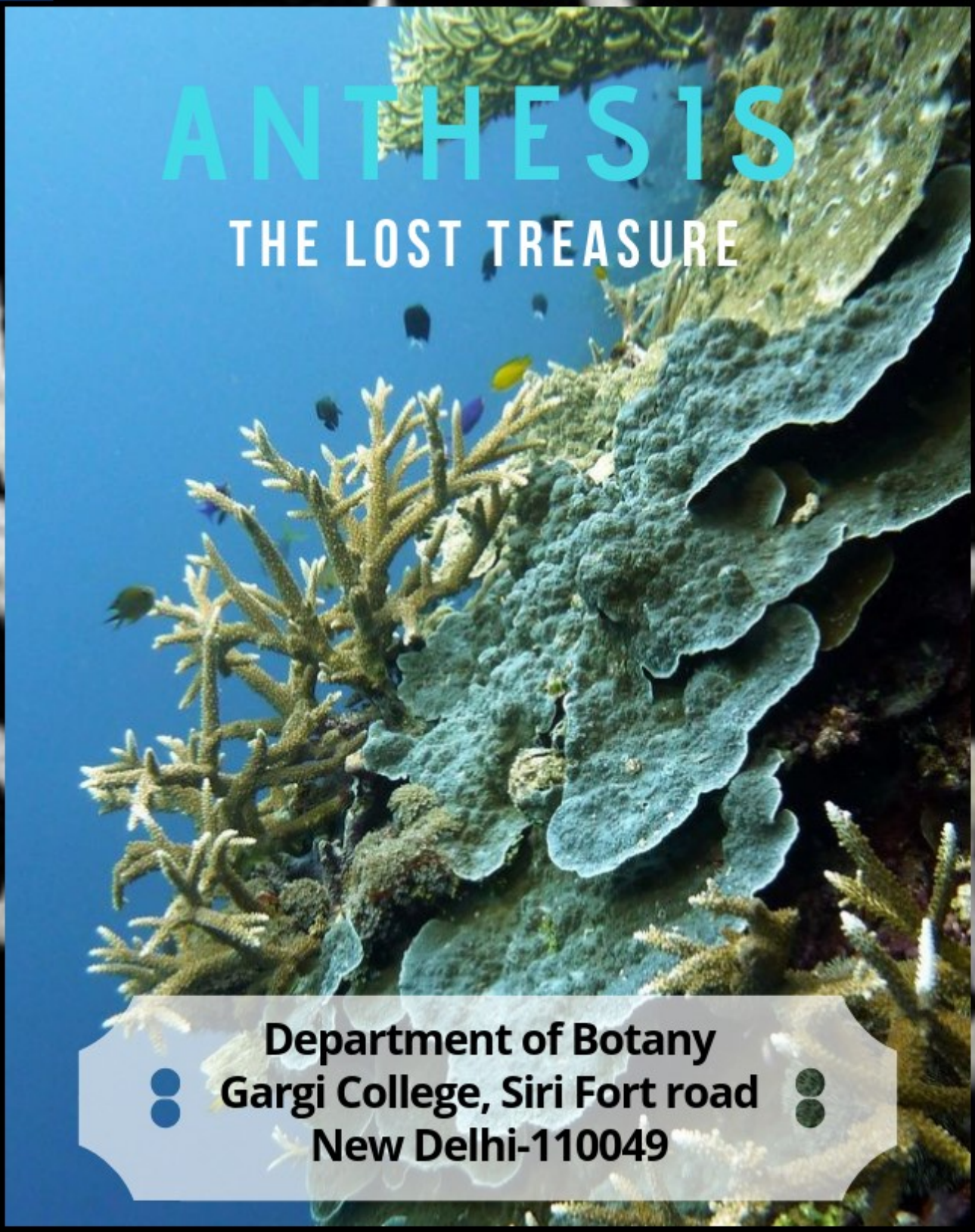
VOLUME 14: 2018-2019

ANTHESIS

THE LOST TREASURE



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

ANNUAL PUBLICATION OF GARGI COLLEGE

BOTANICAL SOCIETY

ANTHESIS

Special Focus:

'Lost Treasure'

Documentation on lesser known plants

On Coverpage- Staghorn Coral

(Contributed by Swagatika and Kangkana)

ANTHESIS

Contents

Articles on theme "The Lost Treasure"

From the Principal's Desk

It gives me great pleasure that the Department of Botany is releasing the fourteenth issue of its Magazine - **Anthesis**

It is indeed a matter of pride to be a part of an institute where students and faculty are always enthusiastic to upgrade themselves. Publishing periodicals and magazines are amongst few endeavors which contribute a lot in their holistic growth. Choosing a theme, writing articles, selecting the suitable ones and then editing. I am sure will do brain storming of both, the editors as well as contributors.

The presence of this department can be felt through well maintained lawns, plants, flowers and scientific cataloguing of this flora while walking down the corridors and lawns of the college. Healthy environment around you enhances your efficiency which in turn helps one to do things more confidently.

I congratulate the editorial team and contributors for this initiative and eagerly awaits the coming edition of **Anthesis.**

Dr. Promila Kumar

Principal, Gargi College

From the Teacher in Charge's Desk

Anthesis is the opening of flower buds/anthers. Our Department **e- magazine ANTHESIS** is also blossoming of emerging talents amongst us. The organization of contents, presentation of thoughts and description of Department activities showcase the skills of thoughts and description of efforts but with immense future prospects.

I wish to extend my greetings to Anthesis team and admiration for such a vivid and information piece of literature.

Best Wishes

Dr. Priyanka Pandey

Teacher in Charge

Department of Botany

Gargi College

From the Editor's Desk

It warms my heart to say that **Anthesis** has completed 14 glorious years with the release of this edition.

Anthesis since 2005 has been providing students and teachers a platform to express their views and summarize their various interests in plant sciences. The magazine started out as paper based but switched to an e magazine format aligning with the need of the hour to conserve our nature and mold our lifestyle in an eco- friendly fashion.

This year Anthesis has come up with yet another intriguing theme "The lost treasure" which aims to educate people about lesser known plants and their importance. The theme also elucidates their immense utility in household remedies, economical and ecological benefits thereby urging us to conserve them.

I would like to extend my heartfelt gratitude to the Faculty Advisors **Dr. Samira Chugh, Dr. Anjana Rustagi, Dr. Vera Kapai**, **Dr. Priyanka Pandey** without whom the magazine would have been a herculean task. Their constant support and encouragement has always motivated us. I would also like to thank our Principal, Dr. Promila Kumar for providing us the opportunity to publish this magazine. It goes without saying that Anthesis would not be what it is without the extremely dedicated Editorial team and I take this opportunity to laude their hard work. Last but not the least I would like to thank all teachers and students for their article and contributions to this issue of Anthesis.

Osheen Taneja

Editor,

Anthesis Volume 14


College Events

ZISTATVA – ANNUAL NSS DIWALI MELA

Supriya Sen

B.Sc. (H) Botany, III year

Every year NSS Gargi celebrates its Diwali Mela – ZISTATVA in a grand fashion. NSS volunteers put up stalls, selling handmade goods made by the residents of some NGOs.This year the NSS Diwali mela was organized on 31st October 2018 and the theme for the same was DILLINAMA. Many NGOs were invited to put up stalls. They sold items such as bookmarks, keychains, paintings, food, Diwali decoration materials (diyas), and earrings. Also first time we had pencils made up of newspaper by FODs. The money collected from selling these items is sent to the NGOs and used for the betterment of the residents. Some of the NGOs present were-

AADI – Action for Ability Development and Inclusion

CHESIRE HOME DELHI UNIT

JAMGHAT

HCRA- Handicapped Children's Rehabilitation Association

MOH – Meals for Happiness.

Apart from these, there was a long line up of various food stalls with mouthwatering dishes on display as well as other stalls selling jewelry, accessories, clothes, stationary and more. There was a mesmerizing performance by ARZZ Band and a DJ was also setup on the premise for some entertainment and dancing. All in all, the mela was a grand success, where everyone enjoyed thoroughly.

REVERIE ’19

A BRAVE NEW WORLD: AN ODE TO DIVERSITY

Swagatika Mohapatra

BSc. (Hons) Botany

3rd Year

This year Gargi College’s Annual cultural festival, Reverie did have an interesting Journey. The theme was “**A Brave New WORLD: An ode to Diversity”** based on 3C’s- **Consent, Choice and Conservation**. Beginning right from its tribute to Individuality and empowerment, the pre-jitters made us believe that stereotyping is now a far-gone concept and that there is nothing more beautiful than people trying to be themselves. This 3-days long celebration made its way on **30th-31st of January and 1st of February.**

The inauguration ceremony was honoured by the Chief Guest, Actress, Sushma Seth. Known for her dedication to Indian film and theatre division, she has been a part of wide range of NGO based plays and drama directions. The opening day of Reverie witnessed various power-packed performances put up by multitude of college societies and events like- Dhanak, Malhar. Cursive-iti, Khayaal, Jugalbandi, and polaroid. Students also showcased their prowess in the form of singing, dance, slam poetry and many more in the Talent Recognition Competition. Not just the performances by talented students, the evening ended with a euphoric performance by the band, The local train with melodious songs like “Choo lo”, “Aaoge tum kabhi”.

Theatre, Turncoat debates, street play, a spectacular closing act by Zaeden, and a host of other musical competitions, marked the second day of Reverie 2019. To make the atmosphere more lively, talented singer, Jatin Sharma made us hum his tunes. Being the EDM night, DJ Zaeden not only brought an exciting energy to the stage, but left spectators swooning over his remixes. A perfect close to an eventful day indeed.

With an enthralling fashion show showcasing the theme of this festival, the 3rd day garnered star attention. Apart from various informal events, the events organised by Glass eye sure did leave us craving for more. However, the excitement of the crowd reached sky high when Prateek Kuhad graced the event. He sure did know how to end an ecstatic night on an emotional note, with a voice that melts a thousand hearts. In a glimpse, the exquisite journey of reverie 2019 finally ended with the Student's union appreciating the crowd and extending a vote of thanks to all the sponsors and performers.

Reverie '19 was not just a celebration of talent and entertainment, but gobsmacking food stalls and innovative décor sure did win our hearts. An amalgamation of eventful memories and stellar performances, Reverie '19 sure set a benchmark for all the coming years.

Sports Day '19

Anshita
B.Sc. (H) Botany, III Year

Success for me is not to have all the medals. Success is always to do your best and try to develop and get better at every event.
~Carolina Kluft

The most awaited Gargi college Annual Sports Day 'Spin' witnessed its celebration on 28 February this year. The hard work by all those enthusiastic participants and volunteers could be seen in all the events, be it march past or the cultural performances. The encouraging teachers along with the weather were perfect boost for all the participants at sports ground. This grand event marked its beginning with an oath of sportsperson ship taken by the distinguished guests. The guests were- Mr. Abhishek Verma (International Archery Player; an Arjuna Awardee) as the Chief Guest, Ms. Madhu Kumar (Sports Alumna) as guest of honour Dr. Sandeep Tiwari (Head of Department Physical Education, University of Delhi) as special guest. Our Principal- Dr. Promila Kumar welcomed the guests with bouquets of flowers. She addressed her speech with a brief report of college sports activities and achievements. She contently announced the names of Gargians who have made India proud by playing at national and international levels. This was followed by unfurling the flag, making the commencement of the Sports day celebration. In sequence, march past competition was held and all the departments took part with zeal. Botany department performed very nicely and was lauded vastly by the crowd. Sequentially,

the students performed self-defence, Zumba, aerobics and yoga acts. These energetic performances filled the hearts of students with exuberance. There were games and races conducted for all the students and teaching, non-teaching staff. This year SPIN spotted a huge participation and the winning of Science added stars to its grace. From science department, many students including Upma, Surbhi, Anju took part in relay race. All the winners of Sports Olympiad were given prizes and certificates. From botany department Neha and Priyanka bagged 1st position in Kho-Kho. Amisha, Surbhi, Ankita, Marisha, Lavleen, Tamanna secured 2nd position in Aerobics. Asmita, Anshita and Lavleen grabbed 3rd position in Rangoli competition. Surbhi, science captain took part in various events and won medals. The Annual Sports Day was ended with beating of songs on the DJ floor.

Glimpses of Sports Day

NORTHEAST SOCIETY FEST, Gargi College

Kangkana

BSc. (H) Botany, 2nd year

The North East Society was formed in March 2017 with the aim to promote the students of the eight states of North East India. The cross- border cultural and historical ties add so much to the treasure-trove of the region, which unfortunately is mostly seen as a buffer for national security. The 2nd Annual Northeast Fest of Gargi College '**Mélange**' was held in the college premises in a befitting manner on **March 13, 2019.** It was a one-day programme striving to create a platform revolving around the diversity and richness of the region. Presided over by the Principal of the college **Dr. Promila Kumar**. The function was attended by- Former Principal **Dr Shashi Tyagi**, Department of Botany, **Prof. Bhagat Oinam,** Centre for Philosophy, School of Social Sciences Concurrent faculty, Northeast India Studies Programme, Jawaharlal Nehru University, and **Suhas Chakma,** Director of Rights and Risks Analysis Group. Distinguished guests, teachers from various departments, elite guardians, and the students of the college also attended the festival. The events of the day-long programme included panel discussion followed by music, dance, story-telling competition, slogan writing competition and folk song competition. This year the northeast society presented a major area in the fest that included panel discussion on the topic 'citizenship amendment bill'

The first panellist Prof. Bhagat Oinam put forward his views on the bill in his initial 15 mins where he introduced us with most recent talks of every nook and corner of the state, with people from all walks of life joining the bandwagon and raising voices

against the ill-fated bill. This thought was taken up by the director of rights and risks analysis group, **Sir Suhas Chakma**. He discussed the **Citizenship (amendment) bill, 2016**, how government plans to change the definition of illegal migrants. Finally**, Dr. Lungthuiyang Riamei**, department of political science, Gargi college, concluded the panel with some conceptual considerations.

The slogan writing competition was followed by folk song and folklore competition**. Mrs. Debahuti Brahmachari**, assistant professor, department of political science from Janki Devi memorial college was invited as a guest to judge the participants. The closing ceremony included giving away gifts and certificates to the winner and the participants. Since a tit bit of tourism was needful, so the students of the society designed a photo booth with 8 different north-eastern costumes. It was highly praised by the visitors.

Glimpses of North East Fest


Departmental
Events

Department of Botany

Faculty

Teaching Faculty

Dr. Shashi Tyagi	Dr. Reema Mishra
Dr. Gita Mathur	Ms. Ruchitra Gupta
Dr. Kiran Prabha	Dr. Anjana Rustogi
Dr. Geeta Mehta	Dr. Vera Y. Kapai
Dr. Aparajita Mohanty	Dr. Garvita Singh
Dr. Priyanka Pandey	Dr. Samira Chugh
Dr. Leisan Judith	Dr. Gladys Muivah
Dr. Jasmeet Kaur Abat	Dr. Shachi Agrawal
Dr. Geeta Prabhakar	Dr. Preeti Aggarwal
Dr. Renu Soni	Ms. Rekha

Non Teaching Faculty	
Mrs. M.D Sharma	Mr. Pancham Singh
Mrs. Shashi Bala	Mr. Vijay Kumar Pandey
Mr. Ashok Kumar Rana	Mr. Hansraj
Mrs. Rajini	Mr. Amit Kumar
Mr. Arun Kumar	Mr. Gopal Kumar

ANNUAL REPORT 2018-2019

Vandana Khurana

President

The Department of Botany has been relishing the growth and prestige at Gargi college since 1967. The Gargi College Botanical Society, Taru came into existence in 1994 and since then has been serving for encouraging the talented buds in the world of flora. It strives to satiate the hunger of students in every aspect of creativity and curiosity. GCBS also publishes its e magazine, Anthesis annually to provide students an opportunity to improve upon their scientific writing skills. The theme of 14th edition Anthesis this year is " The lost treasures" where in the main focus remains on plants that are lesser known or are soon going to extinct. Every year GCBS organizes various events guest lectures, competition and other non academical activities to ensure students get a platform to showcase their skills and keep their zest high. For the academic year 2018-19, the department of botany conducted many events which witnessed massive participation from the students making them a huge success. The Inaugural lecture was delivered by an eminent botanist, Dr. S. Natesh (Senior Project Consultant; DST Centre of policy research, IIT Delhi) on 19th September, 2018 on the topic “Plants that changed India and the World” .Multiple examples like Khejri trees, tulips, breadfruit and their role in changing the history of the world were cited during the lecture there by emphasizing the role of flora on anthropogenic history. An investiture ceremony presided by sir was followed after the lecture where in sir conferred badges to newly elected GCBS members.

On September 28, 2018, The G.C.B.S. screened a documentary “PLANTS BEHAVING BADLY: MURDER AND MAYHEM" by David Attenborough. This short film revealed a world of deceit and intriguing

behavior of carnivorous plants to the students. The astounding plants helped students grasp the essentiality for plants to adapt and survive in its environment.

Taru also conducted some non-academic events such as "An Illustrative Art Competition" which was organized on October 26, 2018.Students made beautiful sketches of plants alongside depicting the symbolism and meaning the plant held for them. Another event namely a Botanical card making competition was held on January 23, 2019 in which students made cards only with the dried plant materials thereby encouraging students to go ecofriendly.

On February 22, 2019 an interactive session with Dr. Saloni Mathur (currently working as a Staff Scientist at the National institute of Plant Genome research, Delhi) a star alumni of the department, was successfully executed. The talk involved around her work on “Non Coding RNAs: New frontier in Regulatory biology”. Dr. Mathur gave a deep insight into the role of non-coding RNAs in tomato during biotic and abiotic stress in environment. This session was followed my career counselling by Dr. Suman Govil another notable department alumni. She discussed the opportunities and jobs prospects in Biotechnology, how to prepare for interviews and create a impressive resume. The event was concluded by sapling plantation in the garden.

On 26 of February, a team of 6 teachers and 7 students embarked on a 4 day research expedition to Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI) at Palode, Kerala to observe and study the ex situ conservation of orchids, insectivorous and many rare plants. The team also visited some adjacent areas to study local flora and to compare floral diversity in marine, backwater and fresh water habitat.

This year GCBS worked around the theme of " Race again time" for Scintillations, the annual science fest. Events like 'General Science Quiz', 'Biocam' (selfie with plants), and 'Riddles' were successfully organized by the department. A pot decoration contest was also organized by Taru to channel student’s inner artist. Both the events received overwhelming response by the students.

This year also witnessed a remarkable participation by the students of Botany Department in various events and competitions bringing laurels to the department throughout the year.

TEACHER' DAY CELEBRATION

Tanvi Saxena

Botany hons II year

"The dream begins, most of the time, with a teacher who believes in you, who tugs and pushes and leads you on to the next plateau, sometimes poking you with a sharp stick called truth."

On the auspicious day of 5th September, the department of Botany of Gargi College came together to wish the enormously hard working and dedicated teacher's and the supporting staff of the department Teacher's day.

All the students of department gathered in the lab and greeted the teachers with huge applause and some personally curated gifts to the teachers.

A speech was delivered by the President of GCBS and was followed by the distribution of gifts to the teachers. The assisting lab staff was also felicitated with the curated gifts for the constant availability, cooperation, experience and support they give to students. After the distributions were over the senior Teachers enlighted students with their words of wisdom.

The program was a sweet gathering and gave an open chance of strengthening of bonds with teachers. The event ended by distribution of chocolates to the students as well and some warm hugs by Dr. Gita Mathur.

The event in whole was a success by the combined efforts of the students of all the years and gave a chance of interaction of seniors and juniors too.

Some pictures of Teacher’s Day celebration

Inaugural lecture of Gargi College Botanical Society

Apoorva Verma

B.Sc. (H) Botany 3rd year

GCBS 2018-2019 organised an Inaugural Lecture by **Dr. S. Natesh** (former senior advisor, Department of Biotechnology, Govt. of India) on 19 of September 2018.

The lecture was based on the topic **"How plants changed the world".** He encouraged us to view history from the perspective of plants and their impacts on trade, eating habits and the ability to define boundaries for countries. A total of 3 plants were discussed by him. The very first was **khejri tree** (*Prosopis cineraria*) also called shami tree. Its wood was used to ignite fire in ancient times and has been described illustratively in Vedas.

Heading towards the next plant, Dr. S. Natesh discussed about **Tulip,** a plant Native to Turkey, looks like turban. It enjoyed a royal status in Turkey. The tulip was considered such a priced possession that when tulip cultivation became feasible for common folks the prices of tulip crashed down to such an extend that it caused a major economic depression. This event is commonly called tulip-o-mania.

The last plant he talked about was **Bread fruit** (*Artocarpus alilis)*, relative of Jack fruit. It is called so because when cooked taste like potato and can be eaten roasted, grilled, chipped. Investiture ceremony followed the lecture.

Glimpses of inaugural lecture.

Screening of David Attenborough's MURDER AND MAYHEM

Anshita

B.Sc. (H) Botany 2nd year

The botanical society 'Taru' never misses a chance to amaze students with their creativity and habit to chase and discover every possible new thing which can help students increase their knowledge and interest in plants. With the collaboration of 'Anthesis' team members, on 28th September, 2018, Taru organised a video screening based on intriguing behaviour of carnivorous plants. '**Murder and Mayhem' by David Attenborough** was a short film that revolved around the gruesome side of insectivorous plants such as Pitcher plant, Venus flytrap etc. The film helped students grasp the essentiality for plants to adapt and survive in the environment. The film screening witnessed a massive turn out from other departments of the college. This was followed by a question session with Dr. Gita Mathur, senior most teacher of Botany Department. She discussed the significance of adaptation in plants among students and concluded the event by thanking GCBS members and advisors.

Some pictures from the Screening

ILLUSTRATIVE ART COMPETITION

Himani Rai
B.Sc. (H) Botany, 2nd Year

The illustrative art competition was organized by the Gargi College Botanical Society **"TARU"** on 26th October, 2018.The sole objective of this competition was to motivate the students to understand the correlation between botany and art thereby boost their imagination and creativity. Many herbs, flowers and other plants traditionally symbolize feelings, moods or ideas and have their own meaning.

Before photography existed, the only way to express ideas were with the help of illustrations. The participants were in the group of two or an individual student, as the competition was open for all the departments, Active participation was witnessed by students of all the streams.

Many novel and creative Illustrations were sketched by the students inculcating the importance of plants in our lives along with displaying the blossoming beauty of nature.The event ended being a success. All the artworks were displayed on the botany department board.

RESULTS of the competition :

Position holders: 1st position : Nimisha Sharma (Life science 2nd year)
2nd position : Midhat and Khoreelembi (Botany Hons 1st year)
3rd position : Shalini Sharma and Neetam Sharma (B.Sc. Botany(H) 3rd year)
Appreciation :
Mohini : (Maths hons 2nd year)
Deeksha and Priyanka : (Microbiology 2nd year)

BOTANY CARD MAKING COMPETITION

Swagatika Mohapatra

BSc. (H) Botany

3rd Year

"For centuries, botanists, artists and hobbyists have enjoyed the art of pressing and drying plants. In addition to the scientific importance of pressing and drying plants, plant materials can also be used to create beautiful art pieces."

Botany isn't just limited to being a science subject but also has its roots in Arts and creativity. Not just roots, but leaves and stems as well. Such was the beauty of Botanical Card Making competition, organised on 23rd of January. The event witnessed a massive amount of participation from various departments. An amalgamation of talents indeed. Students made use of dried flowers, leaves, stems, etc. to create beautiful masterpieces in the form of cards, providing a visual treat to our eyes. There were approximately 20 teams, skillfully organised and managed by the volunteers of "**Taru**", Gargi College Botanical Society. Some of the glimpses of this competition were- Cards made by students with flowers decorated into bouquets while some cards were adorned with numerous inspirational or nature-based quotes. The aim was to inculcate a spirit of competition while bringing out the artistic side of the students. After all, our artistic side isn't just bounded by the diagrams on our practical files or reports. Being an interdepartmental affair, Judges comprising of

Botany Faculty members went through a tough decision making in choosing the winner. Botany did manage to secure a position, however, making this event obviously a success. **Nikita Saini**, Physics Department and **Shalini** and **Neetam** of Botany Department secured 1st and second position respectively.

Glimpses of Botany Card Making Competition

Journey of a Lifelong Student

Dr. Usha Prasad

Department of Botany, Gargi College

Perhaps the most interesting statement I can make about the three and a half decades of my academic and teaching career is that it just happened. It was not part of my plan – if there was one in the dreamy young person that I was in my teens and early twenties. On the other hand, I should have expected this to happen since both my parents were in the teaching profession and there was bound to be some genetic influence of that on my own life and career!

Having been brought up in a home where my parents' students would visit them and show them enormous respect, perhaps there was a romantic attraction for this career for me. Be that as it may, I have no doubt that my parents have been the greatest influence on me in my development as a person and as a teacher. One of the main learning for me in these early formative years was that as a teacher, one also remains a student all one's life. I could see my parents pour over books late into nights, and in the process, I too developed a love for reading and scholarship. And of course, I have been lucky in having a husband, who himself is an eminent scholar and a teacher, and more importantly, has been a source of inspiration and support for me in all my struggles and endeavors. He has been able to keep me grounded whenever I felt restless for any reason whatsoever.

Initial years were difficult. I soon realized, that the task of a teacher was anything but simple. It soon became obvious that you need the courage to stand in front of a class and talk to them in a manner that would hold their interest and be motivated to learn. You also need to know your subject well and be well prepared to put it across to make it look simple to learn. But like everything else in life, perseverance pays, and you get better each day. And as you grow in confidence, you find the students rising up to the challenges that you throw on them, and the experience becomes mutually enjoyable.

But let me share a small secret – one that I can say with some level of confidence, is the secret of every good teacher. Each day one enters the class with a bit of apprehension and sometimes, even a bit of trepidation. How will I perform today? And this tension provides the extra motivation needed to prepare well for the class. In some sense, teaching is like a stage performance. And ask any stage performer and he will tell you that he rehearses his lines every time he comes on stage – no matter how many times he has done it before.

And there are challenges – some that you have faced before and therefore know how to manage. But there are new challenges every now and then that you have neither faced before nor foreseen. One common experience is that every class is different. More specifically, the learning needs of each student

are different, simply by virtue of the fact that every student that walked through my door was different. Some were brilliant, and were highly motivated to learn. It is sheer joy to come in touch with these students. Others, sometimes equally bright, had difficulties – either due to their background or certain propensities. In fact, over the years I experienced immense variability in students' backgrounds, interests and attitudes - as may only be expected. But in each case, there were immense possibilities and potential. Our task as teachers is to engage and try to bring out the best potential. But, however sincere our efforts might be, ultimately it is the student's own motivation and effort that pays. You can only show the way. The effort that is needed has to be made by the student herself. But there is no greater pleasure for a teacher to see her students succeed in life. This is what makes teaching so worthwhile and amazing for me, even as it remains daunting to this day.

I was fortunate to be involved in teaching subjects like Genetics and Molecular Biology, two of my favourite subjects that are still evolving and developing at a fast pace. That made the task both interesting and challenging. You have to be on top of the latest developments, and be able to explain the new ideas and concepts to students in a simple way. To be able to sift the wheat from the chaff, from the vast amount of information being generated every day, is a difficult task that requires your committed attention, as a teacher.

In short, there were moments in the class that were sheer joy. But there were also moments when the class felt so lifeless for one reason or the other. That was painful, since it meant for me that I could not generate the spark of interest that was required to make it a livelier experience for students. Every day was surely different, and the immense heat in the classrooms in the summer did not help very much. Be that as it may, I cared deeply about the welfare of my students. Nothing would give me greater joy than to be of help to my students in whichever way possible (short of adopting unfair means to get better grades)! And it was satisfying when students came to me not only for academic help, but many a times just to discuss their plans, struggles and dilemmas. It was rewarding for me to realize how much you can help by just listening attentively, at times saying nothing in return. The field trips that we

organized for the class were great opportunities for being really friends with the students and enjoy their endearing company.

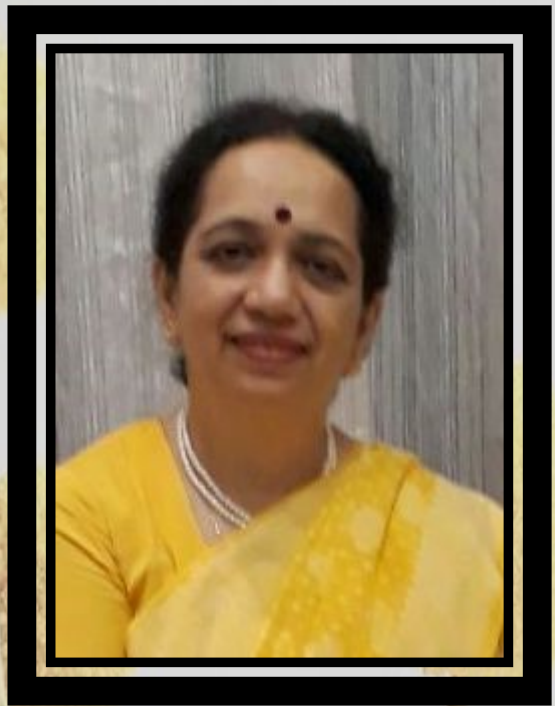
On the whole it has been a fulfilling experience to be amongst young people for all these years - so much as so that you do not realize that all the time, you are growing old. Many of the students have gone on to doing great and wonderful things in life, and it gives one a smug satisfaction, when somewhere, almost out of the blue, comes up in the most unexpected places, and introduces herself as a student of my class.

A word of parting advice for the current batch of students! As you graduate out of your program, you have now the basic knowledge, skills and I hope the right values and attitudes to pursue your goals and take up responsibilities in life. Things are forever changing. No matter what future paths you carve up for yourself, and there are immense possibilities there, you will encounter difficulties and challenges. You will need to gather up your courage and move on. Courage is most of all the virtues. Without courage, you cannot practice any other virtue consistently. You can be anything theoretically – kind, true, generous, fair, merciful, just – any of those things occasionally. But to be that thing time after time demands that you have courage! And remember that the blessings of your parents and your teachers are always with you to see you through the difficult times.

On second thought, I would take up the teaching career if I were a twenty-year-old today!

Dr. Usha Prasad and Dr. Gita Mathur: Collection of some moments spent together; Botanical Excursions, symposia, workshops, invited lectures and faculty celebration

An Educated Woman is a Revolution



Dr. Parvati Dilip Javali
Obestetrician, Gyanecologist
Alma Mater, Gargi College

I Did my Higher secondary from St Thomas girl's school, New Delhi in 1971, where Dr. Gita Mathur, Associate Professor of Botany at Gargi College was my classmate.

Since I was keen to become a doctor, I joined the Premedical course at Gargi College, which was then at Lajpat Nagar, near Lady Shri Ram College.

After completing Premedical in 1972, I appeared for medical entrance tests of many colleges and got selected on merit to St John's Medical College, Bangalore. I got married soon after my final MBBS exam to Dr Dilip Javali who was a gold medalist in Surgery. After MBBS, I got admission on merit for the MD Gynaecology course at Grant Medical College, Mumbai in 1978. It is a 3 year course for specialisation in Obstetrics and Gynaecology. While I was in the final year of post graduation I had my son. My husband was doing his Mch Urology course at AIIMS, New Delhi. After we both completed our respective course we came with our 1 year old son to Bangalore in 1981 and are here ever since.

I was barely 26 years old at that time and seeing such a young doctor, patients used to hesitate to come to me. I worked at St Martha's Hospital for 3 years and came to be better known and liked by my patients.

Then I started full time private practice and struggled hard to make a good name for myself and at the same time had to be a good mother to my young son, a good wife to my husband and an obedient daughter in law to my aged parents in law. All in all I was trying to walk on a tight rope in order to balance my personal and

professional life. I feel proud to say that my husband is the first Urologist to start kidney transplant in Karnataka, way back in 1983. He was only 34 years old then.

I am very proud of my son's achievement too. He was always a topper in school and in the medical college too. Exactly 30 years after his father passed out of AIIMS as Urologist, my son too passed out as Urologist from the same great institute.
I am running a maternity home in Bangalore, successfully since last 30 years, and many of the babies born at my hospital have become good scholars.
I consider myself very fortunate that my ambition was not limited to my own achievements but in the achievements of my husband and son, which was only possible by devoting as much time as I could for them.
I am happy and proud to say that in my early and impressionable years, teachers at Gargi College helped me to develop into a well balanced young lady with discipline and high values. I remember Dr. Rastogi and Dr. Mehra.
I think madam Rastogi was from Agra.
I salute my Alma Mater where, even though, I studied for only 1 year,Gargi College and it's exemplary teachers made me what I am,a respectable citizen of India.

Auf wiedersehen

Gayatri Devi

BSc. (H) Botany, 2nd Year

"There are no goodbyes for us. Wherever you are, you will always be in our heart."

The lecture theatre echoed with these blessings as the students and teachers of Botany department came together to bid their farewell to the outgoing batch of 2018. The day was a fiesta devoted to the years spent together with friends and teachers to revive the joyous moments. It was a memorable day for all.

The 2018 farewell was themed "**Musical Paradise**" symbolizing that just like when musical notes come together and form a beautiful melodious song, the passing students altogether form an amazing batch. The invites were made in the form of a guitar with a cheerful message written within. The event took off with a singing performance by the 1st and 2nd year students, followed by a captivating dance performance dedicated to the seniors. Then a video clip made by the students was shown depicting their happy and unforgettable journey throughout their three years in the college. It was really heartwarming and many students could not help but shed their tears recalling their past experiences and some were delighted to share their memories with the fellow audience be it in the form of a song or just speaking out their minds.

The department award ceremony took place with mementos and given together with various titles like Miss Elegant, Miss Allrounder, Miss Talented and more were distributed which was a blissful moment for all present there. Going along with the theme, the game musical tambola was played and exciting prizes were given to the winners. Seniors also expressed their deep love and gratitude to the teachers for their teaching and also shared some moments with all. Teachers also wished the students for their future and gave blessings to them.

Finally, the cake cutting ceremony and lunch for all the students was organized. Numerous photos were clicked with students as well as teachers followed by a lot of dancing by the outgoing batch and their juniors. At the end, we wish our seniors all the happiness and joy to begin a new chapter in their life.

The ’18 Batch of Botany Department

Guest Lectures on "Non-coding RNA: -New frontiers in Regulatory Biology" And "Crafting your career"

Apoorva verma

B.Sc.(hons)Botany, 3rd year

TARU, The Botanical Society of Botany Department organized a really interactive lecture series for the students which were delivered by none other than our proud alumni. The first lecture was given by **Dr. Saloni Mathur** (Staff Scientist IV National Institute of Plant Genome Research, Delhi) on "**Non-coding RNA: - New frontier in Regulatory Biology".** Dr. Mathur started her talk by showing us some beautiful pictures of her campus flora displaying her true passion for Botany. She explained how with perseverance she managed to flick her stream for Botany to Molecular Biology. And even with all the hardships, she still managed to save her enthusiasm and dedication to Biology. In her talk, she gave us and overview about her research work on RNA using tomato plant pertaining to its sensitivity to heat and how yield is adversely affected because of high temperature. So, Dr. Mathur and her team added external gene to tomato plant to make it resistant to heat. And her incredible discovery brought about a lot of appreciation and awards, making her alma-mater proud.

Her talk was followed by an interactive session with **Dr. Suman Govil {**Senior advisor (Retired) Department of Biotechnology Government of India} on **"Crafting your career".** She gave us an insight to all new dimensions of opportunities we botanists have. Challenging the one-way mentality of students to follow the traditional stigma, she enlisted multiple number of career options. "How to select correct course and college?"- a very common dilemma for many of us was swiftly answered by her. Not only did she give emphasis to extracurricular activities, she also lectured on how one should perceive creativity in even most basic things.

She assured us that no matter what our career choice is, when provided with cent percent efforts, outcomes are always going to be fruitful. Much needed information about effective job planning, an appealing resume and cover page was laid down by her in the form of Presentation. Both of the lectures were not only a refreshing view for us young students but sure did impart some knowledge regarding various major decisions we will be taking in our near future. The session ended with a cordial applaud and appreciations by both Professors and students followed by "Tree plantation" on the college ground.

Glimpses of Guest Lecture by Dr. Saloni Mathur and Dr. Suman Govil

Scintillations – 2019

Osheen Taneja

B.Sc. (H) Botany 3rd year

Scintillations 2019, The Annual Inter-college Science Festival was presented by Gargi College, University of Delhi on 6th and 7th March, 2019. The event commenced with the inaugural lecture by Prof. A.K. Ganguli (HOD, chemistry department, IIT Delhi) and Prof. Alok Bhattacharya (JNU, School of life Sciences) followed by a neck to neck competition between various departments. The competitions so organized kept students on their toes and rewarded them generously with exciting prizes and vouchers. Events like Pot decoration, Sculpt it, Paint the platter, Doodling challenged the inner artist inside every student while JAM, Turn coat, Quiz up, Circuit making, Sudoku made sure to rack their brains.

Some light hearted events like Pictionary, Chemantakshari made sure students had a gala time. The Scintillations Trophy which was finally bagged by the Chemistry Department defeating the previous champions- Department of Microbiology, thus, ending the grand event & making it a huge success.

Glimpses of SCINTILLATIONS'19

BOTANICAL EXCURSION TO KERALA

Shivani Dalai
BSc. (H) Botany 3rd year

The Department of Botany, Gargi College, had organised an educational trip to **Trivandrum**, Kerala, from 26th Feb to 2nd March, 2019.

A group of 13, consisting of 6 dedicated professors and 7 enthusiastic students from the department, landed at the Trivandrum airport on 26th Feb and were welcomed by **Dr. Sathish Kumar,** an eminent scientist from Jawaharlal Nehru Tropical Botanic Garden and Research Institute, Kerala. Dr. Sathish accompanied the team throughout the excursion and helped us to make the most out of it by imparting his valuable knowledge to the students.

The team visited the Jawaharlal Nehru Tropical Botanic Garden and Research Institute (JNTBGRI), a well-known institute which maintains a 300-acre conservatory garden for the wild tropical plant genetic resources of the country, besides an integrated multidisciplinary R & D system dealing with conservation, management and sustainable utilization of tropical plant resources, and was provided accommodation in the Guest House of the institute. A visit to various conservatories and gardens was organised under the guidance of Dr. Sathish and fellow scientists. We visited to the ornamental gardens and repositories of the Orchids, the captivating Carnivorous plants, the extra-ordinary medicinal plants and the alluring species of the family Zingiberaceae, endemic to various geographical locations.

The ornamental plants, chosen for the beautiful blooms, were observed for their diverse emergence. From *Caesalpinia sappan* and *Cassia fistula,* the flowering trees in the legume family, Fabaceae, to *Hopea parviflora* and *Vateria indica,* the timber

and the resin trees from the family, Dipterocarpaceae, we were introduced to a number of species and were explained the significance of each one of them.

Ornamental plants in the garden

Amorphophallus sps. used as an ornamental plant due to the inflorescence

In the Zingeberaceae repository (i.e. the Ginger family Repository) maintaining the living collection of more than 70 species of the family, various species of the aromatic perennial herbs were studied on the basis of the morphological and chemical characterization. *Etlingera elatior,* one of the species studied in the repository, is a rhizomatous herb with flushed purple, young leaves and deep pink inflorescence. The stems of the flowers of the plant are chopped and added in soups and curries served with rice noodles in the South East Asian Countries.

Tapeinochilos ananassae, also called as wax ginger, makes up for a beautiful ornamental garden plant as the stiff, waxy inflorescences make long lasting cut flowers in tropical flower arrangements. Another ornamental species, Hedychium coronarium, also known as the white ginger or the butterfly ginger, was studied for the edible and intensely fragrant, young flowers of the plant.

Pink flower of *Etlingera elatior*

Inflorescence of *Tapeinochilos ananassae*

Inflorescence of *Costus sps*.

Alpinia purpurata (Red Ginger)

Amomum masticatorium

In the Orchid Biology and Conservation Unit of the Institute, maintaining around 650 species and hybrids of orchids, we came across beautiful varieties of the plant including a number of Indian species like *Paphiopedilum druryi*, *Ipsea malabarica*, *Phaius luridus, Vanda thwaitesii*, *Vanda wightii*, etc. and studied various aspects of population dynamics, including the pollination and the fruit sets, and the growing techniques of the mesmerising orchids.

The beautiful orchid sps

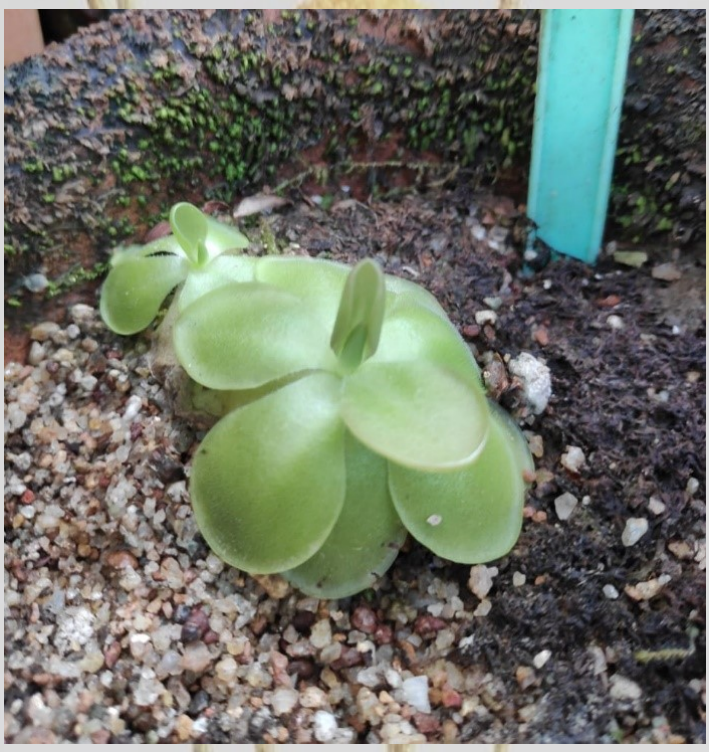
The Carnivorous plants collection of JNTBGRI had over 600 species of the insectivorous plants. The plants catch insects and other animals and eventually digest them to meet the nutritional requirements. These plants have characteristic features enabling them to attract and catch their prey. We observed a number of living species of the Carnivorous plants in the Institute. Some of them are Dionaea muscipula (Venus Fly Trap), *Nepenthes sps.* (Pitcher plant), *Pinguicula* (Butterwort) and *Utricularia* (Bladderworts).

Nepenthes truncata

Dissection of *Nepenthes khasiana*

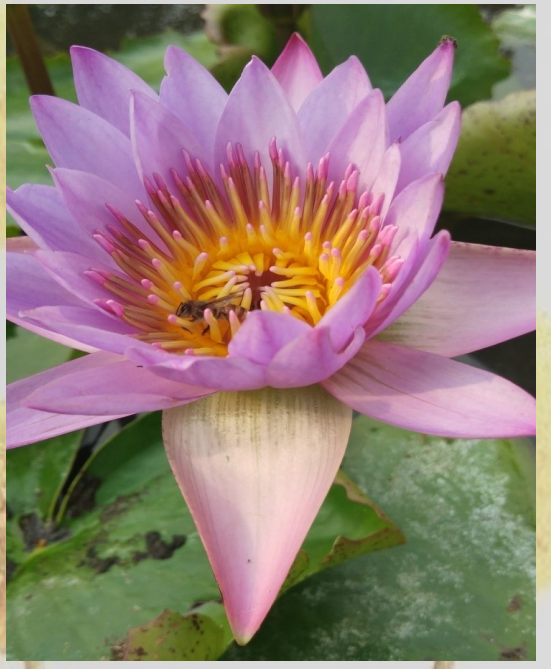
*Dionaea sps (*Venus Fly trap

Nepenthes rafflesiana



Pinguicula (Butterwort)

We also got an opportunity to explore the beautiful water lilies in the Institute.

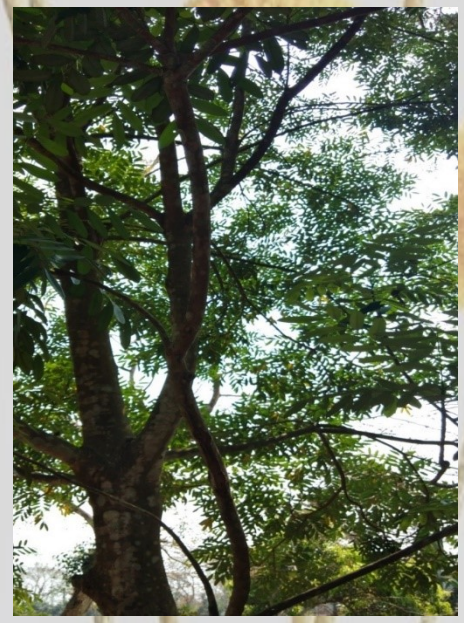


Nymphaea micrantha

Water lilies in the JNTGBRI

Victoria amazonica

Also, *Simarouba glauca,* commonly known as the Paradise Tree and a native to South America, was another attraction cited outside the canteen of the institute.



Paradise Tree

The next day, we were taken to the Bambusetum (a conservatory for various species and hybrids of Bamboo) where we came across species like *Bambusa, Bambusa vulgaris, Ochlandra scriptoria,* Palmetum (with over 160 species of Palm from all around the globe) where we studied the species like Sabal, *Cyrtostachys renda, Areca triandra* etc, the Fernery with one of the largest collection of living ferns in the country consisting of around 150 species belonging to 30 different families, the systematic garden and the garden of gymnosperms having a unique collection of cycads. We also visited the Biotechnology and Bioinformatics Division and the Tissue Culture Unit of JNTBGRI where the basic outlines for DNA extraction and tissue culture studies were explained to us by the scientists of the respective units.

Species studied in Bambusetum

Ochlandra scriptoria

Bambusa

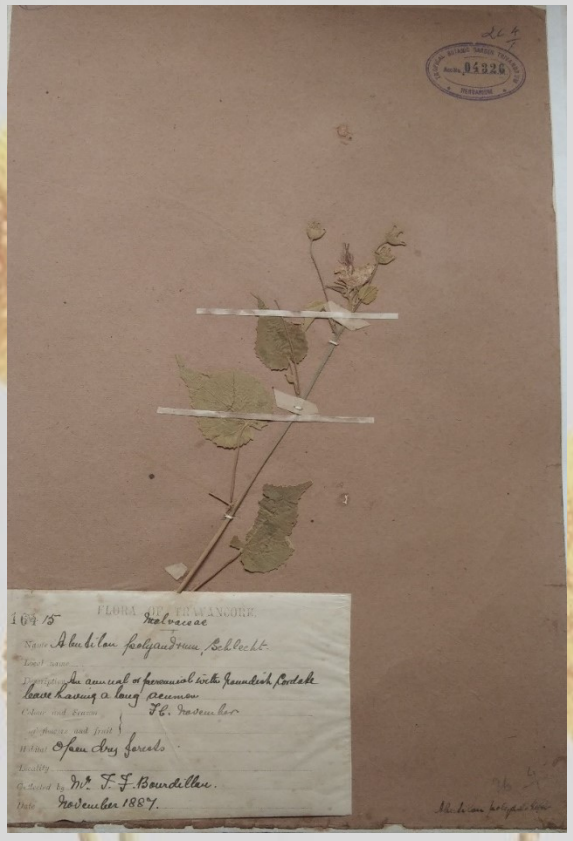
Buddha’s Belly Bamboo

Seeds and fruits of Bamboo

Areca triandus

Sabal sps

Species studied in Palmetum



131 years old specimen in the herbarium of Systematic Division

Cycas sps

Actinopteris radiata

Adiantum peruvianum

Platycerium bifurcatum

Species in Fernery

A large number of endangered species were also studied in the conservatory.

Jerdonia indica

Begonia floccifera

Piper barberi

Phyllanthus gageanus

We left TGBRI in the afternoon and reached Ponmudi Hill station in the evening. Ponmudi, also called the Golden Peak (‘Ponnu’ means Gold and ‘Mudi’ stands for Grass in Malayalam), is a part of Western Ghats mountain range at an elevation of 3,600ft with forestland, plantations and a very pleasant weather. We were shown the native plants of the area by Dr. Sathish and spent the evening amidst the beautiful landscape of the place. We then returned to the city late in the evening and stayed in a hotel.

Students at Ponmudi

On 28th March, we went to Kanyakumari and had a visit to Thanumalayan Temple and the Vivekananda Rock Memorial in Vavathurai. We also dropped by a beach in Kanyakumari where we had a pleasant time enjoying in the waves and collecting good samples of marine alga. On our way back, Dr. Sathish hosted a dinner for the team at his home. We were welcomed affectionately by his family and were served with delicious food and desserts. Sir also gave us a tour of his beautiful garden having all his favourite species of plants.

Few marine samples collected from Kanyakumari

On 1st March, we went to Padmanabha Swamy Temple in Trivandrum in the morning and then left for Veli Tourist Village where we explored the unique art creations of Kanai Kunhiraman and had a soothing boat ride in the Veli Akkulam lake while observing the flora alongside. We then visited the local markets and shopped for spices, snacks, traditional sarees and various other things. In the evening, we reached Eve's Beach in Kovalam where we had a great time enjoying and playing in the waves crashing against the shores.

Students and professors of Gargi College at Velli Village

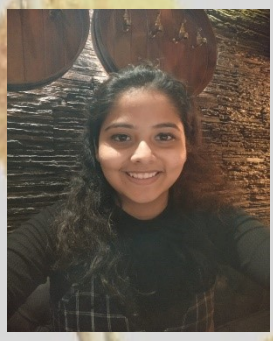
With hearts full of memories, we bade farewell to the place the next day and returned to Delhi.

Semester Toppers of Academic Session 2017-2018

Garima Bisht

CGPA- 9.39

II year

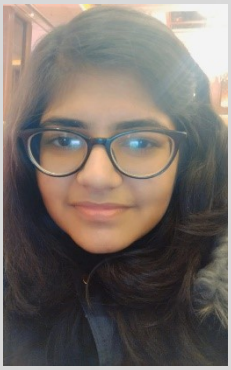


Apoorva

Minora

Cgpa- 9.23

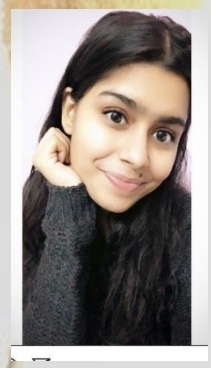
I year



Sanchita

Roohani

Poornima



Midhat

Surbhi

CGPA- 9.18

Semester -1

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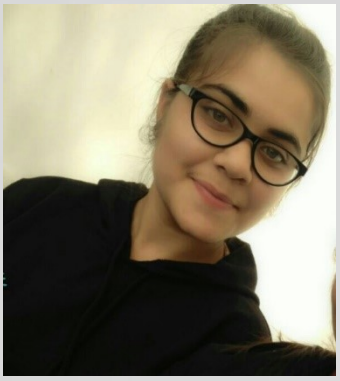

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Shalini Sharma

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(II year)

Sakshi Dawer

(I year)

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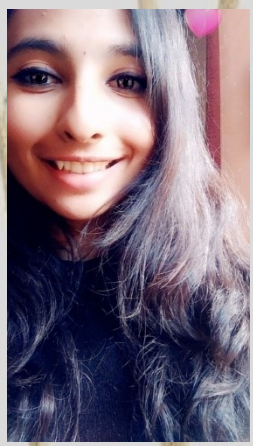
Rupal Yadav

(IIrd year)

Rabiya Parveen

(II year)



Yashsavi Sharma

(I year)

Rashmi Thakur

(I year)

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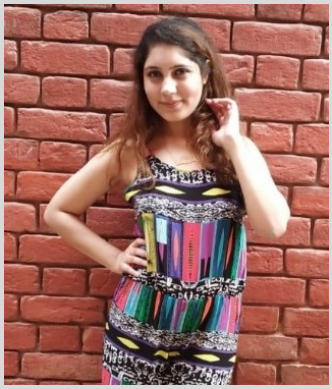

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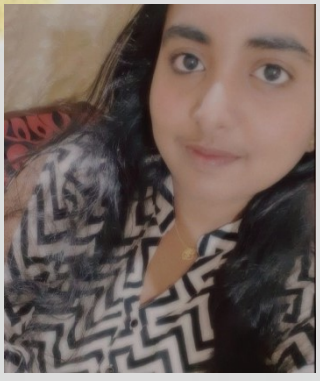


Shreya

(I year)

Articles on theme “The Lost Treasure”

EELGRASS

Upma Garg

B.Sc. Botany (H), 3rd year

On the list of unexplored species, let's now talk about a very beautiful, flexible and ecologically important plant, Eelgrass. Eelgrass is a generic name for two groups of ribbon- like Aquatic plants falling under order Alismatales. First group has approximately ten members of genus *Vallisneria* that is in family Hydrocharitaceae and is popularly known as tapegrass. Group two is a rich eelgrass family i.e. Zosteraceae. There are approximately fourteen species found under this genus, *Zostera* and *Phyllospadix*.The members of the first group are natives of tropical and temperate regions and are herbs that are perennial in nature. They grow submerged in fresh or brackish water. These are dioecious and have a unique aquatic pollination system. The second group members are found in temperate and subtropical climates. These are also herbs but are annual or perennial by nature and grow in marine habitat in intertidal and subtidal portions of coastal areas. The long alternating leaves on the plant body grow from spreading rhizomes. Most members of Zosteraceae are monoecious and have pollination under the surface of water. *Phyllospadix* plants are also known as Surf grass.

CLASSIFICATION

KINGDOM: Plantae

CLADE: Angiosperms

ORDER: Alismatales

FAMILY: Zosteraceae

GENUS: *Zostera*

SPECIES: ***Z.marina***

Picture of *Zostera*

https://www.wildlifetrusts.org/sites/default/files/styles/node_hero_default/public/2018-03/wildlifetrusts_40331185423.jpg?h=19904ff2&itok=YVcugagH

Description and Reproduction

It is a flowering plant; a rhizomatous herb with hair like green leaves. It may be an annual or perennial herb. The plant is monoecious. The fruit is a nutlet containing the seed. The plant may reproduce via vegetative reproduction or sexual reproduction. During sexual reproduction, plant produces large number of seeds and disperses by the breaking of its stem carrying the fertile seeds to new areas.

Ecology

Zostera grows in muddy and sandy shores only at or below spring tides. It plays really important roles in coastal ecosystem in many areas because it helps to physically form the habitat and is crucial for many species. Many species like *Clupea pallasii* find sheltered spawning ground in the bed of *Zostera,* some animals use *Zostera* for its food e.*g. Paracentrotus lividus*. The *Branta bernicula hrota* subsits almost entirely on the plant. When the eelgrass dies and reaches the seashore, it sets up an entirely new ecosystem there as many insects and animals begin to inhabit the dead plant body. In fact, *Granuloicoccus coccoides* was first isolated from the leaves of the plant. It is a bacterial species.

Threats

Human interventions almost everywhere in nature have been harmful in one or the other way. Dredging and trawling have damaged eelgrass meadows. Mussel and scallop harvesting practices in Wadden Sea have led to a clearing of eelgrass from sea bottom there. Turbidity of water and the processes leading to it are responsible for damaging eelgrass populations. Coastal development and Aquaculture operations destroy colonies. Pollution and invasive species have a negative effect on the population of eelgrass. The slime mold *Layrinthula zosterae* caused a “wasting disease” of eelgrass resulting in large scale losses in 1930s.

Genome

The genome of *Zostera* has been sequenced and analysed by Olsen *et.al.* In 2016. The article was published in Nature magazine. The genome is about 202.3Mb and 20450 protein encoding genes are encoded by it.

Uses

People use the plant as roof thatching in some areas. It is dried and used as stuffing for mattresses. It has also been used as cattle fodder and fertilizer in Norway.

Vallisneria americana

Vallisneria being an aquatic plant has the habitat and is a submerged aquatic plant and is a runner. The species beds provide a rich abundance of prey as food for other species. The species reproduces by the clonal reproduction of the runners and seeds also. The plant is cultivated mainly for aquarium trade and is sold as a plant forming the background of the aquarium tanks. To conclude, it can be said that Eelgrass is an unexplored marine plant as when searched from different sources, very less is known about the plant. It has been rightly put in the list of unexplored species yet the fact remains that there are many other species that are not even known till date and need to be found by exploring more and more of the surprising ocean world.

References

https://en.wikipedia.org/wiki/Zostera_marina

https://en.wikipedia.org/wiki/Vallisneria_americana

Johnson's seagrass

Apoorva Verma

B.Sc. (H) Botany, 3rd year

Johnson's seagrass is a submerged grass identified by a pair of linear leaves (2-5 cm). Each leaf has a petiole formed on node of rhizome, which creeps horizontally. Rhizome is present beneath the surface embroidered with unbranched roots. This plant occurs on the southeast coast of Florida exclusively.

Image source- www.biologicaldiversity.org

Halophila johnsonii is the first recognized endangered marine plant. Following are the reasons of its extinction -

- Life cycle of this plant lacks sexual reproduction. This is because the male flowers do not exist, and only female flowers are seen. Thus, this plant has no seed bank and solely depends on the process of regeneration in which new srem originates from underneath root and forms individual plant.
- Genetic diversity in this plant is not recognized yet. Changes in genome occur during recombination in sexual reproduction. As the plant lacks sexual reproduction, plants are nearly similar to each other lacking variations. Because of low genetic diversity, this plant is easily outcompeted by other plant species.

- Plant has limited geographical area and grows in patchy, non-contiguous distribution at water depth of about 3 meters. Habitat destruction and stochastic climate change events are another major threat to survival of this plant.
- Nutrient and sedimentation pollution, and damage from boating are responsible too. Reduction in water transparency due to suspended sediments also causes negative effects on distribution and abundance of the deeper water population of this plant.

Johnson's seagrass is ecologically very important because-

- This plant makes up nurseries for fishes and costal habitat.
- Also provides food for endangered West Indian Manatus and Green Sea Turtles.
- Seagrass beds can store more carbon than the world's forest per hectare.

Ways to recover the plant

Habitat destruction is one of the major reasons for loss of this plant species. We can revive this species of grass by conserving the habitat naturally or using the architectural techniques for designing an artificial critical habitat that can serve as natural habitat. By reducing the level of pollution in water, we can support its growth in submerged aquatic environment.

Image source- https://alchetron.com

For this purpose, disposal of waste material in water near critical habitat should be checked. Propeller dredging and anchor mooring in shallow area of water and in sensitive areas near bridge construction must also be banned.

References-

- www.smithsonianmag.com
- www.sero.nmfs.noaa.gov.
- en.m.wikipedia.org

Neptune grass

Shivani Dalai
B.Sc. (H) Botany 3rd year

Posidonia oceanica, commonly known as Neptune Grass, is a seagrass species endemic to the Mediterranean Sea, occupying an area of 3% of the basin i.e. a surface area of approximately 38,000 sq. kms. The genus *Posidonia* is named after Poseidon, the Greek for the god of the seas, while oceanica refers to its wide distribution. This species is estimated to be approximately 200,000 years old (dating back to the Ice age of the late Pleistocene) and is supposed to be one of the oldest and the largest clonal angiosperms on Earth. It is found in dense meadows or along the channels in the sands, usually at the depth of 1-35metres.

Habit of *Posidonia oceanica*
Image source: https://www.bing.com/images/search?q=neptune+grass&FORM=HDRSC2

The leaves of the flowering plant are bright green (turn brown with age), ribbon like and grow up to 1.5m and balls made up of fibrous material from its foliage, generally known as *egagropili*, often wash up to nearby shorelines. All the stems are approximately 10mm thick and upright in the habit. The rhizome type stems are observed in two forms: one growing beneath the sand and the other rising above the

sand. This type of arrangement of the rhizomes eventually forms a mat, the surface of which contains the active parts of the plant, whereas the centre is a dense network of roots and decomposing stems. The fruit of the seagrass is free floating and is known as "the olive of the sea" (*l'oliva di mare*) in Italy. This Mediterranean tapeweed reproduces asexually by cloning and spreads far and wide for survival, but the meadow formation can take hundreds of years as it is a slow-growing plant.

However, these large underwater meadows are of great importance to the ecosystem. Being a seagrass, *Posidonia* contributes organic matter to the estuarine food chains and stabilizes the sea floor causing a reduction in sedimentation and therefore, keeps the water quality in check. It acts as a food source and provides refuge to number of species of fish, molluscs and crustaceans, which are commercially and recreationally targeted. It is also an important driver in fisheries productivity in coastal water and hence, crucial to maintain the estuarine biodiversity. The shredded leaves of *Posidonia* sps., washed ashore, also provides an important habitat and food source to small invertebrates living around and nutrients to other marine vegetation.

Posidonia sps. and small fish

Egagropili (washed ashore)

Image source: https://www.bing.com/images/search?q=egagropili&qs=HS&form=QBIR&sp=1&pq=eg&sc=8-2&sk=&cvid=C3AC7AB083974648B5AC07A63C3D9246

However, the population of seagrasses, including *Posidonia oceanica*, is in trouble and is experiencing a worldwide decline. Climate change is posing a threat to the species as the Mediterranean is warming three times faster than the global average leading to the decline of about 5 percent in the population of Neptune grass annually. Direct physical disturbances and damages from reclamation activities, boats, propellers etc are also harming the species, accounting for the loss of the seagrass bed as the damages can take as long as 50 years to recover. Also, increased sedimentation and eutrophication have smothered the leaves leading to a reduction in the photosynthetic capacity by blocking the light required for photosynthesis. Potential impacts by the invasive species have also imposed additional consequences over the already stressed

Posidonia. A strain of *Caulerpa taxifolia* reportedly escaped the aquariums and has spread widely in the Mediterranean, replacing native plants, especially *Posidonia*, and depriving the marine life of food and habitat.

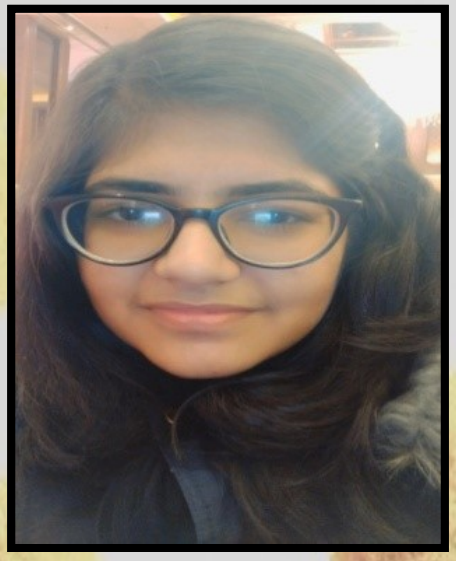
Keeping in mind the significance of the species to the marine ecosystem, NSW (New South Wales), along with a range of stakeholders including the other State authorities, local councils and community groups, has already initiated the conservation and recovery actions to protect the seagrass from further degradation. From conducting the research for the cultivation and rehabilitation techniques suitable for the Neptune grass to educating the boat owners to avoid anchoring over the fragile *Posidonia* beds, from improving protection for the species through land and coastal zone management planning processes to preventing sedimentation, from conserving and restoring riparian (river bank) vegetation to using effective erosion control measures, direct and indirect efforts are being made to conserve the Mediterranean tapeweed by monitoring and assessing the impact of threatening processes affecting the survival of the endangered population and further working towards the eradication of the issue.

The associations, working together, hope not only to understand how these critical coastal habitats work, but how to best protect them and ensure their existence in the future.

References:

https://en.wikipedia.org/wiki/Posidonia_oceanica
https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0007/635857/Endandgered-populations-of-Posidonia-australis.pdf

Moringa



Sanchita

B.Sc. (H) Botany, 1st year

Gone are those days when people were found enjoying their traditional food. The trend of eating exotic, packed and preserved food has taken over all. The prime reason for the disappearance of various vegetables from our plate is the loss of traditional knowledge. In the present scenario our lifestyle has become very hectic and busy as a result we merely get time to have vegetables which cannot be stored and have a time-consuming recipe.

Local food is losing demand even in the rural areas even though it is readily available there. The younger generation is not aware of the most of these food items. With easy access to money, people of all ages especially the younger ones prefer junk food instead of nutritious homemade dal and chapatti. In the so called modern scenario, our lifestyle has become very restless. This has entirely changed people's ideas and philosophy regarding various things for example- now we prefer cereals and pulses which may not be as nutritious but can be stored easily. Vegetables like malar spinach, Dekhia can, Bichhu booties and many more have more or less disappeared from our plates.

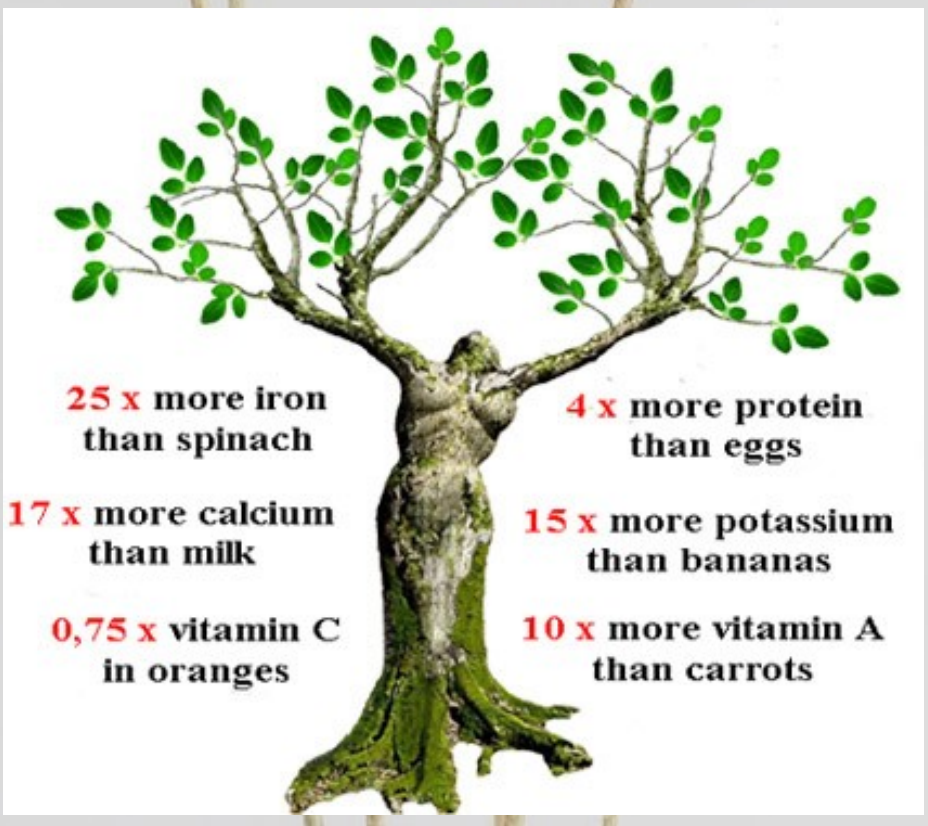
One such disappearing vegetable is *Moringa*. The miracle tree *Moringa* is a multipurpose plant. It is native plant to the parts of Africa and Asia. It is also called drumstick tree by British. In India it is found in the foothills of the Himalayas. This plant derives its name from the Malayalam word "*Muringa*". Grows up to 3-5m within a year of seed placed in the ground. It is an annual plant. The tree yields four different edible parts: pods, leaves, seed, and root.

***Moringa* tree**

***Moringa* leaves**

https://www.thehindu.com/features/metroplus/Food/musings-on-the-moringa/article6574663.ece

Of all *Moringa*'s edible parts, the green young pods are most preferred plant part. According to the Nutritive Value of Indian Foods by C Gopalan These pods possess very high content of vitamin C level, in addition to this vitamin A,K,B are also present in good quantities and beyond that they are among the best sources of minerals like calcium. They also posses high potassium and protein content.



Benefits of *Moringa* plant

Moringa is mainly grown and used in South Indian dishes. Drumsticks are widely used in *Sambar*. People also use it with rice, potato spinach, and dal (pulses). It has anti-microbial and anti-fungal properties that fights infections. It has been effective against types of fungi that cause infections of skin and strains of bacteria responsible for blood and urinary tract infection and digestion problems. It has blood clotting properties in its leaves, roots and stem that benefit wound healing and can reduce clotting time. Moringa seeds and roots are used to extract oil.

Drumstick in sambar

This versatile plant has a remarkable ability for being used as both vegetable and as an ayurvedic medicine. The list of benefits and uses are not only limited to health but it is also used in water purification. The protein found in its seeds can be used to settle silt and other contaminants. Research in Africa has disclosed that it can replace alum.

Despite of its innumerable perks; this plant is dwindling because of people ignorance. Most of the people are unaware of these benefits. Big business houses and farmers do not find any profit in selling this modest vegetable. Nowadays, they are mainly interested in growing and selling cash crops.In the end I would like to conclude that the way we are using *Moringa,* in a very casual manner is perhaps like throwing gold coins in the well.

References:

1 https://www.nap.edu/read/11763/chapter/1

2 https://www.downtoearth.org.in/news/food/high-on-green-46056

3 https://en.wikipedia

Marigold - A Lesser Known Medicine

Shalini Sharma

B.Sc. (H) Botany, 3rd year

We have never seen our grandparents running to a doctor or a medical store every now and then. This is because we have so many wonderful homemade remedies around which nature has given us. Most of the plants which we grow in our backyard have many properties of which we know nothing about owing for their increasingly lesser use. One such plant is marigold.

Marigolds are annual plants and are one of the most common ornamental plant in Indian gardens. Broadly there are two genus which are referred by the common name Marigold Viz. *Tagetes* and *Calendula*.

Kingdom - Plantae

Division - Magnoliophyta

Class - Magnoliopsida

Order - Asterales

Family - Asteraces

Genus - *Tagetes*, *Calendula*

Marigolds come in different colours, yellow and orange being the most common and hence popularly used as ornamental flowers. Most marigolds have strong, pungent odour and symbolise the sun and the light.

They are highly beneficial as it is high in anti-bacterial and anti-inflammatory properties. It's property to soothe the skin makes it an essential component of

cosmetics and baby care products. In the 12th century Macer wrote that merely looking at the marigold plant would improve the eyesight and lighten the mood.

Figure 1: Marigold Flowers

Some of the active ingredients found in marigolds that give the medical properties include

- Plant sterols known as calendulin
- Calendic acid
- Polysaccharides
- Linoleic acid
- Carotenoids
- Flavonoids
- Triterpenes saponins such as triterpenoid
- Tocopherols

Uses of Marigold as a medicinal plant -

- ***Homemade skin treatment:***

Ointment can be used to soothe sunburns, warts, bites, acne and ulcerations, healing wounds, dry skin and blisters.

- ***Digestive soothing tea:***

Tea can be made with marigold flowers to reduce the symptoms of ulcer, gastritis, stomach menstrual cramps.

Figure 2: Marigold flowers

- ***Immune booster:***

Marigold drops or extracts are used to manage coughs, sore throats and fever.

- ***Treatment for genital or skin infection:***

Marigold extract have long been used to treat fungal infections of the genitals, feet, mouth and skin.

- ***Reduces eye inflammation and conjunctivitis:***
  Candula extracts have antibacterial, antiviral and antifungal properties that not only reduce eye infections but also protect vision by guarding delicate tissues of the eyes from the effects of UV light, deterioration/aging and oxidative damage.
- ***Natural antiseptic:***
  It has been found that calendula drops can lower inner-ear swelling and inflammation within short days of use, even without the use of antibiotics in some cases.
- ***Naturally Repels Bugs:***
  Due to their pungent odor, antioxidant content and volatile oils, marigolds can be used to naturally repel mosquitoes, pests and other insects. This is one reason marigold flowers are also used in extract form in candles, room or bug sprays, and many skin lotions in order to prevent mosquito bites. Their aroma also works underground to keep away nematodes and other pests that can harm crops.
- ***Eases Cramps and Spasms:***
  Calendula's antispasmodic actions are beneficial for relieving muscle spasms, pains, stomach cramps and PMS/menstrual cramps. It is able to decrease cramping by improving blood flow to the painful area and lowering inflammatory responses.
- ***Heals Skin Wounds, Burns and Rashes:***
  It has been found that calendula has the ability to promote the growth of healthy new tissue, increase blood flow to the affected area, boost collagen production and speed up the process of skin repair following surgery or damage. It is also linked to increased cell turnover and improved collagen metabolism stimulation. For those with dry, flaking or rash-prone skin, calendula can be combined with natural lubricating products like coconut oil or shea butter to improve skin hydration and firmness.

Precautions of using Marigold-

- One should avoid marigold products if someone have a known allergy to daisies, chrysanthemums and other plants in the same family as marigolds.
- For pregnant women, little is known about the effects of calendula so it is better to get the doctor's advice before taking it internally or using extract on the skin.
- Applying calendula directly on open wounds can cause irritation.

References:

- https://draxe.com/marigolds/
- https://www.offthegridnews.com/alternative-health/

- https://en.m.wikipedia.org
- https://www.theflowerexpert.com
- https://www.google.com

Why were some crops/species lost or their use reduced?

Shreya Srivastava

B.Sc. (H) Botany, 2nd Year

"Over the past 50 years, we are seeing that diets around the world are changing and becoming more similar what we call the 'globalised diet'." -says Colin Khoury, a scientist from the Colombia-based International Centre for Tropical Agriculture. "This diet is composed of big, major crops such as wheat, rice, potatoes and sugar".

Fig. 1 Global Diet available in market worldwidez
https://www.bbc.com/news/science-environment-26382067

Studies have shown that-

- Since 1900s, about 75% of plant genetic diversity has been lost.
- Of 4% of 250,000 to 300,000 known edible plant species only 150-200 are used by humans.
- 75% of food comes from just 12 plants and 5 animals.

These facts, collected from various sources are a clear indication of what we are heading to. Only those species that in some way are useful to us are prominent on

the surface, the rest are either lost or so few in number that they can barely survive the generations.

What all have led to these losses:

Ever since revolution in agriculture has taken place, humans were interested more in only those crops that could either make way to their plates or in some way would help them survive, such as timber yielding plants or other such economically important plants. With the dawn of civilizations, living standards improved which further led to an increase in population size; as the number of people increased, the number of demands also increased. This directly pointed to a need to increase the production in a reduced land size, but this strategy collapsed because only economically important crops were cultivated while the rest were recklessly cut. As Harari says in his book 'Sapiens'- "The agricultural revolution is one of the most controversial events that have taken place in the history. Some partisans proclaimed that it set humankind on the road to prosperity and progress others, insist that it led to partisan". Yes, agriculture revolution was one of the main causes of referring ourselves as been developed and developing today, but at the same time it cannot be denied that it has led to the loss of a large number of wild crops. Wheat, which was a weed back then has become such an important crop that it practically outgrew many wild trees.

As people spread from one place to another new varieties that could survive those climatic conditions were grown, the rest were declined to grow anymore or just eliminated.

Fig. 2 Cultivation of wheat
https://www.agrifarming.in/wheat-farming-information/

One of the other major events that had led to mass loss of species was **Green Revolution.** Green Revolution, in simple terms was helping in developing such crop species which were considered more reliable and more sustainable; it

invented new techniques to protect the economically important crops, and to make space for them. In this quest, the other species were totally forgotten, which lead to their respective loss. During the 1960s, when India was on the verge of mass famine, Dr. M.S. Swaminathan along with Norman E. Borlaug developed a new high yielding variety of wheat by crossing its semi-dwarf wild varieties. The variety, thus generated was very successful and flourished and the other varieties probably lost. Henceforth, we actually lost many species on our plethora hunt of more reliable plants.
Although these were two major events that have led to mass loss of species, there are still many more factors which lead to the loss of hundreds of species, most of which are contributed by humans; deforestation, overpopulation to name a few.

Earth is home to all the living creations of God. We have shaped it, we have remoulded it in every possible way and forgotten the fact that we are actually the minor species which is wholly dependent on other species. And if there is one species that cannot survive without the other ones, it's the humans only. Loss of species is, in fact, a threat to our existence.

References:

1. http://www.fao.org/docrep/007/y5609e/y5609e02.htm
2. http://fafdl.org/blog/2017/05/17/have-we-lost-75-of-crop-diversity-its-not-that-simple/
3. Sapiens A brief history of humankind, Yuval Noah Harari

Algae as food and bio fuel

Anshita
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In terms of health, lifestyle has always been adaptive towards the goal of being fit and this is always accompanied with advancements in utilizing different sources of food and consuming techniques thereby. From algae to animals, humans are adapted to consume every possible dish prepared from them. Many algae are not edible but nutritious as well. Algae have been used as human food for hundreds of years in all parts of the world. Countries like England, France, Greenland, Korea and Thailand feasted upon seaweeds as primary source of nutrition since time immemorial.

Algae are base of marine food web; primary producers present in remarkable diversity and numbers. Algae are probably more than you used to hear about. They not only appear as green nuisance in your tank but are also endorsed as great for your health. They being omnipresent, can be obtained from marine, freshwater, mangrove and terrestrial forms of the biosphere. The algae occurring in various forms such as planktons, benthos, epiphytes, seaweeds etc. are constantly being used in confectioneries and food. Algae are considered as superfood, even a possible saviour to humanity in extreme conditions such as in space. Algae has found its utility in biofuel i.e. biodiesel and bio petrol production too

Algae in terms of nutritious food for mankind, there are about 1 million types of algae that exist in range of size from microscopic diatoms to giant kelps out of which considerable number is edible. Most commonly used and consumed microalgae include Red algae- *Poryphyra* (Nori, Kim, Laver) *Asparagopsis taxisformi* (Limu), Gracilaria, *Condrus crespus* (Irish moss) and *Palmaria palmata* (dulse); the kelps- *Laminaria* (Kombu), Undaria (wakame); Macrocystis and Green algae *Caulerpa racemosa*, *Lodium* and *Ulva*. These species can be easily farmed and harvested and can be consumed either fresh, dried or picked form.

Previews of Algae Food Development & Recipes
http://www.spirulinasource.com/PDF.cfm/AIMFutureofAlgae.pdf

Algae have innumerable characteristics which account for nutritional benefits. Some of them are mentioned are as follows: -

●Algae serve as a great reservoir for-

- Proteins
- Oils rich in PUFA essential for children, pregnant women, vegetarians and patients with fish allergies
- Rich in omega-3 and omega-7 fatty acids
- High levels of iodine
- Vitamins- Vitamin B is synthesised mostly
- Large amounts of Minerals such as calcium, niacin, potassium that are rich in nutritional value
- Iron, potash and zinc are also present in enormous concentration
- Antioxidants and natural colorants

●Algae has also been credited with improving immune system, increment in weight, increase in number of eggs produced in female, maintenance of reproductive performance and reducing cholesterol levels.

●Algae are flavourful and filling. They tend to satiate the hunger instantly providing dollops of flavours and a considerable amount of nutrition and thus energy.

●They serve as magnet for toxins in the body and do a brilliant job of flushing them out of it. Therefore, play a major role in boosting the immune system and fighting the infections.

●They lower the blood pressure and increase the blood flow; thus, elevating the efficiency of blood circulation in the body.

●In aquaculture, they are beneficial for meeting the nutritional needs of animals by supplying them organic nutrition and bioactive compounds essential for their metabolic regulation and needs.

Some of the important algae being used as human food: -

1. Chlorella

It is one among the many algae which possess high food value. It is used as diet food and often considered as 'perfect food' for astronauts. It contains dietary nucleic acids which are natural substances providing nutrition, healing, rejuvenation to the body. It is high in protein and fats.

2. Porphyra

One of the most abundant cold temperature seaweeds, *Porphyra* is domesticated for preparing dishes like Gim, Zikai and Asakusa nori. It has high nutritional value as it contains owing to high conent of protein, carbohydrates and vitamins.

3. Dulse (Palmaria palmata)

Well known as Dulse snack food, this alga is a good source of proteins and minerals, being very high in iron and containing all the trace elements needed in human nutrition. It is considered to possess higher contents of vitamin than spinach. It is consumed either raw in fillings of tobaccos or after incorporating in fish dishes, vegetable soups and bread.

4. ***Laminaria***

It is a kelp that contains useful amounts of proteins, vitamins, and minerals like iodine, potassium, magnesium, iron and calcium. It is widely used in Japan for yielding 'kombu' used to prepare dashi, a stock soup. It is also sold dried and pickled in vinegar.

5. Caulerpa racemose

Commonly known as *sea grapes,* it is an edible green algae found in areas near shallow seas. It is a popular food consumed extensively in Japan, Fiji, Philippines, Indonesia, Malaysia and Thailand. It is rich in fibre, proteins, minerals (calcium and magnesium), folic acid, ascorbic acid, vitamin A, and vitamin B1 and low in fat.

Algae as a Biofuel
https://en.wikipedia.org/wiki/Algae_fuel

Algae based fuels popularly known as Algal oil or Algal biofuel, have proved to the best suited alternative to fossil fuels. Being one of the oldest and efficient photosynthetic organisms on the earth, they yield 15 times more oil per acre than other sources of fuel. Alga culture has been trying since few decades to accommodate the global demand of liquid biofuels. Microalgae have been the greatest suppliers of fuel since history. Algae can be converted into various types of fuels, depending on the technique and the part of the cells used. The lipid, or oily part of the algae biomass can be extracted and converted into biodiesel through a process similar to that used for any other vegetable oil. The carbohydrate content of algae can be fermented into bioethanol or butanol fuel. Microalgae can grow rapidly in ponds and this property has been utilized by companies like Shell and ExxonMobil. But in last decade, vast amount of money have been invested in the development of algae for biofuel production; and it really hit hard the economy of the world. Every artefact comes with its unique set of pros and cons and these are discussed as follows: -

Advantages:

1. Algae can be grown with ease in any kind of environment.
2. Traditional feedstock for biodiesel production is useful for feeding livestock in farms.
3. Environment friendly; reduces Carbon dioxide content in the atmosphere.
4. Low waste production.

Disadvantages:

1. Lesser commercial viability.
2. Less stability; polyunsaturated content is low thus, the capability to remain in fluid form at high temperature is lower.

Regardless of the cons, Microalgae have long been recognized as potentially good sources for biofuel production because of their relatively high oil content and rapid biomass production. Microalgae grow very quickly compared to terrestrial crops; the practice of algal mass culture can be performed on non-arable lands using non-potable saline water and waste water. Thus, use of microalgae as an alternative biodiesel biofuel feedstock is gaining increasing interest from researchers, entrepreneurs, and the general public. The need of the hour still remains to develop a cleaner fuel for the sustenance of environment as well as mankind and algae provides a viable option.

References-

1. https://www.livestrong.com/article/458681-algae-as-a-food-source-for-humans/
2. https://sciencesamhita-com.cdn.ampproject.org/v/s/sciencesamhita.com/algae-used-as-human-food
3. https://en.m.wikipedia.org/wiki/Algae_fuel

The Need to Revamp the lost crops

Lavleen Sachdev

B.Sc.(H) Botany, 3rd year

"It has been rightly said that nothing is unimportant, nothing is powerless in the universe; even a single atom can dissolve everything and save everything. What terror! Their lies the eternal distinction between the good and the evil!"

-Gerard De Nerval

Early men chose to grow and increase the yield of those crops which were easier to harvest and tasted good over the rest irrespective of their nutritional content**.** We have got so addicted to consuming the wheat based products that we forgot other less tastier but more nutritious alternatives**.** This selection led to the discrimination of the ancient crops over the centuries, the consequences of which we are facing today.

Wheat, by means of conventional breeding practices, has been modified to such an extent that it has developed protien- gluten, which not everyone can digest turning the consumers intolerant to gluten, becoming 'Coeliacs'. Thus, there's a need to bring those gluten-free, more nutritious and easily digestible alternatives back to our diet. Alternatives other than usual oats, brown rice and quinoa include the ancient grains like: *Teff, Amaranth, Millets, Chak Hao/Forbidden rice, Bhutanese Red rice, Fonio, Job's Tears, Chia and Buckwheat.* Similarly, many herbs and vegetables like the *Malabar Spinach*, *Moringa, Bicchu booties, Purslane, Dhekia Can etc* have been evaded by the modern ones like *Broccoli, Lettuce, Parsley, Oregano.*

Along with nutritional needs, many other essential reasons call for the *revival* of these crops for each one of them has a unique role to play, manifested by the fact that every crop does not contain all the nutrients required for.

Image source: www.thebetterindia.com.

Need for reviving the lost plant species-

Food security: Food availability has to be sustainable and affordable as it is a necessity for every human irrespective of their economic status. This can be ensured by revival of more crops in the indigenous territories of the world as this will create more varieties which will add to the existing ones and increase the quantity of overall food, thus decreasing their prices and ensuring regular supply of food to all.

Creation of new varieties: Initiating the cultivation of new crops will also add to the germplasm at the gene banks which will offer the scientists the opportunity to make varied combinations from these and make new hybrid varieties with additional traits such as greater yield, resistance to pests and drought; increasing

their nutritional values by biofortification- which will also add to the biodiversity and dietary diversity.

Ecological impact: Restoring the damage caused to the environment by early extinction of some relatives like in co-extinction of closely related fauna to avoid disruption of food chains and disturbances in the ecosystem. Disappearance of even one organism which is a part of large web will disturb the whole web and can cause it to collapse disintegrating the harmony within.

Climate change: Analysis of the present climate by meteorologists suggests that in the coming two decades despite all the feasible efforts, earth's temperature is likely to rise impractically. This will bring a change in weather patterns- seasonal fluctuation; the consequences of which the nature-flora and the dependent fauna will have to face. To ensure sustainability, crops which can withstand the seasonal fluctuations will need to get revamp, also, the existing ones need to be modified for the same.

References-

- www.betterindia.com
- https://www.croptrust.org
- https://www.brainyquote.com
- blogs.ei.columbia.edu

STAGHORN CORAL*

Debasmita Sahabo

BSc. (H) Botany, 1st Year

Ever wondered how colourful vibrant and distinct corals can be? And how they could supplement life and living. Here in this article we talk about the staghorn coral which exhibits the fastest growth of all known Western Atlantic fringe coral. The staghorn coral has been one of the three most important Caribbean coral and contribute immensely to reef growth and fishery habitat.

Staghorn Coral Habit https://goo.gl/images/8TZU

*Even though Staghorn is a coral, it is included in the magazine for its beautiful habitat and immense ecological importance. The fact that it is under the threat of extinction raises an urgent need to protect it.

Features:

The staghorn coral is branched, stony coral with cylindrical branches ranging for a few centimetres to over two metres in length and height. They have antler-like branches and typically stem out from a central trunk and angle upward. Each staghorn coral colony is made up by many individual polyps that grow together. The staghorn coral occurs in black reef and fore reef environments from 0 to 30m (0 to 98 ft) depth. The wave forces define the upper limit, and the lower limit is controlled by suspended sediments and light availability. The staghorn coral is found throughout the Florida Keys, The Bahamas, The Caribbean islands and the great barrier reef. This coral occurs in the western Gulf of Mexico.

Life cycle:

The dominant mode of reproduction for staghorn corals is asexual, with new colonies forming when branches break off a colony and reattach to the substrate. This allows rapid population recovery from physical disturbances such as storms.

Sexual reproduction occurs by spawning of gametes into the water column once every year in August or September. Individual colonies are both male and female (simultaneous hermaphrodites) and will release millions of gametes. The coral larvae (planula) live in the plankton for several days until finding a suitable are to settle. Very few larvae survive to settle and metamorphose into colonies. The preponderance of asexual reproduction in this species raises the possibilities of that genetic diversity in the remnant populations may be very low.

Life cycle of Staghorn Coral

https://www.fisheries.noaa.gov/species/staghorn-coral

Uses:

Being the most biodiverse ecosystem in marine realm, staghorn coral provides protein, livelihood and services to more than over 10 million people worldwide hence, they are of utter importance to mankind. Due to their bush-like growth form, staghorn corals provide complex habitat for fish and other coral reef organisms. When present abundantly, they provide shoreline protections from large waves and storms.

Concerns:

Since 1980, populations have decreased due to various reasons including disease outbreaks, primarily white band disease, with loses compounded locally by hurricanes, increased predation, bleaching and other factors. Also, they are susceptible to damage from sedimentation and sensitive to temperature and salinity variation.

Conclusion:

While overall numbers of this species is going down with passing time, certain populations are striving hard to survive. Thus, providing a tiny hope that they can recover if we start conserving and protecting them. Coral gardening has sure given us a bright chance of possibly restoring them to their former glory no matter how bleak this possibility seems now.

Polyp of Staghorn Coral

https://goo.gl/images/ATZU29

References;

1. https://onekindplanet.org/animal/coral-staghorm/
2. https://en.m.wikipedia.org/wiki/staghorn_coral
3. https://www.fisheries.noaa.gov/species
4. https://news.mongabay.com

SPELT

Swagatika Mohapatra

BSc. (Honours) Botany, 3rd year

One of the earliest domesticated grains, spelt hasn't changed since Biblical times. Spelt, or *Triticum spelta* in more scientific terms is comparatively more nutritious while having its roots deep into civilizations after civilizations. Known for its slightly 'nutty' flavour, spelt has long been popular as a health food in Europe and its time that we take this grain and dominate our modern food supply by substituting it common wheat flour items.

***Triticum spelta* Habit**

https://balconygardenweb.com/how-to-grow-spelt-care-and-growing-spelt/

Features:

Spelt looks a lot like wheat but has a kernel that is tightly surrounded by a tough outer husk or hull, Modern wheat is free threshing while Spelt is not. The tough outer hull of Spelt protects the grain from diseases and thus pesticides also preserving the grain's freshness and its nutrients. Spelt contains various nutritious elements, numerous dietary minerals, protein, dietary fibres, several vitamins. It is not only low in fat, but rich in Mn, P and carbohydrates.

Uses:

Consuming spelt and other whole grains may improve heart health, and digestion, reduce the risk of diabetes, and help people achieve or maintain a healthy weight. Not only it reduces the amount of cholesterol but it also reduces blood pressure. Spelt flour can be used in baking breads, muffins, pastas, etc. In the modern revolution of Organic foods, Spelt's popularity has been somewhat revived.

Spelt Grains

https://www.medicalnewstoday.com/articles/323659.php

Spelt leaves and rolls are widely available in bakeries. Spelt grains are dried and eaten as Grunkern. It is also eaten as cereal, risotto. Beer and Vodka is also made from Spelt in certain parts of the world.

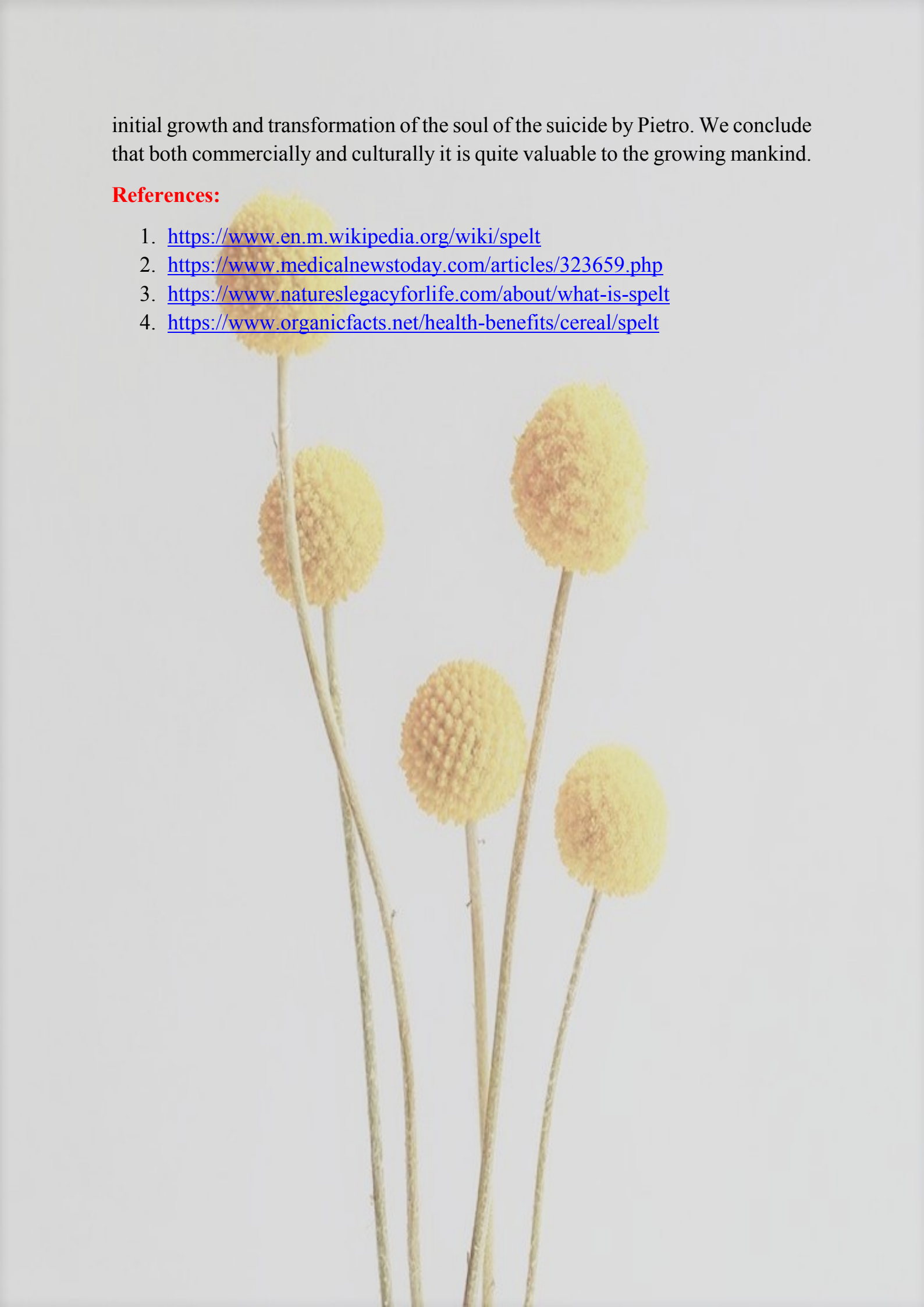
Conclusion:

In Greek Mythology, Spelt was believed to be a gift to the Greeks from the Goddess Demeter. Likewise, nature has gifted us something so pure and healthy but due to the hassle of cheap and fast grain production, spelt sure took a back seat to more modern staple foods. However, it is never too late to grow interest in more healthful foods. And several efforts have been made to reintroduce Spelt in our daily diet be it the high-volume commercial baked goods or simply made into the Peasant's staple food like Porridge. With Spelt being compared to the

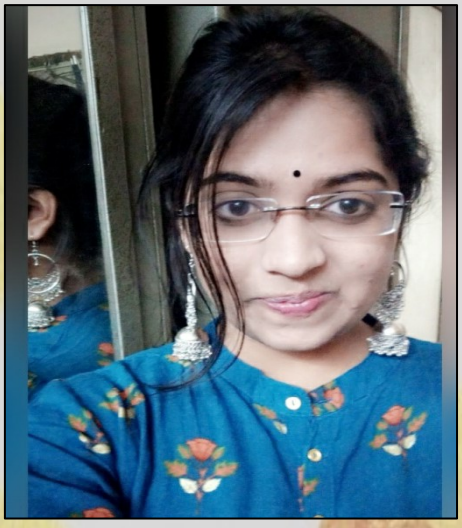
initial growth and transformation of the soul of the suicide by Pietro. We conclude that both commercially and culturally it is quite valuable to the growing mankind.

References:

1. https://www.en.m.wikipedia.org/wiki/spelt
2. https://www.medicalnewstoday.com/articles/323659.php
3. https://www.natureslegacyforlife.com/about/what-is-spelt
4. https://www.organicfacts.net/health-benefits/cereal/spelt



Bombax ceiba



Tanvi

B.Sc. (H) Botany 3rd year

Plants grow not merely for the fulfilment of the ambitions or needs. They grow because someone nurtured them with care and effort. With the growing greediness of humans, the trees once considered as treasure are now cut down recklessly. One such treasure of nature is *Bombax ceiba.* This plant of family Malvaceae is commonly known as Red silk cotton and is found throughout India and other parts of tropical and sub-tropical Asia, Australia and Africa.

The plant is grown both as an ornamental and woodland restoration species. The plant is also known by various names in different parts of India like Indian. Kapoktree(English), Shalmali (Sanskrit), Semal (Hindi), Shimul (Bengali), Mull ilavu(Malyalam), Kondaburuga (Telgu). The plant also finds its significance in Indian mythology of Mahabharata which marks its presence and importance in ancient period. Also used in traditions of Holika dehan in the North India.

What makes *Bombax ceiba* essential?

The plant is important in all the aspects from leaves to root tip. Every part of the plant has some essential qualities which makes it a Multipurpose tree.

Ethnomedicinal uses of the tree:

Every part of the plant is considered to be useful in purpose of medicines.

- The roots and flowers are known for curing maximum number of ailments.
- The plant possesses strong anti-inflammatory, antibacterial, antiviral, analgesic, antioxidant, oxytocic, hypotensive, hypoglycaemic, antimutagenic, as well as fibrinolysis enhancing activities.

Photograph creative Commons Attribution-Share Alike 3.0

Ethnomedicinal uses of the tree:

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- The plant possesses strong anti-inflammatory, antibacterial, antiviral, analgesic, antioxidant, oxytocic, hypotensive, hypoglycaemic, antimutagenic, as well as fibrinolysis enhancing activities.

Commercial use of *Bombax ceiba:*

- *B. ceiba* is also used for various commercial purposes.
  - The tree is exclusively used for agroforestry, food, fodder, fuel also fibre.
  - The leaves are known to have high protein contents, and is thus most preferred as fodder.

An elaborative form of medicinal and commercial importance of the tree :

Edible uses

Flowers, Unopened flower buds and calyx-Highly valuable as cooked vegetable.

Ripe seeds are eaten roasted. Young leaves - cooked and eaten as a vegetable.

Medicinal uses

The flowers have various astringent and refrigerant properties.The young roots are known to be diuretic and tonic. The leaves are hypotensive and hypoglycaemic in nature. When combined with the roots of Moghania macrophylla they are used for curing enlarged spleen. They are combined with *Capparis zeylanica* and Carissa carandas to treat oedema. The bark is famously used to fight against cholera when combined with different other plant species

Commercial Uses

Seed oil is used to make soap.

A methanol extraction of the leaf powder has been shown to be a potent larvicide in mosquito control programmes. The extract from the plant could be used in stagnant water bodies which are known to be the breeding grounds for mosquitoes

Ropes are made from fibrous bark of the tree.

Home remedies:

Bombax ceiba is known for its explicit properties which can be used easily at home for example:

- For the purification of blood the leaves of semal can be grinded and added with water and after filtration it can be consumed.
- In treatment of Leucorrhoea the semal root powder should be consumed twice when mixed with water.
- To minimise the problem of over bleeding in menstruation Semal root powder when mixed with mulethi powder, swarn geru and water when consumed twice with milk is known to be effective cure.

https://en.wikipedia.org/wiki/Bombax_ceiba

Reference:

- http://tropical.theferns.info/viewtropical.php?id=Bombax+ceiba
- http://nopr.niscair.res.in/handle/123456789/6288
- https://indiabiodiversity.org/species/show/31106
- http://www.niscair.res.in/sciencecommunication/ResearchJournals/rejour/ijtk/Fulltextsearch/2009/October%202009/IJTK-Vol%208(4)-%20October%202009-%20pp%20638-644.htm

Jobs tears

Surbhi

B.Sc.(H) Botany, 1st year

The Earth has a very rich biodiversity. So many species are still to be explored by mankind. And yet many even extinct without us even discovering there mere existence. The world is developing in a rapid manner. And this development is not always sustainable. We have so many species of plants which are not so well known but if used effectively, could be of great help. We really need to discover this 'LOST TREASURE'.

One of such plant is an ancient grain, commonly known as "JOBS TEARS".

General account:

Jobs tears, i.e. *Coix lacryma-jobi* also called Adlay millet, are a tall, grain- bearing perennial tropical plant belonging to the family Poaceae.

Two main varieties of the species are found, wild and cultivated. They differ from each other in certain manners. The wild variety has hard pseudo carps, pearly white, oval structures hence are used as beads for making various ornamental objects. While on the other hand the cultivated variety has a soft shell and good

medicinal value. Jobs tears are a useful source of food as well.

Outlook of the name:

The common name jobs tears refers to droplet shaped, pearly white 'beads' to the biblical man of old testament with great suffering. The seeds are symbolic of tears, as they have quite similar shape. This relationship to tear drops is also reflected in the species name lacryma-jobi, in reference to tear producing **lachrymal glands**. Hence the name is quite appropriate.

Morphology:

It is an annual herb. The stem is erect, branched, and is around 1-2 m high. It has leaves with broad base. The male and female flowers are borne on the same plant. Interestingly, the actual bead like structure is not a seed at all. It is a very hard, hollow structure containing a minute fertile female flower and two sterile flowers.

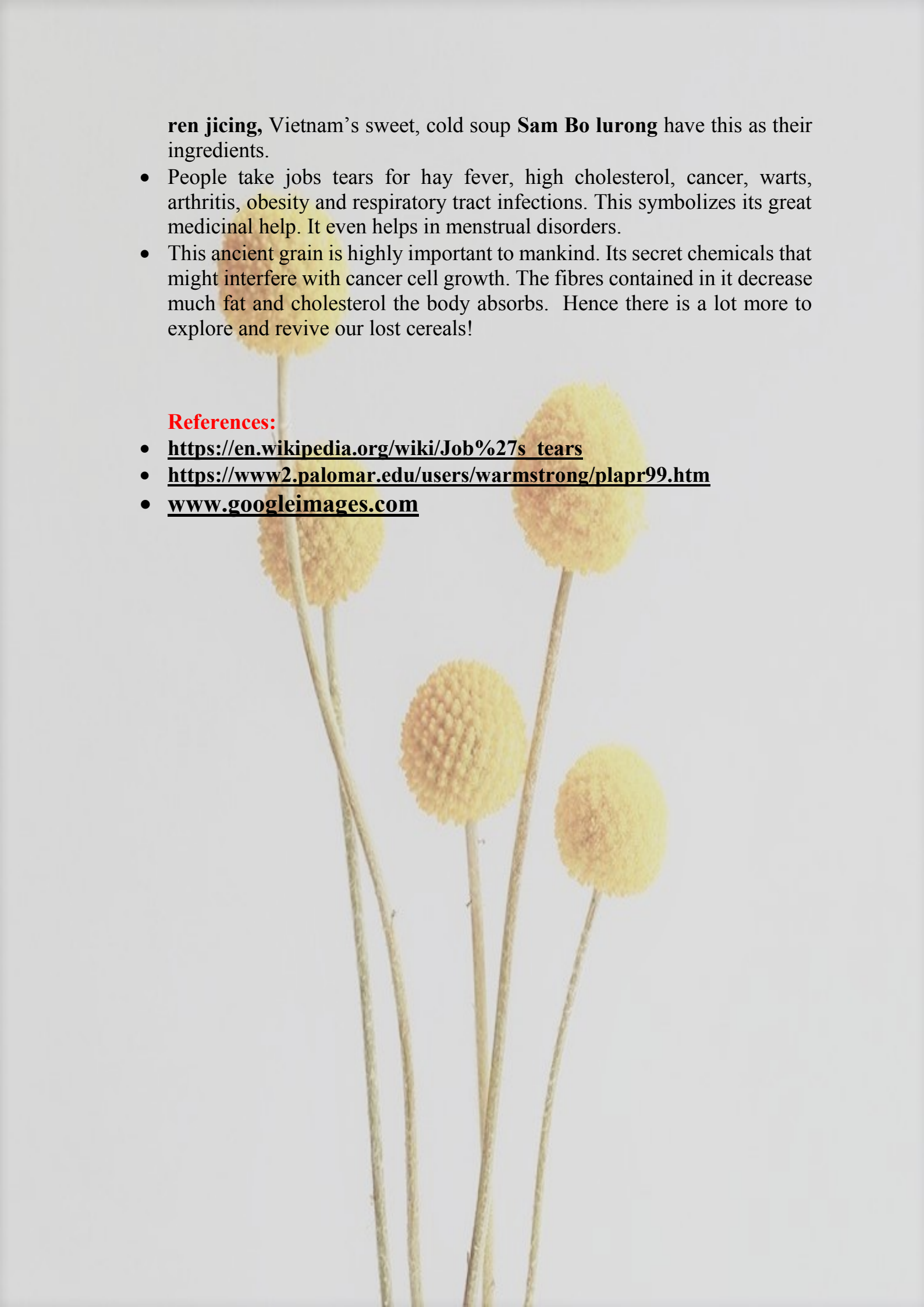
Pollen bearing male flowers is produced on slender stalk that extends out of the bead through a tiny pore. Two feathery stigmas also protrude from the pore to receive the pollen grains.

Uses:

- Jobs tears seeds provide bead for ornamental purposes, with a great advantage, since it is polished and moreover has a piercing through it which makes it quite ideal for this job.
- People use it in various traditional dishes and beverages also such as in Korea, **Yulmu cha** drink is made from jobs tears, similarly Chinese beverages **Yi**

ren jicing, Vietnam's sweet, cold soup **Sam Bo lurong** have this as their ingredients.

- People take jobs tears for hay fever, high cholesterol, cancer, warts, arthritis, obesity and respiratory tract infections. This symbolizes its great medicinal help. It even helps in menstrual disorders.
- This ancient grain is highly important to mankind. Its secret chemicals that might interfere with cancer cell growth. The fibres contained in it decrease much fat and cholesterol the body absorbs. Hence there is a lot more to explore and revive our lost cereals!



References:

- **https://en.wikipedia.org/wiki/Job%27s_tears**
- **https://www2.palomar.edu/users/warmstrong/plapr99.htm**
- **www.googleimages.com**

Bhutanese red rice

Khushi Bhatt

B.Sc. (H) Botany, 1st year

Among one of the most nutritional grains and staple food of Bhutan, Bhutanese Red Rice is grown approximately 9000 Ft. Above sea level for thousands of years and irrigated with mineral rich glacial water. It is a medium sized grain.

It has three original components Bran, Endosperm & Germ layer that makes it nutritionally more superior than other accessible grains.

- Bran is the outermost covering that makes it rich in fibber and vitamin-B
- The large central portion of the grain is called Endosperm that contains carbohydrates which are a known for the good source of energy.
- Germ is rich in nutrient.

Traditionally this whole grain is found in Paro, the northern valleys of Bhutan, Panakha and Wangoli and also cultivated at subsistence levels throughout the country.

Benefits of bhutanese red rice:

- Bhutanese Red Rice contains high amount of Manganese, this mineral is essential for fat metabolism and prevents cell damaging.
- It is irrigated by mineral rich glacial water so it is mineral rich more than other whole grains.
- Being completely pesticide and herbicide free it is eco-friendly and promotes sustainable means of farming
- It cooks faster than normal brown rice that is 20 min (approx.) It has a characteristic earthy taste with complex nutty, smooth texture
- It being a healthy whole grain it is also gluten free and leaves a good alternative to people on gluten free diet
- The most widely eaten white rice undergoes refining process that results in removal of major nutritional part of the grain whereas this rice retains Bran and Germ that makes it healthier and tastier
- It is useful in preventing clogged arteries and also helps in maintaining healthy weight as it is fat and cholesterol free.

Nutritional information:

- It has low calorific value as compared to other grains.
- One serving contains approximately 200 calories.
- It is rich in dietary fibre and provide us with 21% of our daily allotment out of which three grams of it are known to be dietary fiber.
- One serving contains 8% of our daily requirement for protein.
- This grain is heart friendly grain as it does not contain any amount of fat or cholesterol
- Each serving provides us with 2 percent of our daily allotment for iron magnesium 80%, 20% of phosphorus, 35% of molybdenum and 6% of zinc.

- Bhutanese Red Rice also contains antioxidants like for example **Mangan** is an antioxidant that counteracts free radicals formed due to energy production in body.
- It also contains zinc that accelerates wound healing and maintains defence mechanisms.

Do you know?

Bhutanese Red rice currently is the only product imported from Bhutan and it was introduced by LOTUS FOOD in United States in the mid- 1990s.

References:

- https://en.wikipedia.org/wiki/Bhutanese_red_rice
- https://healthyeating.sfgate.com/nutritional-information-cooked-bhutanese-red-rice-1150.html
- https://www.npr.org/2012/04/17/150729746/bhutanese-red-rice-pilaf
- https://www.fondazioneslowfood.com/en/ark-of-taste-slow-food/bhutanese-red-rice/

Ficus elastica

Ishita Chandra

B.Sc. (H) Botany, 2nd year

Classification:

Kingdom: Plantae

Order: Rosales

Family: Moraceae

Genus: Ficus

Subgenus: Urostigma

Species: elastica

Binomial name: *Ficus elastica*

Habit of *Ficus elastica*

https://www.flickr.com/photos/chrisdiewald/3278898873

Ficus elastica is commonly known as the rubber fig, rubber bush, rubber tree, rubber plant or Indian rubber bush, Indian rubber tree. It is native to the Eastern parts of South Asia and Southeast Asia. It is grown widely in Nepal, Indonesia, Bhutan, North-eastern India, Burma, China and Malaysia.

Morphology:

Fig plant belongs to the banyan group of figs. It is a large, upright and branched tree up to 30-40 meters tall and 2 meters in diameter. The trunk of the tree develops aerial roots as well as buttressing roots (these are large, wide roots present on all sides of trees which have a shallow rooted system). Significantly performing two functions- anchorage and support to the heavy branches. The

leaves are large, globous, ovate, shiny, broad and fleshy. Usually 10-35cms long, the size of the leaf, however, varies in younger and older plants. Leaves are the largest in young plants and are smaller in the older trees. All parts of the plant secrete white milky latex earlier used extensively to make rubber. For pollination, a special type of pollinator is required which is a particular species of fig wasp while making sure it does not need to produce colourful or fragrant flowers to attract other pollinators. The fruit of this plant is oval in shape, yellow-green in colour and about a centimetre long. It is called the "Fake fruit" as it contains fertile seeds only where pollinating insect is present and is barely edible.

Fruit of *Ficus elastica* Leaves of *Ficus elastica*

https://en.m.wikipedia.org/wiki/File:Ficus_elastica_leaves_02.JPG

Uses:

1. Ornamental- It is grown as an ornamental plant outdoors in frost free climates and indoors also in colder climates as a houseplant. Dr. Wolverton ranks the Rubber plant as one of the very best houseplants to clean the air. This plant is highly resistant to pests and diseases.
2. Laticifers present in the plant produce latex which is collected to synthesize rubber.
3. The roots of fig plant are used to build bridges as they can bear drought and humidity both.

Ficus elastica grown as a houseplant.

https://m.ikea.com/au/en/catalog/products/art/90397906/

References:

- The Plant List
- Zhengyi Wu, Zhe-Kun Zhou & Michael G. Gilbert. "Ficus elastica". Flora of China. Missouri Botanical Garden, St. Louis, MO & Harvard University Herbaria, Cambridge, MA. Retrieved 29 August 2013.
- Flora of North America, Ficus elastica Roxburgh ex Hornemann, 1819. India rubber plant
- https://www.ourhouseplants.com

Plant with economic importance: *Magnolia*

Victoria

B.Sc. (honours) botany, 2nd year

Description-

Magnolia grandiflora, an ancient genus, is a medium to large evergreen tree which may grow 120 ft tall and typically has a single stem (or trunk) and a pyramidal shape.

The leaves are simple and broadly ovate, 12–20 cm long and 6–12 cm broad with smooth margins. They are dark green, stiff and leathery, and often scurfy underneath with yellow-brown pubescence. The large, showy, lemon citronella-

Figure 1: *Magnolia virgiana*

https://en.m.wikipedia.org/wiki/Magnoli

scented flowers are white, up to 30 cm across and fragrant with six to 12 petals with a waxy texture, emerging from the tips of twigs on mature trees in late spring.

Flowering is followed by the rose-coloured fruit, ovoid polyfollicle. Exceptionally large trees have been reported in the far southern United States and the tallest is a specimen in Smith County, Mississippi, that stands an incredible 37 m.

Economic importance:-

- As a whole, the Magnoliaceae are not an economically significant family. With the exception of ornamental cultivation, the economic significance of magnolias is generally confined to the use of wood from certain timber species and the use of bark and flowers from several species believed to possess medicinal qualities.
- The wood of the American tulip tree, Liriodendron tulipifera and the wood of the cucumbertree magnolia, *Magnolia acuminata*, and to a lesser degree, that of the Frasier magnolia, *Magnolia fraseri*, are harvested and marketed collectively as "yellow poplar". This is a lightweight and exceptionally fine-grained wood, lending itself to precision wood working for purposes such as pipe organ building.
- Magnolias have a rich cultural tradition in China, where references to their healing qualities go back thousands of years. White or Yulan Magnolia is the official flower of the Chinese metropolis, Shanghai. The Chinese have long used the bark of Magnolia officinalis, a magnolia native to the mountains of China with large leaves and fragrant white flowers, as a remedy for cramps, abdominal pain, nausea, diarrhoea, and indigestion.
- *M. sieboldi* is the national flower of North Korea and official flower of Gangnam; *M. grandiflora* is the official state flower of Mississippi and Lousiana.
- Certain magnolia flowers, such as the buds of Magnolia liliiflora, have been used to treat chronic respiratory and sinus infections and lung congestion.
- Recently, magnolia bark has become incorporated into alternative medicine in the west, where tablets made from the bark of M. officinalis have been marketed as an aid for anxiety, allergies, asthma, and weight loss.

- Compounds found in Magnolia bark might have antibacterial and antifungal properties, but no large-scale study on the health effects of magnolia bark or flowers has yet been conducted.
    - Bark stimulant, diaphoretic and tonic; used also for malaria and rheumatism, most part contains an essential oil.
    - Most parts contain an essential oil.
    - It has some limited use in the forest products trade where its wood is made into veneer for plywood and wooden crates to transport vegetables.

References-

- https://www.google.co.in/url?sa=t&source=web&rct=j&url=http://www.softschools.com/facts/plants/magnolia_tree_facts/599/&ved=2ahUKEwiL6PWOnujfAhWHpY8KHaQMBNIQFjAQegQIAhAB&usg=AOvVaw0d6cEzdpUhQU3Wy_zsIHe8&cshid=1547384081540
- https://www.google.co.in/url?sa=t&source=web&rct=j&url=https://www.britannica.com/plant/magnolia-plant&ved=2ahUKEwiL6PWOnujfAhWHpY8KHaQMBNIQFjARegQIBxAB&usg=AOvVaw2OZkVfnEpOOfsNRyQvzbEa&cshid=1547384081540
- https://en.m.wikipedia.org/wiki/Magnolia

Lady fern

Kirti Sharma

B.Sc. (H) botany, 1st year

Athyrium filix-femina is known as common lady-fern or the lady fern. It is a large, feathery species of fern.

Occurrence

It is Native throughout most of the temperate Northern Hemisphere, where it is often abundant in damp, shady woodland environments. There are numerous species of ferns and all have multiple different medicinal uses. One of those is lady fern.

Type: Herb

Latin name of lady fern: *Athyrium filix-femina.*

Synonyms: *Asplenium filix-femina, Athyrium felix-femina, Polypodium filix-femina.*

Family: *Polypodiaceae* (Polypody Fern Family).

There are many varieties of ferns, but if you're lucky enough to spy the soft, delicate lady fern, grab some and roll it up between your palms into a rough mash. The juices that are released will quickly ease stinging nettle burns and can also ease minor cuts, stings and burns (fresh salt water is also known to work in a pinch for bee stings). There are several evidences that reveal the use of lady fern over years in medical purposes.

Habit of Lady Fern

- **Iroquois** used subspecies ***angustum*** for mothers with intestinal fevers, for men with venereal disease and to prevent water breaking.
- Other varieties are also known to be used by **tribes** of other areas for pain, cancer, sores, caked breasts, vomiting blood, and for sore eyes.
- **Root tea** is used as diuretic, for breast pains caused by childbirth, and for caked breasts.
- **Stem tea** is used to ease labor.
- **Cherokee** used species of lady ferns for women's headaches. Lady fern was used in formula with Willow and plants for calming female anxiety.
- **Chippewa**, or **Ojibwa**, used Lady Fern **root** in compound decoction for stopped urine, they grated and dried that for sores.
- **Cowlitz** of the northwest have been using **stem infusions** for pain.
- **Hesquiat** also have been using **unfurling fronds** for internal ailments as with women's womb.
- **Makah** have used the decoction of pounded **stems** to ease labor pains.
- **Meskwaki** used the **root** decoction for the bosom pains caused by childbirth.
- **Potawatomi** have been using root infusions for very long time for caked breasts and other known female disorders.
- **Nuxalk** of Western Canada used subspecies ***cyclosorum*** of fern as a wash for sore eyes as a simple or compound root decoction.

Leaves of lady fern

Parts of lady fern and their specific uses: -

A tea of the boiled stems helps to relieve labour pains, the young unfurled fronds treats internal ailments such as cancer of the womb, Roots are anthelmintic and diuretic. Tea of the boiled roots treat general body pains, stops breast pains caused by childbirth and to induce milk flow in caked breasts. The

dried powdered root is applied externally to heal sores, a liquid extract of the root acts as an effective anthelmintic.

References:

- https://en.wikipedia.org/wiki/Athyrium
- http://www.nathanielwhitmore.com/ferns.html
- http://www.naturalmedicinalherbs.net/herbs/a/athyrium-filix-femina=lady- html
- https://www.permaculture.co.uk/articles/medicinal-benefits-ferns

Dhekia can

Sumi Kalita

B.Sc. (H) Botany 1st Year

What is Dhekia can?

Dhekia can or fiddlehead greens are the furled fronds of a young fern, harvested for use as a vegetable. They have antioxidant activity, and are a source of omega-3 and omega-6 fatty acids, and are high in iron and fibre.

Certain varieties of fiddleheads have been considered to be carcinogenic. Dhekia is generally not planted or grown in gardens. They grow wild by the banks of streams, roadsides or any unused plots of lands. This is probably the most common edible fern found all over Asia. The scientific name is *Diplazium esculentum*.

Availability and Flavor:

Dhekia are available seasonally, and are both foraged and commercially harvested in spring. When picking fiddleheads, it is recommended to take only half the tops per plant or cluster for sustainable harvest. Each plant produces several tops that turn into fronds; repeated over-picking will eventually kill the plant.

Picture of Dekhia Can

Maintaining sustainable harvesting methods is important in the propagation of any non-farmed food species. These delicate delights are available only in early spring when ferns grow their new shoots. The young fern fronds are mainly available by foraging. Dhekia have a grassy, spring-like flavour with a hint of nuttiness. Many peoplewould agree that they taste like a cross between asparagus and young spinach. Some detect an artichoke flavour as well, and even a bit of mushroom. Foraging for fiddleheads is a favourite spring activity in many areas where they grow; again, unless you know for sure which plants to look for, always forage with someone who does.

Commencement and Uses:

- In the Indian subcontinent, it is found in the Himalayan states of North and Northeast India. In Darjeeling and Sikkim regions, it is called niyuro (नियुरो) and is common as a vegetable side dish, often mixed with local cheese. In Assam, it is known as Dhekia xak (Assamese: ঢেকীয়াশাক); there it is a popular side dish.
- In the area of Jammu in Jammu and Kashmir, it's known as kasrod (कसरोड). The most famous Dogra dish is kasrod ka achaar (fiddlehead fern pickle). It's also cooked as a dry vegetable side dish to be eaten with rotis or parathas. This edible fern, called Dhekia (vegetable fern) has been a favourite of the Assamese. They can be eaten in many ways, be it a curry or cooked dry, Dhekia tastes delicious.
- Fiddleheads should be at least lightly cooked. Fiddleheads are tasty steamed or sautéed, and pair well with butter, lemon, in egg dishes, with hollandaise sauce, or in combination with their foraged brethren, morel mushrooms. Because of their short season, many fiddlehead fans like to pickle them to enjoy once the season passes.
- The name Dhekiakhowa Bor Namghor of Jorhat came from this very fern. Lucky for fiddlehead fans, ostrich ferns are fairly common, especially in temperate areas.

References:

- https://www.thespruceeats.com/all-about-fiddlehead-ferns-2217471
- https://en.wikipedia.org

Plants with Economic Importance: *Jatropha curcas*

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Jatropha curcas is a species of flowering plant in the spurge family, Euphorbiaceae. After introduction into Asian countries, *J. curcas* has spread very rapidly and due to its ethnobotanical uses, promotion as an ornamental and hedge plant encouraged its further spread. Due to recent research on its use as a potential biofuel crop, the governments of many Asian countries, including India, are promoting its commercial cultivation.

Habitat:

J. curcas grows as a weed in tropical and sub-tropical environments and can be found in disturbed sites, pastures, open woodlands, waste areas, abandoned gardens, and along roadsides. originally native to the tropical areas of the America, Mexico and Argentina, and has been spread throughout the world in tropical and subtropical regions around the world. Many *Jatropha* species in their native Americas occur in seasonally dry areas such as grassland-savanna, thorn forest scrub. *J. curcas* is a common hedge plant in Guatemala and Florida, USA, where it is even found in roadsides

.

***Jatropha* Habit**

Features:

J curcas is a semi-evergreen shrub or small tree, reaching a height of 6 m (20 ft) or more. It is resistant to a high degree of aridity, allowing it to grow in deserts. It contains phorbol esters, which are considered toxic. *J. curcas* also contains compounds such as trypsin inhibitors, phytate, saponins and a type of lectin known as **curcin**.

Seeds of *Jatropha*

The leaves have significant variability in their morphology, the leaves are green to pale green, alternate to subopposite, and three- to five-lobed male and female flowers are produced on the same inflorescence, averaging 20 male flowers, fruits are produced in winter, or there may be several crops during the year if soil moisture is good and temperatures are sufficiently high. The seeds are mature when the capsule changes from green to yellow. The seeds contain around 20% saturated fatty acids and 80% unsaturated fatty acids, and they yield 25–40% oil by weight.

Known hazards:

All parts of the plant are extremely purgative and poisonous, the oil from the seed contains a toxin, curcasin. The albumen of the kernel is a poison, toxal bumen cursin, most abundant in the embryo. Another poison, a croton resin, occurs in the seeds and causes redness and pustular eruptions of the skin, the plant is listed as a fish poison.

***Propagation of Jatropha curcas* by grafting**

Propagation of *J. curcas* by air layering

Uses:

- Tender young shoots - cooked and used as a vegetable. The young leaves may be safely eaten when steamed or stewed. Ashes from the roots and branches are used as cooking salt.
- Cooked nuts are eaten in certain regions of Mexico. The seeds, though agreeable to the taste, are purgative, and, if eaten in considerable quantities, poisonous.
- Although widely used in traditional medicine, and to an extent in modern medicine, all the parts of the plant are very poisonous and so extreme caution should be employed if utilizing this plant for any internal use, the latex has antibiotic properties against Candida *albicans*, *Escherichia coli*, *Klebsiella pneumoniae*. It also has coagulating effects on blood plasma.
- A methanol extract of the leaves afforded moderate protection for cultured human lymphoblastoid cells against the cytopathic effects of the human immunodeficiency virus. The juice of the bark is used in the treatment of malarial fevers, and is also useful in reducing swellings caused by inflammation. This juice is also applied externally to treat burns, scabies, eczema and ringworm.
- The fresh bark is cut into small pieces and chewed or kept in the mouth for 1 - 2 hours in order to treat pyorrhoea. A paste of the bark is applied to the gums to treat wounds and swellings of the gums. The thin twigs are popularly used in Nepal as toothbrushes to treat toothache. They are considered especially good for treating bleeding and swollen gums. A leaf infusion is used as a diuretic, for bathing, to treat coughs, and as an enema in treating convulsions and fits. The leaves are also used to treat jaundice,

fevers, rheumatic pains, guinea worm sores and poor development of the foetus in pregnant women.

- In Ghana, the ashes from the burnt leaves are applied by rectal injection for treating haemorrhoids. The juice of the leaves, or the latex, is applied directly to wounds and cuts as a styptic and astringent to clean teeth, gums, and to treat sores on the tongue and in the mouth. It is also considered useful for treating decayed teeth. The seeds have been substituted for castor oil and are sometimes called 'larger castor oil'. The seeds are also used in the treatment of syphilis.
- The oil is widely used for treating skin diseases such as herpes, itches, eczema and boils; and also, to soothe pain such as that caused by rheumatism; it is an ingredient in the oily extract, known in Hausa as 'kufi', which is a rubefacient for rheumatism and for parasitic skin conditions. The oil is used to stimulate hair growth. It is warmed and used to dress burns.
- The cotyledons are used to treat constipation and as an appetizer. The root bark is used to relieve the spasms of infantile tetanus and is used for sores, dysentery and jaundice. The juice of the roots is applied to boils and pimples.
- The plant is widely cultivated in the tropics as a living fence in fields and settlements. It is not browsed by cattle; it can grow without protection; roots quickly from fairly large stems placed direct into the ground; and can be used as a hedge to protect field. The plant makes an excellent hedge.
- The plant is used as a support for vanilla and other climbing crops. It has been planted in arid areas for soil-erosion control.
- Jatropha oil is an environmentally safe, cost-effective renewable source of non-conventional energy and a promising substitute for diesel, kerosene and other fuels. The oil burns without smoke and has been employed for street lighting near Rio de Janeiro. The seed contains 20 - 40% of a non-volatile oil. This can also be used for lighting, whilst the cotyledons are used as candles. The oil is also used for making candles, soap and as an illuminant. The oil is used to prepare varnish after calcination with iron oxides. Hardened physic nut oil could be a satisfactory substitute for tallow or hardened rice bran oil. In Europe it is used in wool spinning and textile manufacture. Along with burnt plantain ashes, oil is used in making hard homemade soap.
- Fruit hulls and seed shells can be used as a fuel. Dried seeds dipped into palm oil are used as torches, which will keep alight even in a strong wind. The wood was used as fuel, though of poor quality, in Cape Verde.
- The seed press cake cannot be used in animal feed because of its toxic properties, but it is valuable as organic manure due to a nitrogen content similar to that of seed cake from castor bean and chicken manure. The

nitrogen content ranges from 3.2 to 3.8%, depending on the source. Tender branches and leaves are used as a green manure for coconut trees.

- The seed oil, extracts of the seeds, and phorbol esters from the oil have all been used to control various pests, often with successful results. The oil has purgative properties, but seeds are poisonous; even the remains from pressed seeds can be fatal.
- Leaf juice stains red and marks linen an indelible black. The 37% tannin found in bark is said to yield a dark blue dye; latex also contains 10% tannin and can be used as marking ink. Ashes from the roots and branches are used in the dyeing industry, and pounded seeds in tanning in Ghana. The viscid juice of the plant, when beaten, foams like soapsuds. Children often blow bubbles of it with a joint of bamboo. The branches are used as a chewing stick for cleaning the teeth and strengthening the gums.
- Aviation fuels may be more widely replaced by biofuels such as Jatropha oil than fuels for other forms of transportation. There are fewer planes than cars or trucks and far fewer jet fueling stations to convert than gas station.
- According to a 2013 study of toxic plants, the jatropha tree may have applications in the absorption of carbon dioxide, whose sequestration is important in combating climate change. This small tree is very resistant to aridity so it can be planted in hot and dry land in soil unsuitable for food production.

References:

- Bayer Crop Science Press Release, June 18, 2016. Jatropha - This particular oil well holds a lot of future promise.
- *Kanter, James (December 30, 2008).* Blend "The *New York Times.*
- https://www.davidstrahan.com/blog/?p=170;
- https://www.cabi.org/isc/datasheet/28393
- https://en.m.wikipedia.org

Medicinal Plants: *Cassia alata*

Shreya Shrivastava

Botany (H) 2nd year

Kingdom – Plantae

Division – Angiosperm

Class - Magnoliopsida

Order – Fabales

Family – Fabaceae

Genus – *Cassia*

Species- *alata*

Figure 1: Flower of *Cassia alata*

Description:

- *Cassia alata*_is the synonym of *Senna alata*. It is commonly known as candle bush, ringworm shrub.
- *Cassia alata* is native to South America and can be found in diverse habitats.
- The height of the shrub is 10 to 15 feet. It has an oval shape of crown.
- The arrangement of leaf is alternate and even pinnately compound.
- The shape of leaflet is oblong or obovate. The inflorescence looks like a yellow candle. The fruit, shaped like straight pod.

Figure: Mature fruit of *Cassia alata*
https://www.google.com/search?q=cassia+alata

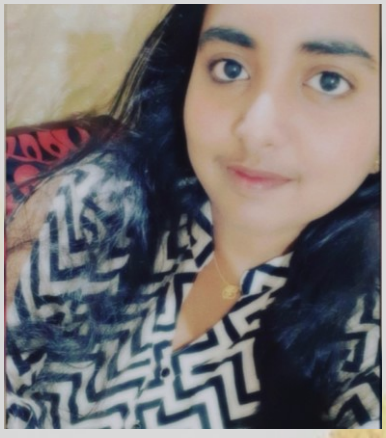
Uses:

- *Cassia alata* is a medicinal tree. Extract of *Cassia alata* leaves have been reported to possess analgesic, anti-bacterial, anti- inflammatory, fungicidal, hypoglycemic, laxative and oxytocic and wound healing activity etc.
- The leaves, root, seed and flowers have laxative property.
- Consumption of leaves treats constipation and purifies the flood. A decoction of leaves treats biliousness & hypertension. The leaves are best for treating skin diseases. It can be used in tincture, poultice and powder form. It is used as an ointment. The sap of the plant is applied over the affected area for cure. It is effectively remedy for skin blemishes, scabies, ringworm and other fungal infection.
- The bark of *Senna alata* treats skin diseases, diarrhea, worms, scabies, and eczema.
- An infusion of the plant is used to treat diarrhea, tympanites and uterus problem, tropical application of root treats sores and skin fungi.
- The seed is anthelmintic. The seeds are cooked and used as a remedy for intestinal worms.
- The flowers of *Cassia alata* are febrifuge. An infusion of the plants leaves, flowers and fruits are used as a remedy for stomach problems.
- In India the leaves of plant are used as purgative, exporant, astringent, vermicide and to treat all skin diseases.

References:

- https://en.wikipedia.org/wiki/Senna_alata
- https://herbpathy.com/Uses-and-Benefits-of-Cassia-Alata-Cid4278

Navajo Tea



Shreya

Bsc. (H) Botany, 1st year

As we all know that there are so many variants of tea around the world such as black tea, white tea, green tea, oolong tea, neem tea, yellow tea and many more. Such a tea is Navajo tea. Navajo tea, is a herbal beverage formed by the herbs belonging to the genus *Thelesperma.* But the most common among them is Thelesperma *filifolium*. It is commonly known as Greenthread or stiff greenthread or plains greenthread.

It is a plant which often to be used by American Indian as an herbal beverage. This herbal beverage is basically traditionally brewed by Navajo, Hopi, and Pueblo people. Navajo are people of Native American of South-western United States and hence this tea got its name. Navajo tea is also known as Hopi tea, Zuni tea or Indian tea.

Figure 1: Flower of *Thelesperma filifolium*

https://www.grandprismaticseed.com/blog/2018/1/20/navajo-tea

Navajo tea basically belongs to North America but some of its species can also be found in South America. This herb prefers growing over the plains and mountain states of central western and southern United States reaching up to **Wyoming, Montana, Nebraska** and **South Dakota**. It grows abundantly on the **Navajo, Hopi,** and **Pueblo lands**, as well as throughout much of New **Mexico, Arizona** and **Colorado**.

Uses:

This plant is considered as one of the best natural remedies for urinary tract infections and gastrointestinal distress. This herbal tea has been used for hundreds of years by Native Americans for detoxification. The whole plant is quite medicinal and can be used to provide good benefits to our health.
For making tea, the leaves are picked and dried beneath the sun which is then steeped as herbal tea.

The taste of this tea is much similar to the taste of green tea. It has mild, grassy or earthy flavour and is cooling, and sweet. Navajo tea is totally natural and is 100% free from caffeine. Navajo tea can be consumed by combining it with other plants such as cinnamon, spearmint, and penny-royal to make this tea tastier.

Navajo Tea

https://www.grandprismaticseed.com/blog/2018/1/20/navajo-tea

Nutrition Facts of Navajo Tea:

- Navajo is quite rich in flavonoids, majorly luteolin. Luteolin is one of the active ingredients in Navajo tea. It is a rich compound having anti-cancer, antioxidant, hepatoprotective, anti-cataract, anti-inflammatory, diuretic, antispasmodic, antiviral, antitussive (against coughs), choleretic properties that can improve the function of gall bladder, and etc.

- One cup of Navajo tea contains just 2 Kcal calories, along with 2 milligrams sodium, and 35 milligrams potassium. Moreover, Navajo tea is free of caffeine and does not contain any fats.

Benefits Navajo Tea for Health:

- Native American has been using Navajo tea for ages to soothe aches and pains from upset stomach or any other gastrointestinal problems.
- Navajo tea is one of the best traditional herbs to cure the pain associated with urinary tract infections. Also, it is good to soothe the gastrointestinal tract and get rid of the cramps.
- Navajo tea is a perfect soothing tea for indigestion and common stomach upsets or for any other digestive ailments.
- Navajo tea helps to improve the flow of blood and lowers the blood pressure. Therefore, it can keep the platelets from sticking together, so the flow of blood will be fairly smooth and provide prevention from strokes and heart attacks.
- Studies showed that Navajo tea content luteolin and glycosides also act COX inhibitors. That is why Navajo tea is great anti-inflammatory. Moreover, it works well for arthritis and any other inflammatory problems like headache, joint pain, and injuries.
- Other health benefit includes cure against various ailments such as treating kidney problems, reducing fevers, purifying the blood, reducing the tooth pain when used as a mouthwash, in treatment of gonorrhea, for expelling intestinal worms (as vermifuge), and as a potent stimulant for the nervous system.

Conclusion:

Such a highly useful rich medicinal plant must be provided all necessity to flourish and provide support to mankind to cure its ailments.

References:

- https://en.wikipedia.org/wiki/Thelesperma_filifolium
- https://drhealthbenefits.com/food-bevarages/beverages/tea/health-benefits-of-navajo-tea
- https://www.grandprismaticseed.com/blog/2018/1/20/navajo-tea

Cryptolepis buchanani

Aayushi Kanth

B.Sc. (H) Botany, I year

From ancient time, plants are recognized as a major resource for mankind. Plants are used as food material, in cosmetics and mostly in medicines. 80% of the world's population has faith in traditional medicines. ***Cryptolepis buchanani*** is one such plant which can be used in healing bone fracture.

- **ABOUT THE PLANT:-**

SCIENTIFIC NAME:- ***Cryptolepis buchanani***

FAMILY: - Asclepiadaceae.

COMMON NAME: - Jambupatrasariva, Dudhi etc.

GROWS IN:-Sub -Himalayan tracts, Bihar, Orissa, Varanasi region.

- It is a large evergreen laticiferous, woody climbing, perennial shrub.
- The leaves are simple, dorsiventral, petiolate.
- It is a medicinal plant growing in moist and swampy areas.
- The roots of plant are well studied for its medicinal properties but the aerial parts nearly virgin.

USES:-

- The plant is used in antidiarrhoel, antiulcerative, anti-inflammatory, blood purifier, antibacterial, demulcent, diaphoretic, diuretic properties and in treatment of rickets.
- The presence of alkaloids and flavonoids in the ethanol extract of *Cryptolepis buchanani* in these molecules are reported to have hepato protective activity.
- Ethanolic extract of leaf extract of *C. buchanani* significantly protects against liver injuries as well as oxidative stress resulting in increased serum biochemical parameter such as serum glutamate oxalate transaminase, serum glutamate pyruvate transaminase, and serum alkaline phosphatase.
- *C.buchanani* also shows antibacterial activities.
- The analgesic, anti-inflammatory, and chondroprotective activity of *C. buchanani* extract is reported in literature.

MAIN USE IN HEALING BONE FRACTURE:-

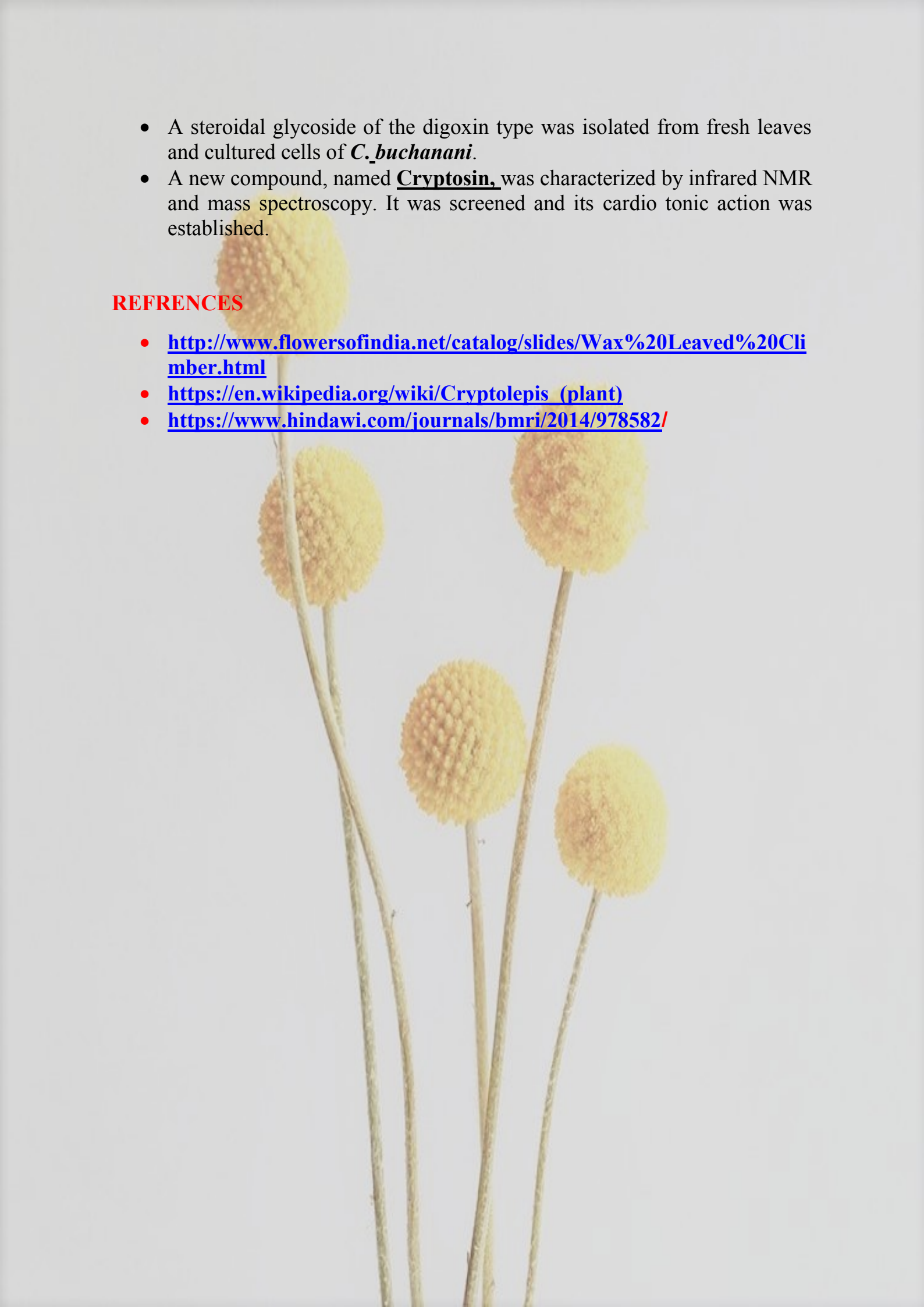
- In traditional practice of bone healing using roots, stem, and leaves by tribal people in Arunachal Pradesh.
- The local practitioner detects the nature of fracture by placing hand over injured region.
- According to the nature of fracture, different parts of plant are used. Local application is made by making paste of herb with mustard oil on the banana leaves for 1 week.
- For systematic use instead of mustard oil ,200 milk is added 100g of paste ; after proper mixing , it is given orally 3 times daily for 5 days.

LATEST RESEARCH:-

- A steroidal glycoside of the digoxin type was isolated from fresh leaves and cultured cells of ***C. buchanani***.
- A new compound, named **Cryptosin,** was characterized by infrared NMR and mass spectroscopy. It was screened and its cardio tonic action was established.

REFRENCES

- http://www.flowersofindia.net/catalog/slides/Wax%20Leaved%20Climber.html
- https://en.wikipedia.org/wiki/Cryptolepis_(plant)
- https://www.hindawi.com/journals/bmri/2014/978582/



Cardiospermum halicacabum

Shrushti Raut

B.Sc. (H) Botany, I year

‘One touch of nature makes the whole world kin’

-William Shakespeare

In our biosphere an immense diversity exists from levels of tiny cells to enormous biome, from small wolffia to huge rafflesia. But human has become the reason for the threat to these varieties. This nature’s library is burning even before we can catalogue the titles of all the books stocked there. So, here we have our **balloon vine yet** to be catalogued.

https://en.wikipedia.org/wiki/Cardiospermum_halicacabum

General account:-

- Balloon vine i.e. *Cardiospermum halicacabum* which is also known as 'love in a puff' is a wood vine.
- It is distributed almost globally in the tropics and subtropical Africa and Asia.
- It is often found as a weed growing along roads and rivers.
- It belongs to the family Sapindaceae and is a climbing plant.
- The Family contains 16 species which 4 are found in parts of Brazil and 12 are found in parts of South America.

Habit of Balloon vine

Morphology:-

- Balloonvine can grow up to 3 cm in height. This plant is a pubertusor almost glabrous, yearly or perpetually having thin twigs having tendrillar hooks.
- Flowers are small and white in colour, unisexual, obliquely zygomorphic, having straight pedicel.
- Presence of chemical compounds like flavones, aglycenes, triterpenoids, glycosides and a variety of fatty acids with volatile esters have been reported.
- The seed oil is yellow in colour having fatty acids having distinguishing smell.
- The mode of pollination is commonly by Bees, wasps, flies and butterflies.
- Fruits are inflated, papery, balloon like.
- Large teeth and lobes found on leaflets of the compound leaves.
- Forked tendrils borne at the base of inflorescence.

Geographical distribution:-

The plant is native to tropical America and was introduced throughout the southern and southeastern United States as well as. The plant species can also be found in East Asia, India, Africa and Southern Europe.

Amazing uses of balloon vine:-

Plants have always having been useful to mankind. Likewise, balloon vine also possesses a variety of uses.

- It acts as diaphoretic, diuretic, emetic, refrigerant and anti-diarrheal.
- It also acts as an antioxidant and suppresses TNF production.
- This plant can also be used as an anticancer and, vasodepressant.
- It is also useful in curing of rheumatism, severe bronchitis and snakebites.
- Amenorrhea, gonorrhea, asthma and several system ailments can be cured by its juice

Due to its lesser known facts its uses and identity is majorly restricted to Ayurveda only and thus rightly placed under our “lost treasures”

References:

- https://en.wikipedia.org/wiki/Cardiospermum_halicacabum
- https://indiabiodiversity.org/species/show/229078
- https://www.google.com/url
- http://www.plantsoftheworldonline.org

THE LOST CEREALS: - CHIA

Muskan Verma

BOTANY (H), 2ND Year

Chia Seed

Edible seeds of *Salvia hispanica,* also known as chia seeds, are oval and grey with black and white spots, having a diameter around 1 millimetre. *Salvia hispanica,* is a flowering plant which belongs to mint family *Lamiaceae, native* to CentralAmerica. Seeds are hydrophilic, absorbing up to 12 times their weight in liquid when soaked and developing a mucilaginous coating that gives chia-based creams and beverages a distinctive gel texture.

Habitat

Salvia hispanica is considered a pseudo cereal, cultivated for its edible, hydrophilic chia seed, grown and commonly used as food in several countries of western South America, western Mexico, and the southwestern United States.

Description

Chia is an annual herbaceous plant that can reach nearly 1 metre (3 feet) in height. Its lime-green leaves are oppositely arranged and have serrated (toothed) margins. The plant bears spikes of small blue, purple, or white flowers that have a high rate of self-pollination. The small oval seeds are about 1 mm (0.04 inch) in diameter and feature a shiny, mottled, or speckled seed coat that ranges in colour from dark brown to grey-white. The seeds produce a mucilaginous gel when soaked in water. Chia is a desert plant requiring little irrigation and grows well in sandy loam soils, but it is sensitive to frost and day length. The plant resists insect pests and disease and is a good candidate for organic production.

Usage of Chia Seeds in past

The ancient civilizations believed that the Chia seed provided supernatural powers. In Mayan, "chia" means "strength." This probably has to do with the large amounts of energy provided by chia seeds. Ancient warriors attributed their stamina to this tiny seed. This still holds true for certain groups of people today. The Mexican Tarahumara tribe is famous for their runners. These runners drink a mixture of chia seeds, lemon, and water called Iskiate. After drinking this, they are said to be able to run hundreds of miles. Something with that kind of track record deserves our attention.

Like many of the ancient grains, chia was lost for a while. The Spanish, when they came conquering, banned chia because of its religious uses. It survived in certain regions of Mexico and has resurfaced for our modern-day use .Some scientists, nutritionists, and farmers teamed up to cultivate chia commercially in Argentina. Today, chia is grown in several Latin American countries, but its main producer is fast becoming Australia. Chia seeds, in actuality, don't have a very strong flavour. So, they can be included in a wide range of foods for a little texture. They also form a sort of gel when mixed with liquid. So, chia can be substituted for eggs or used as a soup thickener. It can also be included in all kinds of baked goods for some added energy.

HEALTH BENEFITS

- **Aids in weight loss:** - A normal intake of chia seeds a day, which amounts to 25 to 38 grams a day, can go a long way in helping you shed those kilos. The seeds are also found to reduce belly fat. Fibre in chia seeds also helps you feel full for longer periods of time. It promotes satiety. The seeds absorb water in the stomach and then expand, thereby suppressing your appetite. This can eventually lead to weight loss. As per a Brazilian study,

chia seeds play a role in fat reduction. Chia seeds are also rich in protein, which also has been found to promote satiety and weight loss.

- **Prevents Constipation**:-Since they are packed with fibre, especially insoluble fibre, chia seeds turn into a gel when they come in contact with water. This adds to your stool and aids bowel movements, thereby relieving constipation. Fibre also has been found to improve digestion.
- Regulates blood sugar and helps in preventing diabetes, Fight breast cancer and other form of cancer, Supports healthy blood lipid level, Boost energy and metabolism, and Improves sleep.
- As per the size chia seeds provide many benefits to the mankind. It's just like a bunch of powerful benefits. A one-ounce (28 grams) serving of chia seeds contains Fibre: 11 grams. Protein: 4 grams., Fat: 9 grams (5 of which are omega-3s),Calcium: 18% of the RDI, Manganese: 30% of the RDI, Magnesium: 30% of the RDI, Phosphorus: 27% of the RDI. They also contain a decent amount of zinc, vitamin B3 (niacin), potassium, vitamin B1 (thiamine) and vitamin B2.They are rich source of antioxidants, fibres, proteins. Chia Seeds are rich in Omega-3 Fatty Acids.

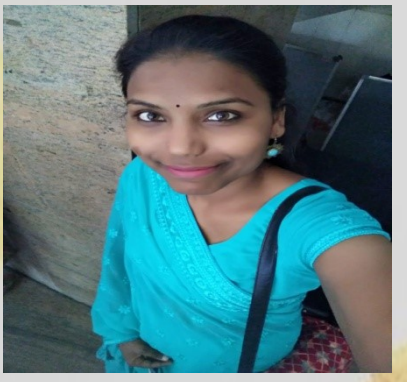
Chia pets

Joe Pedott created the Chia Pet in 1977 and marketed it widely after 1982. During the 1980s in the United States, the first substantial wave of chia seed sales was tied to chia pets, clay figures that serve as the base for a sticky paste of chia seeds. After the figures are watered, the seeds sprout into a form suggesting a fur covering.

Reference

1. https://www.stylecraze.com/articles/health-benefits-of-chia-seeds/#gref
2. https://www.healthline.com/nutrition/11-proven-health-benefits-of-chia-seeds#section8
3. https://en.wikipedia.org/wiki/Salvia_hispanica

KOKUM



Ms.REKHA,ASSOCIATE PROF.

(Botany Department)

Botanical name- *Garcinia indica* (Thouars) Choisy

Family – Clusiaceae

It is one of the important indigenous *Garcinia* species growning the Western Ghats of India. Out of 35 species found in India, 17 are endemics that includes 7 in western ghats, 6 in Andaman Nicobarislands,4 in Northeast region of India.The genus *Garcinia* is distributed in tropical region of South Asia, Southeast Asia, and Indonesia. The most common members are *G. mangostana* commonly known as queen of tropical forest, *G. indica* Choisy (Kokum), *G. gummi-gutta* (Malabar tamarind)..*G. indica* is generally known as 'kokum tree', 'wild mangosteen' or 'goa butter tree'.

In the Western Ghats, the trees are found along the costal belt of Konkan region of Ratnagiri district of Maharashtra, Goa, Uttara Kannada, Udupi and Dakshina Kannada Districts of Karnataka and Kasaragodarea of Kerala. Kokum variety from Ratnagiri and Sindhudurg districts have recived a Geographical Indication (GI) tag on 31 march 2016 with the application no. 474. The species is well known for its food, medicinal and commercial values, but the *Garcinia indica* is classified as '**Vulnerable**' in the IUCN red list, because of continuous decline in the plant population dueto habitat loss. The National Medicinal Plant Board **(NMPB)** has identified *G. indica* as an important plant for promotion and development and the Western Ghats Kokum Foundation (**WGKF**) is an

organisation which promotes cultivation and works on conservation of *G. indica* in India.

ECONOMIC IMPORTANCE

G. indica fruit is commonly used in culinary, pharmaceutical, nutraceutical and industrial significance. Fruit juice is used as a soft drink, fat extracted from seeds constitute of Stearic acid and oleic acid which is major component of is kokum butter and fruit rind also contains Hydroxy Citric Acid (HCA) benzophenone and garcinol,. The HCA is an antiobesient which is rare in plant kingdom.

The dried fruit rind gives a sweet-tangy taste to food and is widely used as flavouring agent in food preparations as substitute for tamarind in traditional culinary practices. It also has antiscorbutic, cholagogue, treat diarrhoea, inflammatory ailments, dermatitis, bowel problems, rheumatic pains and prevent hyper perspiration, antihelmintic, cardiotonic and anticancer activities. Kokum juice from the rind is used against piles, colic problems, dysentery and diarrhea.

References

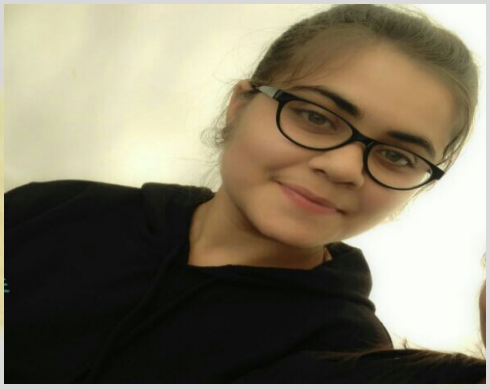
http://theepicentre.com/spice/kokum/

https://www.nagpurtoday.in/kokum-juice-healthbenefits

http://www.whatiscalled.com/spice-names/kokum

https://www.thehindu.com/features/metroplus/Food/kokum

ECOLOGICAL IMPACT OF LOST SPECIES



TAMANNA BATRA

B.Sc. (H) Botany, 2nd year

Ecological extinction is "the reduction of a species to such low abundance that, although it is still present in the community, it no longer interacts significantly with other species". Ecological extinction is necessary to study as it help in conversation and ecology analysis. They state that- "unless the species interacts significantly with other species in the community (e.g. a single organise may play as an important predator, competitor, symbiont, mutualist, or prey) and its loss may result in different degrees to the abundance population structure of other species, thus ecology.

Extinction of the plants may result in a loss of plant biodiversity in the area. Due to inter-dependency of organisms in the ecosystem, if one species relies on these plants as food resources, then the species may go extinct with the disappearance of plant. An example of the cascade effect caused by the loss of a top predator is apparent in tropical forest. When hunters cause local extinction of top predators, the prey's population may increase in number, causing an overexploitation of food resource and cascade effect of species loss becomes prominent.

Loss of biodiversity appears to influence ecosystem as much as climate change, pollution and other major forms of environmental stress do. These consequences highlight the need for stronger local, national & international efforts to protect biodiversity and to sustain the ecosystem. Studies over the last two decades have demonstrated that more biologically diverse ecosystems are more productive. As a result, very high rates of modern extinctions due to habitat loss, over harvesting & other human caused environmental changes reduce nature's ability to provide services like food to eat, clean water & a stable climate. But still it has been unclear how biodiversity loss stacks up against other human caused environmental changes that affect the productivity and sustainability of ecosystem. Many human activities have been known to impact species loss since time immemorial.

High species diversity has a positive effect on numerous functions of ecosystems. For example, a large number of plant species shows the production of biomass. Every organism, be it small herbivores (snails or caterpillars), predators (ladybirds or spiders) or animals that live underground (earthworms or nematodes) and microorganisms (bacteria or fungi) play a differential role in functioning of ecosystem and have a positive influence on ecosystem. Pollinators like bees and bumblebees, for example, are indispensable for the reproduction of many plants species. Other insects such as ants help plants in seed dispersal. Decomposers such as earthworms and soil microorganisms recycle nutrients for plant growth along with retrieving the soil fertility.

So to analyse the species- ecosystem maintenance, goals set by experimental chambers includes to explore ecosystem functions by manipulating complex animal and plant communities. The environmental conditions must be as constant as possible to avoid disruptive events which could distort the results. Each EcoUnit can be divided into four largely independent comapartments, determining the dependency patterns song organisms. This includes, for example, cameras that observe the interactions between animals and plants.

When plant species disappear due to climate change, this may lead to the subsequent loss of various animal species. Insects which depend on interactions with specific plant partners are particularly threatened. Plants, in contrast, will be less sensitive to the disappearance of their animal partners. One plant species ineracting with ecological networks is neccesary for the functioning of its whole food web. The local extinction of plants and animals can lead to chain reaction of other extinction events in these networks e.g. as a result of climate change says Dr. Matthias Schleuning. The stimulation indicate that the initial spark for extinction cascades is a result of climate change which mostly originates from plant species and is indirectly transferred to animal species. This domino effect is a particular threat to animal species that only interact with a small number of plant species, since they are more sensitive to climate change than generalists. A consideration of biotic interactions between animals and plants is, therefore, important for predicting the impacts of climate change on biodiversity.

References:-

https://news.umich.edu

https://phys.org

https://www.thoughtco.com

https://www.sciencedaily.com

https://en.m.wikipedia.org

Botanist of the year – S.C. Maheshwari

Sir S.C. Maheshwari

Dr. Satish Chandra Maheshwari is an Indian botanist, also a former professor at the University of Delhi. He is chiefly noted for his contributions to the important fields of plant physiology and plant molecular biology. He is also an elected fellow of the National Academy of Sciences, India. He is also a fellow member of the Indian Academy of Sciences, the Indian National Science Academy and The Council of Scientific and Industrial Research, which is the highest agency of the Government of India for scientific research. In 1972, He has also been awarded the Shanti Swarup Bhatnagar Prize for Science and

Technology for his contributions to biological sciences, which is one of the highest Indian science awards to be received.

Birth and education

Dr. Maheshwari was born on the 4th of October in 1933 at Jaipur, Rajasthan. He did his early schooling in Jaipur and later in Dhaka (in the present day Bangladesh). Later, after the Indian independence in 1947, he moved back to India along with his family. He did his graduation in Botany (H) from St. Stephen's College of the University of Delhi. He also did his master's (MSc) and doctoral (PhD) degrees from the same university. He did his post-doctoral research on the Embryology of Duckweeds , under Professor B. M. Johri. He further started his career as an alma mater as a member of the faculty of science in 1954. He also obtained a Fulbright Smith Mundt Fellowship after the 4 years of service in 1959.Later he traveled to the US, where he continued his research at Yale University and the California Institute of Technology. He resumed his career at the University of Delhi as a professor as well as at Jaipur National University till his superannuation from service. In between all this, he also worked as a visiting scientist at Oxford University. He also served as a Homi Bhabha Fellow at Harvard Biological Laboratories, USA, during 1973–74. Again as a visiting professor at Yale University, during 1981–82 and as a guest scientist at the International Centre for Genetic Engineering and Biotechnology.

Contributions in Science

Among the various significant contributions, first was the discovery of RNA polymerase activity in the chloroplast and revealed the presence of DNA in the cellular organelle. He accomplished this while working with Dr. Robert S. Bandurski during his early research at the California Institute of Technology.

He lead to the development of a new high-speed culture technique for the production of homozygous pure lines of haploid plants, which is now immensely in practice for the crop improvement and also for the commercial production of horticultural and ornamental plants in 1966 along with Sipra Guha Mukherjee.

He has also well researched on the plant growth hormones and led to new protocols for the isolation of cytokinins and gibberellins and also elucidated the function of salicylic acid during the flowering period.

He also assisted in genetic engineering of plants and in the phytochrome control of the plant metabolism.

Dr. S C Maheshwari is the founder of the Department of Plant Molecular Biology at Delhi University, the first as such department in India, where he established a unit for Plant Cell and Molecular Biology, another first thing to happen in the country. He is also known to have led a group of scientists in the field of photobiology and in researches on rice chromosomes along with their DNA sequencing. His research works have been detailed in more than 200 articles and majorly in a book "Signal Transduction in Plants: Current Advances", which is co-edited with Sudhir Kumar Sopory and Ralf Oelmüller. He has also mentored about 30 scholars in their MPhil, doctoral and post-doctoral researches and Sipra Guha Mukherjee (1938–2007), a noted biologist, mentioned earlier, is also among them.

Awards and Honors

Dr. Maheshwari was awarded with the Shanti Swarup Bhatnagar Prize, one of the highest Indian science awards to receive by the Council of Scientific and Industrial Research in 1972. He has also received several other honors which include J. C. Bose Gold Medal, the Goyal Prize, and Birbal Sahni Gold Medal of the Indian Botanical Society. Being a Homi Bhaba Fellow, he was also elected as a fellow by the Indian Academy of Sciences in 1975 and after three years tenure; Indian National Science Academy also elected him as their fellow. In 1979 he also became an elected fellow of the National Academy of Sciences, India. Among his various projects, Survey and Synthesis the information in the area of molecular Biology of Plant Development and Differentiation, was selected for the Jawaharlal Nehru Fellowship in 1981. Lately, in 2013 the University of Hyderabad also awarded him the Doctor of Science degree (Honoris Causa).

Dr. Satish Chandra Maheshwari is truly among the lead flag marchers of our Indian science.

Sources: - 1.https://en.wikipedia.org/wiki/Satish_Chandra_Maheshwari

2. https://wikivisually.com/wiki/Satish_Chandra_Maheshwari

3.https://www.researchgate.net/scientific-contributions/25970573_Satish_C_Maheshwari

Plant of the year - Jackfruit

Osheen Taneja

B.Sc (H) Botany III year

The **jackfruit** (*Artocarpus heterophyllus*), also known as **jack tree**, is a species of tree in the fig, mulberry, and breadfruit family (Moraceae) native to southwest India. The jackfruit tree is well-suited to tropical lowlands and its fruit is the largest tree-borne fruit, reaching as much as 55 kg in weight, 90 cm in length, and 50 cm in diameter. A mature jackfruit tree can produce about 100 to 200 fruits in a year. The jackfruit is a multiple fruit composed of hundreds to thousands of individual flowers, and the fleshy petals are eaten.

https://food.ndtv.com/health/6-remarkable-benefits-of-jackfruit-seeds-1667345

Jackfruit is commonly used in South and Southeast Asian cuisines. The ripe and unripe fruit and seeds are consumed. The jackfruit tree is a widely cultivated throughout tropical regions of the world.

Cultural importance

The jackfruit has played a significant role in Indian agriculture for centuries. Archeological findings in India have revealed that jackfruit was cultivated in India 3000 to 6000 years ago. It has also been widely cultivated in Southeast Asia.

The ornate wooden plank called avani palaka, made of the wood of the jackfruit tree, is used as the priest's seat during Hindu ceremonies in Kerala. In Vietnam, jackfruit wood is prized for the making of Buddhist statues in temples. The heartwood is used by Buddhist forest monastics in Southeast Asia as a dye, giving the robes of the monks in those traditions their distinctive light-brown color.

It is the national fruit of Bangladesh and Sri Lanka, and the state fruit of the Indian states of Kerala and Tamil Nadu.

What makes Jackfruit a wonder plant?

1.One cup of sliced fruit provides the following nutrients:

- **Calories:** 155
- **Carbs:** 40 grams
- **Fiber:** 3 grams
- **Protein:** 3 grams
- **Vitamin A:** 10% of the RDI
- **Vitamin C:** 18% of the RDI
- **Riboflavin:** 11% of the RDI
- **Magnesium:** 15% of the RDI
- **Potassium:** 14% of the RDI
- **Copper:** 15% of the RDI
- **Manganese:** 16% of the RDI

https://food.ndtv.com/health/6-remarkable-benefits-of-jackfruit-seeds-1667345

2. What makes jackfruit unique from other fruits is its protein content. It provides more than 3 grams of protein per cup, compared to 0–1 grams in other similar types of fruit, such as apples and mangoes.

3. It has a fairly low glycemic index (GI), which is a measure of how quickly blood sugar rises after eating a food. This has been attributed to the fiber it provides, which slows digestion and helps prevent blood sugar spikes .

4. Since Jackfruit is high in a few powerful antioxidants that provide various health benefits, including a reduced risk of several diseases.Antioxidants protect your cells from oxidative stress and inflammation, which often result from damage caused by molecules called free radicals .Some of the antioxidants that are most abundant in jackfruit:

- Vitamin C: Jackfruit contains high amounts of vitamin C, which may help prevent the inflammation that can lead to chronic diseases like heart disease and cancer.
- Carotenoids: Carotenoids have been shown to help lower inflammation and reduce the risk of various chronic diseases, such as type 2 diabetes and heart disease.
- Flavanones: Flavanones contain anti-inflammatory properties that may help lower blood sugar, blood pressure and cholesterol levels — important factors in reducing the risk of type 2 diabetes and heart disease.

5. Immune health: Jackfruit's content of immune-boosting vitamins A and C may help prevent illnesses. Eating this fruit is also claimed to be helpful for reducing the risk of viral infections.

6.Preventing skin problems: This fruit provides several nutrients and antioxidants, such as vitamin C, that may improve skin health. There is anecdotal evidence that eating it may slow the aging of your skin (18, 21).

7.Heart health: Jackfruit may have the potential to reduce the risk of heart disease due to its content of potassium, fiber and antioxidants (18).

8.The roots and extracts have been used in traditional Indian and Sri Lankan medicine to treat several conditions, including asthma, diarrhea and stomach ulcers.

How to Eat It.-

Jackfruit is quite versatile. It can be eaten raw, cooked, ripe or unripe and tastes great in a variety of sweet and savory dishes.Vegetarians and vegans often use jackfruit as a meat alternative due to its texture. Adding jackfruit to your diet is worth a try, as it is quite healthy and a unique food to experiment with.

References-

https://www.healthline.com/nutrition/jackfruit-benefits#section3

https://en.wikipedia.org/wiki/Jackfruit

Poems

Mother Earth's Tears

Look at the earth crying
Crying, remembering those golden days
When its air was pure and its water fresh!

Look at the earth crying
That earth whose love is as pure as a mother's love.
Look at your mother crying
for its aquatic creatures dying
Coz the water is full of your shitty waste, the toxins that your industries continue to fabricate.

Your mother is crying as it is no more able to see the starts shining in the sky!
Oh! Do you ask why?
It's because the air is filled with your moments of leisure
Those moments when you travelled to the meekest distance by your beloved vehicle
When carpooling was not your way
Coz your reputation matters as you say.

Your mother is crying for its beauty is dying
Coz the forests and nature are scrapped off
For your grey buildings and your so-called factories.
Stop destroying nature for your filthy needs
Coz one has to pay for his deeds
Realise the love you got from your mother earth
Its time to reciprocate some love and respect
Coz this is what the slightest
She expects!

-**Aashita Chadha**
BSc. (H) Zoology, 1st Year.

Nature's Domain

There the autumn asks the leaves
To have a fall along with;
I incline for the rejoice
Different carnations offer in.
The intimacy of leaves and gravity
Kills the sky's desire for rest.
And begets a heaven on the crest.
The fluctuating seasons get you waves
And a way through heart to chase.
The light weighed daffodils
Feel like getting rid of sorrows for sins.
And wobbling in the garden
Full of dreams.
That is
serene as Baby's- breath
And as smooth as butter cup,
My brain hums in the universe of
Lily-stargazers and bee's buzz.
In the pots pink and lilac,
Blue pansies and white magnolia
Tickle to love,
I plea to accustom these
Blazing stars into the moon
And let the tulips bloom
Without sun and rain,
Onto hierarchy of chains.
Because,
Nature is the main
To nurture is its domain.
Nature is the main
Love is its domain.

- **Anshita Sharma**
BSc. (H) Botany, 3rd Year.

Decrypt the Wonder of Nature

Find out the names of some of the amazing and unique plants in the crossword with the help of given hints and photos.

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

Hints-

1.Plants that accumulate large amount of metal compounds in its parts.

2.Plants that have red sap.

3.A flower that smells like Chocolate.

4.Phenomenon in which canopy forms channels like gaps

5.A species of Screwpine from Hawaii

6. An insectivorous feeding on small aquatic invertebrates.

7.A densely packed shrub that looks like moss covering rock.

8..Lobster Flower of Goa

9. A pink fleshed apple.

10. A South American plant evolved to look like stones.

11. Tallest tree in the world.

12. Pods of this plant resembles Caterpillers.

13. Also called ghost of the forest.

14. Also called Desert Survival Champion.

15. Miniature version of Banyan tree, with cups forming pitcher leaves

16. A succulent, perennial plant, has hermaphroditic flower.

Plants of Gargi College

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B.Sc. Botany (H)

III year

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II year

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II Year

Answers to Crossword

12 C	A	T	E	R	P	I	L	L	A	R	P	L	A	N	T	4 C
	7 I	L	A	R	E	T	A							3 C		R
	2 D	R	A	C	A	E	N	A						H		O
		A	T								5 H			O		W
		E	H					16 D			A			C		N
1 H	Y	P	E	R	A	C	C	U	M	U	L	A	T	O	R	S
6 A		K	E				8 H	V			A			L		H
L		N	S				E	A			T	13 A		A		Y
D		I	I				L	L			R	G		T		N
R		9 P	S				I	I			E	E		E		E
O			T				C	A			E	N		C		S
V			E				O			10 L	I	T	H	O	P	S
A		15 K	R	I	S	H	N	A	F	I	G	I		S		
N			14 S	W	A	I	N	S	O	N	A	A		M		
D								11 H	Y	P	E	R	I	O	N	
A														S		

Contact us

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