

AQUATIC BIODIVERSITY AND MARINE POLLUTION

LIFE E-NEWSLETTER

THE QUATERLY NEWSLETTER OF TEAM LIFE

VOLUME 12 ISSUE 1

EDITOR'S DESK

WRITTEN BY MOKSHADA MALI

Dear Readers,

I hope you all are fine and eager to read the 1st edition of Zoology Life Newsletter of academic year 2022-2023. We are excited to share the articles and photos with you. As most of you are aware that this year's theme is **AQUATIC BIODIVERSITY AND MARINE POLLUTION**, we are excited to share our array of work based on the above theme with you.

Newsletter comprises some articles related to theme and some offbeat. One need not to be science student to read the Newsletter as it is made keeping general public in mind .

Watching aquatic biodiversity even on mobile phone is completely treat for eyes. Bioluminescence, lionfish, feather star, leafy sea dragon these aquatic animals and their movements are very therapeutic to watch. If you have not heard about it do give a check, I know you will feel same.

This Newsletter is fruit of our labour and we hope you will enjoy it. Happy Readings.

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PHOTO GALLERIA

Editor: Life E-Newsletter 2022-2023

Contact: editor.lifeneewsletter@gmail.com

BIOLUMINESCENCE

WHAT IS BIOLUMINESCENCE?

Bioluminescence is the production and emissions of light energy by certain living organisms that may be vertebrate or invertebrate.

WHAT IS THE USE OF BIOLUMINESCENCE AND WHICH ORGANISMS USE IT?

Bioluminescence is used by many different organisms such as fireflies, jellyfish, noctiluca, anglerfish and even fungi. Though the function of bioluminescence is not known for every glowing organism but jellyfishes use it mostly for defense against potential predators by either startling a predator or confuse them by detaching one of its glowing tentacles as decoys. Bioluminescence can also be used by fungi to spread the fungal spores. The glowing fungus attracts many insects that are positively pototactic such as certain species of beetles and flies that help the fungus to spread its spores and ensure species survival. Anglerfish also uses bioluminescence to attract the prey by glowing its esca which is a modified dorsal ray.



Aaryan Nakum
SYBSC/ div A

WHAT ARE THE CHEMICAL PROCESSES THAT HELP AN ORGANISM TO PRODUCE LIGHT WITHIN ITS BODY?

To produce light an organism has presence of luciferin and luciferase enzyme in which luciferin reacts with oxygen which helps in releasing energy due to which light is emitted and the enzyme luciferase facilitates this reaction. To continually emit light an organism must produce luciferin all the time through its diet.

THE DEEP SEAFLOOR CAN BE A VERY DARK, COLD AND AN INHOSPITABLE PLACE AND RESOURCES ARE OFTEN SCARCE. BIOLUMINESCENCE IS A FASCINATING SUPERPOWER AND A SPECTACULAR PHENOMENON THAT'S IMPOSSIBLE TO IGNORE AT NIGHT THAT HELPS DIFFERENT ORGANISMS TO CAMOUFLAGE AND ATTRACT PREY.

NO ESCAPE FROM POLLUTION EVEN FOR THE DEEPEST PLACE ON EARTH — THE MARIANA TRENCH

Plastic is present in our everyday lives. Some plastics we will utilize or recycle and several play vital roles in areas like **drugs** and public safety but different things, like straws, are designed for not more than one use. In fact, over forty percent of plastic is employed just once before it's thrown away, it lingers within the setting of an environment for a long time. It usually breaks down into smaller and smaller particles, known as **microplastics**, which may be eaten by animal and folks. The Mariana Trench—The deepest point in the ocean extends nearly **10,975 meters** down. However, if you thought the Trench could escape the world onslaught of plastic pollution, you'd be wrong. A study discovered that a bag, just like the kind given away at grocery stores, is currently the deepest famed piece of plastic trash, found at a depth of 10,975 meters within the Mariana Trench. Isn't that crazy! Scientists found it by exploring through the Deep Sea Debris Database, a set of photos and videos taken from 5,010 dives over the past thirty years that was recently made public.



Most of the plastic a large **eighty nine percent** was the kind of plastic that's used once then thrown away, sort of a **plastic bottle** or **disposable implements**. While the Mariana Trench could seem sort of a dark, lifeless pit, it hosts additional life than you would possibly assume. **NOAA's** Okeanos human vessel

searched the region's depths in 2016 and located various life forms, as well as species like **coral**, **jellyfish**, and **octopus**. The recent study conjointly found that seventeen percent of the photographs of plastic logged within the Database showed interactions of some kind with marine life, like animals being entangled within the debris.

Swati Yadav
 SYBMS(Finance)

CORAL BLEACHING

WHAT ARE CORALS AND CORAL REEF?

When corals are mentioned most people thinks about is beautiful rocks beneath the water. Usually people have mistaken these corals for non-living things but Corals are considered as **living things**. Corals are small, **plankton** eating invertebrates which are called **polyps** living in a colony. **CORAL REEF** are made up of colonies of hundreds to thousands of these individual corals.



WHAT IS CORAL BLEACHING?

Due to the increase in pollution and global warming, the temperature of the sea are rising and as these corals are sensitive to temperature they tend to lose their colours.

Corals establish a symbiotic relationship with a type of seaweed algae called as zooxanthellae, this algae lives in them(corals) and determine their colour. Coral bleaching happens when corals lose their colours and turn white. When corals get affected by factors like heat or pollution, they start repelling this alga and as this algae leaves (a white skeleton is left behind) the corals start to lose their colour until it looks like bleach(white). This is known as coral bleaching. Corals are very sensitive to temperature changes.

Coral reefs are not just beautiful coloured background but they are vital to life on earth as atleast a quarter of world's marine life need coral reef for some part of their life as this reef provides **shelter** and gives **protection** to smaller fishes from predator. As these coral reef grows they protect the coastal areas by reducing the **waves force** hitting the coast.



THE GREAT GARBAGE PACIFIC PATCH

WHAT ARE GARBAGE PATCHES?

For most people it is an island of trash floating in the ocean but garbage patches are almost entirely made up of **Microplastics** and **Marine debris**.

HOW DO GARBAGE PATCHES FORM?

Garbage patches are formed from discarded fishing equipment, plastic wastes, microplastics etc also called as **marine debris**. It is formed by "gyres", which are large system of swirling ocean current. These gyres are similar to **cyclones**, as they are areas of **low pressure** that spin with a centre that is quiet and stable.

WHICH IS THE LARGEST GARBAGE PATCH IN THE WORLD?

The great pacific garbage patch is the largest garbage patch in the world and is located in the **northern pacific ocean**. It occupies 1.6 million square kilometres about half the size of our country.



HOW IT AFFECTS THE LIVING ORGANISMS?

The great pacific garbage patch is the largest garbage patch in the world and is located in the northern pacific ocean. It occupies 1.6 million square kilometres about half the size of our country.

HOW CAN WE CLEAN THE GREAT PACIFIC GARBAGE PATCH?

National Oceanic and Atmospheric Administration estimates that it would take over 67 ships in one year just to clean less than one percent of the garbage patch. The patch only stands to get bigger over time, however, so by reducing the amount of plastic we use and making sure to recycle, we can do our part to slow down the growth of this trash vortex.



HUMAN IMPACT ON AQUATIC BIODIVERSITY

Lake Victoria is one of the largest lake in world situated in Africa .

Victoria lake has lost its endemic fish species to large introduced predatory fish .

Nile perch was introduced to the lake in 1950 to boost the fish industry . But the introduction of Nile perch resulted in economic boom and caused extinction of a native fish the cichlids.



Source africafreak.com



Source deepblue.com

We people know about the biodiversity of marine and freshwater. The highest marine biodiversity occurs in coral reef and deep ocean .

The biodiversity is higher near the coast and surface because of habitat and food source variety.

People have destroyed and disrupted a large proportion of world's coastal, marine and freshwater ecosystem. During the past, many years go there was rise of 10-25 cm of the sea level. People destroyed the mangrove forest for shipping purpose, Plastic items are thrown from the ships and it is left on the beaches.

Why it is difficult to protect aquatic biodiversity.

Citizen unawareness, rapid increasing human impacts & much of the damage to the ocean is not visible to most people.

The Florida Manatee

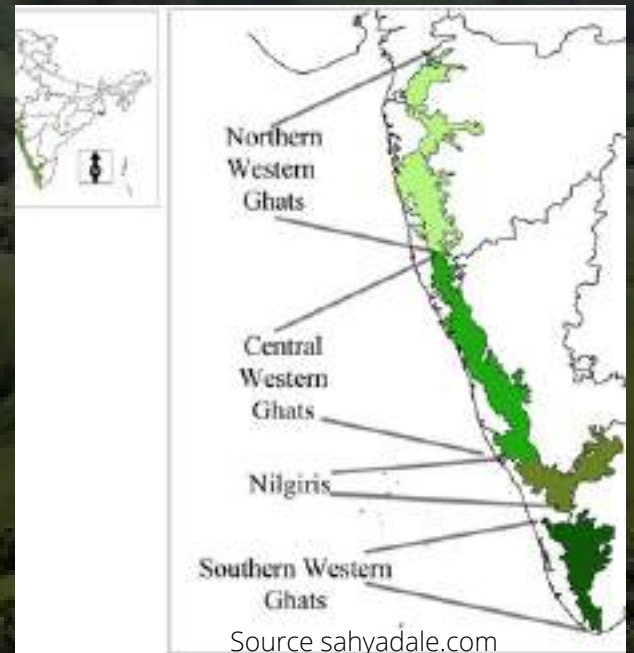
Manatees eat unwanted water hyacinths but now they are endangered due to habitat loss and low reproductive rate.

Saving marine life is important because healthy ocean regulates climate and reduce climate change, impacts the ocean, absorbs 90% of the heat and approximately 30% of carbon dioxide emissions produced by human activities.

THE WESTERN GHATS

The Western ghats were formed during the break-up of the supercontinent of Gondwana around 150 million years ago. They were declared as UNESCO world heritage site in 2012, The Western ghats, also known as Sahyadri hills are one of the most diverse places in the world Older than Himalayas, these mountains running parallel to India's western coast, around 30-50 km inland, the Western ghats are passing through the States of Gujarat, Maharashtra, Goa, Karnataka, Tamil Nadu and Kerala. These mountains cover an area of around 140,000 km² in a 1,600 km long stretch.

The forests of the Western Ghats include some of the best tropical evergreen forests in the world. The Western ghats include around 325 globally threatened species. The globally threatened flora and fauna in the Western Ghats are represented by 229 plant species, 31 mammal species, 15 bird species, 43 amphibian species, 5 reptile species and 1 fish species. Of the total 325 globally threatened species in the Western Ghats, 129 are classified as Vulnerable, 145 as Endangered and 51 as Critically Endangered.



Neelakurinji Flowers



source.worldatlas.com

India is blessed with the Western ghats, which are considered as one of the world's eight "hottest hotspots" out of the 36 recognised biodiversity hotspots on the planet Earth. Unfortunately the Western ghats are facing threats like deforestation, illegal hunting, loss of biodiversity and many other issues. Many plants and animals species who conquered the land millions of years ago are now on the edge of extinction due to destruction of habitat by us Humans, we're the ones who changed everything.

The Western Ghats is a priceless treasure that, once destroyed, can never be recreated by human hand. We have already lost a great deal of the natural wealth of the Ghats, and cannot afford to lose any more. Nature provided us many precious resources since time immemorial, but it's our responsibility not to exploit them. The beauty of Western ghats should be known to everyone of us, it will make us fall in love with its beauty, because when we love something, we protect it.

-Sanket Khambe
SYBSC/A

MARINE POLLUTION

Marine pollution is a combination of chemicals and waste, most of which comes from land and is washed or blown into the ocean. This pollution damages the environment, the health of all organisms, and the economy all around the world. This growing problem needs to be controlled; resulting in which the balance of marine life will be restored.



Marine pollution can occur due to many reasons. Major factors affecting the marine life and water are oil spills which cover the feathers of birds and the gills of fish, littering of plastics and other wastes, ocean mining, discharge of industrial pollutants, etc. These factors result in being harmful to marine organisms and are also a threat to human health.

For example- The reproductive system of marine animals can lead to failure from exposure to poisonous industrial and agricultural chemicals that are released by industries. This can cause an imbalance in the food cycle.

MARINE POLLUTION



**TO SAVE THE
MARINE LIFE FROM
GETTING POLLUTED
WE NEED TO TAKE
MEASURES ON AN
INDIVIDUAL LEVEL
AND A
GROUP/NATIONAL
LEVEL.**

THE MEASURES THAT YOU AND I CAN TAKE ARE:

Use less water so excess runoff and wastewater will not flow into the ocean.

Reduce waste.

Shop wisely.

Fish responsibly.

Practice safe boating.

Reduce the use of single-use plastics.

Spread the word.

Opt for reusable bottles and utensils.

Participate in a beach or river clean-up.

THE MEASURES OUR GOVERNMENT CAN TAKE OR HAVE TAKEN:

Avoid production of products containing Microbeads.

Reduce industrial and agricultural pollutants.

Direct discharge of untreated waste into the oceans has to be stopped and prohibited.

Reduce chemical fertilizer use.

PHOTO GALLERY



Rudra patra TYBSC/A



Felix shekar TYBSC/A



Sanket khambe SYBSC/A



Vedant khokrale SYBSC/A



Saniya khan SYBSC/A



Rajni patwa SYBSC/A