The Editorial

The Third volume of the Department Magazine ZΩI – ZOI which means 'Life' in Greek, is a wonderful walk down the memory lane of the academic year 2019-2020. It is the colourful and cheerful butterfly that had unfolded its wings with the hard work of the staff and students of the department. This silent flight of the butterfly over the colourful flowers- that is the events both curricular and co-curricular, is a beautiful dance that is worth to be recorded in this volume.

With gratitude and contentment we have completed the academic year, and with eagerness and enthusiasm we look for the brighter forth coming academic year. The department will spread the joy of life and prove to be a proud Auxilian in all its endevours…..

On behalf of the Faculty of Zoology,

Dr. A. Mary Agnes

Associate Professor of Zoology
Auxilium College (Autonomous)
Vellore- 632006

STAFF CORNER

ANIMAL BEHAVIOUR

Dr. J. S. Arockiamary, Head and Associate Professor, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

Although the scientific study of Animal Behaviour, has its origin in the work of 18th century Naturalists such as, Gilbert White (1720-1793), and Charles Heroy (1723-1789), it is Charles Darwin (1809-1882), who is regarded as the father of the scientific study of Animal Behaviour. His theory on natural selection, his views on instincts, his observations on behaviour, influenced the development of ethology or the science of Animal Behaviour.

We are inherently very inquisitive about the behaviour of animals around us. The sense of wonder has always been the root of scientific enquiry. Why to learn Animal Behaviour? Behaviour can be observed right from the simplest single celled animals to the most evolved Primates. Behaviour, is the mechanism designed to enable the animal, to cope with its particular mode of life. Basic behaviour of the animals such as feeding, fighting, fleeing and mating decide the survival of the Species. Behaviour patterns result from the complex interactions of external stimuli and internal conditions. Animal Behaviour plays an important role in animal adaptation and evolution, and has formed a significant bridge between the molecular and physiological aspects of biology and ecology.

Some animals appear to be preprogrammed to learn about certain aspects of the environment during particular period of their development, this is termed as innate behaviour. Innate behaviour develops without obvious environmental influence. It just needs a particular stimulus to trigger it. The waggle dance of honey bee, Cocoon spinning in moths, and migration in birds are some amazing examples of innate behaviours.

Learned behaviour develops as result of experience. Learned behaviour allows the animals to adapt to the changes in the environment. Types of learned behaviour includes, habituation, sensitization, classical conditioning, operant conditioning, observational learning, play and insight learning. Animals develop throughout their life and must be well adapted to its environment. Thus behavioural development is not simply a matter of constructing adult behaviour pattern.

Even though the study of Animal Behaviour seems very simple, in reality it takes years of hard work and commitment to come to a conclusion regarding a particular behaviour. The wildlife films that we enjoy watching are actually the careful observations made by the ethologists for several hours in the wilderness to give us a glimpse of the amazing behaviour of animals.

Humans often forget and many times neglect to understand the behaviour of animals. We only pay attention to those traits of the animals which have a direct or indirect impact on us. Every animal plays a vital part in the food chain and adds value to nature. Understanding the behaviour of animals will enable us to protect them and thereby maintain a balance in the ecosystem. Many questions regarding Animal Behaviour still remain

unanswered. Younger generation must pursue their research and higher studies in the field of ethology, not just for the benefit of humans but also for the welfare of animals.

BIO STEEL - SPIDER SILK

Dr. A. Mary Agnes, Associate Professor, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

The silk of spider is a fibro protein that is produced as a liquid in varied and voluminous abdominal glands after getting exposed to air they solidify.

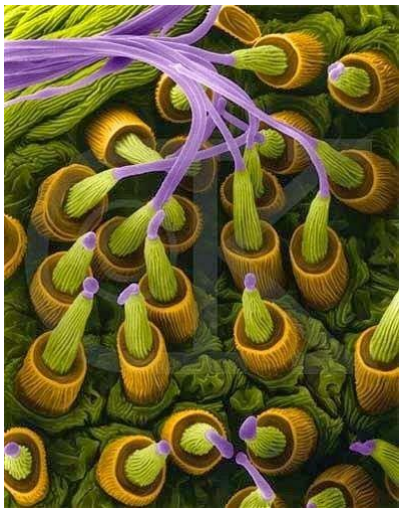
Many spinning glands seem to have two different cell types that contribute chemically different secretory products. While one type secretes only fibroin, the other apparently synthesizes mucopolysaccharides, which are responsible for the hygroscopic properties of the spider silky spiral in webs. Spider Silk protein is found to be stronger than steel, it is not corroded by chemicals and it can with stand high temperatures differences. It has more economical value hence a lot of research is going on to produce spider silk through biotechnological methods.

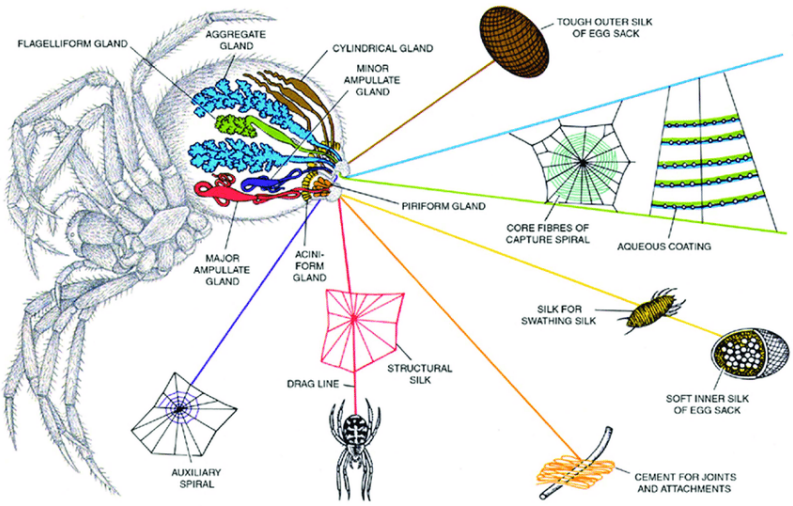
The silk is produced in silk glands and released by the spinnerets. The spider was found to regulate the release, mixing and kind of the silk. Silk is a proteinaceous secretory product and scleroprotein of unknown structure. The molecular weight of the fibroin of orb weaver *Nephilia* was 30,000. The molecule of the polypeptide changes their orientation from alpha configuration to beta which changes the water soluble silk to insoluble thread. It has more economical value hence a lot of research is going on to produce spider silk through biotechnological methods. Recent research on the properties of the spider silk has unearthed more fascinating facets that make ideal for its function.

Comparison of True silk and spider silk:

Reagents	True silk	Spider silk
Zinc chloride	Stains golden yellow.	Same.
Con. H_2SO_4	Dissolves immediately	Dissolves slowly
H_2SO_4 30%	No change when cold. Swells and partly dissolves when hot.	Swells and contracts in length.
Con. HNO_3	Dissolves	Swells without dissolving
Chromic acid	No change when cold. Dissolves quickly when hot.	Swells and contracts when cold, dissolves slowly when hot.
Acetic acid	No change	Swells contracts and curls.
Ammonia	No change	Swells moderately, contracts considerably.
Caustic potash 40%	Moderate swelling when cold, glazes and dissolves quickly when hot.	Slowly dissolves when hot.
Ammonical cuprous oxide	Sercin unchanged. Fibroin dissolves quickly.	Contracts in places and dissolves quickly.
Ammonical nickel oxide	Sercin unchanged. Fibroin turns brown swells and contracts.	Swells and curls finally dissolves.

SPIDER SILK FROM THE SPINNERETS





CONVERSION REACTION- HYSTERIA.

Dr. N. Uma Chandra Meera Lakshmi, Assistant Professor, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

CONVERSION REACTION formerly called hysteria is a neurological condition were physical symptoms occur without any underlying organic causes.

Causes: It is almost always trigged by stressful situations. Medical illness, a dissociative disorder (escape from reality that is not on purpose), a personality disorder. Women are more likely to have it than men, a history of emotional trauma and those who have a hard time talking about their feelings.

Symptoms: Uncontrollable movements; Loss of smell or speech disturbance;

Sensory- loss of sensation in some part of the body, blindness or deafness;

Motor- Numbness or paralysis of limb or entire side of the body, muscular tremors or tics.

Visceral- Including such symptoms as coughing or sneezing spells, persistent hiccupping, choking sensation, lump in the throat and a variety of vague aches or pains.

The physical symptoms are thought to be an attempt to resolve the conflict the person feels inside. Eg. A woman who believes it is not acceptable to have violent feelings may suddenly feel numbness in her arms after becoming so angry that she wanted to hit someone. Instead of allowing herself to have violent thoughts about hitting someone, she experiences the physical symptom of numbness in her arms.

Freud believed that reactions of this type represented the “conversion” of anxiety into physical symptoms. Although no organic cause can be found, the individual with a conversion reaction is not faking; his disorder is quiet real to him, and it usually is easy to distinguish from a malingerer.

Treatment: Talk therapy and stress management training.

TRADITIONAL KNOWLEDGE OF BIODIVERSITY- TRANSFORMATION OF NATURE TO GREEN CHEMISTRY.

Ms. Hannah, Assistant Professor, PG and Research Dept. of Zoology, Auxilium College, Vellore- 6.

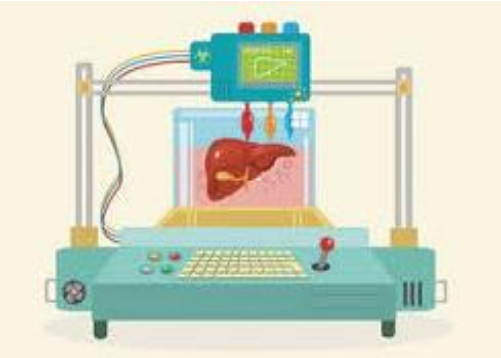
This is the right time to transform the traditional knowledge spread among the communities across the globe. An initiative to be taken to bring out the hidden treasure to the lime light of scientific community. Documentation, monitoring, providing information for sustainable management of local biodiversity resources, promoting biodiversity friendly awareness in the emerging process of decentralized management of natural resources, establishing claims of individuals as well as local communities over knowledge and applications of biodiversity resources and ensure equitable benefit sharing from the use of such knowledge and resources. Educating environmental science and Pharmacognosy to promote the development of practical knowledge of balancing ecosystem among local communities and of traditional sciences such as Ayurveda, Siddha and Chinese system of medicine and other fine arts. It could be achieved by recording species names in the local vernacular in order to link them to scientific validations. Traditional knowledge to be recognized for there is an inextricable link between biological, cultural, and linguistic diversity to integrate the conservation of biodiversity with the maintenance and its revitalization. Researchers, professionals, funders, policy makers, and activists should come forward to make awareness to the ecopeople by improving the lifestyle, economic status, literary, makes to aware the practice and validity of the traditional knowledge o is equally important in order to receive the acquired knowledge on identification, parts used, time and method of collection Commercialization of the traditional biodiversity knowledge is the only possible way to keep this endangered art greenish forever.

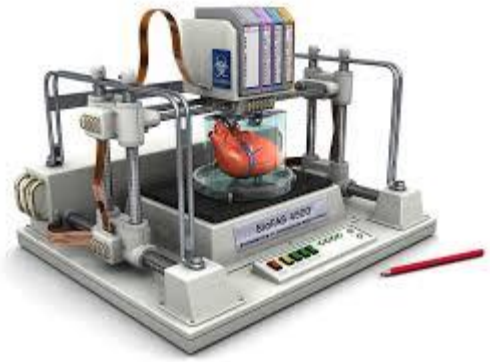
NANOTECHNOLOGY IN ORGAN PRINTING

Ms. K. Vidhya, Assistant Professor, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

Almost 1.5 lakh people in India need a kidney however, only 3000 of them receive one. 90% of people in the waiting list die without getting an organ. India's annual liver transplant requirement is 25,000, but we manage only about 800. 70% liver transplants are taken care of by a live donor, but 30% are dependent on cadaver donations.

Organ printing is an Integrating biology and 3-D printing technology. It is a process where an artificial organ can be created using a 3-D printer or a bio printer. It is a rapid prototyping computer-aided 3D printing technology, based on using layer by layer deposition of cell or cell aggregates into a 3D gel with sequential maturation of the printed construct into perfused and vascularised living tissue or organ. An organ printer incorporates 2 technologies, the tissue engineering and a 3D printer, Instead of paper petridishes are used and instead of ink, cells and chemical called cross linker are used. The cells are individually made from the patient.





CONCEPTUAL BIOPRINTER

Types of 3D Printer:The type of 3D printer chosen for an application often depends on the materials to be used and how the layers in the finished product are bonded. The three most commonly used 3D printer technologies in medical applications are Selective Laser Sintering (SLS), Thermal Inkjet(TIJ) printing, and Fused Deposition Modelling (FDM). SLS printer uses powdered material as the substrate for printing new objects. A laser draws the shape of the object in the powder, fusing it together. Inkjet printing is a ―noncontact technique that uses thermal, electromagnetic, or piezoelectric technology to deposit tiny droplets of ―ink(actual ink or other materials) onto a substrate according to digital instructions.FDM printer uses a print head similar to an inkjet printer. However, instead of ink, beads of heated plastic are released from the print head as it moves, building the object in thin layers.

PROCESS FOR BIOPRINTING 3D TISSUES:

1) create a blueprint of an organ with its vascular architecture 2) generate a bio printing process plan 3) isolate stem cells 4) differentiate the stem cells into organ specific cells 5) preparebio ink reservoirs with organ specific cells, blood vessel cells, and support medium and load them into the printer 6) bio print 7) place the bio printed organ in a bioreactor prior to transplantation.

The procedure of organ printing can be subdivided into three sequential steps: Pre-processing, Processing and Post processing.

Step1: Pre-processing: Pre-processing primarily deals with the development of a computer-aided design (CAD) or blueprint of a specific organ. The design can be derived from digitized image reconstruction of a natural organ or tissue. Imaging data can be derived from various modalities including non-invasive scanning of the human body (e.g. MRI or computerized tomography) or a detailed 3D reconstruction of serial sections of specific organs by bio imaging with CAD Computer Aided Design.

Step 2: Processing: Processing usually refers to actual computer-aided printing or layer- by- layer placement of cells or cell aggregates into a 3D environment using CAD or blueprints. The Petridish is filled with water. Then the printer prints, the cross linker transforms the water into a Jell-O like substance which allows the cells to be

put in. Once one dish is filled, a new one is placed on top of it. This method is repeated until the organ that you want is created. Once the organ is constructed, the petri dishes are removed and all that is left is the organ.

Bio printers have three major components. These are the hardware used, the type of bio-ink, and the material it is printed on (biomaterials). "Bio-ink is a material made from living cells that behaves much like a liquid, allowing people to "print" it in order to create a desired shape. To make bio-ink, scientists create slurry of cells that can be loaded into a cartridge and inserted into a specially designed printer, along with another cartridge containing a gel known as bio-paper. Potential uses for bio-ink include creating sheets of skin for skin grafts and vascular tissues to replace veins and arteries. In bio printing, there are three major types of printers that have been used. These are Inkjet, Extrusion printers and Laser-assisted.

Ideal material properties for bio printing the selection of appropriate materials for use in bio printing and their performance in a particular application depend on several features such as printability, biocompatibility, degradation kinetics and by-product, structural and mechanical properties. The main goal of this approach is to create fabricated structures that are identical to the natural structure that is found in the tissues and organs in the human body. Bio-mimicry requires duplication of the shape, framework, and the microenvironment of the organs and tissues. The application of bio-mimicry in bio printing involves creating both identical cellular and extracellular parts of organs.

Step 3: Post Processing

Post processing is concerned with the perfusion of printed organs and their biomechanical conditioning to both direct and accelerate organ maturation. To maintain the object, both mechanical and chemical stimulations are needed. These stimulations send signals to the cells to control the remodelling and growth of tissues. In addition, in recent development, bioreactor technologies have allowed the rapid maturation of tissues, vascularisation of tissues and the ability to survive transplants. Bioreactors work in either providing convective nutrient transport, creating microgravity environments, changing the pressure causing solution to flow through the cells, or add compression for dynamic or static loading. Each type of bioreactor is ideal for different types of tissue, for example compression bioreactors are ideal for cartilage tissue.

Scientists have created a revolutionary new electronic membrane that could replace pacemakers, fitting over a heart to keep it beating regularly over an indefinite period of time. The device uses a spider-web-like network of sensors and electrodes to continuously monitor the heart’s electrical activity and could, in the future, deliver electrical shocks to maintain a healthy heart-rate. Researchers used computer modelling technology and a 3D-printer to create a prototype membrane and fit it to a rabbit’s heart, keeping the organ operating perfectly outside of the body in a nutrient and oxygen-rich solution.

EXAMPLES:

Human scale bio-printed tissues

2Dimensional tissue: Skin and Cartilage

Hollow tubes: Trachea, Heart valve and Vasculature

Solid organs: Kidney

As the complexity of tissues increases, new approaches will be needed to overcome the challenges of creating them by bioprinting.2D organs have already been fabricated and tested, and these will likely be one of the first types of bio-printed tissues to be transplanted in patients. Hollow tubes, including blood vessels, tracheas and urethras are currently in development and are likely to closely follow 2D tissues in clinical application. Solid organs are the most complex, and there are still many challenges to overcome, especially in achieving vascularisation and innervations.

CHALLENGES:

In 2011, successfully printed a kidney from human cells in seven hours (Doctor Anthony Atala, at Wake Forest Institute of Regenerative Medicine), though not functional in humans yet his research is still in progress.

Why doesn't it Work? It is difficult to create blood vessels between tissue layers and also organs have many specialized functions which are difficult to replicate.

Dr. Jordan Miller, Dr. Christopher Chen, and Dr.Sangeeta Bhatia created a sugar template that can helps shape development of a vascular network for artificial organs. After network is printed, cells are inserted and network then grows, Sugar template is dissolved after completion of development.

AN OVERVIEW OF SPIDERS

Ms. Rebecca Vinolia, Assistant Professor, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

Spiders are diversified group of Invertebrate under phylum Arthropod belonging to Araneae. Spiders dates back to Devonian period which dominates the terrestrial habitat and maintains the equilibrium of the global biodiversity. Spiders are charismatic species and due to scarcity of identification, research in the field of Arachnology is limited in India. Spiders rank seventh in total species diversity consisting approximately 4154 genera and 48438 described species. In Indian context there are 1686 species belong to 438 genera of 61 families.

Spiders are identified for a basic set of characteristics like - body with two sections, the cephalothorax and the abdomen, joined by the thin pedicel eight legs, made up of seven segments each pedipalps and produce silk. Spiders are also identified for their webs and web silk with future prospects. All spiders can make silk but many do not spin web, they may use the silk to wrap the prey, to hang from and to make egg sacs and nests. Spiders are differentiated with respect to their hunting behavior into web builders and wanderers or non-web builders. Spiders, who build webs, catch their prey and generally live in or near their webs. Spiders which do not spin webs or wandering spiders that search out for prey or waiting spiders, which sit and wait for prey to come close

to them and then they ambush the prey and water spiders, which trap a bubble of air under their abdomen and take their air-chamber below the water and get their prey.

Spiders are bio indicators, biocontrol agents, mutualistic pollinators and it stabilize the insect population, being a predator it brings down population. Study on spider venom and spider silk have let to manufacturer of new products in construction materials and medical field. Spiders are found inhabiting bushes, ground litter, underground foliage and utilizes the micro-environment/microhabitat in the given ecosystem.

The microbiota in the host has its impact on development, metabolism, nutrient acquisition, sex ratio, health ,behaviors which leads to selection of habitat and evolution of the host. The interaction between the host microbiota and the micro biome present in the surrounding may have effect on the organisms. The host microbiome study helps to understand the microbial relationships to gain the insights into the microbial community and the potential functions of the diversity in spiders.

Threats to spiders: Many threats to spider diversity have been documented. The primary threat is habitat loss and degradation, as with many other elements of biodiversity. More specifically, some spiders have become imperiled due to urban development, land-use management techniques, air and groundwater pollution by pesticides and fertilizers, the introduction of exotic species, and in some cases, collection and trafficking due to the pet trade. For a few species, these threats have pushed them to the threshold of extinction, attracting the attention of conservation professionals. Many other species may be threatened, but research on them is Lacking. Though spiders play a significant role in maintaining the ecological balance, tropical spiders are least studied the world over. Spiders play an important role in the control of insect pests and thereby helping in the reduced use of pesticides. This in turn helps in conserving the natural ecological balance.

BREAST CANCER

Dr. A. Rajalakshmi, Assistant Professor, PG and Research Dept. Of Zoology, Auxilium College, Vellore-6.

Breast cancer starts when cells in the breast begin to grow out of control. These cells usually form a tumor that can often be seen on an x-ray or felt as a lump. The tumor is malignant (cancer) if the cells can grow into (invade) surrounding tissues or spread (metastasize) to distant areas of the body. Breast cancer occurs almost entirely in women, but men can get breast cancer, too. The uncontrolled cancer cells often invade other healthy breast tissue and can travel to the lymph nodes under the arms. Breast cancer can spread when the cancer cells get into the blood or lymph system and are carried to other parts of the body.The lymph nodes are a primary pathway that help the cancer cells move to other parts of the body.

How Does Breast Cancer Start?

Changes or mutations in DNA can cause normal breast cells to become cancer. Certain DNA changes are passed on from parents (inherited) and can greatly increase your risk for breast cancer. Other lifestyle-related risk factors, such as what you eat and how much you exercise, can increase your chance of developing breast

cancer, but it's not yet known exactly how some of these risk factors cause normal cells to become cancer. Hormones seem to play a role in many cases of breast cancer, but just how this happens is not fully understood.

It's also important to understand that most breast lumps are benign and not cancer (malignant). Non-cancerous breast tumors are abnormal growths, but they do not spread outside of the breast and they are not life threatening. But some benign breast lumps can increase a woman's risk of getting breast cancer. Any breast lump or change needs to be checked by a health care professional to determine if it is benign or malignant (cancer) and if it might affect your future cancer risk.

Symptoms for the most common breast cancers include: A breast lump or tissue thickening that feels different than surrounding tissue and has developed recently, breast pain, red pitted skin over your entire breast, swelling in all or part of your breast, a nipple discharge other than breast milk, bloody discharge from your nipple, peeling, scaling, or flaking of skin on your nipple or breast, a sudden, unexplained change in the shape or size of your breast, inverted nipple, changes to the appearance of the skin on your breasts and a lump or swelling under your arm

Types of breast cancer: There are several types of breast cancer, and they are broken into two main categories: "invasive" and "non invasive," or in situ. While invasive cancer has spread from the breast ducts or glands to other parts of the breast, non invasive cancer has not spread from the original tissue. Ductal carcinoma in situ, Lobular carcinoma in situ, Invasive ductal carcinoma, Invasive lobular carcinoma and other less common types of breast cancer include Paget disease of the nipple, Phyllodes tumor and Angiosarcoma.

Tests that can help diagnose breast cancer include: Mammogram, Ultrasound and Breast biopsy.

Breast cancer treatment: Several types of surgery may be used to remove breast cancer, including **Lumpectomy, Mastectomy, Sentinel node biopsy**, **Axillary lymph node dissection, Contralateral prophylactic mastectomy. Therapy like** Radiation therapy, Chemotherapy, Hormone therapy and Medications are also used for treatment.

NATURAL SYNTHESIS OF MAGNETIC NANOPARTICLES USING MAGNETOTACTIC BACTERIA.

Ms. K.Anu, Assistant professor PG and Research Dept. of Zoology,
Auxilium College, Vellore-6

Magnetotactic bacteria are prokaryotic microorganisms ubiquitous to freshwater and marine habitats. They are all microaerophiles or anaerobes and prefer environments that contain little to no oxygen. These organisms thrive in environments that lack oxygen, it is believed that these microbes may represent some of Earth's earliest inhabitants. Magnetotaxis is the process by which magnetotactic bacteria orientate themselves within Earth's geomagnetic field and then use their flagellum to swim to oxygen-poor sediments where the oxygen and redox conditions preferred by these organisms are found. Magnetotactic bacteria are typically divided into three groups according to the type of magnetic mineral nanocrystal, which they synthesize: 1. Magnetite (Fe_3O_4), 2.

Greigite (Fe_3S_4) or a combination of greigite and pyrite (FeS_2) 3. A combination of magnetite and greigite. At least twenty species of magnetite-producing magnetotactic bacteria have been cultivated in pure culture whereas greigite-producing magnetotactic bacteria have not yet been isolated in pure culture.

Iron uptake systems in magnetotactic bacteria vary from one species to another. Fe^{2+} is very soluble at neutral pH, and Fe^{2+} is quickly oxidized to Fe^{3+} under the aerobic (oxygenated) conditions. As a result, iron on Earth's surface exists primarily as Fe (III)-containing minerals, which are insoluble at neutral pH. In order to utilize solid-phase Fe^{3+}, some magnetotactic bacteria are believed to synthesize iron-binding biomolecules called a siderophores. Siderophores are ferric ion (Fe^{3+}) chelators produced by bacteria and fungi growing under low iron stress. The siderophores have a high affinity for Fe^{3+} and bind, or chelate, the iron. Next, it is believed that the Fe^{3+} sideophore complex enters the cell and then Fe^{3+} is cleaved from the siderophore. Once inside the cell, proteins reduce the Fe (III), converting the iron to Fe^{2+} which is then taken up by the magnetosomes. The magnetotactic bacteria M. magneticum AMB-1 uses a protein called MagA to transport Fe^{2+} in an energy dependent manner into magnetosomes, which leads to an accumulation of Fe^{2+} within the subcellular vesicle. Two additional proteins have been identified within the magnetosome membrane of M. gryphiswaldense, MamB and MamM. Both proteins have also been shown to function in the transport of iron into the magnetosomes. After magnetotactic bacteria die, magnetosome chains deposit in the sediment, and become magnetofossils, which can carry useful paleomagnetic information about past environments on Earth. It was estimated that, in some locations on Earth, up to 10% of the iron contained within sediment may be contributed by magnetotactic bacteria. Recently, scientist suggested that fossil magnetosome concentrations could be used as a climate indicator. Magnetosome production was influenced by changes in the bacteria's natural habitat, which is directly controlled by climate. It has been pointed out that magnetofossils often mix with soils in the sediment and may be reduced or oxidized in different environmental conditions, which often challenge a researcher's ability to discern the biogenic information contained within the magneto fossils.

BIODIVERSITY CRISIS! PROTECT OUR SPECIES.

Ms. M. Anuradha, Assistant professor PG and Research Dept. of Zoology,
Auxilium College, Vellore-6.

Nature’s gifts to our planet are the species that we know and love, along with the many more that we have yet to discover. Unfortunately, we have distressed the balance of nature and the world is facing the utmost rate of extinction since we lost the dinosaurs more than 60 million years ago. But unlike the fate of the dinosaurs, the quick extinction of species today is the result of human activity. Human modification to the planet from climate change, deforestation, habitat loss, trafficking and poaching, unsustainable agriculture, pollution, and pesticide

use is directly linked to the unprecedented rapid reduction of plant and animal wildlife populations. The impacts are in-depth and we must take action now to defend our Species.

Do you remember growing up and seeing a certain type of plant or animal that you don't see anymore? If you are in tune with the plants and animals living around us, you might have noticed a vast number of animals and plants have gone extinct at a faster pace than ever before. About 75% of land and 66% of ocean areas have been "significantly altered by human activity, which has affected many ecosystems as well as the range in which specific species of wildlife used to exist. You may have noticed that you no longer hear the sound of thousands of frogs croaking in the middle of the night, birds visiting a backyard feeder, or bats flying to their resting place at dusk. If you live close to the ocean you have probably noticed fish stocks are in decline or seen whales, dolphins, and other marine mammals washing up dead on beaches. As a result of species extinction, we are seeing irreversible biodiversity loss, the devastation of genetically unique populations, loss of their genetic variation and ecosystem collapse. The evidence all points to the unfolding of a global tragedy with permanent consequences.

LET'S CHECK IN ON SOME SPECIES

From 2016 to 2019 the world lost 73.4 million acres of trees, a 51% increase from the amount lost the year before. Human actions continue to be the biggest direct cause of deforestation, with commodity-driven deforestation totaling around 27%. Around 8,800 different plant species are threatened with extinction. Most concerning, climate change threatens to reduce global crop production by 23% in the coming decades. BEES have declined by 87% in the last twenty years. Tragically, over the past four decades, scientists have observed a 45% decline in the overall insect population. The population of chimpanzees has declined severely, from two million to around 300,000 left; the Bornean orangutan has lost over half of its population – 150,000 since 1999; Bonobos are anticipated to decline by 50% over the course of the next few decades. Asian elephants have seen their numbers decline from 200,000 to roughly 40,000 over the course of the last century. The overall population of seabirds has declined by 70% in the past six decades. 25% of coral reefs worldwide are already considered damaged beyond repair, and close to sixty-five percent of coral reefs are under serious threat. Between 2000 and 2010, averages of 100 million sharks were killed every year and the Fin whale population has dropped from 720,000 to around 20,000. Giraffe populations have declined from 155,000 in 1985 to 80,000 in 2019 according to the African Wildlife Foundation.

Humans are unlikely to survive if we continue to destroy the other species on Earth, as our survival depends on the health of the planet and its species. Unless we begin to take drastic measures to save biodiversity we will continue to contribute to our own demise. We still have the chance to make changes and embrace new ways of doing things. We can save the planet and its species and efforts to do so will increase our overall well-being.

TAILOR BIRD

Ms. Joice, Asst. Professor of Zoology, Auxilium College, Vellore- 6

Tailor bird (*Orthotomus sutorius)* is a song bird. It lives in tropical Asia. It belongs to the order Passeriformes and family Cisticolidae. It builts the nest made of leaves. All the leaves or plant materials are sewn together. It prefers urban gardens, it also lives in open farmland, scrub forest edges and gardens.


It uses spider silk or plant fibre to make the nest. *Sutorious* means 'cobbler' rather than tailor, while *Orthotomus* means 'straight cutting'. Tailor bird is a shy bird which usually hides in the vegetation. Its loud calls are specific and more familiar which confirm its presence. Tailor bird gets the name from the way their nest is constructed.

DESCRIPTION

It is a brightly coloured bird with green upperparts and creamy under parts. They are distinctive in having a long upright tail, greenish upper body plumage and rust coloured forehead and crown. As the colour conceals the bird from its predator, the green emerges with the natural background. Strong legs and sharp bill helps the bird to sew the nest by using strong fibres.

The male and female are identical, except that the male has long central feathers. These feathers are well developed during breeding season. These are due to the dark pigmented and bare skin that are present in both male and female and sometimes give the appearance of a dark gorget. They are insectivorous.

BEHAVIOUR AND ECOLOGY:

Tailor birds are found singly or in pairs, usually low in the undergrowth or trees, sometimes hopping on the ground. They feed on beetles and bugs. The bird roost alone during the non-breeding season but may roost side by side during the breeding season, sometimes newly fledged juvenile sandwiched between the adults. The roost sites chosen are thin twigs on trees with cover above them and were often close to human habitation.

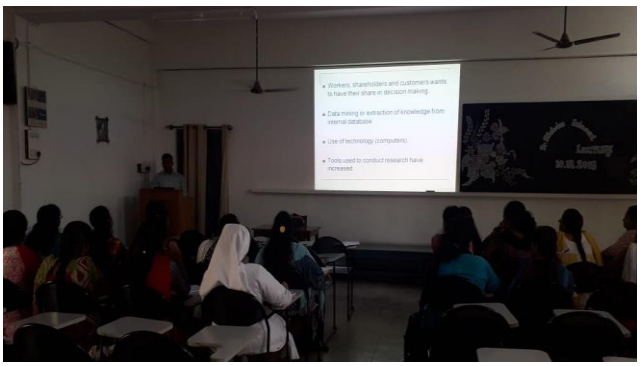
BREEDING :

The breeding season is March to December peaking from June to August in India, coinciding with the wet season. The incubation period is about 12 days. Both male and female feed the young. Mortality of eggs and

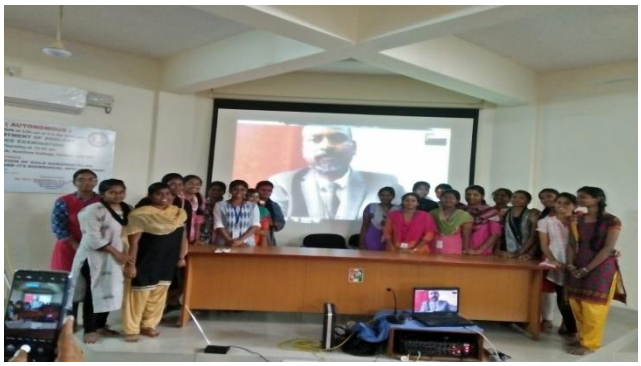
chicks is high due to predation by rodents, cats, crow-pheasants, lizards and other predators. The young birds fledge in about 14 days. The female alone incubates according to some sources, while others suggest that both sexes incubate. However both parents take part in feeding and sanitation.

ENDOWMENT LECTURES

ENDOWMENT LECTURES



VIDEO CONFERENCE



LIST OF ENDOWMENT LECTURES FOR THE ACADEMIC YEAR 2018-19

S. No	LECTURE DATE	RESOURCE PERSON	LECTURE TOPIC	NAME OF THE LECTURE
1	24.7.2019	Dr .M .C. Harish, Faculty, Department of Biotechnology, Thiruvalluvar University, Serkadu, Vellore.	Molecular Farming.	Sr. Helen Fernandez Endowment lecture
2	21.8.2019	Ms. Sujeetha.Y, Nursing Tutor, Oscar paramedical institute ,Vellore.	Appendicitis causes, symptoms and treatment.	Sr. Regina Colombo Endowment Lecture for II B. Sc Zoology.
3	10.9.2019	Dr. Obed John, Assistant Professor, Community Health, CMCH, Vellore.	Health and Disease trends in India.	Sr. Antoinette Aloysius Endowment Lecture for III B.Sc. Zoology.
4	04.12.2019	Dr. V. Rekha, Assistant Professor in Zoology, D.K.M.College, Vellore.	Animals and Bio-mimicry	Sr. Maria Fino Endowment Lecture for I B. Sc. Zoology.
5	10.12.2018	Dr. Febin Prabh Dass Associate professor Department of Integrative Biology School of Bio Sciences &Technology VIT, Vellore.	Research Methodology.	Sr. Ethelvina Endowment Lecture for M.Sc. Zoology.
6	19.12.2019	Dr.R.Geetha, Asst. Professor & Head, Department Of Biochemistry, Arcot Sri Mahalakshmi Women's College, Vellore.	Enzymes in Clinical Applications.	Sr. Cleofe Fassa Endowment Lecture for M.Sc. Zoology.

PLANTS MOLECULAR FARMING

Dr. M.C. HARISH, Assistant professor, Dept. of Biotechnology, Thiruvalluvar University, Vellore. Tamil Nadu.

Molecular farming is defined as the use of genetically engineered plants/crops as a platform for the production of substances for industrial interest i.e. proteins, Biopharmaceuticals, vaccines. Different types of Hosts for production of Biopharmaceuticals are

- Bacteria
- Yeasts, (single celled fungi)
- Whole animals, (insects, birds, fish, mammals)
- Whole plants, (corn, barley, rice, duckweed, moss protonema)

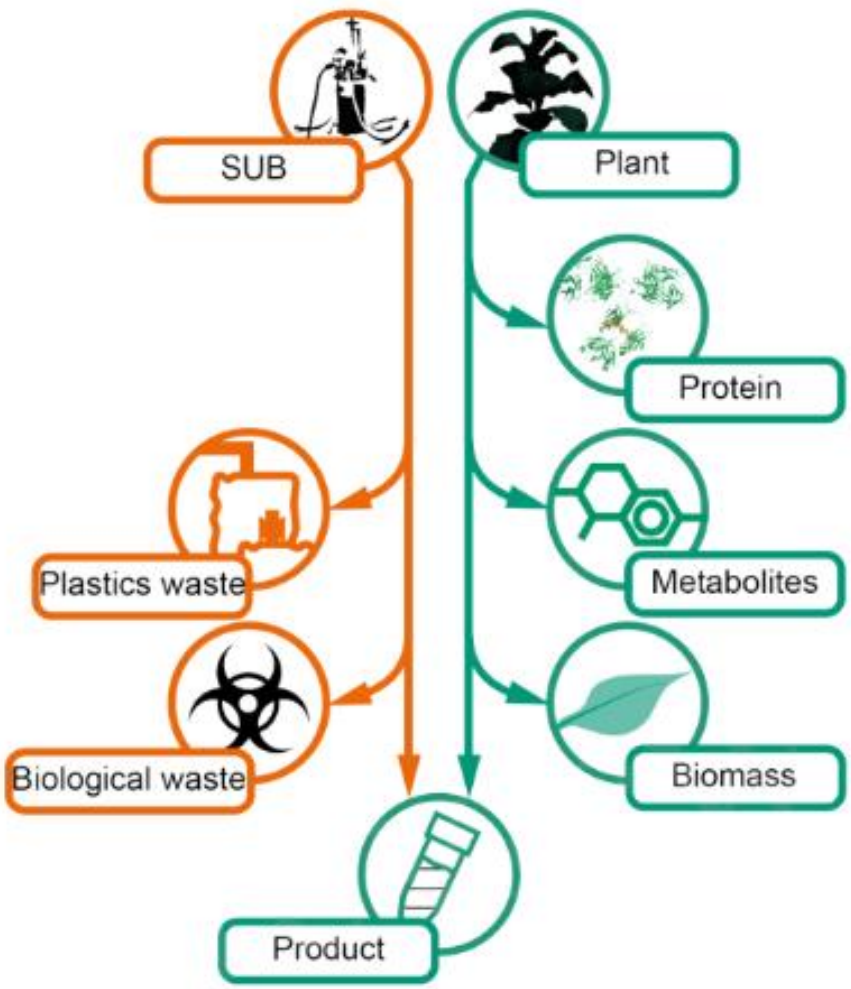
Bacterias are used for following reasons, they do not produce glycosylated full –sized proteins antibodies, lower scalability, preferred for the production of small glycosylated proteins like Insulin, interferon-β. The

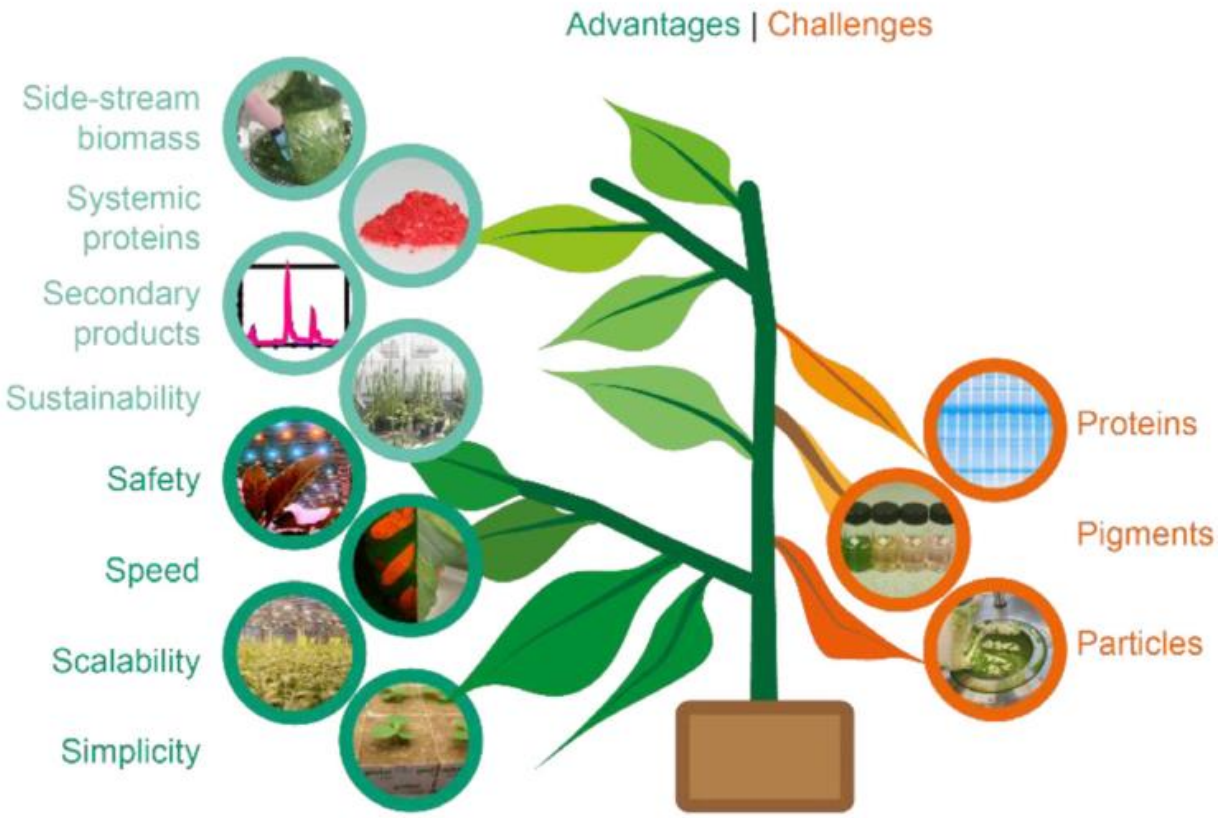
contaminating endotoxin are difficult to remove, recombinant proteins often form inclusion bodies, labour-and cost –intensive refolding in vitro is necessary.

Animal Based Systems are limited by legal and ethical restrictions, requires expensive equipments and media, delicate nature of cell and low scaling up.

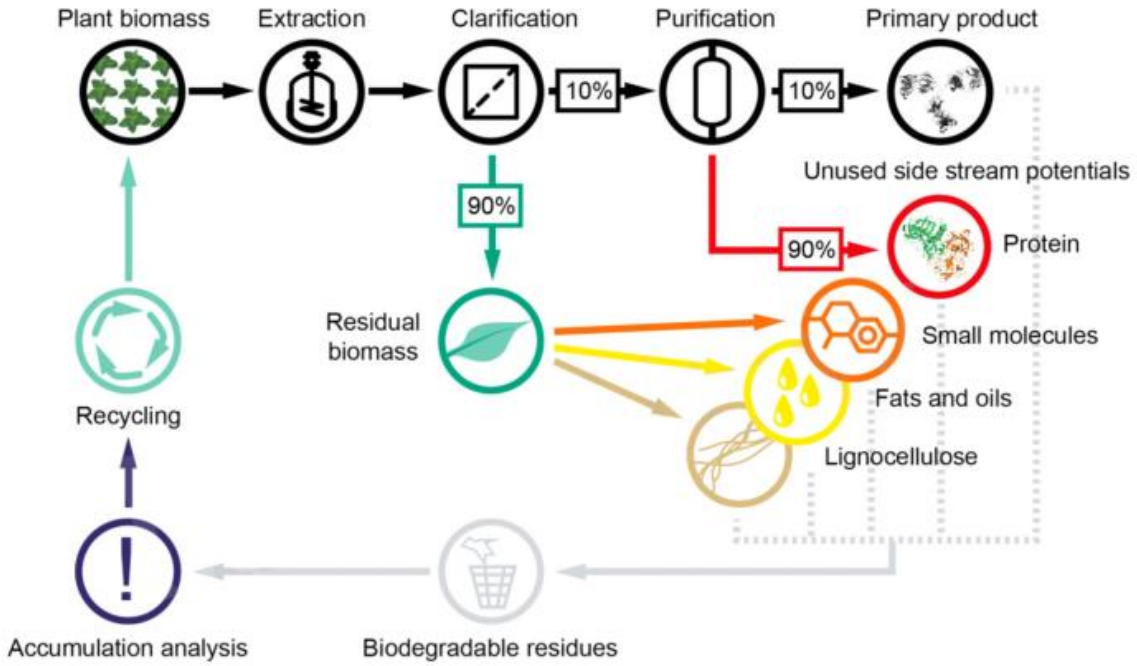
Plants are applied for its low cost, source, easy scale up & rapid harvesting, simple & cost effective process. Plant pathogens do not infect humans or animals. Chimeric plant viruses can be used in production of vaccines, produce large biomass, easy storage for long time. Comparison with other production system, plants are fast in biomass build up, post translational modifications, easy storage and distribution, low upstream production cost.

Comparison of waste streams generated in a mammalian cell culture-based and a plant-based system.





USING PLANT-BIOREACTORS TO HARVEST MULTIPLE PRODUCTS FROM A SINGLE PROCESS



Different types of Plant bioreactors used are Seed-based plant bioreactors, Plant Suspension Cultures, Hairy Root System Bioreactor, Chloroplast bioreactor.

Comparison of Recombinant Protein Production System

Table1: Comparison of different expression hosts for therapeutic protein production (Ma et al. 2003)

System	Overall cost	Production timescale	Scale-up capacity	Product quality	Glycosylation	Contamination risks	Storage cost
Bacteria	Low	Short	High	Low	None	Endotoxins	Moderate
Yeast	Medium	Medium	High	Medium	Incorrect	Low risk	Moderate
Mammalian cell culture	High	Long	Very low	Very high	Correct	Viruses, prions and oncogenic DNA	Expensive
Transgenic animals	High	Very long	Low	Very high	Correct	Viruses, prions and oncogenic DNA	Expensive
Plant cell cultures	Medium	Medium	Medium	High	Minor differences	Low risk	Moderate
Transgenic plants	Very low	Long	Very high	High	Minor differences	Low risk	Inexpensive

Table 2: Cost of Production of Therapeutic Proteins (Hood et al. 2002)

Production System	$/g
Chinese Hamster Ovary Cells (CHO)	300
Transgenic Chikens/Eggs	1-2
Transgenic goats/milk	1-2
Microbial fermentation	1.00
Plants	0.10

PLANT MOLECULAR FARM

PLANTS PRODUCED IN MOLECULAR FARM

Nicotiana tabacum

Nicotiana benthamiana

Maize

Soya

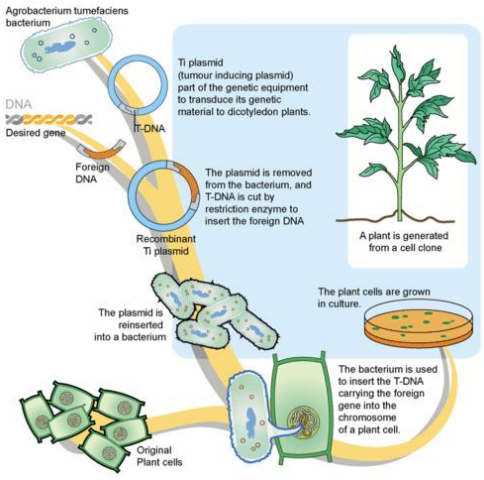
Tomato

Rice

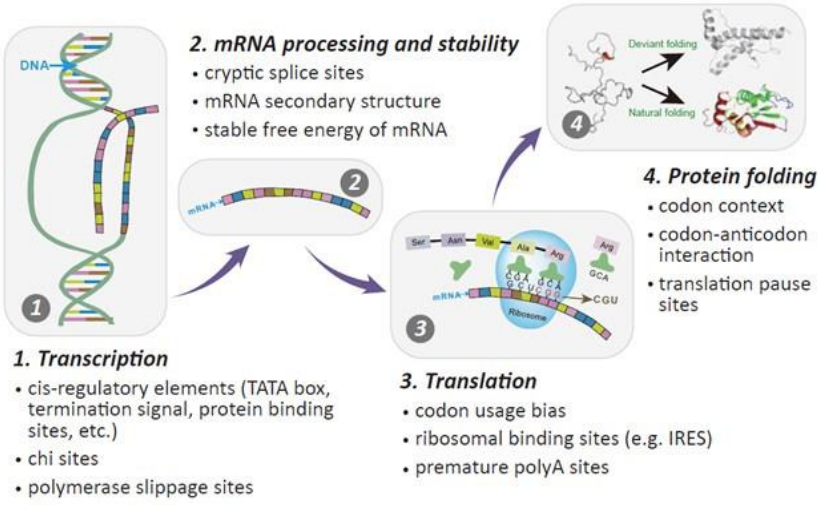
21

Strategies in plant molecular farming are

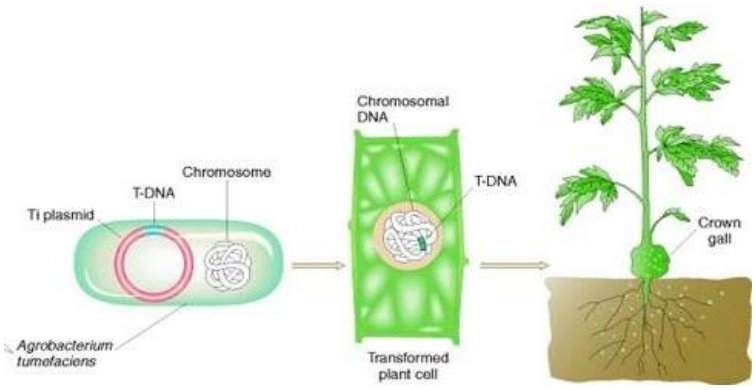
- Clone the gene of interest
- Transfer it to Plant expression vector
- Transformation into plant
- Grow the Plant species
- Recover biomass
- Process biomass
- Purify product of interest
- Deliver product of interest



CODON OPTIMIZATION (NON- PLANT SOURCE)



TRANSFORMATION INTO PLANT



Plant derived vaccine Antigens used has Attenuated vaccines, Plant derives Subunit Vaccine,Viral Like particles (VLP) were the products obtained

Limitations are Glycosylation, Protein targeting and Gene Expression.

ANIMALS AND BIOMIMICRY

Dr. V. Rekha, Assistant Professor in Zoology, D.K.M.College, Vellore.

Biomimicry is the imitation of the models, systems, and elements of nature for the purpose of solving complex human problems.

Gecko's are good climbers

Gecko feet are covered with nano-size hairs that use intermolecular forces (Van der Waals forces), allowing the lizards to stick firmly to surfaces.

Gecko shoes

So, making use of these nanostructures found in setae, the grip of shoes can be improved during mountaineering. This approach may provide better stability on rocky terrain and prevent slipping while you climbing or descending. Then scaling new heights will be no more difficult.

Spider‘s foot

The strength of the suction in a spider‘s foot is due to all of the small van der Waals forces at the nanoscale pulling at the same time. It lifts its leg so that the setules lift successively, not all at once. Imagine astronauts using the same idea for spacesuits that help them stick to the walls of a spacecraft, just like a spider on the ceiling.

Chameleon-like material changes color on demand

Researchers at University of California developed an ultra thin material that can change colour on demand. The chameleon skin material actually changes color when flexed, or when a small amount of force is applied to the surface. The silicon layer, approximately 120 nanometers thick, is flexible and functions as a skin that can be adhered to other surfaces. Spacing of the ridges produces different colors.

Learning anti-microbial physics from cicada

The wings of this small fly display bactericidal nanoscale pillar structures. Densely packed on the wing surfaces, these pillars arrange into nanopatterns which pierce the membranes of bacterial cells on contact, tearing bacteria apart.

Inspiration from fish scales

Fish repel oil by trapping water within their scales to create a self-cleaning, oil- repellent coat and prompted part of the idea behind the work. Researchers in China have taken inspiration from fish scales and skeleton flowers to make a transparent underwater surface that stays clean by repelling oil.

Nano in peacock feathers

Yoshioka and Kinoshita found that the pigmentation in peacock feathers, instead of reflecting light, serves to absorb the randomly scattered light and make vivid the interference color.

Color in Butterfly Wings

The layered nanostructure of the butterfly wing inspires scientists to develop textiles by assembling nano particles into layers from the bottom up.

Butterfly Wings-Intelligent solar panel

Wings are made up of nano-thin layers that cause light to reflect differently. Scientists and engineers are using this to hopefully develop a new type intelligent solar panel.

Shark Skin

Ever wonder how sharks swim so fast? The various size/shapes and texture of shark skin at the micro and nano levels reduce drag and make sharks very fast in the water. This idea has been used to create reduced drag suits for athletes.

A BRIEF DISCUSSION ON APPENDICITIS - CAUSES, SIGNS, SYMPTOMS AND TREATMENT

Sujeetha.Y M.Sc.(N),MBA (HM).,RNRM., Nursing Tutor Oscar paramedical Institute, Vellore.

Introduction:-

Appendicitis is an inflammation of the appendix, a finger-shaped pouch that projects from your colon on the lower right side of your abdomen.

Appendicitis causes pain in your lower right abdomen. However, in most people, pain begins around the navel and then moves. As inflammation worsens, appendicitis pain typically increases and eventually becomes severe. Although anyone can develop appendicitis, most often it occurs in people between the ages of 10 and 30. Standard treatment is surgical removal of the appendix.

Acute appendicitis (AA) is the most common surgical disease, and appendectomy is the treatment of choice in the majority of cases. A correct diagnosis is key for decreasing the negative appendectomy rate. The management can become difficult in case of complicated appendicitis.

An inflamed appendix may be removed using a laparoscopic approach with laser. However, the presence of multiple adhesions, retroperitoneal positioning of the appendix, or the likelihood of rupture necessitates an open (traditional) procedure. Studies indicate that laparoscopic appendectomy results in significantly less postoperative pain, earlier resumption of solid foods, a shorter hospital/same day surgery stay, lower wound infection rate, and a faster return to normal activities than open appendectomy.

Although many of the interventions included are appropriate for the short-stay client, the traditional appendectomy care provided on a surgical unit, after being diagnosed in the Emergency Department (ED).

Symptoms:-

Signs and symptoms of appendicitis may include:

- Sudden pain that begins on the right side of the lower abdomen
- Sudden pain that begins around your navel and often shifts to your lower right abdomen
- Pain that worsens if you cough, walk or make other jarring movements
- Nausea and vomiting
- Loss of appetite
- Low-grade fever that may worsen as the illness progresses
- Constipation or diarrhea
- Abdominal bloating
- Flatulence

Causes:-

A blockage in the lining of the appendix that results in infection is the likely cause of appendicitis. The bacteria multiply rapidly, causing the appendix to become inflamed, swollen and filled with pus. If not treated promptly, the appendix can rupture.

Complications:-

Appendicitis can cause serious complications, such as:

A ruptured appendix. A rupture spreads infection throughout your abdomen (peritonitis). Possibly life-threatening, this condition requires immediate surgery to remove the appendix and clean your abdominal cavity.

A pocket of pus that forms in the abdomen. If your appendix bursts, you may develop a pocket of infection (abscess). In most cases, a surgeon drains the abscess by placing a tube through your abdominal wall into the abscess. The tube is left in place for about two weeks, and you're given antibiotics to clear the infection.

Once the infection is clear, you'll have surgery to remove the appendix. In some cases, the abscess is drained, and the appendix is removed immediately.

Imaging Studies:-

Tests and procedures used to diagnose appendicitis include:

Physical exam to assess your pain: Apply gentle pressure on the painful area. When the pressure is suddenly released, appendicitis pain will often feel worse, signaling that the adjacent peritoneum is inflamed.

Look for abdominal rigidity and a tendency to stiffen abdominal muscles in response to pressure over the inflamed appendix (guarding).

Use a lubricated, gloved finger to examine lower rectum (digital rectal exam). Women of childbearing age may be given a pelvic exam to check for possible gynecological problems that could be causing the pain.

Blood test. To check for a high white blood cell count, which may indicate an infection.

Urine test. Urinalysis to make sure that a urinary tract infection or a kidney stone isn't causing pain.

Imaging tests. An abdominal X-ray, an abdominal ultrasound, computerized tomography (CT) scan or magnetic resonance imaging (MRI) to help confirm appendicitis or find other causes for pain.

Treatment:-

Appendicitis treatment usually involves surgery to remove the inflamed appendix. Before surgery a dose of antibiotics are prescribed to treat infection.

Surgery to remove the appendix (appendectomy)

Appendectomy can be performed as open surgery using one abdominal incision about 2 to 4 inches (5 to 10 centimeters) long (laparotomy). Or the surgery can be done through a few small abdominal incisions (laparoscopic surgery). During a laparoscopic appendectomy, the surgeon inserts special surgical tools and a video camera into abdomen to remove appendix.

In general, laparoscopic surgery allows to recover faster and heal with less pain and scarring. It may be better for older adults and people with obesity.

Lifestyle and home remedies:-

Expect a few weeks of recovery from an appendectomy, or longer if your appendix burst. To help your body heal:

Avoid strenuous activity at first. If appendectomy was done laparoscopically, limit your activity for three to five days. If had an open appendectomy, limit activity for 10 to 14 days. Always ask doctor about limitations on activity and when can resume normal activities after surgery.

Support abdomen when coughing. Place a pillow over abdomen and apply pressure before coughing, laughing or moving to help reduce pain.

Call doctor if pain medications aren't helping. Being in pain puts extra stress on body and slows the healing process. Despite on pain medications, if still in pain call doctor.

Get up and move when ready. Start slowly and increase activity. Start with short walks.

Sleep when tired. As body heals, feel to sleep than usual. Take it easy and rest when need to.

Discuss returning to work or school with doctor. Return to work when felt up to it. Children may be able to return to school less than a week after surgery. They should wait two to four weeks to resume strenuous activity, such as gym classes or sports.

TRENDS IN HEALTH AND DISEASE IN INDIA

Dr. Obed J.H. Antipas, M.B.B.S, M.D., Assistant Professor, Community Medicine, C.M.C.H, Vellore.

Health and disease in our country have seen gradual and significant changes over the past decades. Earlier in the 20th century and through the latter half too the major challenges for the healthcare system in India were infectious in nature Vaccine development, universal immunization coverage were some major interventions aimed at pushing back infectious diseases in India. Medical advances also accounted for the life expectancy to cross 67 years, and infant and under-five mortality rates to decline along with the rate of disease incidence and many diseases, such as polio, guinea worm disease, yaws, and tetanus, have been eradicated. However, several diseases like dengue fever, chikungunya, malaria, tuberculosis and swine flu which show up during particular seasons are still high priority and need attention in India. Antimicrobial resistance another one of the biggest health challenges facing us that must be tackled with all seriousness.

Changing lifestyles due to urbanisation, globalisation of trade and marketing, and increasing life expectancy because of medical and technological advances have, in recent years, contributed to a shift in disease burden from communicable to non-communicable diseases (NCDs) from the latter part of the 20th century onwards. Non-communicable diseases or NCDs are now the leading cause of death in the country, contributing to 60% of deaths. Four diseases - heart disease, cancer, diabetes, and chronic lung diseases account for almost 80% of all deaths due to NCDs and they share four common risk factors - tobacco use, alcohol abuse, unhealthy diet, and sedentary lifestyle.

India's healthcare delivery system has been traditionally focused on communicable diseases, and maternal and child health problems and needs to get fully geared

to deal with the triple burden of disease – the challenge of noncommunicable diseases (NCDs), linked with lifestyle changes; and emergence of new pathogens causing epidemics and pandemics and the unfinished battle against infectious diseases.

ENZYMES IN CLINICAL APPLICATIONS

Dr. R.Geetha, Assistant Professor & Head, Department of Biochemistry, Arcot Sri Mahalakshmi Women's College, Vilapakkam.

The lecture was on the enzymes uses in clinical applications the following points was discussed: Enzymes are biological catalysts; increase the velocity of the reaction. Enzymes are present in virtually all organs but with slight different forms in different locations. Enzymes can also act as reagents for various biochemical estimations and detections.

Enzymes are the preferred markers in various disease states such as myocardial infarction, jaundice, pancreatitis, cancer, neurodegenerative disorders, etc. They provide insight into the disease process by diagnosis, prognosis and assessment of response therapy. Enzyme estimation is helpful in the diagnosis of Myocardial Infarction, Liver Diseases, Muscle Diseases, Bone diseases, GI tract Diseases, Cancers.

Lactate dehydrogenase catalyzes the reversible conversion of lactate to pyruvate. Normal level 55-140 IU/L. The levels are generally higher in children. LDH level is 100 times more inside the RBCs than in plasma, therefore even little hemolysis results in false-positive result. The increase in serum activity of LDH is also seen in hemolytic anemias, hepatocellular damage, muscular dystrophies, carcinoma, leukemias, and any other condition which causes necrosis of the body cells.

Cardiac Troponins -They are not enzymes; however they are accepted as markers of myocardial infarction. They are the contractile proteins of myofibrils. The troponin complex consist of 3 components; Troponin C (Calcium binding), Troponin I (Actomyosin ATPase inhibitory element) and troponin T (Tropomyosin binding element). The normal range for troponin is between 0 and 0.4 ng/mL C-reactive protein (CRP) – Possible marker in CVD. Normal CRP levels are below 3.0 mg/L.

Serum enzyme tests can be grouped into two categories: Enzymes whose elevation in serum reflects damage to hepatocytes. Enzymes whose elevation in serum reflects cholestasis. The activities of 3 enzymes - Alkaline phosphatase, Nucleotidase and GGT are usually elevated in cholestasis. Alkaline phosphatase and nucleotidase are found in or near the bile canalicular membrane of hepatocytes, while GGT is located in the endoplasmic reticulum and in bile duct epithelial cells.The normal serum alkaline phosphatase consists of many distinct isoenzymes.

Amylase – serum activity > 1000 units is seen within 24 hours in acute pancreatitis, values are diagnostic. A raised serum activity is also seen in perforated peptic ulcer and intestinal obstruction. Lipase – levels as high as 2800 U/L is seen in acute pancreatitis. Also reported highly perforated duodenal and peptic ulcers and intestinal obstruction. Alkaline phosphatase – rises in rickets, osteomalacia, hyperparathyroidism and in Paget's disease. Also rises in primary and secondary malignancies of bones. Acid phosphatase – highly increased in bone cancer.

RESEARCH METHODOLOGY

Dr. Febin Prabh Dass Associate professor Department of Integrative Biology School of Bio Sciences &Technology VIT, Vellore.

Clover and Balsely: "Process of systematically obtaining accurate answers to significant and pertinent questions by the use of scientific method of gathering and interpreting information.

Research comprises

- Defining and refining problems
- Formulating hypothesis or suggested solutions
- Collecting, Organizing & Evaluating data
- Making deductions and reaching conclusions
- at last carefully testing the conclusions to determine whether they fit the formulating hypothesis

Characteristics of Research:

Prediction for future occurrences,Direction towards solution, Accuracy in observation and description, Basis of research is experience ,Gathering of data,It is a scientific program, Patient activity,Quest for answers, Objective and logical, Carefully designed procedures, Need Expertise and Careful critical enquiry.

Why Research?

Environmental factors demanding managers to havemore & better information for decision making.

More variables to consider in every decision, Knowledge increment in the field of management ,Global and Domestic competition, Quality of theories and decision models getting increased.Increased role of govt and Growth of commercial sites on web. Workers, shareholders and customers wants to have their share in decision making, Data mining or extraction of knowledge from internal database, Use of technology (computers) and Tools used to conduct research have increased.

Objectives in research:

Description ,Explanation, Forecasting, Control and Modelling.

1. To gain familiarity or to achieve new insights to the phenomenon. Exploratory or Formulative Studies.
2. To portray accurately the characteristics of a particular individual, situation or a group Descriptive Studies.
3. To determine the frequency with which something occurs or with which it is associated with something else. Diagnostic Studies.
4. To test a hypothesis of a casual relationship between variables. Hypothesis testing Studies

Types of Study:

- ✓ Reporting

- Most elementary level
- To generate some statistics

✓ Descriptive Study- Observation

- Who, What, When, Where and sometimes How.
- Describe a subject by creating profile of problems, people or events.

✓ Explanatory Study: Why

- Explains the reason .
- Use of theories or hypothesis to study the forces that caused the event to occur.

✓ Predictive Study: Forecasting

- Predict when and in what situation the event will occur.

Motivation In Research:

- Research Degree & its benefits.
- Face challenges in solving unsolved problems.
- Joy of doing something creative.
- To serve the society.
- To get respect.
- Government directives.
- Employment conditions.
- Curiosity about new things.
- Social thinking and awakening

Types of Research:

1.Descriptive-To describe the event as it exists in present,Survey and fact finding enquiries of different kind,No control over the variable. Report what has happened or happening. Most ex- post facto projects .E.g.. Frequency of shopping, Preferences of people.

2. Analytical Research-Use of facts and information already present to make the critical evaluation of the event.

3. Applied Research-To find solution for an immediate problem being faced by a society or business organization.

4. Fundamental Research-Concerned with generalization & formulation of a theory.

5. Quantitative Research-Measurement of quantity or amount

6. Qualitative Research-Based on qualitative analysis.

7. Conceptual -Based on abstract idea or theory, Used to develop new concepts or to reinterpret the existing ones.

8. Empirical Research-Relies on experience and observation alone without due regards for system or theory.Data based research with conclusions which are capable of being verified by observation or experiments.

9. Exploratory Research

- Development of hypothesis rather than its testing

10. Formularized Research

- These studies are with substantial structure & with specific hypothesis to be tested.

11. Diagnostic Studies

- To determine the frequency with which something occurs or with which it is associated with something else.

12. Historical Research

- Utilizes historical sources like documents , remains etc to study events & ideas of past.

Research Approaches

Quantitative Approaches

- Deals with numerical measurements (i.e. quantities).
- Quantitative approaches aim to test hypotheses, and usually to identify numerical differences between groups.

Qualitative approaches

- Deals with how people understand their experiences (i.e. qualities).

Quantitative approaches	**Qualitative approaches**
'Simple' numeric data	'Complex' rich data
Measurement	Meaning
Explanation	Understanding
Prediction	Interpretation
Generalisable account	Contextual account
Representative population sample	Purposive/ representative perspective sample
Hypothesis-testing	Exploratory
Claims objectivity	Accepts subjectivity

Closed system (experimental control)	Open system (ecological validity)

Research Process

Criteria For Good Research:

- Purpose Clearly Defined
- Research Process described in detail for further enhancement
- Research Design Thoroughly Planned(Procedure , sample, Data collection)
- High Ethical Standards Applied
- Limitations frankly revealed
- Sufficient Analysis
- Findings presented unambiguously.
- Conclusion justifies
- Researcher's experience reflected.

Problems Encountered by Researchers in India:

- Lack of training

- Insufficient interaction between government, Business organization and research dept.
- Less confidence among business units regarding misuse of there data.
- No code of conduct.
- Overlapping researches.
- Library availability.
- Timely availability of published data.

SPINE FUNCTIONAL ANATOMY, POSTURE & ERGONOMICS

Dr. Arun Christopher, Physical Therapy Specialist, Qatar Rehabilitation Institute Hamad Medical Corporation, Doha, Qatar.

In the presentation, following introduction on the significance and the effects of posture and how it affects an individual's health, he explained the anatomy of the spine and its importance in postural awareness. He explained the possible contributing factors to experience back pain and steps to avoid it. Dr. Arun elaborated the biomechanics of Lifting and factors behind back and neck pain acquired postural compromises individuals adapt and are unaware of its consequences in their activities of daily life.

He later explained the Ergonomics and the common issues on prolonged computer usages and in ergonomically deficient environments and constant computer and mobile usage with excessive screen time.

Dr. Arun further explained the significance of Exercises and demonstrated Stretching Exercises from basic to advanced levels with illustrations. The other illustrated exercise program he added were pause break and warm up exercises.

There was an active Interaction from the students with Dr. Arun with questions focused on timing and duration of exercises, diurnal variations in performance of exercise programs.

RESEARCH ACTIVITIES

Ph. D VIVA VOCE EXAMINATION

S.No	Name of The Candidate	Topic	Name of the Guide	Date of examination	External Examiner
1.	Lakshmi Priya. G	Gastro and cytoprotective activity of Indian Medicinal plants against experimentally induced gastric Ulcer in Rats.	Dr. Sr. Mary Josephine Rani	20.08.2019	Dr. Joseph Thatheyus, Head, PG and Research, Dept. of Zoology, American College, Madurai.
2.	Sandhya .C	Biosynthesis and characterization of gold nanoparticles using south Indian Medicinal plants and its biomedical applications.	Dr. Sr. Mary Josephine Rani	10.10.2019	Dr.M.G.Ragunathan, Principal and Associate Professor, Dept. of Zoology, Guru Nanak College, Chennai.

M.Sc SUMMER PROJECT VIVA VOCE The Second batch of summer project was successfully completed by the M.Sc. Zoology students and on 26.6.2019 Project Viva Voce was conducted. Dr. Punitha, Assistant Professor of Zoology, Govt. College, Cheyar, Vellore was the external examiner and Dr. A. Mary Agnes Associate Professor of Zoology Auxilium College was the Internal Examiner.

S.No	Reg.No	Name	Title	Guide
1.	30518P23001	Annakili V	Identification of Microbes present in Waste water at primary level by biochemical method.	Dr. Rajalakshmi.A
2.	30518P23002	Christy Samuel	Comparative analysis of Nutrient content of Protein, Carbohydrate and Calcium in Mammalian milk	Ms. Anu. K
3.	30518P23003	Dhiviya Ephisya E	Isolation and Identification of microbes from secondary tank of Loyola Sewage Treatment plant using biochemical methods.	Ms. Hannah Elizabeth
4.	30518P23004	Irine Towel J	Isolation and Identification of microbes from tertiary tank of Loyola sewage treatment plant using biochemical methods.	Ms. Hannah Elizabeth
5.	30518P23005	Iswariya S	Study on edible coating to preserve the quality of fruits during storage.	Dr. Rajalakshmi
6.	30518P23006	Jayashree S	A Study on Antidiabetic activity of oil extracted from star anise pods and its effects on Liver cell line ($HepG_2$)	Ms. Hannah Elizabeth
7.	30518P23007	Lavanya R	A Study on Anti inflammatory activity of oil extracted from star anise and its effect on Breast cancer cell line (MCF 7)	Ms. Rebecca vinolia
8.	30518P23008	Priyanka S.P	Natural preservation of Cereals and Pulses, Antibacterial activity in onion (*Allium cepa*) and natural food colour production	Dr. Uma Chandra Meera Lakshmi. N
9.	30518P23009	Rajakumari K	In- Vitro Antioxidant activity from methanolic extract of *Eucalyptus globules.*	Ms. Vidhya. K
10.	30518P23010	Sindhu B	Determination of Alcohol content in Fermented fruit juices.	Dr. Rajalakshmi
11.	30518P23011	Vijayasree A	A Study on the Antioxidant and Antihemolytic activity of the seeds of *Strychnos potatorum* in methanol and aqueous extracts.	Ms. Vidhya. K

FACULTY DEVELOPMENT PROGRAMME -2019-2020

Ms. Vidhya K. Ms. Rebecca vinolia Dr. Rajalakshmi A. Dr. Anu K., Ms. Joice Devapriya J	05.06.2019	Faculty Development Progam Enriching, Enhancing the effectiveness of Teaching using 21st Century Skill sets. Organized by The Haskalah Academy.
Ms. Vidhya K	18.07.2019 to 19.07.2019	National Level Training on "Evaluation Reforms in Higher Education" organized by UGC South Eastern Regional Office, Hyderabad.
Ms. Hannah Elizabeth S Ms. Vidhya.K Ms. Rebecca Dr. A. Rajalakshmi Ms. Anu K Ms. Joice Devapriya J	02.08.2019 & 03.08.2019	Two-Day State Level Workshop on "Intellectual Property Right" organized by Tamil Nadu State Council for Science and Technology Chennai and Research Cell and IPR Cell of Auxilium College, Vellore.
Dr. Arockiamary J.S Dr. Mary Agnes A.,	08.11.2019	One-Day Workshop on Data Processing and Automation for National Institutional Ranking Framework India Ranking 2019(NIRF) organized by IQAC, Don Bosco College, Yelagiri Hills, Vellore District, Tamil Nadu.
Ms. Vidhya K	19.11.2019	The Future Scientist-Competition- Judge. organized by VIT, Hindu, Tamil Nadu Science Forum.
Dr. Arockiamary J.S Dr. Mary Agnes A., Dr. Uma Chandra N Ms. Hannah Elizabeth S. Ms. Vidhya.K Ms. Rebecca Dr. Rajalakshmi A Ms. Anu K Ms. Joice Devapriya J	29.11.2019	National Seminar on "Animal Behaviour NSAB-19" organized by PG and Research Department of Zoology
Dr. Uma Chandra N.	03.12.2019 to 09.12.2019	NSS Orientation Course conducted by Empanelled Training Institution Madras School of Social Work
Ms. Vidhya K.	06.12.2019	The Exposure cum Demonstration Programme on Eco Promotive Ethno Crafts. conducted by Solai Program, capacity Development Initiatives- platform for Youth Power Development
Dr. Uma Chandra N. Ms. Vidhya K.	21.12.2019 to 22.12.2019	Research Workshop on Higher Forces of Consciousness in Leadership. Conducted by ISOL Centre for Consciousness Studies in collaboration with Sri Aurobindo Centre for Advanced Research Pondicherry.
Dr. Rajalakshmi A.,	03.12.2019 04.12.2019	International Conference on "Advances in Environmental and Health Sciences organized by PG and Research Department of Zoology, D.K.M. College for women (Autonomous) Vellore-1

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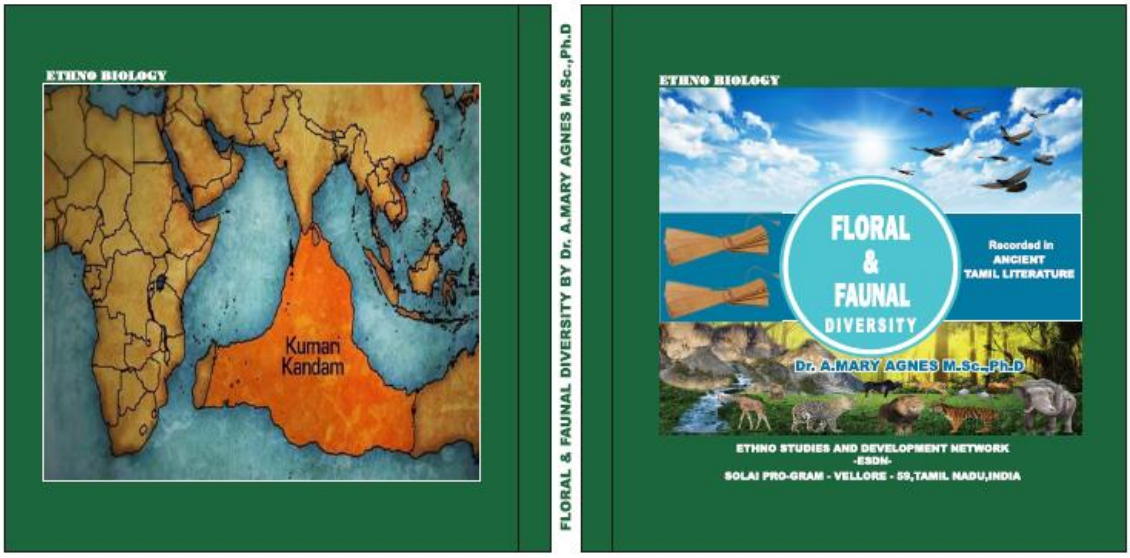

FLORAL AND FAUNAL DIVERSITY
recorded in
ANCIENT TAMIL LITERATURE

Dr. A.MARY AGNES M.Sc., Ph.D

Associate Professor of Zoology

Auxilium College (Autonomous)

Vellore - 632 006.

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ONLINE COURSES

AUXILIUM COLLEGE (Autonomous)
DEPARTMENT OF ZOOLOGY
DETAILS OF THE ONLINE COURSES COMPLETED BY THE STUDENTS

ACADEMIC YEAR 2019-2020						
S.No	**Register no**	**Name**	**Duration in Weeks**	**Completion date**	**Title of the course**	**Institution**
	II PG					
1.	30518P23001	Annakili V	4	20.8.2019	Nutrition and Well being	University of Aberdeen
2.	30518P23001	Annakili V	4	10.9.2019	The Science of Nuclear Energy	The Open University
3.	30518P23002	Christy Samuel	4	July 2019	Stanford Introduction to food and Health	Coursera
4.	30518P23002	Christy Samuel	4	August 2019	Introduction to Reproduction	Coursera
5.	30518P23002	Christy Samuel	6	Sept 2018	Bacteria and Chronic Infection achieved	Coursera
6.	30518P23003	Dhiviya Ephisya	4	August 2019	Introduction to Nutrition and Safety	Taipei Medical University
7.	30518P23003	Dhiviya Ephisya	4	August 2019	The science of Nuclear Energy	The Open University
8.	30518P23003	Dhiviya Ephisya	4	August 2019	Inside Cancer	University of BATH
9.	30518P23004	Irine Towle	4	Sept 2019	Nutrition and Well Being	University of Aberdeen
10.	30518P23004	Irine Towle	6	Sept 2019	Evidence based Medicine in Clinical Pharmacy Practice	Taipei Medical University
11.	30518P23004	Irine Towle	4	Oct 2019	The science of Nuclear Energy	The Open University
12.	30518P23005	Iswariya S	4	August 2019	Digital Health for Cancer Management	Taipei Medical University
13.	30518P23005	Iswariya S	6	Sept 2019	Pharmacokinetics : Drug dosing and monitoring in Renal diseases	Taipei Medical University
14.	30518P23005	Iswariya S	4	Sept 2019	Introduction to Nutrition and food Safety	Taipei Medical University
15.	30518P23006	Jayashree S	4	Sept 2019	Nutrition and Well Being	University of Aberdeen
16.	30518P23006	Jayashree S	4	Sept 2019	Introduction to Nutrition and food Safety	Taipei Medical University
17.	30518P23006	Jayashree S	4	August 2019	Process Mining in Health Care	Taipei Medical University
18.	30518P23007	Lavanya R	4	25.08.2019	Climate Change : Solutions	Taipei Medical University
19.	30518P23007	Lavanya R	4	13 .08.2019	Digital Health for Cancer Management	Taipei Medical University
20.	30518P23007	Lavanya R	4	15.09.2019	Artificial Intelligence for Health for Cancer Management	Taipei Medical University
21.	30518P23008	Priyanka P	4	16.09.2019	Digital Health for Cancer Management	Taipei Medical University
22.	30518P23008	Priyanka P	4	01.09.2019	Introduction to Nutrition and food Safety	Taipei Medical University
23.	30518P23008	Priyanka P	6	28.09.2019	Pharmacokinetics : Drug	Taipei Medical

					dosing and monitoring in Renal diseases	University
24.	30518P23009	Rajakumari	4	August 2019	Climate Change : Solutions	Taipei Medical University
25.	30518P23009	Rajakumari	4	August 2019	Nutrition and Disease prevention	Taipei Medical University
26.	30518P23009	Rajakumari	4	Sept 2019	The Science behind Forensic Science	Kings College, London
27.	30518P23010	Sindhu J	6	Sept 2019	Evidence based Medicine in Clinical Pharmacy Practice	Taipei Medical University
28.	30518P23010	Sindhu J	4	Sept 2019	Pharmacokinetics : Drug dosing and monitoring in Renal diseases	Taipei Medical University
29.	30518P23010	Sindhu J	4	Oct 2019	Become a Pharmacy Preceptor	Taipei Medical University
30.	30518P23011	Vijayashree A	4	Sept 2019	Introduction to Nutrition and food Safety	Taipei Medical University
31.	30518P23011	Vijayashree A	4	August 2019	The science of Nuclear Energy	The Open University
32.	30518P23011	Vijayashree A	4	Sept 2019	Nutrition and Well Being	University of Aberdeen
I PG						
1	30519P23001	Angel Helen	4	12.08.2019	Dementia and the Arts: Sharing practice, developing understanding and enhancing lives.	UCL
2	30519P23002	Anupama Vijay	8	September 2019	Wildlife conservation	NPTEL
3	30519P23003	Berlin R	4	August 2019	Biology for Engineers and other Non biologists	NPTEL
4	30519P23004	Gayathri R	4	19.19.2019	Inside Cancer	University of Bath
5	30519P23005	Gomathi S	6	21.08.2019	Clinical Pharmacokinetics: Dosing and Monitoring	Taipei Medical University
6	30519P23006	Mathura R	4	August 2019	Biology for Engineers and other Non biologists	NPTEL
7	30519P23007	Priyadharishini G	4	09.08.2019	Management and Leadership : Growing as a Manager	Future Learn
8	30519P23008	Renuka R	4	03.09.2019	Insight Cancer	University of Bath
9	30519P23009	Rowdri R	4	25.08.2019	Inside Cancer	University of Bath
10	30519P23010	Selvamani P	4	August 2019	Biology for Engineers and other Non biologists	NPTEL
11	30519P23011	Sruthi Priya. G	5	20.11.2019	Extinctions	University of Cape Town

AUXILIUM COLLEGE (Autonomous)
DEPARTMENT OF ZOOLOGY
DETAILS OF THE ONLINE COURSES COMPLETED BY THE STAFF

ACADEMIC YEAR 2019-2020					
S. No	**Name**	**Duration in Weeks**	**Completion date**	**Title of the course**	**Institution**
1.	Vidhya K	13	10.11.2019	Solid and Hazardous Waste Management	Swayam
2.	Vidhya K	4	September 2019	Biomedical Nanotechnology	NPTEL

AUXILIUM COLLEGE (AUTONOMOUS)
DEPARTMENT OF ZOOLOGY
Details of the online course completed by the students 2018-2021

S.No	Register No	Name	Duration	Completed Date	Title of the course	Institution
1	30518U33003	Anjani.V		02.07.19	HIV/AIDS Awareness and Prevention	Alison
2	30518U33004	Anusuya. S	1 hr	24.06.19	Biology taster course. An intro to key concept	Udemy
3	30518U33005	Arshiya Fathima. A	1 hr	28.06.19	Chemistry 101- Part 4 chemistry in society	Udemy
4	30518U33007	Asly Jose . A	38 mints	25.06.19	Determine your body type	Udemy
5	30518U33008	Asmakowser.M	1 hr	25.06.19	Personality Psychology	Udemy
6	30518U33009	Deepa ananthi. M	36 mints	28.06.19	Basic Bone Healing	Udemy
7	30518U33010	Dhivya . K	1.5 hr	24.06.19	Cancer Nutrition	Udemy
8	30518U33012	Indhu. C	1 hr	25.06.19	7 Chakra Meditation for beginners	Udemy
9	30518U33014	Jerlin Vailanganni. V		02.07.19	HIV/AIDS Awareness and Prevention	Alison
10	30518U33015	Jothika . J	36 mints	25.06.19	Body confidence in 4 weeks	Udemy
11	30518U33016	Kalistha mary. K	43 mints	25.06.19	Discover your Energy Body	Udemy
12	30518U33017	Kani mozhi. K		02.07.19	HIV/AIDS Awareness and Prevention	Alison
13	30518U33018	Kavitha . S (1.05.2001)		25.06.19	Alcohol and its effects on health	Alison
14	30518U33019	Kavitha .S (14. 06.2001)	38 mints	07.07.19	Determine your body type	Udemy
15	30518U33020	Komathi. N	43 mints	07.07.19	Discover your energy body	Udemy
16	30518U33022	Loshika. D.S	1 hr	25.06.19	5 Amazing Psychology experiments	Udemy
17	30518U33023	Loshini. D.S	1.5 hr	25.06.19	Chemistry course- Colligative propertive of solution	Udemy
18	30518U33024	Manju.S		13.06.19	Digestive system	Alison
19	30518U33025	Mary Jeromy. M		08.07.19	Introduction to human nutrition	Alison
20	30518U33026	Mary Lency.A		07.05.19	Gobal health initiative Malaria - Awareness	Alison
21	30518U33027	Monisha. K	I hr	25.06.19	Plant based Diet to reverse health damage	Udemy
22	30518U33028	Nandhini. N		02.07.19	HIV/AIDS Awareness and Prevention	Alison
23	30518U33029	Nandhini. V	2.5 hrs	25.06.19	The neuroscience of reframing	Udemy

					and how to do it	
24	30518U33030	Narmatha. A	1hr	25.06.19	How to introduced your dog to your new baby	Udemy
25	30518U33031	Nirmala. B	1 hr	02.07.19	Current electricity alternating current and atoms	Udemy
26	30518U33032	Nithiya Shree. R		07.05.19	Global Health Initiative Malaria- Awareness	Alison
27	30518U33033	Nivetha. K	2.5 hr	28.06.19	A beginners guide to kinematics	Udemy
28	30518U33035	Preethi. S		02.07.19	HIV/AIDS Awareness and Prevention	Alison
29	30518U33036	Priyadharshini. K		08.07.19	Introduction to human nutrition	Alison
30	30518U33037	Priyadharshini. R	1.5 hr	25.06.19	The organic chemistry	Udemy
31	30518U33038	Ranjana. K	1.5 hr	24.06.19	HIV/AIDS REIKI- course level one	Udemy
32	30518U33039	Rithika. J		08.07.19	Introduction to human nutrition	Alison
33	30518U33040	Sajida Banu. M		04.06.19	Introduction to human digestive system	
34	30518U33041	Shalini. S		08.07.19	Introduction to human nutrition	Alison
35	30518U33042	Sharumathi . C		02.07.19	HIV/AIDS Awareness and Prevention	Alison
36	30518U33043	Sree Lekha. S			Global Health Initiative Malaria- Awareness	Alison
37	30518U33045	Swetha. G	2.5 hrs	25.06.19	Introduction to the psychology of carljung	Udemy
38	30518U33046	Tamil selvi. P	1 hr	25.06.19	Meet your brain.Ashirt Introduction to Neuroscience	Udemy
39	30518U33047	Thahiya Fathima. R	1 hr	08.09.19	A- Level Biology, An Introduction to key concepts	Udemy
40	30518U33048	Thenmozhi . M	5 hrs	22.06.19	Biology principles of inheritance variation	Udemy
41	30518U33049	Valarmathi. B		08.07.19	Introduction to human nutrition	Alison
42	30518U33051	Varsha. V			Food safty and hygiene	Alison
43	30518U33052	Varshiba. S		02.07.19	HIV/AIDS Awareness and Prevention	Alison
44	30518U33053	Varshini. S		02.07.19	HIV/AIDS Awareness and Prevention	Alison
45	30518U33002	Angel Deepika.A		15.07.19	Chemistry in society	Udemy

STUDENTS CORNER

ENDANGERED SPECIES OF INDIA

India is still home to some of the most beautiful creatures in the world, There are 400 wildlife sanctuaries and 80 National parks in India, which give shelter to the wide range of wild and Endangered Wild Animal. Because of deforestation and other human activity wild animals lost their habitat and reached at risk of become extinct. Indian is losing their animals due to Environmental pollution, deforestation, loss of habitat, human interference, poaching and hunting.

However, owing to human activities and increased poaching and killing of animals by the poachers for their horns, or their skin or even their teeth or hooves, has lead to lowering their numbers. Sometimes many species move out of their natural habitat for the need of food and also due to gradual contamination of the lands with pollution that they are habituated to live in. It can also happen when there are floods or there are other natural calamities or the slow increase of the saltiness of the water.

All animals and birds in India are rated as critically Endangered (CR), Endangered (EN) or Vulnerable (VU). Mainly endangered animals in India are big cats family includes snow leopard, Bengal tiger and Asiatic Lion, other India's endangered animals are Purple Frog or Pig nose Frog, Great Indian Vulture, Indian giant squirrel, Giant Indian Fruit Bat, Great birds and King Cobra.

According a report issued by the International Union for Conservation of Nature (IUCN) Red List in 2014, 15 species of birds, 12 species of mammals, and 18 species of reptiles and amphibians have joined the critically endangered list. Some of which are:

1. Indian Tiger
2. Red Panda
3. Ganges Dolphin
4. Gharial
5. Indian Bustard
6. Indian Rhinoceros
7. Lion tailed Macaque
8. Nilgiri Tahr
9. Sangai Deer
10. Indian Pangolin
11. Wild water buffalo
12. Indian wild dog
13. Snow leopard
14. Purple Frog
15. Pink Headed Duck
16. Indian Vulture

17. Kala Hiran

WHY CRITICALLY ENDANGERED?

According to IUCN Red List the critically endangered species are at a highest risk of extinction. There are basically five ways to determine whether the particular species are endangered or not.

1. When the species have a limited geographical range.
2. Very limited or small population of less than 50 adult individuals.
3. Whether the population has decreased or will decrease by more than 80% for the last three generations or 10 years.
4. If the population is less than 250 individuals and is continuously declining at 25% for the last one generation or three years.
5. There is a high possibility of extinction in the wild.

Indian elephant, Bengal tiger, Indian lion, Indian Rhino, Gaur, lion tailed macaque, Tibetan Antelope, Ganga river dolphin, the Nilgiri Tahr, snow leopard, dhole, black buck, great Indian bustard, forest owlet, white – winged duck and many more are the most endangered animals in India.

REASONS FOR THEIR ENDANGERMENT:

1. Loss of habitat is one of the primary reasons for the endangerment of species. Today, human intervention plays a major role in the destruction of the natural landscape. Human activities like removal of trees that provide both food and shelter for innumerable number of species, mining and agriculture.
2. Over hunting and poaching has a very destructive and catastrophic effect on the number of animals and fishes all over the world.
3. Pollution like air pollution, water pollution and waste pollution, especially in the form of plastic plays a very dominant role in the endangerment of animal species. Pollution not only causes health hazards for humans, but it affects the animals also.
4. In a robust and hearty environment there is always an accurate balance between the number of predators and their prey animals. The predators who are natural enemies of their prey animals choose the old and sick preys as they cannot keep up with their group. In this scenario the relationship between them is totally healthy as the predators only eat these prey animals that are already nearing the end of their life.
5. To save the animals from poaching and hunting they are often kept in a sanctuary and shelter. Though for some animals it has proved to be very much beneficial, there are other animals too who suffer and are in trouble for being endangered. The main two reasons are overcrowding and overgrazing. Usually there are too many animals that are enclosed in small areas. These animals often eat the same grass and trees in a limited area whereas in natural surroundings the grazing animals keep on changing the landscape while eating and keep on moving for most of the time

FEW WAYS TO SAVE ENDANGERED ANIMALS

• If pollution can be controlled all across the globe then it can have a major positive impact on animals, fish and birds all over the world.

• To save the endangered animals from extinction, a number of breeding programmes have been introduced. The government, NGOs and the other corporate bodies should come forward for this noble cause as this programme involves dedicated and special people and of course a lot of money.

• Reintroducing the endangered animals to the wild once their numbers increase has become successful in some cases though all species have not done well.

• If hunting and poaching can be controlled then there can be a significant change in the numbers of the endangered animals.

By
Christy Samuel
II- M.Sc Zoology

LIST OF PHOBIAS

Achluophobia	Fear of darkness
Algophobia	Fear of pain
Aichmophobia	Fear of needles or pointed objects
Ataxophobia	Fear of disorder or untidiness
Batrachophobia	Fear of amphibians
Cynophobia	Fear of dogs
Dendrophobia	Fear of trees
Ephebiphobia	Fear of teenagers
Hypochondria	Fear of illness
Iatrophobia	Fear of doctors
Lockiophobia	Fear of childbirth
Mysophobia	Fear of dirt and germs
Necrophobia	Fear of death or dead things
Obesophobia	Fear of gaining weight
Somniphobia	Fear of sleep
Venustraphobia	Fear of beautiful women

By
S. Iswariya
II M.Sc. Zoology

ANIMAL FACTS

- Trained pigeons can tell the difference between the paintings of Pablo Picasso and Claude Monet.
- Studies have shown that wild Chimps in Guinea drink fermented palm sap which contains about three percent alcohol by volume.
- The Chevrotain is an animal that looks like a tiny deer with fangs.
- Capuchin monkeys peck on their hands to wash their feet.
- Dragon flies and Damselflies form a heart with their tails when they mate.
- Sea otters hold hands while they are sleeping so they do not drift apart.
- Animal behaviourists have concluded that cats don't MEOW as a way to communicate with each other. It is a method used for getting attention from humans.
- Flamingos are naturally white but their diet for Brine shrimp and algae turns them pink.
- Red eyed tree frog can hatch early if they sense danger.
- All Clownfish are born male, some turns into female to enable mating.

Angel Helen
I M. Sc Zoology

AMAZING FACTS OF PINK BIRD

- Flamingo are known for its pink coloured feather. They are grey or white during its birth but turns pink due to various amazing factors.
- The pink colour on the feathers of the flamingo comes from the pink crabs they feed on. But flamingo in zoo doesn't show pink colour their plumage becomes white.
- They get reddish pink colour from special colouring chemical (i.e.) pigment found in algae and invertebrate they eat.
- Flamingo are pink on inside too. Because they are well adapted to collect metabolize carotenoid pigments which are found in microscopic plant material that form tones which is orange, red, yellow and pink.
- Flamingo skin is pink, blood is pink but their egg and yolk are not pink in colour. Flamingoes are among a selected few birds which feed their young directly from a secretion produced in their crop (i.e.) from throat and this crop milk is bright pink.

Anupama Vijay
I M.Sc Zoology

FACTS ABOUT ANIMALS

- The heart of shrimp is located in its head.
- A snail can sleep for three years.
- The fingerprints of a koala are so indistinguishable from humans that they have on occasion been confused at a crime scene.
- Slugs have four noses.
- Elephants are the only animal that can't jump.
- A rhinoceros horn is made of hair.
- It is possible to hypnotize a frog by placing it on its back and gently stroking its stomach.
- It takes a sloth two weeks to digest its food.
- Nearly three percent of the ice in Antarctic glaciers is penguin urine.
- Bat always turn left when leaving a cave.
- Giraffes have no vocal chords.
- Kangaroos can't fart.
- An ostrich's eye is bigger than its brain.
- Frogs cannot vomit. If one absolutely has to, then it will vomit its entire stomach.
- Dragonflies and Damselflies from a heart with their tails when they mate.

Madiha Thabasum. A
III B.Sc., Zoology

FEELING OUR EMOTION

"Emotion is a mental state associated with the nervous system brought on by chemical changes variously associated with thoughts, feelings, behavioural responses and a degree of pleasure or displeasure". To a great extent, we live in a culture that resists and fear emotions. From the time we're babies we're taught to quickly shut off negative feelings like anger, sadness or pain. Emotion make us human and our feeling make us unique! Together, they shape our responses to the vast spectrum of experiences throughout life.

Feeling our emotion is very different from allowing them to rule our behavior. When our most unacceptable seeming feelings in a safe and healthy forum, we're actually less likely to act on them in destructive ways. Being able to feel our feelings actually makes us stronger and more resilient. However, none of us are born with ability to regulate our emotions. Unfortunately, we can't always pick and choose the feelings we feel.

One shouldn't avoid the feeling, but they shouldn't indulge in processes that would intensify it. It's not healthy to numb our feelings that are triggered by negative experiences can have a serious impact on our mental health. Emotion shape every area of our lives including who we are and how we function. When we're willing to open ourselves up and experience our emotions fully, we gain insight and awareness into ourselves are important to

express in order to experience the natural response of adaptive anger toward the source of the thought and self compassion that will follow.

Feeling our emotions and drawing on past experiences to remember how they made us feel, gives us the power to relate to others. It also allows us to develop empathy, increased awareness, and compassion. Remember, emotions will come and go, and all feelings are acceptable. We can learn to feel our feelings, while at the same time making rational decision as to how we want to behave. In order to evolve or change, we have to feel our pain fully and make sense of it. This helps to integrate our brain allows us to build stronger relationships in the present. Though it may seem counter-intuitive, if we delve in and feel our sadness, we are more likely to feel love, gratitude and happiness a well. Thus acquiring the ability to process and regulate our emotions in healthy ways is one of the most important skills to live our best life. **"The best and the most beautiful things in the world cannot be seen or even touched. They must be felt with the heart."**

By
Revathi. V,
III B.Sc. Zoology

WHAT A MIRACLE YOU ARE!

This is the phrase lingers in my mind as I look at each animal in the creation. Till a few months back I was only considering Zoology as a study that help people to know something and to step into work. But now I understood that it is far beyond studies and Animals are "Wonderful People" who exist for a greater purpose.

Here I would like to pen my own experience that made me realize the worth of each species on the earth. I never liked Zoology. In the class when I was given the topic called – "Arenicola" from the Phylum Annelids, I just wanted to quit from doing the assignment because of the structure it possesses. When I searched for the images in the website it was unbearable for me to see them lying in the sea shores.

Out of all my uneasiness there was a deep thirst in me to know why did God create them and why at all they do exist? As an alternative for my dislike I started searching for the purpose of their living on earth. Here come some wonderful and unbelievable facts that I came to know about "Arenicola" and the other creatures which made me to have high opinions of all the other animals.

Arenicola:

- Their blood has an extraordinary ability to load up with life giving oxygen.
- "The hemoglobin of the lugworm can transport 40 times more oxygen from the lungs to tissues than human hemoglobin.
- It also has the advantage of being compatible with all blood types.
- More than 1.3 million of the creatures each year provide tiny amounts of the precious hemoglobin.
- So far kidney transplantation has been done for more than 60 patients using their blood.

- The properties of extracellular hemoglobin extracted from the lugworm could help protect skin grafts, promote bone regeneration and lead to universal blood.

Leeches:

- Recent researchers have demonstrated that it is the Leech's salivary secretions which contain an amazing cocktail of medicinal substance which justify its therapeutic use in numerous medical and surgical conditions.
- It is used to reduce post operative swelling in plastic and reconstructive surgery and pain relief in various arthritic diseases.

Termite:

- It is said to cure variety of diseases like rheumatic diseases and anemia.
- It was also said to be a general pain reliever and health improver.

There are millions of species around the earth. They are not only used for the human needs but they stand as the model for me to lead a purpose driven life. After knowing about them the following were my feelings:

- If these tiny creatures has a great deal to fulfill in life what more could I do with all the potentials that I have?
- If they can cure why can't I? If they save lives why can't I too?

Now my study has become the source of my energy. I thank God for all the living creatures because of whom the world still lives and moves healthily. There is so much to be told of them because they stand as wonders amidst all the wonders. What a miracle they are!

By
T. Tamilselvi
I B.Sc., Zoology

AUXILIUM COLLEGE (AUTONOMOUS)
LIFE SCIENCE QUIZ COMPETITION 2019 – 2020

FILL IN THE BLANK (1x15=15)

1. Ostrich is the largest living bird.
2. A rare and endangered animal in silent valley is lion tailed macaque.
3. Typhoid is caused by *Salmenalla thyphi*
4. The element Oxygen is most abundant in the human body.
5. Penicillin is the first antibiotic.
6. The hybrid between horse and donkey is called mule.
7. The nitrogen in the ecosystem is circulated by bacteria.
8. Liver is rich in proteins.
9. Night blindness is caused due to the deficiency of Vitamin A.

10. Number of bones in human body is 206.
11. Birds excrete nitrogenous waste in the form of uric acid.
12. Inner part of the brain is White in color.
13. Hypothalamus gland holds the body's thermostat.
14. Femur is the largest bone in the human body.
15. Glaucoma is a disease of the eyes.

MULTIPLE CHOICE QUESTIONS (1x15=15)

1. Quantity of fresh air required for a man
   a. **1000 cubic feet of air for every 20 minutes** b. 1000 cubic feet of air for every 20 seconds c. 1000 cubic feet of air for every 10 minutes d. 1000 cubic feet of air for every 10 seconds
2. Reserpine is used to
   a. Cure arthritis b. Alleviate pain c. **Reduce high blood pressure** d. Increase blood pressure when it is low
3. Dehydration in human body is caused due to the loss of
   a. Vitamins b. Salts c. Hormones d. **Water**
4. Angora wool is extracted from
   a. Fox b. **Rabbit** c. Goat d. Sheep
5. Radiologists do not take direct X-ray photograph of intestine
   a. X-rays cannot cross intestine
   b. X-rays are not able to capture clear picture
   c. Intestine are affected by direct exposure to X-rays
   d. Even short exposure of X-rays causes cancer in intestine
6. AIDS virus has
   a. **Single stranded RNA** b. Double stranded RNA c. Single stranded DNA d. Double stranded DNA
7. Anglo-Nubian is the breed of
   a. Sheep b. **Goat** c. Poultry d. Cattle
8. Which of the following blood group is Universal recipient?
   a. A b. B c. **AB** d. O
9. Disease caused by the virus
   a. Malaria b. Ringworm c. Whooping cough d. **Poliomyelitis**
10. Which of the following is known as vitamin B_1?
    a. Retinol b. **Thiamin** c. Riboflavin d. Ascorbic acid
11. The area of the human tongue sensitive to bitterness is restricted to

a. Tip b. Edges c. Middle part d. **Posterior part**

12. The enzyme that converts proteins?

a. Enterokinase b. Pepsin c. **Trypsin** d. Erepsin

13. A cell increase in volume when it is placed in

a. **Hypotonic solution** b. Isotonic solution c. Hypertonic solution d. None of the above

14. Plague is caused by

a. Protozoa b. Virus c. **Bacteria** d. None of the above

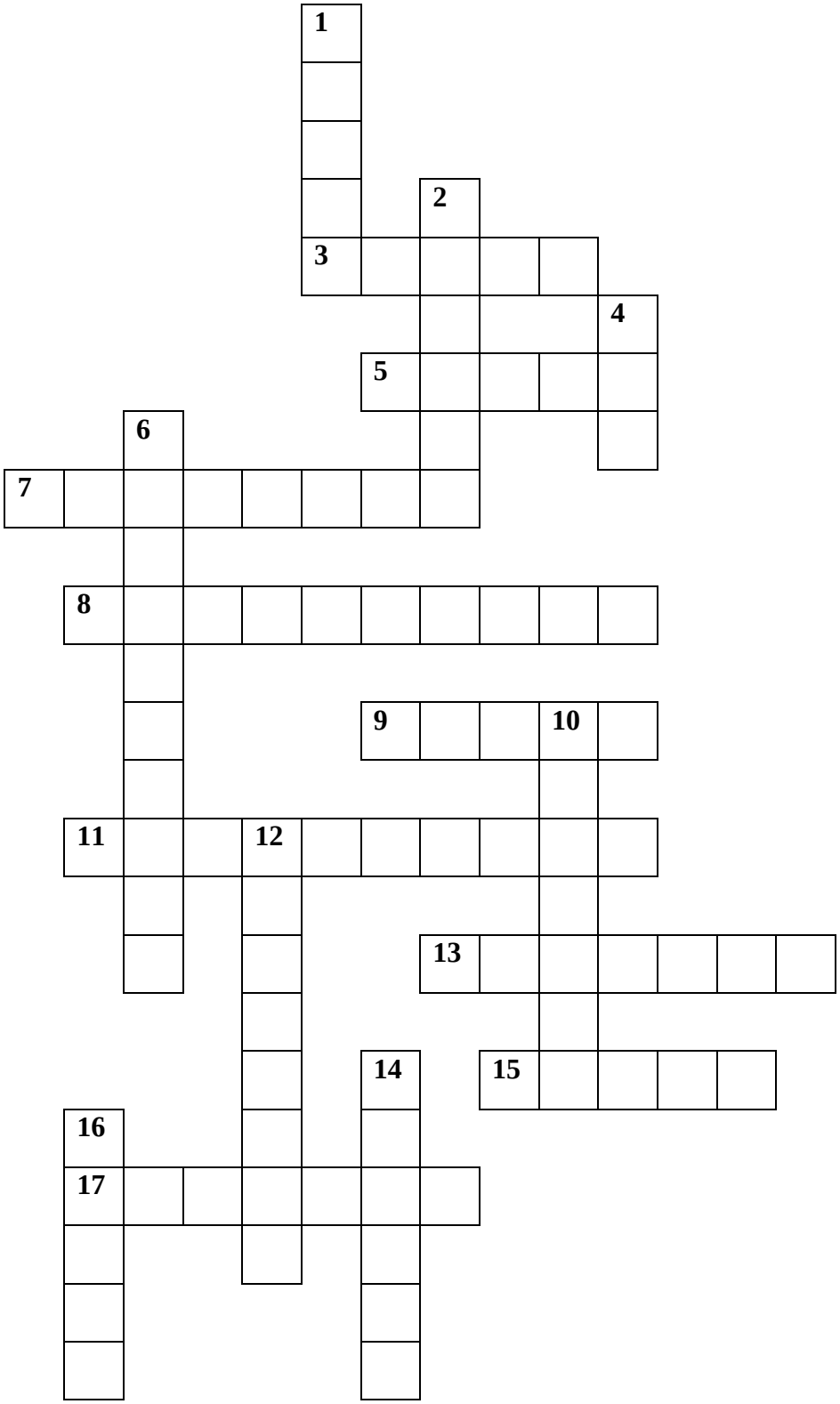
15. Approximate life span of parrot is

a. **20 years** b.30 years c.40 years d.50 years

MATCH THE FOLLOWING (1x20=20)

1. Gir - Australia (5)
2. Bharatpur - Aphrodite (10)
3. Physalia - Study of Earth crust (7)
4. Butterfly - Bhopal tragedy (8)
5. Kangaroo - Rajasthan (2)
6. Periyar sanctuary - Lion (1)
7. Geology - Portuguese Man of War (3)
8. Methyl isocyanide - Insecta (4)
9. Nidology - Elephants (6)
10. Sea mouse - Study of nest of birds (9)
11. King crab - Fry (18)
12. Radia - Chick (20)
13. Spotted deer - Sow (Roost)
14. Tubeworm - Sabella (14)
15. Redfox - Vulpes (15)
16. Rooster - *Axis axis* (13)
17. Ass - Foal (19)
18. Zebra - Liver fluke (12)
19. Fish - Mare (17)
20. Swan - Limulus (11)

CROSS WORD PUZZLE



ACROSS:

3. What is the polar bear's dominant sense?
5. What bird mobs other animals as an act of intimidation to get what they went?
7. What are the dietary habits of demoiselle crane?
8. Where is the sifaka found?
9. What color is the polar bears skin?
11. What kind of water does the African slendernose crocodile live in?
13. What is the largest bird?
15. What color is the colobles monkey's hair when born?
17. What is the rhino's horn made of?

DOWN:

1. Where does the African leopard takes its food to eat?
2. Which sex of the African lion hunts ?
4. How many offspring does a zebra have during a pregnancy ?
6. The sitatugna's population status is what ?
10. What is the fastest land animal ?
12. The Abyssinian ground hornbill lives in the Africa ?
14. What shape does the lesser kuda's horn made ?
16. What animal looks like a zebra, but is more closely related to a giraffe?

ANSWERS: ACROSS:

3.Smell,5.Raven,7.Omnivore,8.Madagascar,9.black,11.freshwater,13.ostrich,15.white,17.keratin

DOWN :

1.Trees,2.Female,4.One,6.Endangered,10,Cheetah,12.Savannah,14.Spiral,16.Okapi

GAYATHRI.A,
III BSc ZOOLOGY

ESSAY WRITING WINNERS

LIFE BELOW WATER

INTRODUCTION:

We humankind can thank ocean for rainwater, drinking water climate, weather, food we eat ,oxygen we breathe. ocean covers about 1/3 rd. of the earth's surface and they are home for more that 2,00,000 species. Marine diversity is not just beautiful, it is livelihood. For 3 billion people. Transaction and transportation take place through water.

No water, no life, no blue, no green!

IMPORTANCE

The ocean provides us food, fossil fuels and so many precious things. into homeland for many different types of speciesism. Coastal and marine helps in the break down of molecule. the coastal line pact as buffer Ans prevents from storm. It makes the gender equality even woman also works on making small things from the ocean. the ocean is full of intestines creatures it has single celled organisms to world biggest organisms over iron the blue whale. its responsible for the climatic changes.

If there magic on this 9earth it is contained in water.

Challenges:

The challenges face by the ocean can be classified into three thematic types.

1. Sustainable development
2. Climatic changes
3. Marine debris

MARINE DEBRIS:

Marine debris is slops called as marine litter. Plastic are the majorly found as marine litter. Plastics which ar3 less than 2mm in size are called as microplastics, almost microplastic ear one which affects the ocean, the plastics which are somewhat bigger in size fleets on the water. microplastics are intake by marine organisms which ignores the gut end causes oxygen insufficiency. Some times they also get emotes ion the skin of the animal human rate major cause of this problems they dumb the wastages into the ocean.

EUTROPHICATION:

Nutrient pollution which are caused by nutrient such as nitrogen, phosphorous, the increase in the level of these nutrient will also affect the ecosystem of the water. Oxygen depletion occurs Ans changes in the species compactions.

OCEAN WARMING:

It is the problem caused due to the global warming the increases in the temperature affects the water mainly the terrestrial areas are also affected but ocean get 10 ties faster than that. due to increase in the temperature the nature of the fish’s changes some may die due to alteration in the temperature. it is the greatest change in the ocean which cause serious problem.

OCEAN ACIDIFICATION:

Ocean acidification is caused due o the alteration in the ph. of the water. then the ph. decreases, the calcium carbonate in the water also declines whitish does not allow the formation of shell do that coral reef all majority affected.

OVER FISHUNG ABD FISHERY SUBSIDES:

The over fishing also affects the marine sustainability. over fishing causes the depletion of the particular species. the water also gets affected due to that.

STEPS TO OVER COME THE CHALLENGES:

Man is the major course for almost all the problems. the open ocean sniff deep sea is sustainability can be increased through international cooperation. We should buy ocean friendly products which do not affect the ocean. Make a small change in our daily lives like retaking public transport, these reduce carbine foot prints. Which contributes the reduction in the depletion of sea?

Conclusion:

We effectively and efficiently thrive towards the advancement of our goal life below water. Definitely there will ne positive outcomes. People must become aware of the problems that oceans forces. The clean not only affected by the climatic changes, over fishing, debris ocean acidification. but it is affected only because of affinity.

Revathi .V
III B.Sc. Zoology

LIFE BELOW WATER

The realm under the surface of water contains water in its natural states like rivers, lakes, oceans, seas, pools, ponds, forming underwater. Almost three quarter of the surface of earth is covered with water bodies. Initially life forms evolved in marine habits. Marine life produce sequester carbon. The term 'MARINE 'comes from the Latin word 'mare' meaning sea or ocean. Humans perform activities like scuba diving and research. But, now, however a majority of marine life is still unexplored and expected to reveal a several million verities of flora and fauna. " The best way to observe a fish Is to live like a fish"

Characteristic of underwater life:

Man cannot survive in underwater due to heavy pressure at that level causing breathing difficulty. The density of water also increases. The colour spectrum changes variedly and there are an event of diminishing visible light. Temperature is low because of minimal heat energy. Sound waves travel four times faster than normal. "Keep calm and swim with turtles"

Ecosystems and food webs:

Aquatic ecosystem is a community of plant, animals and microorganisms living and interacting within a particular environment. the two main types of aquatic ecosystem include marine and freshwater ecosystems. Marine ecosystem (lagoons, oceans, mangroves shore and coral reefs) and Freshwater ecosystem(Ponds, Lakes, Estuaries , Rivers and Wet lands)

The aquatic ecological pyramid is inverted I shape. chemosynthetic sulphur bacteria form the basis of food web in hydrothermal events below the water. The gulf of marine has rich diversities of marine species. The simple aquatic food chain is as follows. Phytoplanktons>zooplanktons>small fish> large fish>whale.

At a fundamental level marine life contributes to the natural aspects of the planet, thus maintaining the climatic stability.

Flourishing floras:

The evidence of the appearance of first land plants near the seashore is observed in the Ordovician period. The marine plants are seen in intertidal zones and shallow waters include sea grasses like eelgrasses and turtle grass, thalassic. Keeps from the largest underwater forest, covering 25%of the world coastline. sargassum is planktonic in nature. mangroves and seaweeds form the important portion in nursery habitats and hiding, foraging places for the larval and juvenile stages of large fish and invertebrates. Coral reefs are the splendid examples od aesthetic beauty under the water. The 'GREAT BARRIER REEF 'in Australia form the latest coral reef system in the world made by microorganisms. Phytoplankton's ate the primary producers in the oceans. it can be classified as cyanobacteria various types of algae, dinoflagellates, diatoms, cryophytes, silico Flagel late, chlorophytes, phylotypes. Zooplanktons are much larger and can be precategory on small phytoplankton. it includes zooflagellates, radiolarians, etc. sargassum is a large brown alga found in marine habitats. Mermaid's wine glass is an invasive species colloquially known as killer algae."Less boat, more fish".

Wild and amazing faunas:

The earlier vertebrates are mainly fishes. Dorn of which developed into amphibians and other become land mammals, subsequently evolving into oceans. the marine invertebrates exhibit a wide range of adaptations to survive in poorly oxygenated areas such as lung tubes in mollusc siphons. lung fishes have lungs instead of gills. Barophilic marine microbes occur in Mariana trench, the deepest spot in the earth's surface. marine micro -organisms includes prokaryotic viruses, bacteria and archaea. Eukaryotes organisms include sponges, echinoderm. viruses affect the causing agents of algal blooms and destroy them. Marine mammals include seals, wheals, oysters, dopiness horses are amazing underwater creatures. Carbon sink of the underwater are also maintained by certain micro-organism. Whale pump trains nitrogen contenting oceans.Microbes are extremely adaptable and are present almost everywhere"

Constant efforts against global effects:

The integrity of ocean values and services are at risk because of ocean management phylogeny and their failure contributing to over exploitation of fishes, and other marine species, as sea foods. Ocean acidification also increases because of the changing global climate experts with IAFA are using isotopic and other techniques to research the harmful effects of microplastics, heavy metals other radionuclides in ocean.

Conclusion:

The United Nations and other communities observe world ocean day on June 8 every year. The theme of 2019 included 'gender and the ocean' emphasizing the gender equality in the workers of ocean related activities."life below water -for people and planet"

Raises awareness about its diversity and measurable activities for its sustainable development, recognized as major theme of 2019.

'SAVE OCEAN, SAVE LIFE SAVE UNDERWATER LIFE"

S. Archana,
I BA English –A Sec

LIFE BELOW THE WATER

Introduction:

Under the waters we have several kinds of lives. God has created many species both as on the land (i.e.) terrestrial as well as aquatic. here, we are come to know about the species and organism which ate aquatic and hydrophilic in nature.

Under the blue:

One of the most common species are fishes. There are different types in it. They also have the characteristic which are very peculiar like parental care, feeding etc…

Tilapia

Tilapia type of species made care for their young ones inside their buccal cavity(mouth). Some species like rouge, puff fish, golden fish, star fish, jelly fish, shark, dolphins, small fishes. Some may care at their abdominal region, some at their back, god gives us these kinds of senses but too fishes also."take care of nature and it Will take care of you "

"IF YOU KILL THE NATURE; IT WILL KILL YOU:

Food web

Initiation of the food web is from phytoplankton's which are living under the sea. If there are no underwater organisms: no life can excite on the earth as terrestrial and aquatic, amphibians."learn to love nature"

Coral reefs

Corals reefs are the most beautiful creatures under the sea. It will be in various colours which are attractive and made habitat for such aquatic animals. It had diversity of living creatures and it called biodiversity. We have come to know that life stars below the water and it plays a major role in biodiversity.

Some amazing under the blue:

We have to do some favour to conserve the wildlife but we have to do some steps to preserve and product aquatic miniatures. They are initiation of living ecosystems and, ecology development also made possible by there species under the sea."Stop pollutinf it is the only solution"To conserve aquatic creatures….

God has given the unique freshwater for almost all species under the water. They adapted to the habitat and survive in water."survival for the fittest"This theory is applied on to aquatic species. We are the barriers of goodness by creating pollution and harm the organisms. Some are oviparous: some are ovoviviparous and take

care of their young ones. Pearl oyster, molluscs, echinoderms, star fish, lobster, jelly fish are poisonous. Sea snakes are also lived in it.

Conclusion

Under water survivors are the most amazing living creatures which are connected with one another. they do not have eyelids but have nictitating membrane to defines and prevent them from irritations. They are the most blessed Ans does good things for other living organisms also. Pearl from is very precious are born from oyster and the reservoir is water. Ultimately water is the key too almost all organism and source of lives on terrestrial as well as aquatic. ‘loaf after the star: It will do unto you, conservation is better than creation!!!!

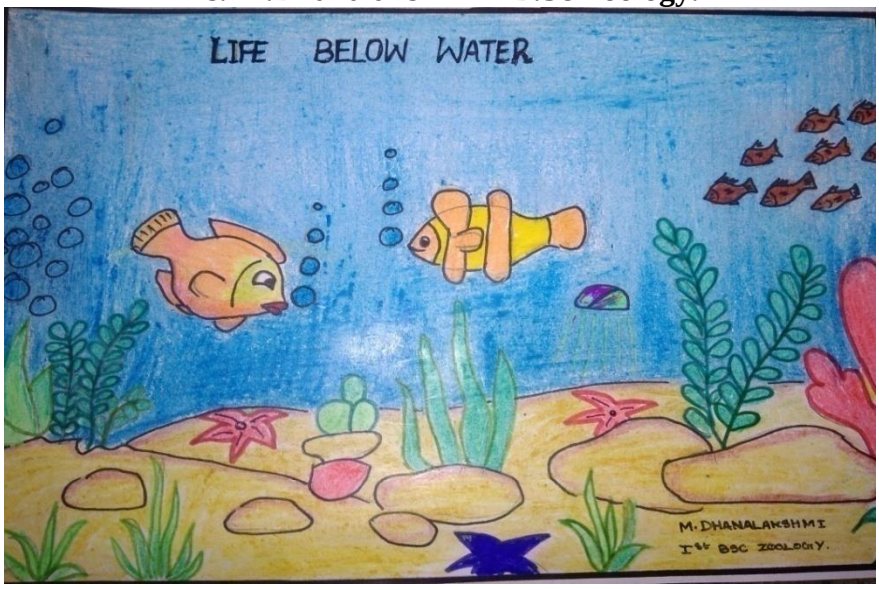
V. Varsha

II B.Sc. Zoology

ART GALLERY

Ms. S. Deepa Anandhi, II B.Sc Zoology.

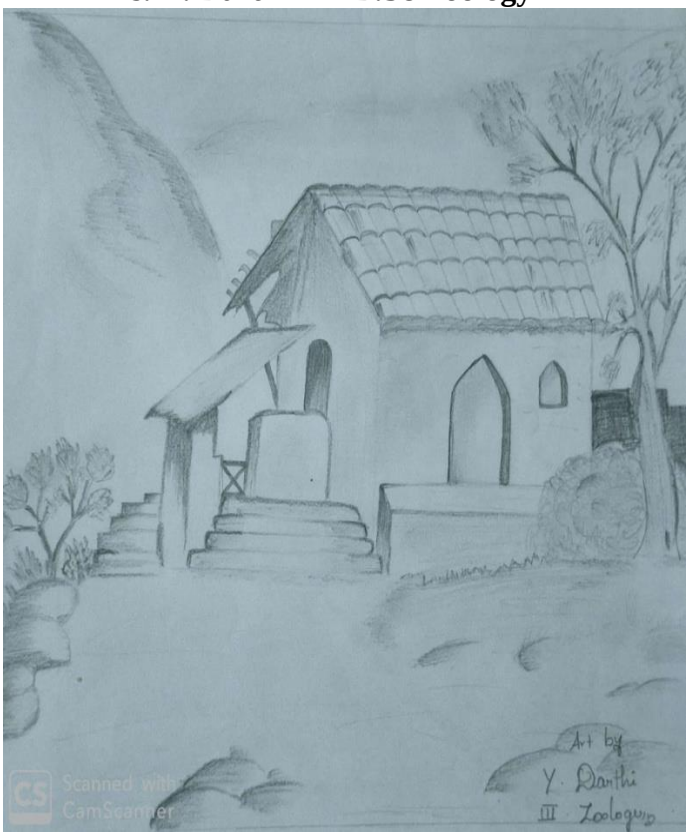
Ms. M.Dhanalakshmi- I B.Sc Zoology.



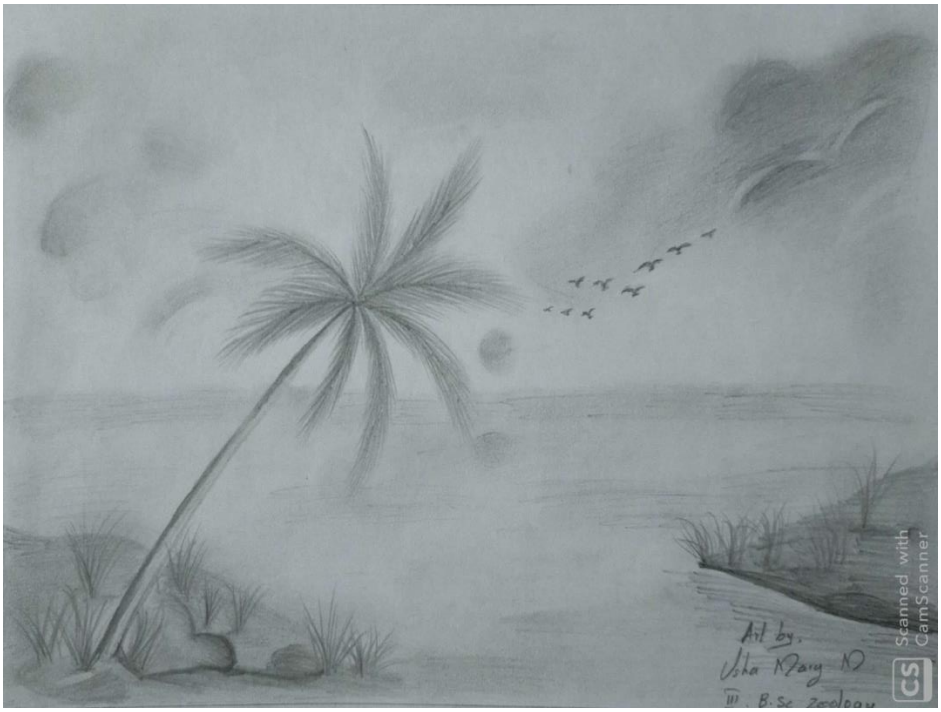
Ms. Berlin. R- I M. Sc Zoology

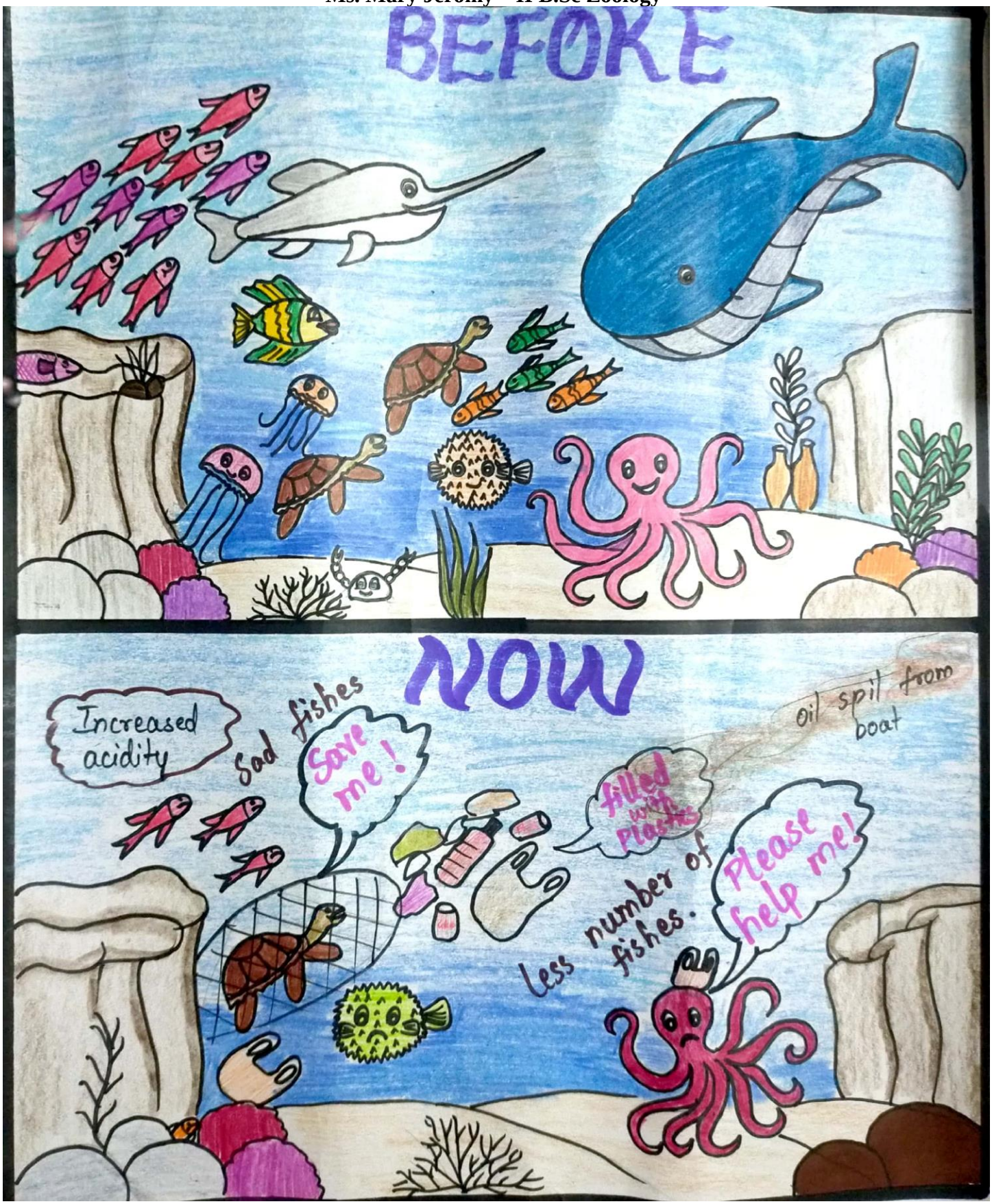
Ms. V. SAaranya –III B.Sc Zoology

Ms. Y. Darthi- III B.Sc Zoology

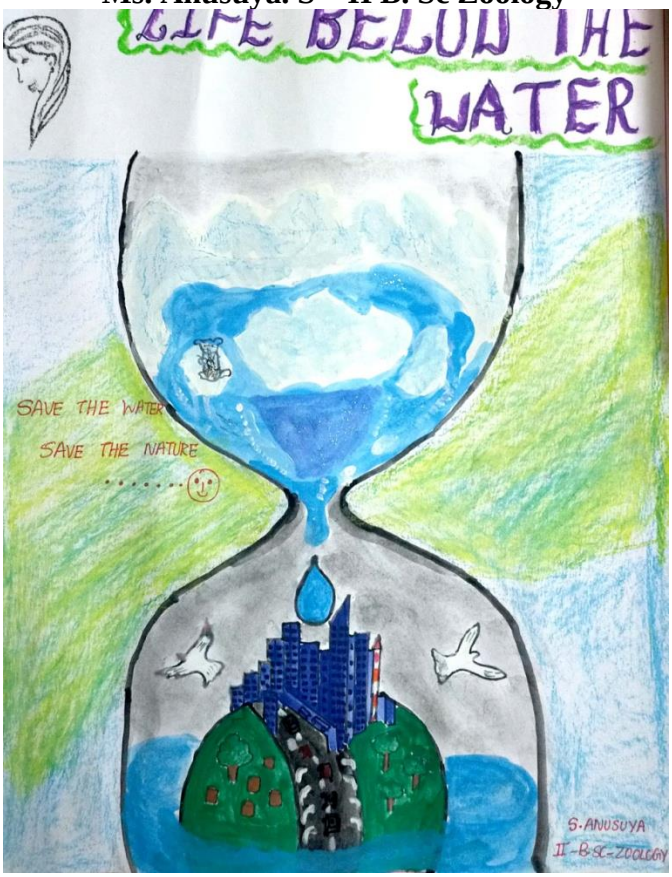


Ms. Usha Mary – III B.Sc Zoology

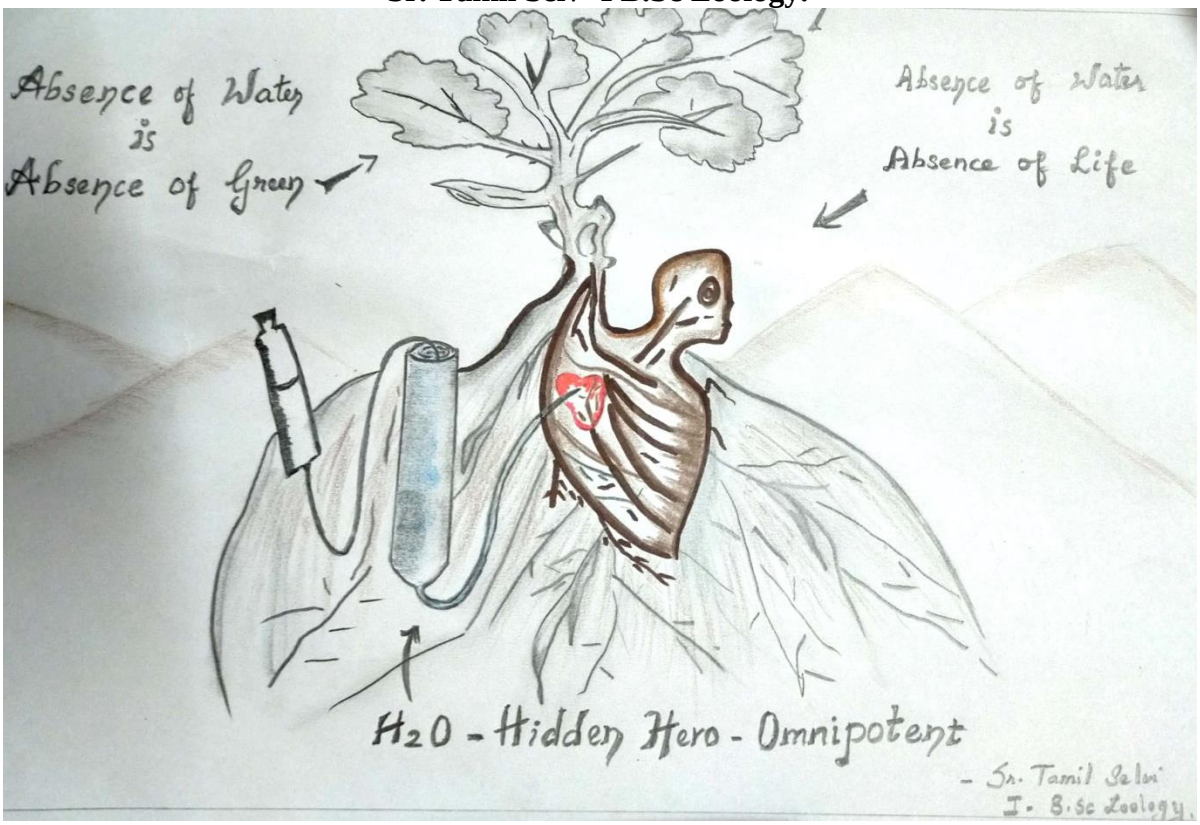



BEFORE
NOW
Increased acidity
Sad fishes
Save me !
oil spit from boat
filled with Plastics
Less number of fishes.
Please help me!

Ms. Anusuya. S – II B. Sc Zoology



Sr. Tamil Selv- I B.Sc Zoology.



DEPARTMENT ACTIVITIES

Students Participation In The Academic year 2019-2020	
MAY	
21.5.19 to 31.5.19	MATTRU NATAGA EYAKKAM T.Haritha,Y.Darthi,S.Diana from III B.Sc. Zoology participated in Mattru Nadaga Eyakkam conducted by Thirupathur, Sacred heart college.
JUNE	
17.6.19	College Reopened after summer vacation
19.6.19 to 28.6.19	Induction programme/bridge course for B.Sc. Students by Haskalah academy.
24.6.19	Fresher's entered the Department with enthusiasm and charisma
28.6.19 to 30.6.19	STREET THEATRE CAMP T.Haritha ,M.Jenifer, F.Sherly Celshia of III B.Sc Zoology participated in the street theatre camp Conducted by AICQF of our college
21.6.19	INTERNATIONAL YOGA DAY YRC club of our college jointly participated in the inter collegiate Yoga day celebration. At Vellore Fort the student from III B.Sc zoology Lavanya Devi .P, Elakkiya .V, Anushiya.S, Felicia.M and Lavanya .V participated and In our college yoga day was celebrated, in which R.Ramya from NCC, Janani.I,Sathya.R,Anbarasi.K,Pavithra.J,Haritha.T,Darthi.Y,Diana.S, Sulochanna. M, Jenifer. M participated .
26.6.19	SUMMER PROJECT VIVA-VOCE II PG Student had there viva voce for their summer project for the academic year 2019-2020. Dr.Punitha Assistant Professor Department of Zoology was the External examiner.
JULY	
5.7.19	INAUGURATION OF COLLEGE UNION Dr.Sandhiya Pentareddy, VIT University was the chief guest and delivered the inaugural address . Leaders from the zoology UG Secretary : A.A Mahalakshmi ,III Zoology III Zoology Representative - Ms. J.Pavithra II Zoology Representative - Ms. M.Deepananthi I Zoology Representative- Ms. J.Swathi PG Secretary : Ms. S.P. Priyanka I PG Representative-Ms.S.Gomathi II PG Representative :Ms K. Rajakumari Department of zoology was in charge of the stage.
10.7.19	COMMEMORATION OF SEPOY REVOLT NSS volunteers and AICUF volunteers participated in the programme to create awareness through drama.

18.7.19	FMA-INDIA PCI TRANING IN YOUTH MOVEMENT R.Ramya, III B.Sc Zoology, NSS participated in the procession .A.A Mahalakshmi-III B.Sc Zoology Association secretary described the department objectives.
19.7.19 to 20.7.19	LEADERSHIP TRANING PROGRAMME Leaders of the college union participated in the leadership training programme .Ms. Sherin ,social activist for women empowerment and backward people was the resource person and it was useful students were benefited.
22.7.19	NSS:LECTURE ON IMPORTANCE OF NSS Mr.Gopalakrishnan, Thiruvalluvar University, Serkadu Vellore ,gave a lecture on improvement of NSS organized by NSS unit of our college. NSS volunteers of Department of Zoology participated.
23.7.19	YRC -ONE DAY STUDY CAMP M.Gayathri , M.Divyapriya, A. Madiha Thabasum. A of III B.Sc .Zoology participated in the study camp.
24.7.19	INAUGURATION OF ZOOLOGY ASSOCIATION AND Sr. HELEN FERNANDEZ ENDOWMENT LECTURE Dr .M .C. Harish, Faculty, Department of Biotechnology, Thiruvalluvar University, Serkadu, Vellore was the resource person and delivered a lecture On Molecular Farming.
AUGUST	
9.8.19	BONE MINERAL DENSITY The Department of Zoology organised BMD test for all teaching and non teaching staff
15.8.19	INDEPENDENCE DAY Department of history and NCC organised the Independence day Celebration. R.Ramya, III B.Sc. zoology participated in The NCC parade
20.8.19	PHOTO EXPO Department of Communication Media conducted Photo expo M. Divya priya III B.Sc Zoology won II nd prize
20.8.19	ENGLISH DRAMATICS Students of department of zoology participated in the dramatics in the topic ‘preservation of species’
20.8.19	Ph.D VIVA VOCE -DEPT OF ZOOLOGY Ph.D Viva Voce was conducted for the candidate Mrs. G. Lakshmipriya student of Dr.Sr. Mary Josephine Rani.A Former Principal & Head Department of Zoology. The External Examiner was Dr.Joseph Thathyrus, Department of Zoology, American College, Madurai. The thesis was defended and successfully.
20.8.19	KAVIDHI -POEM WRITING COMPETITION,DEPT OF TAMIL Ms.Diana, Ms.Darthi, Ms.Vetriselvi, Ms.Sivasakthi, Ms.Mahalakashmi, Ms.M. Umamageshwari, Ms. A.A. Mahalakshmi and Ms.Ramya, from III B.Sc Zoology participated.

21.8.19	SR.REGINA COLOMBO ENDOWMENT LECTRUE III B.Sc Zoology Students participated in the Sr. Regina Colombo Endowment lecture Ms. Sujeetha.Y ,Nursing Tutor , Oscar paramedical institute ,Vellore, was the resource person and delivered a lecture on the topic Appendicitis and causes ,symptoms an treatment.
21.8.19	SPEECH COMPETITION V.Prabhavathi, J.Pavithra, Meena.R, J.Jeevitha, Haritha.T from III B.Sc Zoology participated in the speech competition conducted by department of Tamil.
22.8.19	EDUCATIONAL TOUR-PG DEPARTMENT OF ZOOLOGY I and II PG Students went for educational tour to Adyar Eco Park, Guindy park and Brila Planetarium Chennai. Accompanied by staff members .Dr, Mary Agnes. A and ,Ms. Rebecca Vinolia.
26.8..19	NSS RALLY Ms. K.Anbarasi, Ms. R.Sathya, Ms. M.Felicia, Ms M.Jeniefer, Ms.S.Diana participated in the NSS rally.
27.8.19	DRAMA Ms.Pavithra.J, Ms.Diana, Ms.M.Prabavathi, Ms.A.A.Mahalakshmi, Ms.Haritha, Sr.Daisy from III B.Sc. Zoology participated in the Tamil drama and won first prize.
18.9.19	MODEL MAKING M.Madiha Thabasum, M. Gayathri, M.Divyapriya and S.Sivasakthi of III B.Sc. Zoology won the model making competition conducted by Enviro club.
19.9.19	M.PHIL VIVA VOCE M. Phil vice voce for M.Phil students Dr. Arivoli.S professor, Thiruvalluvar university, Vellore was the external examiner.
21.9.19 to 22.09.19	SOFT SKILL TRAINING PROGRAMME III B.Sc Zoology students participated in soft skill training programme conducted by carrier guidance and placement cell
SEPTEMBER	
7.9.19	65TH SPORT'S DAY TMT. Kamini. IPS Deputy Inspector General of police was the chief guest and distributed the prizes'.A. Magimi, E. Abirami took 3 rd prize in discuss throw and 2nd place in short put.
10.9.19	Sr. ANTOINTTE ALOYSIUS ENDOWMENT LECTURE Sr. Antointte Aloysius Endowment Lecture was conducted for II B.Sc Zoology students Dr.Obed John Assistant Professor, Communiy Health, CMCH, Vellore ,delivered lecture on Health and Disease trends in India.
10.9.19	WORLD SUICIDE PREVENTION DAY I and II M.Sc. students participated in the seminar on prevention of team suicide. Organised by the Department Of social work, Dr. Ramanuja Devi MBBS, DPM, was the resource person.
13.09.19	Inter departmental Hindi patriotic song –singing competition-students participated.

OCTOBER	
1.10.19	INTER-DEPARTMENTAL ESSAY WRITING COMPETITION Zoology association conducted interdepartmental essay writing competition on the topic life below water. The winners are Ist place- S. Archana, I BA English –A Sec IInd place-V. Varsha –II B.Sc. Zoology IIIrd place- V. Revathi-III B.Sc. Zoology
2.10.19	NAKSHTHRA -COMPETITION- ROTRACT CLUB Rotract club organized competition as a part of nakshthra celebration at Don Bosco School, Vellore. M.Gayathri, II Zoology participated in elocution .M. Divya priya, P. Sivasakthi, participated in spot painting competition. A. Madhiha thabusum, K. Anbarasi, V. Revathi, participated in craft from waste.
3.10.19	INTER -DEPARTMENTAL DRAWING AND PAINTING COMPETITION Zoology association conducted inter departmental drawing and painting competition. The winners are Ist place-S. Anusiya II B.Sc. Zoology IInd place -Sr. Tamilselvi-I B.Sc. Zoology IIIrd place- M.Mary Jeromy-II B.Sc. zoology
3.10.19	YRC MEDICALCAMP AT ETHIRAJ SCHOOL Students from III B.Sc Zoology participated in the medical camp organised at Ethiraj school.
4.10.19	PARENTS TEACHERS MEETING Parents teachers meeting was conducted by the department of zoology to issue the mark sheets and discussed the ward progress.
9.10.19	SHAKESSPEARE V.Varsha, II B.Sc. Zoology participated in the Shakespeare competition conducted by English department.
9.10.19	ACADEMIC WRITING LECTURE A lecture on academic writing was organised by Auxilium Research cell for PG, M.Phil , and Ph.D. Scholars Dr. Jose, professor of physics, sacred heart college, Thirupathur.
10.10.19	PH. D BUBLIC VIVA VOCEPublic viva voce of Ms. Sandiya. Ph.D scholar was held, student of Dr.Sr.Mary Josephene Rani, former Principal& Head of Department of Zoology.Dr. Ragunathan Department of was the external examiner the thesis was deafened successfully.
12.10.19	Abirami.E (II B.Sc. Zoology), won II place in shot put at Thiruvalluvar University sports meet.
12.10.19	Anti-plastic Awarness programme conducted by Enviro-Club. All the members of Enviro club from department of zoology participated.
12.10.19	Post graduate Students of our department Visited Ram Ragu Fish Farm Walajapet and learned the rearing techniques ,Vellore Science Center and SIDCO Ranipet and the effluent treatment process was explained.

15.10.19	Inter Collegiate Cultural Fest "Synapse" conducted by Vellore Government Medical College. III B.Sc. Zoology Students Participated in Various events like 1. Craft with waste- M. Gayathri , A.Shaistha Mariyam and V.Revathi Participated. 2. Face painting- A.Gayathri, Lavanya Devi .P and won First Prize and Anbarasi .K and Lavanya . V Participated. 3.Pencil drawing –Madiha tabasum and Divya priya .M participated 4. Make Over – Runners : V.Revathi & Mahalakshmi A.A Participated : V. Lavanya & Shaistha.A
21.10.19	VIDEO CONFERENCING was organized for IPG and II PG students. Dr. Arun Christopher, musculoskeletal orthopaedists, gave a lecture on "Spine Health"
22.10.19	Anti-plastic Awarness programme conducted by Enviro-Club. All the members of Enviro club from department of zoology participated.
22.10.19	EXTENSION ACTIVITY –II B.Sc. Zoology went to Government Panchayat school, kangeyanellur. Students beneficiaries were taught with health and hygiene. Students performed skit, dance and hygiene. Students sponsored toothpaste, brush and soap for under privileged students.
24.10.19	Diwali Celebration – Department of Zoology were in charge of the Diwali celebration. The celebration started with prayer service. students performed Dance and candle lighting Diwali Feast.
24.10.19	Recycling of plastic cup: Enviro Club conducted a programme on "Recycling of Plastics Cups". Enviro Club members and III zoology students participated.
NOVEMBER	
18.11.19	College reopened for even semester.
18.11.19 to 22.11.19	NCC CAMP R. Ramya III B. Sc. Zoology Participated in the NCC camp.
22.11.19	STATE LEVEL DRAWING COMPETITION M.Usha Mary III B. Sc zoology participated in the competition.
28.11.19 to 30.11.2019	RANGERS CAMP AT HOGENNAKKAL Magimai Alisha.A. III B.Sc zoology participated in the camp.
29.11.19	NATIONAL SEMINAR ON ANIMAL BEHAVIOUR NSAB 19 Behaviour patterns result from complex interactions of external stimuli and internal condition. The inaugural address was delivered by Ms. Zai Whitaker Joint Director, Madras Crocodile Bank Trust/Centre for Herpetology,Chennai, Tamil Nadu, India. She shared her experiences on wildlife and conservation. Dr. Ravi Chellam Chief Executive Officer, Metastring Foundation, Bengaluru, Karnataka, India. Presented the keynote address with a special emphasis on the Behaviour of lions, leopards and tigers and implications for their management and conservation. Rev.Sr.Alice K.T., Secretary and Dr. (Sr.) Regina Mary .R, Principal offered felicitations. Dr .A. Mary Agnes, Organizing Secretary, and Associate Professor of Zoology welcomed the gathering. Dr .J.S. Arockiamary Convenor, Head & Associate Professor of Zoology presented the dynamics of the conference The resource talks were delivered by Dr. K. Emmanuvel Rajan Professor & Head, Department of Animal Science, School of Life Sciences, Bharathidasan University, Tiruchirappalli, Tamil Nadu, India. Dr. Kumaraguru Arumugam Consultant Scientist in Tamil Nadu Forest Department, Tiruchirappalli, Tamil Nadu, India. Dr.V.Kalaiarasan Project

	Officer, Chennai River Restoration Trust, RA Puram, Chennai, Tamil Nadu, India. Dr. N. S. Manoharan Additional Director, Tamil Nadu Animal Husbandry Department, Chennai,Tamil Nadu, India .
DECEMBER	
04.12.19	Annakili .V, Christy Samuel, Iswariya .S and Rajakumari .K of II M.Sc. participated in workshop on Recent trends on Environmental monitoring and Biodiversity organized by Department of Zoology Madras Christian College, Chennai.
04.12.19	Extension activity, III B.Sc., Zoology went to Government panchayat primary school, Kangeyanellur and created awareness on 'Health and Hygiene". Student beneficiaries were given snacks and stationeries. Students animated the concept through songs, skit and play.
04.12.19	Sr. Maria Fino Endowment Lecture was organized for I B.Sc., Zoology, Dr. V. Rekha, Assistant Professor in Zoology, D.K.M.College, Vellore, was the guest speaker and delivered a lecture on "Animals and Biomimicry" students were benefited.
06.12.19	Mahalakshimi A A, Anbarasi .K of III Zoology and all the II B.Sc. Zoology Students participated in the workshop on Youth Empowerment Solai ,Christianpet.
10.12.19	Sr.Ethelvina Endowment Lecture was conducted for II M.Sc. Students Dr. Febin Prabh Dass Associate professor Department of Integrative Biology School of Bio Sciences &Technology VIT, Vellore delivered a lecture on Research Methodology.
11.12.2019	I B.S.c, Zoology students went for extension activity to blind school in Vellore. Students interacted with blind students and they donated hygienic needs like tooth paste, detergent, bathing soap and washing soap. Students get benefited.
13.12.19	Extension activity, III zoology went to Government panchayat primary school, kangeyanellur and created awareness on 'Health and Hygiene". Student beneficiaries were given snacks and stationeries. Students animated the concept through songs, skit and play.
18.12.19	NCC workshop was organized in our campus, R. Ramya, III B.Sc., Zoology participated in the workshop.
19.12.19	Sr. Cleofe Fassa Endowment Lecture Was Organized For I PG Students, Dr.R.Geetha, Asst. Professor & Head, Department Of Biochemistry, Arcot Sri Mahalakshmi Women's College was the resource person and delivered a lecture on the topic " Enzymes in Clinical Applications"
JANUARY 2020	
23.01.2020	III B.Sc, Zoology students attended the interview conducted by BPO- Indian Medical service organized by Carrier guidance and Placement cell, Auxilium College. Madhiha thabasum. A, Gayathri, Divya priya.M, Yuvashree.R, Hinduja.P.
27.01.2020	I M.Sc., Zoology students visited Molecular Biology, Analytical lab, Tissue culture lab and Animal house at VIT vellore. Students gained knowledge on the subject of particle size analyzer, Cooling centrifuge, Sonicator, Bacterial transmission, Spectrophotometer, Western blot, SDS PAGE, Ultra microcentrifuge, Fluorenscence spectrophotometer, Cryopreservation etc.,
30.01.2020	LIFE SCIENCE QUIZ COMPETITION was conducted UG and PG students of Department of Zoology participated. Ist place- Mathura.S I M.Sc. Zoology IInd place-Christy Samuel II M.Sc Zoology IIIrd place- Priyanka S.P II M.Sc Zoology

LAB AND FIELD VISITS






PAST PUPIL MEET

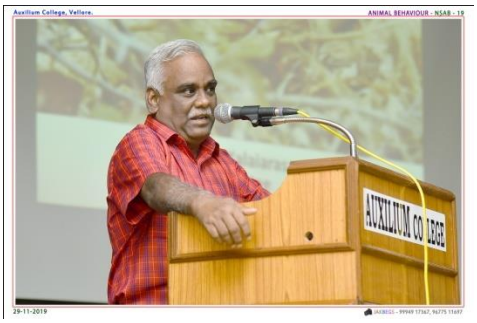
FACULTY DEVELOPMENT PROGRAMME

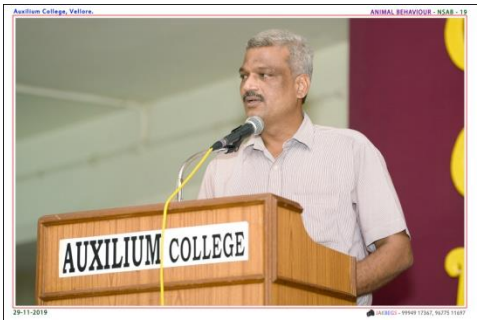
SUMMER PROJECT VIVA VOCE

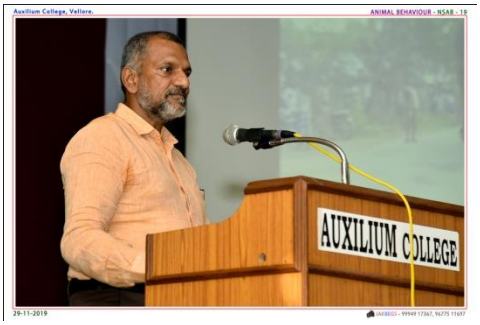
BMD TEST

MONTH VALUE PRESENTATION

NATIONAL SEMINAR ON ANIMAL BEHAVIOUR- NSAB19







EXTENSION ACTIVITIES


STAFF X'MAS VISIT

REMEDIAL CLASS

ASSOCIATION ACITIVITIES