




BOTANICA

2023-24



Department of Botany
Garhbeta College
Garhbeta, Paschim Medinipur
West Bengal

Published by: Department of Botany,
Garhbeta College, Garhbeta, Paschim
Medinipur-72127, West Bengal, India
Date of Publication: 29th February, 2024



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Acknowledgement

We are very much thankful to respected Dr. Hariprasad Sarkar, Principal, Garhbeta College and Dr. Sushil Kr Ghosh, Coordinator of Internal Quality Assurance Cell (IQAC) of the college, for their inspiration to make the publication of the magazine a successful venture.

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Botanica, 2023-24
Department of Botany,
Garhbeta College



Preface

The magazine of the Department of Botany, Garhbeta College, is intended to bring out the hidden literary and creative talents in the students and also to inculcate leadership skills among them. This is a platform, where the young minds share their knowledge and creative thoughts.

Departmental Magazine Committee
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*Few information taken from internet & google scholar database

Bioluminescence in Fungi

When a living organism produces and emits light as a result of a chemical reaction, the process is known as **Bioluminescence**.

Bioluminescence comes from the Greek word *bio* means 'living' and the Latin word *lumen* means 'light'.

The light production from bioluminescence is "cold night" emission, where in less than 20% of the light is thermal radiation.

Fabre (1882) established the basic parameters of bioluminescent fungi. Those being:

- ★ The light without heat.
- ★ The light ceased in a vacuum, in hydrogen and carbon di-oxide.
- ★ The light was independent of humidity and did not burn any brighter in pure oxygen (O₂).

Process The process is caused by an enzyme-catalysed chemoluminescence reaction.

During the process, chemical energy is converted into light energy.

Bioluminescent fungi

There are about 100 species of fungi that generate light. Different species of fungi produce bioluminescence for different reasons.

Most are found in tropical jungles, but a few are found in temperate forests, like the species called foxfire.

Glowing fungi have always enchanted people who venture into forests during the nights. Many cultures around the world have named them ghost fungus as the glow from the fungi sparks fear among the people.


Scientists are still trying to figure out why certain fungi species use bioluminescence, but there are three main hypotheses.

First, by emitting light at night, the fungi can attract insects that pick up spores and spread them to new locations.


Second, Fungi use bioluminescence to attract predators that eat the insects that eat the fungi.

Third, a few species emit light all the time, meaning bioluminescence is probably a metabolic reaction to release excess energy.

Myceena chlorophoros



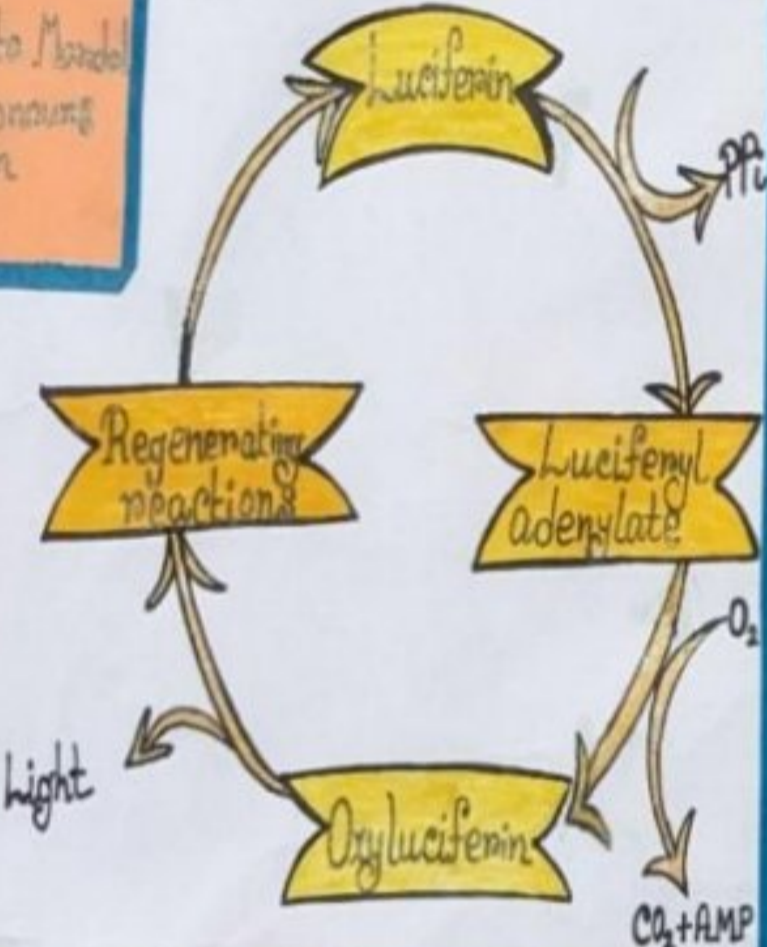
Hygrophysa sp.



Chemical Reaction:

$$\text{ATP (energy)} + \text{Luciferin (Substrate)} + \text{Luciferase (enzyme)} + \text{O}_2 \text{ (Oxidizer)} = \text{Oxyluciferin} + \text{Light}$$

Diagram:



Author: Name - Sangita Mondal
 Botany Honours
 1st Sem.

THE MOST EXPENSIVE MUSHROOMS Yartsa gunba

Caterpillar fungus is an entomophagous fungus endemic to the Tibetan plateau and the Himalayas. It has become the most important source of cash income in wide areas of the Tibetan plateau, where it is known as yartsa gunba 'Summer grass winter worm'.

Scientific Classification

Kingdom : Fungi
Division : Ascomycota
Class : Sorchariomycetes
Order : Hypocerales
Family : Ophiocordycipitaceae
Genus : ophiocordyceps
Species : O. Sinensis



According to beads this year the traders paid them Rs. 600 to Rs. 1000 per piece, depending on the size and quality of the fungus. Before the pandemic a piece would fetch Rs. 300 to Rs. 500. Local traders used to sell it for Rs. 1 million to Rs. 1.2 million per kg.

Yartsa gunba thrives in cold, grassy, alpine and sub-alpine meadows on the mountainous Himalayan plateau.
It is found 3500 - 5000 meters above mean sea level

It has also been reported to possess anti-cancer, anti-tumour-modulating and antioxidant activities. Yartsa gunba has mostly been popular for its potential to enhance stamina and libido.

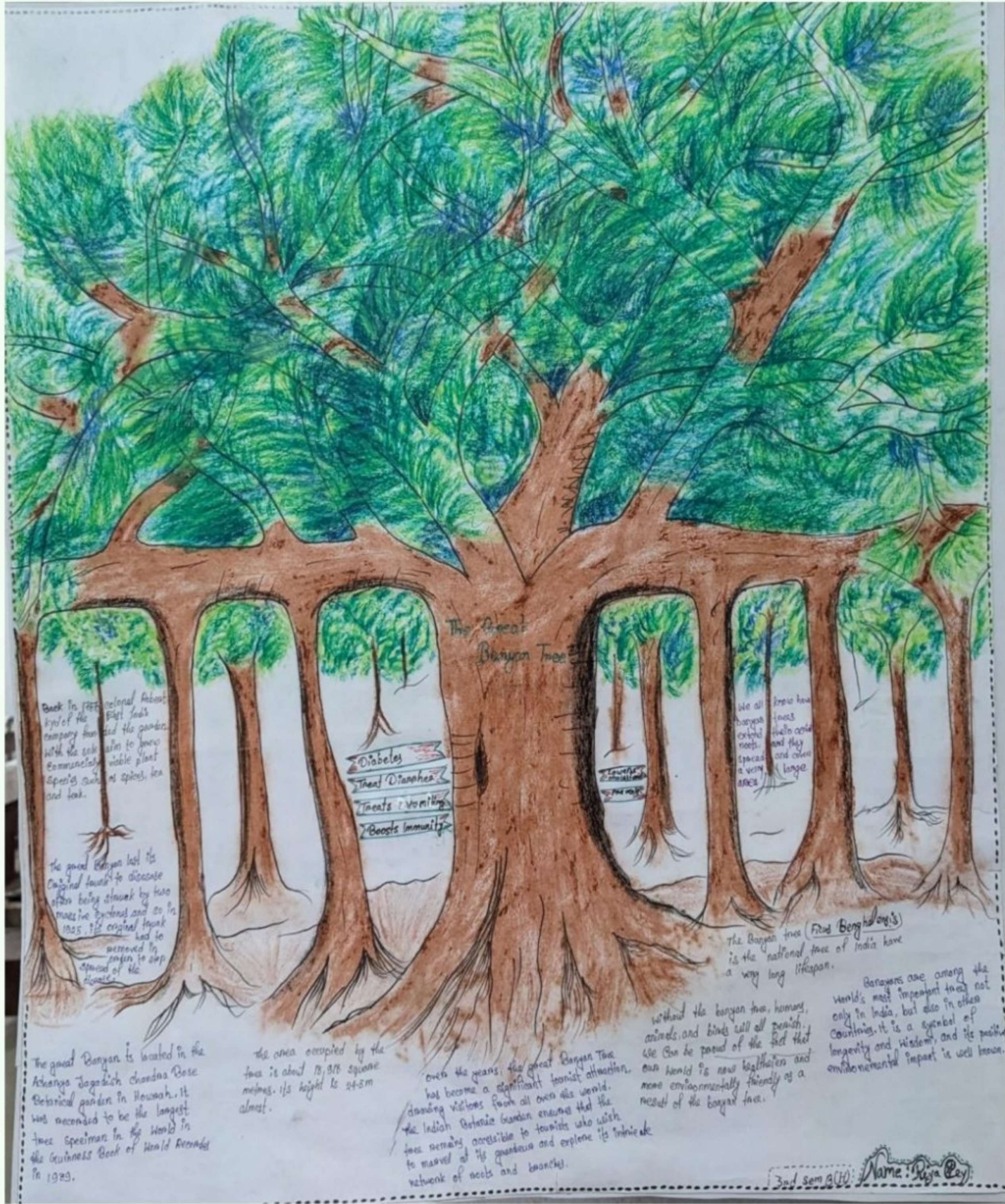
Medicinal value: Bronchitis, Diabetes, Hepatitis B, Atherosclerosis

Conservation in Danger

- Exploitation
- Environmental conditions
- Scarcity of host moth
 - Land slides
 - Illegal trade

Lilabati Hazra
Botany Honours Ist sem

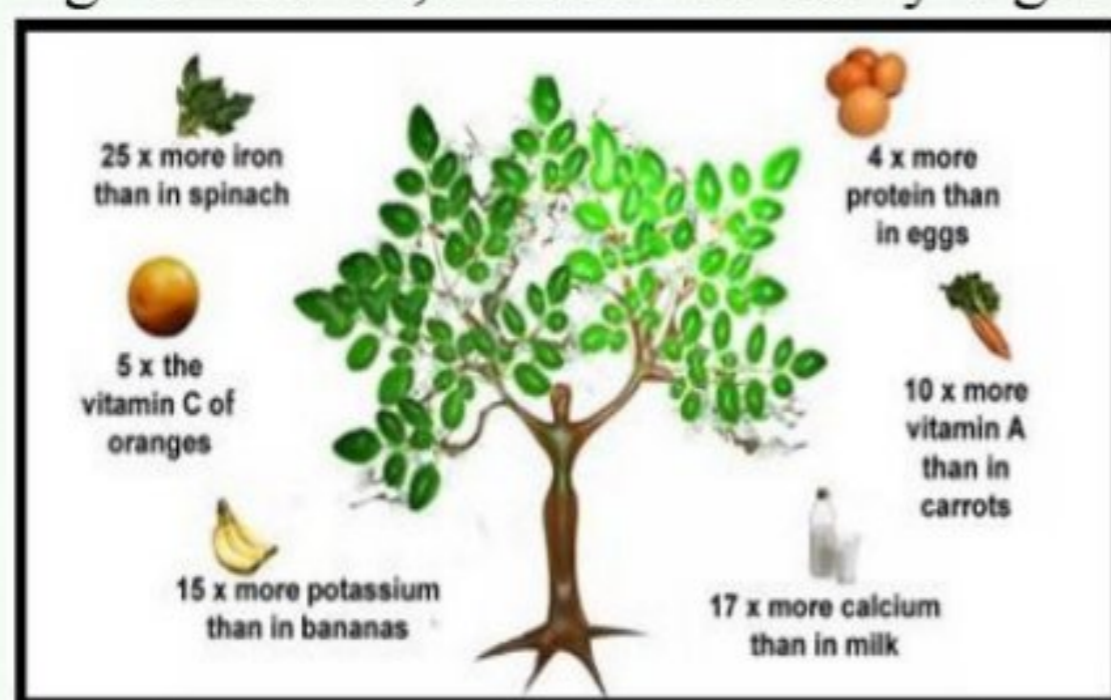




Moringa: The Magical Super food

Dr.SK Sahanawaz Alam, Assistant Professor
Department of Botany, Garhbeta College.

The Moringa tree (belongs to Moringaceae family) is one of the most incredible plants, out of 13 species, Moringa Oleifera is found in many regions. Moringa tree can be grown also in adverse condition. Moringa's nutritional and medicinal properties have the potential to end malnutrition, starvation, as well as prevent and heal many diseases and maladies worldwide. It is truly a miracle plant and a divine gift for the nourishing and healing of man. it contains vitamin A, vitamin C, Calcium, Potassium, Iron, and Protein in high amounts., that can be easily digested.



Moringa is rich in anti-oxidants, glucosinolates, isothiocyanates and covalently linked to the sugar- rhamnose. The bark and stem synthesize two alkaloids Moringine and Moringinine along with these more bio active compounds like β -sitosterol, β -sitostenone, 4-hydroxylamine, vanillin and octacosanic acid. β -Sitosterol works by competing with cholesterol during metabolic interaction and also prevents heart disease, cancer, flu, rheumatoid arthritis, tuberculosis, psoriasis, allergies, lupus, asthma, bronchitis, enlarged prostate and many others. Moringa activate the leptin to control the diabetes, obesity & pathophysiological function.

Plant parts	Medicinal uses
Leaves	Laxative, used for haemorrhoids, fevers, sore throat, bronchitis, eye & ear problems, Scurvy, Anti-diabetic, helps lowering the swelling of glands.
Flower	Acts as aphrodisiac, Anti-inflammatory, Anti-tumor, Lowering serum Cholesterol, Lipids, Triglyceride, VLDL, LDL.
Root	Antilithic, Rubefacient, Vesicant, Carminative, Anti-fertility, Anti-inflammatory, Stimulant, Cardiac-circulatory tonic, Lower pain in the kidney.
Seeds	Seed extract lowers lipid peroxides in liver, Anti-hypertensive effects.
Gum	Used for dental caries, Rubefacient, Fever, Asthma, Treatment for Syphilis and rheumatism.
Stem bark	Rubefacient, prevents tooth cavity, earache, pain killer and prevents Tuberculosis.

INDOOR PLANTS

"Inhale The Good Energy, Exhale The Bad"

Snake Plants (*Dracaena trifasciata*):

Evergreen flowering plant with strong and long pointed leaves. It produces oxygen at night. Remove toxins and pollutants from the air, such as formaldehyde, benzene, and xylene. It's important to note that Snake Plants require less water during the winter months when they are not actively growing! Nighttime absorption of CO₂ purportedly makes them especially suitable bedroom plants. Sansevierias use the crassulacean acid metabolism process.



Fun Fact!
Just One Snake Plant Per 100 Square feet can improve air quality significantly!

Lucky Bamboo (*Dracaena Sanderiana*):

Lucky bamboo is a well known and most loved plant when we talk about enhancing wood element and prosperity in our home as per Feng Shui.



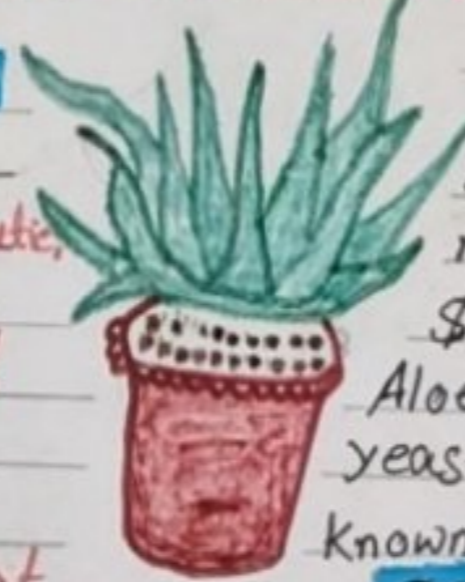
Fun Fact!
In Chinese tradition the amount of stalks of Lucky Bamboo Plant you have corresponds to what energy you'll attract

Benefits:

1. Believed to bring good luck and cleansing energy into our home.
2. Reduce harmful chemicals and toxins that are in the air in our home. A lucky bamboo plant does not use regular loam soil. Instead, it uses rock to represent Earth.

Aloe (*Aloe vera*):

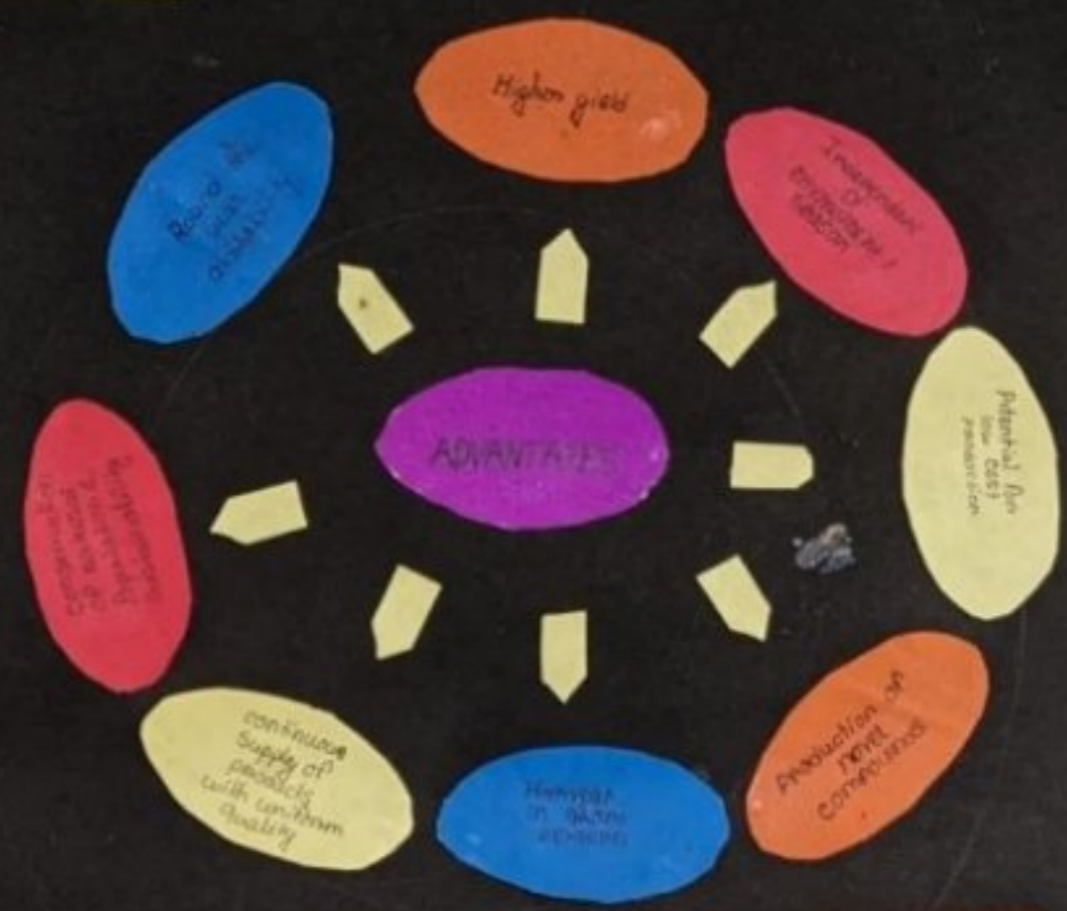
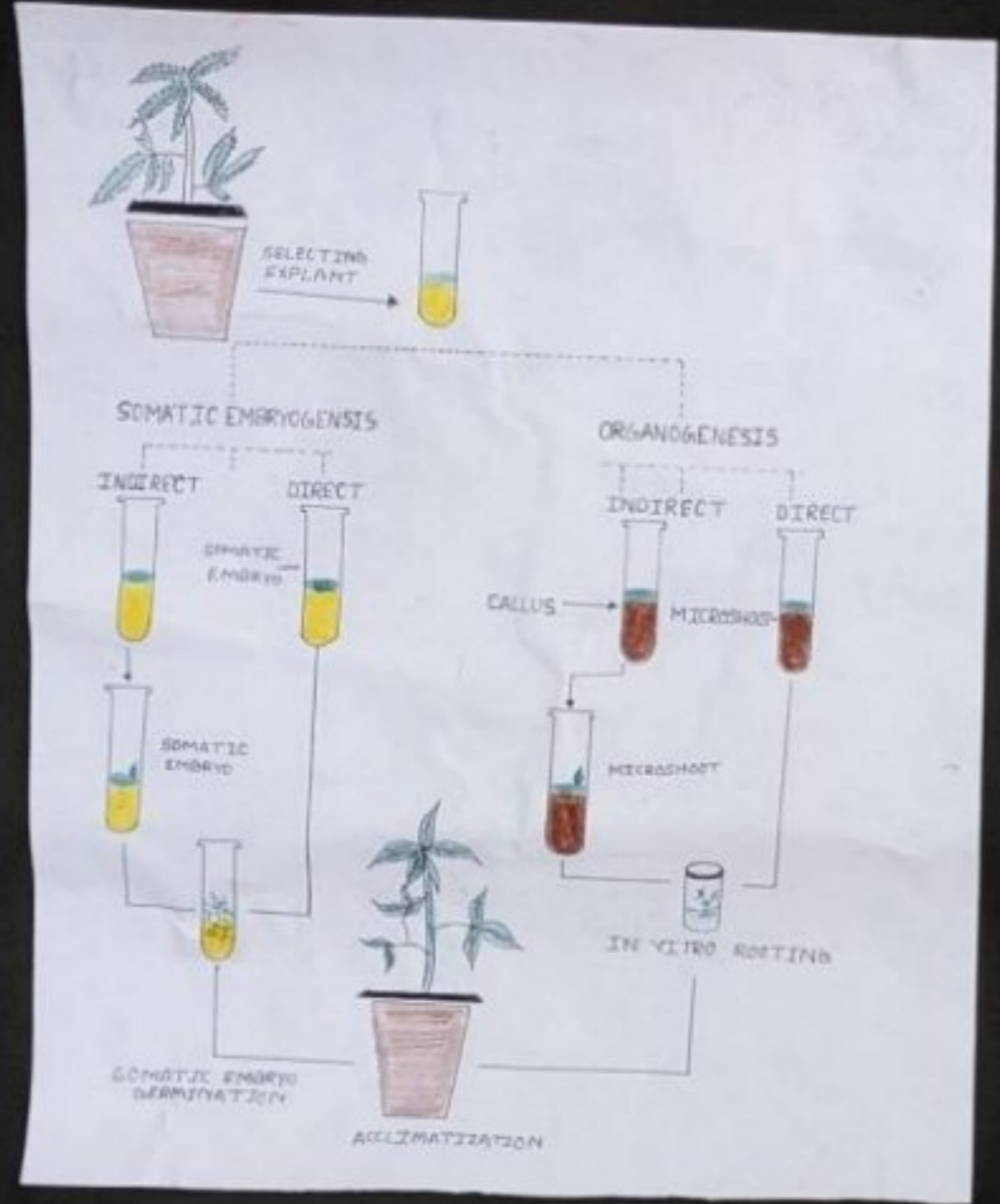
Aloe vera is known for its thick pointed, and fleshy green leaves. The cosmetic, pharmaceutical and food industries use aloe vera extensively. It has antioxidant and antibacterial properties known as polyphenols. It may improve skin and prevents wrinkles. It contains Alkaline that balances the pH level of the hair which promotes growth.



The plant has an estimated annual market value of \$13 billion globally. Aloe vera killing a yeast found in the mouth known as *Candida albicans*

Name - Subhadip Ghosh
Sem - 5 Dept - Botany

PLANT TISSUE CULTURE



Plant tissue culture is a collection of techniques used to maintain or grow plant cells, tissues or organs under sterile conditions on a nutrient culture medium of known composition. It is widely used to produce clones of a plant in a method known as micropropagation.

- PLANT TISSUE CULTURE APPLICATION**
- The commercial production of plants used as potted landscape and floral subjects.
 - To conserve rare or endangered plant species.
 - To screen cells rather than plants for advantage characters e.g. herbicide resistance / tolerance.
 - To cross distantly related species by protoplast fusion and regeneration of the novel hybrid.
 - To produce clean plant material from stock infected by viruses or other pathogens.

TYPES OF PLANT TISSUE CULTURE

- EMBRYO CULTURE
- SEED CULTURE
- MERISTEM CULTURE
- PROTOPLAST CULTURE
- BUD CULTURE
- OVARY CULTURE
- CALLUS CULTURE
- ANTHER CULTURE
- CELL SUSPENSION



MALA DEY
BOTANY (6TH SEM)

HOLY BASIL USES



Medicinal Properties:

It is valued for its potential health benefits, including anti-inflammatory, antioxidant, and antimicrobial properties.

Ayurvedic Medicine:

Holy Basil is a key herb in Ayurvedic medicine, used to treat various conditions like respiratory disorders, skin diseases, and digestive issues.

Stress Relief:

It is often used for its adaptogenic properties, helping the body adapt to stress and promoting overall well-being.

Respiratory Health:

Holy basil is known for its effectiveness in managing respiratory issues like coughs, colds, and asthma.

Skin Care:

Applied topically or consumed, holy basil is believed to promote clean and healthy skin.

Name-Saikhat Mandal
Semester - 5th

The Snake Plant

The snake plant (*Dracaena trifasciata*), also known as *Sansevieria* or mother-in-law's tongue, is a popular handy indoor plant with upright, sword-like leaves with a distinctive pattern that resembles snake skin.

The name 'Sansevieria' is derived from the Italian scientist Raimondo di Sangro, Prince of San Severo, who was involved in its introduction to Europe. *Sansevieria* are evergreen perennials that can grow anywhere from 8 inches to 12 feet high. It has web-like underground roots and thick, sword-shaped leaves with a unique banded pattern. It can flower once a year, producing clusters of cream-coloured flowers, that may develop into small orange fruits.



This plant is a popular indoor plant not only for its elegant, structural beauty, but also for its extreme hardiness, adaptability and air-purifying power. It can purify the air inside your home as its leaves absorb a variety of toxins, according to one study by NASA. They are also according to Feng Shui teachings, the perfect plants to attract money, prosperity and good energy. In small contributions, snake plants can absorb cancer-causing pollutants, including: CO, benzene. So, these plants are on the top list of air purifying plants.

Name - Mithu Maity
3rd Sem. Botany (Hons)

BRAIN MUSHROOM

GYROMITRA ESCULENTA

DESCRIPTION: The fruiting body, or Mushroom, is an irregular brain-shaped cap dark brown in colour that can reach 10 centimetres [4 inches] high and 15cm [6in] wide, perched on a stout white stipe up to 6cm [2½ in] high.

TAXONOMY: The fungus was first described in 1800, by mycologist Christian Hendrik Persoon, as *Helvella esculenta*, and gained its current accepted binomial name when the Swedish mycologist Elias Magnus Fries placed it in the genus *Gyromitra* in 1849.



SCIENTIFIC CLASSIFICATION
 Domain - Eukarya
 Kingdom - Fungi
 Division - Ascomycota
 Class - Pezizomycetes
 Order - Pezizales
 Family - Discinaceae
 Genus - *Gyromitra*
 Species - *G. esculenta*
 Binomial name
Gyromitra esculenta
 Synonyms
 • *Helvella esculenta* Pers. [1800]
 • *Physomitra esculenta* (Pers.) Boud. [1907]



SIMILAR SPECIES: The hooded or pouched false morel, *Gyromitra infula*, resembles the false morel in size and colour but it grows on wood and has a 2-4-lobed head, often saddle-shaped, that is not as deeply wrinkled as in *Gyromitra esculenta*.

HABITAT: on ground in conifer forests; saprotrophic? Geographical range - North America and Europe.

TOXICITY: Mushroom poisonings may range from benign symptoms of generalized upset to potentially devastating manifestations which include liver failure, and neurologic sequelae.

SYMPTOMS: • Fever • Headache • Nausea and vomiting • stiff neck • Photophobia

TREATMENT: Doctors treat fungal meningitis with long courses of high-dose antifungal medications, often given directly into a vein through an IV.

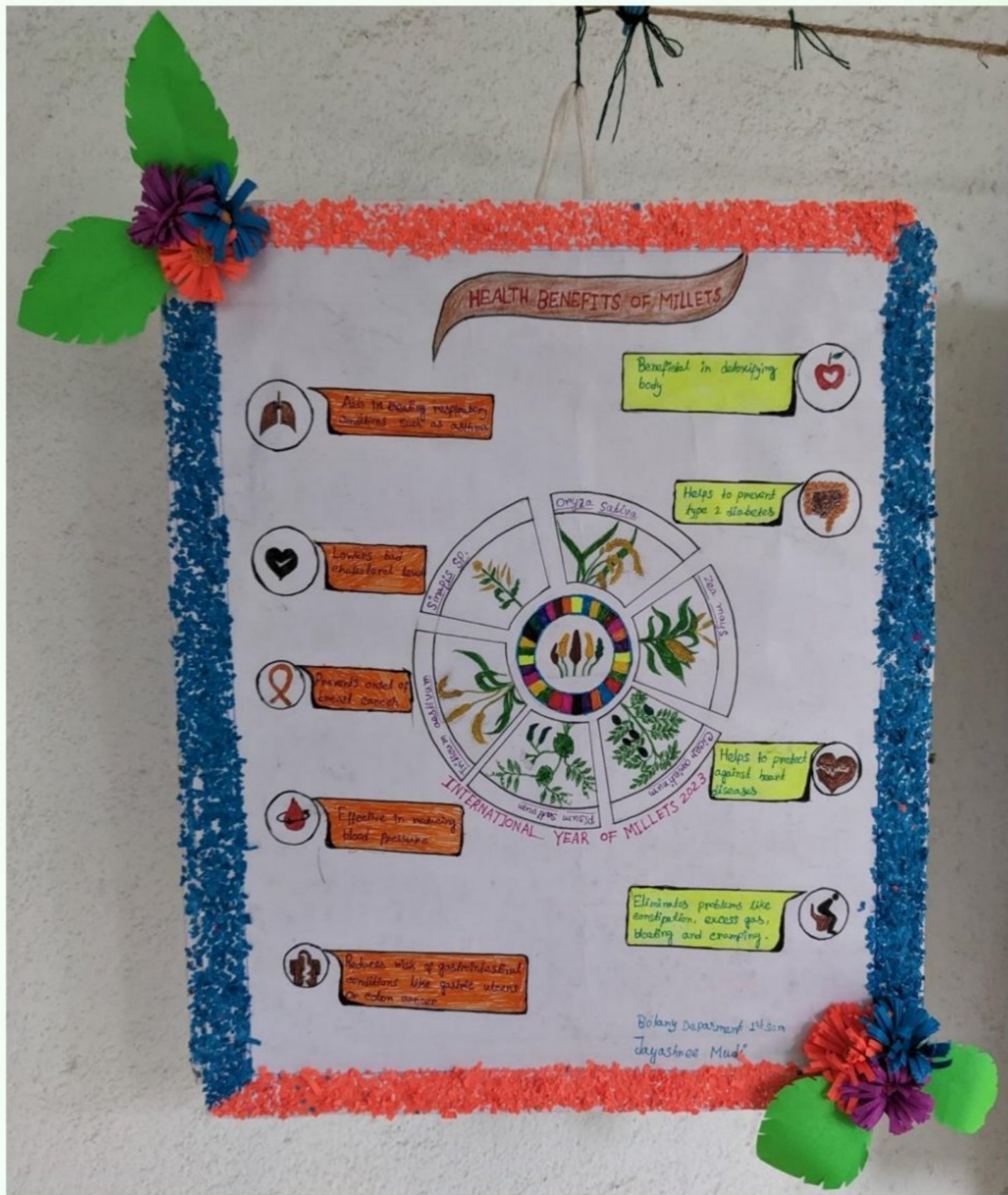


Property	Value
Smooth hymenium	Smooth hymenium
Cap is convex	Cap is convex
Hymenium attachment is not applicable	Hymenium attachment is not applicable
Stipe is bare	Stipe is bare
Spore print is yellow to buff	Spore print is yellow to buff
Ecology is saprotrophic or mycorrhizal	Ecology is saprotrophic or mycorrhizal
Edibility is deadly or inedible	Edibility is deadly or inedible

Gyromitra esculenta
 Mycological characteristics

• *Gyromitra esculenta* (Pers.) Boud. (1907)

Ballantine Headstone



NAME: RIYA KARAN
GARHBETA COLLEGE
1st SEMESTER
BOTANY DEPARTMENT

COVID-19 & NEW STRAIN - JN.1

PRECAUTIONS.....

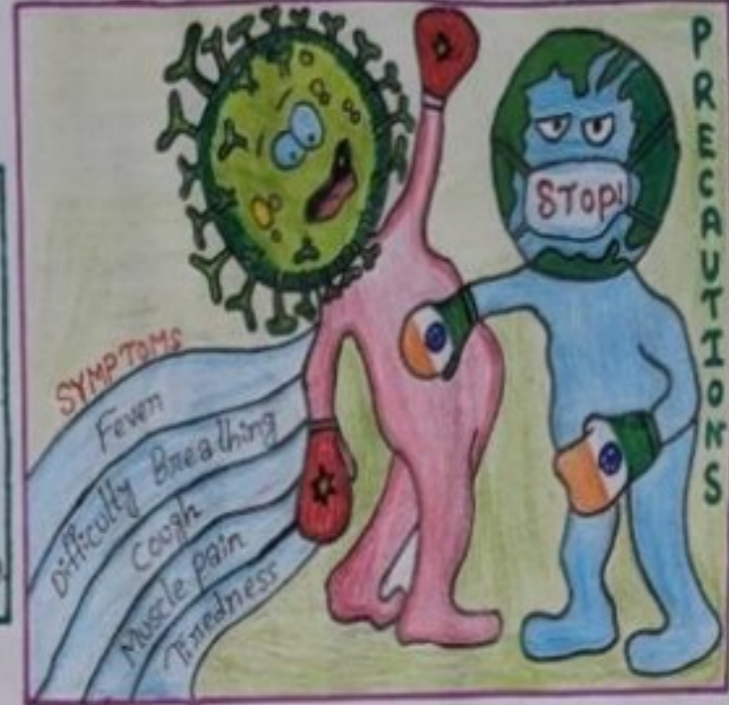
- Wash hands frequently
- Avoid contact with sick people.
- Don't touch eyes, nose, mouth.
- Cook food thoroughly.
- Avoid contact with animal.
- Stay at home.
- Maintain social distance of 2m.
- Wear mask when go out.
- Keep objects & Sanitiser clean.
- Cover your mouth when sneezing.



COVID-19 means corona virus disease 2019.

The name "corona virus" is derived from Latin *corona* meaning crown or wreath, itself a borrowing from Greek *κορώνη* *korōnē*.

The name coined by Juan Almeida & David Tjonnell who first studied human COVID-19.



Realm: Riboviria
Kingdom: Orthornavirae
Phylum: Pisuviricota
Class: Pisuviricetes
Order: Nidovirales
Family: Coronaviridae
Sub-family: Orthocoronavirinae



COVID NEW VARIANT - JN.1

The JN.1 variant is the latest mutation of the SARS-CoV-2 virus, the causative agent of COVID-19. It is a subvariant of Omicron (COVID) variant.

Doctors currently recognize seven types of corona virus that can infect humans. Among them four common type are:

- 229E (Alpha corona virus)
- NL63 (Alpha corona virus)
- OC43 (Beta corona virus)
- HKU1 (Beta corona virus)

BUILD PROTECTION WITH VACCINES

The vaccines will strengthen immune system by training it to recognise & fight against the virus that causes COVID-19.

As per WHO, the overall risk is low. Similar to other (COVID)-19 variants, JN.1 poses a risk to individuals of all ages. However, certain groups may be more susceptible to severe outcomes, including older adults, individuals with underlying health conditions, & those with weakened immune systems.



Individuals infected with the JN.1 variant may experience a range of symptoms, which can vary in severity. However, it's important to note that the symptoms of JN.1 may overlap with those of other COVID-19 variants.

Diagnostic tests, including PCR & rapid antigen tests can identify any COVID variant. However, to know if it is a JN.1 variant, genome sequencing is required.

As of now there is no plan for a fourth dose (booster dose) against COVID-19 infection.

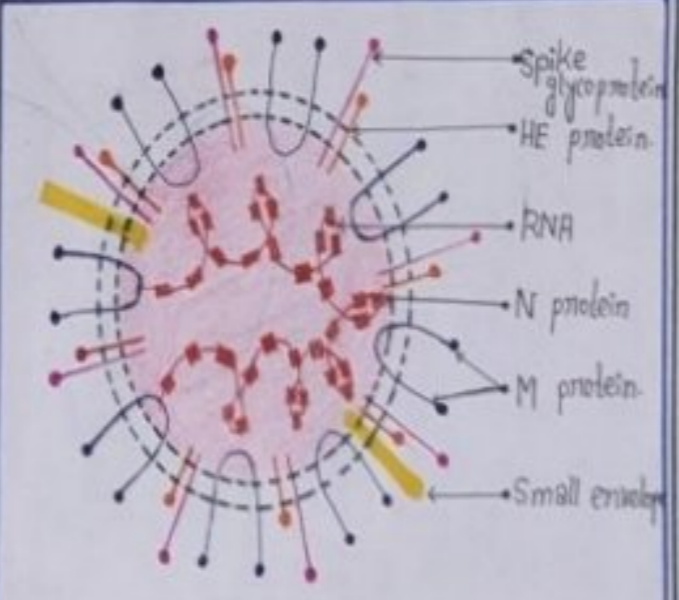


Fig: Structure of COVID-19 Virus.

The corona virus particles are organised with long RNA polymers tightly packed into the center of the particle surrounded by a protective capsid. The capsid are coat proteins.

The corona virus core particle is further surrounded by an outer membrane, envelope made of lipids with proteins. Protein in the outer membrane project out from the particle are known as spike protein.

FORENSIC BOTANY

Forensic Botany is the application of the plant science to crime scene analysis for use in legal cases.

In 1935, forensic botany was used for the first time to solve a crime.

ECOLOGY
It is useful for locating clandestine graves if certain localized site shows different succession stage then surrounding area it is an indication of potential burial site.

ANATOMY
Identifying a plant based toxin that was used to poison someone on the hairs of a leaf that are clinging to murder suspect's jacket.

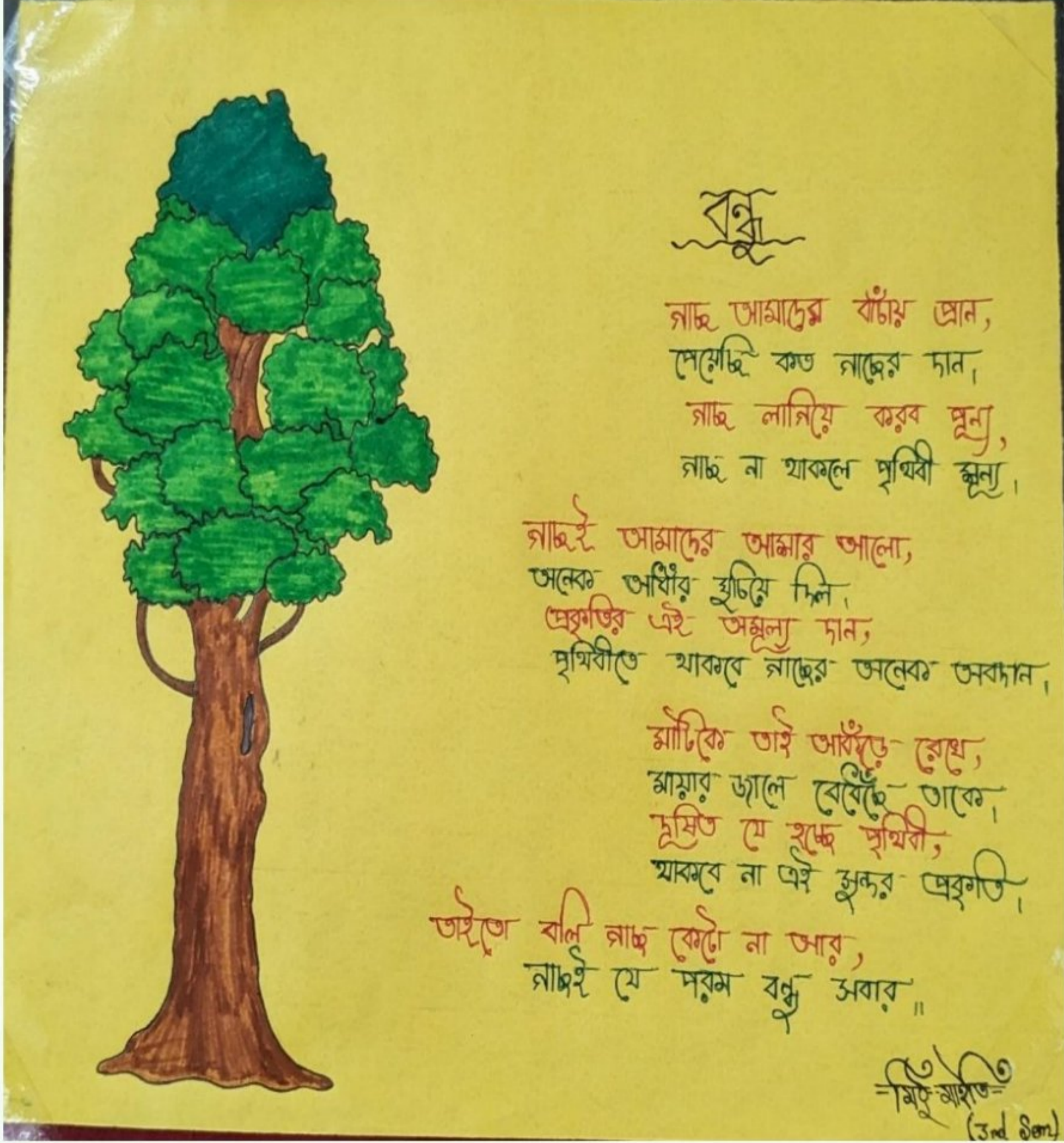
PALYNOLOGY
Study of pollen grains, spores and acid resistant microorganisms to provide and associative evidence it can help in finding location of death, time of death.

SYSTEMATICS
Systematics is the study of how plants interact with one another on the controlled substances.

MOLECULAR BIOLOGY
Botanical evidence may be too small to identify the morphological feature. DNA may be used to identify stem man.

LIMNOLOGY
Seasonal variation, indicator abundance and diversity is used to make flowchart profiles and correlated to make with specimens collected from body tissues. It helps in diagnosis of drawing and estimating post mortem interval.

Tamasha Maji
Botany (H) 1st Sem



বন্ধু

নাছ আগাচের কাঁচা প্রাণ,
সেজেছি কত নাছের দান,
নাছ লানিয়ে করব পুণ্য,
নাছ না থাকলে পৃথিবী স্থল্য।

নাছই আগাচের আশ্রয় আলো,
অনেক অধীর ছুটিয়ে দিল,
প্রকৃতির এই অমূল্য দান,
পৃথিবীতে থাকবে নাছের অনেক অবদান।

ঝাটিকে তাই আঁকড়ে রেখে,
স্বায়াব জালে বেঁধেছে তাকে,
দূষিত যে হচ্ছে পৃথিবী,
থাকবে না এই সুন্দর প্রকৃতি।

তাইতো বলি নাছ কেটো না আয়,
নাছই যে দরম বন্ধু অবার।

মিষ্টা অর্থাৎ
(3rd Sem)



JAPANESE PLANTATION TECHNIQUES

Japan has various popular plantation techniques. Some of them are 'Miyawaki', 'Daisugi', 'Bonsai' etc.

Miyawaki Method:-



Akira Miyawaki, a Japanese botanist created this type of afforestation technique. Here a abandoned land is used. Various kind of native plants are planted. It is a method where plants are planted in different layers. The plants are self-dependent.

- **Benefit** :- 1. Low maintenance cost.
2. More greenery in less space.

- **Uses** :- To reduce the carbon level, to create new biodiversity, to create fast growing native forest.

Daisugi Method :- Daisugi is a ancient Japanese plantation technique. This technique is performed on cryptomeria trees. Basal shoots of the tree are layed off so that the trunks remain straight. It is believed that the production of straight logs by daisugi method began in the munomachi period.

- **Uses** :- 1) To produce straight wooden logs.
2) To create daisugi bonsai plants.



Bonsai Method :- Bonsai is a Japanese art of growing and shaping miniature trees in containers. It focuses on a tree on a group of trees of same species. It is a miniature replica of fully grown tree. Bonsai can be created from nearly any perennial woody stemmed tree. It is a great example of genetic engineering.



- **Uses** :- 1) As a decorative plant.
2) To give a asthetic look to the interior.



Kabita Sen
Botany
Honours
1st Sem

Alien Fungus : The Blob



Scientific Name *Physarum polycephalum*

Inventor Von Schweinitz (1822)

Brief Description This is a bright yellow unicellular eukaryote with multiple nucleus. It is shaped in a network of inter-lacked tubes.

Uses It's a model organism for research into motility, cellular differentiation, chemotaxis, cellular compatibility and the cell cycle.

Transport System It shows back and forth motion, can change direction and can reach a top speed of 1mm/s.

Special features According to the scientists -

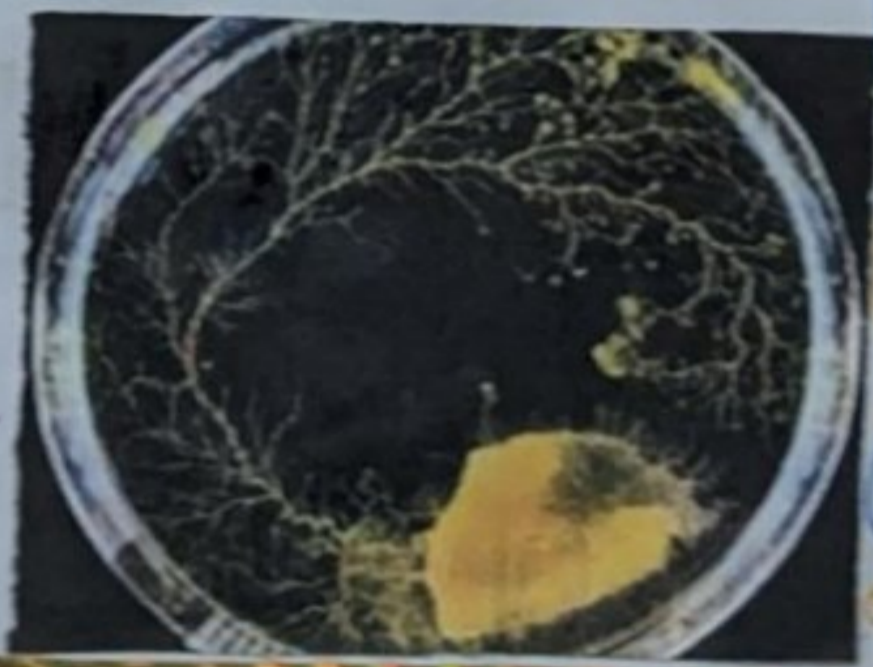
i) It can hijack it's own flow to transport signals.

- It can find the shortest path
- It has a kind of memory.
- It can make decision.
- They can learn and also can share learning with each other.
- It can prevent some crop diseases.
- Theoretically they are immortal.

Malay Mahata
Botany Honours
1st Semester

How we can use If we will able to understand it's mechanism, we can -

- Make biological nanorobot.
- Make a fast computing system.
- Make self driven car's/veichles.
- Creal maps more efficiently at low cost.



পাছের কথা

আমরা কারনে বা অকারণে
পাছ কেটে ফেলি কোনো দিনও অর্থাৎ
পাছেরাও করা করে, চিৎকার করে।
বহুদিন যাবৎ জল না পাওয়া তুচ্ছ
পাছও চিৎকার করে। আমরা সেই চিৎকার
বগলা জুনতে না পেলোও কিছু রক্ত, বায়ু ও ইলেক্ট্রন জুনতে পায়। সেই



Fig: আল্ট্রাসোনিক স্ক্রিমিং যন্ত্র

আওয়াজ জুনতে লেমেজেন বর্তমান
যুগের বিজ্ঞানীরা। তারা আল্ট্রাসোনিক
স্ক্রিমিং যন্ত্রের আত্মা এই
প্রথম পাছের চিৎকার ও করার
আওয়াজ রেকর্ড করেছেন।

ওপরে অর্থাৎ লাগে, পাছ
করা করে, কিন্তু এই করার আওয়াজ
কমা থেকে আসে? পাছের Vocal Cords
বা Lungs কোথাওই থাকে না। জানা গিয়েছে
পাছের কয়েক-এক মিনিট প্রচুর পরিমাণে

বুঝে তৈরি হয় ও সেই বুঝে ফেটে যেমন
আওয়াজ আসে। বিজ্ঞানীরা এমটা Machine
Learning মডেল বানিয়েছেন যার মূল কাজ হল
পাছ থেকে আসা স্ক্রিমিং বিন্দু বিন্দু করে
সেই গাছটি আনতে আছে নারিক দুঃখে
আছে।

এর আগে প্রধান হয়ে পাছেরাও
উদ্ভিদসমূহ আত্ম দেয়। বিজ্ঞানী আচম
ফরাসিগণের বহু আগে প্রধান করেন। আনন্
মার্কিন যুক্তরাষ্ট্রের Harvard এবং
ইসরাইলের Tel Aviv বিশ্ববিদ্যালয়ের
বিজ্ঞানীরা প্রধান করে পাছেরাও করা
করে, চিৎকার করে।

STRESSED PLANTS 'CRY' — AND SOME ANIMALS PROBABLY HEAR THEM

Microphones capture ultrasonic crackles from plants that are water-deprived or injured.

By Emma Martin

Plants that need water or have
injured their stems can produce up to
120 ultrasonic crackles per hour. The
crackles are produced by the plant's
stems and are most likely caused by
the plant's vascular system breaking
down. The crackles are most likely
produced by the plant's vascular system
breaking down. The crackles are most
likely produced by the plant's vascular
system breaking down. The crackles
are most likely produced by the plant's
vascular system breaking down.



Microphones or injured plants emit high-frequency sounds that humans cannot hear.

Name- Kaushik Pal.
Botany Honours, 5th Sem.
2024

WEEDS: THE UNWANTED PLANTS

**BIMAN DUTTA, STATE AIDED COLLEGE TEACHER
DEPARTMENT OF BOTANY, GARHBETA COLLEGE.**

*In the corner of a garden,
An unnamed seedling arises stealthily –
Without getting no custody
It just looks healthy.*

*Florist always cares the plantation.
The seedling remains inattention.
Yet it shows great effort to grow—
But one day it is uprooted and throw.*



*Falling in the crack of a stone
The seedling took rest,
And trying it's best—
To save itself alone.*

*Under the first shower,
It developed flowers.
Butterflies came to suck nectar
And pollinates—just better.*

*Then flowers transformed in fruits.
What a feeling of the weed!
To make the—
Propagatory organ like seeds.*



*The weeds don't live for a name or fame,
Still, they cool and clean the air.
And thus, for our ignorance
Many herbals became rare.*

মধুমেহ রোগ নিরাময়ে কার্যকর উদ্ভিদ সমূহ:

আকুইয়া
 বৈজ্ঞানিক নাম- *Cruciferae* *Pinguicula* গ্রন্থি
Asclepiadaceae পরিবারের উদ্ভিদ, আকুইয়া
 যাকে মধুমেহে পরিচালিত করা হয়, অনেক
 জন্মানোয় প্রচুর যদি ফলক ৫ ফলক ২১ টি
 পাওয়া যায়, সুস্থিত বৈজ্ঞানিক মতামত মতামত
 জন্মানোয় নিরামুকে অধিক পরিচালিত
 আকুইয়া পরিচালিত জন্মানোয় যায়

স্টেভিয়া
 বৈজ্ঞানিক নাম- *Asteraceae* *Stevia* গ্রন্থি
 পরিবারের উদ্ভিদ, *Stevia* গ্রন্থি
 যাকে মধুমেহে পরিচালিত করা হয়, অনেক
 জন্মানোয় প্রচুর যদি ফলক ৫ ফলক ২১ টি
 পাওয়া যায়, সুস্থিত বৈজ্ঞানিক মতামত মতামত
 জন্মানোয় নিরামুকে অধিক পরিচালিত
 আকুইয়া পরিচালিত জন্মানোয় যায়

স্টেভিয়া
 বৈজ্ঞানিক নাম- *Stevia rebaudiana* গ্রন্থি
Asclepiadaceae পরিবারের উদ্ভিদ, *Stevia* গ্রন্থি
 যাকে মধুমেহে পরিচালিত করা হয়, অনেক
 জন্মানোয় প্রচুর যদি ফলক ৫ ফলক ২১ টি
 পাওয়া যায়, সুস্থিত বৈজ্ঞানিক মতামত মতামত
 জন্মানোয় নিরামুকে অধিক পরিচালিত
 আকুইয়া পরিচালিত জন্মানোয় যায়


স্টেভিয়া
 বৈজ্ঞানিক নাম- *Costaceae* *Stevia* গ্রন্থি
 পরিবারের উদ্ভিদ, *Stevia* গ্রন্থি
 যাকে মধুমেহে পরিচালিত করা হয়, অনেক
 জন্মানোয় প্রচুর যদি ফলক ৫ ফলক ২১ টি
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 আকুইয়া পরিচালিত জন্মানোয় যায়

SUMAN DAS, BOTANY(H), YEAR 2021-2024.





LIQUID TREE



What is Liquid tree?
 ⇒ Liquid trees concept represent a biotechnological innovation that has been developed by scientists to tackle air pollution.



Structure:-
 ⇒ The liquid tree structure consists of a 600-liter water tank filled with microalgae, which bind with carbon dioxide in the environment through photosynthesis, converting it into oxygen.

FUNKCJE	FUNKCTIONS
1. ...	1. ...
2. ...	2. ...
3. ...	3. ...
4. ...	4. ...
5. ...	5. ...

Who discovered liquid tree?
 ⇒ Dr. Ivan Spasojevic [Ph.D. in Biophysical Science], and one of the authors on the project from institute for Multidisciplinary Research at the University of Belgrade. [Invented in late 2021]

Pralay Maitty
 3rd Sem;
 Botany Hons

TULSI
Family-Lamiaceae


Health Benefits:

1. রক্তে সুগাণ্ডের পরিমাণ কমায়।
2. জ্বরের প্রতিরোধ করে।
3. কোলেস্টেরল কম করে।
4. লিপিড মেটাবলিজম করে...
5. সর্দি-কাশি চলে যায়।

*Tulsi types:

1. Rama Tulsi (Green Leaf)
2. Krishna Tulsi (Purple leaf)
3. Vana Tulsi (Wild leaf)
4. Kapoor Tulsi (Heavy Flowered)

Subrata Ghosh
Dept: Botany
Sem - 5



The Bloom's Secret

Aditya, a fearless adventurer navigated the captivating Rainshadow forest in pursuit of the legendary Celestial orchid. Its petals shimmered with every color imaginable, promising unimaginable powers to those who could unlock its secret.



Guided by the Sylvan Guardians, Aditya faced challenges like the Thorned Serpent and elusive Misty Will-o'-Wisps. As they journeyed, the forest unfolded its magical tales - the whispering Blossoms with melodies in the night, and the Luminescent Ferns illuminating hidden corners.

Amidst these trials, Aditya's respect for the forest earned the trust of its mystical beings. Finally, after overcoming the guardians, Aditya stood before the Celestial orchid. Upon touching it, a surge of energy connected him to the forest. He realized the orchid's true power was not personal gain but fostering harmony between humanity and nature.



Becoming an ambassador, Aditya shared his knowledge worldwide, emphasizing the importance of preserving nature. The Sylvan Guardians celebrated the union of human and flora, making the Rainshadow forest a sanctuary for those seeking connection with botanical wonders.

Aditya's legend echoed through generations, inspiring adventurers to embrace nature's magic. "The Bloom's Secret" became a beacon of harmony, reminding all that respecting the delicate balance of the ecosystem was the key to unlocking the enchanting realm of botanical wonders.

A Botanical Story
by
Surjendu Poria
(5th Sem)



Laxman Phal- the miracle fruit

Sudeshna Sasmal, State Aided College Teacher
Department of Botany, Garhbeta College

It is a shrub or small tree (*Annona muricata*), 3-10 meters in height native to south america . It is adopted to warm humidity, tropical climate and can tolerate both drought condition and partial shade.

It is known to be god's gift to humanity. It is a evergreen tree with broad, oblong leaves. The fruit is more like a custard apple from the inside and pulp is smooth and creamy with large black seed. The taste of this fruit seems to be a combination of strawberry and pineapple with hints of citrus.

Nutritional value

Like many fruit laxman fruit is a healthy source of dietary fibre, vitamins and minerals. One cup of (about 225 grams) of raw soursop or laxman fruit contain

Calories :148 kcl, Protein: 2 .25 grams, Dietary Fibre :7.42 gram ,Beside fibre, it contains Vitamin C, Potacium(K), Magnesium (Mg), Copper (Cu), Zinc (Zn) etc. It contain antioxidants such as acetogenins quinolones and alkaloids which have been directly associated with cancer prevention and reducing tumor size.

Health benefit

- | | |
|---------------------------|-----------------------------|
| i) Cancer killer | iv) Prevent constipation |
| ii) Prevent UTI | v) Prevent Leg crus |
| iii) Prevent Osteoporosis | vi) Prevent water retention |
| iv) | |

Cancer killer (Nature's chemotherapy fruit)

The leaves of these plant are known to help in killing at least 12 types of cancer cells. It helps to prevent colon, breast, Prostate, lung and even pancreatic cancer. Unlike a chemotherapy session when a patient suffers nausea, hair loss and weight loss, eating Laxman Phal kills cancer cells in the body without any of these side effect. Unlike allopathy it slows down cancer growth in the body.



Muscodor albus and its biological promise

Sani Sen, State Aided College Teacher
Department of Botany, Garhbeta College

Muscodor albus is a species of endophytic fungi known for its biocontrol potential against various plant pathogens and its ability to produce volatile organic compounds (VOCs) with antimicrobial properties. Here are some potential applications and uses of *Muscodor albus*:

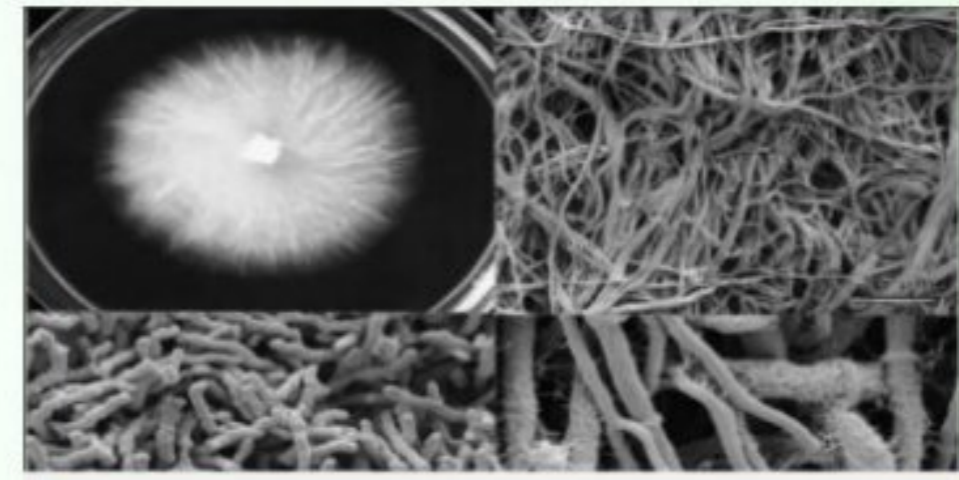


Fig : SEM and Plate view Of *Muscodor albus*
(Photo Taken from internet)

- **Biocontrol Agent:** *Muscodor albus* has shown promise as a biocontrol agent against a range of plant pathogens, including fungi, bacteria, and nematodes. It can inhibit the growth of various plant pathogens such as *Botrytis cinerea*, *Fusarium spp.*, *Rhizoctonia solani*, and others.
- **Post-harvest Disease Control:** VOCs produced by *Muscodor albus* have been investigated for their potential to control postharvest diseases in fruits, vegetables, and other perishable crops. They can be used to fumigate storage areas or applied directly to produce to extend shelf life and reduce losses due to fungal decay.
- **Soil Amendment:** *Muscodor albus* can be used as a soil amendment to suppress soil-borne pathogens and promote plant growth. When applied to soil or used as a seed treatment, it can colonize plant roots and protect against diseases such as damping-off and root rot.
- **Organic Agriculture:** *Muscodor albus* offers a natural and environmentally friendly alternative to synthetic fungicides and pesticides in organic agriculture. Its use can help reduce reliance on chemical inputs and minimize negative impacts on ecosystems and human health.
- **Bioremediation:** Some studies suggest that *Muscodor albus* may have potential applications in bioremediation by degrading organic pollutants or mitigating soil or water contamination caused by pathogens or toxins.
- **Medical and Pharmaceutical Applications:** Research into the antimicrobial properties of *Muscodor albus* VOCs has also explored potential medical and pharmaceutical applications. These volatile compounds may have uses in controlling human and animal pathogens or in developing new antimicrobial agents.
- **Industrial Uses:** VOCs produced by *Muscodor albus* could potentially be utilized in various industrial applications, such as in the production of antimicrobial coatings, packaging materials, or air purification systems.

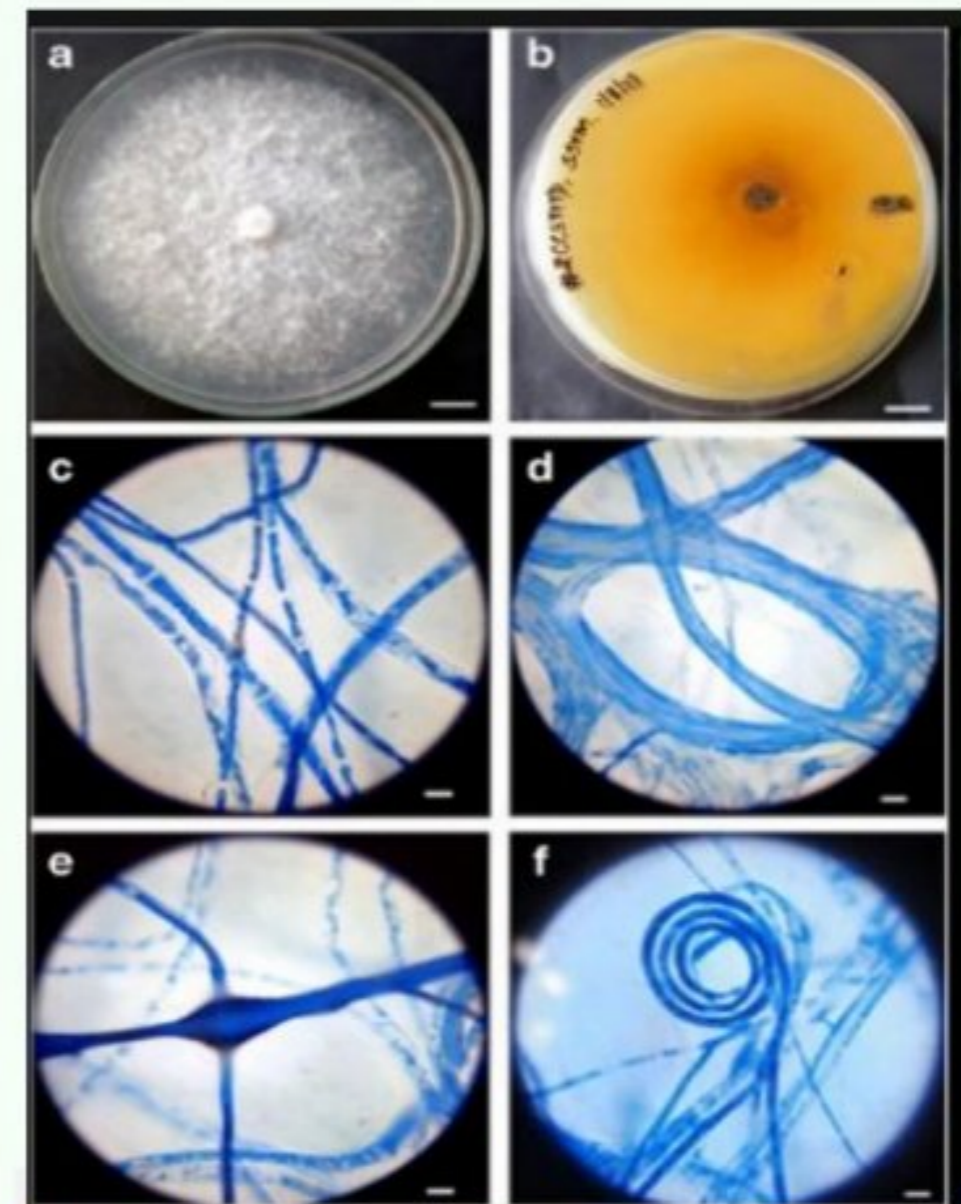
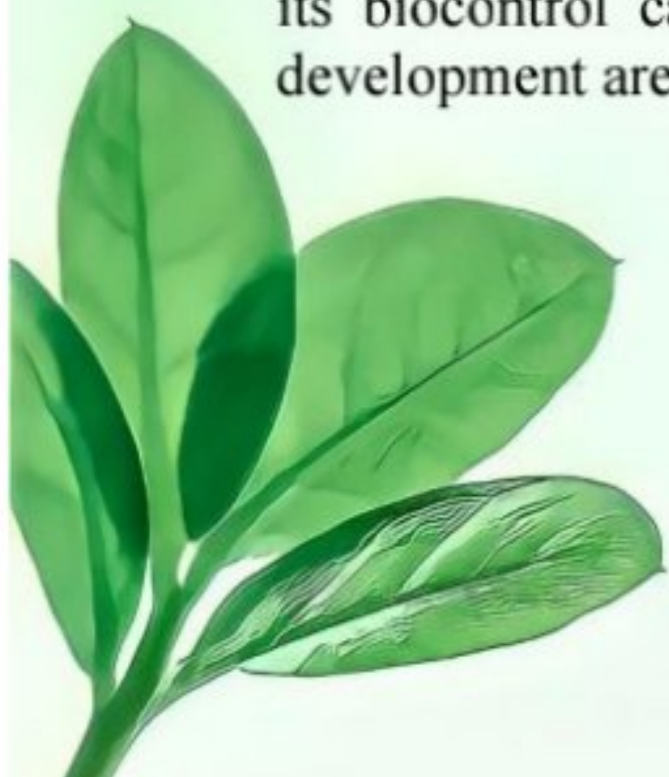


Fig : Microscopic and Plate view Of *Muscodor albus*
(Photo Taken from internet)

Overall, *Muscodor albus* shows great potential in agriculture, environmental management, and other fields due to its biocontrol capabilities and the antimicrobial properties of its volatile compounds. Further research and development are needed to fully explore and exploit its diverse range of applications.



Sacred grove

Kunwar Hansda, Assistant Professor
Department of Botany, Garhbeta College

The sacred grove is a significant location where various ethnic groups come together for their community worship. India has a long tradition of prudent use and wise conservation of forest resources that are useful to people. The sacred grove holds great cultural and spiritual significance for these communities, serving as a space to connect with their respective religious beliefs and practices.

In many cultures, the sacred grove represents a natural sanctuary, often filled with trees, plants, and other elements of nature. It is believed to be a sacred space imbued with divine energy and the presence of ancestral spirits. The grove is usually well-preserved and protected, ensuring its sanctity and importance to the community. The sacred grove is not only a place for worship but also a symbol of community identity and heritage. Its existence and preservation speak to the community's commitment to their traditions and beliefs. Through generations, these sacred groves have been cherished, protected, and passed on, ensuring the continuity of ethnic cultures and spiritual practices.

Sacred groves often exist in their natural state with minimal human interference. They serve as repositories of diverse plant and animal species, including rare and threatened species, which contribute to the overall biodiversity of the region. These groves act as ecological islands, preserving numerous endemic species and maintaining the balance of the local ecosystem.

Overall, the sacred grove holds great significance in promoting the sense of community, preserving cultural heritage, and providing a space for worship and celebration for various ethnic groups. It serves as a vital cornerstone in the cultural fabric of these communities, highlighting their shared values, beliefs, and deep connection to the natural world.



Phytomicrobiome

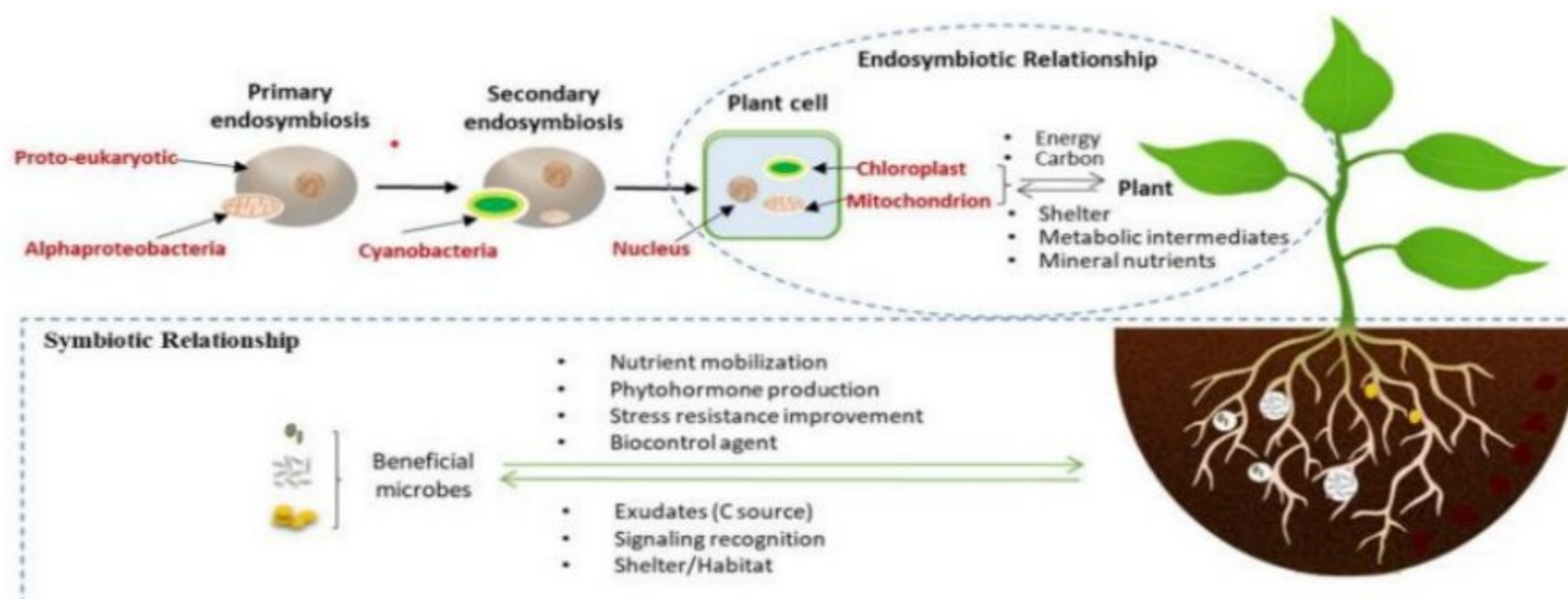
Dr. Santanu Maity

SACT-I

Department of Botany, Garhbeta College

The phytomicrobiome refers to the diverse community of microorganisms that inhabit in the various parts of plants, including roots, stems, leaves, and even in seeds. This diverse ecosystem consists of bacteria, fungi, archaea, viruses, and other microorganisms, which interact with each other and with the plant host in complex ways.

- ❖ **Evolution:** The evolution of the phytomicrobiome involves the co-evolutionary dynamics between plants and microorganisms across geological timescales. This process is shaped by factors such as host specificity, horizontal gene transfer, environmental selection pressures, and human activities. Over time, plants and microbes have developed mutualistic, commensal, and pathogenic relationships, influencing nutrient cycling, disease resistance, and ecosystem functioning.



- ❖ **Impact on plants:** The phytomicrobiome aid in nutrient acquisition and cycling, promote plant growth through hormone production, and mitigate stress by enhancing tolerance to environmental pressures. Additionally, they contribute to disease suppression through biocontrol mechanisms and facilitate pollination and seed germination. It also fosters soil health, enriching fertility through organic matter decomposition and carbon sequestration.

- ❖ **Role in human welfare:** The phytomicrobiome, with its diverse array of microorganisms inhabiting plants, holds significant promise in pharmaceuticals. Microbes associated with medicinal plants produce bioactive compounds with therapeutic potential, including antibiotics, antifungals, and anticancer agents. These natural products offer a rich source of novel drug leads and scaffolds for pharmaceutical development. Moreover, plant-microbe interactions influence the biosynthesis of secondary metabolites in medicinal plants, enhancing their pharmacological properties.

Understanding and manipulating the phytomicrobiome could lead to the discovery of new drugs, the optimization of plant-based medicines, and the development of sustainable approaches for drug production, contributing to advancements in healthcare and biotechnology.

Ornamental flowers in Garhbeta

Samir Koley, Skilled Laboratory Attendant
Department of Botany, Garhbeta College





Gladiolus



Butterfly flower



Cineria



Calendula



Impression



