effect of prepared manure on plants, where students tested growth against controls grown in garden soil without compost

Through the composting project, students gained practical knowledge of various composting methods and their benefits. They learned about the importance of organic waste recycling, and sustainable gardening practices.

The activity was coordinated by Ms. Arina Frank

“PETRIDISH” 2023-2024

The 8th Edition of “Petridish”, the annual Microbiology Quiz for students of FY, SY and TY was conducted via google form quiz on the 6th of April 2024. The quiz is envisaged as an avenue to help students revise their subject knowledge and help them prepare for their upcoming examinations as the questions are based on the syllabus of the respective classes.
Petridish 2023-24 received a total of 127 responses and 12 students of F.Y.B.Sc. tied with full marks. An online tie breaker was then held to decide the winner.
Following are the list of winners: **F.Y.B.Sc**: Ms. Suman Prasad, **S.Y.B.Sc**: Ms. Snela Almeida and **T.Y.B.Sc**: Ms. Megan Menezes
Prizes were awarded to all the winners. The quiz was coordinated by Ms. Ruella D’Souza.

Journal Club!!

The Department of Microbiology, St. Xavier's College Mapusa, Goa organised a Journal Club activity for its final year students on 16th March, 2024 under the DBT Star College Scheme in association with MBSI. Twelve students presented and scientifically discussed recent research papers and review articles published in reputed high-impact factor journals in front of a panel of experts constituting Dr. Varada Damare (Goa University), Dr. Sheryanne Velho-Pereira (St. Xavier's College), Ms. Nadine de Souza (St. Xavier's College, and Dr. Alisha Malik (St. Xavier's College).

Team 1 comprising Ms. Anisha Silveira, Ms. Riya Gawas, and Ms. Kelly Dias presented a paper titled, "*Soil microbiome indicators can predict crop growth response to large scale inoculation with arbuscular mycorrhizal fungi" published in the journal "Nature Microbiology*".

Team 2 comprising Ms. Walusha Silveira, Mr. Assad Shaikh, and Ms. Divyanka Borkar presented a paper titled, "*IgY antibodies: The promising potential to overcome antibiotic resistance*" published in the journal "Frontiers in Immunology".

Team 3 comprising Mr. Kshitij Kumar, Ms. Tanaya Amonkar, and Ms. Megan Menezes presented a paper titled, "*Formulation and evaluation of probiotic properties of* ***Lactobacillus*** *with antimicrobial activities*" published in the journal "International Journal of Drug Delivery Technology".

Team 4 comprising Ms. Magdalene Carvalho, Ms. Jazlynn D'Souza, and Ms. Sydelle Pereira presented a paper titled, "*Gut microbiota in anxiety and depression: Unveiling the relationships and management options*" published in the journal "Pharmaceuticals".

The entire event was a very informative, interactive, enriching, and scientifically satisfying experience for both the presenters and the audience. All Journal Club members were given certificates. The event was coordinated by Dr. Trelita de Sousa.

Bioprocess Technology Workshop

The DBT Builder Bioprocess Technology Workshop was held at BITS Pilani, K K Birla Goa Campus from 20th to 22nd February 2024. Faculty members Ms. Ruella Dsouza (Department of Microbiology) and Dr. Andrew Dsouza (Department of Chemistry); along with students Mr. Assad Shaikh and Mr. Kshitij Kumar from the Department of Microbiology participated in the 3-day workshop. The resource person, Mr Paraj Malayekar adeptly demonstrated the practical use of various instruments employed in bio-process technologies. Fermenters, centrifuges and chromatography and filtration systems including High-Performance Liquid Chromatography (Preparative HPLC) and advanced technologies like FPLC, Tangential Flow Filtration System and continuous centrifuge systems were demonstrated and handled by the participants. The standard operating protocols for the above instruments was discussed, purification runs of various samples were conducted of and data obtained was analyzed and discussed. The sessions were interactive and enlightening.

Educational Trip to District Hospital, Mapusa Goa

On the 20th and 21st March 2024, the Department of Microbiology, organised an educational visit to the District Hospital in Mapusa, Goa. 35 students of Third Year Microbiology were taken for the trip; they were divided in two batches and taken over the two days. As an extension of their Haematology theoretical knowledge the students visited hospital's pathology laboratory, to gain an insight into various techniques and protocols used in healthcare settings. The students were also made aware of the Laboratory Information Management System (LIMS), an advanced software used to manage patient information and tests, which ensures timely and accurate communication of diagnostic findings. The students were taken through various sections of the Pathology lab where they were shown automated fluid analyzer and a thermocycler, both essential tools for diagnostic purposes in microbiology. The field trip to the District Hospital in Mapusa was a valuable experience that deepened the understanding of the applications of microbiology in healthcare and provided first-hand insights in the working of pathology lab in a hospital setting. The students were accompanied by Ms. Arina Frank, Dr. Sheryanne Velho-Pereira, Ms. Nadine de Souza, and Dr. Valerie Gonsalves.

A visit to ICAR-CCARI, Old Goa

The students of TYBSc Microbiology, participated in a Field Trip on 13th and 14th March 2024 to the Indian Council for Agricultural Research - Central Coastal Agricultural Research Institute (ICAR-CCARI) at Old Goa. It was a captivating journey into the world of agriculture. This excursion, was part of the Agricultural Microbiology practical syllabus, and provided them with experience and practical insights into the various applications of biotechnology in agriculture.

Accompanied by four faculty members, Ms Ruella D'Souza, Dr. Valerie Gonsalves, Dr. Alisha Malik and Ms. Nadine de Souza, the students embarked on an exploration of genetically modified plants. They were shown indigenous rice varieties, tomatoes, pest-resistant brinjals and high-yielding bananas. The highlight of the visit was an interesting learning experience on Polymerase Chain Reaction (PCR), where they gained a deeper understanding of PCR's role in genetic analysis and diagnostics. Additionally, Dr. Manohara K. K., a Senior Scientist at ICAR, shared his expertise on genetically modified crops and their ethical, environmental, and socio-economic implications, sparking lively discussions among the group. They were also shown the facilities for fish breeding and animal husbandry by Mr. Datta Velip.

Internship

The internship programme conducted by the Department of Microbiology is aimed at providing students with an opportunity to engage in hands-on laboratory work and experience in techniques and equipment used in the fields Microbiology. Besides which the internship acquaints the students with the ethos and culture in the real work environment.

46 Second-Year Microbiology students completed internships spanning a duration of 15 to 30 days during their summer vacation in May/June 2024 at various pathology laboratories and research institutions across the state, including Goa Medical College - Bambolim, North District Hospital-Mapusa, Community Health Centre - Pernem, Manipal Hospital-Dona Paula, Santa Cruz Diagnostic Laboratory, Dr. Dukle's Hospital and Research Laboratory – Candolim, NIMR-Field Unit-Goa, CSIR-National Institute of Oceanography - Dona Paula. At the end of

their training sessions, feedback forms evaluating each student's performance were sent to the Department by the respective establishments.

The Internship Programme for the academic year 2023-2024 was coordinated by Ms. Katelyn Gonsalves.

Consultancy Services

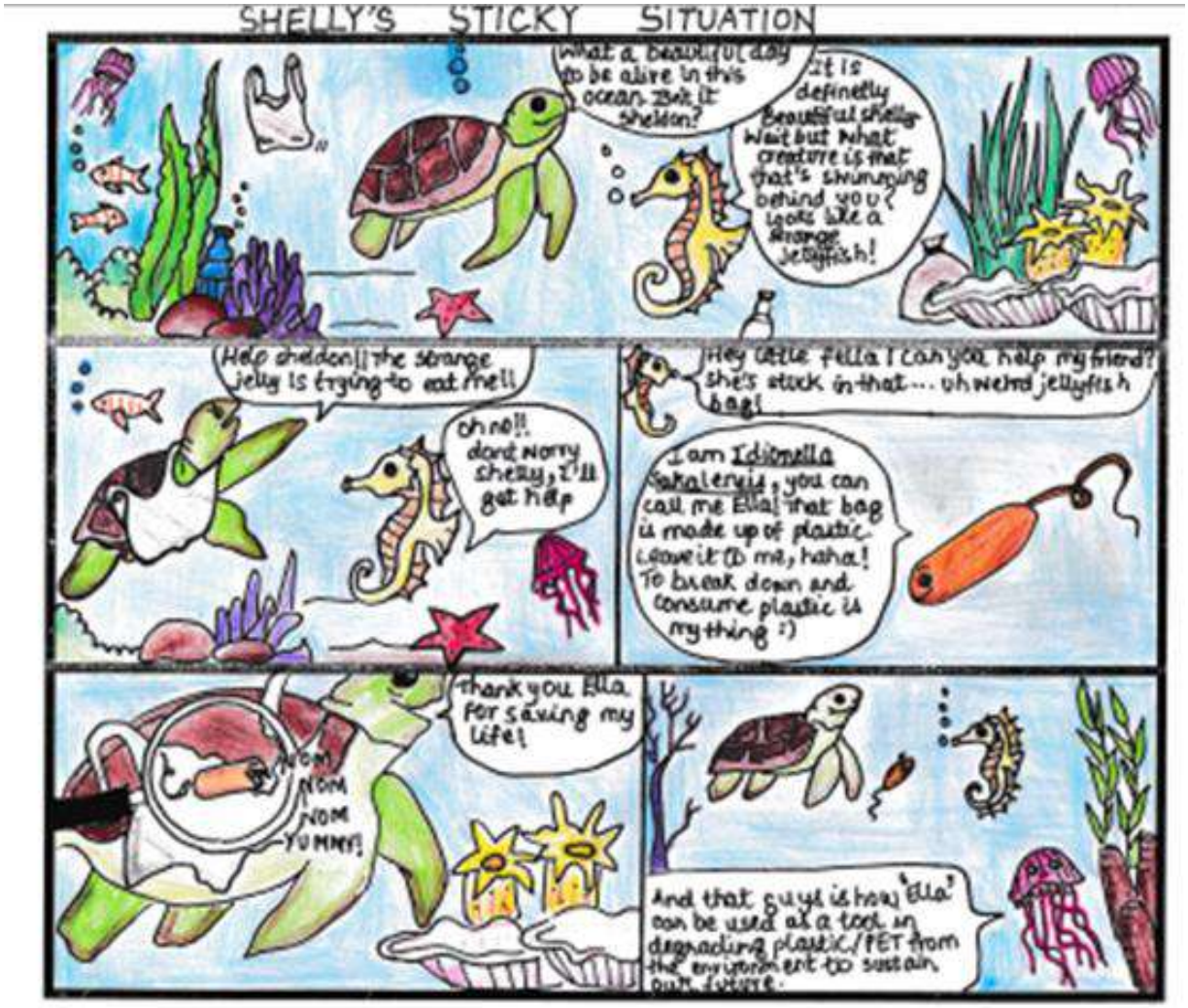
Drinking Water analysis

The Department of Microbiology provides a consultancy service to ensure the safety of water meant for human consumption. Ideally, all samples taken from the distribution system including consumer's premises, should be free from coliform organisms and the bacteriological quality of drinking water collected in the distribution system is therefore specified when tested in accordance with IS 1622. Analysis of drinking water samples collected from filters installed in the college campus besides the samples collected from people desirous of availing this consultancy service. The amount generated till April 2024 was ₹ 800 at the rate of ₹ 200 per water sample. The programme for the academic year 2023-2024 was co-ordinated by Ms. Linette de Souza, faculty, Department of Microbiology with assistance of Second year students.

Determination of antimicrobial activity

The Department of Microbiology of St. Xavier's College, Mapusa – Goa offers a consultancy service for the determination of antimicrobial effectiveness of newly synthesized organic and inorganic chemical products, organic extracts, etc. This service is extended free of cost to the students of this college and at a rate of Rs. 100 per sample for students of other colleges. Samples of herbal tea, ferrites, extracts of medicinal plants and liposphere were analysed for their antimicrobial effectiveness against *E. coli*, *S. aureus* and *B. subtilis* by the students of the Chemistry Department (Undergraduate) of St. Xavier's College, Mapusa – Goa and DM's

College, Assagao (Postgraduate). The analysis was carried out from 15th January 2024 to 27th January 2024. The consultancy service was co-ordinated by Ms. Linette de Souza.



Winners of 'Tiny Toons' comic strip competition Ms. Tanaya Bhagat and Ms. Jhislaine Fernandes (students of T.Y. B. Sc Microbiology)

EDITORIAL TEAM