



KERALA STATE BIODIVERSITY BOARD

EKAA

Environment. Kerala. Awareness. Action

E -Newsletter of the Kerala State Biodiversity Board

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World Environment Day Celebrations

World Environment Day is the United Nations day for encouraging worldwide awareness and action to protect our environment. Since 1974, World Environment Day is being celebrated every year on 5th June, engaging governments, businesses and citizens in an effort to address pressing environmental issues. The theme for World Environment Day 2021 was 'Eco-Restoration'. This means preventing, halting and reversing the damages to ecosystem and reversing from exploiting nature to healing it. This World Environment Day also kicked off the UN Decade on 'Ecosystem Restoration' which is a global mission to revive billions of hectares included in various ecosystems by means of restoration programmes.

Kerala State Biodiversity Board celebrated World Environment Day 2021 by conducting diverse activities engaging students and people at large. An online event to celebrate the day was presided by respected Chairman of Kerala State Biodiversity Board, Dr. C. George Thomas. The e-newsletter of KSBB for the month, May was released during the event. Release of a mobile app for monitoring plant growth created with the technical support of National Informatics Center was released by Shri. K. V. Govindhan, KSBB member during the online programme. The app is an excellent initiative for the monitoring tree seedlings from its planting date through all its growth stages. This will be made available in Google Play Store and could be utilized by students or any others interested in plant growth monitoring.

The online event also provided a platform for sharing of experiences of individuals who are actively involved in biodiversity conservation activities in Kerala. This includes Mr. Shaji. N.M, 'the tuber

man of Kerala', Smt. DevakiAmma who made a forest by herself in 5 acres and Sri. Surendran, a mangrove conservationist based on Thalassery. The students across Kerala participated in the event and actively discussed the opportunities and constraints in biodiversity conservation activities. The event also witnessed presentations of the winners of various programmes conducted as part of Children's Biodiversity Congress.

June 8: A day for humanity to celebrate Oceans

Oceans, the "lungs of our planet," provides at least 50% of our oxygen, absorbs about 30% of Carbon dioxide and covers around 70% of our planet. It is the life source, sustaining humankind as well as all other organisms on the planet and also the major shield against global warming. Oceans are home to rich biodiversity and it is also a major protein source for more than a billion people in the world. As per the World Meteorological Organization (WMO), the "blue economy," which is estimated at US\$ 3-6 trillion/year, accounts for more than three quarters of world trade and provide livelihoods for over 6 billion people

The United Nations celebrates World Oceans Day every year on 8th June for celebrating the benefits humankind receives from the oceans and also to create awareness on the individual and collective responsibility to use its resources sustainably. The focus for World Oceans Day 2021 was "The Ocean: Life and Livelihoods," as well as a statement of intentions to meet the Sustainable Development Goal 14, "Conserve and sustainably use the oceans, seas, and marine resources," by 2030. The latest UNESCO report, published in April 2021, shows that, without this protection, the ocean's crucial role in climate control might in the future be diminished.

Presently, we are extracting more from the ocean than can be restored, with 90 percent of major fish populations decimated and 50 percent of coral reefs devastated. To conserve and maintain the ocean and everything it supports, we need to strike a new balance based on a genuine knowledge of the ocean and how civilization interacts with it and the World Oceans Day call for action on the same. By celebrating Oceans day the people all around the world is appreciating all

that the oceans gives us in everyday, from that oxygen that we breathe and the inspiration that motivates our poets.

KSBB organized a Scientific talk on 'Ocean literacy Community participation' by Ms.Aneesha Ani Benedict, Research Assistant, KSBB on the event of World Ocean Day on 8th June 2021 to create awareness on the importance of Ocean biodiversity.

Species Discoveries

New Bryophyte Species from Kerala:

A new species of moss *Bryocurmia malabarica* has been discovered from the Malabar Wildlife Sanctuary, Kozhikode. This is the second species identified from this area from the genus *Bryocurmia* and named after the Malabar region from where it was spotted. The finding has been published in the journal 'ActaBotanicaHungarica'. The habitat of this species is the rocky patches along the stream inside the Sanctuary. The species is distinct from the related species *B. vivicolor* by its light green color and structure of leaves. (*Acta Botanica Hungarica*, 63(1-2), pp.165-170.)



Arachnid rediscovered from Wayanad Wildlife Sanctuary after 150 years



A group of researchers from the Centre for Animal Taxonomy and Ecology (CATE), Christ College, Irinjalakuda have rediscovered a rare spider species named *Chrysvillea volupe* from Wayanad Wildlife Sanctuary after a period of 150 years. They have spotted both male and female specimens from the Sanctuary which was first described by Dr. Ferdinand Anton Franz Karsch in 1868 based on a single male specimen. Both sexes were found in a lemon tree inside a forest patch in Wayanad. The rediscovery was considered as special because the species was believed to be extinct due to the absence of records in past 100 years. The finding underlines the need for more exploratory surveys, especially for the under-studied groups like arachnids in the species rich forests of Western Ghats.

Biodiversity news

Ayushi Jain and rediscovery of Cantor's Giant Softshell Turtle in Kerala

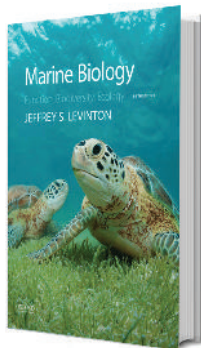
Ms. Ayushi Jain, a young conservation biologist from Uttar Pradesh is gaining fame in Kerala by her efforts in conserving Cantor's Giant Soft shell Turtle, one of the rarest turtles in India. This turtle locally called 'Bheemanama' or 'Pala Poovan' was recognized as an evolutionarily distinct and globally endangered (EDGE) species. It was recently rediscovered from the banks of the Payaswini river of Kasargode, after nine years. Ms.Ayushi Jain, Dehradun is a research affiliate of Wildlife Institute of India and for the past two years, she was leading a community-based



conservation initiative for protecting the remaining breeding population of this turtle. She is spreading the knowledge of conservation significance of this endangered species with her continuous efforts and interaction with the local people and have also encouraged the local community to take up this conservation initiative. Her efforts to bind together a community network of key informants and educated locals who can rescue, rehabilitate, and securely release by-catch of this incredibly rare species have met with good initial success. She is very hopeful about the involvement of the local people in conservation activities through their knowledge and traditional practices.

Marine Biology: Function, Biodiversity, Ecology 5th Edition:

Written by one of the most highly respected researchers in marine biology, this text is the most current and accessible treatment of all aspects of this interdisciplinary field. Marine Biology aims to heighten students' inherent fascination with the ocean and marine life and describes in an easily understandable manner the biological principles which govern marine biological systems. It introduces the rich diversity of the marine environment by focusing on three major themes: 1) function, the way organisms solve problems and the chemical and physical factors affecting these solutions; 2) biodiversity, an overview of the various life forms in the ocean; and 3) ecology, the interaction of organisms with their environment.



Designed to help undergraduate students, this book is a fascinating introduction to marine biology which is both accessible to and captivating for students of marine biology, marine ecology, and marine science. The book is written in a clear and concise manner that could be easily understood by an undergrad or a person interested in marine biology. The focus of this marine book is the perfect balance between organisms and ecology with the latest developments in the field of global climate change, molecular biology, and ocean processes.

Author: Levinton, Jeffrey

Publication Language : English

Pages : 592, Publication Date: 07/14/2017)

Publisher: Oxford University Press

Rate: ₹16463.17 ,

Source: Amazon

Model Conservation Activities

BMC activity :- Mangrove may guard cost of Mararikulam

Soil erosion and water logging due to strong tidal waves are serious problems in the coastal belt of Kerala. In the past, this phenomenon was a part of Monsoon. But, Climate change shuffled the situation and now huge waves and subsequent coastal floods are very common at any time in a year. Current methods of protective sea wall constructions using stones are not much effective in checking sea waves and are not sustainable. Alternative suggestions to form green shield using suitable plant varieties is yet not acceptable to local people and the authorities due to various reasons. Huge tidal waves not only create problems in sea shore like soil erosion but it also cause temporary floods in nearby residential areas by pushing sea water. Pozhis –the main canal that opens to the sea with a network of small canals, pushes excess rain water in to the sea in monsoon season and holds tidal wave water in other seasons. This acts as natural flood checking system in the coastal areas. Due to encroachment and filling, water holding capacity of these canal systems are reduced or lost due to lack of protection. People in the coastal wards of Mararikkulam South Panchayat, in Alappuzha District, puts hopes on luxuriantly growing mangrove plants in the banks of restored Pozhi's and canals

expecting them to solve this problem, to some extent in the coming future. Planting mangroves in the banks of Pozhi's and the adjacent canals were implemented by Biodiversity Management Committee (BMC) of the Panchayath, as Model BMC project with the financial aid and technical support from Kerala State Biodiversity Board. This project was started in 2017-18, and the project locations were the coastal wards no-2,13,15,16,23 along the banks of four pozhis namely vazhakkootam pozhi, Kaaripozhi, Arakkapozhi, Cheriya pozhi, and Odapozhi. By this project they had rejuvenated the canal system by removing sand and other waste materials and protected the banks using geotextiles and by planting the mangrove plant - Kuttikandal (*Bruguiera sp.*) procured from the Social Forestry Wing of Alappuzha. This project can be considered as a model wetland conservation project which other BMCs can replicate to conserve their pozhi- system for checking the tidal floods.

Shri. Chandraprakash T G,
District coordinator, Alappuzha





Biodiversity news

Where do fishermen catch fish from !

Most of us think that fish freely wander in the water column throughout their life and we can catch them when we need, easily. But the fact is that even though fish are dynamic in nature, they also have home like us and such residential areas in the ocean are called Reefs which are basically different marine ecosystems. The coastal geography has a great influence on the near inshore marine biodiversity and the conservation of this biodiversity is evitable for the whole coastal ecosystem.

Kerala has a coastline of 589.5 kilometres, which forms 10% of India's total coastline which is mainly formed of sandy beaches, promontories (rocks heading into sea), cliffs, mangroves, mud flats, estuaries etc. If the beach is sandy, then the nearby sea bottom will also be covered with sand and if the coast is hilly then the sea bottom will be covered with rocks. The fishing method along the Indian coast, are traditionally varied according to the nature of the continental shelf, littoral currents and wind patterns. The fishers are known for their traditional knowledge of navigation, bottom configuration of sea bed, ocean currents and the wind patterns.

Below are the myriads of marine ecosystems (Reefs), from where the fishermen catch fish.

- **Algae beds/Sea grass beds:** As on the land, the marine plants are called sea weeds (Algae) and sea grass. They produce oxygen and consume Carbon dioxide through photosynthesis. These algae and sea grass grow extensively and form Algae beds and sea grass bed. Such ecosystems harbour a variety of fish and other organisms which are mainly herbivorous.

- **Sandy ecosystem:** This is another reef which is similar to that of desert on land. This reef contains very few varieties of fish and other organisms since the sandy reef doesn't act as a stable substratum. Ray fish, flat fish, and a few varieties of solitary sponges are mainly seen in such reefs.

- **Rocky reefs** are formed of strong rocks extending from the land and composed of small

rocky patches and hilly areas underwater. Since these rocky reefs perform as strong and stable substratum such reefs support more biodiversity and complicated food web system. Therefore, rocky reefs are more productive in nature and can ensure fish availability, hence fishermen select such productive rocky reefs for active fishing.

- **Muddy reefs:** If the beach is composed of mangrove forest, the near inshore sea bottom will be mostly muddy in nature. Such areas are highly productive and support the growth of coral reefs. Muddy reefs serve as fish nursery and majority of the fish chose to breed and lay their eggs here as muddy flats are rich in nutrients.

- **Artificial Reefs:** The ships/vessels, boats or even piers and bridges those which are sunken in the sea will settle down on sea bottom and gradually form an ecosystem. That means anything which is solid deployed into the sea will attract organisms to attach to it and gradually develop a food web and finally forms marine ecosystem and are named Artificial Reefs. There are so many artificial ship/ boat reefs in our oceans which serve as marine ecosystems.

- **Coral reefs:** These are made up of myriads of individual coral colonies and form extensive coral reefs. They play a major role in the production of Oxygen and consume Carbon dioxide and help to bring down earth's temperature and reduce global warming. Besides that, coral reefs provide food, shade, shelter and serve as breeding grounds and nursery of fish and other marine organisms.

On the other hand, the introductions of modern technologies like bottom trawlers that are usually operated near shore areas are a major challenge to these ecosystems. Drastic decline of resources have taken place where these practises are being followed.

Aneesha Ani Benadict,
Research Assistant
Kerala State Biodiversity Board

Coral reefs 'The biologist's paradise' and its threats

Coral reefs are unique and one of the most diverse marine ecosystems on Earth. They are believed to have existed for about 200 million years. It is estimated that it took corals about 50 million years to reach their present level of diversity. They play a crucial role in supporting the flora and fauna in the marine ecosystem. They have, since time immemorial, provided us with food, pleasure and protection from storm and other natural calamities. They are also described as 'underwater tropical rainforest, fairy land under water, biologist's paradise, magnificent repository of resources, genetic garden, submerged meadows and treasure house of wealth'. Coral reefs act as breeding, spawning, nesting and feeding areas for many fishes and other marine organisms and also provide revenue and employment through tourism and recreation. It has been assessed that one square kilometre of coral reef produces 20-35 mega tonnes of fishes sufficient to feed about 600 people annually. They are also used in jewellery, cement industries and in construction fields.

Indonesia has the largest coral reef area in the world. India, Maldives, Sri Lanka and Chagos have the maximum coral reefs in South Asia. The Great Barrier Reef of the Queensland coast of Australia is the largest aggregation of coral reefs extending to a length of 1,931 kilometres and a width that varies from 16-322 kilometres. India has around 8,000 km of coastline with mega coral reef areas: Gulf of Mannar, Palk bay, Gulf of Kutch, Andaman and Nicobar Islands and the Lakshadweep islands. Three major reef types (atoll, fringing and barrier) occur in India. While the Lakshadweep reefs are atolls, the others are all fringing reefs. Studies by CMFRI discovered the patchy growths of hard corals are also found to occur off Vizhinjam and Enayam in the Kerala coast. This study also included the coral cover and biodiversity

richness of these reefs.

However, these amazing ecosystems have been impacted singly or synergistically by human and natural perturbations. The overall degradation of coral reefs, observed on a global level, is alarming. As many as 10 per cent of coral reefs have degraded; another 30 per cent are likely to disappear within next 20 years across the globe. According to biologists, if proper conservation and management measures are not taken, all coral reefs of the Indo-Malayan region may disappear in the next 40 years.

Most of the Indian reefs are listed as Marine Protected Areas (MPAs) and therefore, are well protected by laws. They have been studied moderately well and several studies are ongoing, which is certainly a good indication. However, more intensive studies on ecology, biology, microbial diseases, bleaching, and restoration are needed. Recent studies showed that Coral ('White plague', 'White pox', 'White band', and 'Black band' etc), Reef fishing (Illegal and destructive fishing practices), Extreme natural events (cyclone, local tectonic upheavals, tsunami etc), Bio-invasion (Introduction of invasive species like macroalgae *Kappaphycus alvarezii* etc), Reef tourism, Illegal harvesting of shells, various exotic marine organisms and products derived from the reef etc are the major current threats to the Indian reefs.

Conservation of Indian coral reefs is enforced under the Wild Life (Protection) Act (WLPA) 1972, Marine Fishing Regulation Act (MFRA) 1983, 2000 and the Coastal Regulation Zone (CRZ) Notification, 2011. There are a total 31 Marine Protected Areas (MPAs) in India among them 5 coral reef regions have been surveyed and identified for protection.

Dr.Sudheesh. N,
Scientific Officer
Kerala State Biodiversity Board

Artificial Reefs - An Overview

Artificial reefs are natural or by manmade external objects or stable structures placed in the sea to provide an artificial fish habitat and thereby attract, aggregate and regenerate fishery resources. Artificial reefs are used worldwide to increase the productivity and fisheries potential of relatively barren or unproductive

areas. Artificial reefs are also used as effective fish attracting devices during certain times of the year on the basis that Reefs when properly located and structured will not only concentrate fishes but also will increase the biological productivity of the area. Reefs also serve as the spawning and nursery areas for fishes and shellfishes. Artificial reefs are considered to play significant role in revitalising the aquatic environment,

which have been damaged by developmental projects and overfishing.

The benefits of artificial reefs include the availability of fish at all times day and night. Reefs reduce or prevent bottom trawling in the area and almost serve as a mini Marine Protected Area. They help in the restoration of the ecosystem through rejuvenation of the flora and fauna of the area concerned. The fishes are of high quality and very fresh as they caught mostly by hooks and line and gillnets and the journey time to and from the fishing ground is very short. The short distance to the fishing ground in the reef area helps the fishermen to save fuel and journey time. Economic returns are excellent and lead to an improvement in the socioeconomic conditions of the fishermen community. Artificial reef is an excellent intervention for better conservation and enhancement of our biological resource in general and fishery resources in particular.

The world's largest artificial reef was created by the purposeful sinking of the aircraft carrier USS Oriskany off the coast of Pensacola, Florida, in 2006. The second largest artificial reef will be the USNS Hoyt S. Vandenberg, a former World War II era troop transport that served as a spacecraft tracking ship after the war.

Materials used to construct artificial reefs include coconut stem, broken pots, rocks, cylinder blocks, concrete rings, used tyres, automobile bodies etc. Recently Triangular modules made up of Ferro cement are also being used. Fisheries and port departments undertook the Vizhinjam project of installing artificial reefs in the inshore region off the coast of Kollemcode, Paruthiyoor, Poovar, Valiyathura, Kochuthura, Puthiyathura, Pallom and Adimalathura fishing villages of Thiruvananthapuram District and the project is continuing.

As part of the People's Artificial reefs (PAR) project funded by Kerala State Biodiversity Board (KSBB), two artificial reefs were deployed along the inshore region off the Valiyathura coasts of Thiruvananthapuram District in 2015. The concept of PAR has its roots in the documented traditional knowledge in Marine Biodiversity Register that naturally available reef areas are swarming with fishes. Furthermore, this reef was named as KSBB Artificial Reef and it was built by using damaged OBM fishing boats and the location details

of the Artificial Reefs was given to the fishermen's who helped to succeed the project that they can fish from the location without damaging it.

Artificial reefs are designed to increase the biological productivity of the inshore waters for sustainable use and enhance the complexity of ecological niche which over a period of time will mature into a full-fledged near natural ecosystem supporting diverse species. It also provide livelihood for artisanal catamaran fishermen and improves the socioeconomic conditions of the fishermen community.

Dr. Gigi C Rajan,
Research Officer
Kerala State Biodiversity Board

KSBB Artificial Reef installed at the inshore region of Valiyathura Coast of Thiruvananthapuram District





Planting of trees in the Vechoochira BMC as a part of RKI Pampa project during Environment day celebration



Planting of bamboo saplings along the river in Vellinezhi Grama Panchayat BMC, Palakkad



Planting of *Clerodendrum inerme* by combined efforts of the KSBB Perumbadappu BP and GP to protect the Palappatti sea shore



Inauguration of the 2nd phase of the model BMC project at Vellinezhi Grama Panchayat, Palakkad



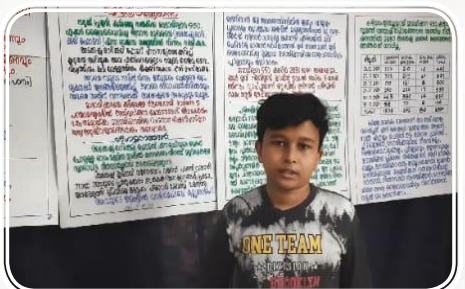
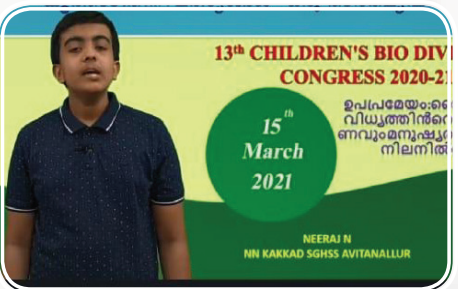
KSBB Activities



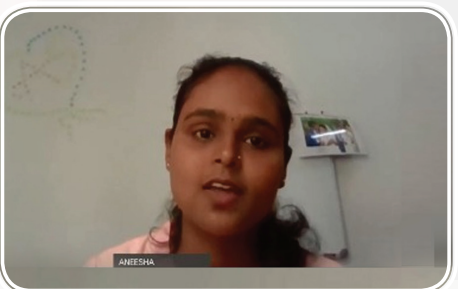
Experience sharing by Shri. Shaji Kedaram, Devaki Amma and Mr. Surendran (Kandal Surendran) on Environment Day celebration



Project presentation by 13th Children's Biodiversity Congress winners



Project presentation by 13th Children's Biodiversity Congress winner



Scientific talk on 'Ocean literacy Community participation' by Aneesha Ani Benedict, KSBB

Dr. C. George Thomas
Chairperson
Smt. Roney.R.Pillai
Member Secretary



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