ANTHESIS

ISSUE 18 | 2022-2023

Trailing Green

A DIVE INTO THE VERDUE

ANNUAL PUBLICATION OF GARGI COLLEGE BOTANICAL SOCIETY

Department of Botany
Gargi College, Siri Fort Road
New Delhi- 110049

ANTHESIS

VOLUME 18 | 2022-2023

The flowering period of a plant, from the opening of the flower bud.

Photography- Sudeepa B.Sc. (H), 2nd year

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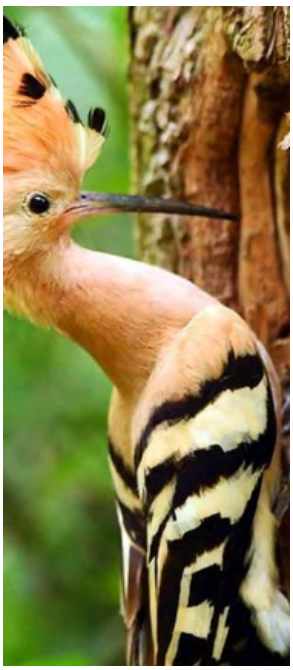
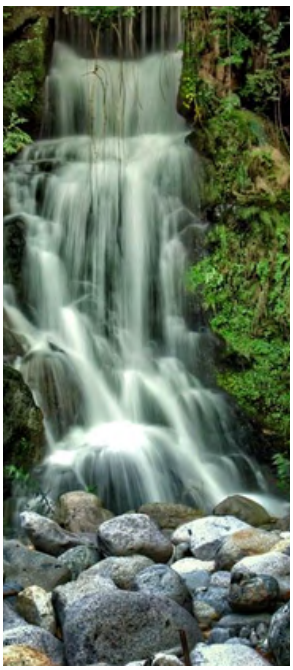

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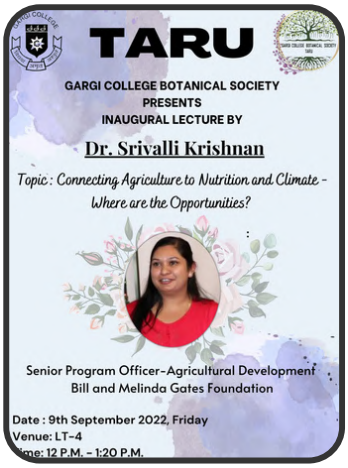

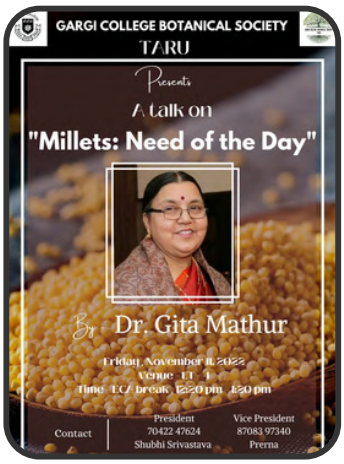

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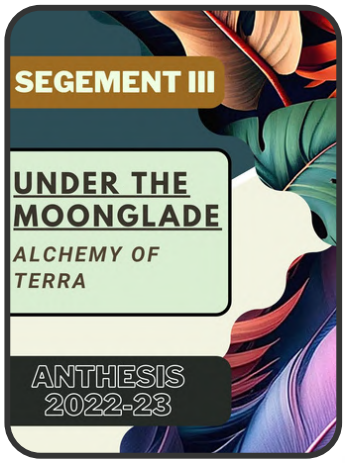


VERDANT GREEN: TRAVERSING THROUGH TERRAIN

AMBROSIAL BOND: RECIPROCITY BETWEEN MAN & WILD

UNDER THE MOONGLADE: ALCHEMY OF TERRA

PRINCIPAL'S DESK

Prof. Sangeeta Bhatia
Principal
Gargi College

My Dear Students,

Congratulations and best wishes on yet another successful Magazine from your department: Anthesis, with the wonderful theme "Trailing Green: A Dive into the Verdure." The theme by itself evokes wondrous images of our beautiful and resplendent mother nature along with all the myriad ways it is bountiful in helping our lives to flourish on our planet Earth.

Unfortunately, we read frequently in the daily news as are also experiencing rapid global changes in our climate patterns. Man-made disasters are on the rise and the responsibility towards leaving a sustainable planet for the next generation more significant than in any other time in our history. During the last century, research has been increasingly drawn toward understanding the human-nature relationship and has revealed that undoubtedly humans are linked with the natural environment. A lot of work is needed for the sustainability of natural resources and to create awareness about the health benefits associated with engaging with nature. Of these examples, the impacts of the human-nature relationship on people's health have grown with interest as evidence for a connection accumulates in the research literature. A daily dose of the recommended 'walk-of-awe ' outside in the company of the hues of nature especially by putting away our smartphones would definitely make us smarter!

I am confident that you as a Gargi student would take all the learnings to make a difference by bringing change for the better. You shall make us all proud given such sensitivity and respect for our nature as the theme and the segments of the magazine show.
My best wishes in all your endeavours. Keep Gargi's flag flying higher than ever before!

TEACHER IN-CHARGE'S DESK

Dr. Renu Soni
Teacher In-Charge
Gargi College

The year 2022-2023, the first offline session following the Covid era is characterised by a year-round upsurge in energy and enthusiasm. I am thrilled and humbled to see the success of departmental activities and events that are undertaken by the GCBS-TARU team and Department of Botany and are presented so well under one roof, ANTHESIS. The publication is evidence of the department's successful literary, educational, and other initiatives. The team's well-organized structure and operations are clearly reflected in its polished composition. Students now have more opportunities to learn, develop their ideas, and develop the discipline needed to become future leaders thanks to the magazine. The department has provided various intra- and inter-college activities throughout the academic year, allowing students to learn about and take part in a variety of competitions that ultimately led to their success. Students have been able to gain a variety of responsibilities through event planning and developing ANTHESIS, which has facilitated their personal and professional development. They have undoubtedly benefited greatly from their mentors' advice and gained priceless exposure as a result. The journal plays a significant role in the lives of both the readers and the college students who put together ANTHESIS. It is a thorough compilation of current knowledge and information with notable contributions from our exceptional students, adored teachers, and admirable alumni. The magazine is a treasured memento that brings back pleasant memories among alumni. I send the ANTHESIS and GCBS team members my heartiest congratulations and best wishes for success in their future endeavours. I also hope that the Botany Department students will continue to uphold the reputation of the college as a whole.

EDITOR-IN-CHIEF DESK

Yashasvi Saini
Editor-in-Chief
Gargi College

ANTHESIS refers to the period when a plant blooms, beginning from the moment the flower bud opens. Similarly, the Annual Publication of Gargi College Botanical Society, ANTHESIS, marks the start of an exquisite and experienced period of a student's life. The GCBS- TARU Botanical Magazine offers a platform to acquire and hone intellectual, creative, and scientific writing skills that prove beneficial in the long run. Each year, the ANTHESIS members put in a significant effort to present cutting-edge scientific topics interwoven with innovative expertise. The journey of magazine designing is an intensive and exciting opportunity that starts with choosing an interesting theme for the magazine and ends with the final compilation of the ideas that leave an imprint on the reader's mind. The obstacles encountered by the team, along with the continuous encouragement from the faculty advisors, served as stepping stones that led to the successful publication of the 18th Issue of ANTHESIS.

This year's theme, "Trailing Green: A Dive into the Verdue", takes readers on an enchanting journey into the revered beauty of nature that lies hidden beneath the layers of progress. The current periodicals exclusively focus on the harm inflicted on the planet by anthropogenic activities and strategies to revive our environment. The theme unravels the mystique of the green orb, the co-existence of life and nature, and how nature is our sole gate away from the hustle and bustle of city life. It compels us to remember the time when nature was unbridled, vibrant, and untouched by human influence. The theme is a reminder of how Altruistic Gaia gives forever and receives nothing but tears of sorrow. She longs to be liberated from constraints and breathe freely, lest the remainder of her magnificence be reduced to dust.

The Department of Botany

Gargi College

2022-2023

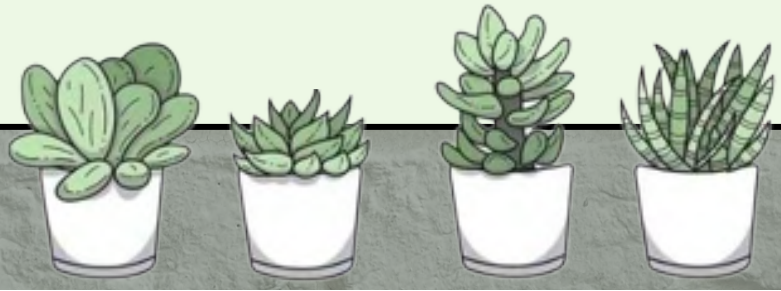
Pillars of Department of Botany

Beloved Late Superannuated Faculty

Dr. Chhaya Biswas (August 17, 1932 to February 3, 2012)
Dr. Lalita Sehgal (November 21, 1942 to August 12, 2016)
Dr. Bharti Bhattacharya (December 26, 1942 to March 23, 2018)

Superannuated Faculty

Dr. Pushpa Markandan
Dr. Ahalya Chintamani
Dr. Krishna Kumar
Dr. Shasi Tyagi
Dr. Usha Prasad
Dr. Gita Mathur
Dr. Kiran Prabha
Dr. Geeta Mehta



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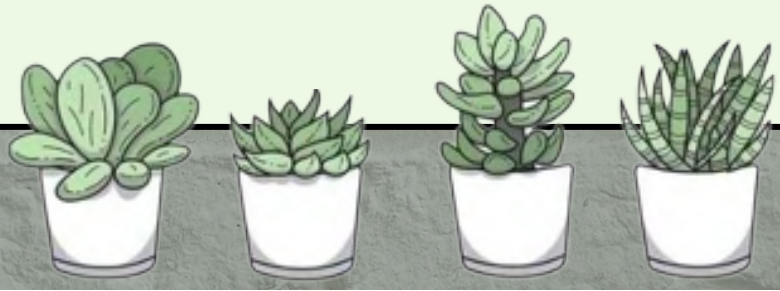

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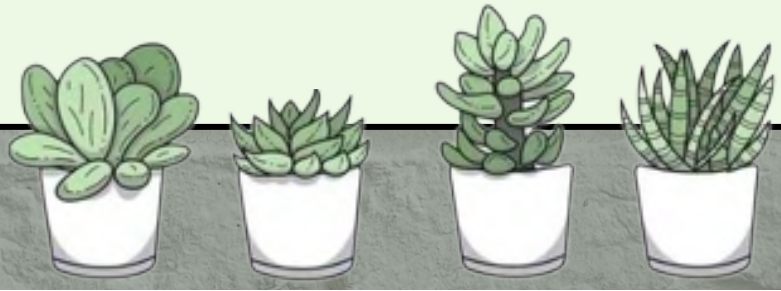
Mr. Hansraj

Mr. Amit Kumar

Mr. Gopal Kumar



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Dr. Neha Singh

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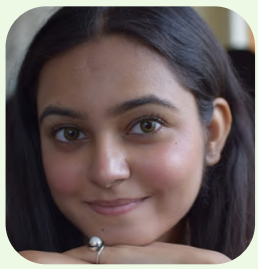

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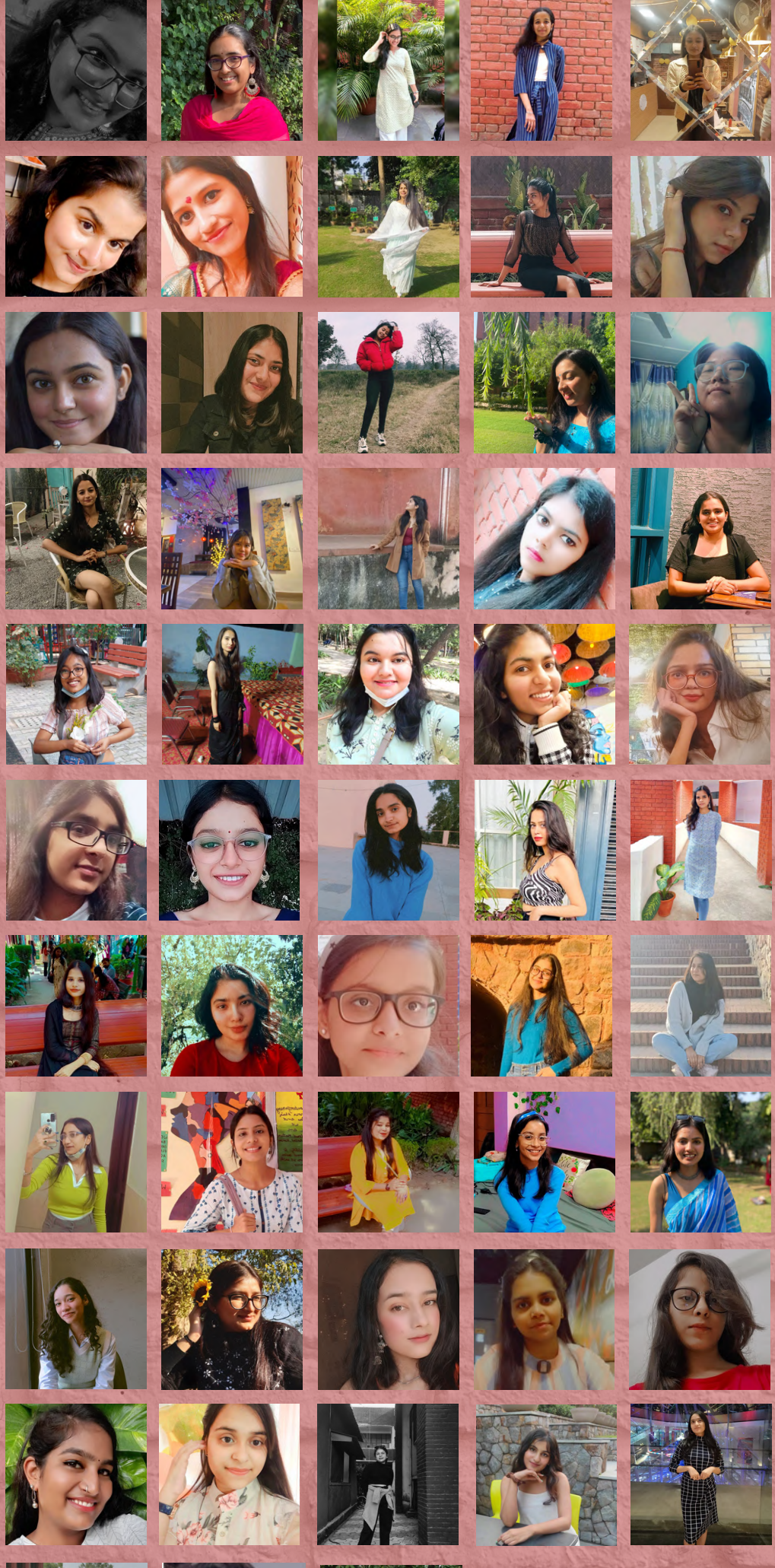

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NEHA NEGI
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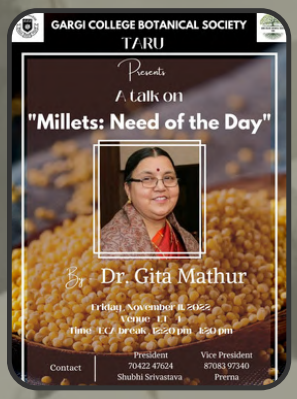
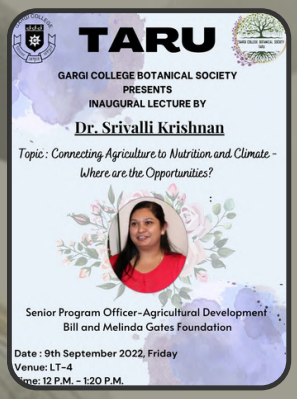
ANANYA SINGH
ANKITA
ANSHIMA SINHA
ANSHU CHAHAR
ANSHU KUMARI
ANUSHKA DAS
ANUSHREE SHARMA
ASHA
ASHA RANA
ASTHA JUYAL
BHAVYA GUPTA
BINAL PANDEY
DHISEKA PAWAIYA
DIVYA BHARTI
HARITHA
JAHANVI KHOKHAR
JUHI CHOBEY
JYOTI KUMARI
KASHISH RAJORA
KHUSBU
KIRTI VASHISHTHA
MANASVINI SINGH SAMBYAL
MUSKAN MAHAR
MUSKAN THAKUR
NEHA KUMARI
NISHA
POOJA
PRACHI SONKAR
PRIYANKA SAHARAN
PULKITA KOHLI
RAFIA WASIM
RASHI SINGH
RASHMI PANT
RISHIKA KHANDELWAL
RIYA VIG
ROMAL
RUKHSAR PARVEEN
SAPNA MEENA
SHAILLY
SHILPI RAJ
SHIVA UPADHYAY
SHIVANI
SHREYA SINGH
SHRUTI PRIYA
SMITA SINGH
SNEHA GUPTA
SOMYA
SRISHTI SINGH
TANVI
TANVI SINGH
VANDANA YADAV
VANDITA SINGH
VARTIKA YADAV
ZOYA KHAN

Batch 2022

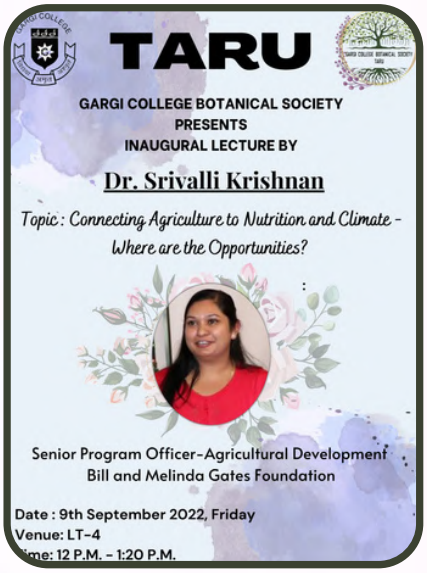




Department Events 2022-2023

Inaugural Event

Yashasvi Saini (Editor-in-Chief, Anthesis)



After two years of the pandemic, Gargi College Botanical Society- TARU organized its first offline inaugural event to mark the beginning of the new session 2022-2023 on 9th September 2022. Dr. Srivalli Krishnan, Senior Program Officer-Agricultural Development Bill and Melinda Gates Foundation, graced the event with her presence and delivered a talk on the topic 'Connecting Agriculture to Nutrition and Climate: What are the Opportunities?'. The lecture was attended with great zeal and enthusiasm by students and the faculty of the Botany Department.

The event started with lamp lighting by Prof. Sangeeta Bhatia (Principal, Gargi College), Dr. Gita Mathur (superannuated teacher), Dr. Srivalli Krishnan (Guest Speaker), Renu Soni (Teacher-in-Charge) and Dr. Leisan Judith (faculty advisor). Plant samplings were given as a token of love from the Botany Department. Prof. Sangeeta Bhatia also attended the event, delivered a few words of gratitude for the invitation, and encouraged young minds to engage in research and development. Hansa Wali (Cultural Secretary, GCBS) and Khushi Bansal (Creative Team Member, GCBS) took the lead and briefly introduced the Botany Department. The event proceeded with a welcoming gesture towards Dr. Srivalli Krishnan by Shubhi Srivastava (President, GCBS). Dr. Srivalli's talk was a lively and enthralling insight into the world of agriculture that continuously mingles with our daily lives. She began the talk by inter-relating all the fields of science- Botany, Zoology, and Life Sciences to agriculture which is the backbone of the world economy. According to her, agriculture and the food system are closely linked. She also shared the problems of how 30-40 percent of food in India never reaches the consumer as being lost as post-harvest losses.

She discussed that the seed setting in agriculture is the most crucial stage, and crops get damaged during this stage. Then Dr. Srivalli took the attendees into biotechnological advancements- transgenic and gene editing technologies. She described them as being climate as well as nutrition-smart. She also spoke about the Agri tech startups taking over the world by giving examples of Kamal Kisan, DeHaat, and Zomato. She also shared how one can invest in green bonds and restore the carbon footprints to nature. Throughout the talk, Dr. Srivalli encouraged the audience to contribute to the growth and development of the agriculture sector. She also called out the present generation as the most privileged ones and encouraged them to actively participate in the R&D with a twist of commerce and tech. The lecture left the attendees to know more from Dr. Srivalli, so she enthusiastically answered all the questions and was happy with the active response of the audience.

The event progressed with Dr. Gita Mathur congratulating the GCBS Team on the first event's success and encouraging the students to believe in the 'ME' concept and focus on their growth and development for a brighter future. A batch ceremony was conducted to welcome the newly elected team of GCBS-TARU. The vote of thanks by Adithi Rao (General Secretary) was followed by a photo session commemorating the event.

Glimpses of the event

Gargi College Botanical Society- TARU

Shubhi Srivastava (President, GCBS)

TIC: Dr. Renu Soni
Faculty Advisors: Dr. Leisan Judith, Dr. Pritam Kaur, Dr. Neha Singh

Sanskrit for the tree, TARU stands as an emblem for GCBS carrying in itself a multitude of imperative tenets and morals, that are the guiding light for the Botany department. A tree is an entity representing wisdom, and harboring in itself the potential to grow and to let grow which inspires the department to strive for knowledge. Our logo is represented by a "peepal tree". Ficus religiosa is named so because of its extremely rich history in human culture. Peepal is the same tree under which Lord Buddha attained enlightenment. And we at TARU believe we need enlightenment not just individually, but collectively to save the planet.

Over the years, the department has maintained high academic standards and also produced a number of eminent scientists. Fast forward to now, the department and the professors have taken up the mission to carry out several research paper projects along with the students providing insight into the basics of scientific writing and research methodologies. Frequent Webinars, Guest Lectures, and Alumni Interaction also provide much-needed exposure to a wider arena of academics to the students. This year, the department is celebrating The International Year Of Millets along with thousands of other fellow Indians.

The Gargi College Botanical Magazine- ANTHESIS, as an intellectual and creative forum has provided the students with expanded learning opportunities in scientific research and writing. This year's theme is ***Trailing Green - A Dive into the Verdure***. The venerated beauty of nature is masked beneath the layers of progression. The dazzling virtue of the earth harbors innumerable life forms. The theme discusses the mystique of the green orb, the coexistence of life and nature, and the present state of the earth.

For the academic year of 2022-2023, the Inaugural guest lecture was presented by Dr. Srivalli Krishnan, Senior Program Officer at Agricultural Development at Bill and Melinda Gates Foundation, on 9th September 2022 where she provided deep insights on the topic "Connecting Agriculture to Nutrition Climate- Where are the opportunities?". The Principal Prof. Sangeeta Bhatia also took the time to grace the occasion and deliver a few words of wisdom to the students. Followed by the immensely interesting talk by Dr. Krishnan, the new team of GCBS-TARU session 2022-23 was officially facilitated as part of the Inaugural ceremony.

As 2023 is being celebrated as the International Year of Millets, the Department took it upon itself to spread awareness on the nutritional benefits of millets and how to use them in your daily life. For the same reasons, the department organized a talk on "Millets: Need of The Day" on November 11th, 2022 by our beloved Dr. Gita Mathur Ma'am. On the 15th of February, 2023, the department organized a Hands-on Workshop on Millets by Ms. Pallavi Upadhyaya, Co-founder and Managing Director at Millets for Health organization. It was indeed an enriching and tasteful experience for all the students and faculty of the Botany Department.

The department also organised a number of competitions to hone the skills of students. To celebrate Azadi ka Amrit Mahotsav, the department also conducted an online 18 Word Story Writing competition on Green India Post Independence on August 15th, 2022.
An online Essay Writing Competition "Write Out Loud" was conducted on 28th January, 2023 giving topics related to environment and plant sciences.
On the occasion of World Food Day, the department organised an inter college Quiz Competition on Healthy and Safe Food - "It's Food o'clock" on 14th October, 2022 which saw participants from all over the city, and inculcating in them the importance of a healthy diet. In lieu of this, a college wide Food Donation Drive was conducted by the department, where students and faculty from all over the college came forward to donate food items for the underprivileged. Well made food packages were then handed over to the children in collaboration with the NGO "Sewa Bharti", Delhi.

Furthermore, the department also organized an interactive talk on "Environmental and Social Perspectives on Fashion Industry" by Prof. Vandana Mishra, an eminent scientist, and professor at the Centre for Interdisciplinary Studies for Mountain and Hill Environment, Delhi University, in collaboration with the Research Development Cell (RDC) of Gargi College, on February 10th, 2023. Continuing the legacy of Gargi College Botanical Department, we put together the annual flower show Gargi Blooms 2023 with the Garden Committee.

This year, Gargi College came back with Scintillations, the annual science fest of the college. To celebrate the days of 28th and 29th March, the department conducted two competitions under Scintillations 2023. In the "Fallen Art" competition, the students brought out the creativity hidden in fallen leaves and flowers, making the best out of waste. In the "Your Slide Your Pride" competition, the students showed their best slide preparation skills in under an hour! The event indeed was a success.

The session of 2022-23 was certainly a plethora of opportunities and knowledge for all the students of the department. It was a heartfelt experience and never could we forget the immense efforts put in by the faculty of the Botany Department to be the guiding light for all their students. Our department believes that together we can grow, like a TARU, and this session has been an accurate example of the same values.

Inaugural Event by Dr. Srivalli Krishnan

Glimpses of the year

It's Food o'Clock- World Food Day Quiz

Food Donation Drive- World Food Day Quiz

Lecture on Millets by Dr. Gita Mathur

18-Word Story Writing Competition

Anshita Bhatnagar (Co-editor, Anthesis)

"Long years ago, we made a tryst with destiny, and now the time comes when we shall redeem our pledge, ...At the stroke of the midnight hour, when the world sleeps, India will awake to life and freedom." - Jawaharlal Nehru.

The whole country is cognizant of the struggles our forefathers had to go through to make our blessed country independent. To bring this to light and invigorate students all over the country to perform their part in celebrating 'Azadi ka Amrit Mahotsav', Gargi College Botanical Society- TARU organized an '18-word Story Competition' as the first competition of the session 2022-2023. The students were required to write a story comprising of eighteen words. The theme for the competition, decided by the ingenious members of the team, was finalized to be 'Green India Post Independence.' The theme marks the importance of flora in the development of our country in the following strenuous years after independence.

The competition was held in online mode to make it easier for everyone to participate. It attracted the attention of many creative minds across the country and the reception of the competition was positive and jubilant. The total number of entries submitted for the competition was twenty-three. Every story brought out a sense of wonder in the judges. The google forms were circulated from 12th August 2022 and the results were announced on the auspicious day of 15th August 2022. The position-holders received exciting cash prizes and E-certificates.

- 1st position was secured by Ananta Pareek, B.Sc. (P) Life Sciences, 3rd year, Gargi college with a cash prize of Rs. 1500/- and an e-certificate.
- 2nd position was backed by Ishita Sukhija, B.Sc. (P) Life sciences, 3rd year, Miranda House with a cash prize of Rs. 1000/- and an e-certificate.
- 3rd position was secured by Shubhangi Ashish, B.A. (H) Philosophy, 2nd year, Gargi College with a cash prize of Rs. 500/- and an e-certificate.

The competition was able to serve its purpose i.e., to light a spark of pride and respect toward our nation in the hearts of young scholars.

WINNERS ENTIRES

Ananta Pareek- *"The shackles of colonialism lifted, now clouds of climate change haunt us, green India equals a free India."*

Ishita Sukhija- *"Tina felt feeling of patriotism and pride after planting a mango sapling in front of the Indian flag."*

Shubhangi Ashish- *"It occurred to us, to turn green, not because she was always green but because we couldn't breathe."*

Teacher's Day Celebration

Yashasvi Saini (Editor-in-Chief, Anthesis)

"The mediocre teacher tells. The good teacher explains. The superior teacher demonstrates. The great teacher inspires." - William Arthur Ward.

Teachers play a crucial role in shaping the lives and futures of their students. They are responsible for imparting knowledge, values, and skills that prepare students to succeed in various aspects of life. On the occasion of Teacher's Day, the student union of the Gargi College Botanical Society- TARU undertook various activities to celebrate one of the key foundation building blocks of a student's life, the teachers. The GCBS members distributed blank post chits among the students of the Botany Department which were filled with words of gratitude towards the professors by the students. The post chits were pasted in the Teacher's Staff room where the teachers could read out the heartfelt messages. The student union also made handmade cards for the teachers and the lab staff members who consistently work day and night to shape the future of the students. The students of the Botany Department also took the initiative and arranged a cake-cutting session for the teachers. The department's faculty members gathered and celebrated the occasion by cutting a cake and expressing emotions of appreciation towards the students' initiative.

Dear Teachers,

Your unwavering dedication and tireless efforts to educate, inspire, and support us have not gone unnoticed. You have not only imparted knowledge but have also shaped our character and instilled valuable life lessons that will stay with us forever. You have been the guiding light in our journey of growth and self-discovery, and we are forever indebted to you. Your impact on our lives is immeasurable, and your influence will continue to shape our futures for years to come. Thank you for your patience, kindness, and unwavering support. You are truly an inspiration, and we are lucky to have you as our teachers.

Sincerely

Team Anthesis

Glimpses of the event

We..the Spike of spikelets 🌾, wishing💐 you all teachers.. *a very happy Teacher's day* 🎉.... and thanking you all 🙏 for...

🪂 drenching us by the bottomless ocean of your knowledge 🌊📚

🪂 converting us from a Totipotent cell to a specialised cell of quiescent stage (🌱👉🌳) .. by guiding our thoughts and

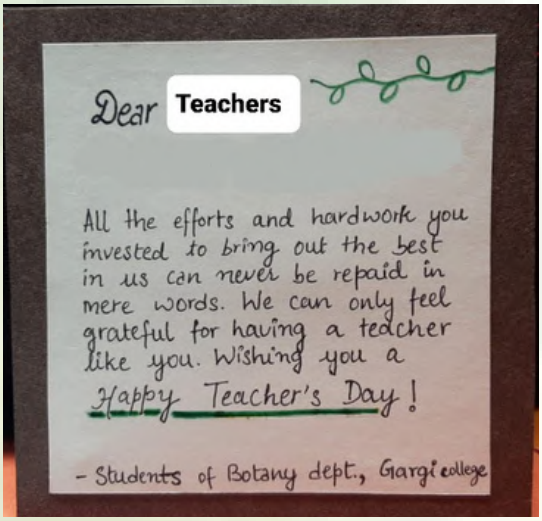
🪂 the foremost thing i.e. for deepening our roots to the grooves of the B-Horizon of soil by telling us the nuances of the Botany subject.. Because *The strength of a tree is not measured by how high* 🌴 *it has grown..rather it is measured by the how deep it's root has been gone.*🍂

We assure you teachers.. that we.. the flowers🌷 of the garland...will anthesis🪷 with brilliant amount of anthocyanin and carotenoids and will surely transpire the knowledge.. that you people gave us. 😊
Thanking you all for all of these 🙏

We wish you all a very happy 🎄, healthy 🪴 and prosperous life 🌞🌻 ahead.

✨ ***Happy Teacher's Day*** ✨
🌸🌼🌸🌼🌸🌼🌸

Regards
Vishakha Anushri
(2017-2020) ★ 10:40 am



It's Food o'Clock

Shruti Apurva (Co- Editor, Anthesis)

The Gargi College Botanical Society-TARU organised a fun inter-college quiz competition- "It's Food o'Clock", to celebrate World Food Day on 14th October 2022. The event consisted of delightful segments that brought amusement to both the participant and the audience, making it an enjoyable experience for everyone involved. Riya and Pearl (Creative team members, GCBS) hosted the event with great success by captivating the audience's attention and maintaining the participants' enthusiasm levels throughout the event.

The day began with an illuminating speech by Hansa (Cultural Secretary, GCBS) about the history and importance of World Food Day, followed by a visually stunning video about the same. The quiz started with Prerna (Vice President, GCBS) instructing about the rules and regulations of the quiz to the participants. There were sixteen teams from various colleges across Delhi University consisting of two participants each. The teams were given quirky names based on food items making the event even more entertaining. The quiz was conducted in four fun-filled rounds. The first round was called “Maize Runner”, which consisted of a crossword puzzle that had to be solved in fifteen minutes and consisted of fifteen questions whose answers at the end formed a scientific name. At the end of the first round, six teams were eliminated and the remaining teams were promoted to the second round called “Baar Baar Dekho”. The hosts also kept the audience engaged with brain-teasing questions throughout the events and offered enticing rewards to those who answered correctly. In the second round, the teams were asked to answer ten questions based on pictures shown on the screen. This round led to the elimination of four more teams.

In the third round, “Andhadhun”, the remaining teams had to gear up their senses of touch, smell, and taste as one participant from each team was blindfolded and was asked to recognize the given food item using any one of the three senses mentioned above. After the completion of this round, three more teams were eliminated, and the remaining top three teams entered the fourth and final round, “Fast and Furious”, which was a rapid-fire round. The top three teams were asked food-based questions that had to be answered rapidly. The scoring of this round was based on both speed and accuracy of the answers. This round and the competition were won by “Team Avocado”. Shubhi Srivastav (President, GCBS) gave the vote of thanks, and the day concluded with judges awarding prizes and each participant receiving a certificate of participation.

The Winners of the inter-college quiz competition "It's Food o'Clock" are as follows

First Place- Team Avocado, Kalpana Jha and Vanshita Khangarot of Gargi College

Second Place- Team Basil, Hansika Kashyap and Ritika of Kalindi College

Third Place- Team Barley, Anisha Kumari and Dinky of Deen Dayal Upadhyay College

Glimpses of the event

Food Donation Drive

Shruti Apurva (Co- Editor, Anthesis)

"Food should be a right and not a privilege."

The Gargi College Botanical Society- TARU arranged a food donation drive to commemorate World Food Day on October 18, 2022, that allowed students from all over the college to donate non-perishable food items for those in need. The students of Gargi college enthusiastically participated in this food drive and donated packaged foods like biscuits, wafers, etc. The food donation boxes were kept at various places for easy accessibility by the students. Once the food items were gathered, GCBS members assembled food packets to distribute on the day of the drive. On the day of the donation drive, some students and faculty of the Botany Department, along with the NGO Seva Bharthi, Delhi, visited young kids to celebrate World Food Day.

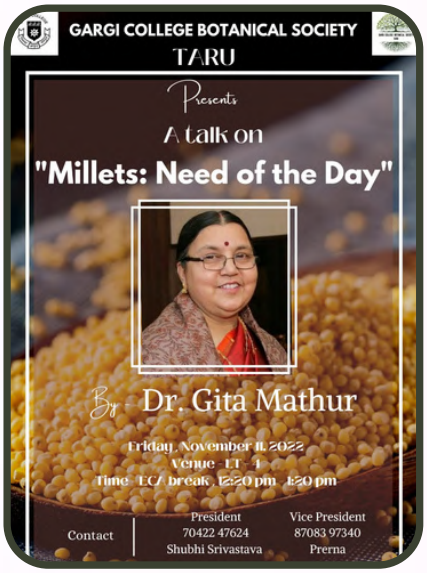
The whole day was lively because of the joyous aura of those kids. The event commenced with an interactive session with the children to understand their daily routines and future aspirations. Following this, the children were taught valuable lessons about hygiene and life, and interaction with these young children left everyone feeling affectionate and optimistic. The kids also showed extreme enthusiasm, recited poems, sang songs, and shared their aspirations. Finally, the food packages were distributed to the children, containing not just food but also some stationery items that brought joy to the kids. Witnessing their excitement was a delightful experience for everyone present.

By the end of the day, joyful energy had permeated the event, leaving everyone feeling fulfilled. The smiles on their faces were enough to express their emotions, and even after a tiring day, everyone felt a sense of inner contentment. There is no doubt that this food drive left a significant impact on everyone, enabling them to celebrate World Food Day in the best possible way.

Glimpses of the event

Millets: Need of the Day

Hibu Paku (Editorial Member, Anthesis)



"Millet are a forgotten treasure to be explored."

The name "millet" encompasses a wide range of small-seeded grasses (Poaceae). They are generally grown around the world as cereal crops and fodders. Millets are important crops that are highly drought tolerant and have a high productivity rate with similar nutritional value to other cereals. They are staples in semi-arid regions where other plants struggle to flourish.

A lengthy history exists between millet and India. Some of the earliest Yajurveda writings mention millet, proving that millet consumption predates the Indian Bronze Age and is highly widespread. The production of millet decreased after the west's expansion, and to increase the production of millet in the country, the Government of India designated 2018 as the National Year of Millets. In March of 2021, UNGA [united nation general assembly] declared 2023 the international year of millets [IYOM].

To celebrate the collaborative effort of GOI (Government of India) and UNO (United nation organization), the Department of Botany organized a talk on 11th November 2022 under the topic "Millet: need of the day".

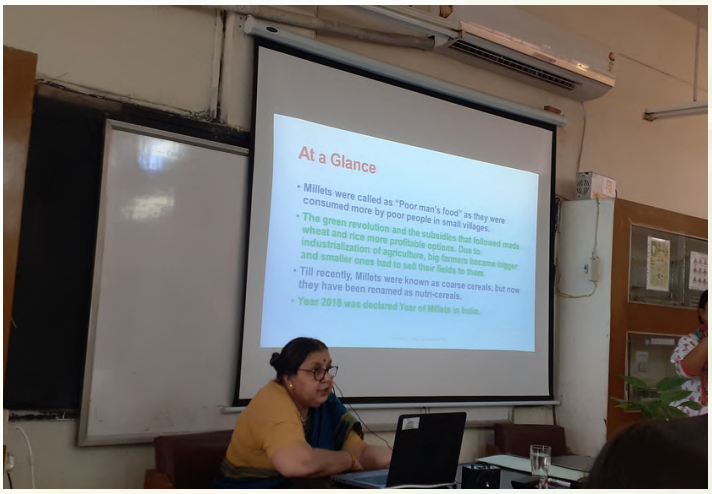
Dr. Gita Mathur (superannuated teacher, Botany Department, Gargi College) was invited as the guest lecturer for the lecture. The session started with Ananya Tomer (Co-editor, Anthesis) and Pearl (Creative team member, GCBS) hosting the event and welcoming Gita ma'am to start the much-awaited talk on millets.

Gita ma'am first briefed us on the context of India's initiative on designating 2023 as the international year of millets. She further provided the background of millet production in India and its connection with the green revolution and the industrialization of agriculture. Her talk detailed, the objective of IYOM, which included increasing the consumption and production of millet over the year and to raise awareness of millet in food security and nutrition. She also compared certain millet products from various e-commerce sites, stressing the rising prices of millets over the past few years and adding that millets have changed from being a food for the poor to a fascinating food for the general public as a result of growing interest in health culture.

Later Dr. Gita Mathur gave several detailed descriptions of millets and pseudocereals along with their nutritional values and shared some delicious recipes for different dishes using millet. Some of her favorite dishes included ragi roti and baby food made using regional millet varieties.

By the end of the talk, she illuminated TARU members with more ideas to work on IYOM and other future events. Everyone was filled with zeal and knowledge. And the session ended with a vote of thanks from Shubi Srivastava [President, GCBS].

Glimpses of the event



Departmental Orientation

Anshita Bhatnagar (Co-Editor, Anthesis)

With the utmost ardor and enthusiasm, the Botany Department of Gargi College welcomed the freshers into the department on 2nd November 2022. The new botanists were eager to know about the department and sat patiently throughout the event.

The Teacher-in-Charge, Dr. Renu Soni, along with the other faculty members, introduced themselves with the heartiest words and acquainted the students with the incredible life of an academician and other possible endeavors waiting for them after graduation. Subsequently, the teachers requested the students to introduce themselves to establish a sense of ease within the department. The students then shared their names and places of origin, which aided in acquainting themselves with each other. As the event ensued, Dr. Renu Soni ardently accorded an insight into the department's building, equipped labs, research opportunities, the Gargi College Botanical Society, and its annual publication- Anthesis. The newcomers were provided with a comprehensive understanding of the exceptional educational experience through practical periods, classes, and excursions. The TIC then progressed to accustom the freshers to the new syllabus, including the Value added courses (VAC) and Skill enhancing courses (SEC), and also talked about the benefits these courses would grant the students for their future ventures. Following the aforementioned events, the students were offered refreshments and some time to converse and absorb the information provided to them. Lastly, the TIC introduced all the lab staff members to the students and explained their unmatched role in the functioning of the department. The students were glad to have attended the orientation, and the event ended with all freshers feeling privileged to be a part of the botanical family at Gargi College.

Glimpses of the event

Departmental Interaction

Ananya Tomer (Co-Editor, Anthesis)

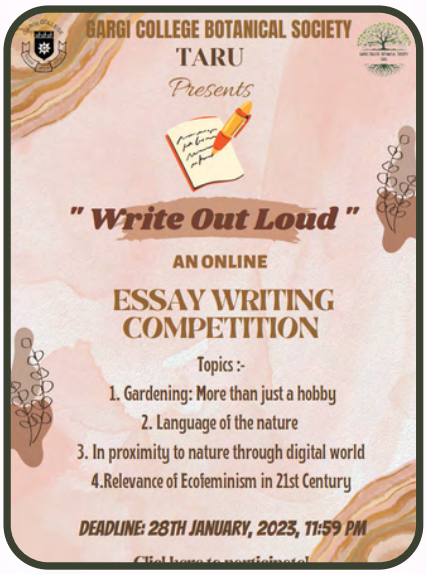
The Gargi College Botanical Society- TARU, on January 27th, 2023, organized a fun interactive session with the first-year students of the Botany Department. The session consisted of introductions among the students and familiarisation of the students with the department and its work. The event also featured fun games that were entertaining for both the participants and the audience. The event was hosted by Surbhi Mendiratta (Student, Botany Department) and Pearl Sharma (Creative Team Member, GCBS) hosted the event and succeeded in keeping the audience engaged throughout the session.

The event started with a welcome speech by Dr. Leisan Judith (Faculty Advisor, GCBS), introducing the students to the Botany Department and its faculty members and, also orientated the first-year with the departmental society, GCBS-TARU and the annual magazine, ANTHESIS. The freshers were encouraged by Dr. Judith to become a part of the society as well as the department to make them feel welcomed and have a sense of belongingness. The hosts extended their gratitude to the faculty members on behalf of all the students for their valuable contribution to their endeavors and for bringing out the best in them. This was followed by the first game of "Scientific Pictionary", in which the students were called upon to select a chit containing a name that they had to draw while the audience guessed it. Another game, "Whisper Challenge", was also enjoyed by the students. Exciting prizes were awarded to the winners, and the event came to an end with short introductions among the students, a vote of thanks by Shubhi Srivastav (President, GCBS), and refreshments.

Glimpses of the event

Write Out Loud!

Yashasvi Saini (Editor-in-Chief, Anthesis)



"As a writer, you should not judge, you should understand."

Writing and nature are two things, exquisite and mesmerizing in their ways. When combined, they create a euphony that deeply resonates with people.

The Gargi College Botanical Society- TARU organized an Online Essay Writing Competition- 'Write Out Loud'.

Be it science, history, or technology, everything, and everyone connects to nature in some or the other way, and there is no better way to connect and express than to write it out. The competition was conducted to bring the hidden scribes to attention and provide a platform to showcase one's penmanship.

The participants were required to write an essay on any one of the topics given which were as follows-

1. Gardening: More than Just a Hobby
2. The Language of Nature
3. In Proximity to Nature through Digital World
4. Relevance of Ecofeminism in the 21st Century

The participants were required to strictly adhere to certain rules, such as submitting non-plagiarized content, limiting their article to 700 words, and ensuring that it was relevant to the assigned topic. The students were asked to submit their entries through the Google form link. Participants from all over Delhi University enthusiastically participated in the competition.

The competition results were announced via the GCBS-TARU social media handles and winners were awarded cash prizes. The winning entries were also published in the departmental annual publication- ANTHESIS. The competition proved to be a success, as it unearthed the writing prowess of the students, who expressed their ideas in a scientific yet captivating manner.

The winners of the competition were as follows-

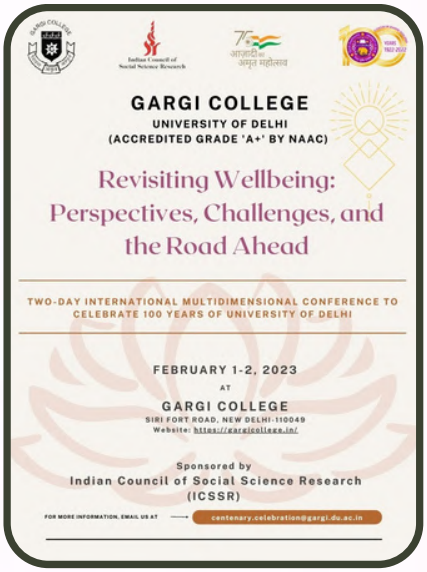
YOSHITA BHARDWAJ, B.Sc. (H) Botany, Miranda House College backed the first position and wrote the article "The Language of Nature".

SHRUTI JHA, B.Sc. (H) Botany, Gargi College was the first runner-up and wrote the article "Relevance of Ecofeminism in 21st Century".

GAURI SATISH NAMBISSAN, B.Com Hons., Atma Ram Sanatan Dharma College (DU) was the second runner-up and wrote the article "Gardening: More than just a Hobby".

Revisiting Wellbeing: Perspectives, Challenges, and the RoadAhead

Yashasvi Saini (Edior-in-Chief, Anthesis)



The Gargi College, University of Delhi, organized a two-day International Multidimensional Conference sponsored by the Indian Council of Social Science Research (ICSSR) to celebrate the hundred years of the University of Delhi on 1st and 2nd February 2023.

Prof. Sangeeta Bhatia (Patron, Principal, Gargi College), Dr. Geeta Sidharth (Organising Secretary), Dr. Geeta Prakash, and Dr. Varun Bhandari (Conveners), along with the teaching and non-teaching faculty at Gargi College successfully arranged the workshop.

Wellbeing, or the state of being comfortable, healthy, and happy, is crucial for living a fulfilling and enjoyable life. The importance of wellbeing cannot be overstated, as it affects all areas of life, including physical health, mental health, and overall happiness. The foremost objective and central aspect of human existence is wellbeing, whether at an individual or collective level. This is what sets us apart from other animals, who must struggle for mere survival. However, the concept of wellness has evolved beyond mere survival to encompass a comprehensive and holistic approach to life, which has gained traction in the last fifty years. Because wellbeing is subjective and dependent on personal circumstances, we must endeavor to comprehend and redefine it within our present context, given its significant impact on our sense of self.

Gargi College had planned a series of activities and events between January 2023 and March 2023 as part of the DU Centenary Celebration. The conference was a highlight of the celebration, with a pre-conference workshop in collaboration with Art of Living (AOL), beginning in January 2023, and a valedictory session in March 2023 by Sri Sri Ravi Shankar Ji from Art of Living Foundation. These events signified Gargi's commitment to academic excellence and building a community where every stakeholder is heard, valued, and encouraged to reach their full potential. The conference was a blend of academic, pragmatic, and cultural festivities, and provided participants with an opportunity for hands-on exposure to enhance their wellbeing.

INAUGURAL PROGRAM AND PRE-CONFERENCE WORKSHOP

The opening ceremony of the program was graced by several eminent personalities, including Prof. Balaram Pani (Dean, Colleges, DU), Prof. S.P. Singh (Director, South Campus, DU), Prof. Amit Kumar Singh (Chairperson, Gargi College), and Prof. R.K. Dhamija (Director, IHBAS, Delhi). In addition, a pre-conference workshop titled "THE IN-T-RESTING HOUR: Achieving Outer Excellence through Inner Rest" was also conducted in partnership with the Art of Living Foundation as part of the Har Ghar Dhyan initiative of the Ministry of Culture, Govt. of India to commemorate the Azadi ka Amrit Mahotsav on the same day. The workshop, which lasted for an insightful hour, provided an introduction to the secrets of breath and meditation to unlock personal excellence, enhance clarity in decision-making, and promote emotional and mental wellbeing.

INAUGURAL SESSION

On February 1, 2023, the conference was launched with the presence of eminent personalities from the University of Delhi and Gargi College. Prof. Yogesh Singh (Vice Chancellor, University of Delhi), Dr. Vikas Gupta (Registrar, DU), Prof. Balaram Pani (Dean of Colleges, DU), and Prof. S.P. Singh (Director, South Campus, DU) graced the occasion as distinguished guests from the University of Delhi. The opening keynote speech was delivered by Prof. A.K. Singh (Head, of the Department of Commerce and Dean of, the Faculty of Commerce and Business, DU).

During the opening speeches, the speakers discussed the diverse aspects of wellbeing and their correlation with science. Additionally, they shed light on the portrayal of wellbeing in the Hindi Vedas. The day progressed with technical sessions and Wellbeing workshops conducted by eminent speakers on interesting topics which were as follows-

TECHNICAL SESSIONS

Technical Session 1

Panel Discussion- Science for Wellbeing: In Spirit and Practise

Panelists- Prof. Rup Lal, Prof. S.K. Trigun, and Dr. Fiyaz

The session unified stakeholders from various fields to identify different parameters of science for wellbeing, and emphasized how the constant advancement of technology broadens our horizons and potential to influence our overall wellness. This session revolved around various fields from microbiology, environmental science, and the proof of wellbeing in Indian Vedas and provided the audience with the relevance of wellbeing in different areas of Science.

Technical Session 2-

Panel Discussion- Fitness, Mental Wellbeing, and the Living Meaningfully

Panelists- Dr. Manasvini Yogi, Ms. Ankita Bhambri, and Dr. Arvinder J Singh

This session talked about the concept of a fulfilling life typically involving a balanced state of physical, mental, and spiritual enlightenment, which collectively can lead to making a positive impact on society. The discourse on well-being primarily revolves around two perspectives: subjective well-being (SWB), which is based on hedonic pleasure, and psychological well-being (PWB), which is grounded in the idea of self-realization and positive psychological functioning. This notion resonates with Aristotle's and Buddhist philosophy, where leading a virtuous life and striving for happiness are considered the ultimate goal. Yoga philosophy and scriptures like the Bhagavad Gita guide achieving physical, mental, and spiritual fitness while pursuing righteousness.

WELLBEING WORKSHOPS

The multidimensional conference also celebrated wellbeing by offering practical exposure through four distinctive live workshops conducted by professionals, related to the theme.

Workshop 1

Title- Living With Purpose: Lessons from Cognitive Wellbeing and the Power of the Mind

Resource person- Dr. Arvind J Singh, Ashoka University

Workshop 2

Title- Wellness: In Spirit and Practise

Resource person- Ms. Anuradha Agarwal, The Gnostic Centre

Workshop 3

Title- Celebrating Emotional;, Mental, and Spiritual Wellbeing

Resource person- Ms. Seema Charla, Science of Spirituality

Workshop 4

Title- Alternative Healing to Wellbeing

Resource person- Dr. Poonam Gulia, AOL

The first day of the conference came to an end with this, and the attendees were provided with refreshments and lunch to keep them energized throughout the session.

The second day of the international workshop started with Talk on Wellbeing by Prof. Balaganapathi on Equanimity and Wellbeing: An Inquiry into IndianTradition and an interactive session with Dr. Geeta Sidharth on the topic Patanjali Yoga Sutra which was followed by technical sessions.

Technical Session 3-

Panel Discussion- Re-envisioning Development: Moving Towards a Wellbeing Economy

Panelists- Mr. Mukund Rajan, Mr. Sanjiv Ranjan, Mr. Varun Sahai, and Prof. Asmita Kabra

During the discussion, the focus was on how incorporating environmentally-friendly practices in business development can enhance the welfare of both people and the natural world. Mr. Sanjiv Ranjan's hypnosis session highlighted the interconnectedness between the human mind and wellbeing.

Technical Session 4-

Panel Discussion- The Challenge of Caste, Gender, and Disability

Panelists- Prof. Farhat Hasan, Prof. Sukumar, and Prof. Anita Ghai

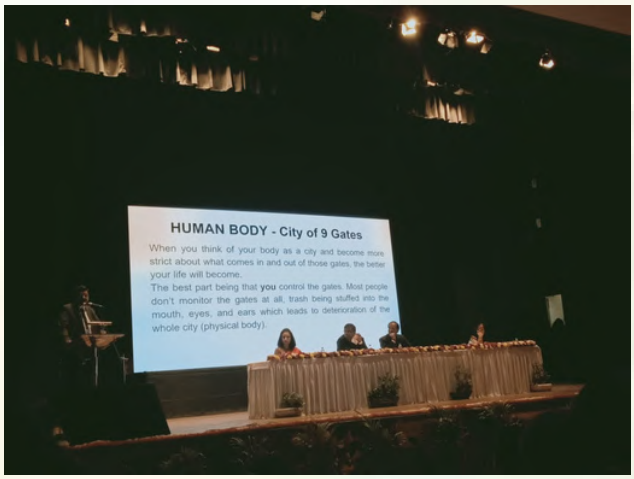
The conference also invited research papers for presentation on suggested themes. The teachers and students of the Department of Botany also partook in this presentation.

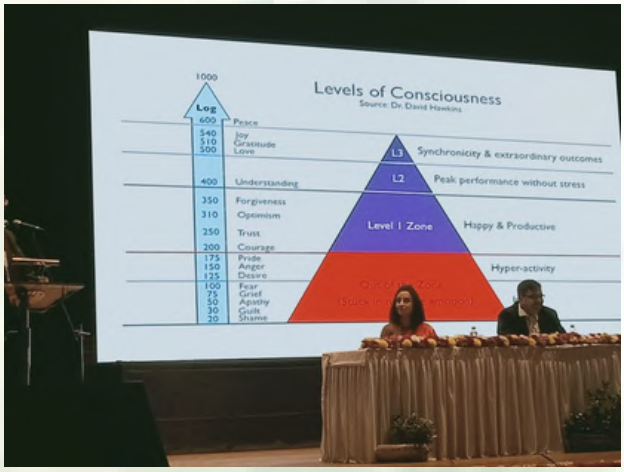
- Prof. Aparajita Mohanty presented the paper "Role of Bioinformatics in Mitigating Climate Change: The Road to Wellbeing".
- Dhiseka Pawaiya, Dr. Pritam Kaur, and Jyoti Kumari presented the paper "Tapping Inside for Wellbeing".
- Yashasvi Saini, Dr. Geeta, and, Shweta Sharma presented the paper "Comparative Analysis of TP53 gene Encoding for Tumour Protein p53 in Different Organisms to Understand the Molecular Mechanism of Cancer Resistance".
- Dr. Akanksha Madan and Priyanka Pandey presented a paper on "Organic Lifestyle for Creating Wellbeing".

The Valedictory session by Prof. Namita Ranganathan on the topic "Contruals of Students' Wellbeing in Contemporary Times."

A valedictory Address by Prof. Sangeeta Bhatia, a Report presentation by Dr. Geeta Sidharth followed a Cultural Program, and a Vote of Thanks concluded this two-day international workshop on wellbeing.

Glimpses of the event





Interactive Talk on Environmental and Social Perspectives of Fashion Industry

Rashi Singh (Creative Team Member,GCBS)

The Gargi College Botanical Society-TARU, in collaboration with the Research Development Cell (RDC), organized an interactive talk on "Environmental and Social Perspectives on Fashion Industry", on 10th February 2023. Professor Vandana Mishra [Department of Environmental Studies, and Director, Centre for Interdisciplinary Studies for Mountain & Hill Environment (CISMHE), University of Delhi] was the speaker for the day.

The event was well-received by both students and faculty, who attended with great enthusiasm and gained valuable knowledge.

The event started with Dr. Leisan Judith (Faculty Advisor, GCBS) expressing her gratitude on behalf of the Botany department to Prof. Vandana, faculty members, and students for their venerated presence and presenting a gift of honor to Prof. Vandana. Shubhi Srivastava (President GCBS-TARU) introduced Prof. Vandana to the participants. Prof. Vandana then started with the much-awaited talk.

Beginning with the notion that fashion is a unifying force, Prof. Vandana went on to explain how the textile industry can negatively impact human health and the environment. During her presentation, she delved into the main research projects she and her students have conducted regarding the environmental impact of textile industry waste discharge.

Her lecture elaborately explained the environmental and social consequences of the fashion industry. She shared her experiences gained through the research work on the use of microbes and enzymes for the bioremediation of effluent from textile and other industries. She also gave us an insight into how the growth of the fashion industry has increased after globalization - that is Fast Fashion. She explained how this industry directly impacts us, as 92% of the total deaths in Asian countries are due to pollution only. She also highlighted the unpredictable fate of azodyes in the environment which is a major challenge to the sustainable industry, ecosystem, and human health. Prof. Vandanashared that globally no policy covers the rule to check the Aromatic concentration in the dyes. The Global policies made for the use of PPD (para-phenylenediamine) are loosely regulated in some Asian countries including India, Pakistan, Bangladesh, etc. She also discussed the ecotoxic effects of microplastics on living beings and the environment. Prof. Vandana also highlighted that the so-called non-toxic substances in dyes like Acid Orange 7, PPD, etc., are used to commit suicide.

As the lecture came to an end, Prof. Vandana emphasized our role as consumers, and how our small steps such as extending product use time, slow consumption, developing emotional connections, environmentally friendly clothes, etc., can help mitigate the pollution generated by the textile industry.

Change in the perception and behavior of consumers plays an important role in protecting the environment from the harmful effects of this huge industry.

In the end, Prof. Vandana enthusiastically answered all the questions. Overall, the interactive talk was an enriching experience for everyone present there. The vote of thanks by Shubhi Srivastava followed a brief photo session commemorating the event.

Hands-on Workshop on Millets

Anshita Bhatnagar (Co-editor, Anthesis)

Millets have been a staple food in many cultures around the world and are gaining popularity as a healthy and sustainable alternative to more common grains like rice and wheat. At the behest of The Government of India, the United Nations declared 2023 as the 'International Year of Millets', to raise awareness and promote greater production and consumption of millets.

To celebrate this much-needed program, the Gargi College Botanical Society - TARU organized a 'Hands-on workshop on Millets' on 15th February 2023. The speaker of this promising event was Ms. Pallavi Upadhyaya, the co-founder and MD of 'Millets for Health'.

The program was initiated with Hansa Wali (Cultural Secretary, GCBS) and Pearl Sharma (Creative Team Member, GCBS) introducing the speaker for the day. Ms. Pallavi began her workshop with a set of some interesting questions about millets and considerably increased the knowledge around the room. She educated the students as well as the teachers about the benefits of millet in our daily life. Then she proceeded about the gluten-free and easy-to-digest properties of millets, which makes them a great option for those with celiac disease or gluten sensitivity. Ms. Pallavi also called millets, 'good for us, good for the environment, and good for the farmers', due to their sustainability in harsh climatic conditions, rain-fed property, and highly nutritious nature.

After the discussion session about millets, Ms. Pallavi practically demonstrated to the audience her most beloved recipes involving millets, among which the first one was Kodo Millet Salad.

KODO MILLET SALAD:

1. Wash and soak 1 cup of Kodo millet in 3 cups of water.
2. Boil the millet in the soaking water. Cook at a simmer for some time.
3. Once all the water has evaporated, switch off the gas and be careful not to stir the cooked millet vigorously.
4. Add oranges, palak, boiled beetroot, honey, salt, and nuts to the salad.
5. Serve while still hot.

Both the teachers and students relished the salad, and it was liked by everyone. After the immensely positive response, Ms. Pallavi moved on to the second and third dishes which were Foxtail millet rice and Foxtail Millet Tikki respectively.

FOXTAIL MILLET RICE:

1. Wash and soak 1 cup of foxtail millet in 3 cups of water.
2. Boil the millet in the soaking water. Cook at a simmer for some time.
3. Once all the water has evaporated, switch off the gas and be careful not to stir the cooked millet vigorously.
4. Add lemon juice and salt.
5. Make a tadka of ghee, rapeseed, turmeric, red chili, and curry leaves. Add it to the millet, along with some peanuts.
6. Spread it out on the plate and serve hot.

FOXTAIL MILLET TIKKI:

1. Wash and soak 1 cup of foxtail millet in 3 cups of water.
2. Boil the millet in the soaking water. Cook at a simmer for some time.
3. Once all the water has evaporated, switch off the gas and be careful not to stir the cooked millet vigorously.
4. Mix the above salad with potatoes, carrots, peas, banana, coriander, and salt, and make a tikki.
5. Pour some oil on the pan over a stove, and fry.
6. Serve hot.

After the completion of the workshop, Hansa and Pearl introduced the question-and-answer round, to which everyone enthusiastically partook. This was followed by a vote of thanks by Shubhi Srivastava (President, GCBS). In the end, Dr. Renu Soni, the Teacher In-charge of the Botany Department, wholeheartedly thanked the speaker for coming and sharing this amazing experience with the department.

Once the speaker and teachers left, refreshments were offered to the students, marking a cheerful conclusion to the event.

KODO MILLET SALAD

FOXTAIL MILLET RICE

FOXTAIL MILLET TIKKI

Glimpses of the event

Flower Show: Gargi Blooms

Devyani Dwivedi (Creative Head, GCBS)


GARGI COLLEGE
University of Delhi
Accredited Grade 'A+' by NAAC
GARDEN COMMITTEE
in association with
DEPARTMENT OF BOTANY
organizes
OWER SHOW 2023: GARGI BL
&
Saplings Distribution
on
15th March 2023
12:00 pm onwards
Venue: Arts Quadrangle
. Sangeeta Bhatia
Convenor: Dr.
izers: Gardeners, Garden Committee and Department
All are cordially invited to enjoy the beauty of bl
Interactive session with gardeners in case of qu

Flowers bloom in vibrant hues,
Petals soft like morning dew,
Their fragrant scents fill the air, A
sight to cherish and to bear.
Oh, flowers, how you make us smile,
With your grace and timeless style,
You bring hope and peace to all, A
precious gift, both great and small.

The Garden Committee, in association with the Department of Botany, organized the "Flower Show: Gargi Blooms" on 15th March 2023.

The show began with Dr. Renu Soni, the Teacher In-charge, giving an introduction to the flower show and its significance which was followed by the felicitation of our Principal ma'am, Dr. Sangeeta Bhatia. An interactive session with the gardeners was the highlight of the flower show.

Candytuft, Marigold, Cineria, Salvia, Petunia, Verbena, Kalenchoe, Aster, **were some of many of the flowers displayed along with their botanical name, common names, and family. The teachers, along with the enthusiastic students of the Botany Department, distributed saplings to students from all over the college.**

The beautiful arrangement of pots with different colorful blooms was a sight to behold. From hues of yellow, red, pink, and white to purple, orange, and blue, all the visitors were mesmerized by the beautiful flowers on display and took pictures with them.

Glimpses of the event

Scintillations 2023

Anshita Bhatnagar (Co-editor, ANTHESIS)

Scintillations'23- Gargi College Annual Science Fest, a magnificent celebration of scientific wonders, took place at the prestigious Gargi College, University of Delhi, on March 28th and 29th. This momentous occasion brought together a diverse array of esteemed scientists, erudite researchers, accomplished educators, avid students, and ardent science enthusiasts, all converging to partake in a captivating showcase of the wonders of botany, zoology, microbiology, physics, chemistry, and maths. With its multifarious exhibits, engaging activities, and illuminating presentations, the Scintillations 2023 was a symphony of scientific knowledge, orchestrated to inspire curiosity and ignite a deep-seated reverence for the enigmatic realms of science. Covering an extensive range of scientific fields, from the obscure domains of physics, chemistry, biology, and mathematics, the event presented a diverse collection of innovative research and educational programs, tailored to captivate and enlighten the curious minds of the attendees.

On the first day, the event commenced with the prestigious ceremony of lamp lighting. The guests, Prof. Dhar and Mr. Ratti were respectfully seated in their respective seats, and the event progressed. Dr. Uttara Datta introduced the event and gave the significance of the theme of this year's fest, i.e., STEMerald: the Lineage of Wellbeing. She was then followed by Dr. Geeta Kichlu, who beautifully described the all-around well-being of STEM (Science, technology, engineering, and Maths). She also talked about the importance of STEM in times of epidemics and pandemics (like Covid-19). Following this, Dr. Datta invited the former principal of the college, Dr. Shashi Tyagi to briefly talk about the history of Scintillations. She ardently talked about how scintillations came to be what it is today. She also talked about her emotional attachment to this annual event. She apprised the audience with the story of the establishment of Zenith - The Physical Science and Life science association.

She said that the sole purpose of this fest was to bring togetherness and a sense of belonging to the students of various scientific fields. She then invited one of the honorable guests, Prof. Dhar, to speak to the audience.

Prof. Dhar is a highly accomplished scientist, currently working as the president of the Institutional Innovation Council at Jawaharlal Nehru University. The topic of his talk was 'The Making of a Scientist'. He educated the audience on the importance of the need to get familiar with our scientific roots, instead of just getting drawn toward the rest. He said intelligence is just memory and creativity and added how we should learn to work with Artificial intelligence. He talked about the factor of success in future leaders and a survey of 1500 CEOs, which showed how creativity and asking questions are really important for success. He also added how our ancestors used their minds as laboratories and presented the world with eminent inventions and discoveries like 'zero' by Aryabhatta and also how Baudhyan invented the 'Pythagoras theorem'. He also educated the audience on the integrated view of life, which was the mixture of body, thoughts, emotions, science, and spirituality. He said that a reduced number reduces energy utilization and also the importance of 'desperation' in achieving success in life. His influential words made everyone sitting in the room full of hope and ardor for their future endeavors.

Following this speech, Mr. Karan Ratti was invited onto the stage. Mr. Ratti is an incredibly talented entrepreneur and the founder CEO and CSO of the Ratti Foundation. He introduced his speech by invigorating the audience with the societal mindset of having fairer and brighter skin to look more beautiful. He introduced his company, 'Melblok' which focuses on natural skin color. He told the audience that the world has enough products that don't work and cost too much. He educated the audience that a good product takes around 12-18 months to be fully functional, so any product which is finished in 3 months is not good, for people as well as the environment. He talked about the 4 essential stages of the development of a cosmetic product, the first being ideation and research, the second, formulation and sourcing, the third, pilot, and the fourth, production and shipping. He also talked about the importance of make-up to an individual and how it is a way of self-expression and confidence.

He then went on to educate about how the brand name and design are extremely essential as it directly communicates with the consumers. He told the audience how innovation in science is progressing by giving the example of retinol. Retinol when mixed alone, results in reddening, and peeling of the skin, but when mixed with myristyl nicotinate, it is extremely healthy for the skin. Lastly, he said that people are not becoming simpler, but even more demanding, and companies should take their standards to the level of the consumers. While concluding his talk, we told the audience about his company, Melblok believes in bio-recovery and is environmentally cautious. Subsequently, a short question-and-answer session was conducted, and the audience was informed of the schedules of various competitions organized by different science departments. All the competitions were filled with joy and enthusiasm, marking the successful culmination of the first day of Scintillations.

The next day, the 29th Of march, the event commenced with different science societies' presidents' speeches. The first speech was given by the President of Gargi College Botanical Society-Taru, Ms. Shubhi Srivastva. She started her speech by thanking the organization for this esteemed opportunity and went on to introduce the society to everyone. She educated the audience about the history of its establishment. She also talked about all the conferences, and donation drives held by the society in the year 2022-23. Following her, all the scientific societies, including 'Quasar' – Physics Society, 'Rasgandhayan'- The Chemistry Society, 'Albatross'- The Zoological Society, 'G.E.R.M.S.'- The Microbiology Society, 'Mathema'- The Mathematical Society, 'Zenith Association- The Physical and Life sciences society, and 'Wegyanum'- The Research Wing of Gargi College. With this, all the members were requested to participate in various competitions. In conclusion, the Scintillations 2023 was an extraordinary celebration of scientific discovery and innovation, where minds were ignited, and passions were kindled. It was a dazzling showcase of the wonders of science, an ode to the pursuit of knowledge, and a testament to the transformative power of STEM education. Everyone gathered in the auditorium for the valedictory session.

All the winners of the competition were awarded certificates with a never-ending round of applause. This was followed by a heartfelt vote of thanks and with this, the Science Fest- Scintillations, 2023 came to a jubilant end.

Glimpses of the event

Fallen Art Competition

Ananya Tomar (Co-editor, ANTHESIS)

"If you truly love nature, you will find beauty everywhere." -Vincent Van Gogh

Nothing that nature has is waste, and every part of it tells an artful story; even those fallen, discarded parts- the brittle leaves that are yellowed or the flowers that have lost that breathtaking tinge of red and white that once made us all swoon. The fact that something may have lost its appealing features does not necessarily mean it has lost its artistic value because *"Art is not supposed to look nice; it is supposed to make you feel something."*

With this essence, The Gargi College Botanical Society-TARU under the course of *Scintillations* (Gargi College Annual Science Fest) on 28th March 2023 organized *"Fallen Art"* - An art competition that involved creating artwork using fallen leaves, flowers, twigs, and other natural materials. The event was hosted by Jyoti and Khushbu (executive Team Members, GCBS) and captivated the audience's attention and retained the participants' excitement levels throughout the event.

The day commenced with an introduction to the Botany department and GCBS-TARU, after which the competition rules were announced. Undergraduate and postgraduate students studying in colleges affiliated with the University of Delhi were eligible to participate in the competition. The competition was an individual event, and only fallen and dried plant materials were permitted, prohibiting the use of freshly plucked flowers or leaves.

The participants showcased some stunning and awe-inspiring creations. The winners were awarded cash prizes and certificates for their achievements. All participants were awarded an E-certificate. The competition truly proved that there's art and beauty present in every corner and part of our nature.

- ***1st position was secured by Deepti, B.Sc. (P) Life Sciences, 3rd year, Gargi College***
- ***2nd position was backed by Vishestha, B.Sc. (P) Life Science, 3rd year, Gargi College***
- ***3rd position was secured by Asha Rana, B. Sc. (H) Botany, 1st year, Gargi College***

First Place- Deepti, B.Sc. (P) Life Sciences, 3rd year, Gargi College

Second Place- Vishestha, B.Sc. (P) Life Science, 3rd year, Gargi College

Third Place- Asha Rana, B. Sc. (H) Botany, 1st year, Gargi College

Glimpses of the event

Your Slide Your Pride

Ananya Tomar (Co-editor, ANTHESIS)

"The gifts of microscopes to our understanding of cells and organisms is so profound that one has to ask: What are the gifts of the microscopist?"

The gift of the great microscopist is the ability to think with the eyes and see with the brain. Deep revelations into the nature of living things continue to travel on beams of light.

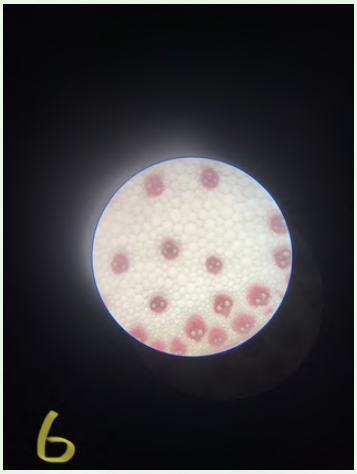
With the same thought in mind, on March 29th, 2023, a plants' section dissection and identification competition "*Your Slide Your Pride*", was organized by The Gargi College Botanical Society-TARU under the Gargi College Annual Science Fest, *Scintillations*.

The inter-college event involved a fun and knowledge session with microscopes that brought an insightful experience to both the participant and the audience, making it enjoyable for all. Pearl Sharma and Anshu (Creative members, GCBS) hosted the event, successfully engaging the audience and keeping the participants enthusiastic throughout the competition.

The day commenced with a short introduction about the Botany department and the society's history, after which the competition rules were announced. The competition was open to all undergraduate and postgraduate students enrolled at the University of Delhi.

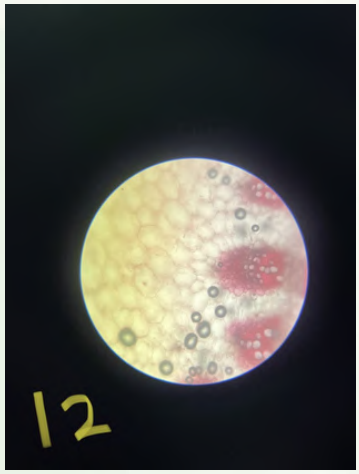
The competition was an individual event, and the judges observed some exceptional slides that evoked a sense of pride and wonder. The position holders were rewarded with cash prizes and certificates. All participants were given E-certificate. The competition served its motto by igniting a true sense of interest in the subject.

- ***1st position was secured by Krishna, B.Sc. (H) Botany, 2nd year, Gargi College***
- ***2nd position was backed by Anushka Kumari, B.Sc. (H) Botany, 2nd year, Gargi College***
- ***3rd position was secured by Rajasvi, B.Sc. (P) Life Sciences, 3rd year, Gargi College***



First Place- Krishna, B.Sc. (H) Botany, 2nd year, Gargi College

Second Place- Anushka Kumari, B.Sc. (H) Botany, 2nd year, Gargi College



Third Place- Rajasvi, B.Sc. (P) Life Sciences, 3rd year, Gargi College

Glimpses of the event

Reverie 2023

Dhiseka Pawaiya (Editorial Member, ANTHESIS)

"Where the words fail, music speaks." -Hans Christian Andersen

On the 10th of April 2023, Reverie, the annual festival of Gargi College under the University of Delhi, was organized. It was a much-awaited event for the students who had spent a year immersed in studies, assignments, presentations, exams, and the associated stress. Only currently enrolled students of Gargi College were granted access to this enjoyable celebration.

Dr. Manju Sahai, the convener of the program, commenced the proceedings, and the highly respected Padma Shri awardee, Dr. Geeta Chandran Ji, a renowned Indian Bharatnatyam dancer, and vocalist graced the occasion as the esteemed Chief Guest.
The Guest of Honor was the chairperson Prof. Amit K. Singh Ji.

The event began with the ceremonial lighting of the lamp and the felicitation of guests. The Guest of Honor and Chief Guest addressed the students with inspiring speeches, which were followed by cultural performances by the talented students followed by the Nizami Bandhu's qawwali which created a peaceful and energetic environment.

Refreshment coupons were distributed among the students, and the day drew to a close at around 6 PM with an atmosphere of dance, merriment, and exuberance.

Glimpses of the event

Alumni Interaction 2023

February 4, 2023
Dr. Renu Soni, Dr. Reema Mishra, Dr. Preeti Agarwal
Ms. Ritu, Ms. Devyani

The Alumni Interaction is held to provide the current batches with information for future careers they might want to pursue. Thus, to share the know-how of the fields available after graduation, the Department of Botany, Gargi College, University of Delhi in association with Samavaya, The Botany Alumni-Student Interaction Forum, Gargi College conducted the interaction on 4th February 2023 on the Google Meet platform.

The program started with a welcome message by TIC, Dr. Renu Soni. She then invited our superannuated teacher, Dr. Gita Mathur to share her experience and viewpoints with the audience. Post-felicitation, the program began with students pursuing M.Sc. Botany from the University of Delhi. Ms. Akshita provided insightful details about the different entrance examinations including DUET, GAT B, TIFR, etc., required to pursue a master's degree in the biological sciences. Her talk also included information about the books one might find helpful during their preparation for the aforementioned examinations and YouTube channels that could help students during revision. She went on to give much-needed tips for examinations, from the marking scheme to time management to checking the cut-offs of various colleges regularly. Her love for Botany was visible throughout her lecture. Ms. Monika Mishra addressed an important question right at the beginning of her interaction which was clearing the doubt of many students if they even want to pursue a career in Botany. She gave a view of different careers one can pursue including MBA, Content writing, Government job preparations, diploma courses, and many more, after graduation along with furnishing details about different examinations and subjects to prepare for. She mentioned a few books that might help in quick revisions. Her knowledge of different examinations was much appreciated by the students as she solved many budding doubts in their minds.

Ms. Jayati Pandey highlighted an important tip of checking the college website for a particular professor's CV to know their area of expertise and if it aligns with the student's interest. Additionally, she shared a very important yet neglected part of a science student's life i.e., the importance of internships and skill building. Her guidance was very fruitful to all the students. Next up, the alumna of the batch 2021, Ms. Sakshi Dawer gave a detailed description of the examinations held by different universities including Punjab University, Delhi University, GB Pant University, and FRI. She gave tips for the examinations held by these universities and gave a special mention to FRI for its different syllabi. She mentioned a few internships the students can apply for to gain knowledge in laboratory work that would be of importance during their masters. She also gave a far-sighted view of scholarships that students can avail including INSPIRE, Reliance Foundation Scholarship, and a few more.

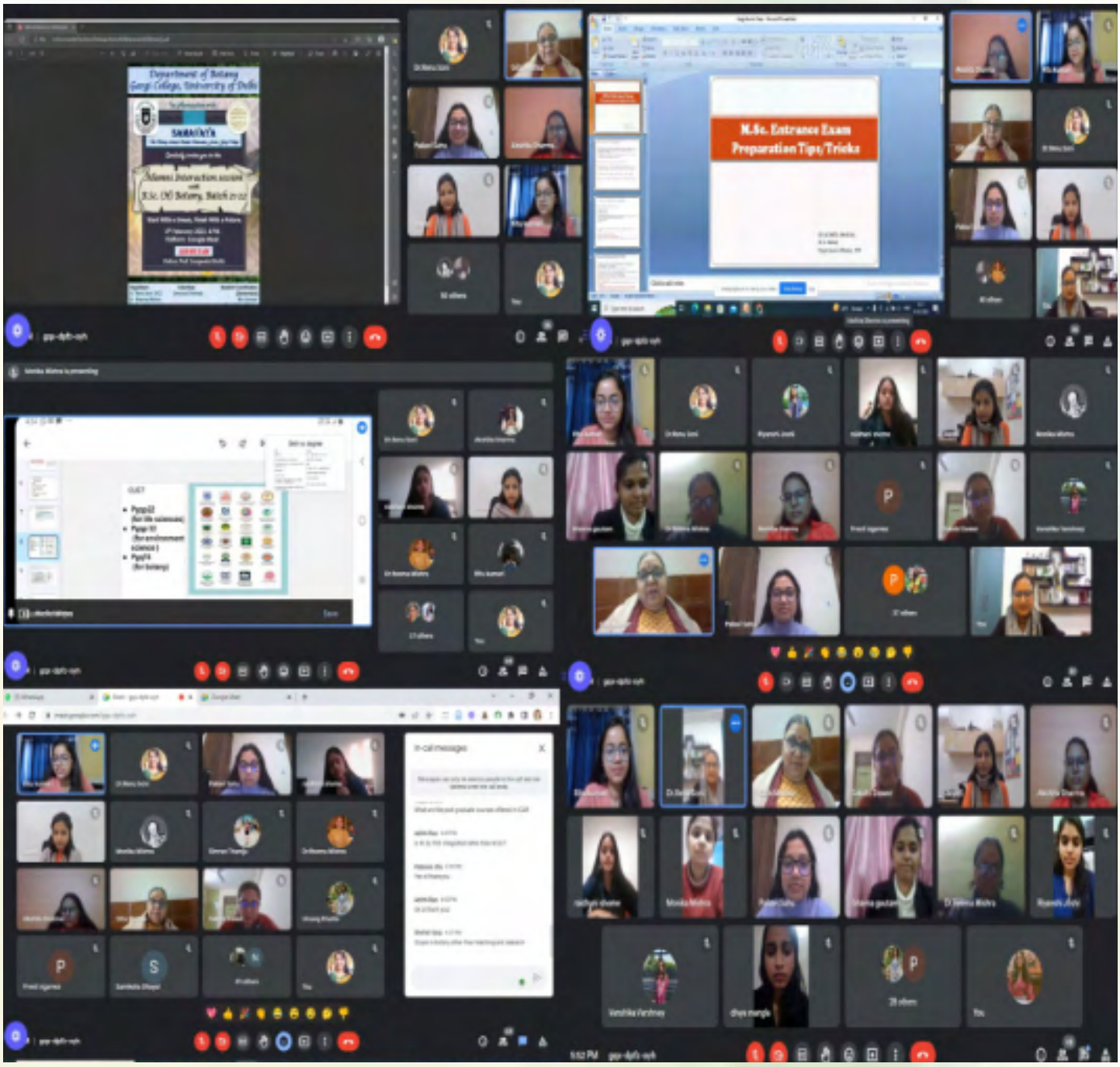
Ms. Umang Khatta, from the same batch, pursuing MSc. Botany from Panjab University enlightened the students about its entrance exam, PUCET. She concluded with a beautiful quote stating that one must work meticulously until they have what one desire. The next alumna was Ms. Pinky, Batch-2021, who is a GCI Officer, NCC, and is preparing for the PCS examination. She mentioned that working towards your goal step by step is extremely important. She is also preparing for the UPSC examination along with the PCS examination. She also gave a brief account of the banking sector and how one can make a transit to that sector even after an M.Sc. Botany. She introduced the concept of practicing previous years' question banks for the aforementioned examinations.

Ms. Divya Mangla who is currently pursuing M.Sc. Environmental Sciences from the University of Delhi highlighted her involvement in different jobs through the Placement Cell of Gargi College and her interest in the creative writing field. She talked about her interest in MBA in Brand Management, encouraging students to explore their strengths. Ms. Kritika, Batch 2021, currently pursuing M.Sc. Food Science and Technology from the University of Melbourne, Australia, mentioned that Australian universities require only one examination for admission into itself universities for courses in the biological field. The examination includes IELTS, TOEFL, etc. and the student is required to appear for any one of the examinations and provide the scores for the same. She put forward the importance of maintaining a good grade in graduation and how that helps in aiming towards availing a scholarship. Ms. Riyanshi Joshi who is pursuing D. El. Ed. from DIET, Delhi detailed to the students the examination required to get into the course, the marking scheme, and future prospects of the following course.

Ms. Pallavi is pursuing LLB from the University of Delhi. She gave immensely deep detail related to law entrance examinations like DUET, NLSAT, LSAT, etc. She mentioned the minimum requirements for admission into the Law Department of the University of Delhi, the marking scheme, the cut-off, and the syllabus of the examination. She also highlighted the importance of time management and co-curricular activities. Ms. Raidhani Shome who is pursuing M.Sc. Bioinformatics from Central University, South Bihar, Gaya, gave a brief introduction of the course she is involved in and mentioned the practicability of the learnings from the course. Computer languages like JAVA, C++, PYTHON, etc. are taught in the course and are highly useful for different careers including website designing, program development, etc. She gave details of the examinations, syllabus, marking scheme, and books to refer to for the examinations.

The Alumni Interaction Session with B.Sc. (H) Botany, Batch 21-22, was a huge success and provided a platform for the alumni and current students to interact and share salient information. The event witnessed an influx of queries from the participants and evidently showed the importance of mentorship and guidance. The efforts by the organizing committee and the alumni network were lauded and well-received both by the faculty and the students. The Department of Botany of Gargi College continues to aim for the best provisions for their students so that they make use of the best of their potential. Samavaya envisions a platform for the students to connect with their alumni, be inspired and progress in their lives both personally and professionally.

Glimpses of the event



Intercollege Add-on course on the topic- "Advances in Plant Sciences"

B.Sc. (Hons) Botany and B.Sc. (P) Life Science students for the academic session (2022-2023)

Conveners-Dr. Renu Soni, Dr. Reema Mishra, Dr. Garvita Singh
Organizers-Dr. Preeti Agarwal, Dr. Neha Singh, and Dr. Pritam Kaur

The Department of Botany initiated an inter-college, interdisciplinary add-on course *"Advances in Plant Sciences"* with more than 50 enthusiastic participants from different colleges of the University of Delhi. This course was undertaken with the objective of making students aware of the importance and significance of plant sciences, scope, and advancement in each sub-field of Botany. Research on plants enriches and adds to our knowledge about plant life processes. The study of plants can teach us how to address issues pertaining to agriculture, public health, and the environment. Advancement in Plant Sciences is an important step to cater to the needs of modern times. Since the inception of the course from October (2022) to April (2023), 12 lectures, 2 workshops and 2 virtual trips (details given below) have been conducted by eminent research personalities, from distinguished institutes and universities. The sessions were followed by an evaluation of the knowledge of students through online tests.

Add-on course was initiated with a session by Dr Babita Gaur, Librarian, Gargi college where she talked about plagiarism in academic writing that thoroughly familiarized students with new tools to check plagiarism and importance of unique content in writing research articles and papers. This was followed by a session on the diverse plant groups and their relevance today, taken up by Dr Gita Mathur, former Associate Professor, Gargi College, Delhi University.

The session helped students understand the diversity of life, their divergence from each other, and how relevant their classification into different groups with their significance. The next session was on a vast group, Algae – biodiversity, present research scenario and its relevance in the past, present, and future and it was taken up by Dr Prashant Singh from Banaras Hindu University. Another expert from Kirori Mal College, Delhi University Prof Rajni Gupta led us with the most exhilarating experience and knowledge on group "Fungi". This was followed by a session on Archegoniate and their evolutionary significance and diversification by Prof P L Uniyal, Department of Botany, Delhi University. In a row of sessions, another talk was taken up by add on course organizers - Dr Renu Soni, Dr Reema Mishra and Dr Pritam Kaur elaborating Plant Propagation and Multiplication including cryopreservation technique for biodiversity conservation. Then we got connected with Dr Prashant Kumar Singh from Mizoram University for a very interesting session on Genome and Epigenome Editing in Plants and its influences. Further, Dr Nithaniyal Stalin A from Central Regional Centre, Botanical Survey of India detailed methods and challenges on How To Authenticate Indian Botanicals by DNA Barcoding. Then, Dr. Rita Sharma from BITS Pilani explained about role of Computational Biology, the vast use of bioinformatics approach in Plant Research. This was followed by an interesting session providing Hands-on Workshop on Reference Management and Automation using tools as Mendeley and Zotero, conducted by Dr Dwaipayan Sinha, Paschim Medinipur, West Bengal. Another thrilling and most fulfilling virtual visit to Yamuna Biodiversity Park was guided by Nature Education Officer, Ms Preeti Vohra to Yamuna Biodiversity Park. Next to it was session on Transgenic Technology approach in Basic and Applied Research and introduction of transgenic Brassica to students by Prof. Arun Jagannath, Department of Botany, Delhi University. Once again, a virtual tour and this time to Yakult was taken up by their firm representative. Another aspect to learn under advances in Plant sciences covered Phospholipase- Mediated Lipid Signalling for Stress Tolerance in Plants by Dr. Amarjeet Singh, NIPGR, New Delhi. An aspect to consider and need for an hour session was Solid Waste Management taken up by Dr. Deeksha Dave, Environmental Studies, School of Interdisciplinary and Transdisciplinary Studies, IGNOU, and did complete justice to make young minds understand the importance of segregation and management of solid waste. Further, the most important aspect to nurture and to provide complete guidance to the young buds was the valedictory session on Careers for Biological Science Graduates, and was conducted by Dr. Shashi Tyagi, Former Associate Professor, of Department of Botany, and former Principal of Gargi College, University of Delhi.

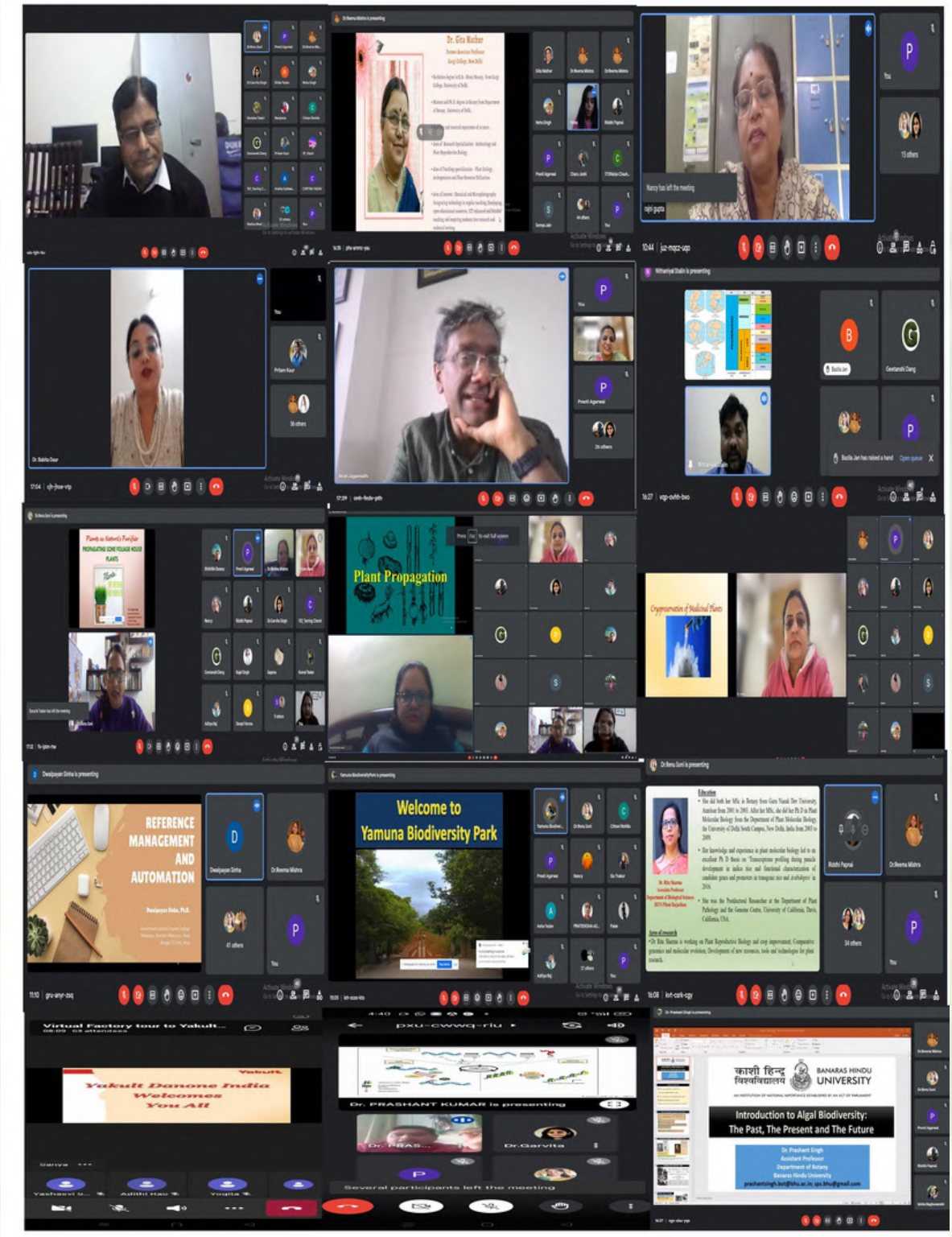
This course witnessed enthusiastic and highly motivated participants from Botany (H) and Life Sciences course from Host institutions, Gargi College, Hindu College, Dyal Singh College, Kalindi College, Maitreyi College, Miranda House College and Ramjas College. For the success of this addon course, we are grateful to our respected Principal madam, Prof Sangeeta Bhatia for her continuous support throughout. We are also thankful to all the teaching and non-teaching staff for continuous guidance and support. Along with the availability and kind support of eminent speakers of the sessions, the consistency and perseverance of student participants led to successful and smooth execution of the add on course.

List of invited speakers of Eminence

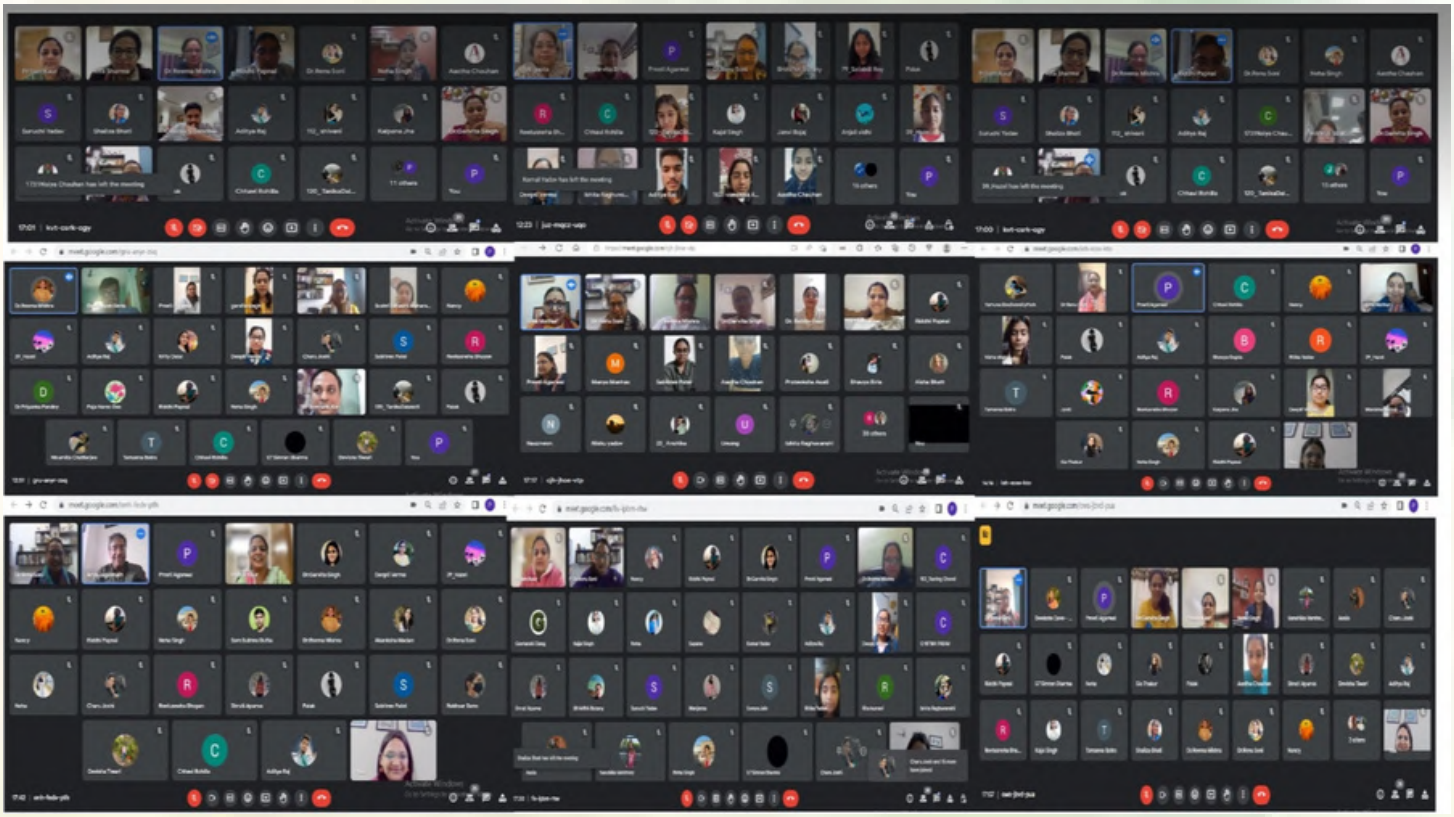
S. No.	DATE OF THE EVENT	SPEAKER	DESIGNATION OF SPEAKER	TOPIC OF THE LECTURE
1.	Oct 28, 2022	Dr. Babita Gaur	Librarian, Gargi College	Plagiarism in academic writing and how to avoid it
2.	Oct 29, 2022	Dr. Gita Mathur	Former Associate Professor, Department of Botany, Gargi College, University of Delhi	Diverse Plant Groups and Their Relevance Today
3.	Nov 12, 2022	Dr. Prashant Singh	Assistant Professor, Department of Botany, Banaras Hindu university	Introduction to Algal Biodiversity: The Past, The Present and The Future
4.	Dec 23, 2022	Prof Rajni Gupta	Professor, Department of Botany, Kirori Mal College, Delhi University	Journey of fungi from lower to higher group
5.	Jan 21, 2023	Prof. Prem Lal Uniyal	Senior Professor, Dept. of Botany, Delhi University	Archegoniates: A System to Understand Evolutionary Diversification
6.	Jan 28, 2023	Dr. Renu Soni, Dr. Reema Mishra, Dr. Pritam Kaur	Assistant Professor, Dept. of Botany, Gargi College, University of Delhi	Plant Propagation and Multiplication for Environment Conservation
7.	Feb 11, 2023	Dr. Prashant Kumar Singh	SERB-SIRE Fellow, Israel; Assistant Professor Dept. of Biotechnology, Mizoram University	Genome and Epigenome Editing in Plants
8.	Feb 25, 2023	Dr. Nithaniyal Stalin A	Central Regional Centre, Botanical Survey of India	How To Authenticate Indian Botanical by DNA Barcoding? Methods and Challenges
9.	Mar 4, 2023	Dr. Rita Sharma	Associate Professor Dept. of Biological Sciences, BITS Pilani, Rajasthan	When Computational Biology meets Botany: Impact of Bioinformatics on Plant Research
10.	Mar 11, 2023	Dr. Dwaipayan Sinha	Assistant Professor, Dept. of Botany, Govt. General Degree College, Mohanpur, Paschim Medinipur, West Bengal	Hands-on Workshop on " Reference Management and Automation (Mendeley and Zotero)
11.	Mar18, 2023	Ms Preeti Vohra	Nature Education Officer, Yamuna Biodiversity Park	Virtual Visit to Yamuna Biodiversity Park
12.	Mar 25, 2023	Prof. Arun Jagannath	Department of Botany, University of Delhi	Transgenic Technology in Basic and Applied Research
13.	April 1, 2023	Yakult Representative	Yakult Danone, Sonepat	Virtual Yakult tour
14.	April 8, 2023	Dr Amarjeet Singh	Scientist-IV, National Institute of Plant Genome Research- NIPGR, New Delhi	Phospholipase-Mediated Lipid Signalling for Stress Tolerance in Plants
15.	April 15, 2023	Dr. Deeksha Dave	Assistant Professor, Environmental Studies, School of Interdisciplinary and Transdisciplinary Studies, IGNOU	Solid Waste Management
16.	April 22, 2023	Dr. Shashi Tyagi	Former Associate Professor, Department of Botany, Gargi College, University of Delhi	Careers for Biological Science Graduates

Glimpses of the event

Glimpses of the event

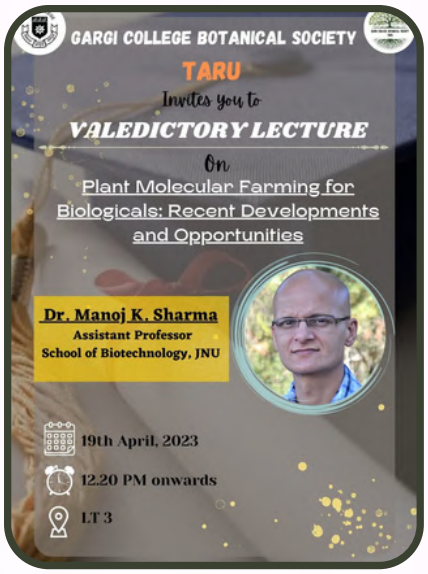


Glimpses of the event



Valedictory Event

Juhi Chobey (Executive Team Member, GCBS)



"As you leave, remember the lessons learned and cherish the memories made."

On April 19th, 2023, the TARU division of Gargi College's Botanical Society held the valedictory lecture entitled "Recent Advancements and Possibilities in Plant Molecular Farming for Biologicals."

Dr. Manoj K. Sharma, an Assistant Professor at the School of Biotechnology at Jawaharlal Nehru University, brought great prestige to the lecture by being the Guest of Honor. The lecture was enlightening and passionate, and both students and faculty members were delighted to attend. The event began with Dishika (Editorial Member, ANTHESIS) and Jyoti (Executive Team Member, GCBS) introducing the GCBS, and its mission and giving a brief of all the events conducted by GCBS in the session 2022-2023. They also extended a warm welcome to our esteemed speaker.

During the lecture, Professor Manoj provided an elaborate account of plant farming and plant genetic engineering, with a particular emphasis on novel products of industrial or therapeutic significance that can be produced through the use of genetic engineering methods. He discussed the two primary methods of gene transformation, stable and transient transformation, and highlighted the economic and ecological benefits of the latter. Professor Manoj also pointed out that transient transformation is more economically feasible and helps to address crucial issues such as ecosystem contamination, which is a significant hurdle to the growth of the genetic sector.

Professor Manoj tackled significant queries related to plant molecular farming, such as product selection, required levels of engineering, species selection, and expression determination. He illustrated his point with the first human biologic produced from a plant called Elelyso, which is a recombinant glucocerebrosidase. He also enlightened the audience about various companies active in this sector, such as Plant Biotics, Medico, and Icon Genetics. In addition, he discussed the advantages and importance of plant genetic engineering and clarified the critical issues surrounding the use of animal-based vectors versus plant-based vectors.

The session concluded with Dr. Leisan Judith (Faculty Advisor, GCBS) expressing her gratitude in a vote of thanks. She conveyed her heartfelt appreciation to the entire GCBS-ANTHESIS team for organizing a series of successful events throughout the year and thanked them for their hard work. Subsequently, a photo session was conducted to commemorate the last valedictory event for the academic year 2022-2023.

Glimpses of the event

VERDANT GREEN

TRAVERSING THROUGH TERRAIN

SEGEMENT I

ANTHESIS 2022-23

Dr. Gita Mathur
Superannuated Teacher
Department of Botany

Plants are Intelligent Planners

All living organisms have their own strategies to survive. Do plants also have their strategies for survival? Can plants think and plan how to dominate others? Can they survive under unfavorable conditions? Can plants make other organisms work for them? Plants do not have a brain but still manage to survive in all kinds of conditions, while we need to teach and train our children to handle different situations. We have a lot to learn from our green-friendly neighbors. The recent Covid pandemic has made us realize how difficult life becomes if we are not able to move around, plants are always rooted in one place, so let us try to see how plants plan a life without moving around.

NUTRIENTS 'SUPPLY NETWORK' OF PLANTS

The most difficult task during the lockdown phase was getting supplies of fruits, vegetables, medicines, and daily provisions. We can say that plants being autotrophs, make their food from carbon dioxide and water in presence of sunlight by photosynthesis. This is only carbohydrates, what about the minerals known to be essential?

It is interesting to know that plants have a network for "home delivery" of nutrient supplies too. This is in the form of thread-like branched hyphae of soil fungi, forming the mycelium. The thread-like hyphae surround the roots forming mycorrhizal associations or as VAM fungi, the spore-producing bodies of some of these are mushrooms. The fungal network in the soil is massive, it transports minerals from one place to another over long distances, to all the plants.

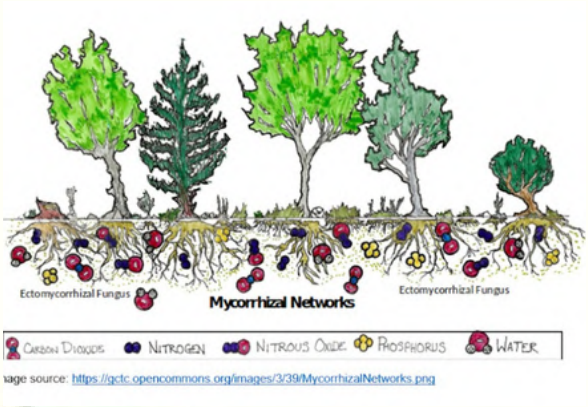


Image source: https://gctc.opencommons.org/images/3/39/MycorrhizalNetworks.png

When we grow plants in pots, they need fertilizers and manure because there is no connectivity with the fungal supply network. What a master plan for survival and growth.

Also note here, that the soil fungi release spores for dispersal through the formation of mushrooms which come out of the soil and release the spores in the air to be carried away with the slightest of breeze.

HEAVY POLLEN PRODUCTION FOR WIND POLLINATION

Most of the grasses including wheat, rice and maize, and cone-bearing plants (Conifers) are pollinated by wind. For wind to carry pollen grains in all directions these plants produce copious amounts of pollen so that some reach the receptive stigmas of the same species. Excessive pollen is needed as a lot of it is lost when it falls on various surfaces as well as stigmas of other species. Plants must 'plan' how much of pollen grain production is necessary for the survival of the species.

Image source-
https://paleofoundation.com/health-in-our-backyard-pine-pollen-benefits/

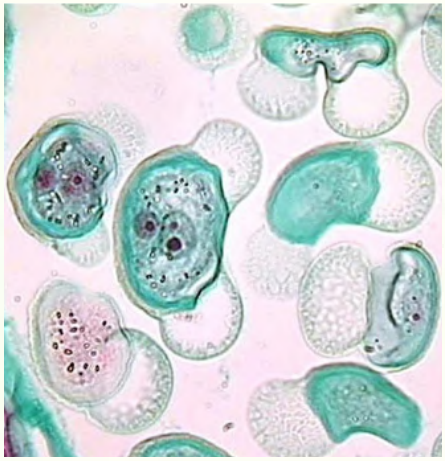


Image source-
Microphotograph by Dr. Gita Mathur.
Winged Pollen of *Pinus*

Pollen must be dry, to be carried with the wind. Pinus (chir) and Cedrus (deodar) release heavy amounts of the yellow pollen grain, this is seen as 'sulphur shower'. How do insect-pollinated plants produce sticky pollen to adhere to the body of the insects and wind-pollinated plants produce light and dry pollen? Chir pine pollen even has wings for floating in the air.... amazing how plants can plan which type and how much pollen to produce. They must be great planners!

Image source- **Dr. Gita Mathur**
Banana plant showing younger entire erect leaves above and older dissected, wind torn, drooping leaves below

LEAF TEARING IN BANANA

Another interesting example is the lamina of the banana leaf. Being a monocot plant, it has parallel veins, young leaves are with entire lamina but older leaves growing in windy places get torn along the veins. As the so-called stem of a banana is made of leaf sheaths and not wood, the plant would fall on a windy day, but leaves get torn allowing wind to pass through. What a wonderful planning!
Botanists call them adaptations and study them extensively in hydrophytes and xerophytes, but the question to think about is, how do plants decide what the adaptation should be? They do some 'planning' for sure!

LOCATION OF STOMACH IN FLOATING LEAVES

In aquatic plants with floating leaves, stomata develop on the upper side of the leaf unlike on the lower side as seen in most dicot land plants. How do plants decide which surface will be in contact with air for the exchange of gasses? Think! In many monocots like grasses with erect leaves, stomata are found on both upper and lower surfaces.

Image source- **Dr. Gita Mathur**
Floating leaf of Giant Water Lily growing in JNTBGRI, Kerala.

FORMATION OF SOFT TISSUE IN WOOD OF CLIMBERS

We study about anomalous secondary growth in woody climbers. In stem cross-section under the microscope, we see softer tissue of phloem which differentiates as phloem wedges (in Bignoniaceae) or phloem patches (in Salvadora), inside the hard xylem/ woody tissue. This gives flexibility to the climbing stem. The point to note here is how does the growing stem know when and how much of softer tissue to develop for the stem to be able to turn around an external support? How does a cambium cell know where and how much softer phloem tissue to produce. How does this planned differentiation of tissues occur?

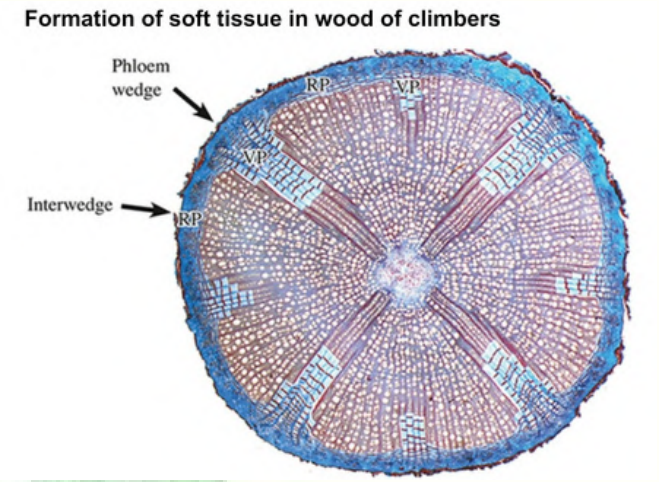


Image source- American Journal of Botany, Volume: 98, Issue: 4, Pages: 602-618, First published: 01 April 2011, DOI: (10.3732/ajb.1000269)

The phloem wedges seen in the image become narrow on the side near the support and broader on the opposite side, ensuring bending of the hard woody stem.

MIMICRY IN MUSHROOMS AND FLOWERS

Mimicry is seen in numerous insects which may look like a leaf, a stick, or some poisonous animals because they can see and respond but mimicry in mushrooms when they look just like poisonous ones is not explainable as they cannot see and adapt.

Image source- https://en.wikipedia.org/wiki/Amanita_muscaria
Poisonous mushroom *Amanita muscaria*. Some non-poisonous mushrooms mimic this to prevent predation.

Orchid flower Ophrys speculum not only appears like female of the insect but even produces chemicals that smell like the female insect which attracts the male insect for pseudo copulation as an adaptation for pollination. It is an unbelievable case of planning by the plant without seeing the insect or smelling it, the shape, colour and odour producing chemicals are produced, remaining fixed to the soil in one place.

Image source- https://commons.wikimedia.org/wiki/File:Ophrys_speculum_(flower_detail).jpg
Orchid flower *Ophrys speculum* which looks like a female insect.

DOMESTICATED PLANTS OR DOMESTICATED HUMAN BEINGS

We know that success of any species is determined by the number of progenies it produces and the land area that it spreads to. We talk about DOMESTICATED PLANTS, the crops grown for cereals, vegetables, fruits, legumes, spices, oils, flavoring agents, fodder and many more. But I would like to look at this from the viewpoint of plants. I feel that WE have been "domesticated" by PLANTS, because plants are making us grow them in large numbers.

For the plants that we need, we are cutting down forests, reclaiming wastelands, doing extensive research to modify plant varieties which can be grown in all types of climatic and edaphic conditions. Also developing high yielding plants. Basically, we are working for the plants to make them get established and to grow well.

We are finding methods of protecting plants from herbivores as well as pathogens. We even spread the plant's world over, something they could not have achieved on their own. If plants are making us do so much for their dispersal, survival, and production in large numbers, are they not using us? All food on earth comes from plants, except for some bacteria, every organism depends on plants for food. A glance at food webs and food chains supports this fact further. So, that is the "payment" the plants are giving us for all the "services" we give to plants. Does this not imply that plants are intelligent! They are certainly great planners.



Image source- Dr. Gita Mathur

Mankind has worked towards growing and spreading economically important plants like wheat, mustard and tea. See their massive monoculture as fields. Right from sowing to harvesting, all the requirements are taken care of by us. Plants are using us for sure and repaying as produce or yield.

Image source- Dr. Gita Mathur

See the amount of effort involved in collecting our "payments". This photo shows threshing in process of rice after harvest in Sirinagar.



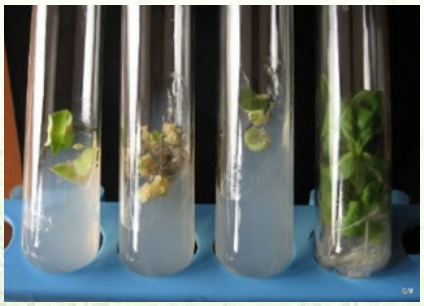


Image source- Dr. Gita Mathur

Glimpses of science and technology inputs for the development of new varieties of crop plants.

SURVIVAL STRATEGIES OF WEEDS

Weeds are wild plants which have strong survival strategies. Water hyacinth, the floating weed can produce a new plant by regeneration of even a small piece of the plant. It grows well on polluted waters and can remove toxins from the water. As seed set is very low in this plant it has developed the strategy of vegetative propagation for rapid growth. Floating in streams, drains and rivers the plant breaks and every piece regenerates to produce new plants.

Lantana, a bushy weed grows more vigorously if it is cut. Butterflies and small insects called thrips visit it for nutrients. Butterflies get nectar by using their long proboscis. Thrips go inside the corolla tube consume the sugar rich stigmatic extract and carry pollen on their body to the next flower and bring about pollination. Lantana has high seed production and seeds are dispersed by birds who eat the fruits, seeds come out with bird droppings and grow in the organic matter or in other words, as in manure enriched bird droppings. Wonderful plan for pollination and to disperse seeds and ensure the survival of new plants. We can see that plants have deployed numerous other organisms to work for them. All the pollinators whether non-specific ones like bees and butterflies or specific pollinators like fig-wasps, are rendering their service to plants. Nutrients are available in small amounts to ensure pollinators to visit many flowers.

Image (a)

Image (b)

Image (c)

Image (d)

Image Source- Dr. Gita Mathur

Image (a) & (b)- Water Hyacinth plants covering a lake in Bengaluru and a closeup of the plant with leaves having bulbous petiole for floating and flat lamina.

Image (c) & (d)- *Lantana camara*: Inflorescences of beautiful flowers attract butterflies and Thrips and fruits are eaten by Common Myna for seed dispersal.

Plants are unique living examples of awesome phenomenon in Nature. "Never did logic say one thing and Nature say another". Out of the box thinking about various observations in plants can lead to a whole new perspective. Many aspects related to their social interactions with other plants, fungi and the animal world are not explainable, indicating that there is more to their actions.

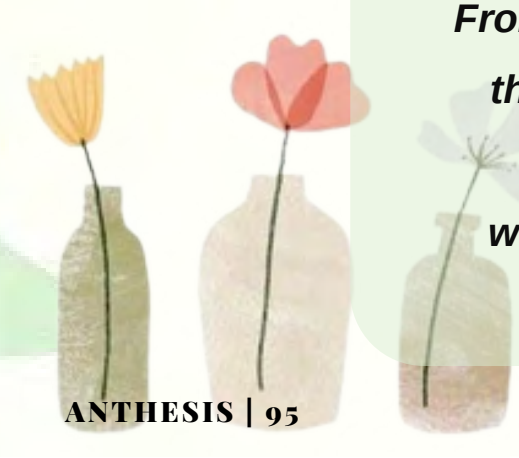
Let us observe plants around us for more of such phenomenon and look at them with respect as they seem to be intelligent too!

Plants do exhibit very special survival strategies which seem to be very well planned.

The gentle sway of leaves in the breeze, The vibrant colors of petals and leaves, A wonderland of life in each seed, A world of beauty for us to feed.

From humble beginnings in the soil, To towering giants that capture our toil, Plants sustain us in so many ways, And add to our lives in every phase.

The mysteries of plant life are vast, From pollination to photosynthesis, they last, And we are blessed to share this Earth, With such a wonderful and diverse botanical worth.



Devyani Dwivedi
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Enigmas Naturales: Nature's Greatest Mysteries

Before the advent of conspicuous reasons, nature had been dumbfounded because of its not-so-obvious mysteries. Science and technology have straightened out many of these 'question marks'. However, a lot of them are yet to be answered. These have been termed as 'mother nature's great mysteries' due to their inefficacy. A few such mysteries have been discussed in this article.

The 'Crooked Forest' in Poland is one of them. Some characteristics that define pine trees include long needle-shaped leaves, and whorls of horizontal branches with round flat, or spreading crowns. However, the pine trees of a forest in Poland are far from these characters. The Crooked Forest in Poland is an eerie forest that remains a mystery to date because of its oddly shaped pine trees. The forest consists of 400 pine trees that grow at a sharp 90-degree angle on emerging from the ground and then curve upwards like normal trees.

Many researchers have tried to explain this phenomenon giving several reasons. Some said that the gravitational pull in this area of Poland has a unique gravitational pull due to which the trees have an abnormal ascent. However, this idea was dismissed rather quickly. Others suggested that due to the area being subjected to heavy snowfall, the trees were weighed down causing a curve in the growth of trees before their ascent. But other trees in the same area did not show this distinction.

The most widespread theory of them all was that the farmers manipulated the trees when they were 7- to 10-year-olds. This force resulted in the curvature. The real reason has been dead and buried with the World War survivors. Thus, a single reason has not been adopted for the occurrence of these trees and they remain a mystery to us.

Image source-
https://discovery.sndimg.com/content/dam/images/discovery/fullset/2020/3/4/CrookedTree2_Getty.jpg.rend.hgtvcom.406.406.suffix/1583342444531.jpeg

One of the most beautiful yet peculiar lakes in the world is 'Lake Hiller' in Australia. Lake Hillier is a saltwater lake about 600 meters wide. It is one of the cleanest lakes due to the lack of polluting elements. The mesmerizing pink-colored lake is separated from the blue ocean by a narrow strip of land covered with Melaleuca, a plant in Australia.

Image source-
https://www.google.com/imgres?imgurl=https%3A%2F%2Fcdn.hswstatic.com%2Fgif%2FFlipboard-pic-replacement---pink-lake-1600x900.jpg&imgrefurl=https%3A%2F%2Fscience.howstuffworks.com%2Flife%2Fcellular-microscopic%2Faustralia-pink-lakes.htm&tbnid=XIob36WmaDWLxM&vet=12ahUKEwjWg72a8Zn8AhXtyXMBHVLZBvAQMygFegUIARDWAQ..i&docid=brYO2oo6Epb5wM&w=1600&h=900&q=pink%20lake%20hillier&ved=2ahUKEwjWg72a8Zn8AhXtyXMBHVLZBvAQMygFegUIARDWAQ

Many scientists have provided different reasons for the occurrence of pink colour. Some suggested that carotenoid-rich seaweed belonging to the species Dunaliella provides this pink colour. It's also thought that some microorganisms like bacteria present on the surface of the lake provide this colour. However, none of these facts have been accepted as the reason for the pink-colored lake.

Image source-
https://www.google.com/imgres?imgurl=https%3A%2F%2Fwp-assets.futurism.com%2F2015%2F04%2Fstarjelly-2.jpg&imgrefurl=https%3A%2F%2Ffuturism.com%2Fstrange-unexplained-things-science-star-jelly&tbnid=im_U1kjY1ITD5M&vet=12ahUKEwiwpOybpZr8AhUQyaACHWciCCkQMygEegQIARB-..i&docid=_Ak7_kLuQ8TH3M&w=400&h=225&q=star%20jelly%20mystery&ved=2ahUKEwiwpOybpZr8AhUQyaACHWciCCkQMygEegQIARB-

Another one of these other spectral things on the planet is the 'Star Jelly' in Scotland. Star jelly is a gelatinous substance, greyish-white or translucent in colour. It looks like globs of aloe vera. According to observers, this block of gelatinous substance often disappears eventually. Many theories have been proposed by such witnesses. Some of them stated this clump to be a communication medium from the dead. Some said it is a kind of fungus, excrement of frogs, toads, or worms. Others implied it is a remnant of meteor showers. Regardless, none of the theories are widely accepted.

The final and the most riveting enigma is the ‘Paradox of the Phytoplankton’. According to the Competitive Exclusion Principle also called Gause’s law, two species competing for the same limited resources cannot coexist stably. One of the species will dominate over the other, no matter how minor, and drive it to extinction. Planktons, however, seem to be exempted from this rule. According to this paradox, at any given time, 10 to 100 phytoplankton are always present in a lake. Many hypotheses attempting to solve the paradox have been given. Nonetheless, a single answer is required that will solve the paradox.

Image source-
https://www.toptenz.net/wp-content/uploads/2021/10/plankton-768x512.jpg

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"The clearest way into the universe is through a forest wilderness." - John Muir

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Socotra: The Otherworldly Setting

In the dawn of the internet, it takes a simple click to wander into a different part of the world. During one of my daily doses of the internet, I stumbled upon the beautiful island called Socotra. It is an archipelago island under the Republic of Yemen, stranded in the Arabian Sea, southeast of Yemen. The total mass land cover is 250 km, comprising four islands and two scars. Socotra is often annotated as "the alien island" due to its unnatural view, and in 2008, UNESCO recognized Socotra as a natural world heritage.

The name, Socotra, can be traced back to a Sanskrit syllable- '*dvip-sakhadara*', which translates to 'island adobe of bliss', and true to its name, it is a bewitching archipelago. Owning to its long geographical isolation (approx. 25 million years) from the mainland, the island has some very alien topography. Of the total 825 plant species found in Socotra, 307 (37%) are considered endemic. Many species of plants are well adapted to the climate of islands- arid mountains, limestone plateaus, and coastal plains.
Some of the highlighted plant species include:

1. Dragons blood tree: (*Dracaena cinnabari*)

It is an endangered species with unique habits. It exhibits dichotomous branching with all the branches facing upward, shaped similarly to a mushroom or umbrella.

It can grow up to 18 meters tall & 6 meters wide. The tree is recorded to have a very long life expectancy, around 650 years. The plant also bleeds red when truncated. The red substance is the red resin which contains the substance called Draco which has high medicinal value (gastrointestinal conditions) and, is also used in other industries like varnishing and fabric. The tree also produces a very expensive honey called red honey /dragon blood honey. Locally they are called brother blood trees about the story of Cain and Abel from the Old Testament. According to Yemeni mythology, Cain and Abel were the first people to settle on the island of Socotra, and after Cain killed his brother, Abel, Abel's blood gave rise to a dragon blood tree.

Image source- https://www.bibalex.org/SCIplanet/en/Article/Details.aspx?id=13628

Dragons blood tree

2. Desert rose: (*Adenium socotranum*)/Socotra rose /Socotra bottle tree

It is considered to be the largest member of the Adenium genus. It is a slow-growing succulent tree. It exhibits a stout trunk with short branches, and depending upon the local wind pattern, vegetation forms differ in the wild. It blooms pink-tinted flowers at the tip of the plant. The tree goes by two names in the Socotri language: time in the eastern regions and finds or aid in the center and western regions; the latter word means "useless" or "without value."

They are found widespread on the plains and limestone plateau of Socotra and are well adapted to the arid condition of the island. They are characterized by the early formation of the caudex and thin waxy small leaves.

The white sap of the tree has large medical uses, including skin diseases and injuries. They are cultivated worldwide for ornamental use.

Image source- https://www.google.com/url?sa=i&url=https%3A%2F%2Fwww.istockphoto.com%2Fphotos%2Fdesert-rose-socotra&psig=AOvVaw1TFouPvGdm_-2Uhn4Pfoqe&ust=1674505794660000&source=images&cd=vfe&ved=0CA8QjRxqFwoTCJCA-amC3PwCFQAAAAAdAAAAABAE

Socotra rose /Socotra bottle tree

Image source- https://upload.wikimedia.org/wikipedia/commons/thumb/1/1c/Desert_Rose_Bottle_Tree%2C_Socotra_Island_%2815534436912%29.jpg/411px-Desert_Rose_Bottle_Tree%2C_Socotra_Island_%2815534436912%29.jpg

Cucumber tree: (*Dendrosicyos socotronus)*

3. Cucumber tree: (Dendrosicyos socotronus)

It is a perennial succulent tree characterized by its bloated trunk (exhibits a high degree of pachycauly). The genus is an old lineage of Cucurbitaceae [progenitor lineage], which is extinct from the rest of the globe. It is the only species under Cucurbitaceae that show tree habit. They are generally used by natives for traditional medical practice and as animal feeders during drought times.

The archipelago of Socotra also displays elevated biodiversity and endemism in the reptiles (90%) and snails (95%) population. It has great global importance due to its high biodiversity and endemism. In recent years the Socotra has faced many complications including political distress, invasive species, climate change, encroachment, etc. Many efforts from both native and international organizations are made in the conservation of the paradise.

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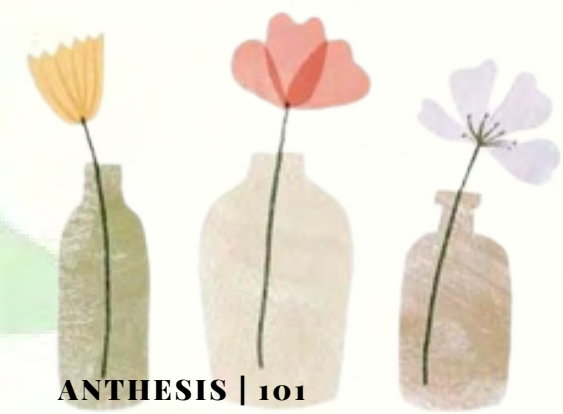

Shruti Apurva
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What makes Nature Colourful?

The world we live in is magnificent. It is filled with aspects that contribute to its aesthetics. Colours play the most crucial role in making this earth exquisite.

Colour is the property possessed by an object to produce different sensations in the eye due to the way it reflects or emits light. But what is the factor involved in making different objects appear of a different colour?

For plants, this factor is known as "pigments" which are coloured molecules involved in plant metabolism. In plants, there are four major pigments- Carotenoids(Yellow, Orange, Red), Anthocyanins (Red, Blue, Purple), Chlorophylls (Green), and Betalains (Red).

From a commercial point of view, Carotenoids are the most important group of pigments. It is responsible for their yellow, bright red, and orange colours are carotenoids that play a key role in plant health and are compounds that are composed of a 40-carbon skeleton of isoprene units covalently linked together giving them multiple conjugated double bonds. Although animals cannot synthesize carotenoids, some animal foods contain carotenoids, these molecules are then absorbed, deposited, and modified in the animal tissue. For example, the yellow color of yolks is due to carotenoids. The role of these plant pigments is not just limited only in providing fascinating colours to plants but plays major roles in the physiology of plants. For example, they are involved in controlling photosynthesis, growth, and development of plants and also protect plants from damage caused by UV and visible light.

These plant pigments and their colouration works in a very interesting way. Basically, it is the pigment's interaction with the sunlight which determines its colouration. White light, like sunlight, contains the range of wavelengths visible to the human eye, called the visible spectrum. When white light is refracted through a prism, the visible spectrum is broken down into a rainbow of rays from red to violet. In the case of the plant pigment Chlorophyll, pigments absorb at the outer edges of the spectrum, such as reds, oranges, blues, and violets. Green and yellow wavelengths in the middle of the spectrum are not absorbed but are reflected by plants. This reflection makes plants with chlorophyll appear green to the human eye. Plants of various colors contain other pigments such as anthocyanins, which are responsible for their red and purple colors. Anthoxanthin that reflects yellow. A carotenoid that reflects yellow, orange, or red.

There are many sophisticated uses of light that go well beyond the ability to photosynthesize low molecular weight sugars using only carbon dioxide, light, and water. Photomorphogenesis is the growth and development of plants in response to light. This allows plants to optimize their use of light and space. Photoperiodism is the ability to track time using light. Perception of light in the environment is important for plants. It is very important for competition and survival. The response of plants to light is mediated by a variety of photoreceptors consisting of proteins covalently attached to light-absorbing pigments called chromophores. Together, these two are called chromoproteins.

The red/far-red and violet-blue regions of the visible light spectrum cause structural development in plants.

Image source - https://tse2.mm.bing.net/th?id=OIP.mEFMmui65j9q4WypA6wz2QHaE7&pid=Api&P=0

Image source- https://tse2.mm.bing.net/th?id=OIP.dLynFvKpLIpHHwOxF7JF6AHaE8&pid=Api&P=0

Image source- https://tse2.mm.bing.net/th?id=OIP.Y38f8_TKjWCxdxXEDOOFggHaEo&pid=Api&P=0

Sensory photoreceptors absorb light in these specific regions of the visible light spectrum due to the quality of light available in the daylight spectrum. In terrestrial habitats, light absorption by chlorophyll peaks in the blue and red regions of the spectrum. When light is filtered through the canopy and blue and red wavelengths are absorbed, the spectrum shifts to the far-red end, shifting the plant community towards plants better suited to respond to far-red light. Blue photoreceptors enable plants to sense the direction and amount of sunlight, which is rich in blue-green radiation. Water absorbs red light, so blue light detection is essential for algae and aquatic plants.

But it's not just the plant that glamorizes the earth we see a variety of animals that add colours to our surroundings. This colouration is produced by physical and chemical means. Physical coloring is caused by surface engraving on the body. A light beam striking this surface is refracted and split into its component beams. Chemical coloring is primarily due to the presence of pigments. Chameleons have specialized cells called iridophores, which help them to change their colour in accordance with their surrounding object. These iridophores contain pigments and nanocrystals that reflect different wavelengths of light. Chameleons change color by stimulating or relaxing their skin changing the density of the upper layer of iridophores. The Earth is filled with fascinating phenomena which makes it one of the most bewitching planets in this universe. There are innumerable things that make this earth astonishing and extraordinary that cannot be contained in one article. I hope this article impelled you to understand the beauty around you and motivated you to preserve it for future generations.

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2nd year

Life in the Extreme: Unravelling the Enigmas of the Mariana Trench

"This world is a scary place" We have heard this sentence many times from our elders, and this is the truth because, on this planet, only strong predators of the food cycle can survive. Researchers know about most of the food web existing on land and under the water, but what about the horrifying predators present under the deepest water body of earth, " The Mariana Trench"?

A long, steep-sided valley on the ocean floor is called a trench, and the Mariana Trench is the deepest oceanic trench known to men. It is crescent-shaped and measures about 2,550km in length and 69km in width. It is located in the western Pacific Ocean. Its name originated from the Mariana Islands which is present in its west.

The ocean floor at such depth consists of a type of pelagic sediment known as biogenous "ooze". Biogenic pelagic sediment is composed of shells of different microscopic plankton, both zooplankton, and phytoplankton. Under the harsh environment of the Mariana Trench, there are different types of animals and plants surviving that have adapted to extreme hydrostatic pressure, lack of sunlight and oxygen, food limitation, and low temperature.

A study published by some Chinese researchers, Nature Ecology and Evolution, examined the anatomy and genetics of the fish found here. The deepest dwelling fish is the hadal snailfish and the first fish from the extreme ocean to get its gene sequenced. The genetics behind the organisms with such adaptations gives an evolutionary basis for the closest relative in shallow water bodies.

Most fishes have a skeleton made up of bones, but here it is cartilaginous because the primary gene responsible for calcification (formation of calcium) has a mutation in it which help them bear the bone-crushing pressure of deep sea and cartilage is much more flexible than bones.

Here, we can see that *Macropinna* has a gap in its skull with fluid-filled in it and is essential for balancing internal and external pressure.

Like other deep-sea fishes, it's almost motionless, and the most genes available for sensing lights are inactive, making them almost blind and suitable for sunlight lacking. They have a high number of fatty acids (making their cell membrane flexible), proteins (responsible for the transportation of minerals), and piezometers than fishes in other water bodies. Piezolytes like Trimethylamine N-oxide (TMAO) and is the most abundant in their cellular response to hostile hydrostatic pressure.

https://factanimal.com/wp-content/uploads/2022/05/barreleye-fish-facts.jpg

Scientific Name: *Macropinna microstoma*

Family: Opisthoproctidea

Discovery: W.M. Chapman, 1939

https://www.outlookindia.com/outlooktraveller/public/uploads/filemanager/images/Frilled_shark_head2.jpg

Scientific Name: *Chlamydoselachus anguineus*

Family: Chlamydoselachidae

Discovery: Samuel German,1884

https://thefisheriesblog.files.wordpress.com/2014/12/loosejaw2.jpg

Scientific name: *Malacosteus niger*

Family: Stomiidea

Discovery: Ayres, 18485

https://neuromag.files.wordpress.com/2016/09/deep-sea-fish.jpg?w=500&resize=500%2C331

Scientific name: *Lophius*

Family: still is in debate

Discovery: 2008

To survive in the deepest point of the earth without light, some of the fishes living here produce light by enzyme-catalyzed reactions in the cells, and this phenomenon is known as bioluminescence. Since light with short wavelengths travels farthest and light with long wavelengths is absorbed in the ocean, therefore most of them emit blue light with their eyes showing sensitivity to the colour.

However, dragonfish hunts using red light since most of the fishes are unable to perceive red light. The eyes of such deep-sea fishes have chlorophyll-based visual systems, and there are several different hypotheses for the presence of bacteriochlorophyll in their eyes.

An environment that is not suitable for the growth of well-developed plants still has many scopes for revelation. It is the home for different newly found nightmarish fishes and plastic pollutants. Yes! Pollution has found its way here, and it has been suggested as nuclear waste disposal site as well. Now, it depends on us if we want to explore it more or let the secrets buried with it.

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"Nature is not a place to visit. It is home." - Gary Snyder

Neha Kaswan
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Microbes: The Hidden Masters of the Environment

Stewart Brand — " If you don't like bacteria, you're on the wrong planet ".

The environment is a broad term that comprises the surrounding. The air that one breathes, the land on which one lives, the water one drinks, and all living and non-living things that are part of the surroundings are referred to as the environment. A microorganism is an organism of microscopic size, which may exist in its single-celled form or as a colony of cells including fungi, bacteria, and viruses.

Within the environment, microorganisms are also present. "Microbes run the world. It's that simple". Microorganisms make the essential elements of oxygen, carbon, nitrogen, and sulfur available for other life on the planet. Without decomposing microbes, life would be smothered in dead organisms. Microorganisms are responsible for half of the photosynthesis on earth, resulting in an increase in oxygen levels and a decrease in carbon dioxide levels. Plants as well as animals are intimately related to microbial communities, which help in making essential vitamins and providing protection against diseases. Take an example of the human body, it hosts 10 microbes for every human cell. These microorganisms contribute to various organ systems like the digestive system, and immune system and detoxify harmful chemicals. And microbes are also used to make various food items like bread, cheese, wine, etc.

Microorganisms are omnipresent. One can think of microbes beyond the world in which we all live (i.e., from Earth to space). Microbes are an integral part of biogeochemical cycles which are crucial for our survival as species. Microbes basically act as environmental protectors and have the foremost importance in the present-day life of mankind. The microbes present in soil have the potential for biodegradation, bioleaching, bio composting, nitrogen fixation, improving soil fertility, and as well as in the production of plant growth hormones. Microorganisms found in soil improve agricultural productivity.

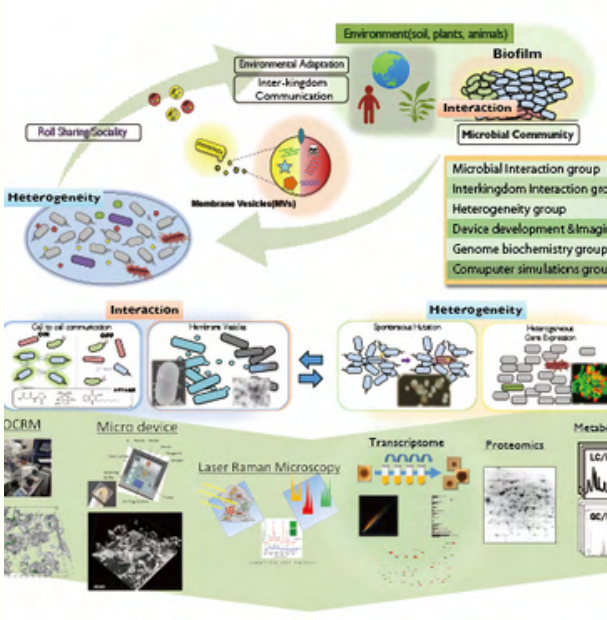

Image source - https://www.jst.go.jp/erato/nomura/images/outline_en.png

Men use naturally occurring organisms to develop biofertilizers and biopesticides to assist plant growth and control weeds, pests, and diseases. Microorganisms that inhabit the soil help plants to absorb more nutrients. Plants and these microbes partake in the process of nutrient recycling. These microbes assist the plant to capture important energy sources. In return, plants donate their waste by-product for microbes to use for food. Rhizobium is a bacteria that is used in manufacturing biofertilizers. Another example is that of a fungus named Penicillium billion which helps in unlocking phosphate from the soil.

Image source- https://www.news-medical.net/life-sciences/Using-microorganisms-to-treat-cancer.aspx

Interactions between microorganisms and between microorganisms and plants can enhance our understanding of how we can utilize nature's useful microbiological resources to combat plant pathogens and as manufacturers of pharmaceuticals (e.g., antimicrobial, antiviral, antioxidant, anticancer). Bioremediation is a biotechnical process, which subsides contamination. Microorganisms like Bacteria and Fungi are the main role players when it comes to executing the process of bioremediation.

Image source- https://www.nchasia.com/en-in/nch-insights/industry-news/the-role-of-microorganisms-in-wastewater-treatment

Bacteria are the most pivotal microbes in this process because they decompose the waste into organic matter and nutrients. Some habitats like the cactus community in the Sonoran Desert, rely on nitrogen-fixing bacteria at the base of the food chain as the source of nitrogen for the maintenance of cell material. Every plant in this process ultimately depends on biological nitrogen fixation. The cyanobacterium, Synechococcus, is a primary component of marine and freshwater plankton and microbial mats, the unicellular prokaryote is involved in primary production, nitrogen fixation, and oxygenic photosynthesis and thereby participates in the cycles of oxygen, nitrogen, and carbon. Synechococcus is estimated to be one of the most essential photosynthetic bacteria in marine environments, approximated to account for about 25 percent of the primary production occurring in typical marine habitats. The effects of microbes on their environment can be beneficial or harmful or inappropriate with regard to human measure or observation.

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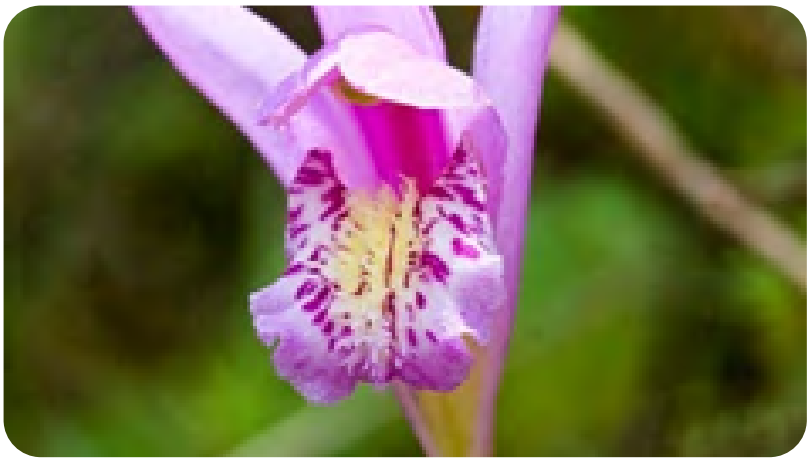
"The earth is what we all have in common." - Wendell Berry

SEGMENT FINALE

Enchanting Blossoms of Orchidaceae Family

Dragon's Mouth Orchid
Arethusa bulbosa

Anshita Bhatnagar, Co-editor, ANTHESIS



***Arethusa bulbosa*, also known as the dragon's mouth orchid, is the only species in the *Arethusa* genus. The quintessence behind its genus name is related to Greek mythology's naiad i.e., an ethereal female spirit. The literal name of the species is derived from Latin meaning 'bearing bulbs' owing to the presence of pseudobulbs in the said species. It is famously known as the dragon's mouth orchid because of its flower's congruence to that of an open mouth of a dragon.**

It is a terrestrial plant and grows up to a height of 2–40 cm. It usually resides in boggy and acidic regions. The plant prefers shaded areas and will often grow in thick clusters, creating a visually striking display. It bears beautiful and vibrant terminal pinkish-purple flowers and has a sweet fragrance that adds to its resplendent beauty. The flowering season for this species is typically in the spring. Its residence is usually only restricted to eastern North America. It is not correct to think that this plant is celebrated only for its beauty because recently it has been found that *Arethusa* was used to ameliorate toothache by early Americans.

The pollination in this plant is accomplished by entomophily i.e., pollination with the help of insects. Their usual pollinators are bumblebees. It has been discovered that this plant offers no reward to the pollinators and achieves the task by deceiving the pollinators into thinking they will receive the reward (nectar).

'The only downside to its eloquent beauty is its collection by humans. *Arethusa* bulbosa is regarded as an 'endangered species and is listed as critically imperiled' in North Carolina. As a result, it is important to observe proper conservation measures, such as not collecting or harvesting wild specimens, to ensure the continued survival of this unique and beautiful plant.

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Lady's Slipper Orchids *Cypripedium calceolus*

Ananya Tomar, Co-editor, ANTHESIS

Among all hardy orchids, Lady's slipper orchids (*Cypripedium calceolus*) are among the most sought-after. These rhizomatous perennials, which are frequently vivid and eye-catching, have a characteristic inflated pouch or modified lip (labellum) that mimics a slipper or shoe, hence the name. Other than its physical appearance, there's a beautiful story behind its name. And not just any story, but a beautiful love story. The myths of ancient Greece are the story's source. According to a flower legend, the goddess Aphrodite (Venus to the Romans) and the dashing mortal Adonis were out hunting when a strong storm forced them to seek shelter together in a cave. Love followed. After the storm, the lovers fled, leaving Venus without a slipper. As a mortal human came upon the shoe and bent down to pick it up, it suddenly and mysteriously changed into a flower with a golden petal in the shape of a slipper. Linnaeus (Carl von Linné) himself gave the lady's slipper orchid its lovely binomial (two-part) Latin name, *Cypripedium calceolus* when he included it in 'Species Plantarum' in 1753. The great botanist packed a lot of symbolism into that name: *calceolus* means "little shoe," pilon is the Greek word for "slipper," and Cyprus was the sacred island where Venus was born. The lady's slipper orchid is a native of a sizable portion of the temperate world, ranging from Asia to Europe. The orchid is still widespread in some wild locations, but because of over-adoration in other places due to its beauty, it is currently thought to be extinct in Greece, the land of its legendary antiquity.

Depending on the species, the slipper may be fairly little or as big as an egg. Insects trapped in the pouch are compelled to crawl under the anther as they emerge, transferring pollen to the stigma in the process. The three long, twisted petals and labellum frequently have different colors on them.

In addition to increasing demand for exotic plants from across the world, the flower craze that swept through Britain in the late 19th and early 20th century also had a negative impact on the native plants of the English countryside. Since the 1980s, only one native lady's slipper orchid plant has survived in the wild across the entire nation due to habitat loss and excessive human collection. It was given last-ditch protection and fostered until it grew strong and eventually bloomed. Its seeds were saved and delivered to Kew's Royal Botanic Gardens, where a conservation initiative was launched. Eventually, the difficult-to-germinate seeds germinated. *Cypripedium* species have long been prized for both their beauty and the pharmaceutical industry (often utilized as a milder alternative to Valerian). Sadly, because of their declining natural habitat and widespread collection, numerous species in both America and Europe are on the verge of extinction. In some areas where it is now forbidden to dig or collect orchids, several species are legally protected. Rarely can lady's slippers make it through a transplant from the wild.

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Vanilla Orchid: *Vanilla planifolia*

Hibu Paku , Editorial Member, ANTHESIS

The exquisite flavor 'vanilla' is derived from a group of tropical climbing orchids of the genus *vanilla*, which are considered to be one of the primitive groups of orchids.

Characteristic of the genus includes evergreen epiphytic vine with pale green/yellow/creamy white flowers. The flower grows in congested raceme and is ephemeral (single-day bloom) in nature. The orchid produces long capsule fruit (20cm) which can contain 1000 tiny black seeds.

Vanilla is the 2nd most expensive spice in the world just after saffron. They are harvested by curing the unripe pods of the orchid. There are 3 main species of vanilla that are produced commercially, i.e., Bourbon vanilla (*Vanilla planifolia*), Tahiti vanilla (*Vanilla tahitensis*), and Indiana vanilla (*Vanilla pompona*). 98% of the vanilla in the market comes from *Vanilla planifolia* and now artificial vanillas are produced to imitate vanilla using chemical vanillin which is a major component of vanilla that gives its distinct taste and smell.

The vanilla orchid originated from Central America and Mexico region. Historically they were used by the American natives (Totnacs & Aztecs) to flavor their Cocoa. After the invasion of America, it was transported all across the globe in the 1880s. but later it was discovered that vanilla orchids grown outside America were sterile due to the specialized pollination of the vanilla plant with Melipona bee (endemic species).

The worldwide expansion of vanilla transpired following the success of artificial pollination by Edmond Albius, a 12-year-old slave from reunion island. Over the century uses of vanilla have increased all over the market of cosmetics, perfumes, pharmaceutical, and food industries, and the current global market of vanilla is worth US$ 1.2 Bn and is expected to grow more over the year.

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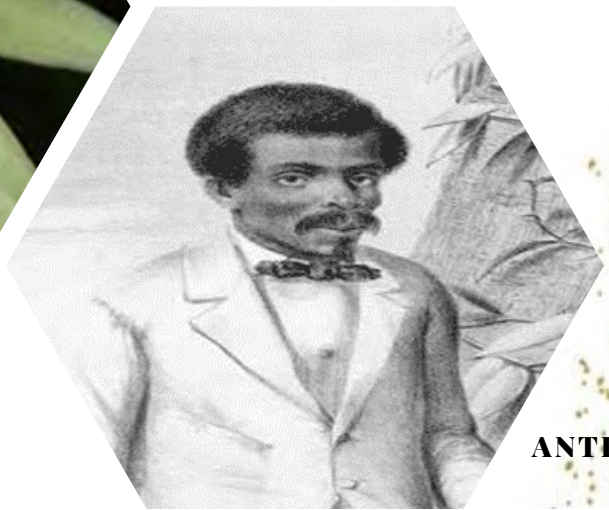

Ghost Orchid
Epipogium aphyllum

Yashasvi Saini, Editor-in-chief, ANTHESIS

Epipogium aphyllum, also known as the Ghost orchid, is a rare plant species belonging to the family Orchidaceae. Famous for its unpredictable appearance, the orchid lacks chlorophyll and is a hardy myco-heterophyte. It was thought to have gone extinct but was confirmed in the United Kingdom and thus got the name because of its ghostly habitat. Orchids form associations with fungi (basidiomycetes, e.g., *Inocybe, Hebeloma, Xerocomus, Lactarius, and Thelephora*) to drive nutrition due to a lack of photosynthetic machinery. Ghost orchids grow from an underground, burrowing stem possessing ephemeral leaves that are small scales and emerge above the ground to flower. The plants are exceptionally distributed across Europe and northern Asia from Spain to Kamchatka and south of the Himalayas. *Epipogium aphyllum* is found in extremely cold conditions. The plant's rhizomes are densely colonized by fungi bearing clam connections and dolipores growing in mycorrhizal association with the roots of coniferous trees. The Ghost Orchids are often much shorter, around 30cm, and are impossible to find due to their unpredictable appearance in the wild. Each stalk carries between 1 - 8 creamy-white flowers, except for the lip (labellum), which is white with intricate pink spots. Curiously the labellums are the uppermost part of the flowers, giving them an overall appearance of hanging upside down. The Ghost Orchid spends most of its time underground, and up to ten-year gaps have been recorded between the flowering of this elusive species.

Overall, *Epipogium aphyllum* is a fascinating plant that has adapted to a unique way of life by parasitizing fungi to obtain its nutrients. Its ghostly appearance and hidden nature make it a mysterious and elusive species that is highly sought after by orchid enthusiasts and researchers alike.

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Boat orchid
Cymbidium hookerianum

Shruti Apurva, Co-editor, ANTHESIS

Cymbidium **which is also known as boat orchids is a genus of evergreen flowering plants in the family Orchidaceae. Orchids in this genus are epiphytic, stony, terrestrial, or rarely leafless saprophytic herbs, usually with pseudobulbs. Each pseudobulb or shoot usually has 3 to 12 leaves, arranged in two rows, and persists for several years. One or more flowers are arranged on unbranched peduncles rising from the base of the pseudobulb. The sepals and petals are all free and similar. The labial petal differs from other petals and sepals in that it has three lobes. About 55 species and 16 other natural hybrids occur in the wild from tropical and subtropical Asia to Australia. Cymbidiums are well-known in horticulture and many varieties have been developed.**

The historical background of the scaly cymbidium dates back to 1900. During this period, the British brought the most important cymbidium plants from the Himalayas to Asia. They began cross-breeding them, and little by little more assortments and varieties were created. These orchids are among the oldest garden orchids in the world, identified in Jin dynasty manuscripts from around 200 BC. said Confucius. Today they are one of the most popular orchid genera in cultivation. They have decorative flower spikes and are one of the most demanding indoor orchids. For good flowering, they need a pronounced temperature difference between day and night in late summer. Plants should stay outside in the fall until nighttime temperatures drop to nearly 0°C (32°F).

The *Cymbidium hookerianum* species is considered a delicacy in Bhutan and is traditionally cooked in spicy curries and stews called 'olatshe' or 'olachoto'.

Cymbidium represents a community that is pure, worthy, and respected. Demonstrations of offering flowers are considered both honor and receipt. As always, roses are well known in China as gifts for close friends. Flowers also represent deep quality and justice. *Cymbidium* gets some additional pictures from the orchid genealogy. In ancient Greece, orchids represented masculinity and maturity. European flowers were then admired even more deeply for their excellence, strength, and luxury.

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Naked Man Orchid
Orchis italica

Dhiseka Pawaiya, Editorial Member, ANTHESIS

Orchis italica **belonging to the family Orchidaceae commonly called naked man orchid or Italian man orchid is an endemic of the Mediterranean basin such as in areas of Jordan, Turkey, Italy, Portugal, Spain, Israel, and Greece is placed among the category of world's rudest flowers. It got its common name as it has a resemblance of its flower with the general shape of a naked man. Developing well in wet soil plant reaches a height of 20-50 cm, is a hermaphrodite, and its flowers are densely clustered on a single stalk and are pale pink or purple in color, tepals are helmet-shaped with dark stripes, the flower is shaped like a naked man wearing a straw hat. Its seeds will germinate in 90-365 but even under preferable conditions germination might be erratic. Like most plants whose shape gives indications of organs or parts of the body that can be healed, this one is no different. Since ancient times it is used as a treatment for men's virility as an aphrodisiac. It also helps in the treatment of skin and is beneficial for dry skin. It is edible and is used in Turkey to make desserts and beverages. The plant has tuberous roots which are full of nutrition and can be made into flour known as "salep". It is a plant that is utilized as an espresso elective to make a drink called the Turkish Delight. Is used in cereals and in making bread. The plant is also useful having nutritive and diarrheal properties.**

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NEWS COLLAGE

TOI

Students in Goa urged to document biodiversity in their surroundings | Goa...

Documenting the biodiversity of Goa's endemic species, habitats and ecosystems is the need of the hour, said Goa University's senior professor Malapat

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AMBROSIAL BOND

RECIPROCITY BETWEEN MAN &WILD

SEGEMENT II

ANTHESIS 2022-23

Dr. Priyanka Pandey
Associate Professor
Botany Department

My work is What will Survive

This article is adapted from the literary work published in Smithsonian magazine by Leila McNeill (2019) entitled "The Pioneering Female Botanist Who Sweetened a Nation and Saved a Valley" which pointed to the contribution of first Indian woman botanist to science. It also mentions her as a pioneering female botanist in the introductory paragraph:

"In 1970, the Indian government planned to flood 8.3 square kilometers of pristine evergreen tropical forest by building a hydroelectric plant to provide power and jobs to the state of Kerala. And they would have succeeded—if it weren't for a burgeoning people's science movement, buttressed by a pioneering female botanist. At 80 years old, Janaki Ammal used her status as a valued national scientist to call for the preservation of this rich hub of biodiversity. Today Silent Valley National Park in Kerala, India, stands as one of the last undisturbed swaths of forest in the country, bursting with lion-tailed macaques, endangered orchids and nearly 1,000 species of endemic flowering plants".

Janaki Ammal, India's finest plant scientist was a talented botanist who developed several hybrid crop species grown even today, including varieties of sweet sugarcane that India could grow on its own lands instead of importing from abroad.

Edavaleth Kakkat Janaki Ammal was born in 1897 in Tellicherry (now Thalassery) in the Indian state of Kerala. Her father maintained a garden in their home and wrote two books on birds in the North Malabar region of India which probably aroused her interest for the natural sciences.

She obtained a bachelor's degree from Queen Mary's College, Madras and an honours degree in botany from the Presidency College. It was rare for women to pursue higher education in those times since women and girls were discouraged from higher education, both in India and internationally. After graduation, Ammal taught for three years at the Women's Christian College in Madras before receiving a unique opportunity to study abroad for free through the Barbour Scholarship, established at the University of Michigan by philanthropist Levi Barbour in 1917 for Asian women to study in the U.S. She joined the botany department as Barbour Scholar at Michigan in 1924. During her time at the University of Michigan she focused on plant cytology. She specialized in breeding interspecific hybrids (produced from plants of a different species) and intergeneric hybrids (plants of different genera within the same family). In 1925, Ammal earned a Masters of Science. In 1931, she received her doctorate, becoming the *first Indian woman to receive that degree in botany in the U.S.*

Her expertise was of particular interest at the Imperial Sugar Cane Institute in Coimbatore, now the Sugarcane Breeding Institute. The Institute was trying to bolster India's native sugarcane crop, the sweetest species of which (Saccharum officinarum) they had been importing from the island of Java. With Ammal's help, the Institute was able to develop and sustain their own sweet sugarcane varieties rather than rely on imports from Indonesia, bolstering India's sugarcane independence. Ammal crossed dozens of plants to determine which Saccharum hybrids yielded higher sucrose content, providing a foundation for cross-breeding with consistent results for sweetness in home-grown sugarcane. In the process, she also developed several more hybrids from crossing various genera of grasses: Saccharum-Zea, Saccharum-Erianthus, Saccharum-Imperata and Saccharum-Sorghum.

In 1940, Ammal moved to Norfolk, England, to begin work at the John Innes Institute. There she worked closely with geneticist—and eugenicist—Cyril Dean Darlington. After five years of collaboration, the pair coauthored the Chromosome Atlas of Cultivated Plants, which is still a key text for plant scientists today. Unlike other botanical atlases that focused on botanical classification, this atlas recorded the chromosome number of about 100,000 plants, providing knowledge about breeding and evolutionary patterns of botanical groups.

In 1946, the Royal Horticultural Society in Wisley offered Ammal a paid position as a cytologist. She left the John Innes Institute and became the Society's first salaried woman staff member. There, she studied the botanical uses of colchicine, a medication that can double a plant's chromosome number and result in larger and quicker-growing plants. One of the results of her investigations is the Magnolia kobus Janaki Ammal, a magnolia shrub with flowers of bright white petals and purple stamens. Though Ammal returned to India around 1950, the seeds she planted put down roots, and the world-renowned garden at Wisley still plays host to Ammal's namesake every spring when it blooms.

When she returned to India in the early 1950s, she did so at the request of Jawaharlal Nehru, India's first Prime Minister after their 1947 independence from British rule. India was recovering from a series of famines, including the Bengal famine of 1943 that killed millions. It was for this reason, Noted Historian Vinita Damodaran wrote that Pandit Nehru was very keen to get Ammal back to India to improve the botanical base of Indian agriculture. But Ammal found herself dissatisfied with some of the initiatives that the government had implemented to boost India's food production causing rampant deforestation. . At this point, Ammal's work took a decidedly different turn. After spending decades applying her skills to improving the commercial use of plants, she began using her influence to preserve indigenous plants under threat. One of Ammal's goals for the botanical survey was to house plant specimens that had been collected from across the continent in an herbarium in India.

To preserve Indian plants, Ammal emphasized the need to value the indigenous knowledge about them. In 1955 she was the only woman to attend an international symposium in Chicago, ironically entitled Man's Role in Changing the Face of the Earth. The Symposium interrogated the various ways that humans were changing the environment in order "to keep abreast of all the means at man's disposal to affect deliberately or unconsciously the course of his own evolution." In the room full of mostly white men, she spoke about India's subsistence economy, the significance of tribal cultures and their cultivation of native plants, and the importance of Indian matrilineal traditions that valued women as managers of property, including a family's plants—all of which were threatened by the mass-production of cereals.

Janaki Ammal pioneered both indigenous and gendered environmental approaches to land use whilst continuing to be a leading national scientist.

In the later years of her career, Ammal lent her voice to a booming environmental movement called Save Silent Valley, a campaign to stop a hydroelectric project that would flood the Silent Valley forests. Harnessing her scientific expertise, she spearheaded the chromosomal survey of the Valley plants in an effort to preserve the botanical knowledge held there. As part of the larger movement, one of the most significant environmental movements of the 1970s, Ammal was successful: the government abandoned the project, and the forest was declared a national park on November 15, 1984. Unfortunately, Ammal was no longer around to see the triumph.

Ammal believed that "My work is what will survive."

Though she is relatively unknown in her country, her story is out there, written in the pages of India's natural landscape. From the sweetness of India's sugar and the enduring biodiversity of the Silent Valley to Wiseley's blooming magnolias, Ammal's work does not just survive, it thrives.

Yashasvi Saini
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Powering the Future with Plant Electricity: A Breakthrough in Renewable Energy

Electricity is one of the salient resources in the cutting-edge world. Almost everything in the current world runs on electricity- lighting, heating, cooling, refrigeration, for operating appliances, computers, electronics, machinery, and public transportation systems. The vast majority of the power created on the planet is still from non-inexhaustible resources like fossil fuels (oil, petroleum, natural gas, and coal) which dominate over sustainable assets like sun, water, wind, biofuel, geothermal, nuclear, and biomass. The demand for electrical energy will continue to increment in the future, and our dependency on exhaustible resources will make them extinct for the coming generations. So, the pressing priority is to bring the inexhaustible resources into action or devise eco-friendly ways of generating electricity.

Plants are known to be ubiquitous in fulfilling human needs. They provide oxygen, habitat, medicines, fuel, food, clothes, and building materials, help control climate, make landscapes beautiful, prevent soil erosion, are essential components of the water cycle, etc. However, plants have never been considered a good source of electricity generation until now. For the first time, researchers at ACS Applied Materials & Interfaces have used the naturally flowing electrons in succulent plants to create a living "bio-solar cell" that runs on photosynthesis. All living organisms, from bacteria and fungi to plants and animals, are composed of high-energy electrons stored in the atoms. The transfer of electrons via their oxidation and reduction provides the energy to fuel cellular functions.

If the cells containing electrons are attached to electrodes, they may produce electricity that can be used externally. In plants, photosynthesis is a metabolic process that results in the flow of electrons and was used by Noam Adir's team to generate current. The general features of a broadly acknowledged system for photoelectron movement, in which two light responses (light reaction I and light reaction II) happen during the exchange of electrons from water to carbon dioxide, were proposed by Robert Slope and Fay Bendall in 1960. This system depends on the relative potential (in volts) of different cofactors of the electron-move chain to be oxidized or reduced. During this reaction, light drives a flow of electrons from water, which ultimately leads to the production of oxygen and sugar. Therefore, living photosynthetic cells are continuously generating a flow of electrons that can be pulled away as a "photocurrent" and used to drive an external circuit like a solar cell. For the experiment, Yaniv Shlosberg, Gadi Schuster, and Adir wanted to choose a plant that can retain water and consequently can supply a consistent flow of electrons.

They chose succulent plants that thrive in arid environmental conditions and have thick fleshy tissues adapted for water storage. Photosynthesis in succulent plants drives a force of electrons that moves along the water and nutrients present inside the plant and thus acts as the electrolyte solution of an electrochemical cell that is capable of power production. The scientists constructed a living solar cell using the succulent Corpuscularia lehmannii, also known as the "ice plant." The setup of the living solar cell includes an iron anode and platinum cathode embedded into one of the plant's leaves and yielded 0.28V voltage and 20 μA/cm2 of photocurrent density when connected to an electric circuit.

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Image Source: https://worldofsucculents.com/wp-content/uploads/2016/05/Corpuscularia-lehmannii-Ice-Plant4-702x527.jpg

Image Source : https://blueandgreentomorrow.com/wp-content/uploads/2017/12/green-energy.jpg

Though these numbers are less than that of a conventional alkaline battery, they are illustrative of just a solitary leaf and, when exposed to sunlight, continued to produce current for over a day. It is proposed that the voltage of the framework can be increased by connecting multiple leaves in series. The team specifically designed the biological solar cell in a way that the proton within the internal leaf solution could be combined to form hydrogen gas at the cathode, and this hydrogen could be collected and used in other applications, which can be a step toward the development of forthcoming sustainable, multifunctional green energy innovations.

The commercial use of living solar cells meets two significant sustainable criteria- green and clean resources. The traditional method of power generation from fossil fuels generates a lot of waste and has many side effects. CO2 is an ozone-depleting substance that adds to the greenhouse impact. SO2 causes corrosive downpours, which is hurtful to plants and creatures that live in water. SO2 likewise worsens respiratory sicknesses and heart illnesses, especially in youngsters and the old. PM brings about foggy circumstances in cities and beautiful scenic regions and, combined with ozone, adds to asthma and constant bronchitis, particularly in youngsters and the old. Heavy metals, for example, mercury, are unsafe for human and creature wellbeing. The introduction and utilization of this electricity source will expand the utilization of sustainable power and prompt more plant farming.

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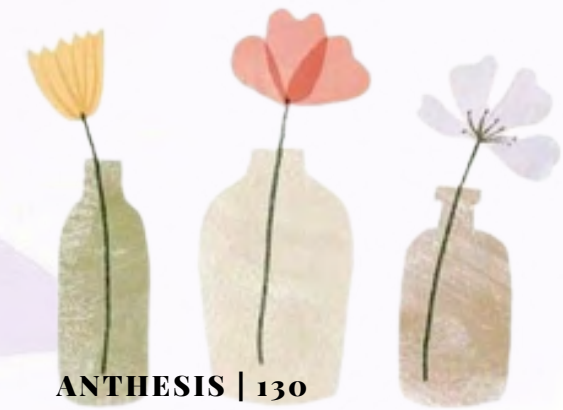

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From Harmony to Disconnection: A study of the evolution of Human–Nature Relations

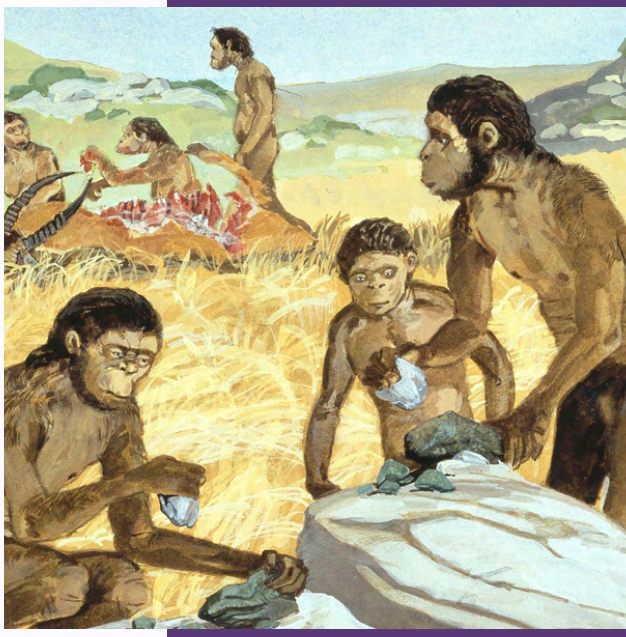
"Tranquility, serenity, and beauty of nature taught me how to find happiness in life and in the silence of eternity."
- Debasish Mridha

The relationship between early humans and nature was one of interdependence and necessity. Early humans were hunters and gatherers, relying on the natural world for food, shelter, and other resources. They had a deep understanding of the environment around them and developed a strong connection to the land. They lived in harmony with nature, taking only what they needed to survive and respecting the balance of the ecosystem. In contrast, modern humans have a very different relationship with nature. The industrial revolution and the subsequent development of technology have allowed us to manipulate and control the natural world to a much greater extent. We have built cities, roads, and other infrastructure that have drastically altered the landscape.

We extract natural resources at an unprecedented rate, leading to pollution and the destruction of habitats. As a result, we have become disconnected from nature, viewing it as something to be conquered and exploited rather than respected and protected. One of the main ways in which modern humans have altered the natural world is through the development of infrastructure such as cities, roads, and other forms of urbanization. This has led to the destruction of habitats and the displacement of wildlife.

Additionally, the extraction of natural resources at an industrial scale has led to pollution and the degradation of ecosystems. The combination of urbanization and industrialization has resulted in the fragmentation of natural habitats and the loss of biodiversity. Another aspect of modern humans' relationship with nature is the way we view it. Early humans had a deep understanding and respect for the natural world, recognizing its value and importance. In contrast, modern humans tend to view nature as something to be conquered and exploited for our own gain. This mentality has led to a disregard for the long-term consequences of our actions and a lack of concern for the health of the natural world. Furthermore, technological advancements have made it easier for modern humans to distance themselves from nature. We have created artificial environments that mimic nature but are completely separate from it. We spend most of our time indoors, in front of screens, and disconnected from the natural world. As a result, we have lost touch with the natural cycles, seasons, and patterns that were once an integral part of our lives. This shift in our relationship with nature has had significant consequences. Climate change, loss of biodiversity, and other environmental problems are all the result of human activity.

These issues are becoming increasingly urgent and require a rethinking of our relationship with nature. We must recognize the value of the natural world and take steps to protect and preserve it for future generations.



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In conclusion, the relationship between early humans and nature was one of interdependence and respect, while modern humans have a relationship characterized by manipulation and exploitation. This shift in our relationship with nature has led to significant environmental problems such as climate change, loss of biodiversity, and other issues that are becoming increasingly urgent. It is vital that we re-evaluate our relationship with nature and take steps to protect and preserve it for future generations. This could involve implementing sustainable practices in industry and agriculture, protecting natural habitats, and educating people about the value of the natural world. Additionally, reconnecting with nature through activities such as hiking, camping, and gardening can help to rekindle our connection with the natural world and deepen our understanding and respect for it. Ultimately, it is up to us as modern humans to take responsibility for our actions and work towards a more sustainable and harmonious relationship with nature.

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"I go to nature to be soothed and healed, and to have my senses put in order." - John Burroughs

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Broken Bonds: The Relationship between Humans and the Earth and Its Impact on Biodiversity Loss

There exists an ambrosial bond between humans and the wild. They have shaped one another for centuries. Man has got lots and lots of resources from plants and animals. Survival of humans could not have been possible without plants and animals. Our ancestors have used wild plants in various ways that have helped in shaping human civilization in many ways.

As we all know, nearly all food webs begin with plants. Agriculture resembles a symbiotic relationship between humans and plants or animals. Plants provide crops, food, fiber, and other products to humans and in turn, humans control weeds and pests and help in protecting crops and livestock by feeding them.

Now the time has changed and we can see more of modern-day applications of biotechnology in crop production. Earlier ancestors used wild plants as a source of medicine that helped in healing wounds. Using that knowledge of plants many medicines are now being made.

Green Revolution can also be taken as a good example that helped in feeding the human population. Humans take in oxygen and exhale carbon dioxide which the plants are breathing in showing a symbiotic relationship between humans and plants.

According to reports from the World Health Organization, nearly 80% of the global population still relies on botanical drugs. Different parts of a plant offer a variety of therapeutic effects. The Ayurvedic medicines that are in very wide use in today's scenario include herbal preparations. The food that we are eating today is all plant derived. Humans depend on plants not only as a food source but also as building and clothing materials and as sources of medicines, psychoactive substances, spices, pigments and more.

Forests make up a major part of the ecosystem. Forest maintains an environmental balance that helps in controlling the temperature of the earth. There will be frequent earthquakes, floods, and other natural disasters if this balance is not maintained. Fossil fuels that are obtained from forests help in increasing the economic growth of the country and in turn, help in contributing better standard of living.

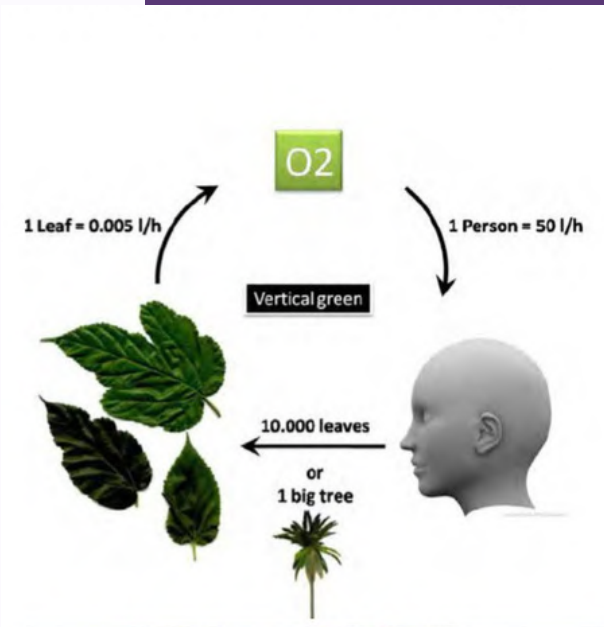
Various species of animals take shelter in huge forests. Microorganisms that exist in wildlife help in fixing nitrogen, thus helping in increasing soil fertility.

Human activities have caused damage to wild plants and animals. As a result, many plant species have been found to become extinct. Human activities also have impacts on climatic changes that have a huge impact on the life of the plants.

Humans have taken these wild plants for granted. There has been a negative impact on these plants and animals due to human civilization. Excessive use of herbicides and pesticides and other toxic products has led to the destruction of habitats. Also, deforestation, degradation of land for making industries, etc. led to the loss of biodiversity. Ocean wildlife has also been changed due to overfishing and through other processes like runoff from agriculture and plastic pollution and dumping of the waste directly into the ocean.

Deforestation is the main cause that is causing threatening the life of these wild plants and animals. Also, climatic changes cause acid rain that falls on plants and corrodes them and hence is responsible for their death.

There is no doubt in saying that there is an unbreakable bond between humans and the wild. We are losing our biodiversity at a rapid rate. Therefore strict rules and regulations should be followed to conserve the life of plants. Plants perform various activities which provide us with various ecosystem services. These wild plants are responsible for maintaining the diversity of life.



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Ethnic and indigenous people have a big role in conserving wild plants. They have to depend upon several wild species for fruits, seeds, bulbs, roots, and tubers which are used for edible purposes. Tribals follow environmental conservation rules in harvesting edible plants which establish ecological prudence.

The ethnic people played a major role in conserving the biodiversity of various plants otherwise these plants or animals may have disappeared much before. There have been many examples of sacred grooves of tribals. They are located in North-East, central and peninsular India.

Various steps can be taken for the conservation of forests and wildlife like

- The felling of trees can be regulated by selective cutting, clear-cutting, and shelterwood cutting.
- Various techniques should be installed for fighting fires in forests.
- Trees should be grown to increase the forest cover.
- The products that we get from forests like fuelwood and timber should be used wisely and should not be wasted.
- Proper forest management bodies need to be enforced to monitor wildlife actions and update on the latest.
- The endangered species should be provided special care and should be saved from becoming extinct.
- Afforestation programs should be introduced.
- The need for food can also be fulfilled by altering dietary choices and at the same time reducing waste.
- Acknowledging tribal people with more ways of conserving wildlife.

Thus these steps should be followed strictly which will surely help in the conservation of wildlife that will makes difference in the conservation of wildlife.

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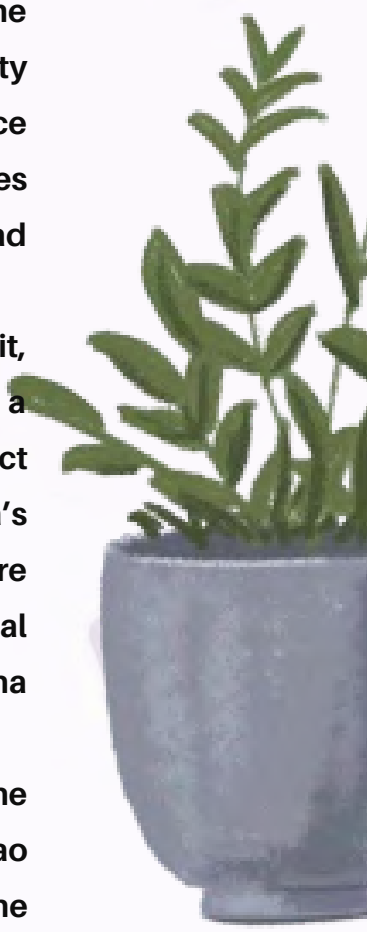
The Sacred Connection: Exploring the Ambrosial Bond between Humans and the Wild

It's the veracity of centuries that humans and nature share a magnificent bond. This biophilia should be holdfast for future generations as well. This emphasis on the reciprocity between man and wild could instead be one between women and wild. Both men and women are equal to 'THE MOTHER NATURE'. Women often called "JANANIS" can understand "THE MOTHER NATURE" as nobody else does, They Give Birth. Two separate entities when sharing the same function, comprehend. Thereupon women are closer to nature. Reciprocity embraces even the dark sides. It is an interplay between the two, but difference arises when both are not treated equally. Our magnanimous mother possesses progressiveness and we as mankind do not respect her magnanimity, instead exploit her.

Live in each season as it passes, breathe the air, drink the drink, taste the fruit, and resign yourself to the influence of the earth. (Thoreau)Here to save a mother is with standing another mother, who gives birth to humans. Women act as a crucial interlink for the strong interaction of mankind and nature. India's 1973 Chipko movement in Chamoli district of Uttarakhand where entire Fraxinus excelsior trees were assigned to Simon Company for commercial purposes. Movement headed by Sundarlal Bahuguna, Gaura Devi, and Sudesha Devi by hugging the trees to prevent them from cutting.

Gaura Devi admired the trees and exclaimed them as her 'MAIKA' and asked the loggers to shoot them instead of cutting the trees. The Narmada Bachao Andolan was started under the leadership of Medha Patkar in 1985 against the construction of The Sardar Sarovar Dam, which could displace lakhs of tribals and could submerge thousands of hectares of forest and agricultural land underneath.



These are some examples of women working for nature under the term Ecofeminism- "The world of women working over the patriarchic society" to work as respective social activists and come up with an individual identity. (Shiva) (Saika).

Besides emotional connection lies the evolutionary principle which sustains deep-rooted. Ongoing the continuous evolution of the interconnectedness leads to the affectedness of the two respectively. Even a small change affects both constituents. Trees are essential for oxygen, trees are essential for furniture, and cutting trees causes global warming, for the decline of global warming ban deforestation but the stoppage of deforestation brings down our standards.

This is the ambrosial bond heading from early humans to modern man, right from evolution to emotions. Mankind and nature are constantly following a barter system- The give-and-take principle is not new, does confirm the use of resources provided by the nature to all living beings. Women in the Kodarapalli tribal village in Orissa collect forest resources and use them for their household threshold chores.

An activity called 'THENGAPALLI' is practiced by the members of the forest to protect their community forest from around 5 decades ago unquestionably is what they return to the forest in turn of using its resources. Use of medicinal plants from the prehistoric period, 'JARIBUTIS' as mentioned for the treatment of diseases in the Vedas, the Upanishads, and now the modern scientific principles, using the sources predominantly.

The Baiga tribes of Madhya Pradesh still rely on herbals for their cure. (Wikipedia) (www.intechopen.com) padam, Ngishi, and I- ldu tribes of Arunachal Pradesh use around 56 plant species as medicines.

Image Source: https://taarik7.tumblr.com/

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Image Source: https://www.deepheat.com.au/

Local people believe that local herbal plants can cure deadly diseases like cancer and diabetes.

Both humans and nature are incomplete without one another. Beauty often lies in interconnectedness. This is the ambrosial bond that let us develop emotions and a sense of giving. Moreover, it is characterized by human activities which should not be ulterior to nature, which are surely not bad but also adequately performed. Life is unimaginable without MOTHER NATURE.

Image Source: https://hindupost.in/society-culture/the-guardian-angels-of-odishas-gundalba-forests/

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"Plants give us oxygen for the lungs and for the soul." - Linda Solegato

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The Nature of Nurturing Nature

"Nature doesn't belong to us, we belong to nature."

We have been taught the value of plants and their use in our daily lives since the first day of school. But after time, it seems like we all lose sight of its significance and begin to take it for granted. Funny how those who earlier didn't think twice about expressing their love of nature now reside in a concrete jungle.

Being surrounded by trees and plants every day may lead us to believe that they are uninteresting. We couldn't be further from the truth given that a variety of plants are essential to preserving ecological equilibrium. The fact that plants give us food, water, medicine, oxygen, and shelter makes them one of the most important resources.

This alone demonstrates how essential plants are to preserving a healthy ecology. A balanced ecology is one that is in good health. And plants are crucial to keeping this equilibrium. Plants and trees are more complex than they first appear. Being a plant or a tree requires the ability to manage several tasks at once without losing your balance. People require resources for survival, but they also need to care for the environment around them, the soil beneath them, and the climate at the same time. Plants support a healthy environment in this way.

Soil erosion will undoubtedly be the subject of several chapters in each environmental student's book. Before planting a tree, be sure the soil can hold onto the nutrients and water that plants need to flourish. However, soil erosion causes the soil to lose nutrients and water, which results in the loss of recently planted crops.

Different factors contribute to soil erosion. To combat soil erosion, getting a plant cover has, however, traditionally been the go-to answer. This is so that the soil is shielded from the direct effects of rainfall and splashes by plants. In the midst of all of this, they significantly slow down runoff by allowing increasing amounts of water.

Since the beginning of time, plants have given both humans and animals a place to live. They are essential to the survival of numerous species. The peepal tree is one of the most prevalent instances. The Peepal Tree is revered in India and is thought to have healing powers.

A woodpecker of any age can get some food by sticking his long beak inside the canopy. The majority of the local animals depend heavily on plants for both survival and nutrition. It is essential to keep the environment healthy in order to ensure that there is a balance.

Air pollution still poses a serious problem in spite of the world gradually moving towards a greener effort. Despite the widespread use of battery-powered cars, a sustainable alternative fuel source has not yet been discovered. In addition, a variety of pollutants and other greenhouse gases directly harm the climate and ecosystem.

Trees are helpful in this situation because they act as a sink for these contaminants that penetrate into any location with a thick layer of vegetation. All of this has the potential to raise the index of air quality and lower the risk of air pollution. It has been demonstrated that planting trees close to urban and industrial areas is the most efficient way to absorb the hazardous gases and pollutants present in the atmosphere.

Humans and the environment, in which our daily lives take place, are intricately interwoven. Our activities are having an increasingly dramatic and negative impact on wildlife and ecosystems, endangering not only wild species but also our own survival.

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Despite the fact that we completely rely on nature for essential, life-sustaining services like clean air and water, a predictable climate, and food, these effects are only getting worse.

The unfortunate reality is that we are mostly using the planet's resources to fulfill our short-term demands, and those who will suffer the most are the most vulnerable or don't have a voice in how those resources are used (such as future generations). Making sure that progress and expansion are accomplished is one of the main issues of the 21st century.

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"Nature is not a place to visit. It is home." - Gary Snyder

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Urbanization and The Green Orb

The Green Orb is the keeper of bio-diversity and the nexus of eco-balance. A lighthouse that reflects the brilliance of the natural world, this brave vessel serves as a metaphor for nature and its antiquities on our planet. It reminds us that we are a small part of the circle of life. we need to respect it and take care of it so we can preserve the future for generations to come. It serves as a symbol of environmental protection and peace. the green orb is a symbol of peace and nature and ecology in general. it represents the interconnectedness of the ecosystem and our place in it.

If human beings want to conserve nature and preserve the planet for future generations, then we need to acknowledge the importance of the Green Orb. We must value the source of life. The sacred planet we live on should not be considered an afterthought.

We have to understand that forests hold an ecosystem that has evolved over millions of years and it has created optimal conditions for living species. All the plants, insects, birds, and animals co-exist and evolve It provides the framework for keeping the world inhabited and the food and water that support life. Unfortunately, the human race has forgotten the role forests have played in our civilization and how they have helped us survive. We must begin to return the gift of life to our forests and reconnect with the harmony of the natural world. To revive it in our hearts we must rediscover the connection between humanity and the natural world.

From ancient civilizations through the ages, man has worshipped and prayed to the Earth Mother for her blessings and prosperity. Over the years we have slowly lost that connection and most of the urban population doesn't seem to care anymore. We think that we are in charge of our planet and that we can do anything we want. Humans need to return to that mindset and adopt back the systems of our nature. The current level of adoption is not enough. Urbanization needs to re-work and bring innovative strategies to amalgamate with the green ecosystem as delay will certainly lead to an uncertain future for mankind.

https://tse4.mm.bing.net/th?id=OIP.qKGvsiC7z13u0oA7kYDydwHaHa&pid=Api&P=0

Urban biodiversity implies a reduction in the emission of greenhouse gases and a focus on the usage of Green Energy. Being a plant sciences student, I must highlight the importance of bio-fuels like bio-gasoline, bio-jet kerosene, and bio-diesels. Unlike other renewable energy sources, biomass can be converted directly into liquid fuels, called "biofuels", to help meet transportation fuel needs.

https://tse2.mm.bing.net/th?id=OIP.EK7R6PPzoiU8v2PGXF-ktQHaE-&pid=Api&P=0

We do have all these and more types of alternative energy resources which are way less polluting and good for our earth but what we lack is the basic implementation of these. Large-scale implementation is definitely not easy and has its own issues but it can surely d wonders for our planet. Just think about it, when the planet was struck by the Covid-19 viru and the general use of non-renewable energy sources decreased, the earth started healing itself. Birds started returning to the city the landscape and animal populations thrived, th holy Ganga cleansed itself and its natural flora and fauna returned. This is why we have to make the switch. We have to make it now.

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"A weed is a plant that has mastered every survival skill except for learning how to grow in rows." - Doug Larson

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The Language of Nature

Winner entry of the Essay Writing Competition- Write Out Loud!

The language of nature is a vast and complex subject that encompasses many different fields of study. A term that refers to the way in which various forms of life communicate and interact with one another. From the intricacies of the human body to the patterns of the stars in the sky, nature speaks to us in a variety of ways. This can include everything from the way that animals use vocalizations and body language to express themselves, to the way that plants use chemical signals and other forms of communication to interact with the environment.

The most fascinating aspect of the language of nature is the way that it is used for survival and reproduction. For example, animals use vocalizations to attract mates, defend territory, and warn of danger. Similarly, plants use chemical signals to attract pollinators and deter herbivores. These forms of communication are essential for the survival and reproduction of these organisms, and they have evolved over millions of years to be highly effective. Another important aspect of the language of nature is the way that it is used for cooperation and mutual benefit. For example, many species of animals form complex social structures in which individuals communicate and cooperate with one another for the good of the group. Similarly, many plants form symbiotic relationships with other organisms, such as mycorrhizal fungi, which help them to access nutrients and defend against pathogens.

The pillars in which nature communicates with us are through the laws of physics and chemistry. These laws govern everything from the movement of the planets to the behavior of individual atoms and molecules. By understanding these laws, we can gain a deeper understanding of the natural world and the forces that shape it.

Another way in which nature communicates with us is through the patterns and cycles that we see in the world around us. From the cycles of the seasons to the patterns of the tides, these cycles provide important information about the natural world and help us to understand the interconnectedness of all living things.
In addition to the patterns and cycles of nature, we also see communication through the diversity of living organisms. Each species has its own unique characteristics, behaviors and adaptations that allow it to survive and thrive in its environment. By studying these characteristics, we can learn more about the natural world and the ways in which different organisms interact with one another.

One of the most fascinating ways in which nature communicates with us is through the process of evolution. Over millions of years, organisms have evolved to adapt to their environment, and this process has led to the incredible diversity of life that we see on Earth today. By studying the process of evolution, we can gain insight into the way in which organisms change over time and the ways in which different species are related to one another.

Another important aspect of nature's language is the way it communicates through its sounds. The songs of birds, the calls of animals, the sound of wind and water all are a way nature speaks to us. These sounds can provide important information about the natural world and can also be used to create music, which can be a powerful form of expression.

Finally, nature communicates with us through the beauty of its forms. From the grandeur of the mountains to the intricate patterns of a butterfly's wings, nature's beauty can be a source of inspiration and wonder. By appreciating the beauty of nature, we can gain a deeper understanding of the world around us and our place in it.

In conclusion, the language of nature is a vast and complex subject that encompasses many different fields of study. From the laws of physics and chemistry to the patterns and cycles of nature, from the diversity of living organisms to the beauty of its forms, nature speaks to us in many different ways. By understanding and interpreting this language, we can gain a deeper understanding of the natural world and our place in it.

"The love of flowers is really the best teacher of how to grow and understand them." - Mary Rion

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Relevance of Ecofeminism in 21st Century

First Runner up entry of the Essay Writing Competition- Write Out Loud!

The term 'ecofeminism' was first used by Françoise d'Eaubonne in her book Le Féminisme ou la Mort (1974). Ecofeminism is an attempt to draw a new horizon by addressing the environmental issue from the categories of patriarchy, gender, and care. Eco-feminism begins with the premise that in a patriarchal dominant world, "women" and "nature" share an instrumental relationship to men.

Feminism since Mary Wollstonecraft's Vindication of the Rights of Woman (1792), has been always concerned with the relation of women to nature. A thing like biology is destiny, male superiority is natural, women's work is reproduction and not production has always remained familiar phrases in sexism.

Ecofeminist theory asserts that a feminist perspective of ecology does not situate women in the dominant position of power, but rather calls for an equal, collaborative society in which there is no one dominant group. Today, there are several branches of ecofeminism, with different approaches and analyses, including liberal ecofeminism, cultural ecofeminism, and socialist ecofeminism. We can establish a connection between women and nature by drawing parallels between the oppression of nature and oppression of women. These parallels provide an insight into how men dominate women and humans dominate nature. The concept of Ecofeminism is rooted in the idea that both women and nature must be respected.

Ecofeminism tries to make visible the interconnections between the domination of women and the domination of nature. For ecofeminists, the structures of patriarchy not only shape human relationships but they also organize the way the nonhuman world, is conceived and treated. Hence, overturning patriarchal domination includes changing the ways human beings relate themselves and their communities to nature. Because of the connections between the oppression of women and the oppression of nature, ecofeminists claim that any feminist analysis must include ecological insights and that any ecological solution must include a feminist dimension.

Since the late nineteenth and early twentieth century women have been part of environmental movements aimed at environment preservation and conservation. In 1973, in the northern part of India women became part of the Chipko movement to protect forests from deforestation. It was a non violent protest in which women hugged the trees in order to protect them from being cut down.

Professor Wangari Maathai, an environmental and political activist initiated the Green Belt Movement in Kenya in 1977. It was women led tree planting movement to prevent desertification of the area. The movement was a huge success as it led to plantation of more than 1000 trees around the village.

In 1978 in New York, mother and environmentalist Lois Gibbs led her community in protest after discovering that their entire neighbourhood, Love Canal, was built on top of a toxic dump site. The toxins from the waste were responsible for causing: illness among children, reproductive health related problems in women, birth defects in babies born to women who were exposed to the toxins. The Love Canal Movement forced the government into assisting evacuation and relocation of 800 families to a new location.

In India, the most prominent advocate of ecofeminism is Vandana Shiva. She critiques modern science and technology as a western, patriarchal, and colonial project, which is inherently violent and perpetuates this violence against women and nature.

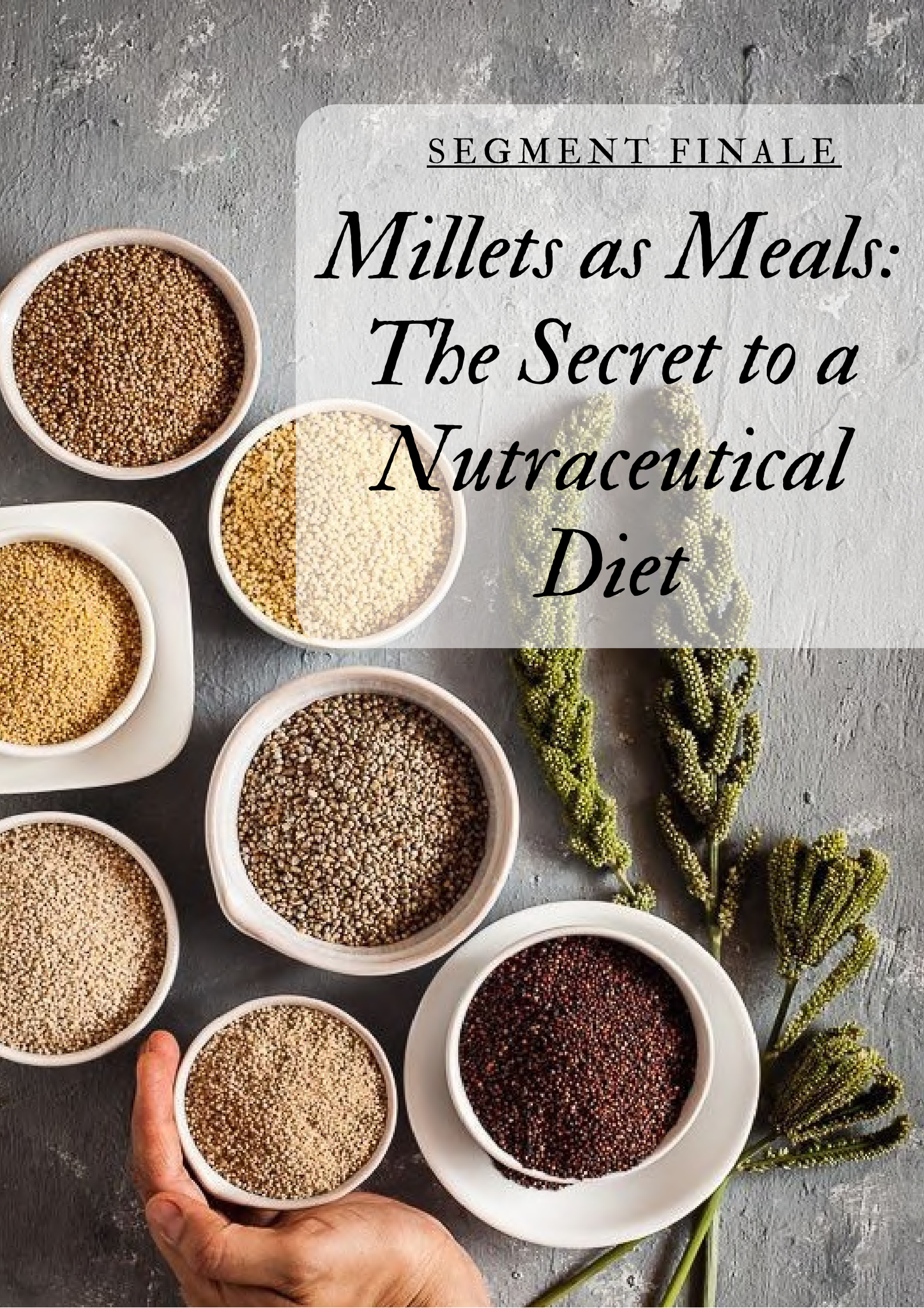
According to her, adapting the western model of development has resulted in shift away from traditional Indian philosophy which sees nature or 'Prakriti' as a living and creative process, the "feminine principle" from which all life arises. In the name of development, nature has been exploited mercilessly and the feminine principle is no longer associated with activity, creativity, and sanctity of life.

Ecofeminism emphasize that women are close to nature. This closeness, therefore, make women more caring and nurturing towards their environment, some indicate the biology of women as the reason behind the closeness, while others give credit to culture and historical factors. It is important to discuss the idea of ecofeminism in order to redefine how societies look at productivity and activity of both women and nature. This discussion becomes more important in today's world when climate change and its consequences have become prominent in parallel with crime against women. It is important to respect and nurture both women and nature in order to have a stable and prosperous society.

"Plants are like people - they need the right conditions to grow and flourish."

SEGMENT FINALE

Millets as Meals: The Secret to a Nutraceutical Diet



International Year of Millets, 2023 (IYM)

The Global initiative, the International Year of Millets 2023 (IYM), aims to promote the production, consumption, and trade of millets, which are small-grain cereals and an essential source of nutrition and income for millions worldwide. The initiative, led by the Food and Agriculture Organization of the United Nations (FAO), intends to raise awareness of the significance of millets in providing food security, enhancing biodiversity and contributing to sustainable development. Millets are a low-cost, drought-resistant, and nutritious food source, making them an ideal crop for smallholder farmers.

The Indian government proposed the initiative to encourage the production and trade of millets, supporting smallholder farmers and contributing to economic growth. The IYM plans to bring together multiple stakeholders, including governments, civil society organizations, academia, the private sector, and farmers, to develop innovative solutions, exchange knowledge and best practices, and create new market opportunities for millets.

The initiative will focus on increasing millet production, promoting millet consumption, enhancing millet value chains, and supporting millet-based entrepreneurship. It will also address the challenges facing millet production, such as climate change, land degradation, and limited access to markets and financing.

Various events and activities will celebrate the International Year of Millets 2023, including workshops, seminars, fairs, and festivals. Additionally, advocacy campaigns, communication and outreach programs, and research and development initiatives will take place.

The International Year of Millets 2023 presents a unique opportunity to recognize the value of millets as a sustainable and nutritious food source and promote their production, consumption, and trade worldwide. Working together, we can ensure that millets continue to play a crucial role in achieving the United Nations Sustainable Development Goals, including ending hunger, promoting food security, and combating climate change.

Pearl Millet, Bajra

Shruti Apurva Co-Editor, ANTHESIS

Pearl millet is the most common type of millet. It has been cultivated in Africa and the Indian subcontinent since prehistoric times. The centers of diversity and proposed domestication areas for harvesting are in the Sahel region of West Africa.

Recent archaeological studies have confirmed the occurrence of domesticated pearl millet in the Sahel region of northern Mali between 2500 and 2000 BC. Pearl millet is well adapted to growing regions characterized by dryness, low soil fertility, low humidity, and high temperatures.

Effective in soils with high salinity and low pH. It can withstand difficult growing conditions, allowing it to grow in areas where other crops such as corn and wheat cannot grow. Pearl millet is an annual summer plant suitable for double cropping and crop rotation. Grains and fodder are valuable as food and fodder in Africa, Russia, India, and China.

Pearl millet is one of the oldest cultivated plants from prehistoric times and is considered the sixth most important cereal crop in the world. Known as Bajra in Hindi, Bengali, Punjabi, Urdu, and Oriya. Cambodia in Tamil and Maryaram. Sajjalu in Telugu and Bajri in Marathi and Gujarati. It is a cereal widely grown in India. It contains the most B vitamins and is rich in other minerals such as iron, magnesium, calcium, phosphorus, manganese, potassium, copper, zinc, and chromium.

Among other grains, it has the highest content of potassium, calcium, and iron. known to be high. In terms of magnesium and zinc content, it is second only to barley. Also, pearl millet is the only grain that contains a lot of chromium. It has the highest folic acid content of any grain, making it the perfect diet for pregnant women.

Now let's take a look at an appetizing pearl millet recipe- Bajra Idli

INGREDIENTS:

- Pearl Millet - 2 cup
- Whole urad dal - ½ cup
- Fenugreek seeds - ½ tsp
- Salt

METHOD:

1. Wash and soak the pearl millet and urad dal with fenugreek seeds separately for 4 hours.
2. Grind as a bit of coarse paste, add enough salt, and keep overnight for fermentation.
3. Next day, stir and pour enough fermented idli batter into the greased idli plates and steam cook them in an idli cooker for 10-15 minutes.

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Finger millet, Ragi

Anshita Bhatnagar, Co-editor, ANTHESIS

Aeleusine coracana, known as finger millet in layman's language and Ragi in India, is a member of the Poaceae family. It is widely grown as a cereal crop all over the world. The root of its common name comes from the resemblance of its panicles to human fingers. It is said to have originated in Central Africa (from its wild relative *Eleusine africana*) where it has been grown since ancient times.

It is an annual plant that can grow up to 1.5 to 2 meters in height, with strong and erect stems. The plant is usually branched at the base and has a fibrous root system. The leaves are long and narrow, with a green to purplish-red color. They are arranged alternately on the stem and have a characteristic rolled-up appearance when they first emerge from the shoot. It has gained a lot of popularity since its small grains which are usually brown (but occasionally white) can easily be ground into flour and made into a thick porridge and can even be fermented to produce beer. Finger millet is highly nutritious considering its high content of iron and calcium along with adequate amounts of protein, magnesium, phosphorous, vitamins, dietary fiber, and zinc, which are largely needed in the human body, this is also why numerous pediatricians recommend the inclusion of this millet in an infant's et.

Some other and equally essential advantages of this millet are that its unthreshed heads or ears can be stored for up to 10 years without undergoing any deterioration and its drought-resistant capacity. These advantages are highly beneficial to the farmers. However, one of the major problems in the cultivation of finger millet is its requirement of a high amount of labor and cooler conditions for its proper growth, and due to this, many farmers are leaning towards cultivating less labor-intensive crops like sorghum, cassava, maize, etc. Major producers of this millet all over the world are Uganda, India, Nepal, and China. Many botanists have considered this millet to be the future as well as the solution to food insecurity in various parts of the world.

Various dishes are cooked using finger millet in India. One of these is listed below:

RAGI RAVA UPMA (NACHNI)

1. Wash and soak the ragi rava for half an hour. Drain and squeeze off the excess water.
2. Heat a pan with oil and proceed to add cumin and mustard.
3. Once the contents start to crackle, add chana dal, urad dal, and peanuts. Fry them until they turn golden.
4. The previous step is followed by adding hing, onions, curry leaves, ginger, and green chilies.
5. Add the previously soaked ragi rava and saute for 3-5 minutes.
6. Add 2.5 cups of water along with salt to a separate pot and bring the stove to a rapid boil.
7. When ragi rava is completely roasted, add the hot water to the pan.
8. Stir and cook until all the water is absorbed.
9. Serve the ragi upma hot.

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Proso Millet

Ananya Tomar, Co-editor, ANTHESIS

The minor millet known as Proso (*Panicum miliaceum*) is a renowned and valuable member of the Gramineae family. In India, a great deal of this short-lived millet type is cultivated. It is particularly suited to the hot summers prevalent in the tropics and at high altitudes, where the growing season is brief and the soil is marginal and deficient in fertility.

The most water-efficient grain crop is common millet, which can be grown in any type of soil other than coarse sand. It is planted in the Himalayan region up to an altitude of 2700 meters and is well suited to plateau lands and high elevations. The crop's fast maturation allows it to avoid drought. The husked grain, which makes up about 70% of the whole grain, is nourishing and is consumed whole, boiled, and prepared like rice. It is occasionally ground into a roti and consumed. Furthermore, the seed is dried and eaten. Around 70 to 80 days, the crop will be ready for harvest. In dry areas, the grain yield ranges from 500 to 700 kg per hectare, and under irrigated or ideal circumstances, it ranges from 1500 to 2000 kg per hectare. The production of straw, which is used as cow feed, is often three times larger than the yield of grains. Immature crops are used as green fodder in various areas of India. Hog millet, white millet, and Pani varagu are all common names for proso millet.

The Proso Millet provides several health advantages, just like regular millet does. First off, folks who can't eat wheat can include it in their diets because it doesn't contain gluten. Moreover, it contains a sizable amount of fatty acids, proteins, carbs, and niacin (Vitamin B3). It also includes important minerals including phosphorus, manganese, and magnesium in addition to these nutrients. Proso millet also has positive effects on the nervous system, lowers cholesterol, lowers the risk of diabetes, and has anti-aging characteristics

A number of dishes are cooked using proso millet. One of them is Proso Millet Venpongal. Let's take a look at its recipe :

PROSO MILLET VENPONGAL

1. Dry roast 1 cup millet and 1/2 cup moong dal cooked over low heat until the mixture is fragrant.
2. To get rid of contaminants, rinse the millet and dal combination four times. Add salt, turmeric, and 5 cups of water. Prepare the dal and millet.
3. Avoid pressure cooking since the millet may burn. Cook for 20 minutes or until the mixture becomes a thick paste.
4. Heat Ghee. Add cashews, curry leaves, whole pepper, jeera, ginger, and black pepper powder.
5. To pongal, add the tadka and stir thoroughly.
6. Boil for a short while. Serve hot with chutney.

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Buckwheat: Kuttu Khichdi

Hibu Paku, Editorial Member, ANTHESIS

Buckwheat or common buckwheat (*Fagopyrum esculentum*) is a flowering plant that originated in northern China and is categorized under pseudo cereal. It has a similar taste to wheat but is gluten-free. They are easy crops and are generally cultivated for their grain and as a cover crop. Buckwheat often undertakes the role of staple food in regions with poor soil where the cultivation of cereal is difficult.

Buckwheat is commonly used in the production of noodles (Japan & China), and pasta (Italy &Switzerland) and is commonly added to other cereals
Throughout time, buckwheat demand has decreased, but with the rise of the healthy diet sector, there has been a noticeable increase in interest in buckwheat.

BENEFITS OF BUCKWHEAT INCLUDE:

a. They are gluten-free
b. Low glycemic index
c. it has Higher mineral and antioxidant content in comparison to cereal
d. All buckwheat's are non-GMO

And good for colon health due to its good fiber and protein content
Buckwheat is generally considered safe for consumption but some may show symptoms of allergy.

BUCKWHEAT KHICHDI:

1. Rinse 1 cup of buckwheat groat in water
2. Drain it and let it slide
3. In a pan add 1-2 tbsp of ghee
4. Add ½ tablespoon cumin seed, 1 chopped chili, and ½ inch finely chopped ginger
5. Sauté the mixture for a minute
6. Chop 2 medium size potatoes into cubes and add them to the pan
7. Stir the mixture till the potato become crisp
8. Add rinsed buckwheat to the mixture
9. Sauté the mixture for a few more minutes
10. Add 2 cups of water to it
11. Add 1 tbsp sugar and salt
12. Mix it well
13. Cover the pan with a lid and let it simmer in low medium heat until water is absorbed and groat softened.
14. Add garnish to the porridge.

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Foxtail Millet

Yashasvi Saini, Editor-in-chief, ANTHESIS

Setaria italica, commonly known as Foxtail Millet, is an annual grass of arid and semi-arid regions and the second most cultivated species in Asia. Other names for the species include dwarf setaria, foxtail bristle-grass, giant setaria, green foxtail, Italian millet, German millet, and Hungarian millet. It belongs to the family Poaceae and has slim, vertical, leafy stems which can reach a height of 120–200 cm.

The seed head is a dense, hairy panicle that bears seeds of economic importance encased in a thin, papery hull available in yellowish-brown color. There are many health benefits of including foxtail millet in daily diet. It is a great substitute for rice and keeps a person satiated for longer hours. As it has low glycaemic index food, it helps to reduce blood sugars and glycosylated hemoglobin. Setaria, being rich in tryptophan, prevents the accumulation of fats in the body and hence triggers weight loss. Foxtail millets are rich in iron, calcium, and vitamin B1 and thus maintain the health of bones and keep various neurological disorders at bay. It is gluten-free, rich in protein, and low in carbs which helps in the formation of the neurotransmitter acetylcholine that transfers messages between muscle and nerves and boosts cardiac health. There are various delicious recipes with foxtail millet as the core ingredient.

Let's have a look at how to make foxtail millet pulao!

1. Soak foxtail millet for about one hour in warm water. (It is suggested to soak the millet overnight to ensure that the breakdown of phytic acid takes place, which is responsible for impaired nutrition absorption.)
2. Chop the veggies- carrots, barabati beans, peas, onions, potatoes, and mint leaves for flavoring.
3. Heat oil in a pan, add the dry spices, and fry till they crackle.
4. Add grated ginger or ginger garlic paste and fry till the raw smell goes off.
5. Add the veggies and mint and fry for about 3 to 4 minutes.
6. Add water and salt. Bring to a boil, add drained millet, and cook on a medium to low flame till soft cooked. If there is more water left, cook it on high and evaporate it. Cooking on a low flame yields a flavourful millet pulao.
7. Towards the end, switch off the stove and keep it covered for about 7 to 8 minutes.
8. Serve hot foxtail millet pulao with any raita.

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Kodo Millet

Dhiseka Pawaiya, Editorial Member, ANTHESIS

Paspalum scrobicutalum or Kodo millet also known as cow grass, Indian cow grass, ditch millet, and rice grass. Cultivated extensively in India, the Philippines, Vietnam, Nepal, Indonesia, and West Africa is a drought-tolerant plant that requires very less water to grow, a monocotyledonous plant that can reach up to a height of four feet.

Having an inflorescence produces 4-6 racemes which are 4-9 cm long. It has leaves of about 20-40 cm in length. Very small and ellipsoidal seeds are produced varying from light brown to dark grey in color. Millets being a storehouse for nutrients, vitamins, and minerals depict Kodo's richness in proteins, fibers, calcium, iron, polyphenols, carbohydrates, and fats respectively. It is rich in B vitamins, especially niacin, B6, and folic acid, as well as the minerals such as calcium, iron, potassium, magnesium, and zinc. Having an exceptionally high amount of antioxidants authorizes it to fight various chronic diseases. Ayurveda classifies kodo millet as Telangana. They are easy to digest. It contains no gluten and is good for people who are gluten intolerant. People suffering from diabetes should opt for a diet rich in kodo due to its medicinal, therapeutic, and culinary properties. It provides strength to beat fatigue and heal wounds at a faster rate. It balances and improves stamina.

it contains a high amount of lecithin and helps strengthen the nervous system. Regular consumption of kodo millet is very beneficial for postmenopausal women suffering from signs of cardiovascular diseases, like high blood pressure and high cholesterol levels.

Let's prepare our favorite Dosa from Kodo Millet:

INGREDIENTS

- 1 cup kodo millet
- ¼ cup urad dal
- ½ tsp fenugreek seeds
- 2 tbsp poha
- Salt

METHOD

1. Wash kodo millet and urad dal. Soak them in water along with poha and fenugreek seeds for 4-6 hours.
2. Grind it by adding an adequate amount of water and make a smooth paste.
3. Add salt and now let it sit for fermentation overnight.
4. Next day, heat a pan and grease it with some oil. Pour the batter and spread it evenly.
5. Let it get crisp. Serve with chutney and enjoy.

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How species partnerships evolve

Biologists from the School of Arts & Sciences explored how symbiotic relationships between species evolve to become specific or general

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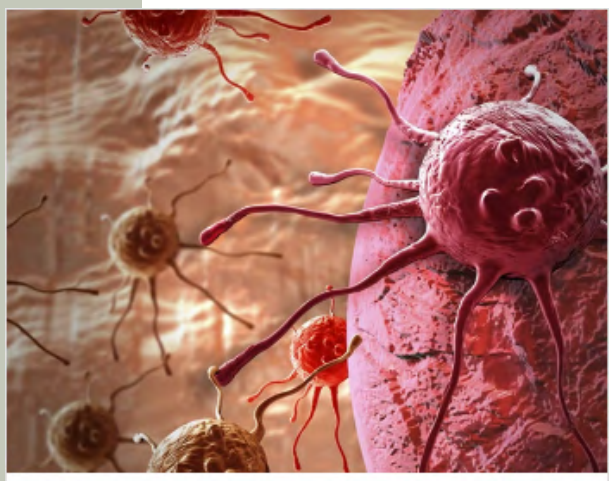

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SEGEMENT III

UNDER THE MOONGLADE

ALCHEMY OF TERRA

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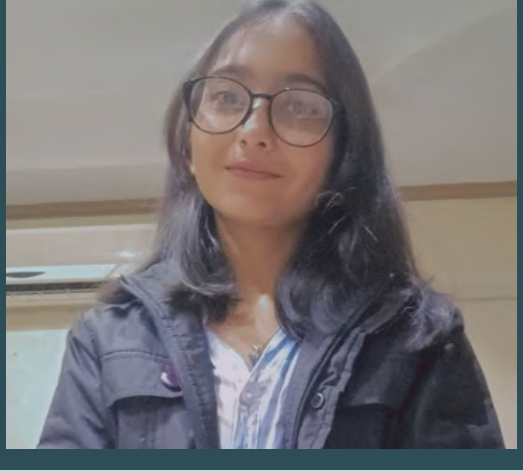

Ananya Tomer
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2nd Year

Traditional Knowledge of India : The Querencia of Alchemy

Growing up we all have witnessed and practiced hundreds of rituals since our childhood. Most of the time there wasn't a reason given for it. For instance, it's a common practice in many Indian households to not sleep with your feet toward the South. When questioned about the logic behind it we get the answer somewhere along the lines of South being the direction of Yamraj, the God of Death, and pointing our feet towards that direction means disrespect to him, and obviously nobody would want to spite the God of Death. Living in this diversely cultured country, I believe all of us have been following some rituals or simple traditions in our lives. But, as the decades have passed and we got influenced by Western beliefs and lifestyles, we started referring to these practices as morose superstitions because they are arcane to most of us. We started calling our very own country primitive. Of course when such absurd practices are present with no logical explanation in sight, who wouldn't think that, right? But, being the people of science, we, of all, should have it brazenly clear in our minds that just because you can't see it with your naked eyes, it doesn't mean that the thing doesn't exist. Most of us just dismissed this Elysian knowledge, which our ancestors passed down to us, without once trying to see it through a logical eye.

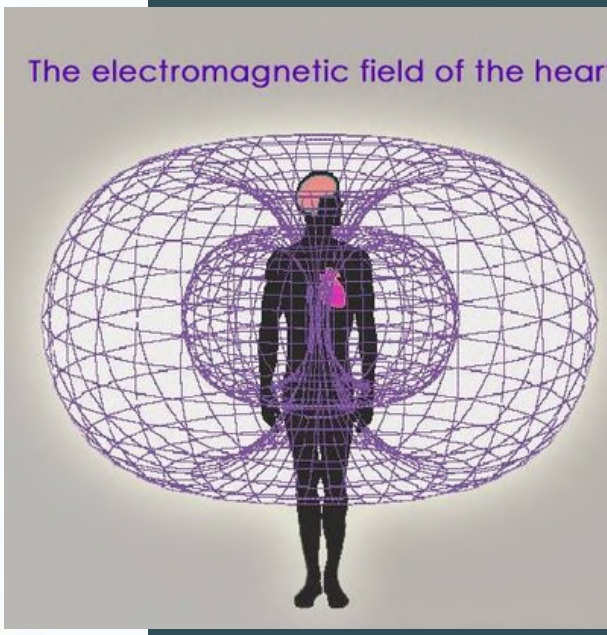
There must have been a reason behind Mark Twain's quoting - ''India is the cradle of the human race the birthplace of human speech, the mother of history, the grandmother of legend, and the great grandmother of tradition our most valuable and most instructive materials in the history of man have treasured up India only.

''If an American could see the richness of our culture and tradition then why couldn't the youth-the future of India?" The answer lies somewhere between the passing off of these practices to us by our predecessors without knowing and explaining the logical reasoning and our unwillingness to acknowledge and be proud of the very heritage that makes us who we are.

Now, going back to the ritual with which we started off. The answer to it lies in that chapter of Magnetism that we all studied and the ancient Vastu Shastra that we may have heard of. As the sun travels across the earth from east to west, it creates a constant current of thermal electricity and this magnetizes the earth. Our continuous contact with the Earth means we too have a magnetized body, with our legs gaining a south polarity and our heads gaining a north polarity. The magnetic north pole has a negative polarity and the basic law of magnets is that opposite attract. Therefore if we are sleeping with our heads towards the Earth's north magnetic pole then our bodies will be pulled by the Earth and this draw of energy can cause all sorts of ailments including disturbed sleep, nightmares, and issues with blood circulation to name a few.

For centuries, Indians, especially Hindus have observed countless rituals and traditions from dawn to dusk in their everyday household chores. Some are mentioned in Vedic scripture and some are added late during the ages of Brahman scripture while Hindus follow these rituals religiously. Parasara and Indian scholars compiled ' Vrikshayurveda '-the science of plant life, which is one of the earliest works ever to have dealt with plant life from a scientific standpoint (250 B.C. -120 B.C.). Along with the morphology, soil properties, and Indian forest types, he described the existence of cells called 'rasakosa' for the transportation of soil solute from roots to the soil. Charaka, another Indian scholar wrote the 'Charaka Samhita' which is a huge treatise on Indian medicine. As scientists dwell deeper into the mysteries of these ancient customs, they found that our customs are abrupt with logic and science.

Image source : https://www.tugeb.com/some-spiritual-temples-to-visit-in-india/?amp



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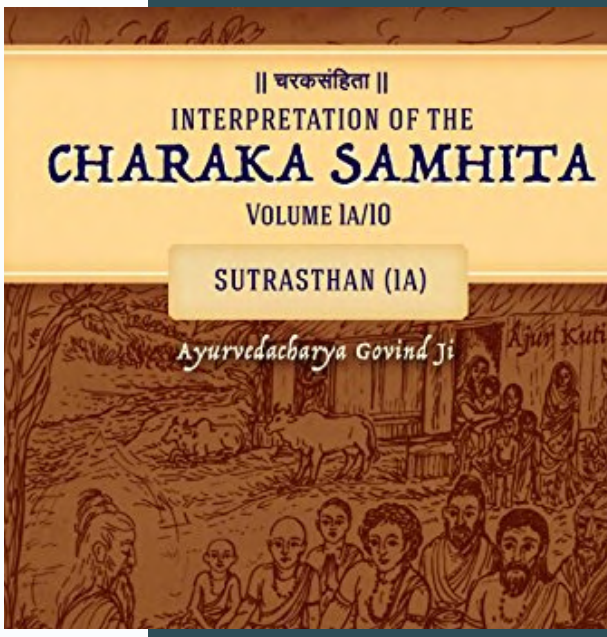
The rituals followed in India are also aimed at bringing a holistic balance between the body, mind, and soul. Surprisingly, these traditions are equally popular outside India, where Indians live. In today's world people are moving on with their busy lives and family has become of lesser importance than professional and personal growth due to this, we have been slowly giving up our traditions and rituals because we have been thinking that they are nothing but utter morosity. Part of the blame should go to the forefathers because they were ineffective in passing the rituals. They have not understood the science behind these rituals. Let us understand the science behind some of the rituals we all have witnessed and easily dismissed as nonsense.

The chanting of the prayer "Karaagree VasatheLakshmi karamadhye saraswati karamoolesthitha gouri prabath karadashanam" upon waking up is common practice reasoned with the logic that when a person is sleeping, it remains in a horizontal position but after standing it changes to the vertical position. So that this change does not become sudden, this prayer is chanted, when the person is in the vertical position, the heart pumps blood more forcefully, and a swift change in position from horizontal to vertical can increase the chance of a heart attack. It has been estimated that 23% of heart attack deaths take place in heart patients when they suddenly get up and stand/walk from a lying position at various times in the night. Also after standing, another prayer is chanted and the floor is touched. "Samudra vasane devi parvatha sthana, mandale Vishnu patnee!! Namasthubhyam paada sparsham kshamaswa me!!".The science on the other hand is that the biostatic electricity in the body is transferred to the earth through the fingers rather than the feet, which in turn reduces the chances of arthritis and other nervous problems. We have rituals to worship trees & plants also. There are some scientific reasons behind this. Trees and plants have always been a divine source for humankind.



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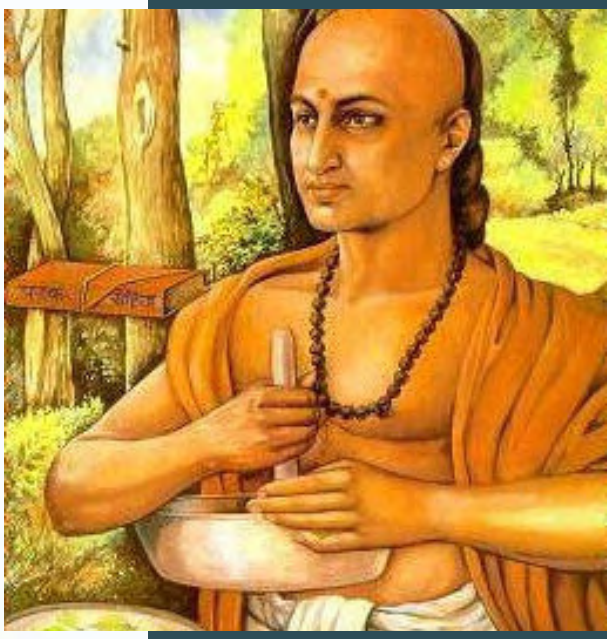

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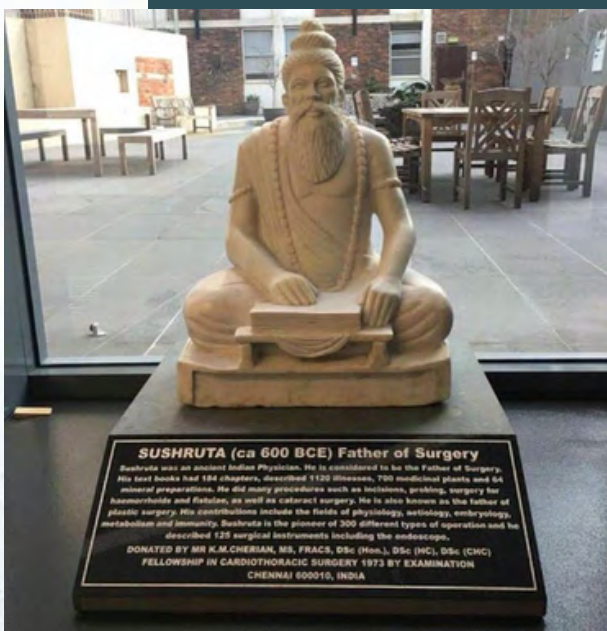

Image source :
https://tamilandvedas.files.wordpress.com/2019/11/b3f48-susrutha.jpg

Our ancestors have recognized their sacredness and passed the notion down to every generation. Some scholars believe that trees and nature, in general, were worshipped by early humans before the Gods and Goddesses. This could be because certain trees had medicinal or held symbolic purposes. For many generations, Indian households have been keeping a Tulsi plant in their households and often worship and care for it daily. Recent botanical research studies have uncovered that the Tulsi (*Ocimum sanctum* Linn) plant enriches the environment with oxygen for around 20 hrs of a day and absorbs other pollutants from the atmosphere. (Shivananjappa M, Joshi M., 2012)(Manikandan P, et.al.,2007). Similarly, Neem (*Azadirachta indica* A. Juss.) plant parts show an antimicrobial role through an inhibitory effect on microbial growth/potentiality of cell wall breakdown. Azadirachtin, a complex tetranortriterpenoid limonoid present in seeds, is the key constituent responsible for both antifeedant and toxic effects in insects[Mordue (Luntz) A. J., et.al.,2000]. Results suggest that the ethanol extract of neem leaves showed in vitro antibacterial activity against both Staphylococcus aureus and MRSA with the greatest zones of inhibition noted at 100% concentration [Sarmiento W. C., et.al.,2011].

The ancient Indian tradition of piercing our ears is now everywhere across the globe as the mark of fashion. It was done because Indian physicians and philosophers believe that piercing can boost our intellect, power of thinking, and decision-making capabilities. It is believed that the more we talk, the more our energy gets drained; piercing ears can restrain our speech. The practice also frees our ear channel disorders.(Abhilash Rajendran (2014, Feb).

The Indian culture, our Sanatan Sanskriti, is such a beautiful, most logical, historical, spiritual, and scientific culture. Mahatma Gandhiji said: A nation's culture resides in the hearts and in the soul of its people. It's absolutely true because there are so many things or rituals we are following for hundreds of years.

Image source : https://organicindiausa.com/wp-content/uploads/sacred-tulsi.jpg

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Image source : https://vedictribe.com/wp-content/uploads/2020/12/Karnavedha-Sanskar-Importance-of-Ear-Piercing-in-Hinduism.jpg

Our lack of curiosity and respect towards our own amaranthine heritage has played the biggest role in the downfall of India from its social pedestal. This lies at the core of the reason why the nation, once resplendent as the Vishwaguru, came to be presented and known as 'the land of snake charmers and magic'. India never regained the original place that it held at the global level for its rich knowledge and heritage, after hundreds of invasions. The biggest reason is the generation today, that regards traditions to be based on purely chimerical beliefs; it's high time that we realize that our forefathers were way more visionary and intelligent than we are. Culture and science are not opposite streams. There is a strong connection. From the dash avatar sitting on the floor and eating, everything is pure science. When we shelved our very own ancient knowledge, a physicist known by all- Werner Heisenberg extolled it by quoting, ''After the conversations about Indian philosophy, some of the ideas of Quantum Physics that had seemed so crazy suddenly made much more sense.''

Our very own texts have been and always will be the greatest latitude of knowledge that we could ever devour. The only thing needed to be done in preserving and getting it world renowned as The Indian way of life provides the vision of the natural and real way of life. We veil ourselves with unnatural masks. On the face of India are the tender expressions which carry the mark of the creator's hand (George Bernard Shaw).

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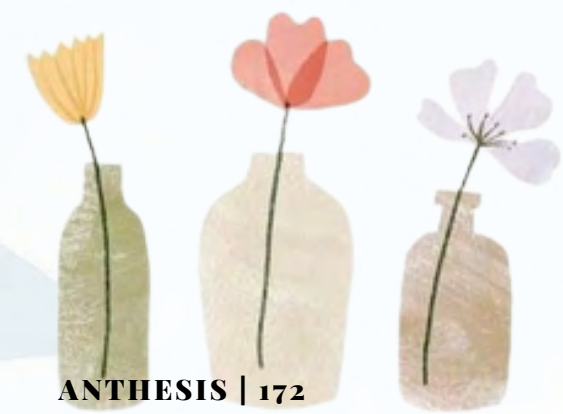

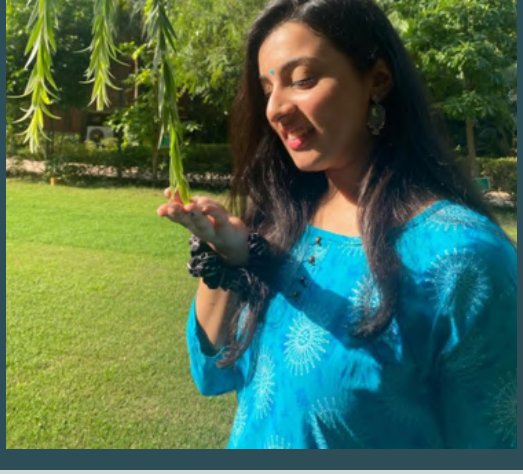

Hansa Wali
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3rd Year

Healing Properties Of Plants Of The Asteraceae Family

The real wealth of any country depends upon the health of its population. Nature has already provided humans with a gift in the form of Plants that can cure many diseases and help us to lead a healthy lifestyle. From the early civilization period, plants have been used as a source of medicine.

Despite the synthetic drug production of antibiotics, plants occupy an important place in the traditional and modern system of medicine.

Studies have been conducted worldwide to verify the efficacy of medicinal plants so that they can be introduced more efficiently in the modern system of medicine.

The Asteraceae family has been found to provide many medicinal plants that are beneficial for the human population.

The members of the Asteraceae family have been used in diet and medicine for many years. Despite their wide diversity, most family members share an identical chemical composition: for example, all the species are good sources of inulin, a natural polysaccharide that has strong prebiotic properties. They also exhibit strong antioxidant, anti-inflammatory and antimicrobial activity, as well as diuretic and wound-healing properties. Their pharmacological effects can be attributed to their range of phytochemical compounds, including polyphenols, phenolic acids, flavonoids, acetylenes, and triterpenes. Some of such plants are as follows.

Image source-
https://upload.wikimedia.org/wikipedia/commons/thumb/c/c8/Matricaria_February_2008-1.jpg/220px-Matricaria_February_2008-1.jpg

Matricaria chamomilla

It is one of the important medicinal herbs and is native to eastern and southern Europe. In India, it was introduced during the Mughal Empire. The flowers of this plant include Blue Essential Oil from 0.2 to 1.9%. This essential oil contains :

•Terpenes such as bisabolol , farnesene and chamazulene

•Flavonoids such as apigenin , quercetin , patuletin and luteolin.

Physical effects of *M.chamomilla*

It has been used in herbal remedies for thousands of years.It is used to treat gastrointestinal diseases such as diarrhoea. It relieves gynecologic complaints such as menstrual cramps. It also finds use in flatulence, colic, hysteria, and intermittent fever. Additionally, it has anti-inflammatory and antiseptic, also it is antispasmodic and mildly sudorific.

Psychological effects of *M.chamomilla*

It is considered a mild tranquilizer or sleep inducer. These properties can be attributed mainly to the component apigenin.

Silybum marianum

It is also known as Milk Thistle and it is a herbal supplement used to treat patients with liver and biliary disorders. The active component of this plant is Silymarin containing a mixture of flavonolignans like silibinin, silychritin, silibinin, silibinin, and others.

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Physical effects of *S.marianum*

It has antioxidant and chemoprotection effects on the liver. Some experiments have shown that silibinin stabilizes cell membranes and thus prevents toxic chemicals from entering the cells and even ensures the export of toxins out of the cell before the harm ensues.

It has also shown the stimulation or inhibition of phase I detoxification pathways and stimulation of phase II detoxification pathways and acceleration of regeneration of liver cells by enhancing the production of cellular enzymes.

Image source- https://www.google.com/urlsa=i&url=https%3A%2F%2Fplants.ces.ncsu.edu%2Fplants%2Ftaraxacum-officinale%2F&psig=AOvVaw0-UAm84-xXfR_B68bGsAnI&ust=1681655998882000&source=images&cd=vfe&ved=0CBMQjhxqFwoTCLj00v-OrP4CFQAAAAAdAAAAABAE

Taraxacum officinale

It is commonly called a dandelion. This herb has been used as a medicinal plant since ancient times.
This plant has photochemical like :

- Sesquiterpene
- Lactones
- Phytosterols
- Flavonoids
- Lignans
- Beta-carboline
- Indole alkaloids, etc

Physical effects of *T.officale* :

Its hepatoprotective and anticancer effects are widely studied. The leaf extract of this plant has acetaminophen (APAP)-induced liver injury (AILI). The leaves of this plant are also able to treat and prevent non-alcoholic fatty liver disease. Studies have shown that the extract of this plant can inhibit the proliferation and growth of breast cancer cells. It is also found that these plant extracts can induce programmed cell death in different categories of cancer cells, such as human leukemia, prostate, and pancreatic cancer cells.
This plant also exhibits antioxidant, anti-obesity, and anti-diabetic activity.

The Asteraceae family is the most varied and cosmopolitan family of flowering plants. Our ancestors have been using this plant family as a source of medicine since ancient times. Nowadays, the growing demand for natural products and the toxic side -effects of allopathic drugs have driven scientific interest in the Asteraceae family. The growing technologies have helped to demonstrate the positive impacts of this family on human health. It is now an established family of medicinal plants due to its hepatoprotective, antioxidant, anti-inflammatory, and anti-microbial activity.

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3rd year

Shinrin-yoku- Forest bathing

We do realize that when dealing with something stressful, we would go out for some air. When feeling low, we would go for a walk in the garden. When we feel like our problems are too big a deal, we would look out the window and realize how insignificant they might actually be. Nature has a hand in healing us in ways we can't imagine.

To examine whether nature can, clinically, help in the therapeutic process, during the 1980s a few Japanese scientists studied and came up with an exercise called shinrin-yoku or forest bathing. The main motive behind the suggestion of walking in the forest was to provide relief from the stress of all-day burnout and inspire people to rekindle their relationship with nature. Since the establishment of this term, a bunch of scientific experiments has been done to prove how forest walks can be an effortless and inexpensive way to improve health. A forest therapy expert at Chiba University in Japan, Yoshifumi Miyazaki was able to prove that people who took a 40-minute walk in the cedar forest had lower levels of cortisol, a stress hormone, as compared to when they walked for 40 minutes in a lab. In another research by Dr. Quig Li, phytoncides were discovered. These aromatic compounds are emitted by plants and trees, and when inhaled, induce biological changes that are therapeutic to humans. The changes in blood can be associated with lower blood pressure, promotion of cancer-fighting cells, and even help with anxiety and depression.

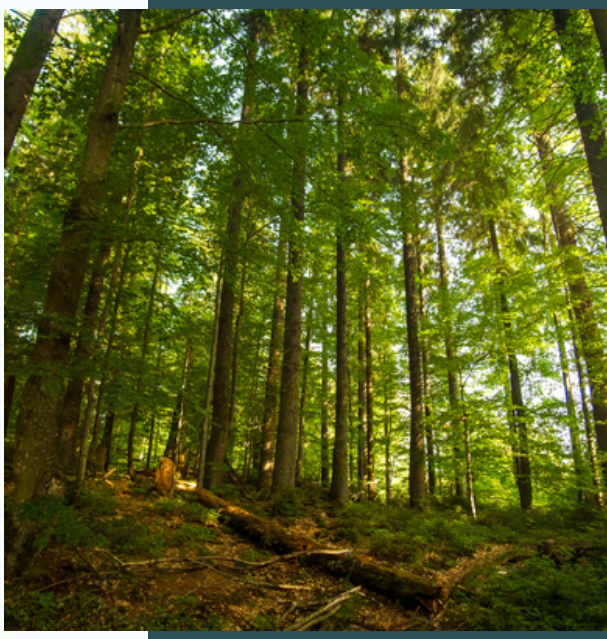
A study on a larger group done in the year 2016 proved that nearly 10% of people with hypertension had significant control over it after a 30-minute walk in the park. Trees have a natural fragrance which might also play a role since some studies suggest that phytoncides lower blood pressure by putting an end to the body's fight-or-flight response, which is known to increase stress.

Some other studies put to light various advantages of nature on human health. Nature leaves people in awe. This scientifically helps in lowering the inflammatory compounds in the body. People living in greener spaces reportedly have more energy and better health, both mental and physical.

One most vital study published in the journal Environmental Health Perspectives reported that women in greener places have a 12% lesser chance of death from all causes as compared to those living in the least green spaces. Dr. Quin Li's study at Nippon Medical School shows that inhaling phytoncides increases the number of Natural Killer cells. These white blood cells can be linked to lower cancer risk and also fights autoimmune disorders and infections. It has also been associated with decreased risk of diabetes and heart disease. In a 2010 study, researchers discovered that people who took two long walks through forests on the same day increased the activity of their NK cells by 56% and 50%, respectively. In the month that followed the walks, those activity levels remained 23% higher than usual. Li and his co-authors discovered in another study that phytoncides infusing hotel rooms had some of the same anti-cancer cell effects as walking through forests. Researchers concur that at the very least, spending time in nature tends to improve mood. However, the precise mechanism by which nature aids mood disorders remains a mystery.

According to Ming Kuo, a University of Illinois at Urbana-Champaign environment and behavior scientist, "People's moods go up when you have a brief blast of exposure to nature."According to a study published in Frontiers in Psychology, another possibility is that the air near moving water, forests, and mountains contains high levels of negative ions, which are thought to reduce depression symptoms.

Image source : https://www.happiness.com/



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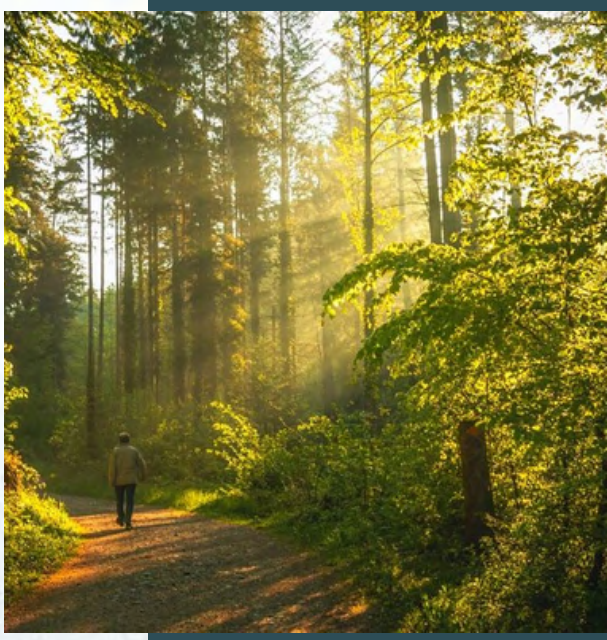

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Forest bathing isn't just for people who love the wilderness; The practice can be as straightforward as walking in any natural setting and consciously connecting with the environment. You can take a meditative ecotherapy excursion with trained guides for two to three hours for a more structured experience. A simple walk in a green space helps too. Choose your way of forest bathing and experience its magic.

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"Flowers always make people better, happier, and more helpful; they are sunshine, food and medicine for the soul."
- Luther Burbank

Juhi Chobey
B.Sc. (H) Botany
Ist year

Finding Serenity in Nature's Embrace: A Journey of Calmness and Tranquility

The voice of great spirit is heard in the twittering of birds, the rippling of mighty waters, and the sweet breathing of flowers- Zitkala-Sa

Imagine yourself deep in the forest with a little wind flowing, birds chirping, and the leaves of the trees falling slowly, with the little sunlight present how do you feel? I am sure the answer must be calm. All the crowd inside your head, all the stress, the thoughts good or bad constructive or destructive stopped for a moment, right? The enchantment silence you feel is the very basic and old benefit of our "not-so-symbiotic relationship" with nature.

What I was driving your attention towards is the effect of nature on our spirit. Nature and peace are always related and peace is always what our spirit wants. The people who live very close to forests, mountains, or even beautiful beaches would not feel it but we live in big metropolitan cities and feel the emptiness of our spiritual connection with nature. Nature is the most beautiful reflection of ourselves which we are just forgetting. Our connection with nature makes us an integral and inevitable part of nature. Sadly it is we who are just narrowing nature's incredible power to heal us and also to reverse all the destructions into perfection. You go hug a tree, play with streams or waves of the ocean, and feel the immense pleasure and satisfaction of mental peace. Our current lives are full of stress, anxiety, sadness, emotional crisis, and everything negative. The best way to deal with these negative thoughts is to vibe with nature.

Take out just 20 minutes from your busy schedule sit in the garden and feel the magical power of healing from all your day. Grow a little plant in your house, take care of it, and talk with it you will see how rapidly it grows and as fast as it grows it takes your negativity out and fills you with feelings of positivity.

Research supports the healing power of nature. A 2022 study published in the INTERNATIONAL JOURNAL OF MENTAL HEALTH AND ADDICTION determined that nature therapy is an effective short-term treatment for mental health conditions most notably anxiety. Participants experienced positive results after spending just 15 minutes outside for 9 days. Researchers credit the efficiency of this treatment to the idea that being in nature allows the body to decrease its stress levels.

In the end, I would like to say that takes some moments to heal and feel with nature and be happy.

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Adithi Rao
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3rd year

Pharma Amazonia: World's Medicine Cabinet

Over 750 different types of trees and 1500 species of higher plants with an equally astonishing number of bacteria, fungi, and insect species per hectare of the Amazon rainforest is something we, as city dwellers, cannot imagine. The Amazon rainforest or Amazonia is undoubtedly the world's largest medicine cabinet boasting life and biodiversity like none other.

To survive in this unique setting, these plants create complex powerful chemical defense systems against these pathogens. Several researchers are showing interest in studying these chemicals for their actions as drugs and therapeutic agents. These plants are centers of active plant chemicals which can be prepared into effective herbal remedies, constituting the true wealth of nature. The local people of the rainforest, led by shamans and herbal healers, have learned over several thousands of years the techniques to harness this power to protect themselves from the same harmful pathogens and to treat other common and sometimes deadly diseases. Species of tropical forest assist Western surgery and medicine in three ways. Firstly, its extracts can be used directly as drugs. For problems ranging from headaches to lethal contagions like malaria, rainforest medicines have provided modern society with a diversity of cures and pain relievers. Secondly, the chemical structures of these organisms sometimes serve as templates from which scientists can artificially synthesize drug composites. For instance, Aspirin is derived from extracts of willow trees found in the Amazon. Finally, rainforest plants provide assistance for research purposes.

Some specific phytocompounds enable us to understand how cancer cells grow, while others serve as testing agents for potentially harmful food and drug products. Leaves of two potato species produce a sticky substance that traps and kills predatory insects. This natural self-defense mechanism could reduce the need for using chemicals on potatoes. Some commercially important drugs and medicines which have their origins in the rainforests are:

- Lapacho is the best-known remedy used in the U.S. to cure cancers like Leukaemia, fungal infections, parasites, and bacterial, and viral infections. It is also considered one of the world's greatest immune-boosting herbs
- Quinine, an aid in the cure of malaria, is an alkaloid extracted from the bark of the cinchona tree found in Latin America and Africa.
- Alkaloid d-tubocurarine is used to treat diseases like multiple sclerosis, Parkinson's disease, and other muscular disorders and is extracted from the deadly poisonous bark of an indigenous tree. It also permits tonsillectomies, eye, abdominal and other kinds of surgery due to its anesthetic potential.
- Rosy Periwinkle, provides two essential antitumor agents. It is a gorgeous pink flower that has been a key factor in developing treatments for acute lymphocytic leukemia, as well as testicular, ovarian, breast, bladder, and lung cancers. The Malagasy people of Madagascar used a tea made of periwinkle to treat diabetes. Their leaves produce vinblastine and vincristine, organic compounds that inhibit cell division. These compounds are such powerful cancer treatments that the World Health Organization lists them as "essential medicines" that should be available in every health system.

Image source : https://www.istockphoto.com/photo/mata-atlantica-atlantic-forest-in-brazil-gm935746242-256021567

Image source : https://sciencesensei.com/hidden-secrets-of-the-amazon-rainforest/

Image source : https://www.thoughtco.com/tropical-rainforests-natures-medicine-cabinet-1204030

The above-listed plants are not even a speck in the vast universe of pharmaceutically useful plants and herbs in the Amazon. But these miracle cures are being subjected to widespread destruction and consequent extinction. Rainforests once covered 14% of the Earth's surface, now reduced to just 6%. Since World War II, industrialists began to take notice of the scope of exploitation, and today many drug companies work in conjunction with governments and native groups to find and record rainforest plants for their medicinal value and synthesize their bio-active compounds. As a result, trees are being cut down for timber and burnt to create farmland. That means we might be losing out on thousands of possible cures for serious diseases. People in indigenous tribes are losing their jobs in educating others about the wonders of the rainforest.

But saving tropical rainforests is also not an easy task, as poverty-stricken natives in these developing countries try to make a living from the forests, and many people with power throughout the Equatorial regions, out of economic desperation as well as greed, allow destructive practices to continue in the biodiversity hotspots. A holistic view of modern medicine and the natural world working in tandem gives off a stirring vision of the future — not just for pharma and medicine, but of society itself. We can use scientific advancements and technologies to benefit indigenous communities and create new medicines, all while improving the natural glories, rather than destroying them.

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Prerna Ghangas
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2nd year

Digging Deeper: The Mental and Physical Benefits of Gardening

“Gardening adds years to your life and life to your years."

Gardening is one of those conditions that we take for granted. We do not think about it as important unless the product we consume goes wrong. But gardening is veritably important. There are numerous reasons why you should start growing some plants in your home not only as your hobby but also as a commodity. It is one of the most popular pursuits around the world. With the recent rise of social media, people are starting to realize digging in and creating green space looks different for everyone. There is benefits in participating, no matter how large or small your growing space is. Gardening can provide you with many benefits, some of which include:

ENHANCED WELLNESS:

Growing and nurturing plants is a hands-on enterprise that relieves stress and helps both bedeck and purify the air inside your home, and it can boost your mood in numerous ways. Research shows that people who live near or have access to green spaces display lesser signs of depression or anxiety. Also, fresh flowers, fruits, and vegetables — from neighborhood sellers, plant parents, or your grocery store — help energize bodies and foster healthy cultures, which is especially important during a global health extremity like the pandemic the world experienced.

CONNECTS US WITH NATURE:

During the unprecedented times of the pandemic, many of us were craving ways to establish connection and meaning. Gardening at home, whether it is a deck flower box or a raised bed, allows us to connect to nature, to our food, and indeed our original communities in a palpable way. Tending to shops at home — from flowers to sauces to a full-overgrown vegetable plot — gave our near and dear ones a great occasion to connect to each other and Mother Earth.

Learning a new skill: Gardening or growing fresh vegetables is a relaxing as well as a family-friendly activity that is satisfying for kids and grown-ups alike. We may use home gardening to increase our fresh produce while also learning more about sustainability by growing colorful flowers to draw pollinators. As John Purcell, Head of Vegetables R&D for Bayer, talks about in his virtual Converse with 11- time-old young scientist Kellen, he uses a variety of tips and tricks to make his terrace garden more sustainable. These include using targeted irrigation styles to conserve water.

In Raleigh, North Carolina, Kurt Vandock, the director of public health for the US Environmental Science Department, maintains a flourishing community garden. He states- "Together as a family, gardening has handed the physical exertion and internal heartiness as we make, tend, stylize and enjoy all of our produce! This spring we're growing lettuce, beets, turnips, radishes, broccoli, carrots, and peas." The glory of gardening is handed in the dirt, head in the sun, and heart with nature. To sum it all up, what better than the words of Alfred Austin, 'To nurture a garden is to feed not just the body, but the soul."

Image source : https://www.orgakart.com/news/terrace-garden-living-with-nature/

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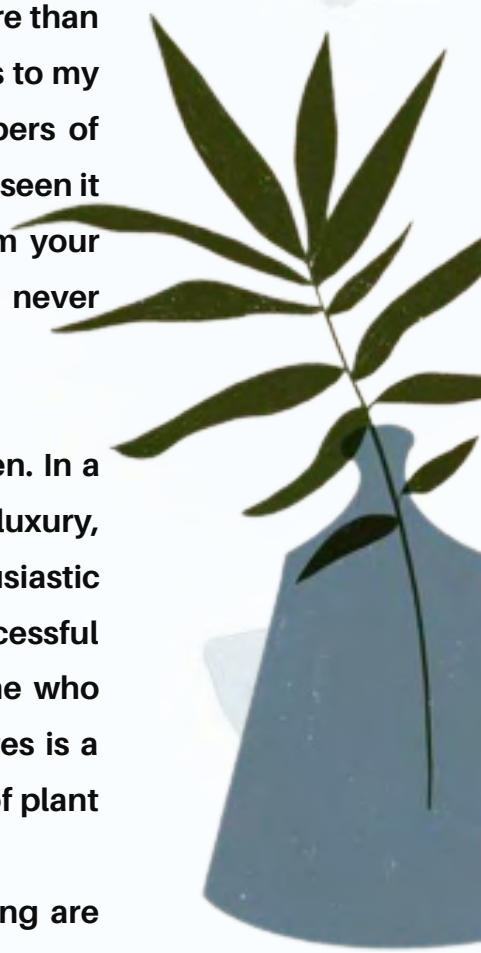
Gardening: More than just a Hobby

Second Runner up entry of the Essay Writing Competition- Write Out Loud!

Have you ever walked through the lush green gardens of Shanti path? It istruly a treat for the eye. Beautiful flowers adorn both sides of the road like a garland on a bride on her wedding day. It brightens up one's mood no matter how gloomy the weather is.

Gardening might be looked at as a hobby for some but for me it is more than just a hobby. All the credit for inculcating the love for gardening goes to my mother who is a Floraphile. Be it the crunchy rejuvenating cucumbers of summers or the sweet and juicy red carrots of winters, our garden has seen it all. The satisfaction of eating organic pesticide free vegetables from your own garden is an experience that its store-bought counterpart can never give.



In most metropolitan cities it is a privilege to have a sprawling garden. In a megacity like Delhi where having a roof on top is itself considered a luxury, gardening is often given the least precedence. But for an enthusiastic gardener space is immaterial. Passion for plants is the first step to successful gardening. With will comes a way, this is proved by a friend of mine who grows vegetables on her balcony which is just 4 ft long. All it requires is a desire to set out on a journey of understanding the intricate process of plant life.

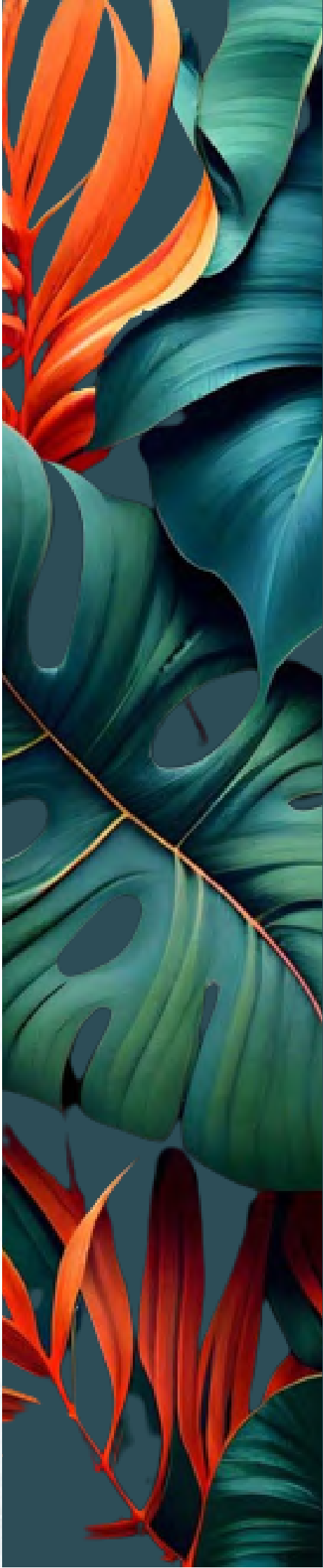
Moreover, with Technology and innovation newer ideas for gardening are coming up, some of these are vertical gardens, hydroponics and many others that have proved to be successful. These methods are not just used for kitchen gardens but also for large scale commercial farming.

Humans' association with plants can be traced back to the medieval ages. It is shocking to see that western gardening had its origins in Egypt some 4,000 years ago. Soon different communities started adopting this and included walled enclosures and planting a myriad of plant species. An astonishing upsurge in gardening began to be witnessed in western countries after World War II. The connection to plants is not new.

Whenever I go to my garden, I feel a connection that is indescribable and unworldly. It helps me to unwind and enjoy a nice cup of coffee. It instantly rejuvenates me. There is increasing evidence that exposure to plants and green space, and particularly to gardening, is beneficial to mental and physical health. It also helps counteract air pollution and climate change. Reduction in stress levels and an instant mood boost is something that I have experienced with gardening.

Seeing a seed grow from a plant ling to a full-fledged tree is a journey that is equivalent to that of a mother caring for a baby. It isn't an easy job, supplying water and nutrients is a full-time job that requires patience and kindness. I frequently find myself singing to my plants like a mother singing a lullaby to her babies. Studies have shown enhancement in plant growth when it is exposed to classical tunes and melodies.

Inevitably Roses and Chrysanthemum remain some of the winter favorites of Delhiites with an occasional appearance by calendula, petunia and pansy. The burst of colours is an instant mood enhancer. The pop of brilliance it gives to a foggy and dull winter morning is unparalleled. I believe gardening is the language through which nature and humans communicate.



Gardening is an art that must be handed down to the next generation. Climate change and other factors are making it difficult but proper care and advanced techniques can help spread the love of gardening to everyone out there. Let us all strive to take care of plants the way they take care of us by giving us an endless supply of nutrition and happiness. Gardens must become ubiquitous because the bond shared by humans and plants is extraordinary. Doesn't matter how small the effort is, for the fruit of one's arduous work is always sweet.

"A garden is a grand teacher. It teaches patience and careful watchfulness; it teaches industry and thrift; above all, it teaches entire trust." - Gertrude Jekyll

SEGMENT FINALE

Healing with Scent: The Magic of Aromatherapy

Chamomile

Anshita Bhatnagar, Co-editor, ANTHESIS

Chamomile is a popular herb that has been used for centuries in traditional medicine and aromatherapy. The term 'chamomile' is used to describe plants under the Asteraceae family. The etymology of the word 'chamomile' comes from the Greek words 'chamos' meaning ground and 'malos' meaning apple (ground apple), since its scent is similar to that of an apple.

Generally, 2 species of this family are extensively used in aromatherapy, namely, *Maricaria recutita* (German chamomile) and *Anthemis nobilis* (Roman chamomile). The main component of chamomile that is used in aromatherapy is its essential oil which is extracted from its bright blossoming flowers. The main constituent of the flowers is polyphenolic compounds. Chamomile consists of several ingredients including glycoside, flavonoid, herniarin, coumarin farnesol, nerolidol, and germacranolide. In aromatherapy,

It is typically used to promote relaxation, reduce stress, and improve sleep. Chamomile essential oil is sometimes used to support digestive health and relieve digestive complaints, such as indigestion, gas, and bloating. Its anti-spasmodic properties are believed to help relax the muscles of the digestive tract and relieve digestive discomfort. It is also known for its calming and relaxing effects on the body and mind. When inhaled or applied topically, its sweet, apple-like fragrance can help reduce stress and anxiety, promote feelings of peace and tranquillity, and improve sleep.

The oil can also be added to a diffuser to release its fragrance into the air, or it can be diluted with a carrier oil and applied to the skin for a topical massage. Chamomile essential oil is also used in some bath products, such as bath salts and bubble baths, for its soothing effects.

In conclusion, chamomile is a versatile and widely used herb in aromatherapy and can be used to support physical and emotional well-being. However, as with all essential oils, it is important to use chamomile essential oil with caution and to follow the recommended dilution guidelines to avoid potential adverse effects.

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Lavender

Shruti Apurva Co-Editor, ANTHESIS

Lavandula is a genus of about 30 species of plants in the mint family (Lamiaceae), native to countries bordering the Mediterranean. Lavender species are often found in herb gardens due to their fragrant leaves and attractive flowers. The plant is widely cultivated for its essential oils used to flavor various products. For example, dried flowers have long been used as sachets to scent chests and cupboards.

The ancient Romans also used lavender in their baths. Lavender is also sometimes used to flavor drinks and sweets and has many uses in herbal medicine, including English lavender (*Lavandula angustifolia*), French lavender (L. *stoechas*), and woolly lavender (L. *lanata*) are among the most commonly cultivated species.

Lavender is a small evergreen shrub with grey-green, gray linear leaves. Purple flowers are sparsely spiked at the tip of long exposed stems, and small fruits are produced. The plant's scent is caused by the shiny oil glands between the tiny star-shaped trichomes (plant hairs) that cover the flowers, leaves, and stems. Cultivated plants usually do not produce seeds and propagation is by cuttings or root division.

Lavender oil or lavender flower oil is obtained by the distillation of flowers and is mainly used in luxury perfumes and cosmetics. It is a colorless or yellow liquid with aromatic components of linalyl acetate, linalool, pinene, limonene, geraniol, and cineole. Lavender water, an alcoholic solution of essential oils plus other fragrances, is used in a variety of toilet preparations. Spike oil, or spike lavender oil, is distilled from slightly inferior lavender. Grain oil is used to paint porcelain, make soap, and flavor other products. According to Christian legend, lavender was originally odorless, but ever since the Virgin Mary dried Jesus' diapers, lavender has taken on a heavenly scent. Lavender essential oil is known to have many uses in aromatherapy.

Today, lavender is still favored as a Polish scent for clothes, closets, soaps, and even furniture. Lavender has traditionally been inhaled to relieve fatigue, insomnia, irritability, and depression. In the Victorian era, women recovered from fainting spells caused by wearing tight corsets and lavender-filled fainting pillows. Lavender is one of the safest and most widely used of all aromatherapy oils. Relieves muscle aches, migraines, other headaches, and inflammation. It is also one of the most antiseptic essential oils and treats many types of infections including lung, sinus, and vaginal infections, especially candida infections. Lavender is suitable for all skin types. Cosmetically, it's like a cell regenerator. It is said to prevent scars and stretch marks and slow down the formation of wrinkles. It is used for burns, skin damage from sunburns, wounds, rashes, and, of course, skin infections. Lavender is also used for digestive disorders, including colic. Among several scents tested by aromatherapy researchers, lavender was found to be the most effective in relaxing brain waves and relieving stress. used to reduce computer errors by nearly a quarter. In ancient times, pillows were filled with lavender flowers to help restless people fall asleep. Lavender aromatherapy treatments, or the use of aromatherapy products containing lavender, have been shown to calm the nervous system. There is no evidence that it can slow down activity, improve sleep quality, and improve mood in people with insomnia. Aromatherapy massage with essential oils, especially lavender, has been associated with improved sleep quality, and more stability Studies also suggest that it can help reduce mood and anxiety. To take advantage of lavender's sleepy properties, store linens in a drawer or closet with a bag of lavender, add a few drops of lavender oil to your tumble dryer, or spriest essential oils mix well, but lavender oil blends especially well with cedarwood oil, clary sage oil, geranium oil, pine oil, nutmeg oil, and all citrus oils (blended with bergamot essential oil). Lavender turns out to be a particularly beautiful combination).

A great formula for headache relief is 1 teaspoon of sweet almond oil and 2 drops of lavender essential oil as a carrier. Apply a few drops to the temples to relieve headaches. Lavender oil is one of the essential oils that mixes particularly well with a variety of other scents and fragrances.

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Holy Basil

Ananya Tomar, Co-editor, ANTHESIS

The name "basil" is used to refer to the fragrant plants in the genus Ocimum. The word "basilica" in Greek, which means "royal plant," is where basil gets its name.

Ocimum sanctum, also referred to as Holy basil or Sacred basil, is regarded by Hindus as being a particularly sacred herb. These fragrant plants are native to the Indian subcontinent and are grown in the tropical regions of Southeast Asia.

The *Ocimum* genus' essential oils are used in a variety of ways in the perfume and cosmetics industries as well as in traditional medical practices. In India, basil is grown across an area of 25,000 acres, and it contributes to an annual oil production of between 250 and 300 tonnes (2014).

Ocimum sanctum Linn., also referred to as holy basil or sacred basil, is a biennial or triennial shrub. Hindus worship this plant, which is frequently grown in temples and courtyards. Steam distillation of the plant's leaves produces a bright yellow volatile oil with a noticeable note of clove oil and a pleasant aroma. Mostly phenols, aldehydes, tannins, saponins, and lipids are present in the plant. Eugenol (71%), eugenol methyl ether (20%), carvacrol (3%), and trace amounts of nerol, caryophyllene, selinene, ß-pinene, camphor, cineole, linalool, and other compounds make up the essential oil. The plant is used as a cooking herb, and the leaves are added to salads and other dishes as a seasoning.O. sanctum is a 30-75 cm tall biennial or triennial that is upright, herbaceous, heavily branched, and gently haired. Flowers are purple or blue, leaves are whole, serrated, and pubescent on both sides. Fruits are sub-globose or broadly ellipsoid, slightly compressed, nearly smooth, pale brown or reddish, and have small black markings. They are crimson and grow in racemes. *O. sanctum* is the species with the broadest range, spanning the whole Indian subcontinent and reaching elevations of up to 1800 m in the Himalayas and the Andaman and Nicobar Islands.

This plant can live in a variety of environments. Holy basil oil smells rich and herbaceous, similar to sweet basil but more potent. Holy basil oil may have notes of eucalyptus, cinnamon, and clove when inhaled. Holy basil oil is used in meditation but also has stimulating properties. Use it for any form of meditation, energetic yoga sessions, or just to clear your mind.

USES & ADVANTAGES

- By combining basil with a citrus oil or clary sage and adding it to a diffuser, you can produce a peaceful, purifying atmosphere.
- In spiritual practice and ceremonies, holy basil oil may be used to provide power and protection.
- Inhale the steam from a bowl of hot water after adding a few drops of holy basil and eucalyptus.
- This can be used as a wellness facial, or to ease headaches and colds. Strong anti-inflammatory effects are present in basil
- As a mouthwash, mix a few drops of basil in some water.
- For grounding and meditation, massage the soles of your feet or your palms with a few drops of diluted basil and frankincense oil.

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Eucalyptus globulus, Blue Gum

Dhiseka Pawaiya, Editorial Member, ANTHESIS

Eucalyptus globulus a member of the Myrtaceae family commonly called eucalyptus or Blue Gum is evergreen and a native to Australia. The tree always remains evergreen and never sheds its leaves completely. It contains an aromatic oil called eucalyptus oil. The oil is extracted from the leaves of the tree. Eucalyptus leaves are long, slender, oval in shape, and taper to a point, averaging 7-10 centimeters in length.

The surface of the leaves is waxy, leathery thick, and tough due to the deposition of lignin. The leaves grow in an alternate pattern facing downwards and are covered by oil glands. The oil has a wooden and sweet aroma which is claimed to build immunity and relieve muscle tension relieving mental exhaustion by boosting circulation to the brain and rejuvenating the spirit, promoting exposure to positivity, and relieving stress and sadness. It often possesses aromatherapy benefits. Hence is used in aromatherapy, a therapy to provide relaxation and improve mood when blended with carrier oils to make massage oil or bath oil. Its vapors freshen the breaths, provide smoothness to irritated skin, decrease pain and promote relaxation, clear the nasal passage, and ease breathing in asthma and cold conditions. Eucalyptus essential oil is an antiseptic, it helps balance the oil balance in the skin while relieving burns, acne, abrasions, and insect bites. It also acts as a tick repellant.

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Oranges

Hibu Paku, Editorial Member, ANTHESIS

Any shrub or tree species under the genus *citrus* of the family Rutaceae are labeled as orange. Which bear spherical fruit with leathery oily rinds and delicious fleshy inside. The fruit is nutritionally rich in vitamin C and also provides vitamin A.

Oranges are thought to have originated in tropical Asia. Which spread across the West following the Roman invasion.

Now oranges are marketed in wide varieties of products; food flavours, cosmetics, pharmaceuticals, and essential oils.

Different types of oranges are used for the production of essential oil which includes bitter orange (*Citrus aurantium*), blood orange, and sweet orange (*Citrus Sinensis*), the most common type available in the market. Essential oils from oranges are extracted from the rind of the fruit and sometimes from leaves & flowers. Some of the common techniques for oil extraction include cold pressing and steam distillation.

The orange essential oil has several scientifically proven effects which include:

- Antimicrobial activities
- Pain relief
- Insecticidal activities
- Reduce symptoms of anxiety and depression

And many reports also suggest limonene (a major component found in citrus) potential for anti-carcinogen and other pharmaceutical benefits.

Other registered anecdotal benefit includes improving skin condition, reducing inflammation, and relieving stomach pain. the orange essential oil also adds a refreshing scent to the environment.

There are very few precautions that must be taken while using orange essential oil.

- Prolonged use can lead to skin irritants
- High doses of essential oil can affect the appetite
- And it is also not recommended for people during early pregnancy.

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Common sage

Yashasvi Saini, Editor-in-chief, ANTHESIS

Common sage (*Salvia officinalis)* is a perennial herb that is native to the Mediterranean region. It has been used for centuries for its medicinal properties, as well as its culinary uses. In recent years, common sage has also gained popularity in aromatherapy due to its unique scent and potential health benefits. Aromatherapy is a form of alternative medicine that uses essential oils and other aromatic compounds to improve physical, mental, and emotional well-being.

Common sage essential oil is extracted from the leaves of the plant and is known for its warm, herbaceous scent. Here are some of the potential benefits of using common sage essential oil in aromatherapy:

- Relaxation: Common sage essential oil is known for its calming and relaxing properties. It is often used in aromatherapy to help reduce stress, anxiety, and nervous tension. The scent of the oil can help promote feelings of relaxation and calmness, which can be helpful for those dealing with stress and anxiety.
- Respiratory support: Sage has been shown to have anti-inflammatory and expectorant properties, which can help support respiratory health. Inhaling the oil can help clear the sinuses and promote easier breathing, making it a useful tool for those dealing with respiratory issues such as colds, flu, and allergies.
- Memory and concentration: Common sage is believed to have cognitive-boosting properties that can help improve memory and concentration. It is often used in aromatherapy to promote mental clarity and focus, making it a useful tool for those who need to concentrate on work or study.

- Menopause symptoms: Sage essential oil has been shown to have estrogen-like effects, making it a potential treatment for menopause symptoms such as hot flashes and night sweats. The oil can be applied topically or diffused in the air to help alleviate these symptoms.
- Skin health: Sage oil has antibacterial and anti-inflammatory properties, making it a potential treatment for skin issues such as acne, eczema, and psoriasis. The oil can be applied topically to the affected area to help reduce inflammation and promote healing.

In conclusion, the common sage essential oil has a range of potential health benefits when used in aromatherapy. Its warm, herbaceous scent can promote relaxation, respiratory health, cognitive function, and skin health. As with all essential oils, it is important to use common sage oil safely and appropriately to avoid any adverse reactions. It is also important to consult with a healthcare professional before using essential oils for any specific health condition.

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SEGMENT FINALE

NEWS COLLAGE

Rare Find: Scientists Discover New Genus Of Fungus From Banyan Leaves Helpful ...

Scientists of the Botany department, Banaras Hindu University, along with researchers from

Marijuana-derived CBD is the new buzzword in skin care — for acne, ageing

With the astonishing results in pain treatment and its march into the skin care industry, it is safe to say, the CBD trend will only climb upwards.

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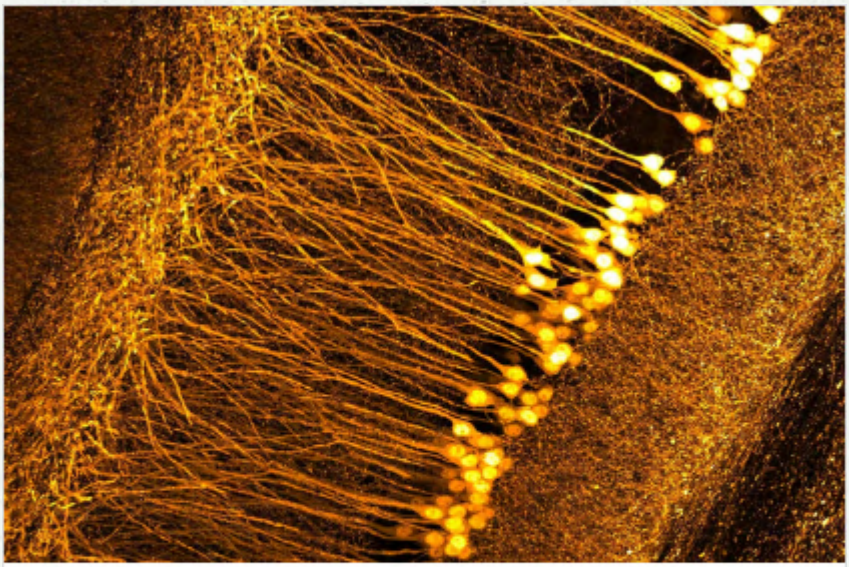

Inspired by the sea and the sky, a biologist invents a new kind of microscope

The device can achieve clear images using samples suspended in any kind of liquid

Gardening can cultivate better mental health

New research suggests that many peopl...

sciencedaily.com

Researchers at Department of Botany

Students of the Department of Botany actively partook in various research activities. This segment is introduced to celebrate these budding researchers and encourage more students to take part in Research and Development field.

Name of Members- Yashasvi Saini
Mentors- Dr. Geeta, Dr. Shweta Sharma
Title of paper- Comparative analysis of TP53 gene encoding for tumour protein p53 in different organisms to understand the molecular mechanism of cancer resistance
Affiliation of Members- 3rd year, B.Sc. (H) Botany
Paper Presentation- ICSSR Sponsored Two- Day international workshop on "Revisiting Wellbeing: Perspectives, Challenges, and the Road Ahead"

WINNER OF PATHFINDER AWARD FOR SCIENCE, 2021-2022

Abstract:

The protein p53 or TP53 or tumor protein is important for tumor suppression in eukaryotes. It is also known as the 'Guardian of the genome' as it conserves the stability of the DNA preventing it from getting mutated [2]. The name is due to its size 53 kilodalton (kDa) fraction of cell proteins, thus the name p53 [3]. In humans, the TP53 gene is present on the short arm of the seventeenth chromosome (17p13.1). The phosphoprotein, p53, is made up of 393 amino acids and contains four domains- transactivation motif (P53_TAD), DNA binding domain (DBD), and P53_tetramer [4]. The core domain is the one that recognize specific DNA sequences. The functions of other domains are- activation of transcription factors (P53_TAD), tetramerization of proteins (P53_tetramer) and domain that recognizes DNA damage (DBD). The p53 proteins have three main functions- growth arrest, DNA repair and cell apoptosis. In growth arrest, the p53 protein stops the cell cycle so that the damaged DNA cannot replicate and activates certain transcriptional units for DNA repair.

Apoptosis is the last method adopted to stop the proliferation of damaged DNA. Because of the function of p53 in the suppression of cancer, this protein is of great importance. But even the presence of p53, Rb proteins, and other compounds does not guarantee resistance towards cancer. These proteins and mechanisms can only function till a certain limit beyond which the restoration of DNA damage is not possible and tumor growth starts in the organisms. However, certain organisms have shown resistance to cancer. Elephant, Naked mole-rat, Blind mole rat, Bowhead whale, Bats, and Squirrels have adopted different mechanisms for cancer resistance. The goal of the present study is to analyze the difference in structure and mechanism of functioning of the p53 protein in cancer-resistant and susceptible organisms. If p53 acts as a tumor suppressor in most organisms, then is there a difference in p53 structure (molecular biology) or pathway in cancer-resistant organisms? If there is then what is the degree of difference? If not then what other mechanisms are adopted by cancer-resistant organisms for cancer resistance?

Name of Members- Devyani Dwivedi, Kalpana Jha
Mentor- Dr. Priyanka Pandey
Title of paper- Effect of medicinal plants on bacterial growth with silver nanoparticles as carrier
Affiliation of Members- 3rd year, B.Sc. (H) Botany
Paper Presentation- Pathfinder Award for Science, 2021-2022

Abstract:

There are two objectives in the proposed project for pathfinder award experimentation. Reports of preparation of nanoparticles from abundantly occurring green resource, bamboo in tropical countries like India are available. A review would be done for research work done on bamboos for yielding nanoparticles. Experiment would be conducted for preparation of silicon based nanoparticles from Bamboo through green technology involving different methods. Preparation of nanoparticles is to be supported by evidences for which characterization would be done using available resources like electron microscopy, thermo- luminescence etc. Comparison between nanoparticles prepared through different methods and those obtained through synthetic means would be done to assess the efficacy of procedures adopted for their preparation. Based on comparative data for characterization of silicon nanoparticles, these would be infused with bioactive compound which can be an extracted pure and easily available extract like neem extract.

With this method, bioactive compound carrier which would be a silicon nanoparticle would be prepared. The effect of this drug carrier matrix would be studied on E coli cultures to determine optimum dose and its effect on eradication of contamination from these bacterial colonies. The experimentation would serve two purposes; it would yield green nanoparticles from abundant bio-resource which can serve as carrier for different bioactive compounds. On the other hand the preparation of bioactive compound carrier would be useful to study the effect of these compounds in various fields like growth of microbial cultures, eradication of contamination, enhancement or elicitation of secretion of useful compounds by microbial cultures. The results can be further worked upon plant cultures.

Name of Members-Tejsevi, Surbhi , Riddhi
Mentor- Dr. Udita mukherjee
Title of paper- Single Cell Protein as Dietry Element
Affiliation of Members- 3rd year, B.Sc. (H) Botany
Paper Presentation- Pathfinder Award for Science, 2021-2022

Abstract:

India, as a developing country, has approximately 189.2 million people who are undernourished. Through the green revolution, we dealt with the issue of starvation up to a great extent but neglected the aspect of nutrition. We can fulfil this requirement of nutrition by using SCPs (single-cell protein) as a source of protein in people's diet. SCPs are dried single-celled microorganisms like algae, fungi and bacteria that are rich sources of protein and can be readily cultured on nutritive or waste substrates. SCPs have the primary advantage of being a valuable source of protein. SCPs are grown on organic waste matter generated in industries and hence minimize waste issues. Their production doesn't demand additional land and they can be grown on existing land resources. Also, they utilise waste matter and hence their production does not pollute the environment. In, a short duration of time, massive amounts of protein can be generated by using SCPs. It is a way of utilising organic waste products, and the residue from SCP production can likewise be exploited as a source of green manure. As the population density of India is expanding at an alarming rate, the demand for nutritive food sources has increased a lot. So, for that, SCPs can be utilized as a protein supplement. We will conduct an online survey among people and college going students. Through this survey, we aim to identify how many people are aware of the presence of SCPs and their role in nutrition. We want to find the percentage of people who already know about the presence of SCPs and their dietary value. We also intend to understand how acceptable SCPs are to the people.

Name of Members- Dhiseka Pawaiya, Jyoti Kumari
Title of paper- Tapping inside for Wellbeing
Mentor- Dr. Pritam Kaur
Affiliation of Members- 1st year, B.Sc. (H) Botany
Paper Presentation- ICSSR Sponsored Two- Day international workshop on "Revisiting Wellbeing: Perspectives, Challenges, and the Road Ahead"

Abstract:

Wellbeing is wellness, a prudential value that refers to, a state of peace and harmony, being healthy, happy or comfortable. Perhaps well-being can be defined as a 'Eudaimonia'. Being a parameter to define the gaiety and prosperity of an individual, wellbeing has a unique definition in each unique mind, which is neither comparable nor can be defined ideally. Perception of subjective wellbeing has a long tradition as well as is an important feature of life. In order to achieve an overall sense of wellness we need to have a balance in key elements which include physical, emotional/psychological, mental, spiritual and intellectual measures. For accompanying these having a balanced diet; doing regular exercise, yoga and meditation; positive thinking; abhorring stress; staying happy; having fewer expectations indispensable. According to us stress, negative thoughts, desires and expectations are factors acting as a hassle in today's world. In an estimation of about 422 million people worldwide, 116 million people in the United States are agonizing stress-generative disorders like diabetes and hypertension. When we undergo mental stress, emotional pain or depression, the physical tendency and immunity of our body to fight diseases or any external stimuli that can be emotional as well drops. It means all the stresses are impacting the wellbeing at the level of body and mind of a person. The data in the study is based on a survey conducted by us that instigated what is wellbeing according to different age groups, how they perceive it to be and how to deal with stress. At different age periods, we have different expectations from life and if not fulfilled those results in a stressful life and can affect the body and mind. Expectations can be excellence in academics and profession, work pressure, relationship problems, fear, overpowering others and/ or financial crisis as faced during Covid, etc. Therefore, in this study, a survey conducted on a limited population of different age groups depicted that we all face different kinds of stresses in day-to-day life. Individualistic thinking and series of events when not happening according to expected and not letting go attitude fuels our anger and ego. To overcome daily stresses, in our survey we observed that > 50% of people out of our total responses spend time with their family and close ones as a recreational activity. That means stress can be relieved when we have people around us, who love us, who cares for us. We as a human cannot always rely on individualistic practices for counter-attacking our problems. Therefore, inner support system is a must for every human to give that unique definition of his/ her 'EUDAIMONIA'.

Inner self that is soul is required to be strengthened, and empowered to overcome all outer stresses and turmoil. Scientific traditions never consider the soul as a part of a living body, but spiritual people believe in it to an extent beyond life and death. Considering those beliefs and facts behind its existence a healthy, empowered and positive soul can lead to a healthy body and mind. We cannot find peace until we attain the comfort of the soul. We found from our survey that >80% of people consider spiritual practices such as meditation to be a part of their self-wellbeing and mostly got inclined during the most stressed face of life like Covid. Meditation is a factor which can anchor inner strength and stability and according to various research studies can have many physical, emotional and medical benefits in long time meditators. Meditation can act as a preventive medicine for the well-being of the body, mind and soul. It is a non-denominational technique practised by people of all faiths, cultures and religions. Meditation is a way to be relaxed and eliminate the imbalance caused by mental stress. Through it, we can calm, control our minds and thoughts, control our reactions to the outer world and restore peace and equilibrium. And to control our reactions and tackle the stress, we need to tap inside, invert and be in silence which is meditation. Besides reducing stress and multiple benefits of doing meditation there is a carryover effect till long time, and will be rippled to outer world. Meditation is not a mechanism to eliminate outer stresses but is a key for being peaceful by maintaining a serene state of mind in the midst of turmoil and hence being happy. Everybody in this world today is searching for a happy and qualitative life. The qualitative aspect is materialistic and standardized happiness, which most often promotes disrupted well-being, but happiness is not left behind. Meditation is a holistic approach to achieve a state of happiness, peace and harmony. Hence, this paper proposes the probability of a holistic approach to well-being through meditation.

Name of Members- Rishika khandelwal, Tanvi kathuria
Title of paper- Comprehending Psychological and Subjective Wellbeing
Affiliation of Members- 1st year, B.Sc. (H) Botany
Paper Presentation- ICSSR Sponsored Two- Day international workshop on "Revisiting Wellbeing: Perspectives, Challenges, and the Road Ahead"

Abstract:

Psychological well being and subjective well being are two vital concepts in Positive psychology that analyze the quality of life. These are often seen as interrelated concepts. There have been many texts and research papers to decipher psychological and subjective well being and its components. The research attempts to comprehend various constituents of psychological and subjective well being.

Whether well being can be termed just as happiness or is it beyond that. The goal is to understand psychological and subjective well being beyond the well defined constructs. Most theories define psychological and subjective well being as in terms of Eudaimonia (personal fulfillment) and hedonia (pleasure). These two approaches form the basis of understanding psychological and subjective well being. In an effort to strengthen the concepts about psychological and subjective well being, the theories of Diener (1984;2000; Diener et al.,2002) and Carol D. Ryff (Ryff.2014) were revisited. Aristotle is considered to be the first advocate of the eudaimonic approach. He stated the highest of all goods achievable by human action was eudaimonia. This approach views well being as happiness plus meaning. Diener(1984;2000; Diener et al.,2002) defines subjective well being as a combination of positive affect and life satisfaction. His theory considers well being to be the subjective evaluation of one's current status in the world. Carol D. Ryff (Ryff and keyes, 1995) explained psychological well being comprising of six vital constructs a) Self acceptance b) Positive relations with others c) Personal growth d) Purpose in life e) Environmental mastery f) autonomy. The hedonic perspective considers happiness to be synonymous to well being. The age old definations of happiness see it as goal satisfaction. According to them human beings are in search of ever lasting happiness. However the modern day definations of happiness see it beyond the materialistic perspective and emphasize on life meaning and pleasure thus making it an important constituent of well being. This theory however is contrary to the eudaimonic approach. In an attempt to understand the determiners of psychological and subjective well being, a survey was conducted on 150 people. Age and Sex of the respondents was also considered to understand its affect on the person's well being. The survey was attempted by 63.9% female and 36.1 % males. The respondents aged from 13 years to 55 years. The survey consisted of 20 questions that attempted to reveal the various aspects that contribute to their psychological and subjective people. (For example: "I am happy and contented with my height, weight and body shape" to understand self acceptance in the participants) The participants were informed that the survey was voluntary, anonymous and that they could terminate the survey anytime. The results revealed that the principal constituents include self acceptance, healthy relationships, unconditional positive regard, life satisfaction, harmony, self determination and development. All these factors together contribute to a person's well being, induces a feeling of happiness and inculcates confidence. For example: 47 % people strongly agreed to "I am happy and contented with my height, weight and body shape" which indicates high self acceptance and confidence in them. After the careful analysis of the result it is inferred that psychological and subjective well being can be seen as a product of life satisfaction, harmony, self development, sovereignty, acceptance and positive relationships. The presence of these factors in a persons may result in good psychological and subjective well being. Well being is more than just happiness. A person' well being is affected by various factors. It includes past experiences and future expectations. Happiness is just an aspect of it and cannot be seen as the principal determiner of it. Similarly life satisfaction, harmony, self development, sovereignty , acceptance and positive relationships are solely not responsible for a person's well being. A balance of meaning, happiness, good past experiences and hopeful future contribute to good psychological amd subjective well being.

Name of Members- Binal Pandey
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Title of paper- Climate Change and Wellbeing
Paper Presentation- ICSSR Sponsored Two- Day international workshop on "Revisiting Wellbeing: Perspectives, Challenges, and the Road Ahead"

Abstract:

Climate change has been around the globe for years bygone and will be present throughout for times to come . According to WHO, the key impacts of climate change are as said : -Climate change affects the social and environmental determinants of health – clean air, safe drinking water, sufficient food and secure shelter. -Between 2030 and 2050, climate change is expected to cause approximately 250 000 additional deaths per year, from malnutrition, malaria, diarrhoea and heat stress. -The direct damage costs to health (i.e. excluding costs in health-determining sectors such as agriculture and water and sanitation), is estimated to be between USD 2-4 billion/year by 2030. -Areas with weak health infrastructure –mostly in developing countries – will be the least able to cope without assistance to prepare and respond. -Reducing emissions of greenhouse gases through better transport, food and energy-use choices can result in improved health, particularly through reduced air pollution. As we are going with the modern ages with the help of technology ,we also see a drastic change in climate ,the daily news of drought, flooding and natural disasters that cause a great disdain to humanity and the destruction of life and earning. Climate change is already impacting health in a numerous of ways, including by leading to death and illness from increasingly frequent extreme weather events, such as heatwaves, storms and floods, the disruption of food systems, increases in zoonoses and food-, water- and vector-borne diseases, and mental health issues. A research on Climate anxiety, wellbeing and pro-environmental action correlates of negative emotional responses to climate change in 32 countries by A.Ogunbode and Mehmet Karasu states analysed cross-sectional data gathered in 32 countries (N = 12,246). The results show that climate anxiety is positively related to the rate of exposure to information about climate change impacts, the amount of attention people pay to climate change information, and perceived descriptive norms about emotional response to climate change. Climate anxiety was also positively linked to pro-environmental behaviours and negatively linked to mental wellbeing. Notably, climate anxiety had a significant inverse association with mental wellbeing in 31 out of 32 countries. In contrast, it had a significant association with pro-environmental behaviour in 24 countries, and with environmental activism in 12 countries. Our findings highlight contextual boundaries to engagement in environmental action as an antidote to climate anxiety, and the broad international significance of considering negative climate-related emotions as a plausible threat to wellbeing. Scholars suggest that climate anxiety can be triggered by a loss of places, activities and traditions due to climate change or fear of the potential scope and impact of dangerous climate change . It is not considered to be inherently pathological (i.e., it is not a clinical disorder). Nonetheless, Clayton and Karazsia (2020) developed a measure of climate anxiety that emphasises the potential for psychological impairment. Their scale is based on clinical measures of functional impairment and rumination.

Climate anxiety is more strongly related to pro-environmental actions in individualistic and wealthier countries. Negative emotions are key drivers of human action (Weber, 2006). Therefore, widespread negative emotional responses to climate change are a positive indicator of the potential for large-scale social and political action on the climate crisis. However, negative emotions can also have adverse implications for human wellbeing and psychological functioning. Earlier research showed a link between climate change concern and psychological distress . More recent scholarship on the relationship between negative climate-related emotions and wellbeing have coalesced around the concept of climate anxiety – a concept closely related to fear and worry . Climate anxiety can be considered a subset of eco-anxiety which is defined by (Clayton et al., 2017) as a chronic fear of ecological doom. The current study diverges from Clayton and Karaszia's (2020) approach by focusing on the negative emotionality embodied by climate anxiety.1 We do not presume an overlap with psychological impairment. Instead, our approach aligns with Pihkala's (2020) argument to avoid narrowly restricting conceptualisations of climate anxiety only to the stronger anxiety symptoms . We used a measure of negative climate-related emotions that is based on the 'State Anxiety' dimension of the State-Trait Anxiety Inventory (by Spielberger, 1983). State anxiety captures the intensity of an individual's feeling of anxiety as an emotional state at a given point in time. High levels of state anxiety are interpreted as reflecting negative emotional responses to situational influences such as anticipated or present danger, or past traumatic events associated with the present situation Correspondingly, our operationalisation of climate anxiety reflects a state of heightened negative emotionality due to perceived threat from climate change.2 This construct differs from concepts like climate change worry or concern by capturing not just the feeling of being worried or anxious, but also the associated mental states of being tense, calm, peaceful or unrelaxed. It is therefore a more holistic representation of the experience of intense negative emotionality. Antecedents of climate anxiety One way negative emotions arise is from appraisals of events or situations in light of their implication for wellbeing. Here, implications for wellbeing encompass the potential fulfilment or obstruction of the appraiser's needs, values, goals, beliefs and other interests. Social cognitive theory indicates that individuals' emotions and cognitions are shaped by contextual influences that provide information through instruction, modelling and social persuasion. We propose that the knowledge that underlies feelings of climate anxiety may be acquired through direct personal experiences , or indirectly through social interaction and media consumption. Below, we outline the empirical considerations that framed our hypotheses regarding the plausible antecedents of climate anxiety. Social norms Drawing from the focus theory of normative conduct, there are two categories of social norms. The first is descriptive norms, which refers to a person's perception of what most people do in a given situation. The second is injunctive norms, which refers to perceptions of what behaviours important social referents (e.g., family, friends, colleagues or neighbours) approve or disapprove of in specific situations. People are more likely to enact adaptive behavioural responses to climate change when they perceive social norms to be supportive of such behaviour. Therefore, perceiving strong negative emotional responses to climate change among key social referents like friends and family members (descriptive norms) may foster feelings of climate anxiety by emphasising the threat posed by climate change, or in other words providing social proof that strong negative emotional responses are an appropriate response to the threat. Perceived descriptive norms of negative emotional responses to climate change among key social referents are positively associated with climate anxiety Scholars have speculated that rising rates of exposure to environmental information via the media may be leading to increased negative emotions and poor wellbeing . Another study showed that exposure to climate change-related media through television predicted greater risk perceptions in India, but internet use showed a negative effect and newspaper use showed no effect .

Now in accord to a study done by David Maddison, Katrin Rehdanz on The Impact of Climate on Life Satisfaction Data are taken from the World Values Survey which includes 178 observations drawn from 87 countries. Surveys were undertaken over the period 1981-2008. The WVS records the views of respondents on a variety of issues but for our purposes the variable of interest is life satisfaction (SATISFACTION) measured on a 1-10 scale. More specifically, question included in the world value survey .For those households inhabiting climates currently characterised by a large number of , the results indicate that warmer temperatures might improve SATISFACTION. But for those households inhabiting climates currently characterised by a large number of warmer temperatures might bring reduced SATISFACTION. In the short- to medium-term, the health impacts of climate change will be determined mainly by the vulnerability of populations, their resilience to the current rate of climate change and the extent and pace of adaptation. In the longer-term, the effects will increasingly depend on the extent to which transformational action is taken now to reduce emissions and avoid the breaching of dangerous temperature thresholds and potential irreversible tipping points. An overview of climate-sensitive health risks, their exposure pathways and vulnerability factors. Climate change impacts health both directly and indirectly, and is strongly mediated by environmental, social and public health . The Intergovernmental Panel on Climate Change (IPCC) has concluded that to avert catastrophic health impacts and prevent millions of climate change-related deaths, the world must limit temperature rise to 1.5°C. Past emissions have already made a certain level of global temperature rise and other changes to the climate inevitable. Global heating of even 1.5°C is not considered safe, however; every additional tenth of a degree of warming will take a serious toll on people's lives and health. Now that we have seen the effect of climate on well being ,we can now even see the actions to mitigate about to a positive change in well-being Human well-being and climate change mitigation by William F Lambi, Julia K Steinberger which states about the climate change mitigation the choice of approach is highly consequential for: (1) understanding inter- and intra-generational equity; (2) defining appropriate mitigation strategies; and (3) conceptualising the socio-technical provisioning systems that convert biophysical resources into well-being outcomes. Eudaimonic approaches emphasise the importance of consumption thresholds, beyond which dimensions of well-being become satiated. With all the above mentioned citations ,we conclude how climate has come about to affect our wellbeing and holistic approach to it which will affect both the human race and the whole biosphere. Conclusion Climate change is undermining many of the social determinants for good health, such as livelihoods, equality and access to health care and social support structures. These climate-sensitive health risks are disproportionately felt by the most vulnerable and disadvantaged, including women, children, ethnic minorities, poor communities, migrants or displaced persons, older populations, and those with underlying health conditions. Although it is unequivocal that climate change affects human health, it remains challenging to accurately estimate the scale and impact of many climate-sensitive health risks. However, scientific advances progressively allow us to attribute an increase in morbidity and mortality to human-induced warming, and more accurately determine the risks and scale of these health threats. While no one is safe from these risks, the people whose health is being harmed first and worst by the climate crisis are the people who contribute least to its causes, and who are least able to protect themselves and their families against it - people in low-income and disadvantaged countries and communities Things that form the core of our wellbeing – our physical and mental health, a secure income, a pristine natural environment, even our identity – can be affected by changes to the climate. In some areas, impacts on things that contribute to our wellbeing are already being observed. For example, the areas where some species live have shifted, including some species that are considered taonga. But in many areas, the ways climate change could affect various aspects of our wellbeing, like our mental health or security is only beginning to be explored all over the globe.

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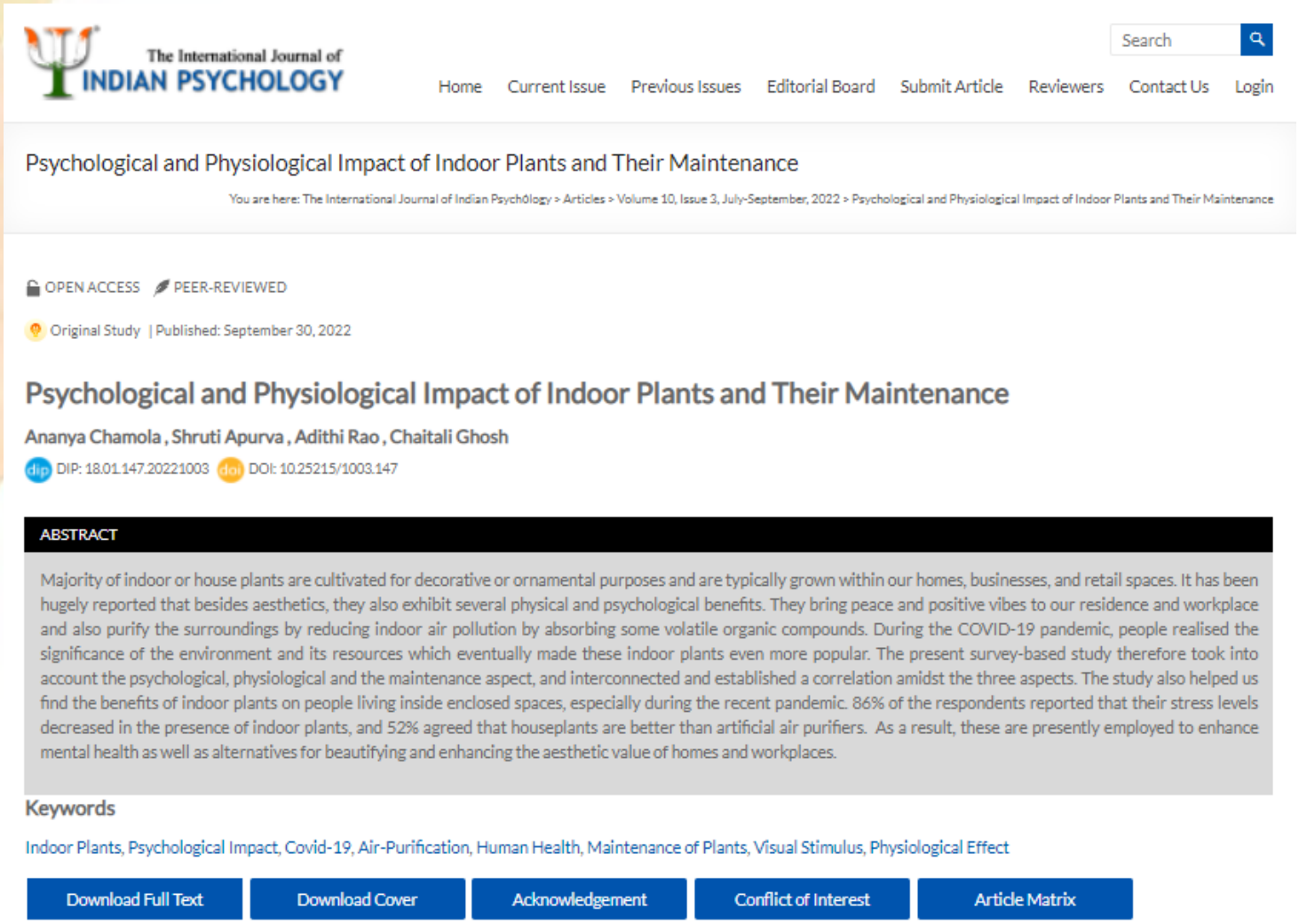
Paper Presentation- Pathfinder Award for Science

PAPER PUBLISHED IN THE INTERNATIONAL JOURNAL OF INDIAN PSYCHOLOGY

https://ijip.in/articles/psychological-and-physiological-impact-of-indoor-plants-and-their-maintenance/



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Psychological and Physiological Impact of Indoor Plants and Their Maintenance

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OPEN ACCESS PEER-REVIEWED

Original Study | Published: September 30, 2022

Psychological and Physiological Impact of Indoor Plants and Their Maintenance

Ananya Chamola , Shruti Apurva , Adithi Rao , Chaitali Ghosh

DIP: 18.01.147.20221003 DOI: 10.25215/1003.147

ABSTRACT

Majority of indoor or house plants are cultivated for decorative or ornamental purposes and are typically grown within our homes, businesses, and retail spaces. It has been hugely reported that besides aesthetics, they also exhibit several physical and psychological benefits. They bring peace and positive vibes to our residence and workplace and also purify the surroundings by reducing indoor air pollution by absorbing some volatile organic compounds. During the COVID-19 pandemic, people realised the significance of the environment and its resources which eventually made these indoor plants even more popular. The present survey-based study therefore took into account the psychological, physiological and the maintenance aspect, and interconnected and established a correlation amidst the three aspects. The study also helped us find the benefits of indoor plants on people living inside enclosed spaces, especially during the recent pandemic. 86% of the respondents reported that their stress levels decreased in the presence of indoor plants, and 52% agreed that houseplants are better than artificial air purifiers. As a result, these are presently employed to enhance mental health as well as alternatives for beautifying and enhancing the aesthetic value of homes and workplaces.

Keywords

Indoor Plants, Psychological Impact, Covid-19, Air-Purification, Human Health, Maintenance of Plants, Visual Stimulus, Physiological Effect

Download Full Text Download Cover Acknowledgement Conflict of Interest Article Matrix

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Title of paper- A survey on some commonly used medicinal plants in Manipur
Paper Presentation- Oral Paper Presentation at National Conference on Medicinal Plants: Frontier areas of research and development

SECOND PRIZE WINNER IN ORAL PAPER PRESENTATION CATEGORY

Abstract:

Manipur is geolocated in a biodiversity hotspot and has many endemic medicinal plants. Many such plants have long been used in primary health care as part of the traditional medicine system. Different plant parts such as their leaves, flowers, fruits, roots, tubers, rhizomes, and bulbs are made into various medications. The plants are either employed singly or as polyherbal preparation by different local communities of Manipur. Most of these uses are part of traditional knowledge and are transmitted orally down the generations. This survey carried out using standard questionnaires and personal interactions across various age groups attempts to assess the use of some medicinal plants by different communities and how effectively it is still transmitted in the present generation. Also, efforts are made to document their benefits.

Strain Your Brains

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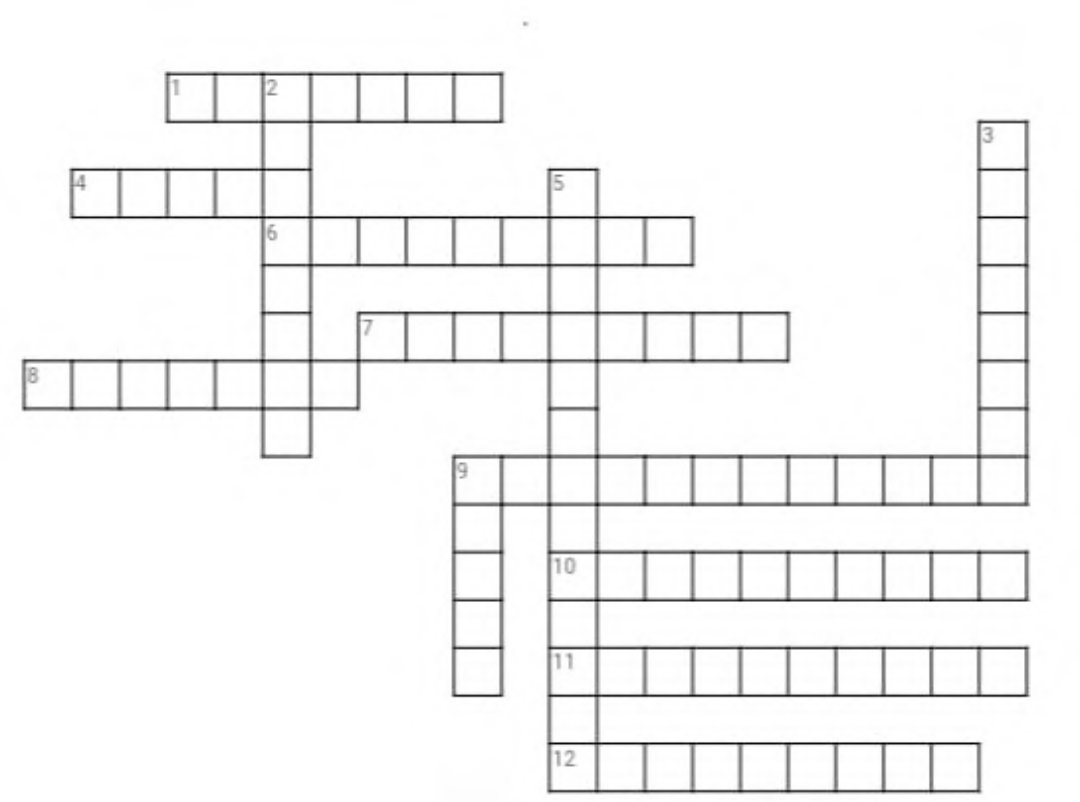
Rooted in Knowledge



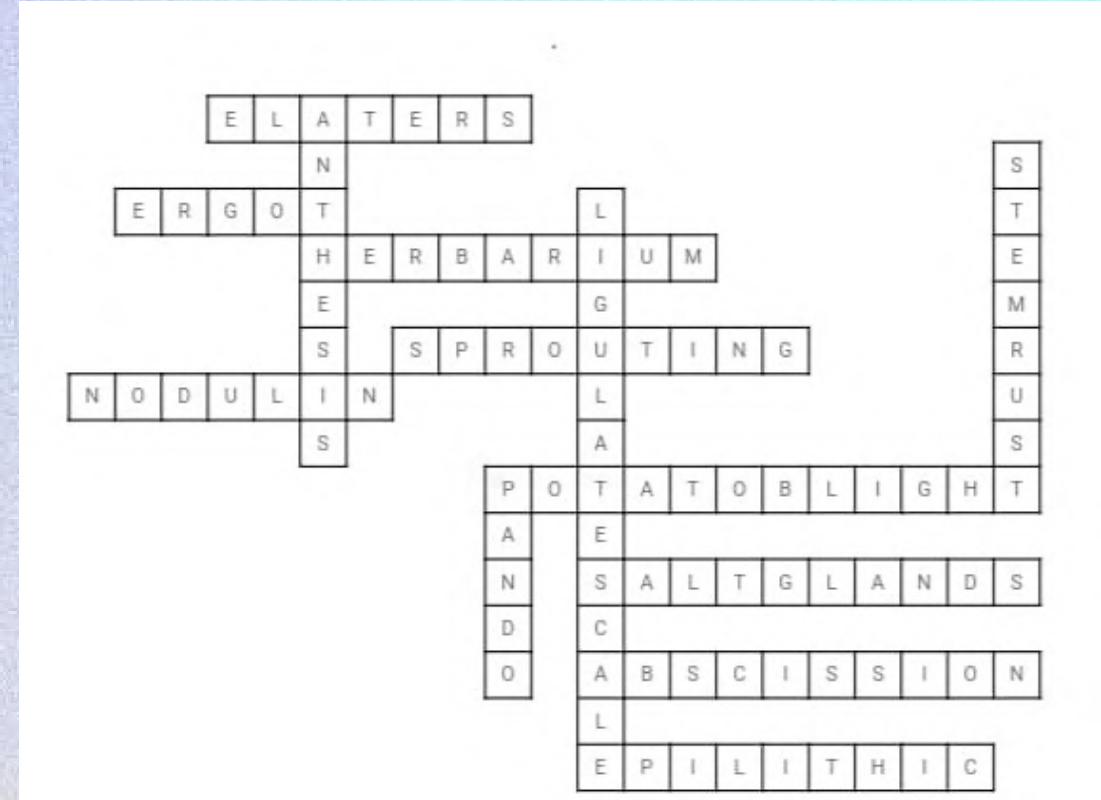
ACROSS

1. Spirally wound bands, with flat spoon tips, hygroscopic in nature, uncoil in absence of moisture in Equisetum.
4. A fungus that grows on rye and less commonly on other grasses such as wheat
6. This is a place to keep dry plant specimens.
7. A process where the seeds are induced to sprout or germinate for commercial purposes.
8. Plant genes to specific nodules.
9. A disease caused by a fungus-like organism that spreads rapidly through the foliage and tubers of potatoes in warm, wet weather causing collapse and decay.
10. It's an epidermal structure specialized for the excretion of excess salt from the plant body.
11. Process by which plant components such as flowers, fruits, and leaves naturally separate from the parent plant.
12. These are plants growing on the surface of rocks and are able to gather their required nutrients from rainwater or small amounts of organic matter that accumulate on the rock surface.

DOWN

2. This refers to the period of opening of the flower bud.
3. Disease-causing large, oval-shaped pustules filled with orange to red spores (urediniospores) and are most commonly observed on stems, and leaf sheaths of infected plants.
5. Appears like tongue, present in Marchantia.
9. A forest made from a single tree sharing one root system.

Answers



ACROSS

1. Salt Gland
3. Stem Rust
6. Pando
7. Ergot
8. Sprouting
9. Epilithic
13. Ligulate Scale

DOWN

2. Potato blight
4. Anthesis
5. Abscission
11. Herbarium

Creative Corner

ANTHESIS | VOLUME 18 | 2022-2023

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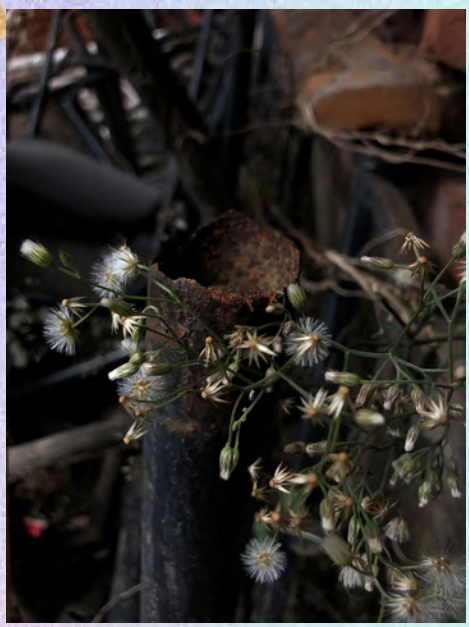
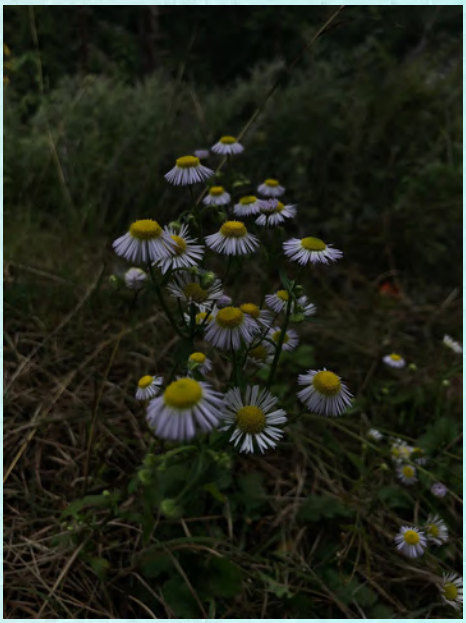
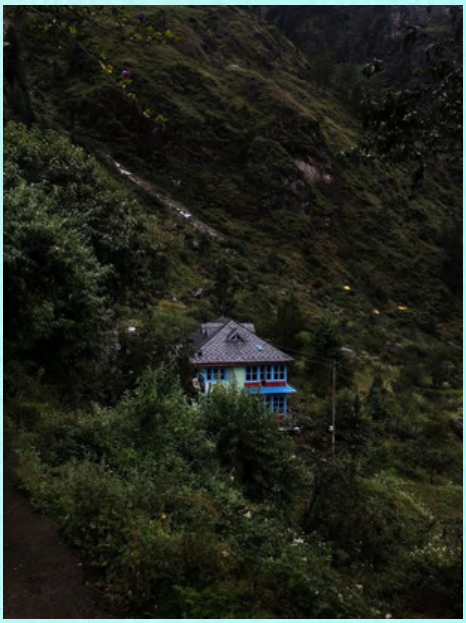


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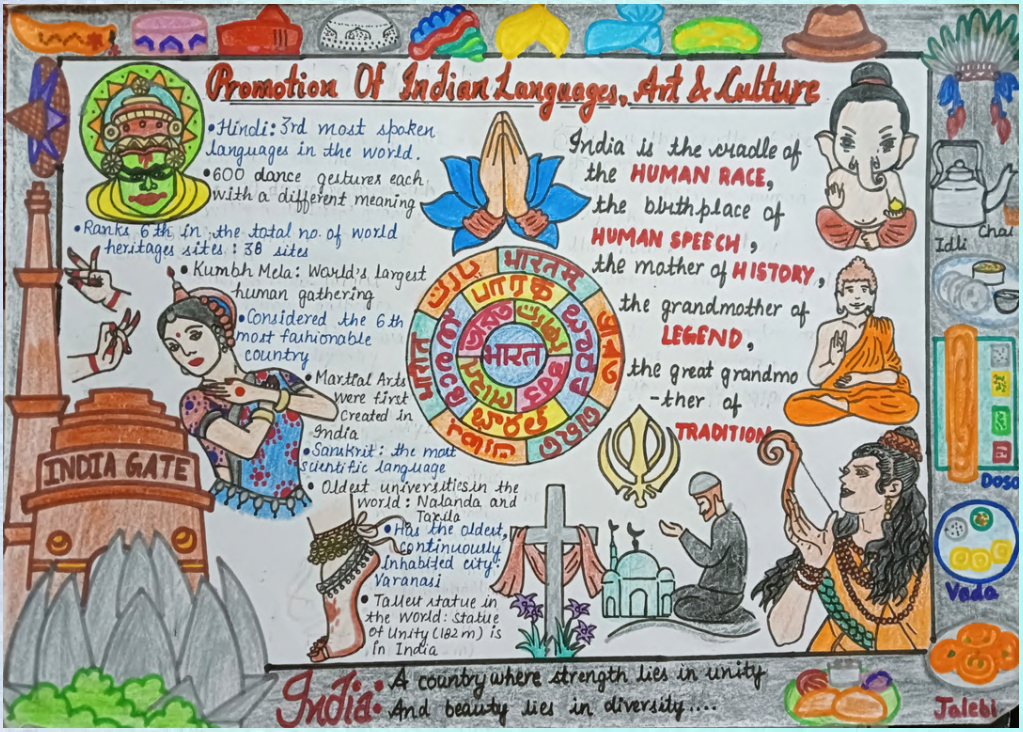

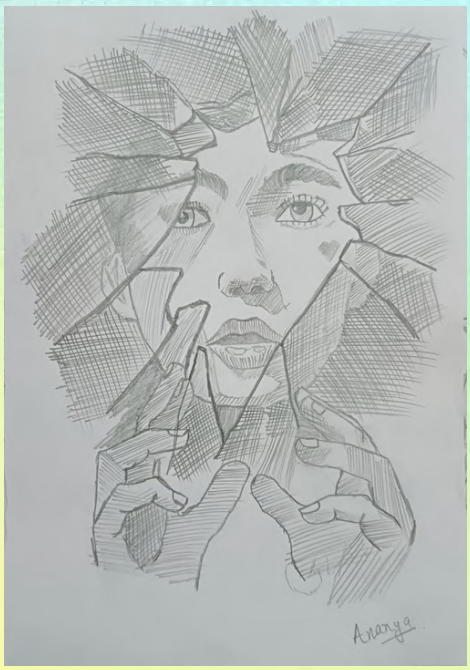

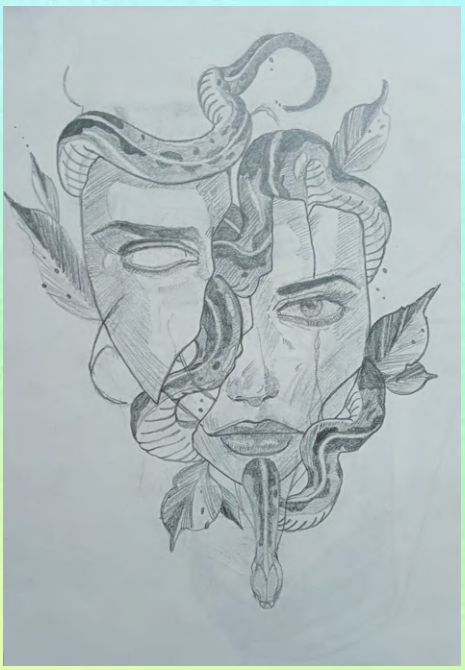

Ending Note

The team of Anthesis comes forward with the annual magazine every year consisting of aesthete themes that are factual and didactic. It provides us all with a suitable and enriching environment to showcase our abilities and to dwale around in the arcane existence of what exists around us. It allows us to weave together an odyssey that gifts us with escapades that are evanescent, yet mesmerizing. From handpicking a theme to finalizing every graphic, the trail has been full of knowledge, excitement, and hard work. The hiccups that we came across and how we dealt with them as a team left us with lessons that will play a great role in making us who we are.

We want to extend our heartfelt gratitude to all of you who have joined us on this journey. It's been a pleasure to bring you captivating articles, compelling stories, and thought-provoking insights that have enriched your lives and inspired your minds. We would like to express our sincere appreciation to our talented team of writers, editors, photographers, and designers for their unwavering commitment to excellence. Their passion, creativity, and hard work have been instrumental in creating a magazine that we are proud to share with you. Also, this wouldn't have been possible without the constant support and assistance of our honorable faculty advisors, Dr. Leisan Judith, Dr. Pritam Kaur, and Dr. Neha Singh.

As we look ahead to the future, we are excited about the new stories and adventures that await us. We are committed to continuing our mission of delivering engaging and meaningful content that informs, entertains, and inspires you, our cherished readers. Thank you for being a part of our magazine's journey. We value your feedback and look forward to your continued support as we strive to create a publication that resonates with you.

Team Anthesis 2022-2023

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