MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI

GOVERNMENT POLYTECHNIC KARAD

THIRD YEAR DIPLOMA COMPUTER ENGINEERING (I-SCHEME)

PART [B]

MICRO-PROJECT REPORT

"STUDY OF ENDANGERED SPECIES OF PLANTS IN INDIA"

UNDER THE SUBJECT

ENVIRONMENTAL STUDIES (22447)

SUBMITTED BY

Sr.no	Roll No	Enrollment No	Name of Team Member
1.	2253	2100100055	Sumit Tanaji Pawar
2.	2259	2100100062	Pratiksha Arjun Pawar
3.	2262	2100100065	Kartik Ramchandra Pawar

UNDER THE GUIDANCE

Smt. K.K.GAIKAWAD

(DEPARTMENT OF COMPUTER ENGINEERING) 2023-24

MAHARASHTRA STATE BOARD OF TECHNICAL EDUCATION, MUMBAI.

Certificate of completion

Of Micro-project Assessment at the end of Semester

This is to certify that,

Sr.no	Roll No	Enrollment No	Name of Team Member
1.	2253	2100100055	Sumit Tanaji Pawar
2.	2259	2100100062	Pratiksha Arjun Pawar
3.	2262	2100100065	Kartik Ramchandra Pawar

Have successfully completed microproject on **"Study Of Endangered Species Of Plants In India"** Of the Fifth semester Diploma in Computer Engineering of subject Environmental Studies (22447) from Government Polytechnic Karad. Institute code (0010)

Prof. K .K. Gaikwad	**Prof. S. B. Patil**	**Dr. R. K. Patil**
(Project Guide)	(Head of the department.)	(Head of Institute)

Seal of the institute

ACKNOWLEDGEMENT

We take this opportunity to thank all those who have directly and indirectly inspired, directed and assisted us towards successful completion of this microproject report.

We express our sincere thanks to Dr. R. K. Patil Principal of Government Polytechnic Karad and the Head of Department Prof. Patil S.B, for having us allowed to submit this report as a part of our academic learning.

We express our sincere thanks to Prof. K .K. Gaikwad Lecturer in Computer Engineering, Government Polytechnic, Karad for encouragement throughout the project report and guideline in designing and working out this project. We are also grateful to team of project

Place: Government Polytechnic Karad
Date:

Yours Sincerely,

2253- Sumit Tanaji Pawar
2259- Pratiksha Arjun Pawar
2262- Kartik Ramchandra Pawar

➢ RATIONALE:

In this micro-project, we're going to put together a document all about "Study of Endangered Species of Plants". Endangered plants are any species of plants vulnerable to extinction shortly, either globally or in specific geographic locations. Studying plants that are endangered is really important because it helps us learn about how the plants get extinct and reason behind it. The loss of endangered plant species annually will threaten the supply of food, fuel, medicines, etc.

Increase in development and an influx of human population means that our impact on the environment has gone up catastrophically. With increasing threats in the form of loss of habitats, degradation, overexploitation of resources and climate change, there are sufficient warning signs out there for the human race. However, even with enlightening information, there is a growing number of endangered species plants in India and world wide. We learn from studying these project helps us figure out ways to protect the different kinds of plants we have today.

➢ AIM AND BENEFITS:

- **Aim**

  To identify the list of plants that are highlighted to be endangered and analyze the relationship between the plants and the ecosystem of an environment.

  To understand the plants history, evolution, and environmental impact of endangered plants in the ecology of the country. and underscore the need for biodiversity preservation.

- **<u>Benefits:</u>**

  1) Biodiversity: Endangered plants contribute to the diversity of plant life, which supports a healthy ecosystem and helps other species thrive.

  2) Ecosystem Services: Some endangered plants provide crucial services like pollination, soil stability, and water purification, benefiting both nature and humans.

  3) Genetic Diversity: Preserving endangered plants helps maintain genetic diversity, which is essential for adapting to environmental changes and potential threats.

  4) Education and Research: Studying these plants helps us understand ecosystems better and aids in conservation efforts, benefiting future generations.

➢ COURSE OUTCOMES:

CO A - Develop public awareness about environment.
CO C - Conserve Ecosystem And Biodiversity.
CO E - Manage social issues and Environmental Ethics as lifelong learning.

➢ LITERATURE REVIEW:

1) We referred book, Red Data Book , by S.K. Jain and A.R. Sastry
2) We referred following link:
   i) https://www.floweraura.com/blog/endangered-species-of-plants-in-india
   ii) https://indiagardening.com/endangered-plants-in-india/

➢ ACTUAL PROPOSED METHODOLOGY:

• We will communicate with each group member
• From above discussion we will decide the topic of our microproject.
• We will plan the general structure of the whole project.
• Collect information regarding to Endangered species plants.
• After collecting all the information, we Analysis it.
• We will prepare a report on basis of this information.
• After that we will make the Final Project report on our project and we will submit it to our respected subject teacher.

➢ ACTUAL RESOURCES REQUIRED:

Sr.no	Name of Resources	Specification	Quantity
1.	Computer system	Laptop i5 Processor 11th Generation	1
2.	Ms Word	Microsoft Word 2021 MSO 64 bit	-
3.	Internet	4G, Wi-Fi	-

STUDY OF ENDANGERED SPECIES OF PLANTS IN INDIA

- ## What are Endangered Plants?

Endangered plants refer to plant species that are at risk of extinction due to various factors such as habitat destruction, climate change, pollution, and human activities. Some endangered plants are helpful as a source of traditional medicine, while others have important ecological roles.

- ## Reasons of plants becomes endangered :

1) **Habitat Loss:** The most significant threat to plant species is the destruction and alteration of their natural habitats. Human activities such as deforestation, urbanization, agriculture, and infrastructure development can lead to the loss of critical habitats where these plants thrive.

2) **Climate Change:** Changes in temperature and precipitation patterns, as well as extreme weather events associated with climate change, can disrupt the ecosystems where plants grow. This can make it difficult for some species to adapt or survive.

3) **Overexploitation:** The unsustainable harvesting of plants for various purposes, including medicine, ornamental trade, and food, can lead to their depletion. Overharvesting often occurs due to high demand and inadequate regulations.

4) **Invasive Species:** The introduction of non-native, invasive species can outcompete and displace native plants. Invasive plants can alter the habitat and reduce the availability of resources for native species.

5) **Pollution:** Air and water pollution can harm plants by damaging their leaves, stems, and roots, as well as contaminating the soil and water they rely on. Some plants are more sensitive to pollution than others.

6) **Disease and Pests:** The spread of diseases and pests, often facilitated by global trade and transportation, can threaten plant populations. Some plant species have no natural defenses against these new threats.

7) **Fragmentation:** Habitat fragmentation occurs when natural landscapes are divided into smaller, isolated patches. This can limit gene flow and make it difficult for plant populations to recover or adapt to changing conditions.

8) **Land Use Changes:** Changes in land use, such as conversion of natural areas into agricultural fields or urban areas, can have a detrimental impact on plant populations by reducing the available space for these species.

9) **Lack of Legal Protection:** Many plant species are not afforded the same legal protections as animals. Inadequate regulations and enforcement can contribute to the decline of plant populations.

10) **Lack of Awareness:** Sometimes, plant species become endangered simply because they are not well-known or valued by the public and policymakers. This lack of awareness can lead to insufficient conservation efforts.

- ## Role of Endangered Plants in Evolution:

Each plant species plays a definitive role in their habitat, which forms a part of the food chain and balances the functioning of the ecosystem. Any loss of endangered species will disrupt our ecosystem and also deprive us of essential requirements like medicines, food and biofuel.

- **Information of endangered plants:**

Musli

The term "Musli" generally refers to a group of medicinal plants known for their aphrodisiac and therapeutic properties. One of the most well-known species within this group is Safed Musli (Chlorophytum borivilianum), which is native to India. Here's some information about it:

1. Botanical Information:

- Safed Musli is a perennial herb with lanceolate leaves and white flowers.
- It belongs to the family Liliaceae.

2. Appearance:

-Musli is a small, herbaceous plant that typically grows to a height of about 1 to 1.5 feet (30 to 45 centimeters).

-It has long, narrow leaves that arise from a central rosette, and the plant produces small white flowers.

3. Characteristics:

- Musli is a small plant, usually around 1 to 1.5 feet tall, with long, narrow leaves and small white flowers.
- The most important part of the Musli plant is its underground tuberous roots, which are used for medicinal purposes.

4. Habitat:

- Safed Musli is primarily found in the Indian subcontinent, especially in regions with well-drained sandy loam soils.

5. Traditional Uses:

- It has been used in traditional Ayurvedic medicine for centuries as an aphrodisiac, adaptogen, and general health tonic.
- Safed Musli is believed to have benefits for sexual health, stamina, and overall vitality.

6. Endangered Status:

- Safed Musli has faced threats due to overharvesting for its medicinal properties and habitat loss.
- As a result, it has been categorized as an endangered species in India.

7. Conservation Efforts:

- To protect Safed Musli, conservation efforts have been initiated, including cultivation programs and legal regulations to control harvesting.

8. Cultivation:

- To reduce pressure on wild populations, cultivation of Safed Musli has been promoted, and it is now grown in various parts of India.

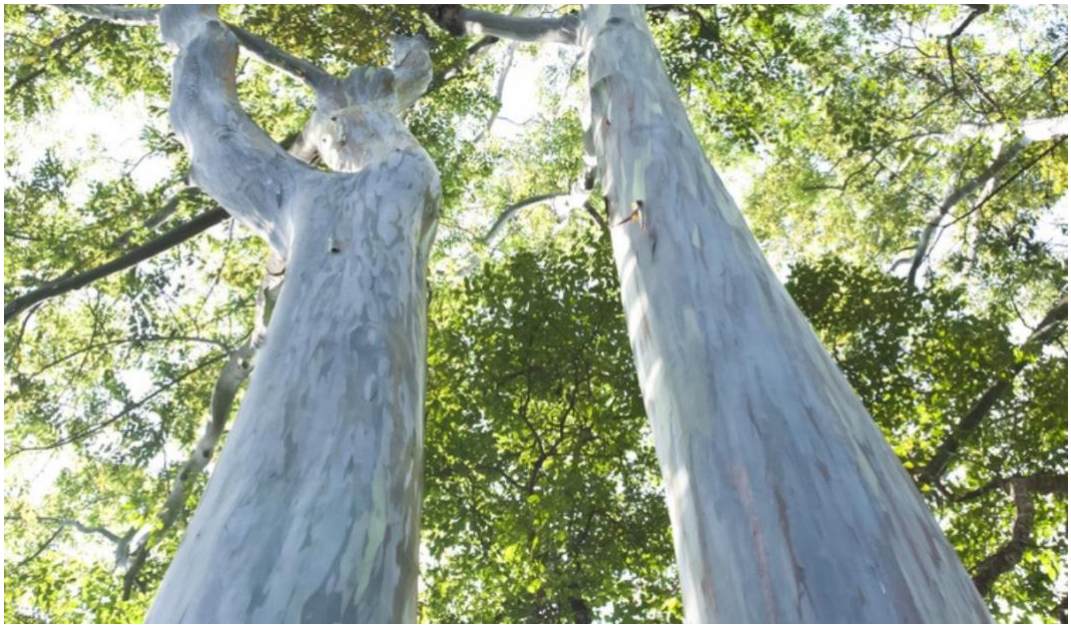
9. Commercial Importance:

- Safed Musli is of economic significance due to its demand in herbal medicine and dietary supplements.

10. Medicinal Properties:

- Musli is highly valued in traditional medicine for its potential aphrodisiac, adaptogenic, and immune-boosting properties
- It is believed to have a positive impact on sexual health, fertility, and overall vitality. Musli is used to prepare various herbal formulations and supplements.

Nilgiri Sandalwood



Nilgiri Sandalwood (Santalum album) is a variety of sandalwood that is native to the Nilgiri Hills in South India. Here is some information about Nilgiri Sandalwood:

1. Botanical Information:

- Scientific Name: Santalum album
- Family: Santalaceae

2. Appearance:

- The Nilgiri sandalwood tree is a medium-sized evergreen tree that can reach heights of up to 10 meters (33 feet).
- It has dark green leaves, small white or purple flowers, and produces a fragrant heartwood.

3. Characteristics:

- Nilgiri Sandalwood is a small to medium-sized evergreen tree with fragrant heartwood.
- It is famous for its aromatic heartwood, which is used in the production of essential oils and perfumes.

4. Habitat:

- Nilgiri Sandalwood is typically found in the Western Ghats region of India, including the Nilgiri Hills, Karnataka, Kerala, and Tamil Nadu.
- It thrives in well-drained soil in tropical and subtropical climates.

5. Traditional Uses:

- In traditional medicine, sandalwood has been used for its cooling and soothing properties, and it is considered sacred in some cultures.

6. Endangered Status:

- Nilgiri Sandalwood is considered an endangered species due to over-exploitation for its highly valuable heartwood.
- The illegal harvesting of sandalwood for the international market has contributed to its decline.

7. Conservation Efforts:

- Conservation efforts have been initiated to protect Nilgiri Sandalwood, including strict legal regulations on harvesting and trade.
- Cultivation programs have been established to reduce the pressure on wild populations.

8. Cultivation:

- Sandalwood cultivation is encouraged in India as a means to meet the demand for sandalwood and reduce pressure on wild populations.

9. Commercial Importance:

- The heartwood of Nilgiri Sandalwood is highly sought after for its aromatic properties and is used in the production of perfumes, incense, and traditional medicines.

10.Medicinal Uses:

- Sandalwood has a long history of use in traditional Ayurvedic medicine for its cooling, soothing, and anti-inflammatory properties.
- It is used to treat skin conditions, as well as for its calming effects on the mind.

Malabar lily

The Malabar Lily, scientifically known as Gloriosa superba, is a striking and colorful flowering plant native to various parts of Asia and Africa. Here is some comprehensive information about the Malabar Lily:

1. Botanical Information:

- Scientific Name: Gloriosa superba
- Common Names: Malabar Lily, Flame Lily, Glory Lily

2. Appearance:

- The Malabar Lily is known for its showy, flame-like flowers. These flowers are usually a brilliant red or orange with yellow margins.
- It is a climbing plant with tendril-like structures that allow it to cling to other plants or structures for support.

3. Characteristics:

- Malabar lilies are known for their distinctive, flame-shaped flowers with reflexed tepals. These flowers are typically red, orange, or yellow and are highly attractive.
- Malabar lilies are climbing plants with a vine-like growth habit. They use tendrils to attach themselves to support structures, making them suitable for vertical gardening or trellises.

4. Habitat:

- The Malabar Lily is native to a wide range of regions, including parts of Asia (such as India, Sri Lanka) and Africa (including South Africa).
- It is often found in open grasslands, woodlands, and disturbed areas.

5. Traditional Uses:

- Malabar lily has been used in cultural and religious contexts in some regions.
- It holds symbolic value and has been incorporated into rituals, ceremonies, and festivals as a symbol of beauty and purity.

6. Endangered Status:

- Gloriosa superba is considered an endangered plant species in many regions due to habitat loss, overharvesting for its ornamental value, and unsustainable collection for its medicinal properties.
- It is important to note that the plant is also toxic and should be handled with care.

7. Conservation Efforts:

- Conservation efforts are essential for the protection of the Malabar Lily, including the enforcement of regulations against illegal harvesting and trade.
- Initiatives may include promoting cultivation and sustainable harvesting practices.

8. Cultivation:

- The Malabar Lily is cultivated for its beautiful and unusual flowers in gardens and as a potted plant.
- Gardeners and horticultural enthusiasts appreciate its vibrant and unique blooms.

9. Commercial Importance:

- Malabar lilies are cultivated as ornamental plants in some regions for their striking and unique flowers.
- They are often grown in gardens and can be sold in the horticultural market as decorative plants, which may contribute to local nursery businesses.

10. Medicinal Uses:

- Some parts of the Malabar Lily, especially its tubers, contain alkaloids that have been traditionally used for medicinal purposes in some cultures.
- However, due to its toxicity, its medicinal use must be approached with caution and under the guidance of experts.

Assam catkin yew

The Assam Catkin Yew, scientifically known as Taxus wallichiana var. mairei, is a yew tree variety native to the Eastern Himalayan region, including Assam in India. Here is some comprehensive information about the Assam Catkin Yew:

1. Botanical Information:

- Scientific Name: Taxus wallichiana var. mairei
- Family: Taxaceae

2. Appearance:

- The Assam Catkin Yew is an evergreen tree that can reach heights of up to 30 meters.
- Its leaves are needle-like, and the tree produces small, reddish-brown cones.

3. Characteristics:

-The Assam Catkin Yew is known for its unique female cones, which have a reddish or purplish color and a catkin-like appearance.

-These cones are a distinguishing feature of the tree.

4. Habitat:

- This yew variety is native to the Eastern Himalayas, including Assam in India, Bhutan, and adjacent regions.
- It typically grows in cool temperate and subalpine forests.

5. Traditional Uses:

- In some traditional medicine systems, various parts of the yew tree have been used for their medicinal properties, although the use of taxol in modern medicine is its most significant application.

6. Endangered Status:

- The Assam Catkin Yew is considered an endangered plant species due to overexploitation for its valuable heartwood.
- The heartwood contains taxol, a compound used in cancer treatment, which has contributed to illegal harvesting and trade.

7. Conservation Efforts:

- Conservation efforts have been initiated to protect the Assam Catkin Yew, including the enforcement of strict regulations on harvesting and trade.
- Initiatives may also include promoting sustainable management and cultivation.

8. Cultivation:

- Cultivation of Taxus wallichiana var. mairei is encouraged to meet the demand for taxol and reduce pressure on wild populations.
- However, cultivating yew trees for taxol production is a long-term endeavor.

9. Commercial Importance:

- The heartwood of this yew species is highly valuable for its taxol content, which is used in the pharmaceutical industry for cancer treatment.
- The demand for taxol has led to illegal logging and overharvesting.

10. Medicinal Uses:

- Extracts from different parts of the tree, such as the bark and needles, have been used traditionally to treat a range of ailments, including fevers, coughs, and digestive disorders.
- Like other yew species, the Assam Catkin Yew contains compounds with potential anticancer properties. Although it is not as commonly used for this purpose as some other yew species, research has explored its potential in cancer treatment.

Indian Pitcher Plant

The Indian Pitcher Plant, scientifically known as Nepenthes khasiana, is a fascinating and endangered carnivorous plant native to northeastern India. Here is some comprehensive information about the Indian Pitcher Plant:

1. Botanical Information:

- Scientific Name: Nepenthes khasiana
- Family: Nepenthaceae

2. Appearance:

- The Indian Pitcher Plant is a climbing or trailing vine with distinctive modified leaves that form pitcher-like structures.
- These pitchers are often green or reddish-brown, with a lid-like structure that covers the opening.

3. Characteristics:

- It attracts insects using its smell.
- Once the insect sits on the pitcher of the plant, it closes its lid, trapping the insect.
- Its leaves are modified to form the pitcher.

4. Habitat:

- Nepenthes khasiana is found in the Khasi Hills and Jaintia Hills of northeastern India.
- It typically grows in high-altitude regions, particularly in cool, moist, and shaded environments.

5. Traditional Uses:

- The leaf and root are used as medicine. Pitcher plant is taken by mouth for digestive disorders, diabetes, and other conditions, but there is no good scientific evidence to support these uses.

6. Endangered Status:

- Nepenthes khasiana is considered an endangered plant species due to habitat destruction and collection for horticultural purposes.
- The unique appearance and carnivorous nature of the plant make it desirable for collectors.

7. Conservation Efforts:

- Conservation efforts are essential to protect the Indian Pitcher Plant. This may include the establishment of protected areas and regulations on collecting.
- Promoting awareness and education about the importance of preserving this unique species is also crucial.

8. Cultivation:

- To successfully cultivate Indian Pitcher Plants, it's essential to replicate their natural habitat conditions. This includes providing a humid and warm environment, well-draining acidic soil (such as a mix of sphagnum moss and perlite), and ensuring they receive bright, indirect sunlight or partial shade.

9. Commercial importance:

- In some cases, Nepenthes khasiana is grown by horticulturists and plant enthusiasts as a novelty plant due to its intriguing appearance.

10. Medicinal Uses:

- In certain traditional systems of medicine, the digestive fluids found in the pitcher of Nepenthes plants have been used as a digestive aid. They are believed to help with digestive problems, although the scientific evidence for this use is limited.

The Western Ghats Tree Fern

The Western Ghats Tree Fern, scientifically known as Cyathea wightii, is an endangered fern species native to the Western Ghats region of India. Here is comprehensive information about the Western Ghats Tree Fern:

1. Botanical Information:

- Scientific Name: Cyathea wightii
- Family: Cyatheaceae

2. Appearance:

- The Western Ghats Tree Fern is a large and robust fern with a trunk-like stem that can reach heights of up to 20 meters.
- Its fronds are feathery and can measure up to 3 meters in length, making it one of the largest fern species in the world.

3. Characteristics:

- The Western Ghats Tree Fern has large, feathery fronds that can grow several meter in length.
- This fern is typically found in the moist and humid environments of the Western Ghats, often in shaded areas near streams, rivers, or waterfalls.

4. Habitat:

- This tree fern is native to the Western Ghats, a mountain range along the western coast of India.
- It is typically found in the cool, moist, and shaded environments of the Ghats' evergreen forests.

5. Traditional Uses:

- The fronds of the Western Ghats Tree Fern are sometimes used by indigenous communities for basket weaving.
- The strong and flexible fronds are suitable for crafting baskets and other woven items.

6. Endangered Status:

- Extensive deforestation and land development in the Western Ghats region have led to the destruction of the fern's natural habitat. As a result, suitable environments for the fern to thrive are diminishing, making it more vulnerable.
- In some cases, the fern may be overharvested for traditional uses or horticultural purposes, further reducing its populations and putting it at risk of becoming endangered.

7. Conservation Efforts:

- Conservation efforts are vital to protect the Western Ghats Tree Fern. Initiatives may include the establishment of protected areas and the enforcement of conservation regulations.
- Reforestation and habitat restoration projects can also aid in its preservation.

8. Cultivation:

- In some cases, the Western Ghats Tree Fern is grown by horticulturists and botanical gardens for its ornamental value.

9. Commercial importance:

- The fern's unique appearance, with its large, feathery fronds, makes it a potential choice for ornamental gardening and landscaping in moist and shaded areas.
- The fern's fronds can be used in some local crafts and basket weaving, contributing to small-scale, localized commercial activities.

10. Medicinal Uses:

- Extracts or pastes made from the fronds of the fern have been applied topically to wounds or skin ailments in traditional medicine.
- In certain indigenous communities, the fern has been used as a remedy for digestive issues, although scientific evidence supporting this use is limited, and caution is advised.

Khasi Pine

The Khasi Pine, scientifically known as Pinus kesiya, is a species of pine tree native to Southeast Asia, including parts of India. Here is some comprehensive information about the Khasi Pine:

1. Botanical Information:

- Scientific Name: Pinus kesiya
- Family: Pinaceae

2. Appearance:

- The Khasi Pine is a coniferous tree that can grow to a height of up to 45 meters.
- Its needle-like leaves are grouped in bundles, with each bundle typically containing three leaves.

3. Characteristics:

- Khasi pine is a tall, straight trunked tree that bears conical fruit 23 months after flowering.

-Its bright green needles are long, erect but soft and are found in arrangements in fascicles of 2-4. The tree has deeply fissured pink to reddish-grey bark.

4. Habitat:

- Khasi Pine is native to several countries in Southeast Asia, including India, Nepal, Bhutan, Myanmar, Thailand, and Vietnam.
- It is often found in mountainous regions, especially in the Eastern Himalayas.

5. Traditional Uses:

- Khasi Pine wood is used in traditional construction for making houses, furniture, and various wooden implements due to its durability and strength.
- Resin obtained from Khasi Pine trees has been traditionally collected and used for various purposes, including as a sealing material, adhesive, and in traditional medicine.

6. Endangered Status:

- The Khasi Pine is not typically considered an endangered species. However, its status may vary in different regions and ecosystems.

7. Conservation Efforts:

- While Khasi Pine may not be endangered, sustainable forestry practices are essential to ensure the long-term health of its populations.
- Conservation efforts are focused on protecting natural forests and promoting sustainable forest management.

8. Cultivation:

- Khasi Pine is cultivated in some areas for its timber and pulpwood.
- Plantations have been established to meet the demand for wood products.

9. Commercial Importance:

- Khasi Pine is valued for its wood, which is used in construction, furniture making, and paper production.
- It is an important timber species in some of the regions where it is found.

10. Medicinal Uses:

- The resin obtained from Khasi Pine trees has been used in traditional medicine as an antiseptic and wound-healing agent when applied topically to cuts and wounds.
- Various parts of the tree, such as the needles and bark, have been used in traditional remedies for respiratory ailments and digestive disorders, although scientific validation for these uses is limited.

The Indian Ghost Tree

The Indian Ghost Tree, scientifically known as Stereospermum chelonoides, is a deciduous tree native to the Indian subcontinent. It is also commonly known as "Padri Tree" or "Peepal of the Deccan." Here is some comprehensive information about the Indian Ghost Tree:

1. Botanical Information:

- Scientific Name: Stereospermum chelonoides
- Family: Bignoniaceae

2. Appearance:

- The Indian Ghost Tree is a medium-sized to large tree, often reaching heights of 15 to 25 meters.
- Its leaves are compound, with several leaflets arranged in pairs along a central stalk.
- The tree produces fragrant, bell-shaped, yellow or pale pink flowers.

3. Characteristics:

- The bark is smooth, fibrous and thick, greenish-grey, with the surface layer peeling off in large flakes.
- The twigs are hairy at first. The leaves are alternate, simple, hairy beneath and have three to five palmate lobes. They are clustered at the tips of the twigs.

4. Habitat:

- Stereospermum chelonoides is native to the Indian subcontinent, including India, Sri Lanka, and parts of Southeast Asia.
- It is typically found in deciduous forests and scrublands.

5. Traditional Uses:

- Various parts of the tree, such as the bark, seeds, and gum, have been used in traditional medicine by indigenous communities.
- The tree produces a gum known as "karaya gum" or "Indian tragacanth," which has been used in traditional and industrial applications, including as a thickening agent in food, pharmaceuticals, and textiles.

6. Endangered Status:

- The Indian Ghost Tree is not typically considered an endangered plant species. It is relatively common in its native range.

7. Conservation Efforts:

- While the Indian Ghost Tree is not endangered, sustainable management and conservation of its habitat are important for its continued health and the well-being of associated ecosystems.
- Conservation efforts often focus on preserving the natural habitats where the Indian Ghost Tree grows.

8. Cultivation:

- Indian Ghost Trees thrive in tropical and subtropical regions with well-draining sandy or loamy soils.
- They require a warm climate and are sensitive to frost. Ensuring the right environmental conditions, including adequate rainfall, is crucial for successful cultivation.

9. Commercial Importance:

- Indian Ghost Trees produce a gum known as "karaya gum" or "Indian tragacanth." This gum is used in various industrial applications, including as a thickening agent in the food industry, in pharmaceuticals, and in textiles.
- While not a primary timber species, the wood of Indian Ghost Trees can be used for fuelwood and small-scale local construction and carpentry, contributing to local economies in some regions where the tree is found.

10. Medicinal Uses:

- Various parts of the Indian Ghost Tree, such as its bark and leaves, have been used in traditional medicine in different cultures.
- It is believed to have properties that can be used for ailments like coughs, skin conditions, and fevers.

Sweet Flag

Sweet Flag, scientifically known as Acorus calamus, is a perennial herbaceous plant native to various parts of Europe, Asia, and North America. Here is comprehensive information about Sweet Flag:

1. Botanical Information:

- Scientific Name: Acorus calamus
- Family: Acoraceae

2. Appearance:

- Sweet Flag is characterized by its long, narrow, sword-like leaves.
- It produces a central flowering stem with a spadix covered by a greenish-yellow hood-like structure (spathe).

3. Characteristics:

- Sweet Flag has aromatic, underground rhizomes that are used for their pleasant fragrance and medicinal properties.
- The plant has long, lance-shaped leaves that resemble reeds and typically grows in wetlands or near water bodies.

4. Habitat:

- Acorus calamus is typically found in wetlands, marshes, and along the edges of ponds and streams.
- It prefers muddy or sandy soil with constant moisture.

5. Traditional Uses:

- Sweet Flag has a long history of traditional and medicinal uses. Its rhizomes (underground stems) have been used in herbal medicine.
- It is known for its aromatic and bitter properties and has been used in traditional remedies for digestive issues and other ailments.

6. Endangered Status:

- The conservation status of Sweet Flag can vary depending on its specific location and regional factors.
- In some areas, it may face threats due to habitat destruction and water pollution.

7. Conservation Efforts:

- Conservation efforts for Sweet Flag primarily involve protecting its wetland habitats, which are also important for various wildlife species.
- Preservation of wetlands helps ensure the survival of not only Sweet Flag but also the entire ecosystem it inhabits.

8. Cultivation:

- Sweet Flag is also grown as a garden plant for its attractive foliage and pleasant fragrance.

9. Commercial Importance:

- The rhizomes of Sweet Flag contain essential oils with a pleasant, sweet, and spicy fragrance.
- These essential oils are used in the fragrance industry to create perfumes, scented candles, and potpourri.
- Sweet Flag has a long history of use in traditional medicine systems, such as Ayurveda and traditional Chinese medicine (TCM).

10. Medicinal Uses:

- Sweet Flag has been traditionally used to promote digestion and alleviate gastrointestinal discomfort. It is believed to stimulate the appetite, relieve indigestion, and reduce flatulence.
- In some traditional herbal medicine practices, Sweet Flag has been used to enhance mental alertness, improve memory, and reduce symptoms of anxiety and stress.

➢ SKILL DEVELOPED:

1) Research Skills
2) Critical Thinking
3) Environmental Awareness
5) Interdisciplinary Learning
6) Empathy and Ethics
7) Collaboration
8) Creativity

➢ CONCLUSION OF MICROPROJECT:

Plants are becoming endangered at an alarming rate, mostly due to human activities like destruction and fragmentation of their habitat, excessive commercial exploitation, the introduction of invasive species that disturb their typical ecosystem and pollution.

the conservation of endangered plants in India is of paramount importance. These plants play a vital role in maintaining ecological balance and biodiversity. Efforts must continue to protect and restore their habitats, raise awareness, and implement sustainable practices to ensure their survival for future generations. It is a collective responsibility to safeguard India's rich botanical heritage and preserve the unique ecosystems these plants inhabit