

# **HARITHAMITRA** **magazine**

## **HARITHA KRISHNA ECO-CLUB**

**DECEMBER 2022**

**BIODIVERSITY**

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**WETLANDS**

**GLOBAL WARMING**

---

**COASTAL POLLUTION**

**ENDEMISM**

**DR. V. S. KRISHNA GOVERNMENT DEGREE  
COLLEGE (A)  
MADDILAPALEM, VISAKHAPATNAM 530013**



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## PRINCIPAL'S MESSAGE



It is with great pleasure that I welcome the initiative of members of Haritha Krishna Eco-Club to release a magazine for the academic year 2022-23. It is a reflection of your hard work, commitment and passion. I hope that this magazine will address the environmental issues the planet faces today and also reflect the recent scientific and technological advancements. This would definitely allow researchers to keep up to date with the developments of their field and course of their research. I look forward to more participation of students and innovation of the faculty for your next article. Warmest congratulations on the grand launch. Wishing you all the best!

**Dr. I. Vijaya Babu**

**Principal**

**Dr. V. S. Krishna GDC (A),**

**Visakhapatnam**



## VICE PRINCIPAL'S MESSAGE



Congratulations on successfully releasing a magazine on burning scientific issues. It is an incredible accomplishment that requires a lot of effort and patience. This is just a beginning and I wish your magazine would bring joy and inspiration to all the student fraternity. I'm confident that your magazine would provide valuable resource, offering insights, inspiration, and knowledge to its readers and have a significant impact. Congratulations once again, and I eagerly anticipate the continued success of your magazine!

**Dr. P. Jaya**

**Vice Principal**

**Dr. V. S. Krishna GDC (A),  
Visakhapatnam**

## MESSAGE FROM ACADEMIC COORDINATOR



Dear Faculty and Students,

I express my heartfelt gratitude to every one of you for your exceptional contributions to the success of our college's academic activities. Your dedication, passion, and hard work have been instrumental in creating a vibrant and enriching learning environment for our students.

Throughout the year, you have gone above and beyond to organize and conduct a wide range of academic activities, including observation of important days, guest lectures, seminars, workshops, video lessons, research work and publications. Your tireless efforts have not only enhanced the academic experience of our students but have also contributed to the overall growth and development of our institution. Whether it's designing innovative teaching materials, mentoring students, or collaborating on interdisciplinary projects, your contributions have truly made a difference in the lives of our students and the success of our college community.

As we look ahead to the future, I have every confidence that you will continue to excel in your respective roles and make even greater contributions to our college.

I am honoured to work alongside such dedicated and talented academicians.

Wishing you all the best for your future endeavours and looking forward to another successful year ahead.

**Dr. Ch. Lalitha**

**Academic Coordinator**

**Dr.V.S.Krishna GDC (A)**



## MESSAGE FROM IQAC COORDINATOR



I am delighted to commend the dedication of the Haritha Krishna Eco-Club members for launching a magazine for the academic year 2022-23. Your unwavering commitment and passion shine through in this endeavor. I anticipate that this magazine will shed light on pressing environmental concerns and showcase the latest scientific and technological breakthroughs, keeping researchers abreast of their field's advancements. I eagerly await the contributions from students and the creative ideas from the faculty for your next publication. Heartiest congratulations on the magazine's successful launch, and I extend my best wishes to you all!

**Dr. K. Ravi Babu**  
**IQAC Coordinator**  
**Dr.V.S.Krishna Govt Degree College (A)**

## FOREWORD



I am pleased to announce that the members of **HARITHA KRISHNA ECO-CLUB** are planning to releasing a magazine, "**HARITHAMITRA**" from the academic year 2022-23. I express my gratitude to the Principal, Dr. I. Vijaya Babu for his support and encouragement in materializing the launch of magazine. I am grateful to **Dr. P. Sree Vani**, Lecturer in charge, Department of Botany, **Dr. T. M. A. Niveditha**, Lecturer in botany, **Dr. D. Apparao**, **Dr. K. Vijaya Lakshmi** to be part of advisory board. I convey my special thanks to **Dr. S. Padmavathi**, lecturer in botany to act as a **Chief editor** to this magazine and accomplishing the task. **Mr. G. V. Vinay**, **Mr. K. Nagendra** and **Mr. M. Prasad** students from **II B. Sc. BZC** will be the student editors who worked hard in compilation and designing the cover page of the magazine. I hope this help the students and staff in advancing their research.

**Dr. D. S. Madhava Rao**  
**Coordinator**  
**Haritha Krishna Eco-Club.**



## PREFACE



*Dear readers, in my capacity of Editor-in Chief I am immensely pleased to introduce the new scientific magazine "HARITHAMITRA" from Haritha Krishna Eco-Club of Dr. V. S. Krishna Government Degree College (A). It is interdisciplinary and invites articles from faculty and students from all the programmes. The main aim of this magazine is to provide a forum for faculty and students to publish their articles on current trends and latest research and development. In this present issue, we would like to address matters related to environment and sustainability. The special attraction of this magazine is the addition of science facts. I must thank our Principal Dr. I. VijayaBabu garu for the inspiration and encouragement to complete the editing of this magazine. I thank all the faculty and student authors who contributed to this magazine. It is a great pleasure for me to thank all those valuable suggestions that have been given. I would like to receive any suggestions that assist us to add value to the second edition.*

**Dr. S. Padmavathi**

**Editor -in Chief**

**Harithamitra**





## EVOLUTION OF GREEN CHEMISTRY

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### 1. Introduction

Paul Anastas and John Warner, in the 1990s, postulated the 12 principles of Green Chemistry, which are based on the minimization or non-use of toxic solvents in chemical processes and analyses, still in use today. These principles propose environmentally favorable actions from the planning of the product to its synthesis, processing, analysis and its destination after use. The main objective is to minimize the environmental and occupational hazards inherent in industrial activities. Later, Paul Anastas discussed the importance of using these 12 principles in the development of new methods and analytical techniques, with the purpose of reducing their environmental impacts.

Thus, this work shows a critical review of the green chemistry, green analytical chemistry.

### 1.1 GREEN CHEMISTRY





The main concept of Green Chemistry is the use of chemical skills and knowledge to reduce or eliminate the use or generation of hazardous substances. Cathcart, who presented a discussion on the growth of the Irish chemical industry, probably used the term "Green Chemistry" for the first time in a paper title in the year 1990. However, only in 1996, the first publication, by Anastas and Williamson,

One of the most active areas of Research and Development in Green Chemistry is the development of analytical methodologies. New methods and techniques that are able to reduce and eliminate the use and generation of hazardous substances in all stages of chemical analysis are the main targets of the so-called Green Analytical Chemistry. The 12 principles of Green Chemistry, adapted by Galuszka, Migaszewski and Namiński in 2013 are based mainly on the elimination or minimization of the use of chemical substances.

## 2. Conclusion

Research advances have enabled sustainable processes over the years with investments in environmentally correct analytical and policy techniques in line with world conferences since 1968. Despite these efforts, industries need to visualize the economic viability of applying green chemistry to their processes, which prevents us from leveraging the use of this ideology. Investments and dissemination on the importance of green chemistry and how they affect directly from the start of pharmaceutical analyzes, employees and patient health until to the environmental sustainability are extremely important for the process of future improvements.

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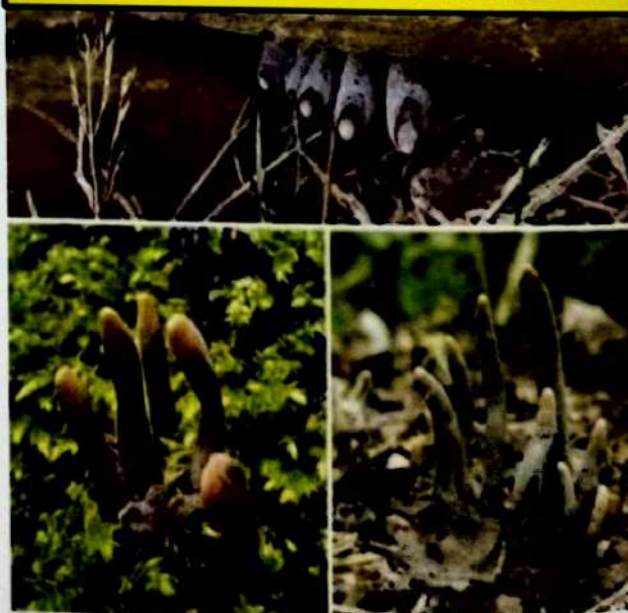
Vol I December, 2022

Harithakrishna Eco- club, Dr. V. S. Krishna Government Degree College, Visakhapatnam

**Do you know?**

**Xylaria polymorpha commonly known as "dead man's fingers" is a fungus.**

**S.Siva**





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Google Scholar

<https://ars.els-cdn.com/content/image/1-s2.0-S131901641830152X-gr1.jpg>

## DO YOU KNOW?

*Eucalyptus deglupta* is a species of tall tree, commonly known as the rainbow eucalyptus.



The skin of this tree is orange. When the skin is pale, the inner skin appears as pale green, red, orange, grey and purplish brown.

The reason why the Rainbow Eucalyptus comes in so many colours

[https://www.freepik.com/premium-photo/colorful-abstract-pattern-deglupta-tree-bark-texture-background\\_3868000.htm](https://www.freepik.com/premium-photo/colorful-abstract-pattern-deglupta-tree-bark-texture-background_3868000.htm#fromquery=eucalyptus)  
[https://commons.wikimedia.org/wiki/File:Eucalyptus\\_deglupta-base.jpg](https://commons.wikimedia.org/wiki/File:Eucalyptus_deglupta-base.jpg)



## **THE GREEN INITIATIVES OF INDIA-GREEN HYDROGEN, BIOFUELS AND CLEAN ENERGY**

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### **Introduction**

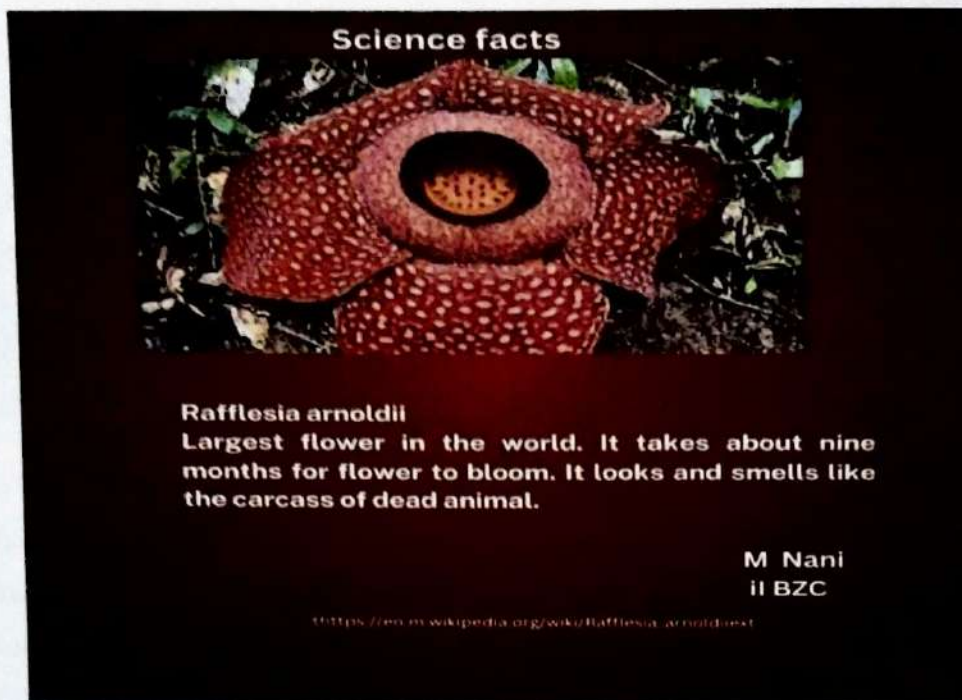
The world has been focusing on green fuels, Biofuels and clean energy to address global environmental issues and to enhance energy security for future generations. In accordance with The Paris Agreement (UNFCCC COP 21) December 2015 and the Glasgow Climate Change Conference (UNFCCC COP26) November 2021, India has been taking several initiatives towards its commitment to create a pollution-free environment and to reduce carbon emissions for a better and sustainable future.

In India, sectors like transportation and industrial production are dependent on imported fossil fuels. The major shift to these fuels is the mission to transition from fossil fuels to sustainable green and clean fuels. India has been promoting the production and use of biofuels as a part of its National Policy on Biofuels. The Ministry of Petroleum and Natural Gas of India formulated a “National Policy on Biofuels” in 2018 and amended it in June 2022 to reduce the import of petroleum products by fostering domestic biofuel production. The policy aims to reach the blending target of 20% bioethanol in petrol, by 2025-26. It also encourages the Make in India Drive and promotes the Atamanirbhar Bharat initiative with a vision of India becoming ‘energy independent’ by 2047 with indigenous technologies and with targets for blending of biofuels with conventional fuels. The blending of Ethanol with conventional petrol and the blending of biodiesel with diesel are the thrust areas. Biofuels like Bio-ethanol and Bio-diesel will reduce the usage of fossil fuels, promote cleaner alternatives and support the agricultural sector.

Along with renewable energy sources like Wind Power, Geothermal, Hydropower, Nuclear Power and Solar Power, the National Green Hydrogen Mission (NGHM),



## DO YOU KNOW????



launched on 4<sup>th</sup> January 2022 outlines a comprehensive plan for the development and deployment of the Green Hydrogen ecosystem and hydrogen technologies. Green fuels are carbon-neutral fuels which help to decarbonize and reduce carbon footprint and India has declared to achieve the target of Net Zero emissions by 2070. The mission aims for the massive production of green hydrogen and its derivatives so as to play the role of an international supplier, development of manufacturing capabilities and create employment opportunities, and economic growth. There are three types of hydrogen based on the method of extraction-Grey Hydrogen, Blue Hydrogen and Green Hydrogen. By 2030 National Green Hydrogen Mission expects 5 million metric tonnes (MMT) per annum, a reduction of fossil fuel imports of over one lakh crore and nearly 50 MMT of annual emissions of greenhouse gases.

The cabinet approved a budget of 19.744 crores for the NGHM for several measures including increasing the production of green hydrogen, advanced technologies for domestic manufacturing of electrolyzers, infrastructure, storage and transportation facilities. Green Hydrogen production requires the use the renewable energy sources for the process of electrolysis. It has a high energy density which is suitable for transportation and power generation.



## Challenges:

- Availability of raw materials for the production of ethanol like sugar beet and other starch-containing materials.
- Policy support like tax incentives, subsidies and regulatory frameworks.
- The economic viability of the production of Green hydrogen.
- Infrastructure facilities for mass production, storage and transportation.

**Conclusion:** India has made significant progress in promoting green fuels, biofuels and clean energy as a part of environment-friendly measures. Yet there are challenges such as infrastructure development, technological advances, economic investments and viability. Sustainable energy policies and research and development play a crucial role in shaping the future of sustainable energy resources and green fuels in the country. Facilities must be provided for massive production for cost-cutting.

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*Dracaena cinnaberi*



The Dragon Blood tree



**Do you know**

**DRACAENA CINNABERRI  
SOCOTRA DRAGON  
TREE THE DRAGON  
BLOOD TREE"**

**THIS EVERGREEN  
SPECIES IS NAMED  
AFTER ITS DARK  
RED RESIN,  
WHICH IS KNOWN AS  
"DRAGON'S BLOOD"**

**V. SRIJA, I BZC**

Dracaena\_cinnaberi.jpg



## ALGAL BLOOMS

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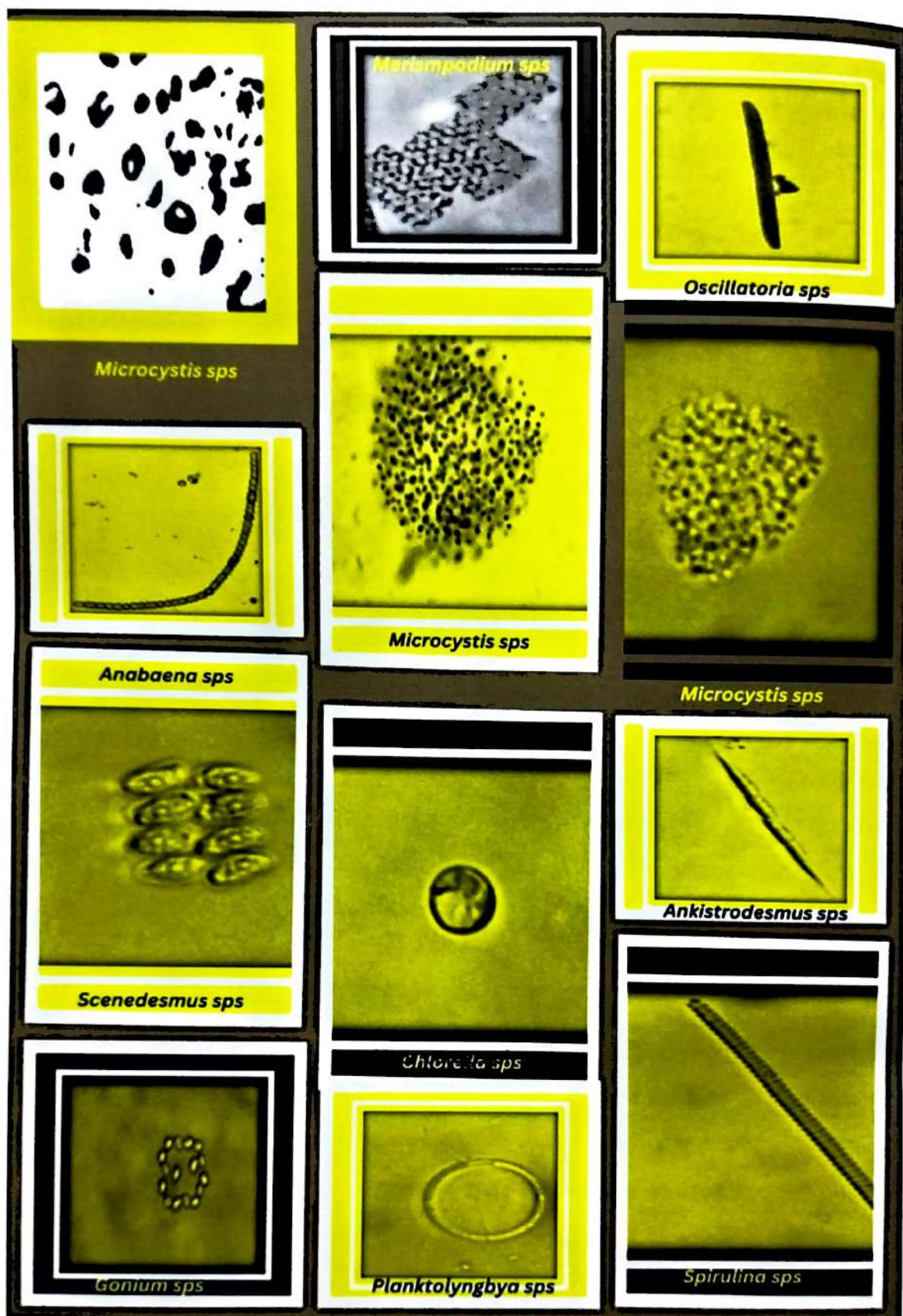


## Introduction

Water is the most precious component for the living organisms on the earth and it is an important factor of the ecosystem. It is the most abundant on the earth. India is blessed with a good amount of fresh water sources in the form of streams, rivers, reservoirs, lakes and ponds. At present Fresh water is subjected to severe competition among multiple stakeholders in many parts across the world. Fresh water has become a scarce commodity due to overexploitation and pollution (Gupta & Shukla 2006). Continuous discharges of human domestic wastes in to the ponds have resulted in eutrophication of water bodies. (Pandey and Pandey , 2003). Seasonal changes in the aquatic ecosystem due to changes in the environmental parameters, biological diversity and water quality of ponds are directly related to health of the living organisms in those specific areas. Monitoring of water quality and algal bloom formation are the first steps to be taken to management and conservation of aquatic ecosystems & healthy water supplies.

## Objectives of topic.

1. To study the environment of water bodies.
2. to observe and identify algal members present in the water body and their seasonal bloom formation.
3. To take precautions against water pollutants.
4. To learn toxicity of algal blooms in water bodies.





**Algal Blooms:** - Micro & Macro Algae are the most important primary producers in the water ecosystem. They are showing seasonal variations in accordance with water level, Physicochemical parameters and other biotic components. Due to high anthropogenic activities some of the algal members showing luxuriant growth and cover the entire surface of the water body and causing depletion of oxygen levels in the water, which can kill fish & other aquatic bios. Harmful Algal Blooms (HABs) can damage digestive systems of aquatic fauna, cattle and Human skin irritations in bathing. HABs sometimes block sunlight penetration and decrease the eutrophic zone in the water body. A Number of researchers have investigated on HABs and eutrophication

A large number of algae create algal blooms in fresh and marine waters. Some of the members of Chlorophyceae (*Scenedesmus*, *Chlorella*, *Chlymedomonas*, *Pandorina*, *Gonum*, *Pediastrum*, *Ankistrodesmus* and *Monoraphidium* etc.), Phaeophyceae (*Sargassum fusiformis*, *Collegedunia*, *Laminaria* and *Fucus* etc.), Dinoflagellates (*Karenia* – Florida Red Tide, *Gonyaulax* & *Alexandrium* etc.) and Cyanophyceae (*Anabaena*, *Nostoc*, *Oscillatoria*, *Microcystis*, *Dolichospermum*, *Phormidium*, *Spirulina*, & *Planktotrix* etc).

Some are shaped in mat-forming, some are in thicker layers and some are in bloom forming. The bloom formers are releasing toxins in to the muddy waters. *Anabaena* produce anatoxines, *Oscillatoria* – oscilitorin and *Microcystis* – microcystin etc. (Babica et.al 2007).

## **Conclusions**

Degradation of aquatic ecosystem by nutrient pollution resulting in massive algal blooms is a global problem representing serious health and ecosystem risks. The toxicity impacts were certainly unknown substances, yet to be known rightly. The



metallic pollutants are persistent pollutants may be causal reasons for formation of algal blooms.

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## DO YOU KNOWWW??

About the plants called by animal's names

Elephant's ear - *Colocasia esculenta*

Hares'bell - *Campanula rotundifolia*

Horse tail – *Equisetum*

Fox Glove-*Digitalis purpuria*

Lamb's ear- *Stachys byzantina*

Snapdragon- *Antirrhinum majus*

Cat's tail- *Typha latifolia*

Snake plant- *Dracaena trifasciata*

Spider Lily- *Hymenocallis littoralis*

Goat beard- *Aruncus dioicus*

Dragon skull- *Dracula saulil*

Crane's bill - *Geranium sylvaticum*







## OZONE LAYER DEPLETION

G. Yerni Kumari, II BZC

Dr. V. S. Krishna Govt Degree College (A)

### Introduction: -

The thin stratospheric ozone layer that surrounds the earth to protect inside the top atmosphere, shielding life in the world from the solar's ultraviolet (UV) rays. It has been called the Earth's sunscreen. It is the first time, in the eighties, scientists determined proof that the ozone layer was being depleted. Depletion of the ozone layer results in multiplied UV radiation reaching the Earth's floor, which in turn ends in a greater threat of overexposure to UV radiation and the related fitness consequences of skin cancer, cataracts, and immune suppression. This fact sheet explains the significance of shielding the

**Ozone layer depletion:** Compounds that incorporate chlorine and bromine molecules, which include methyl chloroform, halons, and chlorofluorocarbons (CFCs), are stable and have atmospheric lifetimes long enough to be transported through winds into the stratosphere. while those ozone-depleting materials (ODS) damage down inside the surroundings, they launch chlorine or bromine, which attack ozone. each chlorine or bromine atom reacts with ozone, time and again combining with and breaking aside as many as 100,000 ozone molecules all through its stratospheric life. CFCs, which have an extended history of use as refrigerants, solvents, foam-blowing agents and in other packages, had been almost absolutely phased out global. further, regulations are now in location to segment out hydrochlorofluorocarbons (HCFCs), compounds used as substitutes for the extra adverse CFCs. The U.S. will segment out HCFCs absolutely in 2030.



### DO YOU KNOW

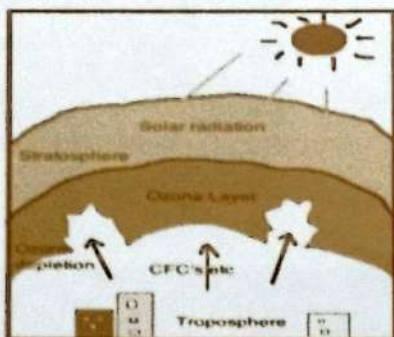
#### *Dracula simia*

**It is also called monkey orchid or the monkey-like Dracula, is an epiphytic orchid.**

**—Srinu**

**I BZC**



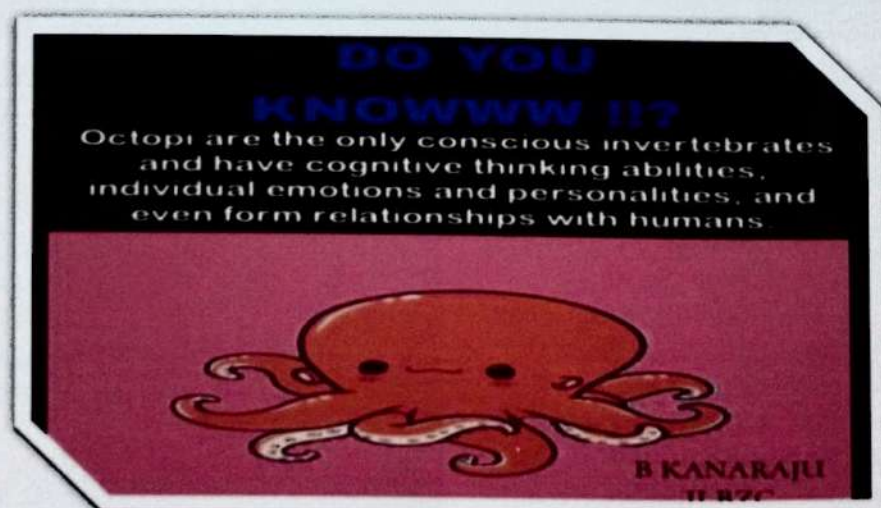


## What we can do: -

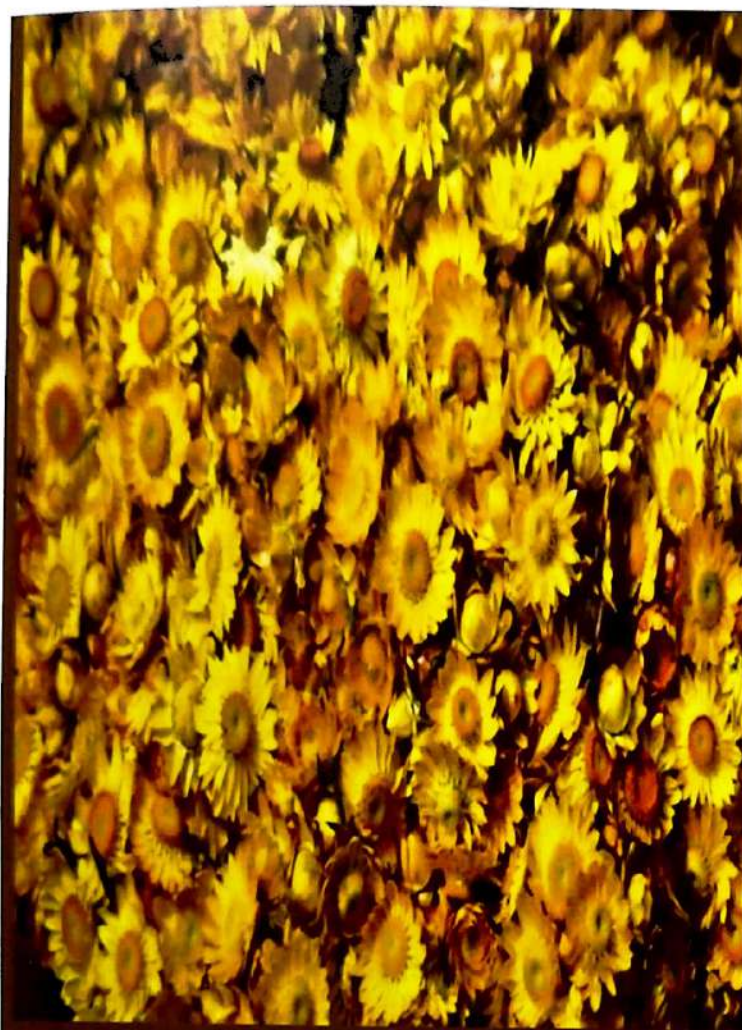
- Reduce the use of ozone depleting substances.
- Avoid the use of CFCs in refrigerators and air conditioners, replacing the halon-based fire extinguishers, etc.
- Buy local products. In this way, you not only get fresh products but you avoid consuming food that has travelled long distances.
- Do not use cleaning products that are harmful to the environment and to us.
- The best transport option is urban, bicycle, or walking. If you use a car to a destination, try to carpool with others to decrease the use of cars in order to pollute less and save.

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- **Image source:**  
<https://commons.wikimedia.org/w/index.php?search=ozone+layer+depletion&title=Special:MediaSearch&go=Go&type=image>







## DID YOU KNOW?

### *Xerochrysum bracteatum*

Everlasting flower from Ooty  
It is commonly known as the golden everlasting or strawflower, is a flowering plant in the family Asteraceae. While cut fresh flowers symbolize longevity and immortality. Everlastings are plants that retain their shape and colour long after they have been picked and dried

[https://en.m.wikipedia.org/wiki/File:Xerochrysum\\_bracteatum\\_Everlasting\\_flower\\_from\\_Ooty\\_India\\_01.jpg](https://en.m.wikipedia.org/wiki/File:Xerochrysum_bracteatum_Everlasting_flower_from_Ooty_India_01.jpg)

## A STUDY ON ENDEMIC SPECIES IN INDIA

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### NILGIRI TAHR, NILGIRI HILLS



### KASHMIR STAG, KASHMIR VALLEY



#### Introduction:

“Endemic species is that ecological state of a species where a species is unique to a defined geographical location.”

Endemic species are exclusive to a certain area and cannot be found anywhere else in the world. Kangaroos, for instance, species that are native to Australia and cannot be found



anywhere else in the globe. When they were kept in captivity, people introduced them, which is why they have occasionally been seen outside of their natural environment. There are further marsupials that are unique to Australia and the islands that surround it. One such creature that was unique to Australia, Tasmania, and New Guinea is the Tasmanian Tiger. But it is no longer alive.

## **Endemic Species of India**

A list of the endemic species of India is mentioned below

### **Kashmir Stag, Kashmir Valley**

The Kashmir Stag, also known as Hangul, is a large animal that lives in the deep forests of Himachal Pradesh's Chamba district, Kashmir Valley, and Dachigum National Park.

### **Nilgiri Tahr, Nilgiri Hills:**

It is an endangered wild sheep species that is exclusive to the Western Ghats' Nilgiri Hills.

It is the rarest, most endangered, and most threatened species of primate, and it can only be found in the Western Ghats of Southern India.

frog in purple, Western Ghats

The western ghats of India are home to the purple frog, commonly known as the pignose frog. The majority of its life is spent underground.

### **Lion-Tailed Macaque, Western Ghats:**

It is the rarest, most endangered, and most threatened species of primate, and it can only be

found in the Western Ghats of Southern India.

frog in purple, Western Ghats

The western ghats of India are home to the purple frog, commonly known as the pignose frog. The majority of its life is spent underground.

### **Asiatic Lion, Gir Forest:**

Indian Lion is another name for the Asiatic Lion, which is unique to Gir Forest National Park in Gujarat. These have an endangered species listing. These are one of the five large cats that can be found in India, along with Bengal tigers and Indian leopards.

### **Sangai Deer, Loktak Lake:**

It is also referred to as the Brow Antlered Deer and is only found in Manipur's Keibul Lamjao National Park. This park is a marshy wetland situated in Loktak Lake's southern region.

### **Other endemic species of India include:**

1. Pygmy Hog, Assam.
2. Bronzeback Vine Snake, Western Ghats.
3. Nilgiri Blue Robin, Nilgiri Hills.
4. Malabar Civet, Western Ghats.



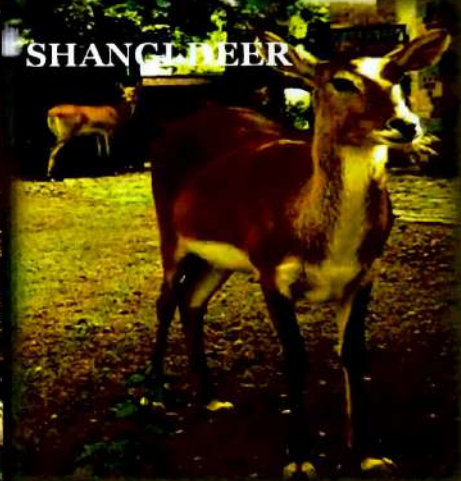
## Lion-Tailed Macaque, Western Ghats



## Asiatic Lion, Gir Forest



## SHANGHAI





5. Anaimalai Gliding Frog, Anaimalai Hills.

6. Namdapha Flying Squirrel, Arunachal Pradesh.

7. Indian Giant Squirrel.

8. Bonnet Macaque.

## Conclusions

Endemic species are important because they are in the habitats restricted to a particular area due to climate change, urban development, or other occurrences. It is critical to preserve endemic species since they are frequently in danger of extinction. The preservation of indigenous species is crucial. Due to habitat loss and other human activities, many of them are endangered. They should be preserved not just because they are peculiar to that location but also because they help to preserve biodiversity.

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2. [https://commons.wikimedia.org/wiki/File:Rusa\\_Deer\\_-\\_Woburn\\_Deer\\_Park\\_%285118310775%29.jpg](https://commons.wikimedia.org/wiki/File:Rusa_Deer_-_Woburn_Deer_Park_%285118310775%29.jpg)

3. [https://commons.wikimedia.org/wiki/File:THE\\_LION-TAILED\\_MACAQUE.jpg](https://commons.wikimedia.org/wiki/File:THE_LION-TAILED_MACAQUE.jpg)

4. [https://commons.wikimedia.org/wiki/File:Sangai\\_Brow-antlered\\_Deer\\_Rucervus\\_eldii\\_eldii\\_Manipur\\_by\\_Dr.\\_Raju\\_Kasambe\\_%283%29.jpg](https://commons.wikimedia.org/wiki/File:Sangai_Brow-antlered_Deer_Rucervus_eldii_eldii_Manipur_by_Dr._Raju_Kasambe_%283%29.jpg)

5. [https://commons.wikimedia.org/wiki/File:The\\_Nilgiri\\_Tahr.jpg](https://commons.wikimedia.org/wiki/File:The_Nilgiri_Tahr.jpg)

## ENVIRONMENTAL SOURCE AND TOXICITY OF MICROPLASTICS

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II BSC chemistry

Dr. V. S. Krishna Government Degree College (A)

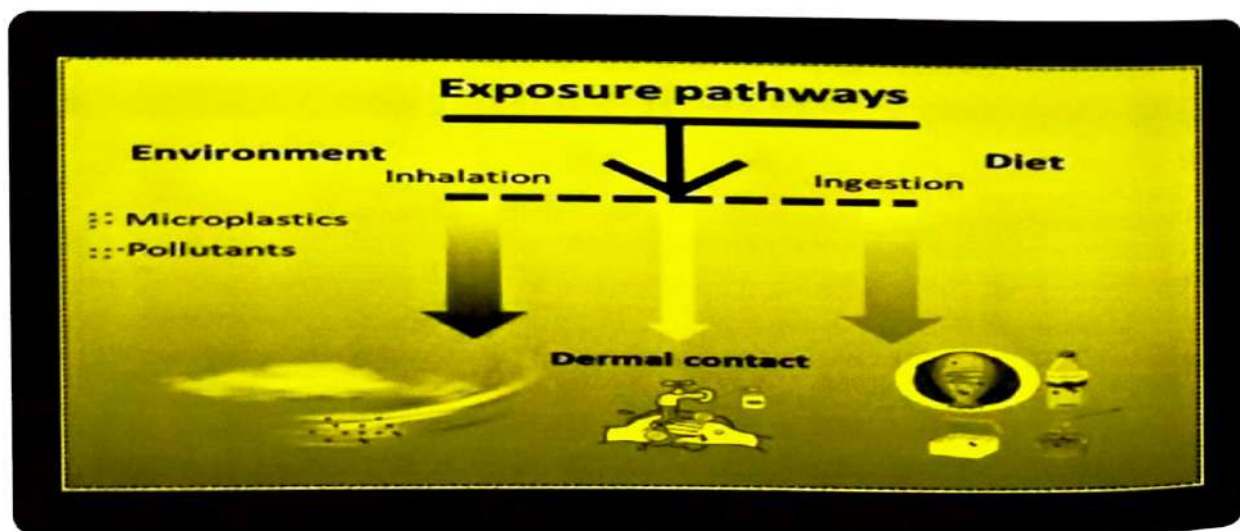
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### INTRODUCTION

The global annual output of plastics has exceeded 300 million tons. Microplastics are small plastic pieces with size less than 5mm. Microplastics are widely found in different areas of the environment, including air, fresh water, waste water, sea water, tap water, bottled water and food.

Microplastics are diverse, mainly consisting of human e.g., synthetic textiles, personal care products, industrial e.g., plastic pellets and transportation e.g., erosion of synthetic rubber tires. Due to their widespread distribution in different environmental compartments, food, and drinking water, microplastics have attracted increasing attention across the world. Microplastics will accumulate into the ocean through river transport or direct discharge.

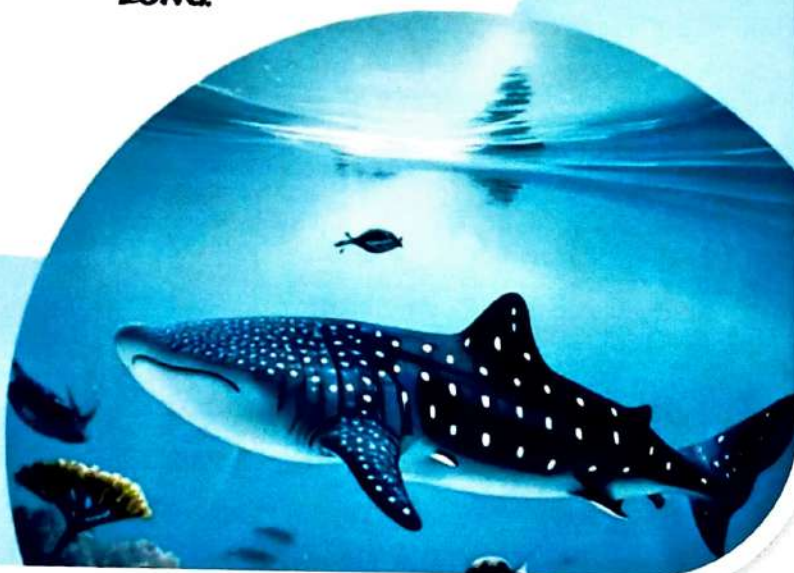




## DO YOU KNOW??

**WHALE SHARKS CAN GROW TO BE 62 FEET LONG AND WEIGH 30 TONS, MAKING THEM THE LARGEST FISH IN THE OCEAN. HOWEVER, MOST WHALE SHARKS DON'T REACH ADULTHOOD AND ONLY GROW TO BE 13 FEET LONG.**

PRIYA  
I BZC



After being discharged into the environment, these microplastics will undergo environmental conditions. Plastics are widely used in all aspects of our everyday life due to their low price, durability, lightweight and good ductility. In recent years, many review articles have been reported on environmental microplastics.

### SECTION SNIPPETS

#### 2.1 Physicochemical properties and applications



Plastics are used in every aspect of our lives, from greenhouses, coverings, coatings and wiring to packaging, films, lids, bags and containers. After nearly 70 years of continuous growth, global plastic production increased to 359 million metric tons in 2018, with an average annual growth of 128 million metric tons between 1950 and 2018. Microplastics are chemically stable and can persist for long periods of time in the environment.

**Air:** The main sources of microplastics in air are synthetic textiles, erosion of synthetic rubber tires, and urban dust. Other sources may include building materials, industrial emissions, plastic fragments from house furniture, traffic particles, waste incineration, tumble dryer exhaust, synthetic particles used in horticultural soils, and sewage sludge used as fertilizer.

## **Potential toxicity of microplastics to humans and organisms**

After releasing into the environment, microplastics will be exposed to humans through different pathways, thus bringing possible health risks. In addition, organisms in both aquatic and soil environments can be exposed to microplastics. It should be noted that some organic and inorganic components e.g., bisphenol A (BPA), tributyltin, Zn, Pb are being released into environments.

## **CONCLUSIONS**

As contaminants of emerging concerns, microplastics are widely distributed to a variety of environmental media. Therefore, close attention needs to be paid to microplastic pollution. With increasing global production and application of plastics, microplastic pollution in the environment is expected to continually increase and may cause severe damage to ecosystems. Current research has indicated that the sources of microplastics are diverse (e.g., synthetic fibres, rubber tires, personal care).

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## Do You Know?

### About insectivorous plants?

Carnivorous plants also known as insectivorous plants are those that have developed especially to use sly traps and pitfalls to catch and consume insects and other animals. Because these plants draw in, capture, and absorb food from animals, they are referred to as "carnivorous" plants. It is thought that this trophic (feeding) mechanism evolved in response to unfavorable growing conditions, particularly soils low in nitrogen.

Similar to other plants that require the attraction of other animals for processes like pollination, carnivorous plants employ a range of strategies to draw in their prey. Some are fragrant, some are vividly coloured, some may have parts that are sticky or slick, and some may be constructed so that it is difficult for prey to escape.

### Sundew/Drosera

Drosera, also referred to as sundew, is another plant that feeds on insects. The largest genera of carnivorous species is this one. Sundew plants catch and digest insects using glands on the surface of their leaves. There will be tentacles on the glands, and at their tips will be a sticky substance. By rolling them in the leaves, these tentacles capture insects that are perched on the leaves and progressively break them down.

### Nepenthes

Nepenthes is a genus of carnivorous plants, also referred to as monkey cups or tropical pitcher plant by the presence of pitcher like leaves. A delicious pigment released by these traps attracts insects and holds them inside a huge chamber.

### Utricularia

Utricularia is a carnivorous plant and capture small organisms by means of bladder-like traps.

### Drosera

Drosera, which is commonly known as the sundews. These members of the family Droseraceae capture and digest insects using stalked mucilaginous glands covering their leaf surfaces.

## CARNIVOROUS PLANTS

### PITCHER PLANT



### SUN DEW PLANT



### BLADDER PLANT



### VENUS FLYTRAP





## A MONOGRAPH ON CLIMATE CHANGE BY

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### Introduction:

Climate change has become a widespread topic in recent years. This a problem that resulted from the emission of greenhouse gases that affect our environment. Therefore, it raises questions on whether the problem is caused by human activities or it's just a part of nature's cycle. This paper discusses and compares the factors that contribute to climate change by humans and nature, some effects of climate change, and some solutions that have been developed to prevent or slow climate change from progressing. Climate Change According to NASA, the Earth average temperature has increased about 1 degree Fahrenheit during the 20th century (Global Climate Change: Effects). That might sound like it isn't a great change, but its effects on our environment have proven otherwise.

### Causes of climate change

#### Industry & Manufacturing:

Industries and factories release a huge amount of harmful poisonous gases like CO, CO<sub>2</sub> etc. These gases blend and react with the other gases present in the atmosphere and form chemical substances which are hazardous to health and environment. Most of the gases are green house gases these gases increase the temperature of the earth which is called as global warming leading to the change in climate.

#### Deforestation

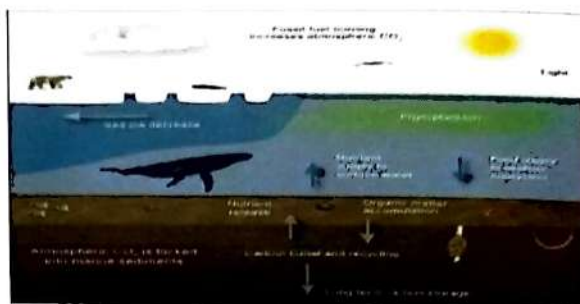
Deforestation is cutting off trees for our daily needs like roads construction, furniture, paper industries etc. When these trees are cut off, they emit large amounts of Carbon into the atmosphere. This carbon now mingles with the other green house gases present in the atmosphere from different sources which increases the chance of global warming and climate change.

## Human Needs

In these days, competition among the people is becoming more due to which the manufacturing of the products is in huge quantity due to which emission of harmful gases is increasing while manufacturing and also when the home appliances are used, they release CFCs, contribute the major amount to the global warming leading to the climate change.

## Consequences:

- Acid rains
- Melting of glaciers
- Forest fires
- Rising in the sea level
- Droughts & Heat waves

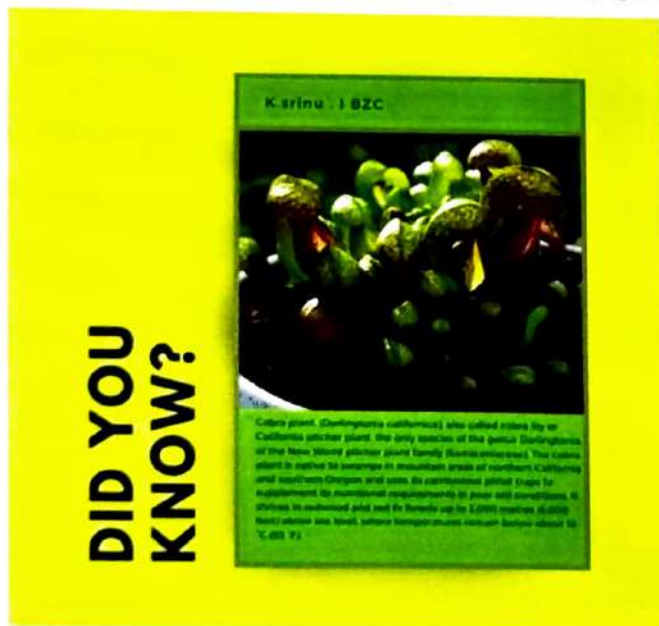


## Conclusion:

We need to follow the path of sustainable development to effectively address the concerns of climate change. We need to minimise the use of fossil fuels, which is the major cause of global warming. We must adopt alternative sources of energy, such as hydropower, solar and wind energy to make a progressive transition to clean energy. By adopting clean technologies, equitable distribution of resources and addressing the issues of equity and justice, we can make our developmental process more harmonious with nature.

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## A MONOGRAPH ON ENDANGERED SPECIES OF PLANTS IN INDIA

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### Introduction:-

Any live plant species that is at risk of going extinct soon, either worldwide or in a particular geographic area, is considered endangered. Approximately 0.7 million of the 1.9 million extant species of flora and fauna are plant-based. The Guardian newspaper claims that over 40% of all plants are in danger of going extinct. Every year, the loss of endangered plant species puts the availability of fuel, food, medications, and other necessities at risk.

### Knowing an endangered plant: -

- An endangered species of plant arises when
- Its population has been drastically declining recently.
- There is no check on the decline, so it continues.
- Also, its geographic range drastically decreases.

### Classification of endangered plants

In 1994, the International Union for the Conservation of Nature and Natural Resources (IUCN) developed a scheme to group endangered plant and animal species

**Vulnerable:** In ten years, there is a 30% drop in population almost **threatened**. The least worried **Extinct** in the natural world Because they are in great danger of going extinct right away if appropriate protections are not put in place, the first three categories are referred to as "Threatened Species."

### The Cause of Plant Species Becoming Endangered: -

**Habitat destruction and habitat fragmentation:** it is the leading cause of plant destruction. Plant habitats are threatened by human activities such as agriculture, deforestation, mining, wars, and hydel projects. Plant populations are depleted as a result of deforestation, paving their way to destruction.

**Invasive species:** the planting of exotic species can negatively impact the local plant communities.

In its quest for minerals and space, the exotic plant outstrips the local plant, and gradually drives the latter to extinction. In india, for example, British colonial kings introduced congress grass (*Parthenium hysterophorus*).



into the following groups based on the availability of sufficient data. **Critically Endangered:** In ten years, the population has decreased by 90%

**Pollution:** several plants are susceptible to pollution, which results in their destruction.

**Natural causes:** wildfires, drought, floods, and landslides also

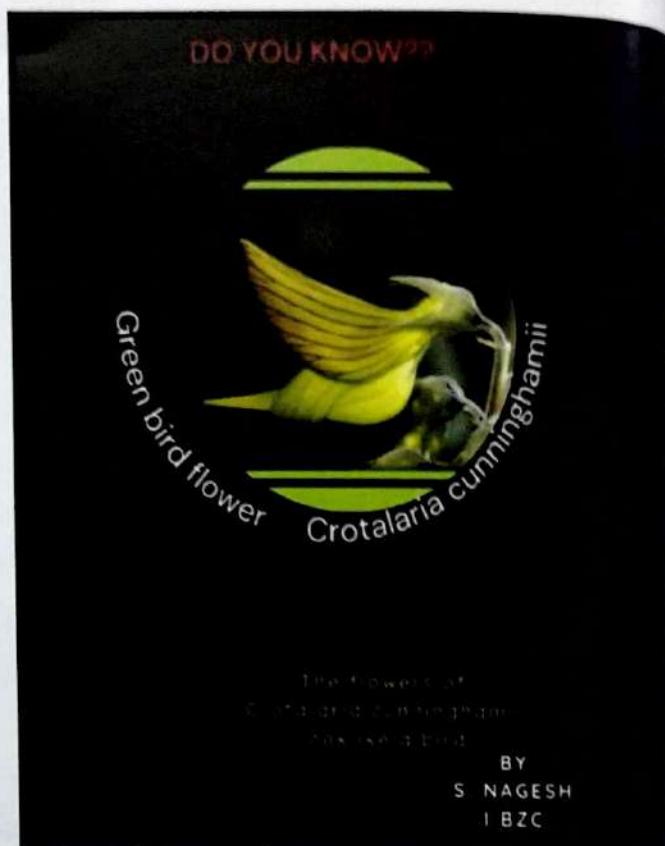
**Diseases:** several species of plants have been destroyed at different locations or threatened to die due to fungal infections. Conflicts between humans and animals are occurring as human populations increase, and agriculture, industrialisation, and infrastructure development have increased gradually, resulting in conflicts with wildlife because these spaces are created at the cost of diminishing the natural habitat of endangered plants.

## Conclusion:-

Plants are being threatened at an alarming rate, due to human activities such as destruction and fragmentation of their habitats, excessive commercial exploitation, and the introduction of invasive species that threaten their normal ecosystems and pollute them. Diseases, natural disasters, and isolated populations are among the natural causes that contribute to this vulnerability, as a result of poor fertility and genetic vulnerability.

It is now critical to gather data on such endangered plant species, group them based on their vulnerability indices, pass legislation and policies to protect their natural habitats, and devise strategies to save them through captive breeding and habitat restoration.

**Commercial use:** several plants have been endangered by commercial overexploitation, such as the exploitation of cherry plants in Africa.



Each plant species plays a central role in their environment, which is a component of the food chain and controls the ecosystem's growth. Any destruction of endangered species will harm our ecosystem and deprive us of essential resources such as medicines, food, and biofuel.

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## A MONOGRAPH ON BIOFERTILIZERS

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### Introduction

A biofertilizer is a material that has living microorganisms in it, when put on soil, plant surfaces, or seeds, colonise the rhizosphere, or inside of the plant, and increase the host plant's availability or supply of primary nutrients, thereby promoting development. Biofertilizers provide soil with nutrients by using the body's inherent mechanisms of fixing nitrogen, phosphorus solubilization, and growth-promoting material synthesis. The natural nutrient cycle of the soil is restored and soil organic matter is increased by the microorganisms found in biofertilizers. It is possible to cultivate healthy plants and improve soil health and sustainability by using biofertilizers. While biofertilizers are not yet able to completely replace synthetic fertilisers and pesticides, it is projected that their use will decrease.

### Use of biofertilizers in sustainable agriculture:

Biofertilizers are becoming more and more popular in sustainable agriculture. In order to maintain sustainability, key nutrients like phosphorus and nitrogen must be managed utilising

a range of complimentary combinations of microbial inoculants. A variety of unique to legumes and other plants biofertilizers that increase nitrogen as well as inoculants that increase phosphorus nutrition are discussed from different perspectives. The role of these internal bacteria and the transformation of nutrients are outlined. To save a substantial amount of fertiliser, there are a number of obstacles with biofertilizer use in India that need to be addressed. One of the main issues that needs to be fixed is the method by which these biofertilizers are made.

### Importance:

In addition to improving crop productivity, modern intensive farming techniques have been connected throughout time to a growing variety of problems, such as low agricultural production, environmental pollution that is harmful to human health, and a threat to the food security of a growing world population. The primary issue is how to produce enough food grains to meet the massive demand from the growing.



One of the most crucial resources in organic farming and sustainable agriculture production is biofertilizers, which are necessary to meet consumer expectations and provide high-quality crops. Live microorganisms referred to as "biofertilizers" increase crop plants' access to enough nutrients by fixing nitrogen, phosphate, and potassium and promoting plant development.

## Conclusion

They support other plant nutrients like phosphates in their solubilization and mineralization. Plant development is enhanced by increased synthesis and availability of hormones, vitamins, auxins, and other chemicals that promote growth. 20–30% more crop is produced.

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### DO YOU KNOW?

*Psychotria elata*  
Is so special that  
the bracts of the  
flower look like  
lips. so it is  
known as  
**HOT LIPS**

K. Shive Kumar  
IBZC



***Psychotria elata***  
**Hot lips**



## AN ARTICLE ON MARINE LIFE CONSERVATION

### Introduction

Marine life conservation is crucial for maintaining the health and sustainability of our oceans and the biodiversity they support. It involves protecting and managing marine ecosystems, species, and resources. Here is a brief overview, including key aspects like the impact of overfishing, coral reef conservation, and the role of marine protected areas. It plays a vital role in biodiversity preservation, food security, climate regulation, oxygen production, climate resilience, scientific research, sustainable fisheries, and economic benefits.

In this article, we will discuss about the critical aspects of marine conservation and the significance of these efforts in maintaining the health and sustainability of our oceans.

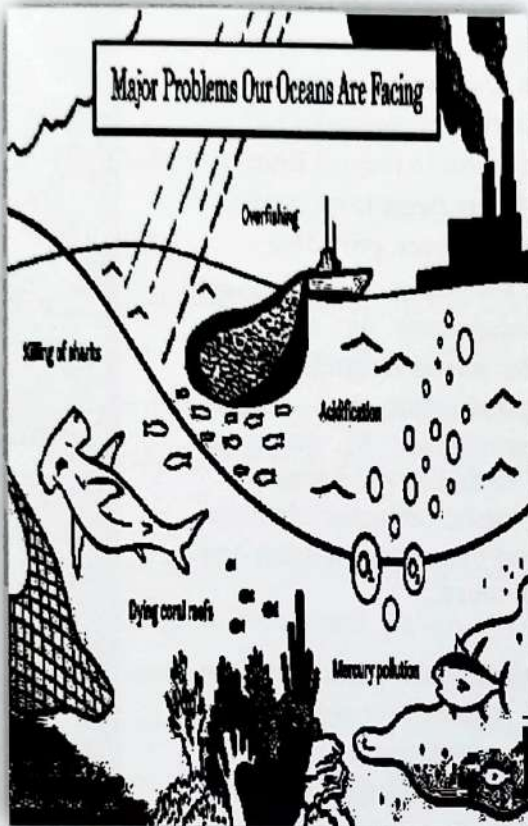
### Overfishing and its impact:

One of the primary challenges facing marine conservation is the problem of overfishing.

Affecting not only fish also seabirds, marine mammals, and other dependent species. depletion of fish stocks, imbalanced systems, economic consequences are the various detrimental effects.

### Coral reef conservation

Coral reefs are invaluable marine ecosystems known for their biodiversity and ecological significance. support coral fishing, ocean acidification, pollution and overfishing, coral restoration are the various important threats



**Lakshman Palaka III B.Sc.  
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However, these fragile underwater ecosystems face numerous threats, including rising sea temperatures, ocean acidification, pollution, and destructive fishing practices. Coral bleaching, caused by elevated sea temperatures, has devastating effects on these ecosystems.

Marine conservation efforts aim to protect and restore coral reefs through sustainable fishing practices, reducing pollution, and promoting marine protected areas where coral reefs can thrive. Overfishing occurs when fish stocks are harvested at a rate exceeding their ability to replenish the health of marine ecosystems, and threatening numerous species. This unsustainable practice depletes fish populations, disrupts food webs, and can lead to the collapse of fisheries. The consequences of overfishing ripple through ecosystems,



They also offer research opportunities and. Marine protected areas are designated zones in oceans and seas with legal protections to conserve marine biodiversity. These areas serve as sanctuaries for marine life, allowing ecosystems to recover from human disturbances. MPAs can range from small coastal zones to vast ocean expanses, providing refuge for a wide range of species.

sustainable fisheries management by acting as sources of replenishment for surrounding areas. They also offer research opportunities and support sustainable fisheries management by acting as sources of replenishment for surrounding areas. biodiversity conservation, habitat protection, fisheries management, research and monitoring, tourism and education are the main functions.

## Conclusion:

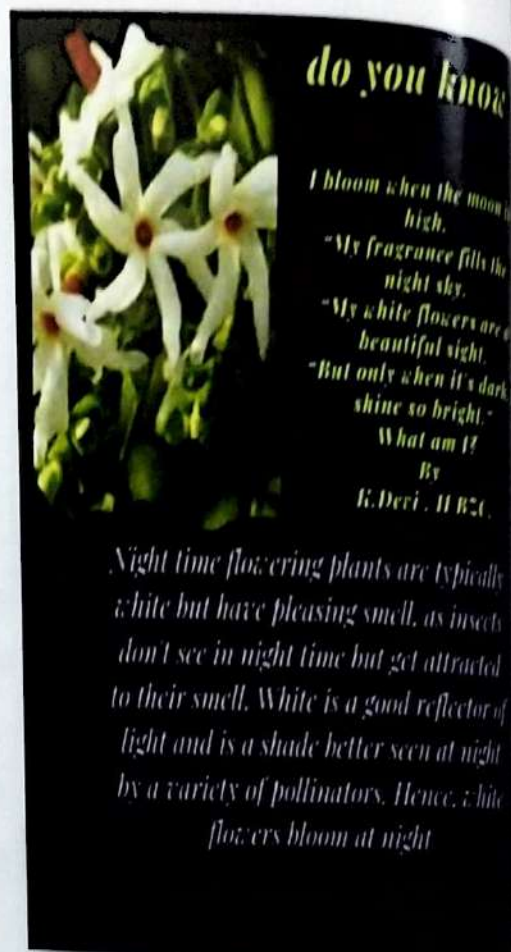
Marine conservation is a global imperative in the face of increasing threats to marine ecosystems and species. Overfishing, coral reef degradation, and the establishment of marine protected areas are critical components of this effort. By addressing these challenges, we can work toward the preservation of marine biodiversity, the sustainability of fisheries, and the long-term health of our oceans. The

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## A MONOGRAPH ON ORGANIC FARMING

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### Introduction:

Organic farming, sustainable agricultural system that uses ecologically based pest controls and biological fertilizers derived largely from animal and plant wastes and nitrogen-fixing cover crops.

Modern organic farming was developed as a response to the environmental harm caused by the use of chemical pesticides and synthetic fertilizers in conventional agriculture, and it has numerous ecological benefits.

Compared with conventional agriculture, organic farming uses fewer pesticides, reduces soil erosion, decreases nitrate leaching into groundwater and surface water, and recycles animal wastes back into the farm. These benefits are counterbalanced by higher food costs for consumers and generally lower yields. Indeed, yields of organic crops have been found to be about 25 percent lower overall than conventionally grown crops, although this can vary considerably depending upon the type of crop. The challenge for future organic agriculture will be to maintain its environmental benefits, increase yields, and reduce prices while meeting the challenges of climate change and an increasing world population.





## **Advantages of Organic Farming;**

**Economical:** In organic farming, no expensive fertilisers, pesticides, or HYV seeds are required for the plantation of crops. Therefore, there is no extra expense.

**Good return on Investment:** With the usage of cheaper and local inputs, a farmer can make a good return on investment.

**High demand:** There is a huge demand for organic products in India and across the globe, which generates more income through export.

**Nutritional:** As compared to chemical and fertiliser-utilised products, organic products are more nutritional, tasty, and good for health.

**Environment-friendly:** The farming of organic products is free of chemicals and fertilisers, so it does not harm the environment.

## **Disadvantages of Organic Farming:**

**1. Incompetent:** The major issue of organic farming is the lack of inadequate infrastructure and marketing of the product.

**2. Less production:** The products obtained through organic farming are less in the initial years as compared to that in chemical products. So, farmers find it difficult to accommodate large-scale production.

**3. Shorter shelf life:** Organic products have more flaws and a shorter shelf life than that of chemical products.

## **Types of Organic Farming**

Organic farming is divided into two types namely:

Integrated organic farming

Pure organic farming

### **1. Integrated organic farming:**

Integrated organic farming includes the integration of pest management and nutrient management to achieve ecological requirements and demands.

### **2. Pure organic farming:**

Pure organic farming means avoiding all the fertilisers and pesticides are obtained from natural sources such as bone meal or blood meal.

### **Need of organic farming**

Excessive use of chemical fertilisers reduces the fertility of soil.

Excessive use of chemicals has led to soil, water and air pollution.

To conserve ecosystem.

To promote sustainable development.

Inexpensive farming.

Increased demand of organic products due to safety of food.



## Conclusion:

Organic farming, Organic farming also known as ecological farming or biological farming, is an agricultural system that uses fertilizers of organic origin such as compost manure, green manure, and bone meal and places emphasis on techniques such as crop rotation and companion planting. According to the commission, the objectives of organic farming are: Responsible use of energy and natural resources. Maintain biodiversity and protect animal welfare. Conserve the regional ecological balance.

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TRANSGENIC PLANTS





**TRANSGENIC PLANTS****Transgenic Maize**

Corn that resists drought. Monsanto introduced the first transgenic drought tolerance trait in 2013. Corn varieties resistant to glyphosate herbicides were first commercialized in 1996 by Monsanto, and are known as "Roundup Ready Corn". They tolerate the use of Roundup. Bayer Crop Science developed "Liberty Link Corn" that is resistant to glufosinate.

**Flavr savr tomato**

The first crop product to be launched with genetic engineering was the FLAVR SAVR tomato. The FLAVR SAVR tomato was the product of marketing and research that led to scientific triumph, brief sales success, and ultimately commercial failure.

For what purpose was the Flavr Savr tomato created?

In the 1980s, the Californian business Calgene developed it. Compared to its non-modified version, the tomato has a slightly higher viscosity, a longer shelf life, and more fungal resistance. Ripe harvesting was intended to enhance flavor and facilitate long-haul transportation.

**Bt Cotton**

Genes encoding poison crystals in the Cry group of endotoxins were added to cotton to make Bt cotton. Because of the high pH of their stomachs, insects that attack and consume cotton plants breakdown crystal protein or cry poisons. The activated and dissolved Cry molecules form a link with proteins on the brush border molecules that resemble cadherins. While permitting access to nutrients, the epithelium of the brush boundary membranes divides the gut from the body cavity. The Cry toxin molecules bind to particular sites on the cadherin-like proteins found on the midgut epithelial cells, forming ion channels that permit potassium to pass through. Controlling the content of potassium is crucial and, if neglected, results in the death of epithelial cells.

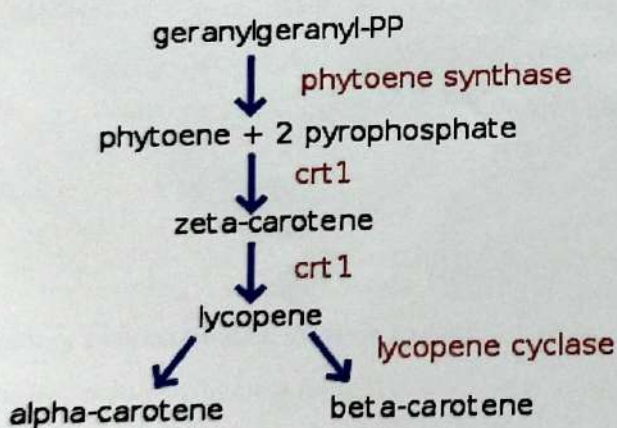
Cotton has been transgenically altered to create the Bt toxin gene, which causes the plant to naturally produce the insecticide within its tissues. Lepidopteran larvae are the primary pests



in commercial cotton in many areas. The Bt protein in the genetically modified cotton that they consume kills these bugs. This removes the need to kill lepidopteran pests (some of which have evolved pyrethroid resistance) with copious doses of broad-spectrum pesticides. This helps manage pests without the use of insecticides and preserves natural insect predators in the farm ecosystem.

## Golden rice

Golden rice is a variety of rice (*Oryza sativa*) produced through genetic engineering to biosynthesize beta-carotene, a precursor of vitamin A, in the edible parts of the rice.[1][2] It is intended to produce a fortified food to be grown and consumed in areas with a shortage of dietary vitamin A. Vitamin A deficiency causes xerophthalmia, a range of eye conditions from night blindness to more severe clinical outcomes such as keratomalacia and corneal scars, and permanent blindness. Additionally, vitamin A deficiency also increases risk of mortality from measles and diarrhea in children.



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- [https://en.wikipedia.org/wiki/Golden\\_rice](https://en.wikipedia.org/wiki/Golden_rice)



## A MONOGRAPH ON "ENDANGERED ORNAMENTAL PLANT SPECIES" IN INDIA

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### Introduction:-

Biodiversity hotspots are areas with a high diversity of locally endemic species, which are species that are confined to particular regions and are not found or are rarely found outside the hotspot. IUCN (International Union for Conservation of Nature and Natural Resources) mainly emphasizes the plants that are endemic (to India) and/or in the rare, endangered and threatened (RED) category. A rare species is one with a small population that is not presently endangered but is at risk.



An endangered species is one, which is in danger of extinction throughout all or of a significant portion of its range and a threatened species is one, which is likely to become endangered in the foreseeable future. India is one of the richest nations in the world with respect to floral diversity.

There are over 45,500 recorded floral species in India, including 17,527 angiosperms, 67 gymnosperms, 1,200 pteridophytes, 2,500 bryophytes, 2,223 lichens, 14,500 fungi, 7,175 algae and 850 virus/bacteria. Among the flowering plants reported from India, one-third is considered endemic in the Western Ghats. Many of these endangered ornamental species including some orchids, which possess medicinal

properties, urgently require to be conserved on priority basis. About 1220 species of orchids have been reported from India among which 300 species are rare, 150 are endangered and ornamental and 37 are of medicinal importance. So in this review attempts were made to create awareness regarding endangered ornamental plant species and methods to conserve them in order to save them from threat of extinction and preserve the beauty of "Mother Nature".



**Endemism and Causes of endangerment: -**

Endemism is the ecological state of a species being unique to a defined geographic location or habitat type. Around 33.5 % of Indian flora has been identified as endemic and is distributed predominantly in the Indian Himalayas and Peninsular India.

**Status of rare, endangered and threatened Indian ornamental flora:-**

Some rare and endemic epiphytic orchid species from Western ghats are *Aerides ringens* Fischer, *Bulbophyllum sureum*, *Dendrobium aqueum*, *Liparis elliptica*, etc. A total of 138 tree species belonging to 38 families have been found to be endemic to Wayanad district of Kerala. These include *Dillenia bracteata*, *Magnolia nilagirica*, *Goniothalamus cardiopetalus* and Thoms, *Orophea uniflora* and *Polyalthia fragrans*, etc.

Plant collection and identification of the Rare Endangered Threatened (RET) listed climbing species of the Southern Western Ghats showed 33 species are RET species like *Ceropegia mannarana*, *Gloriosa superba*, *Celastrus paniculata*, etc.

**Measures for conservation of orchid genetic resources: -**

**In-situ Conservation:** Biosphere Reserve India has 18 biosphere reserves, for conservation of endemic, endangered and vulnerable orchid species.

**National Parks:** Presently, there are 98 national parks in India. About 96 different species of orchids are found in Simlipal National Park of Orissa. About 150 different species of orchids are conserved in Buxa Tiger Reserve of West Bengal.

**Ex Situ Conservation**

In India, Botanical Survey of India maintains three National Orchidarium and Experimental Gardens, one each at Yercaud (Tamil Nadu), Howrah (West Bengal) and Shillong (Meghalaya) where representative species of the region are cultivated. Similarly, Arunachal Pradesh State Forest Research Institute is maintaining a large number of orchid species at Orchid Research Centre, Tipi, Itanagar, Sessa, Dirrang, Jenging and Roing as a measure of ex situ conservation of orchids.

**Field Gene Banks**

The Centre for Orchid Gene Conservation of the Eastern Himalayan region at Hengbung of Senapati district of Manipur, the country's first orchid gene bank, has already been established to conserve orchids as well as to facilitate research work. In the field gene banks of TBGRI, Trivandrum, 600 different species and 150 hybrids of orchids are maintained.



## Botanical Gardens

At present, there are 13 botanical gardens in India maintaining a number of orchid species. About 43 species of orchids are collected and displayed in the orchid house of Lloyd Botanical Garden, Darjeeling, West Bengal.

### Conclusion: -

As the time goes by, the intervention of man with nature is increasing. The uncontrollable increase in population demands space and other needs aggravating the problem. On the other hand increased pollution, natural calamities etc. bring threat to biodiversity and cause endangerment to several wild species which are also useful. Addition of new species into the RET list time by time is proving this fact. Plants with ornamental value are not exceptional for this. As part of the biosphere, it is our responsibility to protect its diversity which in turn helps us to benefit from them and sustain on this earth. In this regard the Indian government has taken efforts by establishing several national parks, natural sanctuaries, biosphere reserves etc.

Several public and private research institutions and NGOs are also working in this area. The future challenges for the conservation of such rare and threatened species are scientific, technical, socio-economical, legal and political including public awareness. A coordinated effort of researchers, research institutions, NGOs and communities is the need of the hour that can jointly make an effort for the best suitable conservation depending on the available resources and also in creating awareness among the public.

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Sarobilanthos\_kunthiana-

Neelakurinji\_from\_Kallattimala

\_%2C\_Near\_ooty%2C\_Tamil\_Nadu.jpg



*Do you know?*

**Orchis italica (naked man plant)**

*The plant has flowers that are shaped like  
naked men*



Ana Retamero



## AN ARTICLE ON WETLANDS

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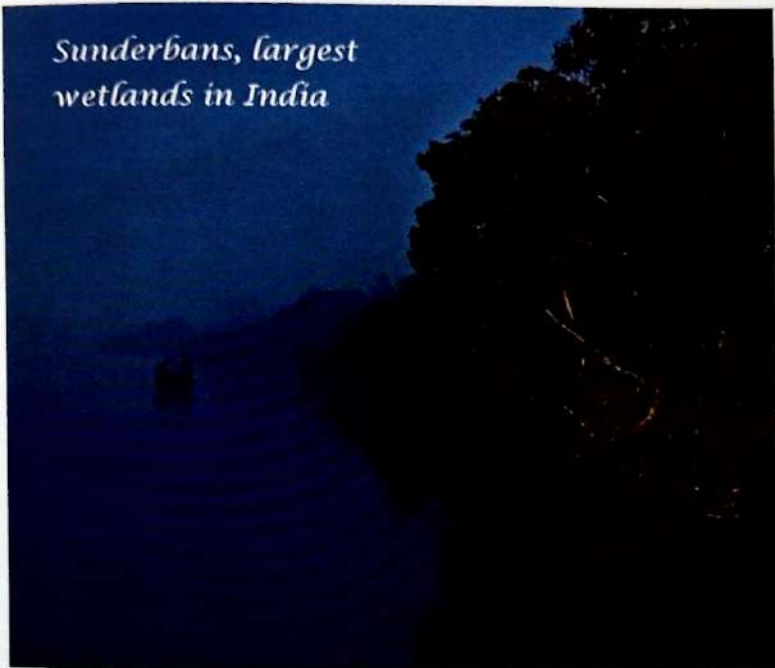


### Introduction

A wetland is an area that is either flooded or inundated with water. So, wetlands are the special ecosystems where water is the main component and is associated with special variety of flora and fauna. The water is often

groundwater, seeping up from an aquifer or spring. A wetland's water can also come from a nearby river or lake. Seawater can also create wetlands, especially in coastal lagoons that experience strong tides, shores,

### *Sunderbans, largest wetlands in India*



rocky areas and coral areas. They are the most productive ecosystems and supports both terrestrial and aquatic species. A wetland is entirely hydrated with water permanently or for a part of the year. The depth and duration

flooding varies. Wetlands are transition zones. They are neither totally dry land nor totally underwater; they have characteristics of both. Wetlands referred by many names, such as swamps, sloughs, peats, marshes, bogs, fens, potholes, and mires. Most scientists consider swamps, marshes, and

Wetlands are transition zones. They are neither totally

### Importance Of Wetlands:

- Wetlands are important because they:
- Help in improving water quality.
- Provide habitat for special kind of wildlife.
- Maintain ecosystem productivity.



- Reduce coastal storm damage.
- Provide recreational opportunities.
- Improve the water supply.
- Provide best opportunities for education

## Classification of Wetlands in India

There are two main classifications for wetlands:

Inland Wetlands.

Coastal Wetlands

Functions Of Wetlands In India:

**Source of Water:** Our principal source of fresh water comes from wetlands. Over 95% of all available freshwater is contained in aquifers, making it the most significant source of drinking water and agriculture.

**Wetland Products:** Fish, one of the most significant sources of animal protein, is produced by nearly two-thirds of coastal wetlands.

**Water Purifier:** Wetlands help to purify water by encasing pollutants in plants and sediments. High levels of pollutants, such as phosphorus and nitrogen, which are commonly linked to agricultural runoff, can be significantly reduced by wetlands.

**Wetland for Research and Education:**

Wetlands are important locations for study and learning about aquatic ecosystems. Example: The Bhoj wetlands in Madhya Pradesh and the Bhitarkanika Mangroves in Odisha.

## Recreation Property of Wetlands:

Because of their natural beauty and variety of plant and animal life, wetlands provide ideal getaways.

**Habitats of Migratory Birds:** Migratory birds stop over at wetland areas for feeding, resting, and building their nests. To avoid the harsh winters of the arctic and temperate zones, about 2,000 bird species regularly move thousands of kilometres between breeding and non-breeding locations throughout the year.

**Biodiversity Hotspots:** A diversity of endemic and nearly extinct species can be found in certain wetlands.

**Conclusion:** Serious consequences, including increased flooding, species decline, deformity, or extinction and decline in water quality could result. Wetlands are also important as a genetic reservoir for various species of plants including rice, which is a staple food for 3/4th of the world's population.

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- <https://education.nationalgeographic.org/resource/wetland>
- <https://www.ramsar.org/about/our-mission/importance-wetlands>



## TYPES OF WETLANDS

**Estuaries:** A very diverse range of biodiversity can be found in the region where rivers meet the sea and the water transitions from fresh to salt. These wetlands consist of salt marshes, tidal mudflats, and deltas.



**Marshes:** These are characterised by herbaceous (non-woody) flora that is acclimated to moist soil conditions and are occasionally saturated, flooded, or ponded by water. Tidal marshes and non-tidal marshes are further classifications for marshes.

**Bogs:** These are wet peat soils found in former lake basins or other natural depressions. Bogs receive almost all of their water from rainfall.

**Swamps:** Trees and shrubs predominate above them, which are mostly nourished by surface water sources. Swamps can be found in saltwater or freshwater floodplains.



## ARTICLE ON BIODIVERSITY IN PLANTS

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### Introduction:

In general, biodiversity generally refers to diversity, or variability of living organisms from the smallest bacteria to complex plants and animals present on this planet earth. And it is referred to even other species which have driven to extinction million years ago. biodiversity, every single living species has an equally important role in the ecosystem. the term biodiversity was coined by walter G.Rosen in the year 1986 .

As we all know, the term biodiversity refers to the measure of the variety of living species existing in the different ecosystems and this may either refer to the ecosystem variation, or the genetic variation or the species variation within a region, biome or the planet. Biodiversity can be studied at many levels. at the highest level, we study the different species existing on the entire earth. on a much smaller species within a pond or a neighbourhood garden. discovering, identifying and understanding between all the living organisms on the planet earth are some of the greatest challenges in science.



## Biodiversity in plants

The diversity of plants on the planet earth is an important resource for food, shelter and agriculture about thousands of plant crop species have been identified, developed, used and relied on for the purpose of food and agricultural production in human history. these plants include bushes, grasses, herbs, shrubs, trees, vines, fern, and mosses. through the process of photosynthesis, plants provide us with the oxygen which we breathe and the sugars that provide the primary fuel for life. There is a great variation in the biodiversity, resulting from human and ecosystem. Interaction for certain food and ecosystem interaction for certain food and development for the survival of the human population, regardless of the pests, climate fluctuations, diseases, droughts and other unexpected environmental events. currently, there are only few crops species which provide us with food and essential energy

requirements for the total human population all around the world. these crops include rice, wheat, maize, cereals, pulses, etc. as per the requirements on this moderately small number of crops for global food security, it will be essential to maintain a continuity of these plants' species along with the increasing environmental stress and to provide opportunities for the farmers to breed a greater number of crops that can be cultivated under unfavourable conditions such as poor soil, salinity, drought, flooding and extreme temperatures.

## Threats to plant Biodiversity

Plants play a key role in ecosystems. they are a source of food and medical compounds while also providing raw materials for many industries. rapid deforestation and industrialization. however, threaten plant biodiversity. in turn this threatens the ecosystem.

## PLANT DIVERSITY





Biodiversity of plants ensures a resource for food crops and medicines. plant life balances ecosystems protect watersheds, miligates erosion, moderates climate, provides sheleter for many animal species. threats to plant diversity , however come from many angles . the explosion of the human population, especially in tropical countries where birth rates are the highest and economic development is in full swing, is leading to human encroachment into forested areas. to feed the larger population, humans need to obtain arable land which leads to massive clearing, of trees. the need for more energy to trees. the need for more energy to power larger cities and economic growth results in the construction of dams, the consequent flooding of ecosystems and increased emissions of pollutants. the other threats to tropical forests come from poachers who log trees for their precious wood. Examples of endangered tree species

**Conclusion:** Diversity can also increase the resistance of ecosystem productivity to climatic extremes [28]. If ecosystems have value because they provide services to humans and ecosystems function better when they contain more species, then the loss of species could diminish the value of ecosystems.

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Image source<http://dx.doi.org/10.1023/a:1026536223478>  
[https://commons.wikimedia.org/wiki/File:Plantae\\_Diversity.jpg](https://commons.wikimedia.org/wiki/File:Plantae_Diversity.jpg)



## GLOBAL WARMING

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### Introduction:

Global warming refers to the gradual rise in the overall temperature of the atmosphere of the Earth. There are various activities taking place which have been increasing the temperature gradually. Global warming is melting our ice glaciers rapidly. This is extremely harmful to the earth as well as humans. It is quite challenging to control global warming; however, it is not unmanageable. The first step in solving any problem is identifying the cause of the problem. Therefore, we need to first understand the causes of global warming that will help us proceed further in solving it. In this essay on Global Warming, we will see the causes and solutions of Global Warming.

### Causes of global warming

Global warming has become a grave problem which needs undivided attention. It is not happening because of a single cause but several causes. These causes are both natural as well as manmade. The natural causes include the release of greenhouses gases which are not able to escape from earth, causing the temperature to increase. Some of the major causes are as follows:

#### Generating power

Generating electricity and heat by burning fossil fuels such as coal, oil, and natural gas causes a large chunk of global emissions.

### Manufacturing goods

Manufacturing and industry produce emissions, mostly from burning fossil fuels to produce energy for making things like cement, iron, steel, electronics, plastics, clothes, and other goods.

#### Cutting down forests

Cutting down forests to create farms or pastures, or for other reasons, causes emissions because when trees are cut, they release the carbon they have been storing. Since forests absorb carbon dioxide, destroying them also limits nature's ability to keep emissions out of the atmosphere.





Image source: [https://commons.wikimedia.org/wiki/File:Human\\_fingerprints\\_for\\_global\\_warming.jpg](https://commons.wikimedia.org/wiki/File:Human_fingerprints_for_global_warming.jpg)

### Producing food

Food production requires energy to run farm equipment or fishing boats, usually with fossil fuels. Growing crops can also cause emissions, like when using fertilisers and manure. Cattle produce methane, a powerful greenhouse gas. And emissions also come from packaging and distributing food.

### Powering buildings

Globally, residential and commercial buildings consume over half of all electricity. As they continue to draw on coal, oil, and natural gas for heating and cooling, they emit significant quantities of greenhouse gas emissions

### Conclusion

In conclusion, climate change is the most significant problem facing the world. Global warming is increasing day by day. If we cannot prevent it as soon as possible, our world will face undesirable consequences.

Artificial intelligence and machine learning, which have been quite advanced recently, is our immense weapon in the fight against climate change.

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## Urban sprawl

G. V. Vinay, II BSc BZC

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### Introduction: -

Urban sprawl and industrialization are entangled to global warming. It is mainly due to the unplanned urban development. It is also called as metropolitan sprawl. It has become a major problem in urban and semi urban areas.

### Impact of urban sprawl: -

Urban sprawl in India has extensive environmental outcomes, affecting herbal assets, biodiversity and the general ecological stability:-

- **Loss of Agricultural Land and green spaces:**

City sprawl frequently results in the conversion of fertile agricultural land into built-up areas, resulting within the loss of critical meals-generating areas. according to the Indian space research organization (ISRO), among 2000 and 2014, India misplaced about 6.2 million hectares of agricultural land to urbanization (ISRO, 2016). This loss threatens food security and increases dependency on imports. additionally, the destruction of inexperienced spaces and flora reduces carbon Sequestration, exacerbating weather alternate influences.

### Degradation of natural sources:

Urban sprawl places sizeable stress on herbal resources, such as water, air, and soil. improved construction and infrastructure development lead to the depletion of groundwater sources, mainly in peri-urban areas. The indiscriminate use of groundwater for city purposes affects neighbourhood ecosystems and might result in water shortage. furthermore, the discharge of untreated sewage and commercial effluents into water bodies contributes to water pollutants, impacting aquatic lifestyles and public health.

### Loss of Biodiversity and Ecological Disruptions:

Urban sprawl fragments and encroaches upon natural habitats, resulting in the loss of biodiversity and disruptions to ecological systems. The destruction of forests, wetlands, and natural ecosystems leads to the displacement and extinction of plant and animal species. This loss of biodiversity negatively impacts ecological balance, pollination processes, and natural pest control mechanisms, increasing the vulnerability of ecosystems to invasive species and diseases.



## **Waste Generation and Management:**

Urban sprawl generates significant amounts of waste due to increased consumption and population density. Inadequate

waste management systems in rapidly expanding urban areas result in improper disposal, leading to pollution of land,

water, and air. Not only the environmental but also urbanization cause more social impacts like informal settlements, life quality health risks, inequality and segregation etc.

## **Solutions**

There are many solutions to help reduce negative effects of urban sprawl.

### **Better transport facilities:**

Reducing the need for transport is one of the most effective solutions to reduce the negative effects of urban sprawl. Cities should build public transportation systems that help people get to the city centre efficiently.

### **More use of public transport than private vehicles:**

Limiting the use of private cars and expanding public transportation systems is another way to reduce urban sprawl. This will help reduce the strain on transport infrastructure and reduce the amount of pollution.

### ***4. encourage building communities, not individual houses***

Building communities involves more than just building new houses. It involves building places where residents can meet each other and interact. This starts from the developments themselves.





## Conclusion: -

City sprawl in India has massive impacts on the environment, society and the economy. Sustainable urban development practices and powerful sprawl control strategies can assist mitigate these bad impacts. via adopting included city making plans processes, setting compact and blended -use improvement, making an investment in green public transportation, keeping green spaces and agricultural land, and presenting less costly housing options, furthermore, embracing transit-oriented improvement, implementing smart metropolis initiatives, and engaging stakeholders in selection- making tactics make a contribution to sustainable urban development. these strategies facilitate monetary boom, beautify social inclusivity, improve environmental exceptional, and create liveable cities for gift and future generations. but effective implementation calls for robust coverage frameworks, regulations, and monitoring mechanisms.

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- **Image** **source:**  
[https://commons.wikimedia.org/wiki/File:Urban\\_sprawl\\_as\\_seen\\_from\\_Tokyo\\_tower\\_towards\\_West.jpg](https://commons.wikimedia.org/wiki/File:Urban_sprawl_as_seen_from_Tokyo_tower_towards_West.jpg)



## Did you know?

x x x x



### **Amorphophallus Titanum (Titan Arum)**

This strange-looking plant is only found in the botanical garden of the area, known as Rose Hills of Huntington. This moody plant only blooms occasionally and it looks like a flower with a red outing with an inner beige colour wick. This is one of the rarest and beautiful plants in the world.



**S Nagesh**

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## **Introduction**

Biodiversity in simple terms defined as the diversity of life. The variability among living organisms for all sources including terrestrial, marine and other aquatic eco systems and ecological complexes of there are the part; includes diversity within species of eco system.

Biodiversity on the planet earth determines the capability of nature to product resources required for human existence. The mere sustenance of humanity depends on biodiversity. Daily needs for subsistence. Biodiversity secure various resources for survival for uncontaminated water, air and food to traditional and modern medicines. Biodiversity loss is not only environmental problems, but also eventually turn into developmental challenges left neglected development boosters at high risk due to loss of biodiversity.

The uninterrupted biodiversity loss could lead to less nutrition, decreased wild foods, impoverished pollination and subordinate less irrepressible agriculture systems result in more vulnerability to agrichemicals decreased traditional medicine access less chance for development of drugs leading to surpassing disease strains.

suppression.

## **RIDDLE**

**I bloom when the moon is high,**

**“My fragrance fills the night sky.**

**“My white flowers are a beautiful sight,**

**“But only when it's dark, I shine so bright.”**

**What am I?**

**Ans: Night Jasmine (*Cestrum nocturnum*)**

**K. Devi, II BZC.**



## Causes of biodiversity loss

- **Habitat loss:**

Thinning, fragmenting or outright destruction of an eco systems plant,so hybrologic and nutrient resources.

- **Invasive species:**

Any non-native species that significantly modifies or disrupts the eco system.

- **Over exploitation:**

Process of harvesting to many aquatic or terrestrial animals, which depletes the stocl of some species while driving others to extinction.

- **Pollution:**

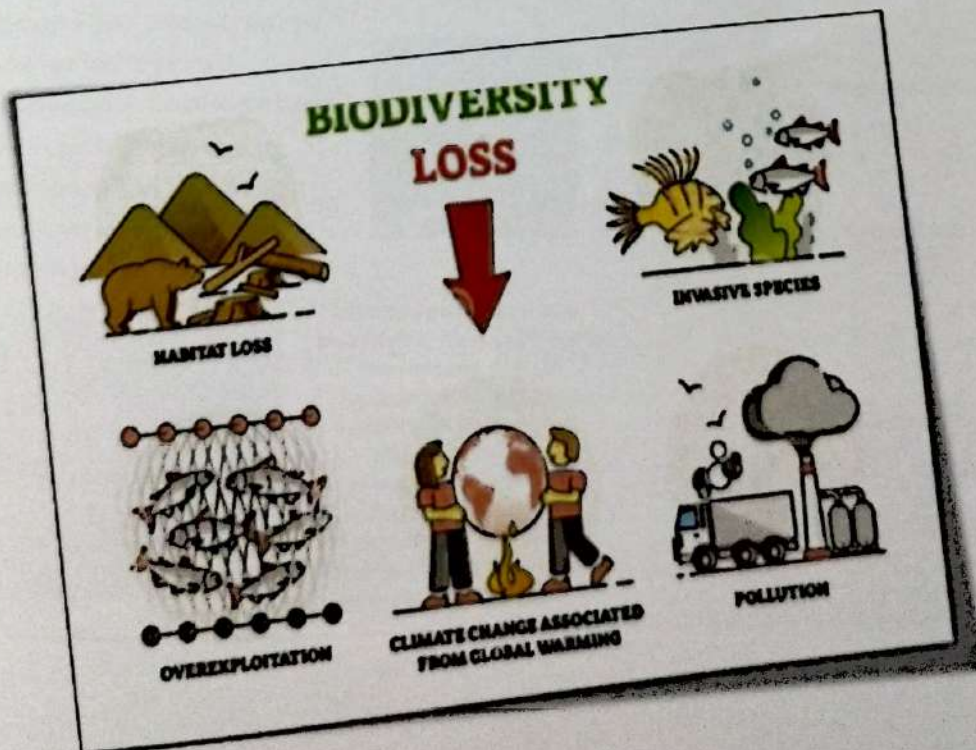
Air pollution, water pollution and land pollution.

Any substance is any form of energy to the environment at rate faster than can l rendered harm less.

- **Climate change associated with global warming:**

Modification of earth climate associated with rising levels of extreme weather, risir sea levels ocean acidification. Greenhouse gases in the atmosphere over the past on to two centuries.

## Conclusion:





**Conclusion:**

The primary causes for biodiversity loss is due to impact of mankind on worlds natural system. Several factors discussed such as pollution, hunting, invasive species, habitat loss and degradation, exploitation of natural resources etc. Biodiversity loss as severe negative impact on all the living organisms including human beings. It is our responsibility to save our planet and take some curcial steps prevents the loss of biodiversity. This is highly significant if we wish secure an inhabitable planet for next generation and for all the plants and animals.

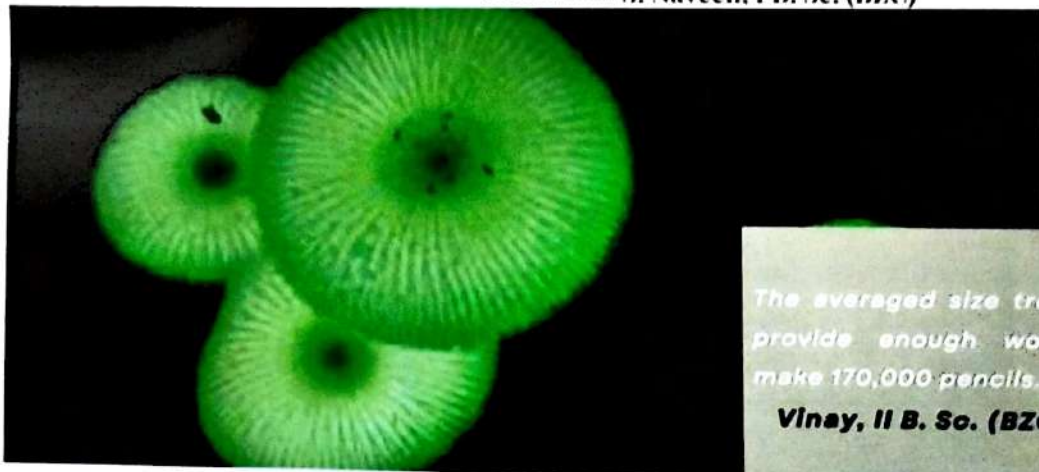
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## *Mycena chlorophos* - Bioluminescent Fungi It create an Enchanting Natural Light Display in The Forest

----- S. Naveen, I B. Sc. (BZC)



The averaged size tree provide enough wood make 170,000 pencils.

Vinay, II B. So. (BZC)



Bananas contain natural chemicals and compounds that can make people happy. So, it would not be wrong if we say it is a Happy Fruit!

G. Viernikumari,  
II B. Sc. (BZC)

The earliest fossil evidence for life on Earth is bacterial layered macroscopic sedimentary structures known as "stromatolites" dating back 3.45 billion years.

Narasimha, II B. Sc. (BZC)



*Mimosa pudica* is well known for its rapid plant movement. Like a number of other plant species, it undergoes changes in leaf orientation termed "sleep" or nyctinastic movement. The foliage closes during darkness and reopens in light.



The first Indian woman botanist, E K Janaki Ammal



Which animals can jump higher than a tree?  
A: All of them. Trees can't jump!

The Jasmine flower, which is the state flower of Andhra Pradesh, is also called the "King of Oils" due to its sweet and pungent smell, which attracts everybody.





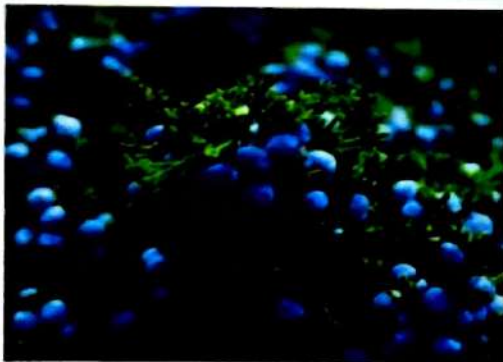
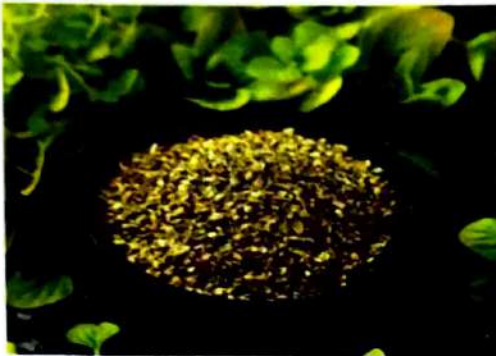
## MEDICINAL PLANTS IN WILD VARIETIES

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## Introduction

In India, extensive knowledge of ethnobotany dates back to ancient times. The subject of ethnobotany has increased since the 1950s; 300 papers and 10 volumes have been published. A dictionary of Indian folk medicine and ethnobotany that contains 2532 plants is the outcome of our labor over the course of four decades in the field and in literary studies. There are over 45000 plant species in India, and thousands of them have been given medical benefits. The number 2000 appears frequently in the literature, although 500 are typically used in native systems. Despite having ancient (4500–1500 BC) roots and a lengthy history of use, Ayurveda has had little formal support over the past two centuries, which has led to less attention from reputable medical professionals and scholars. Currently, a lot of research is being done on the botany, pharmacology, chemistry, and biotechnology.

People have relied on plants for their basic requirements, such as food, shelter, medicine, fuel, and cow feed, since ancient times. Due to a lack of advanced medical services and limited financial resources, approximately 80% of the world's population relies on plant-based medications to manage their main healthcare system. 4,22,000 plant taxa from throughout the world have been reported, and 50,000 of those have been approved for use in herbal medicines. About 25% of allopathic medication, according to B. Tribes, comes from plant sources. According to a World Health Organization survey, the market for medicinal herbs generated 62 billion US dollars in the year of 2012.

In the Himalayan area, certain plant species are unique. Approximately 46% of the higher plants that are native to the Himalaya and are known to exist in India are unique to that region. Sixty-two species of medicinal plants are endemic to the Himalaya while 208 others extend their distribution into nearby places, making them near endemics. Of the total number of medicinal plant species. Himalayan medicinal herbs, which number over 200 species, can be used in food products including oil, spices, jams, pickles, roasts, boils, fried foods, and roasts. Some types of medicinal plants are used by the local tribes for food, fibre, medicine, and a variety of other ethnobotanical reasons. The fruits of *Myrica esculenta* and *Terminalia bellirica*, for instance, are consumed in addition to being used as remedies.

Northern Indian Hindus frequently use *Origanum vulgare* (Oregano), *Saussurea obvallata* (Brahma Kamal), *Ocimum sanctum* (Tulsi), *Cedrus deodara* (Himalayan deodar), *Cynodon dactylon* (Bermuda grass), *Aegle marmelos* ((Bilwa), *Juniperus communis* (Common Juniper), *Musa paradissica* (Banana), *Nardostachys grandiflora* (Muskroot), *Zanthoxylum armatum* ((Prickly ash), *Ficus benghalensis* (Indian Banyan) and *Ficus religiosa* (Bodhi tree)



as medicinal and religious plants. The *Terminalia chebula* plant is considered a significant medicinal plant by the Buddhist community in northern India.

## Conclusion

The current inquiry offers the first ever ethnomedical data on the wild medicinal plants used by the local community in Pakistan's Lower Chitral region's Garam Chashma valley. A total of 83 wild medicinal plant species from 69 genera and 36 plant families have been identified for use in traditional medicine to treat 95 different diseases. The current investigation highlights the valley's remarkable amount of traditional knowledge about therapeutic plants as well as its vast plant biodiversity among the Asteraceae families. Since the majority of medicinal plant species are found in forests, it is our duty to protect them for future generations.

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## A MONOGRAPH ON DRYLAND FARMING

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### Dryland farming

Dryland farming and dry farming encompass specific agricultural techniques for the non-irrigated cultivation of crops. Dryland farming is associated with drylands, areas characterized by a cool wet season (which charges the soil with virtually all the moisture that the crops will receive prior to harvest) followed by a warm dry season. They are also associated with arid conditions, areas prone to drought and those having scarce water resources.



### Dryland farming process

The dryland farming process is a way of growing crops that relies solely on natural rainfall. It is important to choose the right crop for the area due to the limited availability of water. Crops such as wheat, barley, oats, potatoes, and beans are all suitable for dryland farming. When dry farming, some plants may be given more space between them, which allows for better use of the available water. Aside from plant selection, finding soil with the right characteristics is also important. Clay, silt, and loam soils are preferred by many dryland farmers due to their ability to retain moisture.



## Benefits of dryland farming

- Arid lands become fertile fields.
- Disposable items associated with irrigation (hoses, plastic sprinklers, etc.) are unnecessary.
- Dry-farmed crops store longer.
- Fruit and vegetables are more flavorful.
- Implementing dryland agricultural methods enhances humankind's ability to cope with climate change.
- Resources are conserved, including: energy, water, labour and time.
- The health of the soil increases.
- The need for herbicides and fertilizer are practically eliminated.
- Weeds are controlled because water is not readily available.

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## FLOWERS IN POEMS

No one in this world who is not attracted and influenced by flowers. Many authors written poems on flowers are compiled here.

Kavya, Chandana & Ramesh

I Bt. B. C

Ah Sun-flower! weary of time, who contest the steps of the Sun: Seeking after that sweet golden clime Where the travellers' journey is done. Where the Youth pined away with desire, And the pale Virgin shrouded in snow: Arise from their graves and aspire, Where my Sun-flower wishes to go.

**Sun flower by William Blake**



**Daffodil By by William Wordsworth**

Fluttering and dancing in the breeze. Continuous as the stars that shine

And twinkle on the milky way,  
They stretched in never-ending line  
Along the margin of a bay:  
Ten thousand saw I at a glance,  
Tossing their heads in sprightly dance.  
The waves beside them danced, but they  
Out-did the sparkling waves in glee:  
A poet could not be but gay,  
In such a jocund company:

**Daffodil By by William Wordsworth**



Daisies, by Rose Terry Cooke  
Air and peaceful daisies,  
Smiling in the grass,  
Who hath sung your praises?  
Poets by you pass,  
And I alone am left to celebrate your mass.  
In the summer morning,  
Through the fields ye shine,  
Joyfully adorning  
Earth with grace divine,  
And pour, from sunny hearts, fresh gladness into mine.  
Lying in the meadows,  
Like the milky way,  
From nocturnal shadows  
Glad to fall away,  
And live a happy life in the wide light of day.  
Bees about you humming  
Pile their yellow store,  
Winds in whispers coming  
Teach you love's sweet lore,



For your reluctant lips still worshipping  
the more.

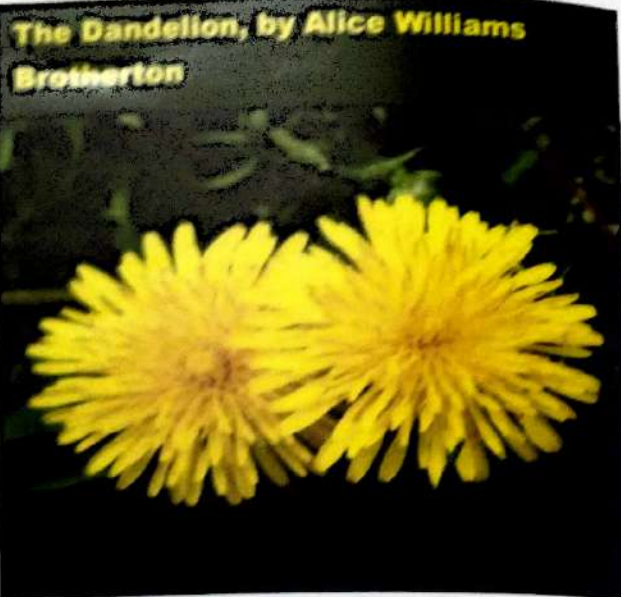
Birds with music laden  
Shower their songs on you;  
And the rustic maiden,  
Standing in the dew,  
By your alternate leaves tells if her love  
be true.

Little stars of glory!  
From your amber eyes  
No inconstant story  
Of her love should rise!  
And yet "He loves me not!" is oft the sad  
surprise.

Crowds of milk-white blossoms!  
Noon's concentrated beams  
Glowing in your bosoms;  
So, by living streams  
In heaven, I think the light of flowers  
immortal gleams.

When your date is over,  
Peacefully ye fade,  
With the fragrant clover  
And sweet grasses laid,

**Daisies,**  
by Rose Terry Cooke



The Dandelion, by Alice Williams Brotherton

The Dandelion

The dandelion disks of gold

Like mimic suns the greensward  
dot,

In woods beyond the meadow-lot

The violet's shy blue eyes unfold.

Bid blithe farewell to winter's cold

And troop to field from hall or cot

The dandelions disks of gold

Like mimic suns the greensward  
dot.

I'm jealous, sweet, lest you should  
hold

The primrose dearer!--Ah, be not

In English primrose time forgot

Our own gold-daisy, brave and bold,

The dandelion--whose disks of gold

Like mimic suns the greensward  
dot!



## A Red, Red Rose by Robert Burns



O my luve's like a red, red rose,  
That's newly sprung in June;  
O my luve's like the melody  
That's sweetly played in tune.

As fair art thou, my bonnie lass,  
So deep in love am I;  
And I will love thee still, my dear,  
Till a' the seas gang dry.

Till a' the seas gang dry, my dear,  
And the rocks melt wi' the sun:  
O I will love thee still, my dear,  
While the sands o' life shall run.

And fare thee weel, my only love,  
And fare thee weel awhile!  
And I will come again, my love,  
Though it were ten thousand miles.

Forget-me-not."  
~Ethel Ridley

It's said that ages, long ago,  
when God had formed the earth and heaven,  
He called the flowers one by one  
until to all sweet names He'd given:  
to one, pure Lily, another Rose  
another Violet, or Daisy fair,  
as each bright flower before Him passed,  
to wear anew its father's care.

One day a tiny flower with pale blue eye,  
stood at the Father's feet and gazing in His  
face,  
it said, in low and trembling tone  
and with a modest grace,  
"Dear God, the name You gave to me,  
alas I have forgot!"  
Then kindly looked the Father down  
and said: "



FORGET - ME NOT  
BY ETHEL RIDLEY



## Tulips by A. E. Stallings



### Tulips by A. E. Stallings

The tulips make me want to paint,  
Something about the way they drop  
Their petals on the tabletop  
And do not wilt so much as faint,

Something about their burnt-out hearts,  
Something about their pallid stems  
Wearing decay like diadems,  
Parading finishes like starts,

Something about the way they twist  
As if to catch the last applause,  
And drink the moment through long straws,  
And how, tomorrow, they'll be missed.

The way they're somehow getting clearer,  
The tulips make me want to see—  
The tulips make the other me  
(The backwards one who's in the mirror,

The one who can't tell left from right),  
Glance now over the wrong shoulder

### The Lily, by William Blake



butterfly

December, 2022

## The Violet By Jane Taylor

Down in a green and shady bed,  
A modest violet grew,  
Its stalk was bent, it hung its head,  
As if to hide from view.

And yet it was a lovely flower,  
Its colours bright and fair;  
It might have graced a rosy bower,  
Instead of hiding there,

Yet there it was content to bloom,  
In modest tints arrayed;  
And there diffused its sweet perfume,  
Within the silent shade.

Then let me to the valley go,  
This pretty flower to see;  
That I may also learn to grow  
In sweet humility.

## THE VIOLET BY JANE TAYLOR VIOLA



### The Lily William Blake

The modest Rose puts forth a thorn,  
The humble sheep a threat'ning horn:  
While the Lily white shall in love delight,  
Nor a thorn nor a threat stain her beauty bright.



## THISTLE BY TED HUGHES



One day a tiny flower with pale blue eye,  
stood at the Father's feet and gazing in His  
face,  
it said, in low and trembling tone  
and with a modest grace,  
"Dear God, the name You gave to me,  
alas I have forgot!"  
Then kindly looked the Father down  
and said: "Forget-me-not."  
-Ethel Ridley

Against the rubber tongues of cows and the  
hoeing hands of men  
Thistles spike the summer air  
And crackle open under a blue-black  
pressure.

Everyone a revengeful burst  
Of resurrection, a grasped fistful  
Of splintered weapons and Icelandic frost  
thrust up

From the underground stain of a decayed  
Viking.  
They are like pale hair and the gutturals of  
dialects.  
Every one manages a plume of blood.

Then they grow grey like men.  
Mown down, it is a feud. Their sons appear  
Stiff with weapons, fighting back over the  
same ground.

## Poppies by Jane Weir

Three days before Armistice Sunday  
and poppies had already been placed  
on individual war graves. Before you left,  
I pinned one onto your lapel, crimped petals,  
spasms of paper red, disrupting a blockade  
of yellow bias binding around your blazer.

Sellotape bandaged around my hand,  
I rounded up as many white cat hairs  
as I could, smoothed down your shirt's  
upturned collar, steeled the softening  
of my face. I wanted to graze my nose  
across the tip of your nose, play at  
being Eskimos like we did when  
you were little. I resisted the impulse  
to run my fingers through the gelled  
blackthorns of your hair. All my words  
flattened, rolled, turned into felt,

Slowly melting. I was brave, as I walked  
with you, to the front door, threw  
it open, the world overflowing  
like a treasure chest. A split second  
and you were away, intoxicated.  
After you'd gone I went into your bedroom,

## Poppies by Jane Weir





HARITHA KRISHNA ECO CLUB  
&  
DEPARTMENT OF BOTANY



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