DEPARTMENT OF BOTANY
Maitreyi College,
University of Delhi

VITTI

वित्ति

VOLUME 3

May 2023

An e-Newsletter, Initiative by Department of Botany, Maitreyi College, University of Delhi

FROM THE PRINCIPAL'S DESK...

It is a matter of immense pride for the institution, as yet another endeavour of our students comes to fruition. The **third issue of Vitti**, newsletter of the Department of Botany, testifies to our students' creativity, skill and ideational competence. The content of this issue combines Botanical knowledge, with a vision for conscious living. Thus, this publication rings true to the essence of its title Vitti, that indicates understanding, consciousness and intelligence manifested in thought, word and deed. As our eyes are intently focused on building the career of our pupils, this newsletter is dedicated to the higher skills of creativity which will prove instrumental in shaping their destiny.

I take this opportunity to congratulate all the students of our Botany Department and faculty who have been working for the successful completion of this literary project, 'Vitti'.

Best wishes.

Prof. Haritma Chopra
Principal
Maitreyi College

MESSAGE FROM TEACHER-IN-CHARGE (EDITOR-IN-CHIEF)

Learning is the inherent interest and ability of mankind, throughout the lifetime. It is a matter of immense pride, that Maitreyi college continues to flourish as an esteemed institution, acclaimed for its pursuits in teaching and learning. Faculty members of the college have continued to conduct significant research in spite of modest infrastructure. The college is committed to provide an intellectual environment to its students through innovative methodology, seminars and its distinguished newsletter.

Vitti **(Volume 3)** is an important milestone of the department of Botany when the synergy between an inherited tradition of inclination towards learning and the commitment of outstanding scholars, and faculty at Maitreyi College can create a revolution by expanding frontiers of knowledge. This initiative would provide our students an excellent opportunity to learn and share their thoughts, knowledge and experience from diverse areas of society.

I congratulate and thank all the contributors, editorial team and faculty members for their hard work and support.
With Best Wishes

Dr. Sandeepa Singh
Assistant Professor
Department of Botany
(TIC: 2022-23)

MEET OUR TEAM

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Contents:-

Bidding Adieu:
Our Superannuated Faculty

Dr. Alka Vadakan

Dr. Alka Vadakan, with superannuated faculty, Dr. Davinder Kaur, Dr. Rina Majumdar and Dr. Renuka Kashyap (L to R).

Dr. Alka Vadakan, the name itself is enough to draw wonders, awe and respect, from everyone in the Botany fraternity and Maitreyi family. Ma'am, you are an epitome of kindness, grace and a reservoir of knowledge. Your expertise in the areas of Plant Physiology and Biochemistry is impeccable and has helped us to grow as teachers. Being a teacher and researcher of the highest order, you have set the bar exceedingly high. The meticulous manner in which you deliver your lectures is exemplary and has been a source of inspiration to all your students, for almost four decades now. In addition to your monumental achievements, you shine bright as an honest, sincere and kind human being. We wish you the best of health and happiness and we hope to continue your legacy as a wonderful teacher!

Warm Wishes and Regards
Department of Botany

Picture Credits: Dr. Pooja Baweja

Gratitude to Our Teacher

From the Bottom of Our

Dear Alka Ma'am,

It's a pleasure to have this opportunity to express our gratitude towards you for being such an astounding teacher and an amazing mentor. You have always gone above and beyond the expectations of a 'Great' Professor. As students, your teachings made a significant impact on both our academic as well as personal growth. You are incredibly committed in classes and were always there to help when we needed it. Some of us were fortunate enough to have been associated with you as a teacher also. We all have always admired and idealized your teaching methodologies. We want to thank you from the bottom of our heart for being such a wonderful, encouraging and supporting mentor. We wish you all the health and happiness in this new phase of your life and hope to stay in touch with you. Thank you for making us who we are today.

With tonnes of love from your students
Dr. Pooja Baweja
Dr. Shweta Sharma
Dr. Ankita Sehrawat
Dr. Vandana

Articles

CELEBRATING 200 YEARS OF MENDEL!

HYBRIDS AND HYBRIDIZATION

Yet again a swift car sped past and shiny metal tag read "Hybrid"; an email alert chimed on a "hybrid" mode meeting; and believe you me scrolling on Netflix came across "Sweet Tooth" a tale of strange human-animal "hybrids"! It has become a common term that has created its unique place in our daily lingo. It is a term of immense import, a profound meaning. I share here my thoughts on the same. The dictionary explains hybrid as 'an offspring resulting from cross-breeding'. It does not just apply to organisms! There are hybrid words, 'a word composed of elements from two or more languages', in fact the term "***Botany***" itself is a hybrid word of the Greek word '**botanē**' indicating plants (pasture, herbs, grass or fodder) and '**-y**' the English suffix. There exists a hybrid computer that combines the attributes of digital devices (memory and logic) with those of analog devices (speed and flexibility). The contemporary times of expanding and merging frontiers of knowledge attest to the fusion, amalgamation and synergy of disciplines.

The very thought of Mendel, creates a vision of a priest in a monastery, huddled over pea vines in a cold country. **Johann Mendel** was born on **July 20, 1822** in the Moravian village of Heinzendorf, close to the borders of Germany, Poland and Czech Republic, to a family of farmers and gardeners. He trained as a philosopher, including mathematics and physics as well. When he joined the Augustinian monastery, he acquired the name '**Gregor**' in October 1843. It is here that along with other monks, he could pursue his scientific activities and was exposed to the wide herbarium collection maintained by another senior

priest. Amongst the various trials and tribulations of family, finances and work, he continued to train - attending lectures in chemistry, zoology along with botany at the University of Vienna.

It is recorded that he was an avid follower of Charles Darwin's writings, in addition to having conversations with like-minded academics. Although he was trained to be a parish priest, he excelled at being a schoolteacher at a high school in Znaim. Unfortunately, in spite of repeated attempts he could not clear the examination for a qualified teacher. He was held in high regard by his students and was an active member of the society for the study of natural science. He bred mice in his rooms at the monastery and even owned a microscope. In 1856, at the age of 34, he began his experiments in a small part of the monastery garden growing garden peas (*Pisum sativum*) that he completed and presented after seven years. The monograph "***Versuche über Pflanzenhybriden***" (***Experiments on Plant Hybrids***) was read at the meetings of the Brunn Natural History Society on February 8, 1865 and March 8th, 1865. It was published in the 'Verhandlungen des Naturforschenden Vereins' in Brūnn, 4, 1865 ('Proceedings of the Brno Society for the Study of Natural Science'). In addition to the 'constant hybrids' in pea, Mendel studied 'variable hybrids' in Hieracium. The work was not accepted, in fact Carl Nageli, a Swiss Botanist, offered a strong critique at the time. It was in 1901, that the Royal Horticultural Society of London,

printed the English translation in the society's journal (volume 26). In 1909, William Bateson published the book '**Mendel's Principles of Heredity**'. During his later years, he devoted time to beekeeping (apiculture) and meteorology. It was only much later, after his death that the revered title of **"Father of Genetics"** was conferred to him. Hybrids, biological or others are a creative product of a remarkable process - ***Hybridization***. A process that unites/mixes the distinct and special features of the parents - the founders or originators and produces a new element of value. Filials or the progeny as we biologists refer to are the showcase for the attributes contributed by the parents displaying ever new combinations of the 'factors' as Mendel referred to or genes as we know them in contemporary biology.

Hybridisation experiments that Mendel conducted used merely **22 varieties** to analyse **seven characteristics**. He deliberately chose parents with distinct phenotypes for the same character and employed the methods of emasculation, selfing and crossing to generate the pool of progenies from parents.

Image Credit: Joana Carvalho

He applied his learning from mathematics to analyze how the descendants differed from the parents and amongst themselves, thus bringing a method of quantifying the transmission of characters and combinations thereof. What we now know as the classical - segregation ratios: phenotypic and genotypic. Another novel approach was the use of symbols - Aa, AA, aa - to represent the 'factors' the abstraction that was not recognized by peers. The cutting edge – modern day technologies of recombinant DNA, genomics, transcriptomics, proteomics rely heavily on the detection of the hybrid molecules that form during the process of hybridization - finding the perfect matches in the infinite pools of possibilities. The two ends of the spectrum of distinctiveness (identity) and inclusivity merge in the domain of the hybrid.

Are all hybridizations successful? Do they follow a strict pathway? What is the ideal combination and which of the hybrids are viable?

Fusion of cultures, values, traditions has been an integral part of human evolution, survival and civilizations. Creativity, innovation are the need of the hour….for individuals, institutions, disciplines to ensure novel ideas, ventures and opportunities in the global scenario. Taking lessons from this brilliant diligent scientist and his struggles tells us that no path is easy, no applauds forthcoming but in spite of the critiques one plods to fulfill the dream, unravel the unknown.

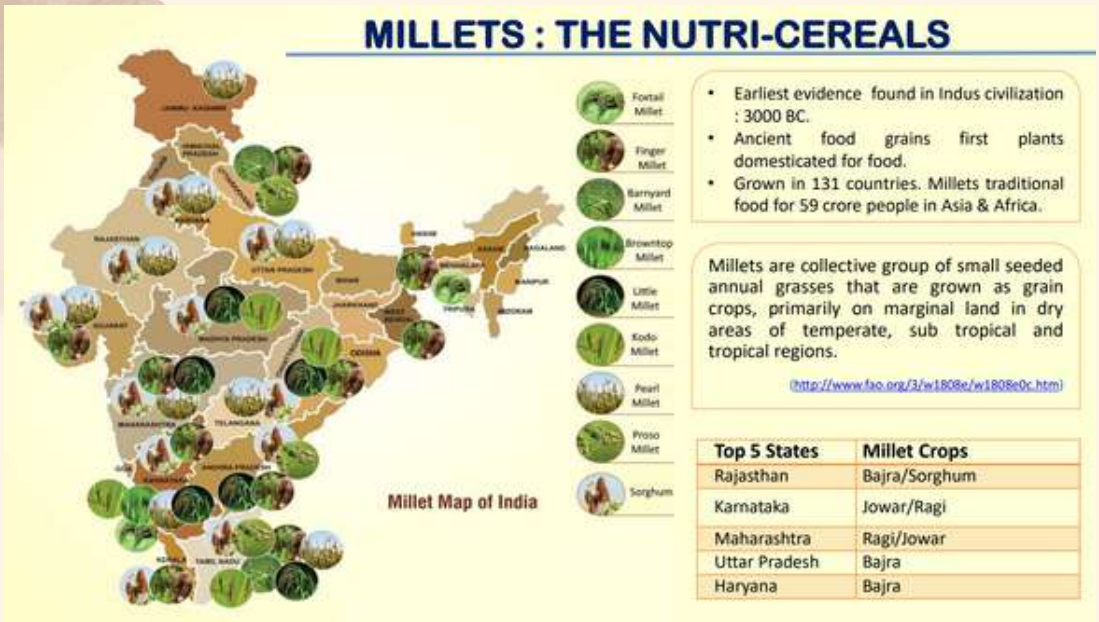
Dr. Atika Chandra
Associate Professor
Department of Botany
Maitreyi College

2023: The International Year of Millets

Who would have thought that a plate of our savory millet delish, "*Murukku*" convinced the UN members to designate 2023 as the International Year of Millets..? In April 2016, the UN General Assembly had proclaimed **2016 to 2025** as the **UN Decade of Action on Nutrition**, keeping in view to rising need to eradicate hunger and malnutrition worldwide. In March of 2021, the idea to declare **2023 as the Year of Millets** was proposed but the major question of many was.. *Who needs millets, when we have Wheat and Rice? How did the once rendered* ***Orphan Millets*** *rise and turn into* ***Global Millets...?***

The word, millet is derived from a French word, '*mille*', which means 'thousand', deeply indicative of the brazen fact that a handful of millets can house up to thousand of grains. Millets, also known as "***Super foods***" and "***Nutri-cereals***" are an affluent source of proteins, fiber, micronutrients and phytochemicals, a lot more so when compared to the staple cereals we consume. Millets have held the title of being the **poor man's grain cereal** for long now. These tiny grains hold intrinsic and indispensable value to the Indian diet system for centuries now. But, is this enough for them to be labeled as the "**Sustainable Substitute of Cereals**"? Well, yes. The benefits of millets as a primary staple are endless. They not only reduce the risk of hypertension, diabetes, cardiovascular diseases, gallstones and ulcers but are so nutrient-dense, they are crucially prescribed to patients with anemia, liver disorders and asthma.

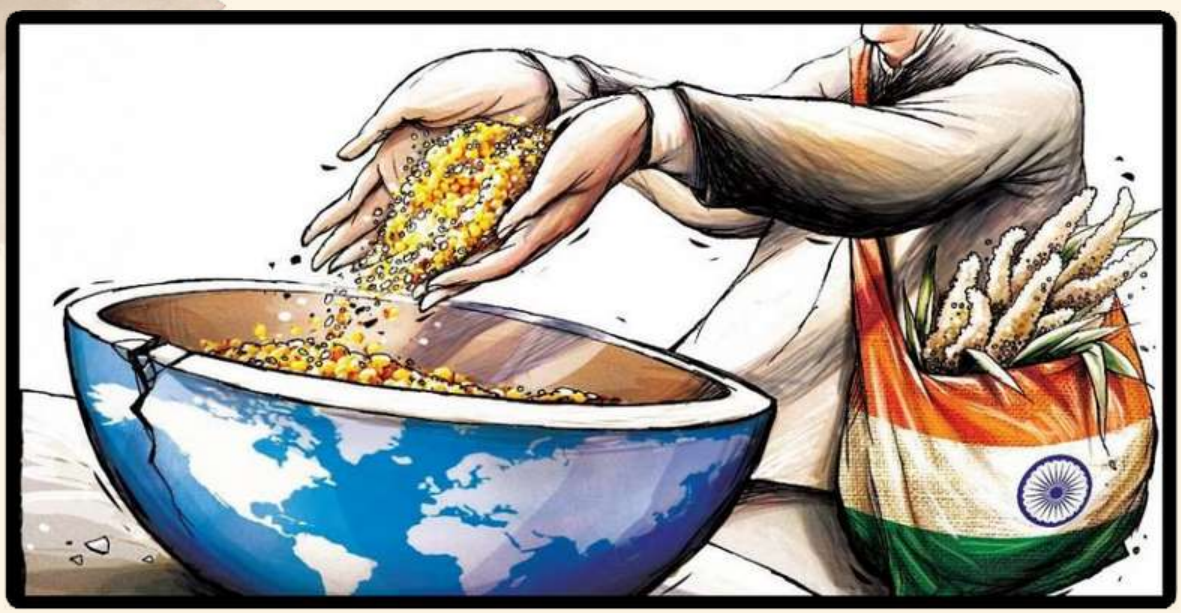
In addition to their contribution to a plethora of health benefits, millets have great ecological significance as well. Any scientific guesses? These wonder-grains have an extremely low carbon as well as water footprint, making them excellent mitigators of water scarcity in areas with low water and input requirements. Being low maintenance beings, they can grow beautifully, with minimalist external inputs. They tiny grains are not just easy to maintain but also very simple to grow and take barely an average of 65 days to mature, with storage up to 2 years or longer. Interestingly and not many know this, but millets were among the first domesticated plants, which have served as a staple for millions of families in developing nations of Sub-Saharan Africa and Asia.



India is a **major producer of millets**, responsible for 80% Asia's production and 20% of the global production. Indian millets are of two major kinds based on grain size - *Major Millets* (Sorghum, Pearl Millet and Finger Millet), and *Minor Millets* (Foxtail Millet, Proso Millet, Kodo Millet, Little Millet), based on whether they need to be processed or not.

Sadly though, the cultivation of millets is declining rapidly. People have failed ceremoniously at realizing the caliber of millets to provide food and nutritional security. This dire need to save and protect their cultivation makes it extremely urgent to spread awareness about these saviors and the ecological and nutritional benefits to scientists, producers and consumers, alike. With the intent to create awareness and elevate production as well consumption of millets, United Nations, at the behest of the Government of India, declared **2023 as the International Year of Millets**. The Government of India had originally proposed this designation in compliance with 72 countries and the UNGA (General Assembly of United Nations). According to the Consulate of India in Toronto, millets are a rich source of protein, fiber, minerals, iron, calcium, magnesium and phosphorous. Additionally, they have a low glycemic index, making it an exceptional choice for diet and diabetes patients. This resolution to declare 2023 as the International year of millets was headed by India with co-sponsorship from over 70 nations. The 193- member General Assembly unanimously adopted the resolution, declaring **2023 as the International Year of Millets.**

India's Permanent Representative to the UN, **S Tirumurti** underlined the primary objective of the resolution and directed the focus for towards a more scientific, agricultural, ecological and economic modus. He expressed confidence that this initiative will play an elemental role in elevating awareness levels amongst people, and simultaneously will be incremental



to the investment, development and food sector linkages. As a part of this revolutionary initiative and G20 India, various Millet Activities are being organized, such as Eat Right Millets: Shree Anna Quiz, Logo Competition for Mega Food Event, Tagline for Mega Food Event, Pledge, Millet Magic (Recipe competition) and many more. Maitreyi College also organized a MasterChef Competition for millet-recipes. These small initiatives will be crucial in changing the outlook of people towards millets as consumer-favorites, as not only are they nutrient-dense but are flavorsome as well.

Recently, as part of this global initiative, on 18th March, 2023, in New Delhi, **Global Millets** were inaugurated by Prime Minister, Shri Narendra Modi. This initiative by the Indian Government can change the Global Outlook on Millets and is something the entire science and non-science fraternity is looking forward to!

Dr. Mansi Gogna
Assistant Professor
Department of Botany
Maitreyi College
University of Delhi

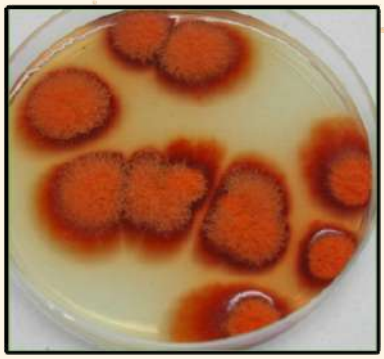
Fungi: Adding Colors to Life

Colors have magical impact on human brain and and can significantly modulate our emotions. Be it clothes, food, walls and even coloring our hair for a change, colors add so much meaning to our life which is probably why man has invested so much to time, effort and money to find a wide range of colors. In ancient time, nature was the only source for extracting colors or dyes but later we learned to develop synthetic dyes also known as "**coal-tar colors**". However, with increasing ill-effects of synthetic colorants, natural dyes are once again drawing the interest of modern world.

Nature has bestowed diverse group of organisms including animals, plants as well as microbes with the ability to produce bio-pigments. Dyes of fungal origin has a wide range of pigments. These pigments include compounds such as melanins, oxopolyene, quinones, anthraquinones, hydroxyanthraquinones, carotenoids, and naphthoquinone. Many of these bio-pigments are polyketide derivatives obtained abundantly from ascomycetes. The first commercial fungal color was **Arpink Red** extracted from *Penicillium oxalicum var. armeniaca*.

A vast range of colors are sourced from fungi inhabiting diverse environmental conditions that can be explored as a source of commercial pigments. A marine fungi *Penicillium bilaii* isolated from an estuary of Australia yields a yellow colored pigment known as citromycetin and citromycin. Two pigments viz **Aspergiolide (red)** and **Variecolorquinones (yellow)** can be obtained from *Aspergillus glaucus* from sediment around the mangrove roots. A strain of *Aspergillus* sp. isolated from coral reef yields two yellow dyes (tetrahydrobostrycin and deoxytetrahydrobostrycin) and a red dye **(bostrycin).**

Approximately 100 fungi were isolated from Godavari mangroves of India and most of them releases biopigments. Nearly 67 endophytic fungal strains are found to be pigmented. *Fusarium verticillioides*, a terrestrial fungi is a potential source of naphthoquinone pigment. An endophytic fungus *Phyllosticta capitalensis* is a foliar endophyte of many trees produces melanin.



Monascus purpureus

Ravenelin is a food grade yellow colored dye obtained from *Talaromyces funiculosus* which can be utilized in food as well as pharmaceutical sectors.
Although production of some dyes of fungal origin such as Monascin extracted from *Monascus purpureus* is huge but a lot of work is still required. This might include extensive research on areas such as elicitors involved in bio-pigment synthesis, stabilization of the dyes, formulation of safe methods for food grade dyes, optimization of growth parameters to ensure mass production of quality product etc.

Dr. Vandana
Assistant Professor
Department of Botany
Maitreyi College

Just a Sparrow..

The People's Republic of China was created on October 1, 1949, led by **Mao Zedong** who believed that it to be the liberation of people from war, and liberation of the nation. He started a new campaign to modernize the newly recognized nation, which was called the "***The Great Leap Forward***". From 1958 to 1962, this campaign became the face of unprecedented social campaign, with several initiatives and interesting titles, one of which is the "Hundred Flowers Campaign". Contrary to the flowery and bright name, what Mao in reality did was declare war on pests responsible for spreading diseases, making rats, flies, mosquitoes and sparrows the major target. Billions of rats, flies and pounds of mosquitoes were killed. However, if truth be told, these beings were not only killed for spreading diseases, but because they were the consumers of food, rice, and grains that Mao felt were elemental for human lives. *The main target in this quest was the Sparrow*.

In May 1958, in a magazine named 'Red China', it was reported that, "No warrior shall be withdrawn until the battle was won". All revolutionaries were called upon to join this courageous fight against doggedness of revolutionaries. It was estimated that a sparrow consumed 4 pounds (2 kg) of grain per year and was accused to be the main cause of hunger and starvation. Mao Zedong addressed the almost 30 million people, including students, civil servants, at the 5 a.m. in the morning, and as they rose to their stations, they chant in chorus the revolutionary anthem:

"Arise, arise, Oh millions with one heart;
Braving the enemy's fire, March on."

What happened next to sparrows was heartbreaking. This campaign was given the name, "**Splash Sparrow Campaign**". The nests of sparrows were broken, eggs crushed, and sparrows and chicks were killed ruthlessly. However, Mao and his followers failed to realize that the supposed culprits of food were also the protectors of cultivated crops.

They fed upon insects, locusts and pests, thus preserving major staple crops in question. This eventually resulted in disruption of the natural crop prevention system. This consequential ecological imbalance led to a decline in yield of major crop plants, like rice. It was then pointed out by Ornithologist, *Tso-hsin Cheng*, that the campaign meant to increase the food yield, has actually had an opposite impact with a major loss in total yield production. In April 1960, Mao ignored the suggestion made by Tso-hsin and introduced locusts into the natural population. The result was tragic. With no sparrows up the food chain, the locust population bloomed and the ecological distress was further aggravated.
Left with no choice and forced to admit defeat that sparrows were not the culprits but rather the saviors of the ecosystem, the Chinese Government was forced to import 2,50,000 sparrows from the Soviet Union.
What's sad is that even after disturbing incidents like these, human beings are still leaving no stones unturned to harm the nature. Be it deforestation for the sake of multi-story buildings or economic boost, plants and animals are being sacrificed left, right and center. Their own existential value has become nothing more than chance to turn money.

Lush green forests are being converted to ghost forests and the reason is us. The final result of all this can be even more tragic, and we have our future generations to come! It's high time that we start reconnecting with the environment and comprehend that ***every life form is crucial for maintaining the balance of the ecosystem, even if it's JUST A SPARROW!***

Savina
B.Sc. Botany (H)
III year

The Wonders of *Rafflesia*

Have you ever come across a wonder of nature that's intriguing and interesting at the very same time? If not, you are going to read about this fascinating flower, a dominant poise in the world of flowers, found deep in the rainforests of South East Asia. *Rafflesia arnoldii*, intriguingly known as the "**Stinking corpse lily**", located in the terrains of Indonesia.

This title was denoted to it owing to its rotting, meaty smell that captivates the attention of pollinators. The central reddish, tentacle-shaped inside of corolla is responsible for its distinct smell. The flower of *Rafflesia* was first unearthed by a French naturalist, Louis Dechamps in then Java (present day Indonesia) between 1791 – 1794. The name is a homage to Sir Thomas Raffles, an adventurer and founder of the British Colony of Singapore. Well, any guesses about the size and weight of the flower? While its size is humongous, and *weighs as much as a human infant*, an average flower of *Rafflesia* can weigh up to **22 pounds or 9.98 kg,** making it **the heaviest and the largest flower in the entire world**. Mind-blowing, right? These flowers may be the heavyweight champions among blooms, however, these are extremely shy and temperamental. Slightest alterations in the surroundings can be detrimental to the pollination of this flower. Each bloom of *Rafflesia* annually produces more than a million seeds, however, only 10-20 percent manage to survive.

The trail of surprises does not end here. It turns out that *Rafflesia* is not just any other regular flower, it's a **parasite** as well. The huge *Rafflesia* flower attaches itself to a host plant, vine of *Tetrastigma*, which grows only in the undisturbed rain forests of Indonesia to obtain water and nutrients in abundance. As a consequence of its peculiar existence in nature, scientists have stumbled across **alien genetic material** in the genome of this parasitic plant, and many times it's from the host where they obtain their dosage of nutrients and water from. About **28 species** of Rafflesia have been nomenclatured according to IUCN, out of which **10 species** are listed as in the category of "**largest flower in the world".**

Renowned scientist, **Limin Cai**, has made vigorous attempts at understanding the genome sequence of *Rafflesia*. Being generous with the transposons housed within them, most organisms are capable of silencing transcription enzymes that others cannot. The presence of **jumping genes** makes these being quite cool and difficult to comprehend.

It has become quite a job for the scientists to put together the jigsaw pieces of their genome together. However, a year ago, Cai has a path breaking discovery when he managed to create a **draft genome** of our corpse buddy. The findings were shocking for the scientific community as 90% of Rafflesia's contained transposons, making it a highly unusual occurrence. No one knows the "Whys" but the answers may transform our understanding of parasite genomics.

While the existence of Rafflesia is special for the locals of South East Asia, its conservation has become need of the hour due to its current status of "highly endangered". Advancements in genome sequencing and editing technologies can be put to use and employed in conservation of the gene pool of this unique entity.

Wafa Jafri
B.Sc. Life Sciences
I Year

IMPLEMENTATION OF ACTION BASED PEDAGOGY FOR SUSTAINABLE DEVELOPMENT

BLUE NUDGE - ACTIONS TOWARDS A CLEANER ENVIRONMENT

From left: Manager, BPES Team Head, Dr. Anshu (Zoology), Sonal, Manu, Dr. Atika (Botany), Jeau, Dr. Ritu (Physics) and Mr. Kamal (Chemistry)

There is an urgent need for taking action to mitigate the rapidly changing climate now....else it would be too late to sustain life on our blue planet. The global efforts to take action are encapsulated in the seventeen (17) United Nations **Sustainable Development Goals (SDGs)**. The success of fulfilling these global targets rest on individual human being's contribution to the environment. Governments all over the world are implementing multi-pronged strategies to harness the various potentials of their citizens/ citizenry. Governments all over the world are implementing multi-pronged strategies to harness the various potentials of their citizens/ citizenry. Towards this end, one key arena is the SDG 4 and Quality Education (Agenda for Sustainable Development adopted by India in 2015). Youth is the life blood of every country and ours is richest in terms of youth power. Enhancing and strengthening the competencies of the young minds especially the undergraduate students who are at the threshold of beginning their working life, contributing their best to the society is most critical. The Office of the Principal Scientific Advisor (PSA) to Government of India, has initiated activities on issues related to Effective Education, Solid Waste Management, Water Security, Air Pollution, Application of AI/ML to Healthcare and Sustainable Mobility through the **Delhi Research Implementation and Innovation Cluster (DRIIV).** An important vertical is Effective Education which is being implemented by the **Delhi Effective Education and Pedagogy Cluster (DEEP-C)** under the leadership of Prof Jyoti Sharma, Cluster Innovation Centre, University of Delhi.

The Blue Nudge is an education to Action platform initiated by the **Blue Planet Environmental Solution (BPES)** global waste solutions company based in Singapore and has an Indian entity The Office of the Principal Scientific Advisor (PSA) to Government In addition to the 3Rs - Reduce, Reuse and Recycle, the Blue Nudge introduces **3 I's initiative** - ***Inform, Involve, Inspire.*** The **Blue Nudge Sustainability Fellowships program** was launched in **August 2022** and faculty were assigned to nominate undergraduate students as fellows. Nearly 50 students from Maitreyi College were nominated by four faculty members (Dr. Ritu Dhingra, Physics; Dr. Atika Chandra, Botany; Dr Kamal, Chemistry and Dr Anshu Arora Anand, Zoology).

A rigorous round of online interviews was conducted by the Blue Planet Skills team and ten students (10) were selected for the same. The SPOCs and Fellows were invited for webinars and orientation talks led by **Mr. Harsh Mehrotra**, Co-founder and CEO, Blue Planet Skills along with **Dr. Gitanjali Yadav**, Member of Delhi City Knowledge Cluster and **Prof. Jyoti Sharma** during September - November 2022 to convey the importance of collecting segregated waste. The prime point of the first phase was to collect ourselves and the second phase to "*nudge our neighbors, friends*". The motto of this fellowship is to practice **LiFE (LIfestyle For Environment)**, to embark upon a journey towards an environmentally conscious lifestyle.

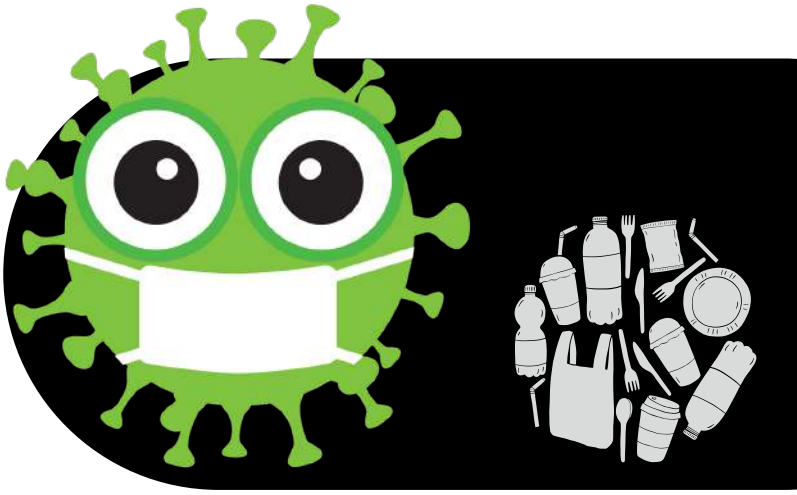
The orientation for students was held on 19th January, 2023. Each fellow was provided three gunny bags earmarked with their unique codes for collecting dry waste - paper and cardboard, PET bottles and general plastics. The fellows from the department of Botany, **Manu Gahlot** and **Sonal** along with other fellows, *deposited nearly 180 kg of segregated dry waste on April 11, 2023*. As the first cohort/batch of Fellows closes the collection drive, it is an opportunity to pass the baton to the incoming students and take action for our blue planet sustainably.

Manu Gahlot (II Year)
Sonal (III Year)

B.Sc. Botany (Hons.)

Dr. Atika Chandra
Associate Professor
Department of Botany

LET'S EAT PLASTICS



Just Microbes Cleaning up, Naturally!

The invisible miniscule lives have been known for their super work of breaking down large organic matter. The story of the engineered superbug made by **Prof. Ananda Chakravorty** set the pace for screening for new molecules and engineering them for efficiency and commercial application. Among the latest microbial molecules to join forces are the plastic degrading enzymes discovered by several independent groups of researchers from different ecological sites. Plastics - these versatile derivatives of fossil fuels are indispensable in our lives but the very 'disposability' of the item has created hazards for us as well as flora and fauna globally - creating a '**plastisphere**'.

From packaging of food and beverages to the ventilator masks, they are an inseparable part of our life. Plastics belong to many categories, essentially **nine key groups** are recognised - polyethylene (PE), polypropylene (PP), poly vinyl chloride (PVC), polyurethane (PUR), polyamide (nylon; PA), polyethylene terephthalate (PET), polystyrene (PS) and synthetic rubber (SR) and '**bioplastics**' which in itself has several sub-classes. Whatever the source, the improper disposal and lack of efficient up-cycling and recycling has led to accumulation of plastics in all ecological niches. These signals are deteriorating health of the overall ecosystems.

Many updates on environmental health show birds on isolated islands choking to death due to bottle caps, the revered cattle choking on polythene bags and even the sea salt we eat has microplastics. In nature the plastics are usually degraded very slowly and are predicted to last for thousands of years especially items like toothbrushes that are used daily by the billion individuals of our planet. Multiple sites are being used for domestic dumps all over the world and are now serving as sites for recovery

of microbes that would have built the capacity to utilize nutrients from such wastes. Under the environmental conditions, consortia of microbes are expected to work on degrading the polymer. However, ***the degradation process is very slow***. The constituent monomers and by products are also known to be **stable chemicals** and are themselves **toxic**. Besides the solid components there are volatiles that are very harmful and are also known to cause various health issues in humans.

Establishing the circular economy is the new paradigm. The aim is to build a closed loop system so the molecules that aggregate to make the polymer (polymerisation) are recycled fully (depolymerized) and polymerised into new products that are similar to the **virgin plastic** rather than recycled plastic.

This dream seems close, with the identification of several microbes - Proteobacteria, Actinobacteria and yeasts that have different types of enzymes.

The transparent food and medically important plastic are increasingly the most prevalent. *Even though the enzymes degrading PET plastics have been known since 1998* (***Thermobifida fusca***), it was only in 2016 that the complete pathway for degradation was unraveled in the bacterium Ideonella sakaiensis. Two enzyme pathway is employed involving - the **PETase** and **MHETase** which are hydrolases, members of the family of Tannase. The PETase is capable of accessing and breaking the stable PET polymer to MHET - mono- (2- hydroxyethyl) terephthalate. In the next step, the MHETase degrades it to the constituents terephthalic acid- TPA and ethylene glycol (EG). The TPA is further degraded to protocatechuic acid by mono-and dioxygenases found in **common microbes.**

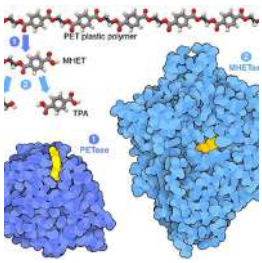
However, the **microbial biodegradation** requires the physical, mechanical and chemical weathering by abiotic factors like UV radiations, water (fresh and sea) and action of macrofauna - snails, macroscopic fungi, beetles to breakdown the inaccessible polymer in the plastic items (tubes, bags, nets, etc.). There are many hurdles to cross before a sustainable process is streamlined but several start-ups are showing the way forward.

The education and outreach portal **Protein Data Bank (PDB-101)** aptly named these enzymes as the **Molecule of the Month in January 2023.**

The increasing interest in engineering efficient derivatives of these enzymes has led to intensive research and creation of three distinct databases for bioinformatic analyses.

The databases provide comprehensive data from several experiments and provide a platform for further research. These are:

a. **Plastics Microbial Biodegradation Database (PMBD)** set up in **2019** with curated data on 8000 sequences from TrEMBL (UniProt) from more than 900 organisms and 79 genes (and growing)
b. **Plastic Biodegradation Database (PlasticDB)** set up in **2022** with 589 microbial species and 208 proteins reported to degrade specific types of plastics.



c. **Plastics Active Enzymes Database (PAZy)** in **2022** that has a curated listing of biochemically characterized plastic-active enzymes. In addition, it has the Lipase Engineering Database (LED) that provides sequence annotation.

Progress in metagenomic studies, proteomics and computational sciences will continue to add more information, but ultimately the responsibility rests on us. The next time you reach out for the crystalline shiny clear PET bottle of water, think of how best to dispose so that it closes the loop.

Abyarthena Jena (II Year)
Nandini Rajput (III Year)
Priya Boora (III Year)

B.Sc. Botany (Hons.)

Dr. Atika Chandra
Associate Professor
Department of Botany

BLOGS, INFOGRAPHICS AND FUN FACTS

...A Sneak - peak into the fascinating world of plants

I am Groot!

*The word, **"Groot"** is derived from a Dutch word which means, "the ability to grow". There is no other life form alive that represents growth and resilience like a plant does...*

*Amidst the hectic lives of 21st century, we are often drawn to the lap of nature, where our brain can resonate and soak in the calmness. It has been rightly said that, **"The Nature is Music, for those who can listen"**. "Don't you think so? The serenity of plants, animals and nature can make us happy like nothing can. It's passive, undoubtedly, however, a walk in nature can cure the complexities of mind and the depression hidden inside. It's like viewing the world through the rose-tinted glasses of plants.*

*In nature, plants are the positive spectra of additivity. They add everything, making this world a positive, safe space for every inhabitant. From providing oxygen to food, to hopeful memories, **plants not only gift us this life, but also make it happy and ebullient. Plants can give a joy that no one can.***

*As the social animals of top most order, we are often sensitive to social and emotional stress. This fast-paced life where everything is limited by a 'timeline', we have forgotten to pause and appreciate the night skies, the bracing air, friendly chorus of birds and thistling of our happy, alive, big and small, Groots, aka, **our wonderful plants**. Plants are natural stress relievers, whose mere presence can make things go from stressful to stress-free.*

I, thus, pay a homage to all the lovely plants, for being the providers of oxygen, food, joy and a sense of purpose to us botanists; the absorbers of stress and negativity, reserves of antioxidants, home of medicines and lastly, for being symbolic of hope, love, friendship, strength and peace.

Savina
B.Sc. Botany (Hons.)
III year

Dr. Mansi Gogna
Assistant Professor
Department of Botany

WAYS TO GARDEN PHYSICAL HEALTH

Your body's overall health, along with how well you sleep, what you eat, how active you stay, how well you maintain your sanitation, and how much relaxation you get. All these define the Physical health. From a student's perspective, 6-8 hours of sleep, as well as balanced meals, thrice a day itself is a challenging task. Additionally, daily exercise regime should also be paid attention to, so as to limit the development of any lifestyle disorders. When we talk about consumption of meal thrice a day, it means healthy and good food, excluding the junk, fried, sweet and spicy meals that we usually crave for.

Why so much fuss, though? Why is being physically healthy important? After our escape from the Covid era, and after having lost uncountable, precious lives, we have finally come to realize and value the importance of physical fitness. Everyone is susceptible to diseases, but not everyone has the ability to fight them and come out healthy. Physical fitness is essential to maintain a cheerful outlook in our daily life. It prevents irritability, keeps our mood jolly and most importantly to us students, it helps to concentrate and retain the content from books that we read and study. In ways more than one, ***our mental health is associated deeply with our physical wellness.***

To put it in simple words, ***our physical health is manifestation of our mental health*** and wellness. People of all age groups need physical fitness to functional well as healthy individuals. One cannot be physically fit for long if they lack peace of mind. Here are five strategies you can implement to improve your physical and emotional health:

- ***Take the stairs and walk -*** Instead of taking a vehicle for short distance traveling, or transform your meetings into short walks with coworkers in order to add brief periods of walking and movement to your day. Focus on increasing your step count to get many benefits, including better cardiac health, more stable blood sugar, and even greater cognitive function.

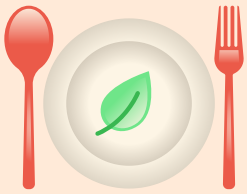
- ***Change Your Eating Habits -*** Remove processed meals that are often highly delicious, making it easier to overeat them without giving us much nourishment. They are also heavy in sugar, oils, salt, and inflammatory fats. If you want to increase the quality of your physical and mental health, it's advisable to increase the intake of daily greens. **Plant-based diets** are helpful in improving the quality of life and provide variety. It also helps in restricting particular types of carbohydrates, fats and encourages mindful healthy eating (including sat intake and portion control) - all aspects of healthy eating.

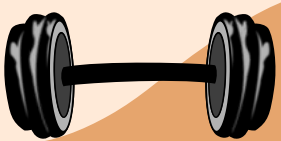
- ***Mind your metabolism and maintain a healthy weight*** - You might notice that as you become older, you have more fat and less energy. Your health could be harmed by carrying additional weight. Being overweight or obese increases your chance of developing heart disease, type 2 diabetes and some forms of cancer. Maintaining a healthy weight may help you reduce this risk.
- ***Focus on a Good Night's Sleep*** - A good night's sleep is crucial for general healing and restoration; in fact lack of sleep has been related to diabetes, kidney disease, diabetes, stroke and other conditions. The majority of the modern age fails to follow a healthy night-time routine, but doing so could help you feel happier, calmer and more focused all day.
- ***Create healthy practices*** - You may improve your physical health by quitting smoking, controlling your alcohol intake, spending time in nature, or with your pets and plants. Adding regular exercises, and daily walks into your schedule can help you feel better, mentally and physically.

Although one might not think of social connections as having anything to do with your physical health, studies have shown that having a solid network of family and friends can really help you prevent disease and live a longer life. So moving ahead, we must live a healthy and happy life, with the motto:

" Your body is the most priceless possession, take good care of it!"

Abhyarthena Jena
B. Sc. Botany (Hons.)
II Year



ENTERING THE WORLD OF CARNIVOROUS PLANTS

Siddhi Kawale
B.Sc. Botany I year
Maitreyi College

CARNIVOROUS PLANTS

VENUS FLYTRAP

Venus Flytraps are the only known carnivorous plants that can snap and shut their specialized leaves to capture their prey. Glands on the leaf surface release a red sap, which initiates the process of digestion. It takes nearly 10 days to digest an insect. The trap dies after digesting 3-4 insects. Classified as an "Endangered species", it is found in Meghalya's West and East Khasi Hills.

Dionaea muscipula

PITCHER PLANT

https://images.app.goo.gl/rw8Ezu2e1xxxAJcE8

The Pitcher Plant or the Monkey Cup has specialized leaves shaped like pitcher, known as "Pitfall Traps", filled with a digestive liquid having hydrolytic enzymes, which attract and drowns the insects, allowing the plant to extract the nutrition from their decaying bodies. It has members belonging to Nepenthaceae and Sarraceniaceae.

https://images.app.goo.gl/CsHhecHaCnqpMBrX6

Nepenthes sp.

COBRA LILY

The cobra lily, employs a clever trap mechanism to entice insects. Enzymes secreted by nectar-glands located in the ramp like-tongue create a foul-smelling stench, acting as bait. However, cobra lily lacks the digestive machinery to satisfy its nutritional requirements. It relies on bacteria instead to do the job. These beauties are found in the Nilgiri Hills of Southern India.

https://images.app.goo.gl/vc9uhwwvytoprt3x

Darlingtonia californica

AUSTRALIAN SUNDEW

Thirsty bugs are drawn to what looks like **raindrops** which is actually a glue-like, naturally occurring hydrogel secreted by sundew plant to trap the insects. Sundews can kill a trapped insect in **15 minutes**, however, they take weeks to digest it. Carnivory supplies them with **Nitrogen**. It is listed as **Vulnerable** on the IUCN List of Threatened Species.

https://images.app.goo.gl/MbhmvSQgzTf28Gqe8

Drosera aliciae

Shruti Shubhangi
B.Sc. Botany, I year

Fun Facts

Did you know that the world's most expensive flower is the orchid, which can sell for up to $50,000.

https://www.interflora.com.au/blog/post/worlds-most-expensive-flowers

The oldest living tree is a Bristlecone Pine Tree in California that is over 5,000 years old.

https://www.britannica.com/plant/bristlecone-pine

The world's most poisonous plant is the Castor Bean Plant, which contains a toxin that can be fatal if ingested.

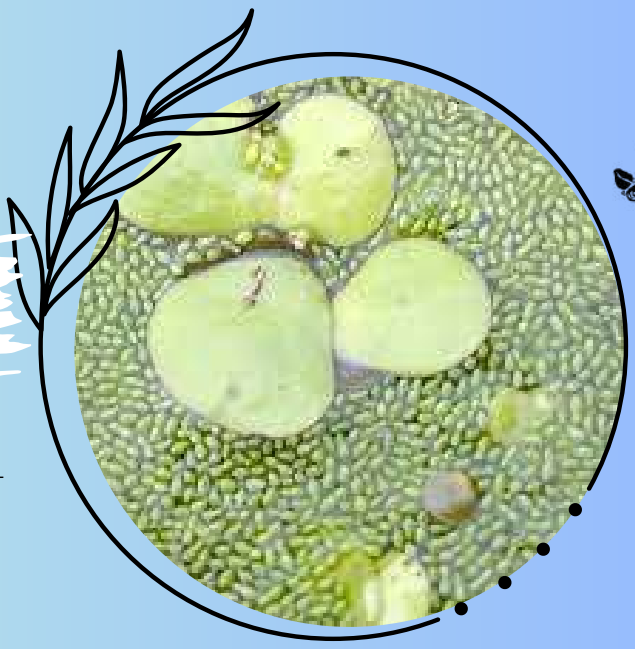
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3087745/

The Telegraph plant (*Desmodium gyrans*) has tiny leaflets that move up and down throughout the day. They dance to the rhythm of sunlight.

https://www.vedantu.com/question-answer/desmodium-gyrans-show-the-movement-of-leaflets-class-11-biology-cbse-5f642b363da50302bd2469ed

Did you know that the world's most popular houseplant is the peace lily, which is known for its air-purifying properties.

https://www.gardeningknowhow.com/houseplants/peace-lily/peace-lily-plants.htm



The world's smallest flower is the *Wolffia globosa*, which is about the size of a pinhead.

https://www.loc.gov/everyday-mysteries/botany/item/what-is-the-smallest-flower-in-the-world/

Did you know that the world's smallest fruit comes from a type of watermelon called the "*Citrullus colocynthis*"? It's about the size of a pea, which means it's like nature's tiniest fruit snack.

https://www.feedipedia.org/node/594

Corpse flower (*Titan arum*) is one of the largest and smelliest flower in the world.It emits a strong odour similar to rotting flesh.

https://www.livescience.com/51947-corpse-flower-facts-about-the-smelly-plant.html

Shruti Shubhangi
B.Sc. Botany, I year

Fun Corner

"Botany Style"

Riddles

Meme Corner

Art Studio

Who am I ?

-Fun Plant Riddles

1 - I am a dicotyledonous seed, green with **three letters** in my name.. Take away the last two, yet I am called the same.... Guess my name?

Hint: I am Gregor Mendel's pick

2 - I have a bark, but I don't bite. Who am I?

3. I am a staple crop, with 5 letters. Remove the first letter, and I am a form of energy. Remove the first two, and I become the bane of your survival. Scramble the remaining three, and I am your daily source of caffeine.. . Who am I?

Hint: You can't bake cake without me

4. I am a tough house of occupants, no more than three. Break my wall, and eat me up as such, or make into a yummy butter.
Guess who I am?

Hint: I live underground

5. I am yellow and bright, warm and fuzzy like something in the sky. I can be small, and I can be 10 feet high. You can eat my seeds or turn them into oil... Who am I?

Hint: My seeds are edible, but my seeds are fruits.

6 - Hey, you can whisper all you want, but I have ears. Who am I?

7 - I am a versatile food and I have eyes. I see you. Who am I?

Bhavya Sharma
B.Sc. Botany, I year

Answers: 1. Pea 2. Tree 3. Wheat 4. Groundnut 5. Sunflower 6. Maize 7. Potato

MEME CORNER

People who knows that only trees fix carbon dioxide

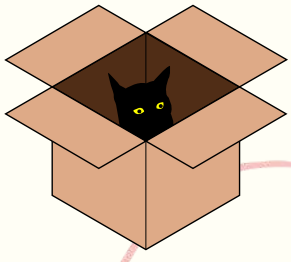
Atleast a half of carbon dioxide fixation on earth is carried out by algae

miley cyrus after spending one day in the botany department:

When you missed your important taxonomy classes

When you are a member of "URVARA"who produces organic compost from bio degradable waste and then you see people throwing their bio degradable waste

Aakangksha and Soumya Suman
B.Sc. Botany, I year



ART STUDIO

Siddhi Kawale
B.Sc. Botany, I year

Siddhi Kawale
B.Sc. Botany, I year

Karnika Sahani
B.Sc. (H) Botany, III year

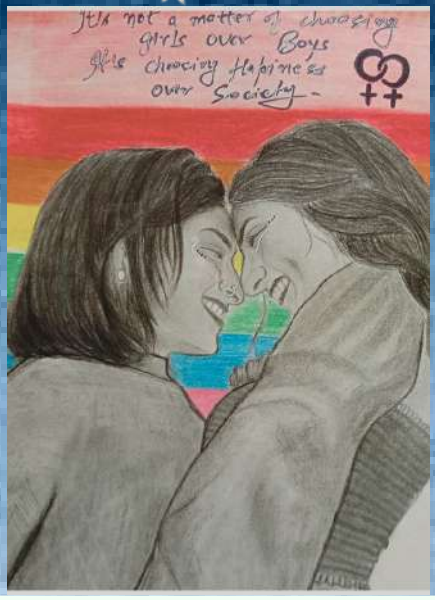
Siddhi Kawale
B.Sc. Botany, I year

Nishi
B.Sc. (H) Botany, II year

Siddhi Kawale
B.Sc. Botany, I year

ART STUDIO

Karnika Sahani
B.Sc. (H) Botany, III year



Nishi
B.Sc. (H) Botany, II year

Siddhi Kawale
B.Sc. Botany, I year

Siddhi Kawale
B.Sc. Botany, I year

Siddhi Kawale
B.Sc. Botany, I year

Spraha Sharma
B.Sc. Botany, I year

WEBINARS AND WORKSHOPS

A One-Day Seminar on

Intellectual Property Rights and Innovations

January 13, 2023

A one day seminar on "*Intellectual Property Rights and Innovations*" was organized by the Department of Botany, Maitreyi college on 13th January 2023. A total of 150 participants (140 offline and 10 online) attended the event with great enthusiasm. The event began with ceremonial lamp lighting by our honorable Principal Madam Prof. Haritma Chopra and Dr. Sandeepa Singh, TIC of Botany Department and Convenor of the event. A warm welcome to our esteemed speakers Ms. Shally Choudhary, Examiner of Patents and Designs, IPO, Delhi and Mr. Subrat Sahu, Examiner of Patents and Designs, IPO, Delhi was offered by Dr Ankita Sehrawat on behalf of the Botany Department of Maitreyi College.

Dr. Shally Choudhary started the session with basic concepts and types of intellectual properties that includes patents, designs, Geographic indications, trademarks, copyrights, layout designs etc. She discussed each type in detail and explained that any idea or product which is unique and new to the market can be treated as intellectual property and the developer of such property has the right of its utilization which is known as Intellectual Property Right (IPR).

Our second speaker **Mr. Subrat Sahu** talked about the carrier opportunities and scopes in IPR. He very precisely discussed about the process of application and qualification required for various posts in this field. He also explained that career in this field has immense scope in government as well as private sectors.

Lectures by our two esteemed speakers were followed by an active interaction session with students where they enthusiastically put forward their queries related to the concept of IPR, job description of various IPR professionals, eligibility criteria and availability of government schemes in this field.

"PRAKRITI" ECO-CLUB

BOTANY DEPARTMENT

CELEBRATES: WORLD WATER DAY | MARCH 22, 2023

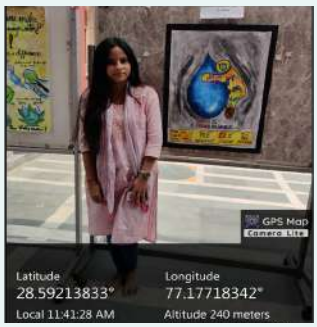
SEMINAR:
"YAMUNA IN DELHI-STORY OF A DYING RIVER"

A seminar was organised on "Yamuna in Delhi-Story of a dying river", inviting from esteemed **Prof. Chirashree Ghosh**, Department of Environmental Studies, University of Delhi. She initiated her talk by emphasizing on the importance of fresh water in sanitation and hygiene which is reflected in the theme of **World Water Day, 2023.** It highlighted the importance of Yamuna as a lifeline.

The water from Yamuna River is utilized for drinking, agriculture, ground water recharge and sustaining aquatic biodiversity. The speaker gave a brief overview of the current condition of Yamuna river due to high levels of pollution. She also gave a detailed account of the actions being taken for reviving Yamuna river. She concluded the seminar by appealing students to realize their responsibilities towards Mother Nature. The seminar was concluded by a vote of thanks by Dr P Kavita.

POSTER MAKING COMPETITION: "SUSTAINABLE WATER MANAGEMENT"

The posters every participant portrayed their views on water conservation and sustainable use of water through their creative expressions. The event was supervised by Dr. Vandana.



Each creation was judged meticulously by **Prof. Chirashree Ghosh**, **Dr. P. Kavita**, Botany Department, and **Dr. Rakhi Gupta**, Zoology Department, Maitreyi College. based on the scores given by the judges, 1st, 2nd, and 3rd prize were awarded at the end.

GREEN VENTURE: BUSINESS PROPOSAL COMPETITION

Students presented their creative business pitches for enhancing sustainability and conservation in entrepreneurship via power point presentation. The event was supervised by Dr. Mansi Gogna.

The event was judges by **Professor Chirashree Gosh**, **Dr. Ritu Dhingra** and **Dr. Monika Heikrujam**. The results of the competition were revealed on the spot.

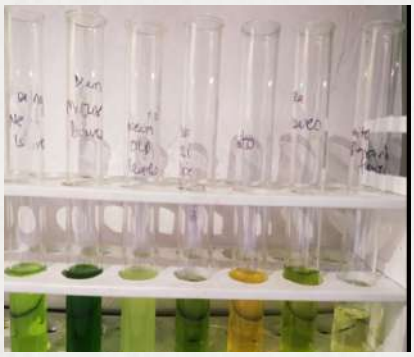
All the participants were given a certificate of participation. Prize winners received commendable cash prizes.

WORKSHOP: September 15, 2022

CONTEMPORARY METHODS IN PLANT SCIENCE

Session I:

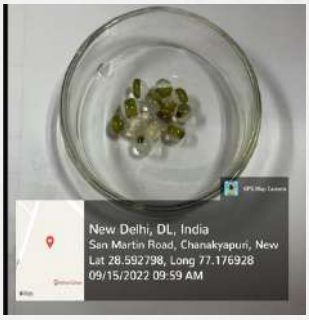
Spectrophotometric estimation of plant pigments from selected samples



The technical session on the topic "Spectrometric Estimation of Chlorophyll Pigment" was conducted by **Dr. Rama Sisodia** and **Dr. Ankita Sehrawat.** Chlorophyll was estimated in various growth stages of Neem leaves (Young, mature and old leaves), green Tea leaves, *Catharanthus roseus* flowers and Tomato fruit, using acetone as the extraction medium. The extracted chlorophyll was estimated using colorimeter.

Session II:

Embryo Dissection and Preparation of Synthetic Seeds



Under the supervision **Dr. Monika Heikrujam** and **Dr. Shweta Sharma**, students were introduced to the basic methodology, advantages, limitations and applications of artificial seeds. A demonstration of the preparation method, which is based on ion exchange reaction between Calcium chloride and Sodium Alginate, was done. The participants used embryo, shoot tip, nodes and internodes as explants for making artificial seeds.

Session III: Plant Tissue Culture - Lab to Land

Conducted by **Dr. Atika Chandra** & **Dr. Vandana**, the main objective of the session was to introduce the basic concept of tissue culture and its significance to the students. Two important in-vitro techniques were demonstrated- 'single node culture' and 'leaf disc culture' using *Nicotiana tobaccum* (tobacco) plants. It involved preparation of culture plates/ jars, type of media used and its significance, working with autoclave and laminar air flow and inoculation method.

Session IV : Sterilization Methods and Epidermal Impression Techniques

This scientific amalgam revolved around the basics mandatory for plant biotech and leaf anatomy. **Dr. Sandeepa Singh** demonstrated surface sterilization method on mustard seeds, using 70 % ethanol and Mercuric Chloride while **Dr. Mansi Gogna** introduced the students to an interesting technique called 'leaf epidermal technique'.

AN EDUCATIONAL VISIT TO

NATIONAL INSTITUTE FOR PLANT GENOME RESEARCH (NIPGR)

JANUARY 12, 2023

A one-day educational visit to National Institute for Plant Genome Research (NIPGR) on January 12, 2023 was organized by the Department of Botany, Maitreyi College. Twenty students of B.Sc. Life Sciences (III Year) along with three faculty members - **Dr. Monika Heikrujam, Dr. Vandana** and **Dr. Mansi Gogna** visited the institute. The purpose of the visit was to familiarize the students with analytical techniques and instruments, currently employed in research development in plant sciences and also, to inculcate an educated inclination in the scopes of plant research in future.

NIPGR is a prestigious institute under the Department of Biotechnology, Government of India, which aims to conduct high-quality research in various frontier areas of plant genomics and molecular biology. The tour started with an elaborated presentation by Dr. Amar Pal Singh (Staff Scientist III, NIPGR), on the basics of plant genome research, the achievements as well as ongoing projects of NIPGR and lastly, various programs open to undergraduate and post-graduate students in the institute. The presentation was followed by an interactive session with Dr. Pal, which he patiently tended to.

The next session was led by Mr. Ratneshwar Thakur (Science Communicator, NIPGR). He facilitated tours to the Central Instrumentation Facilities (CIF) of the institute. Students got to see various analytical tools, such Confocal microscopy, Mass spectrometry, Liquid Chromatography-Mass spectrometry- LC- MS/MS, Real Time PCR, Chlorophyll Fluorometer, Gene Electroporation System, Incubator Shaker, Lyophilizer, HPLC-MS, Refrigerated Benchtop Centrifuge, live and functional. Through this trip, students got an opportunity to learn beyond the textbook, about the current trends, future scenarios and the new technologies developed in plant sciences.

EDUCATIONAL VISIT

Neela Hauz Biodiversity Park

On January 25 and February 17, 2023, the Department of Botany, Maitreyi College organized an educational trip for B.Sc. Botany (H) III year and II year as well as B.Sc. (P) Life Sciences students to Neela Hauz Biodiversity Park, respectively. The students were accompanied by faculty members (Dr. Adesh, Dr. Pooja Baweja and Dr Shweta Sharma; Dr. Atika Chandra and Dr. Mansi Gogna, respectively) and non-teaching staff (Mr. Kanish and Mr. Manish) of Botany department. The tour for the students and teachers was headed by Dr. Yasir and Dr. Faiyyaz.

Neela Hauz is a natural depression and it was earlier used as a sink to receive drainage from surroundings, to furtheron supply water to the colonies of South Delhi. However, accumulation of solid wastes during the construction of Aruna Asif Bridge across Neela Hauz further degraded the natural vent. Neela Hauz Biodiversity Park is a commendable and **live example of wastewater treatment**, **reclamation of land** and **articulately constructed wetlands**. It consists of various interactions between sediment, sand bed, root zone and biomass zones. A mosaic of sites with different levels of dissolved oxygen, and hence biological oxygen demand (BOD), exists in the constructed wetlands, which triggers diverse degradation of organic sewage waste and the removal process as well. The demonstration of reclamation of wastewater was explained in detail to the students.

Visits and Workshops...

SIGNIFICANCE OF RELIGIOUS HEALERS

Speaker : Dr. ROHIT SINGH

Date: 18th August, 2022

The event was held at the seminar hall of **Centre for Himalayan Studies**, University of Delhi. The event started with a welcome note by Prof. Dinabandhu Sahoo, Department of Botany, University of Delhi. The speaker **Dr. Rohit Singh**, Fulbright-Nehru Scholar, University of North Carolina, Greensboro, USA presented his research on '*Significance of Religious Healers*' in **Ladakh** region of India. The seminar was attended by 11 students of B.Sc. (P) Life Sciences, along with Dr. Vandana, supervised by event co-ordinator, Dr. Pooja Baweja.

Our students actively interacted with the speaker and asked about the ethnobotanical uses of plants and their products used by the religious healers. The seminar was followed by refreshment and a photo session.

HANDS-ON WORKSHOP ON OMICS AT THSTI

Dr. YASHWANT KUMAR's Lab

Date: 22nd March, 2023

Under the aegis of Science Setu, Department of Botany organized a Hands-on Workshop on Omics and Tools at Translational Health Science and Technology (THSTI), for 9 Botany and 3 Life Science students of third year. The students were accompanied by **Dr. Mansi Gogna** and **Dr. Priti Giri**. It revolved primarily around the basics of Liquid Chromatography-Mass Spectrometry (LC-MS), Next Generation Sequencing (NGS) and demonstration of Flow Activated Cell Sorting (FACS).

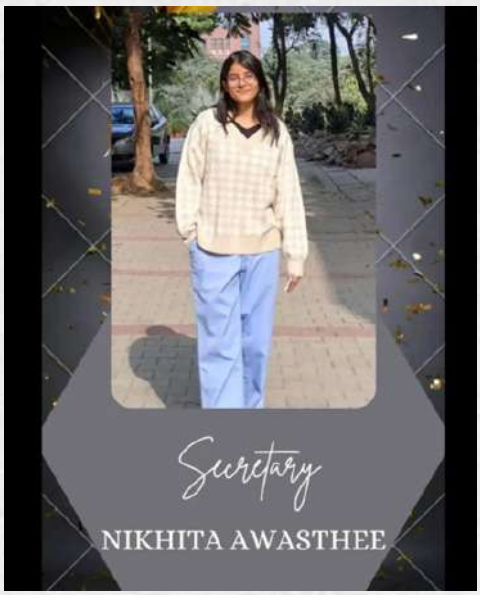
The visit was a great success and students thoroughly learnt from it.

BLOSSOM ELECTIONS - 2023

Blossom, the Botanical Society of Maitreyi College, organized the Departmental Elections on **January 18, 2023** in Room No. 18 of New Science Block to elect the Office Bearers of the botanical society. Various students contested for different posts in the election. There were three candidates running for the post of **President**, two for **Vice-President**, three for **Treasurer** and four for **Secretary**.

The election was preceded by an open house session and active campaigning was done by all the students of Botany (Honors). The nominees for various posts persuaded the fellow students for their candidature by giving speech on their ideas for the department and student welfare. A total of 94 votes were cast. Voting was done, maintaining anonymity, via google form. The result was declared on the spot by the teachers, in the presence of all the nominees and students .

Blossom Team Members: 2023



The elected Blossom's Team with
Faculty Members of the Department of Botany

PALLAV'23

THE ANNUAL DEPARTMENTAL FEST

Blossom, the Botanical Society of Maitreyi College, organized the departmental annual fest, "***Pallav***" on ***23 Feb, 2023*** in the Video Conferencing Room. The fest started with the ceremonial lamp lighting. The major attractions of the event were different competitions with attractive prizes, fun games and various stalls set up by the students as well as sponsors. Most of the registrations for various events were made in advance via google form. The events were open to students of other colleges also that ensured huge participation at intercollege level.

A total of **six** competitions were organized that included,***'Rang-Tarang'***, the botanical Rangoli-making competition with "**Life**" as the theme; ***'Trash-Art'***, for best out of the waste; ***Open-Mic*** competition, an open stage session for participants to show and express their talents' and ***'Saladza'***, the salad designing; ***'Maestro'***, pot painting competition and '***Scavenger-hunt***' that was a botanical treasure hunt.

Bon voyage Farewell 2023

Hasta la vista !

*A farewell party was organized by **Blossom, the botanical Society** of **Maitreyi College,** for the students of Botany (Honors) third year, on **April 24, 2023** in the New Seminar hall, New Science Block, Maitreyi College. It was celebrated by looking back into the past three years of their journey of excellence, growth and resilience.*

The event started with the lamp lighting and Saraswati Vandana, followed by addressing of teachers and blessings the students for their next adventurous endeavors. The event collated a bunch of dance performances, games and poetry presentations by the juniors dedicating and thanksgiving to their seniors. Various titles were presented to the seniors, which was the compilation of their wholesome personality. All the senior shared their journey and thanked Maitreyi College and Faculty for shaping them into great individuals, making the moment heart rendering.

This 5 hours event became the mark of the successful contributions to this organization which proved to be immense and tremendous. Before departing, everyone enjoyed the day with dance and music. At last but not the least, lot of beautiful memories were captured to cherish the college life in future.

Projects: 2022-2023

In the session 2022-2023, the Center for Research (CFR), Maitreyi College approved three Summer Internship Projects (SIPs) from the department of Botany.

Summer Internship Projects (SIP)

Qualitative and Quantitative Analysis of Plant Anthocyanins from Flowers of Selected Plants

Mentors: Dr. Rama Sisodia, Dr. Monika Heikrujam and Dr. Mansi Gogna
Mentees: Kaveri Choudhary, Riya Uniyal, Hrishita Sharma, Nandini Jajoria, Kajal Senger, Yaivenai Ngade D (B.Sc. Life Sciences, II year)

Efficacy of Selected Seed Priming Agents on Seed Germination and Plant Growth Under Salinity Stress in *Vigna radiata* and *Oryza sativa*

Mentors: Dr. Rama Sisodia, Dr. Shweta Sharma
Mentees: Ishani Mallick, Vedanti Garg, Naiya Chauhan, Soniya Chauhan (B.Sc. Life Sciences II year)

Fabricated Natural Hydrogels and Their Potential for Agricultural Applications

Mentors: Dr. Kiran Soni, Dr. Swarndeep Kaur Sethi, Dr. Pooja Baweja, Dr. Gita Batra Narula
Mentees: Savina, Geetanshi Dang (B.Sc. (H) Botany, II Year), Anita Kumari, Kanishka, Isha Bedwal, Uma, Prachi (B.Sc. (H) Chemistry, II Year)

For further queries or details, contact the concerned faculty member.

Projects: 2022-2023

Annual Research Projects (ARP)

In the session 2022-2023, the Center for Research (CFR), Maitreyi College approved three Annual Research Projects from Botany, two being interdisciplinary, in collaborations with the Department of Chemistry and Computer Science.

Fabrication of Crosslinked Nanoparticles by Greener Method and their Potential for Agricultural Applications

Mentors: Dr. Gita Batra Narula, Dr. Pooja Baweja and Dr. Kiran Soni
Mentees: Anita Kumari, Nancy Ghai, Isha Bedwal, Uma Rani (B.Sc. Chemistry (H) III year), Savina (B.Sc. Botany (H) III year)

An Integrative Approach Towards Carbon Neutrality at Maitreyi College to Mitigate Climate Change

Mentors: Dr. Pinkey Bajaj Gandhi, Prof. Haritma Chopra, Dr. Veena Ghuriani, Dr. Pooja Baweja
Mentees: Simran Maurya, Manu Gahlot and Abhyarthena Jena (B.Sc. Botany (H), II year)

Influence of Phytohormones on Abiotic Stress Tolerance in Agriculturally Important Crop Plants

Mentors: Dr. Sandeepa Singh and Dr. Mansi Gogna
Mentees: Harshita Kataria, Nandini Rajput, Geetanshi Dang (B.Sc. Botany (H) III year, Archana (B.Sc. Botany (H) II year)

For further queries or details, contact the concerned faculty member.

Start-Up: Gulistan

Under Aegis of Botany Department and Garden Committee

Gulistan, which means "*a land of flowers*" is a start-up initiative, undertaken by members of the Garden Committee of Maitreyi College to edify entrepreneurial skills to our undergraduate students. Gulistan is a **skill based start-up initiative**, directed at utilization of fallen twigs, leaves, flowers and petals from the college premises to create aesthetic products, accessories and stationery items. Furthermore, another goal under the merchandise of Gulistan is to propagate and sell ornamental (annual, perennials and succulents) as well as medicinal plants from the college's botanical garden. Faculty members, **Dr. Monika Heikrujam**, **Dr. Mansi Gogna** and **Dr. Vandana** laid foundation for this start-up in March, 2023.

The prime focus is to provide a functional skill set to students. Currently, five students from **B.Sc. (Hons.) Botany** and **B.Sc. (P) Life Sciences** are actively engaged in the production process for establishment of our start-up. Student members will be given 7% of the overall profit generated. Team Members: Kaveri Chaudhary, Riya Uniyal (B.Sc. (P) Life Sciences, III Year) Nivedita Rai and Urvashi (B.Sc. (P) Life Sciences, II Year) and Archana (B.Sc. (H.) Botany, II Year).

For further queries or for placing orders, write to us at:

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REFLECTIONS

Messages of Alumnae

Dr. Vandana

From a Pupa to a Butterfly

My journey at Maitreyi began in 2007 as a student. Somehow, I still remember the day when entered the college gate for the first time to take admission, it feels like yesterday. Maitreyi has groomed me in a multi-dimensional ways by blessing me with a wonderful environment to learn and explore. But the two most precious things that I found here are astounding teachers who have always been dedicated to support and guide their students and wonderful friends. Both were always there to help even after I finished my graduation. I never liked Botany in my school but at Maitreyi, I fell in love with this subject and its all because of such amazing teachers. There are few words or rather I should say “Mantras” that I learned from my teachers which I still recall in my tough times to feel confident and empowered. Now when I am on the other side of the table, I can better understand the efforts of my teachers that they have put in to provide us with an excellent learning environment. Joining Maitreyi feels like coming back to home. Every corner of this beautiful campus holds so many wonderful memories of learning, laughter, friendship and growth. I am so grateful to be a part of this cocoon once again that nurtured me as a "pupa" to become a "butterfly".

Dr. Vandana

Dr. Ruby Tiwari

Maitreyi College was the inception of my inclination towards research. The teaching practices along with rigorous practical sessions justifies the coursework. I had developed a much better understanding of the diversity of plants present in the plant kingdom and their importance during my bachelor coursework. Maitreyi college helped me in refining my basics, which are still so useful to me during my postdoctoral research work. I was fortunate to be taught by some of the best mentors in Maitreyi college, who were supportive and worked for the welfare of their students. After completing my bachelors in Botany, I pursued master's in Biotechnology from Amity University, Noida. During my master's course, I was fortunate to undergo training in the Department of Microbiology and Department of Biochemistry at the University of Delhi, South Campus. These internship programs helped me in recognizing my abilities and my interest in the research field. So, I decided to join the doctorate program at the Department of Genetics under the supervision of Professor Manchikatla Venkat Rajam. The PhD journey was full of ups and downs but now when I look back it was all worth it. Presently, I am employed as a postdoctoral associate at Donald Danforth Plant Science Center at Saint Louis, Missouri, United States of America (USA). The journey from being an undergraduate student at Maitreyi college to being employed in the USA is full of hardships and many learnings. I can go on and on, but I would like to end here by acknowledging my family, friends, and mentors from undergraduate, masters and PhD program. I was fortunate enough to be surrounded by beautiful people at heart, who always pushed me towards my goal and inspired me to be the best version of myself.

Still learning and exploring!

Ruby Tiwari

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"Vitti, Volume 3 is a celebration of Botany, wonders of plant sciences, life and milestones of 2023. This volume is a reflection of functional Botanists and the ones in making in Maitreyi family.."

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