The Editorial

The second volume of the Department Magazine ZΩI – ZOI which means 'Life' in Greek, is a pride testimony of the department. It is the small flame that spreads the light from the lamp of Auxilium family. It showcases both curricular and co-curricular activities, achievements and the talents of the staff and students for the academic year 2018-19.

With grateful hearts and joyful memories we have successfully completed the academic year, and with commitment and steadfast love for the department and the college we are moving forward to the next academic year, the department will carry its everlasting enthusiasm and liveliness in spreading the joy of life to each and everyone associated with it….

On behalf of the Faculty of Zoology,

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THE AVIAN ARCHITECTS

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

Life on earth is filled with many amazing phenomenon. Looking at the behavior of many animals it has always made me wonder, whether man actually learnt the concept of culture from them. Territoriality, parental care, courtship, playing, nest building techniques found in some animals surpass even the human intellect.

I have always been intrigued by the image of the elaborately constructed hut and the beautifully decorated front lawn, - **'*the bower*'** of the bower bird ('Maypole Bower' of the *Vogelkop* bowerbird), that often resembles a child's play house.

Bowerbirds show an Austro-Pauan distribution (Australia and Papua New Guinea), with a single species being endemic to Indonesia (*Golden-fronted bowerbird*). They belong to the family: Ptilonorhynchidae, order: Passeriformes, and comprise 8 genus and 20 species.

Bowerbirds draw our attention by their unique courtship behaviour that involves the construction of a complicated and elaborate structure called bower by the males. The bower can be as simple as some leaves around a plant or tree trunk to a large dome or hut made of sticks. The male will spend days or months to prepare the bower. A bower once built can even be maintained for years. (upto 30 years in the case of *Satin bowerbird*). The most fascinating part of the bower construction is the male's ability to decorate and display the bower in the most colourful and attractive fashion to woo the female. They find and carry seeds, pebbles, snail shells, berries, ferns, dead beetles, fresh flowers, bones, leaves (Modern-day bowerbirds even use brightly coloured rubbish like, bottle caps, coins, pieces of glass, plastic, aluminium foil), grow moss and lichen. Some species even paint their walls with a mixture of charcoal dust, saliva or plant juice, using his beak or a bit of chewed bark or leaf as a paintbrush. It is interesting to find that different species favour different colours. *Satin bowerbirds* choose blue; *Stripped gardener* prefer yellow, red, blue; *Fawn-breasted bowerbird* use green; *Spotted bowerbird* prefer green and white; *Great bowerbird* choose red and green. It doesn't stop here, the male continuously defends his bower, rearrange the decoration, replace the dried items with fresh ones and touch-up the paint in the walls.

According to the type of bowers they build, bowerbirds can be grouped into four types. No bower; the stage maker; the maypole builder; the avenue builder.

The *Green catbird*, *Spotted catbird* and *White throated catbird* do not build bower. The *Green catbird* clears an area and displays colourful fruits, flowers and leaves, and performs a courtship display to attract the female.

The *Tooth-billed catbird* and *Sanford's bowerbird* are called as **'Stage Makers'**. They create a display court or stage type bower. The male clears 3-5 feet space on the forest floor and displays this space with fresh leaves (laid upside down) or tiled with rocks. The old leaves are regularly replaced with new ones. The display court will have one tree trunk for the male to perch. When the female arrives it drops to the ground to pose and sing. The *Sanford's golden crested bowerbird* mats its dancing ground with fern fronds, and decorates the edges with beetle wings, snail shells and pieces of resin. Then it hangs a curtain of bamboo strands and wilted ferns from vines around its arena, among which it scatters pieces of barks and berries.

Five species of bowerbirds are **'Maypole Builders'**. The male builds its bower by piling sticks and twigs horizontally around the base of a small tree in a cleared court to a desired height (4-6 feet). Then he builds a smaller pyramid around the base of another sapling or shrub few feet away and arches over the intervening space with vines and sticks so that it resembles a thatched roof. The entrance is usually propped by two columns of stick. The front lawn of some square meters is cleared of debris and planted with moss. Hence these birds are referred to as '*gardeners*'. The dancing ground and the entrance of the tower are embellished with flowers, berries, shells and other brightly coloured objects. The male *Vogelkop bowerbird* goes to greater lengths to decorate the lawn. They collect items with novelty value and arrange them artistically to create a spectacular visual display. The golden bowerbird (one of the smallest of the family, 9 inches long) builds the largest of the bowers that may tower 9 feet in height.

The male **'Avenue Builders'** clears a space of about 4 feet in diameter and floors it with a mat of twigs and sticks several inches thick. In the center he erects two parallel walls of upright sticks firmly implanted and entwined together and sometimes arched over at the top. The walls are just far enough apart for the bird to walk through without brushing the sides with its wings. The dimensions vary among the species of avenue builders. The males decorate the play ground with

pebbles, bleached bones, shells, leaves and flowers. Usually the bowers are built under large thorny bushes that provide shelter and fruit.

Of the nine species of Avenue Builders *Satin bowerbird, Regent bowerbird*, and *Spotted bowerbird* use tools - paint *daubers* for decorating their bower (these are the only birds to use tool other than Galapagos finches). *Regents* mix a muddy grayish blue or pea green saliva paint in their mouths and use wads of greenish leaves as paintbrush to spread the paint on the walls of the bower. *Satin bowerbird* produce paint of charcoal and pigment mixed with saliva and use chewed bark to paint the inner walls of the bower. *Spotted bowerbird* paints the walls with masticated grass and saliva.

Bowerbird's mating ritual is an important demonstration of sexual selection. Competition between the males to mate is intense and centered around the bower. The males even steal the decorations from each other to display an attractive bower to the female. If the female is enticed by the architecture, she will visit the male be entertained by a song or dance on his stage or court and decide if he is worthy. The female bird will visit several bowers in the process of selecting a mate. Young females (in the first and second year of breeding) are mainly influenced by appearance of the bower; older females make their choice more on the basis of male dancing displays. Once the females have been attracted to the bowers successfully, males perform elaborate courtship displays that may last from few minutes to more than an hour with vocalizations like chirping, whistling and buzzing being made throughout. Some bowerbird species are excellent mimics. They mimic other bird species' calls and sounds from their environment (large herbivore moving through scrub branches, the twang of fence wire, wood chopping, waterfalls, cat meowing and crying child). Males often use decorations as props, holding them in their bills or throwing them up. Mating occurs in the bower and lasts only few seconds and the female usually leaves and the male prepares for the next song-and-dance routine used to attract yet another female.

After mating the female builds a cup shaped nest in a higher, more secluded location in a bush or tree hole. She is solely responsible for building the nest, laying eggs (1-3 eggs depending on the species), incubating (12-15 days) and feeding. Mother cares for the young for 2-3 months before they go off on their own.

Bowerbirds are indeed the greatest Avian Architects found nowhere else in the animal kingdom.

NEST OF FEMALE VOGELKOP BOVER

MAYPOLE TYPE NEST OF VOGELKOP BOVER

AVENUE BOVER-SATIN BOVER

STAGE TYPE BOVER – TOOTHBILLED CAT BIRD

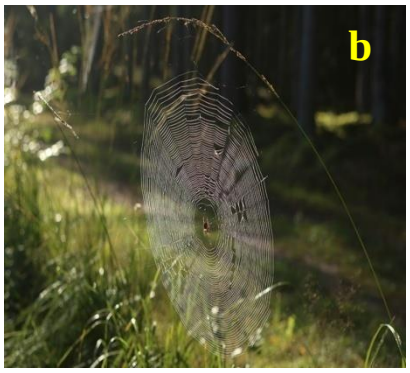
WONDER WEB

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

Spiders belong to the phylum Arthropoda and class Arachnida they are found from frigid Artic to dry desert, found abundant in areas rich in vegetation. The study of spider is called Arachnology. Spiders are divided into two groups, they are Wandering spiders that moves about fast on ground and the other the sedentary web sppiders that constructs webs. They always hang upside down defying the laws of gravity and it was observed to construct near normal web in space where humans were unable to maintain the posture. The web spinners use their ability to produce silk for the construction of snares. The ability of the spider to judge distance, space, wind speed, its structural details are yet to be unearthed.

TYPES OF WEBS

The web could be a single line snare which is a horizontal line attached at both the ends to branches, that stretches about four feet across open spaces in the forest or can connect across the river beds(a). Some webs are 2 dimensional, it may look like a triangle, and appears like a fragment of an orb web. The web of *Araneus* is an excellent illustration of orb-web termed as complete orbs(b,c). Few webs are 3 dimensional with elaborate dome like structures without any supporting pillars inside(d). The domestic spiders build the irregular webs, where threads are extending in all directions or spin irregular webs. The most familiar example of sheet web is that of *Linypia*, the web consists of a closely woven sheet extended in all directions in that plane with no apparent regularity of arrangement(e). The last type of web is the funnel web that is a sheet like structure, having a tube extending from one edge; which leads to the retreat of the spider where the mouth is wider and it leads to a trap door(f).



CONCLUSION

The spider uses its web for prey capture and it involves three strategies. If the prey size is small it is seized with chelicerae, pulled out of the web, carried in chelicerae, wrapped to hub and secured to the web followed by feeding. The second strategy is observed in *Nephila* where the prey size is like butterflies or dragonflies at first the spider bites then wraps the prey to the web, when in need cuts out of the web carry's in chelicerae then it feeds. The third strategy is preferred by *Araneus* and *Argiope* it wraps the prey, bites, and cuts out of web carries in chelicerae, wrap at hub and secure to web followed by feeding.In the cribellate orb weavers (Uloboridae) a fourth strategy is observed where the prey is wrapped but not bitten at all. The web its structure and composition are the key for the evolutionary success of the spiders in the different ecosystems.

OBSESSIVE-COMPULSIVE DISORDER (OCD)

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

OCD is a common chronic and long lasting disorder in which a person has uncontrollable reoccurring thoughts and behavior that one feel the urge to repeat again and again. The American Psychiatric Association (APA) state that females are affected at a slightly higher rate than men. Some people with OCD successfully hide their symptoms in fear of embarrassment or stigma.

World Health Organization (WHO) Mental Health report- estimated that OCD was among the top 20 causes of illness- related disability worldwide for people aged 15 to 44 years. The report also suggested that OCD was the fourth most common mental illness after phobias, substance abuse and major depression.

People with OCD experience severe anxiety and distress. To relieve this anxiety they perform some repetitive acts known as compulsions. Compulsions offer temporary relief to people suffering from OCD. In severe cases, the urge to perform such actions repeatedly can severely hamper a person's daily life activities.

SYMPTOMS

Fear of germs or contamination: Feels a constant and overbearing need to wash and obsesses that objects they touch are contaminated. The fear is that the individual or the object may

become contaminated or ill unless repeated cleaning take place. It can lead to excessive tooth brushing, over cleaning certain rooms in the house, such as the bathroom or kitchen and avoiding large crowds.

Mental contamination is the feeling of being 'dirty' after being mistreat or putdown. A person with OCD will try to 'scrub away this feeling by showering and washing excessively. Having things symmetrical or in a perfect order: To relieve their anxiety they can be seen ordering and arranging things in a particular precise way Eg. Rearranging books, cutlery, aligning carpets, pillows and cushions repeatedly.

Perfectionism: Concerns about exactness, needing to remember things and fear of losing things.

Unwanted forbidden or taboo thoughts about sex.

Intrusive thoughts: These are often violent, horrific, that often involve hurting a loved one violently or sexually.

Rumination: Focuses on wide –ranging broad and often philosophical topics such as what happens after death or the beginning of the universe.

Hoarding: Find it impossible to dispose of anything they collect for example old newspapers, clothes, mails, other objects for no apparent reason.

Counting: Such people repeatedly count their belongings and other objects used in daily life, such as the number of steps on a staircase or number of lights in a hall way. If they lose count, they go back and start again.

Religious obsession: It includes concerns about offending God.Aggressive thoughts towards others or self.

Safety: Some people have irrational fears about safety, constantly checking whether the doors and windows are secure. Repeatedly checking to see if the oven is off, monitoring taps, alarms, car doors. Everyone double checks things sometimes. But a person with OCD generally can't control his or her thoughts or behaviors even when those thoughts or behaviors are recognized as excessive spends at least 1 hr a day on these thoughts or behavior.

Doesn't get pleasure when performing the behavior or rituals but may feel brief relief from the anxiety the thoughts causes.

Some individuals with OCD also have tic disorders. More tics are sudden, brief, repetitive movements, such as eye blinking and other eye movements, facial grimacing, shoulder shrugging

and head or shoulder jerking, common vocal tics include repetitive throat clearing, sniffing or grunting sounds.

RISK FACTORS:

Genetics: Twin and family studies have shown that people with first degree relatives who have OCD are at higher risk.

Brain Structure and Functioning: Imaging studies have shown differences in the frontal cortex and sub cortical structures of the brain in patients with OCD.

Biological /Neurological factors: Chemical imbalance of serotonin and glutamate in the brain.

Environment Factors: People who have experienced abuse in childhood or other trauma are at an increased risk for developing OCD

Autoimmune Causes: In some cases, children may develop OCD or OCD symptoms following a streptococcal infection- this is called Pediatric Autoimmune Neuropsychiatric Disorders Associated with Streptococcal Infections. H1N1 flu virus have also been associated with the rapid onset of OCD in children.

Behavioral factors: People who are extremely organized, neat, meticulous and those who like to be in charge from a young age sometimes run the risk of developing OCD.

Life changes: Sometimes, major life changes such as a new job or the birth of a child thrust more responsibility on a person.

BRAIN TEASERS!

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

1. **What is Generation Gap?**

Father used to walk 20mins to save Rs 20/- , son spends Rs 20/- to save 20mins (Surprisingly both are correct).

2. **What is cultural gap?**

If electricity goes in America they call power house. In Japan, they test the fuse. But in India, they check neighbour's house, "power gone there too, and then okay!

3. **Sense of Responsibility**

A man goes to library and asks for a book on suicide. Librarian looks at him and says: "Hello who will return the book"?

4. **Solve the Riddle**

I am the word of five letters!
People eat me!
If you remove my first letter I will be a form of energy!
If you remove my first two letters I will be needed for living!
If you remove my first three letters I will be a preposition!
If you remove my first four letters I will be a drink for you!

- **I am Wheat**

5. **Can you crack the logic ?**

If 1111 = R
2222 = T
3333 = E
4444 = N

Then
5555 = ?

ANSWER

1+1+1+1 = FOUR R
2+2+2+2 = EIGHT T
3+3+3+3 = TWELVE E
4+4+4+4 = SIXTEEN N
5+5+5+5 = TWENTY Y

6. Which alphabet is a question?

Y

7. Which alphabet is an insect?

B

8. Which alphabet is a part of our body?

I

9. Which alphabet is a tool?

X

10. Which alphabet is a drink?

T

11. Which alphabet is a source of salt?

C

12. Which alphabet is a vegetable?

P

EMERGING TRENDS OF BIOLUMINESCENCE IN RESEARCH

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

Bio-luminescence is the phenomenon of light emission by living organisms which is widespread in the marine and terrestrial environment. Bio luminescent organisms can create their own light. There are many weird and wonderful bio luminescent creatures in the ocean. They emit the light in the form of chemiluminescence for the purpose of communication, camouflage, defense during capturing the prey and for sexual attraction. The principle chemical reaction in bio luminescence involves some light emitting molecule that accompany the oxidation of organic compound called luciferin mediated by luciferase.

Bacterial bio-luminescence is very sensitive to toxic materials and its application for determining the toxicity of several chemicals. Naturally or genetically modified bacteria can be used for preparation of bio-sensor probes which helps in screening and detection of toxicity. The main principle involved behind this is very simple in case of optimal condition the bacteria emit light normally but in presence of toxic substance their luminescence decreases. Thus presence of toxic molecules can be evaluated. This is very rapid, sensitive, reproducible and cost effective assay for detection of pollutants.

Bio-luminescence is used as a tool for mapping organisms distribution patterns. In 2001, the genetic material of the pink Bollworm, an insect pest of cotton was modified with Green Fluorescent Protein (GFP) derived from jelly fish, *Aequora victoria*. The GFP transgenic pink Bollworm strain illuminates florescence strong greenish which is viewed in its larval stage. Thus it is beneficiary in two folds viz GFP marked strain of pink Bollworm for field performance studies and to map the distribution of the pest.

The bio-assay based on luminescence have been used for several decades and test species include *Vibrio fischeri*, *Vibrio harveyi* and *Pseudomonas fluorescence* (Girott et al 2001). Between them the most employed one is the naturally available bioluminescent marine bacterium *Vibrio fischeri*, the use of which was developed in the 1970s (Trott et al 2007).

The toxicity test is usually based on the bioluminescence inhibition assay. In luminescence inhibition assay the luminescent bacteria emit light when they find themselves in optimal

condition, where as in presence of toxious substance their luminescence decreases. Thus the presence of toxic molecules as pesticides, heavy metals or organic compounds can be evaluated (Girotti et al 2002). As a biological method, luminescent bacteria offers the advantage and of a simple test procedure and rapid response.

Bioluminescence has been most extensively studied in marine bacteria (*Vibrio harveyi*, *Vibrio fischeri*, *Photobacterium phosphoreum*, *Photobacterium leiognath* and to a lesser extent in terrestrial bacteria (*Xenorhabdus luminescence*). Application of mercury based pesticides on agricultural lands can wash into nearby surface water or travel through the soil into underground water supplies. Bio-sensor assay is used in developing a simple and rapid screening system for heavy metals in water sources.

VERSATILITY OF STEM CELLS

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

Stem cells differ from other kinds of cells in the body, regardless of their source have three general properties: they are capable of dividing and renewing themselves for long periods; they are unspecialized; and they can give rise to specialized cell types. They do not have any tissue-specific structures that allow it to perform specialized functions. It cannot work with its neighbors to pump blood through the body (like a heart muscle cell), carry molecules of oxygen through the bloodstream (like a red blood cell); and it cannot fire electrochemical signals to other cells that allow the body to move or speak (like a nerve cell). However, unspecialized stem cells can give rise to specialized cells, including heart muscle cells, blood cells, or nerve cells. Unlike muscle cells, blood cells, or nerve cells–which do not normally replicate themselves–stem cells may replicate many times.

When cells replicate themselves many times over it is called proliferation, population of stem cells that proliferates for many months in the laboratory can yield millions of cells, resulting cells continue to be unspecialized, like the parent stem cells are said to be capable of long-term self-renewal. When unspecialized stem cells give rise to specialized cells, the process is called differentiation.

Scientists are trying to understand the signals inside and outside cells that trigger stem cell differentiation. The internal signals are controlled by a cell's genes, which are interspersed across long strands of DNA, and carry coded instructions for all the structures and functions of a cell. The external signals for cell differentiation include chemicals secreted by other cells, physical contact with neighboring cells, and certain molecules in the micro environment.

POTENTIAL USES OF STEM CELLS

Stem cells have potential uses in many different areas of research and medicine. Replace damaged tissue Human stem cells could be used in the generation of cells and tissues for cell-based therapies Due to their ability to replace damaged cells in the body, stem cells could be used to treat a range of conditions including heart failure, spinal injuries, diabetes and Parkinson disease. It is hoped that transplantation and growth of appropriate stem cells in damaged tissue will regenerate the various cell types of that tissue. For example, haematopoietic stem cells (stem cells found in bone marrow) could be transplanted into leukaemia patients to generate new blood cells, or neural stem cells may be able to regenerate nerve tissue damaged by spinal injury. Stem cells could be used to study early events in human development and how cells differentiate and function and help to find answers as to why some cells become cancerous and how some genetic diseases develop, which may lead to clues as to how they may be prevented. Testing of new drugs Stem cells grown in the laboratory may be useful for testing drugs and chemicals before they are trailed on people. The cells could be directed to differentiate into the cell types that are important for screening that drug. These cells may be more likely to mimic the response of human tissue to the drug being tested, compared to some of the animal models currently being used. This may make drug testing safer, cheaper and more ethically acceptable to those who oppose the use of animals in pharmaceutical testing. Screening toxins Stem cells may be useful for screening potential toxins in substances such as pesticides before they are used in the environment. There are several ways adult stem cells can be isolated, most of which are being actively explored

1) From the body itself:

Tissues and organs contain small number of adult stem cells that help maintain them. Adult stem cells have been found in the brain, bone marrow, blood vessels, skeletal muscle, skin, teeth,

heart, gut, liver, and other (although not all) organs and tissues and assumed to live in a specific area of each tissue, where they may remain dormant for years, dividing and creating new cells only when they are activated by tissue injury, disease or anything else that makes the body need more cells. Adult stem cells can be isolated from the body in different ways, depending on the tissue. Blood stem cells, for example, can be taken from a donor's bone marrow, from blood in the umbilical cord when a baby is born, or from a person's circulating blood. Mesenchymal stem cells, which can make bone, cartilage, fat, fibrous connective tissue, and cells that support the formation of blood can also be isolated from bone marrow. Neural stem cells (which form the brain's three major cell types) have been isolated from the brain and spinal cord.

2) From amniotic fluid:

Amniotic fluid, which bathes the fetus in the womb, contains fetal cells including mesenchymal stem cells, which are able to make a variety of tissues. Many pregnant women elect to have amniotic fluid drawn to test for chromosome defects, the procedure known as amniocentesis. Investigations are going on how to isolate mesenchymal stem cells and use them to grow new tissues for babies who are having birth defects detected while they are still in the womb, such as congenital diaphragmatic hernia. These tissues would match the baby genetically, so would not be rejected by the immune system, and could be implanted either in utero or after the baby is born.

3) From pluripotent stem cells:

embryonic stem cells and induced pluripotent cells (iPS cells), which are functionally similar, are able to create all types of cells and tissues, scientists hope to use them to produce many different kinds of adult stem cells. Laboratories around the world are testing different chemical and mechanical factors that might produce embryonic stem cells or iPS cells into forming a particular kind of adult stem cell. Adult stem cells made in this fashion would potentially match the patient genetically, eliminating both the problem of tissue rejection and the need for toxic therapies to suppress the immune system.

4) From other adult stem cells:

In certain kinds of adult stem cells can transform, or differentiate, into apparently unrelated cell types (such as brain stem cells that differentiate into blood cells or blood-forming cells that differentiate into cardiac muscle cells). This phenomenon, called transdifferentiation, has been reported in some animals. However, it's still far from clear how versatile adult stem cells really are, whether transdifferentiation can occur in human cells, or whether it could be made to happen reliably in the lab.

CANCER DIAGNOSIS AND TREATMENT

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

The cancer scenario in India:

Every year, lakhs of Indians are devastated by news of cancer. On an average, more than 1,300 Indians succumb to the dreaded disease every day. With new cancer cases or its incidence in India estimated to grow by 25% by 2020 (according to the cancer registry released by the Indian Council of Medical Research), cancer has become one of the major causes of death occurring in the country. Women, especially, are being increasingly diagnosed with cancer.

The number of cancer cases in India is increasing every year. According to WHO's Cancer Report, in India, lung, oral, lip, throat and neck cancers are the most common among men while women suffer more from cervix, breast and ovarian cancers. In the elderly, the most commonly occurring cancers are kidney, intestine and prostate cancer.

It is usually not possible to know exactly why one person develops cancer and another doesn't. However, research has shown that certain risk factors may increase a person's chances of developing cancer. These include things people cannot control, like age and family history. Lifestyle choices that increase your chances of contracting breast cancer are the usual suspects such as smoking, obesity, lack of exercise and poor diet.

Cancer is notoriously stealthy, so it's important not to miss those cues. Ignorance and denial leads to delayed diagnosis and treatment; most Indians change doctors when asked to go in for a

screening or biopsy. Other than the fear of invasive treatment, disfigurement and financial burden, the ill-placed belief that a cancer patient will always die makes patients and their families refuse specialised treatment. The importance of awareness can be seen from the fact that in highly literate Kerala, 40% cases are detected early, a fact that ultimately leads to fewer deaths.

The earlier cancer is diagnosed and treated, the better the chance of its being cured. Some types of cancer -- such as those of the skin, breast, mouth, testicles, prostate, and rectum may be detected by routine self-exam or other screening measures before the symptoms become serious. Most cases of cancer are detected and diagnosed after a tumour can be felt or when other symptoms develop. In a few cases, cancer is diagnosed incidentally as a result of evaluating or treating other medical conditions.

Cancer diagnosis begins with a thorough physical exam and a complete medical history. Laboratory studies of blood, urine, and stool can detect abnormalities that may indicate cancer. When a tumour is suspected, imaging tests such as X-rays, computed tomography (CT), magnetic resonance imaging (MRI), ultrasound, and fiber-optic endoscopy examinations help doctors determine the cancer's location and size. To confirm the diagnosis of most cancers, a biopsy needs to be performed in which a tissue sample is removed from the suspected tumour and studied under a microscope to check for cancer cells.

If the diagnosis is positive (cancer is present), other tests are performed to provide specific information about the cancer. This essential follow-up phase of diagnosis is called staging. The most important thing doctors need to know is whether cancer has spread from one area of the body to another. If the initial diagnosis is negative for cancer and symptoms persist, further tests may be needed. If the biopsy is positive for cancer, be sure to seek a confirming opinion by a doctor who specializes in cancer treatment before any treatment is started.

There are many types of cancer treatment. The types of treatment that you have will depend on the type of cancer you have and how advanced it is. Some people with cancer will have only one treatment. But most people have a combination of treatments, such as surgery with chemotherapy and/or radiation therapy. You may also have immunotherapy, targeted therapy, or hormone therapy.

NANOPARTICLE FOR ONCOCELLS

Ms. K.Anu, Assistant professor PG and Research Dept. of Zoology,

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No matter how much we hear about it, nanotech remains something of inscrutability. We can't see it, and we indeed can't feel it. Scientists say it will be in our medicine, but it's odd to think of something measured only in nanometers saving your life. Nanotechnology has initiated a place in consumer products, medical treatment, the food industry and so much more. In fact, it's becoming gradually harder to continue track of where nanotech isn't. Still, many of the big breakthroughs are being worked out in laboratories. As well as only some of the simplest forms of nanotechnology have really come to the marketplace.

Medicine might well be the most gripping area where nanotech can be put to use. For instance with cancer, many different treatments are being developed to attack tumors at the cellular level. Research has shown promising results from using gold, selenium nanoparticles against a variety of cancers. The use of nanoparticles in cancer treatment offers some exciting possibilities, including the leeway of destroying cancer tumors with least damage to healthy tissue and organs, as well as the detection and eradication of cancer cells before they form tumors.

One technique under development involves targeted chemotherapy that delivers a tumor-killing agent called tumor necrosis factor alpha (TNF) to cancer tumors. This targeted chemotherapy method to deliver TNF and other chemotherapy drug to cancer tumors is called cytimmune. Another technique being developed works on destroying cancer tumors by applying heat. Nanoparticles called auroshells absorb infrared light from a laser, turning the light into heat. The developing of this technique is called nanospectra.

Using polymer nanoparticles to deliver a molecule called JSI-124 to cancer tumors. This molecule degrades the capacity of the cancer cells to suppress the immune system, probably slowing the growth of cancer tumors. Magnetic nanoparticles that affix to cancer cells in the blood stream may allow the cancer cells to be removed before they establish new tumors. Most efforts to get better cancer treatment through nanotechnology are at the research or development stage. However the endeavor to make these treatments a reality is highly focused.

Nano-devices, may support the diagnosis of cancer in future especially nano drug with epigenetic conceptual frame work is eagerly anticipated as they likely to form the basis for novel and context-specific pharmacological intervention that constitute prime of both prevention and therapeutics. In accordance, outcomes envisage that nanodrug will be possible complementary agent to traditional anti cancer drugs for limiting the growth of cancer cells and thus reduce the dosage of the drugs with higher specificity and low toxicity.

COLOUR CHANGING ANIMALS AROUND THE WORLD

MS. Lakshmipriya , Assistant Professor, PG and Research Dept. of Zoology, Auxilium College, Vellore- 6.

There are millions of species of animals that are living on planet earth. All the species are not same they have different characteristics line that varies from animal to animal. Following is the list of colour changing animals around the world.

1. CUTTLEFISH.

The Cuttlefish is an undersea creature and one of the colour changing animals in the world that uses its characteristics in order to defend itself. This will help the Cuttlefish to hide from the predators. It has the ability to change the colour of a rock, plants and much more in order to keep it safe in the extreme conditions. It also uses ink at the last moment for the defence purpose.

2. PACIFIC TREE FROG.

Pacific Tree Frog is found in North America. They are found in many different colours like green, tan, red, brown and green naturally but they can also change colour according to the surroundings and hence one of the best colour changing animals in the world. It uses its colour changing ability to defend from its enemies. The colour change happens in 1 or 2 minutes which is very difficult for the predators like snakes and birds to spot them.

3. GOLDEN TORTOISE BEETLE.

Golden Tortoise Beetle is a very small insect that is found in North America. They are also known as golden bugs. When threatened it changes its colour to goldish orange. The changes of the colour will last for about 2 to 3 minutes.

4. CHAMELEONS.

Chameleons are one of the most famous colour changing animals around the world. The rapid change of the skin colour is the most amazing characteristics of the animal. The change of colour in Chameleons is depended on their mood, the outside temperature and the intensity of light in the surroundings.

5. NORTH PACIFIC GIANT OCTOPUS.

Besides changing colours the North Pacific Giant Octopus is also famous for its size. They have a weight of around 156 pounds which makes them oceans biggest. It is very large but at the same time, it's very difficult to spot them. They are generally found in brown colour but can change colour depend on the mood.

6. FLOUNDER.

Flounder fish is one of the perfect examples of adapting to a different habitat. They can easily change colour depending on the habitat. They are naturally brown in colour. They also have markings on the skin. The markings as well the colour both changes as soon as they move into the new habitat. The retina of the Flounder fish receives the light to detect the surface colour of the new habitat and colour changes accordingly.

7. ARCTIC FOX.

Artic Fox survive even if the temperature is less than 50 degree Celsius. The thick fur helps them to be well adapted to live in the Arctic climate. The different body shape also helps Arctic Fox to conserve heat. It changes the coat as per season. In the winters it is a bright and snowy white and in the summers they are light brown that helps it blend in with rocks.

8. FLOWER SPIDER.

It is also known as crab spider. These spiders are predators that wait very patiently on the leaves for their next meal. When they are sitting on plants they can change the colour and can develop rich yellow, white or green that makes them completely invisible. This happens due to the reflection of light.

9. SEAHORSES.

These fish are termed as Ocean's most decorated fish. It changes its colours, textures, and patterns depending on their background hence it is very difficult to find this slowest sea animal in its habitat.

10. MIMIC OCTOPUS.

These are intelligent aquatic animals that are found in the Indo-Pacific region. The aquatic mimic Octopus can mimic different sea animals like snake, stingrays, and jellyfish and the surroundings. They mimic the body movement and the colour of the animal.

Mimic Octopus

Cuttlefish

Tree Frog

Golden Beetle

Chameleon

Pacific Octopus

Flounder Fish

Artic Fox

FlowerSpider

Seahorse

LIFE SCIENCE QUIZ

Ms. Rebecca Vinolia, Assistant Professor, PG and Research, Dept. Of Zoology,

Auxilium College, Vellore - 6

CHOOSE THE CORRECT ANSWER

1. Impulse of the heart beat originates from ----------
   a) **SA node** b) AV node c) Vagus nerve d) Cardiac nerve
2. Melanin protects from----------.
   a) **UV rays** b) Visible rays c) Infrared rays
3. Ribosomes are produced in ----------.
   a) **Nucleolus** b) Cytoplasm c) Mitochondria d) Golgi body
4. In which era reptiles were dominated?
   a) Coenozoic era b) **Mesozoic era** c) Paleozoic era d) Archaeozoic era
5. In which animal the nerve cell is present but the brain is absent
   a) Sponge b) Earthworm c) cockroach d) **Hydra**
6. The richest source of vitamin B_{12} --------
   a) Chocolate and green gram b) Rice and hen's egg c) Carrot and chicken's breast d)**Goat liver and spirulina**
7. Which one of the following is not a living fossil----------
   a) King crab b) Sphenodon c) **Archaeopteryx** d) Peripatus
8. Virus envelope is known as----------
   a) Nucleoprotein b) Core c) **Capsid** d) Virion
9. The Indian rhinoceros is a …….. in habitatant of which state
   a) Uttar Pradesh b) Himachal Pradesh c) **Assam** d) Uttarakhand
10. Jaundice is a disorder of----------
    a) Skin and eyes b) **Digestive system** c) Circulatory system d) Excretory system
11. Typhoid is caused by----------
    a) Pseudomonas b) Staphyoeoccus c) Bacillus d) **Salmonella typhi**
12. _____ pairs of spinal nerves are present
    a) 28 b) **31** c) 35 d) 42
13. Gene mutation takes place in
    a) Ribosomes b) Chloroplast c) **DNA** d) Mitochondria
14. Yellow fever is spread by----------
    a) Air b) Water c) House fly d) **Mosquitoes**
15. The outer convex region of kidney is called
    a) Pelvis b) **Cortex** c) Nephron d) Calycus
16. Medulla oblongata is called ----------
    a) Diamater b) Duramater c) Vital knot d) **Pons verotic**
17. Bees are sensitive to

a) Red colour b) **UV light** c) Green colour d) No colour

18. The tusks of an elephant are modified
    a) Molars b) Premolar c) Incisors d) **Canines**
19. Chilka lake is famous for
    a) Pisces b) **Aves** c) Reptiles d) Mammals
20. Who is the father of medicine ?
    a) Linnaeus b) Johnnsen c) **Hippocrates** d) Roentgen

FILL IN THE BLANKS

1. Which animals sweat is red in colour **Hippopotamus**.
2. Animal that never drinks water **Kangaroo Rat.**
3. The bird which can fly backward **Humming Bird**.
4. The only fluid which lacks vitamins C **Milk**.
5. Busiest organ in human body **heart.**
6. Study of fishes **Ichthyology**.
7. Longest bone in human body **femur.**
8. Alternation of sexual and asexual cycle is known as **Metagenesis**.
9. Pneumatic bones are found in **birds.**
10. **Nissile** granules found in neuron
11. Amino acids are units of **Protein**.
12. RBC are formed in **Bone Marrow**.
13. Deficiency of Insulin causes **Diabetes.**
14. Sweat glands in rabbits are mostly found in **lips.**
15. **Bioindicator** is the name given to species that can be used as a signal about environment.
16. **Lactose** is the sugar found in milk.
17. Study of the fresh water known as **Limnology.**
18. The animal found over a wide variety of climate conditions **Fox.**
19. Hardest substance in human body **Enamel**.
20. **Duck billed platypus** is the oldest living mammal

MATCH THE FOLLOWING

1. Measles	CFC - **5**
2. Sea fan	Litmus - **6**
3. Leprosy	Suicidal bags - **9**
4. Police guard	Ornithology - **11**
5. Ozone	Koplick's spot - **1**
6. Lichens	Poppy - **12**
7. Octopus	Arachinida - **13**
8. Whale	Notochord - **14**

9. Lysosome	Intestine - **17**
10. Euplectella	Incus - **20**
11. Birds	Liver - **16**
12. Opium	Gorgonia - **2**
13. Spider	Skin - **4**
14. Chordata	Mycobacterium - **3**
15. Yesinia pestis	Bat - **20**
16. Bile	Ink glands - **7**
17. E.coli	Nocturnal - **18**
18. Cockroach	Bubonic plague - **15**
19. Flying fox	Venus flower basket - **2**
20. Ear	Blubber - **8**

PICK OUT THE ODD MAN OUT

1. Tiger : Lion: Cat : **Dog**
2. Potato : Ginger : **Tomato**: Carrot
3. Seahawk : Owl: Eagle : **Parrot**
4. **Cereal** : Oats : Rye : Barley
5. Tortoise: Crab: Frog: **Fish**
6. **Milk** : Ghee : Paneer: Butter
7. Phycology-Algae: Ornithology- Birds :Mycology-Fungi : **Biology-Botany**
8. Papaya: **Mango**:Pomegranate:Guava
9. Fish,:Snake:Crocodile: **Whale**
10. **Lake**: Brook :River :Stream

CROSS WORD PUZZLE

1. Silk protein-**Serine**
2. Talkative bird-**Parrot**
3. One of the Largest museum in India-**Madras**
4. Sorrow of Bengal-**Dhamodhar**
5. Tartaric acid is present in- **Grapes**
6. Male honey bees are called-**Drone**
7. Respiratory pigments in mollusces-**Haemocyanin**
8. Connecting link between plants and animals- **Euglena**
9. Scientific term for a cold blooded animal- **Poikilotherm**
10. Group of animals exclusively found in sea- **Echinoderms**
11. Father of biology -**Aristotle**
12. North American marsupial-**Opposum**
13. These animals are found in herd-**Antelope**
14. Bipolar neuron is found in -**Retina**
15. White gold-**Ivory**

H	E	M	O	C	Y	A	N	I	N	Y	A	T	U	E	W	P	I	N	D
X	A	O	P	O	S	S	U	M	C	D	S	H	R	O	N	V	K	D	H
E	Y	D	O	Z	C	E	W	D	S	O	T	E	U	G	L	E	N	A	A
L	O	Y	M	A	D	R	A	S	N	U	N	M	U	O	H	Z	O	A	M
N	U	U	S	V	L	G	M	C	R	Z	A	O	M	E	E	E	S	L	O
X	Y	S	E	R	I	C	I	N	G	F	N	C	G	A	A	R	W	V	D
P	O	I	K	I	L	O	T	H	E	R	M	Y	O	S	N	E	O	L	H
E	C	H	I	N	O	D	E	R	M	S	B	A	F	I	Y	T	T	N	A
Q	U	N	O	S	T	I	U	Q	E	T	E	S	D	R	A	I	A	I	R
M	O	B	N	M	D	P	A	R	R	O	T	R	R	R	P	N	W	V	C
X	A	N	T	E	L	O	P	E	S	D	M	O	O	P	A	A	M	O	A
A	Z	D	Q	U	W	W	Q	U	E	E	N	U	N	T	N	S	N	R	C
E	D	Z	E	R	W	X	T	U	S	U	M	L	E	O	A	S	O	Y	N
S	V	A	S	A	R	I	S	T	O	T	L	E	S	E	R	I	S	O	S
G	R	A	P	E	S	S	Q	U	O	T	E	S	X	Z	P	P	I	W	Y

ENDOWMENT LECTURES

IST OF ENDOWMENT LECTURES FOR THE ACADEMIC YEAR 2018-19

S. No	LECTURE DATE	RESOURCE PERSON	LECTURE TOPIC	NAME OF THE LECTURE
1	16.7.2018	Dr. Aruliah Rajesekar, Assistant Professor and Ramalingaswami Fellow, Department of Biotechnology, Thiruvalluar University, Serkadu, Vellore.	Microbes and Environment.	Sr. Helen Fernandez Endowment lecture
2	23.8.2018	Dr. M. Job Gopinath, Assistant Professor, PG and Research Department of Zoology, Voorhees College, Vellore.	Co-Evolution.	Sr. Regina Colombo Endowment Lecture for II B. Sc Zoology.
3	6.9.2018	Ms.Thamariselvi, Guest lecturer, Oscar College of Paramedical Sciences, Vellore.	Healthcare associated infections.	Sr. Antoinette Aloysius Endowment Lecture for III B.Sc. Zoology.
4	12.10.2018	Ms.Jane Sanjeevi, Clinical Nurse Specialist, National Health Services, Northampton, United Kingdom.	Vector Borne Diseases	Sr.Maria Fino Endowment Lecture for I B. Sc. Zoology.
5	05.12.2018	Dr. Febin, Associate Professor Department of Biotechnology VIT Vellore.	Introduction to Bioinformatics	Sr. Ethelvina Endowment Lecture for M.Sc. Zoology.
6	22.1.2019	Mrs. Rosaline Rhenius, Professor, Medical surgical nursing College of nursing CMC.	Cancer	Sr. Cleofe Fassa Endowment Lecture for M.Sc. Zoology.

ENDOWMENT LECTURES 2018-19

Microbes and Environment

Dr. Rajasekar, Assistant professor &DBT- Ramalinga fellow,
Department of biotechnology, Thiruvalluvar University, Serkkadu, Vellore.

The resource person gave a comprehensive note on biofilm, complex aggregation of micro organism growing on a solid substrate and its life cycle that goes with three stages: attachment, aggregation to maturation (growth) and detachment or dispersion of microbes. Eventually, the effects of biofilm in industry and environment was explained. Particularly in environment, metabolic activity influenced by micro-organisms in metallic surface causes corrosion; this leads to redox reaction of micro organisms that have a significant effect on properties of minerals in the environment. Consequently, the knowledge about the technique of investigating microbially induced corrosion and bio-degradation of hydrocarbon and its influence on corrosion; and also the way of screening, optimizing, production and characterization of bacterial biosurfactant and finally the treatment of soak liquor and bioelectricity generation in dual chamber microbial fuel cell.

CO – EVOLUTION

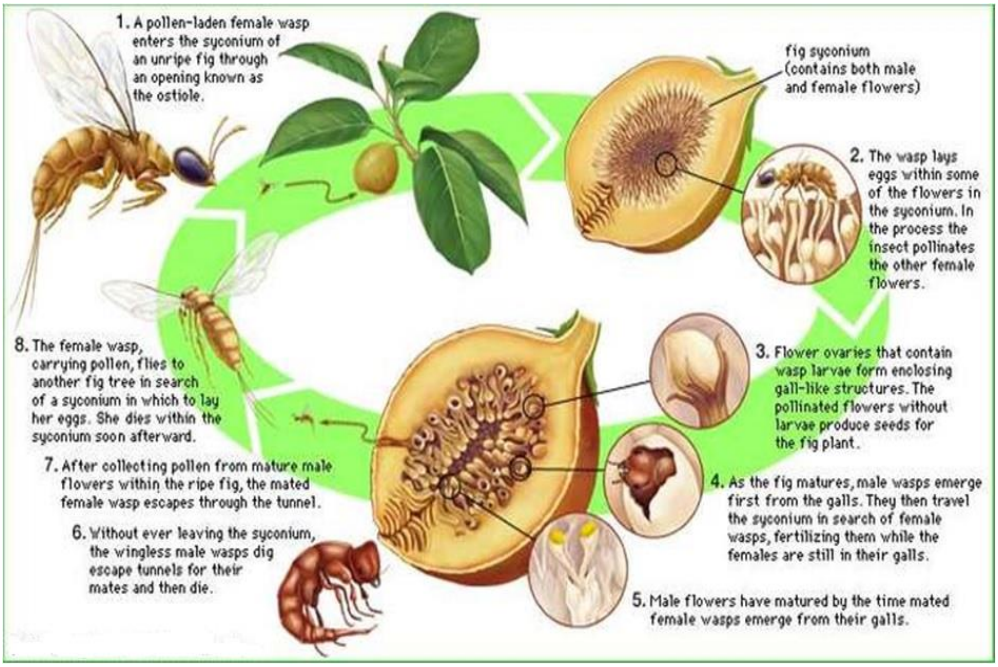
Dr. M. Job Gopinath, Assistant Professor, PG and Research Department of Zoology, Voorhees College, Vellore.

Figs and Wasp that pollinate them is one of the biologist's favourite examples of a beneficial relationship between two different species. In exchange for the pollination service provided by the Wasp, the fig fruit provides room and board for the Wasp developing its young ones, however Wasp don't always pollinate the fig. Fig tree punishes these cheaters by dropping the unpollinated fruits, killing the wasp offspring inside. Thus the figs and fig wasp are interdependent generally there relation is strictly specific that is every species of fig has its own species of pollinator wasp.

There are 3 kinds of fig flowers viz male, female and a neuter or gall flowers. Fig sycones hallow receptacles bearing the flowers on the inner surface may contain all three types of flowers or they may have male and gall flowers in the one and female flowers in another plant. Co-Evolution in the fig wasp system, figs can only be pollinated by the female agonid wasp. The wasp can only lay their eggs inside the fig inflorescence, where there larva feed on some of the developing seeds.

The fig and fig wasp is highly co-evolved mutualist that depends completely on each other for continued reproduction. However their reproductive interests are not identical. The natural history of their interaction often permits the direct measurement of total life time reproductive success of the wasp and of major component of reproductive success for the fig.

Data from monocious species of new world figs and their wasp pollinators indicate that fig fruit size, wasp size and the number of foundresses that pollinate and lay eggs in any given fruit interact in complex but systematic ways to affect the reproductive success of both the wasp and fig. Different aspects of the interaction may work against the reproductive interests of either the wasp or the fig or often. However that same crowding selects for more male biased sex ratios in the wasp that reduce potential fitness gains through pollen dispersal for the fig. This can lead to more extreme adaptations, as the two species become increasingly specialized for interacting with one another. Possibly most extreme plant – pollinator relationship exists between the fig and the fig wasp. The fig wasp mutualism originated between 70 and 90 million of years as a product of a unique evolutionary event. Since then co-cladogenesis and co-adaptation on a course scale between wasp genera and fig section have been demonstrated by both morphological and molecular studies. This illustrates the tendency towards co-radiation of figs and wasps. Such strict co-speciation should result in identical phylogentic trees for the two lineages and recent works mapping fig sections onto molecular phylogenesis of wasp genera provided strong evidence for co-speciation at that scale. This is called co-evolution.



HEALTHCARE ASSOCIATED INFECTIONS

Ms. Thamarai Selvi

Guest Lecturer, Oscar College of Paramedical Sciences Vellore.

Healthcare associated infection is also called as nosocominal infections or iatrogenic infection. It is beloved that up to 20% of healthcare associated infections can be prevented.

Common types of Healthcare associated infection

Healthcare associated UTI: Even with adequate precautions, catherisation in hospitals leads to 50% of infections.

Healthcare associated bacteraemia: It is commonly caused by infected cannulae. The longer the cannulae are kept in situ, the greater the risk of infection.

Healthcare associated Pneumonia: Aspiration in unconscious patients and pulmonary ventilation or instrumentation may lead to nosocominal pneumonia infection.

Healthcare associated wound infection: Mostly this kind of infection is postoperative wound infection, such as the site and duration of surgery, health of the patient and skill of the operator.

Healthcare associated infection due to hepatitis virus B and C: These infections are a serious risk for patients receiving blood transfusions or undergoing renal dialysis.

Healthcare associated episodes of tetanus: Usage of contaminated dressing or suture materials, improper disinfection of intramuscular infections, inadequate care while cutting the umbilical cord of the new born child.

Healthcare associated gastroenteritis: Staphylococcal contamination of cooked food with diarrhoea may induce such infections.

Sources of infections:

Self infection or acute infection, Cross infection- with air ,hospital personnel or direct contact with infected patient and infection from environmental sources.

Standard Precautions:

Hand-hygiene: Usage of alcohol based hand rubs and proper hand washing with soap and water, usage of gloves can prevent nearly 40-60% of infection.

Personal protective equipment: This refers to wearable equipment intended to protect patients or healthcare worker like gloves, gowns, facemasks, goggles and face shields.

Infection safety: Aseptic safety precautions should be considered while handling infections and administering medications.

Environmental cleaning: Removal of visible soil organic contamination with appropriate chemical agent cleaning helps in prevention.

Medical equipment: Reusable and single medical equipment should be equipment should be accompanied by instructions.

Respiratory hygiene/cough etiquette: Usage of disposable tissues to cover their mouth/nose while coughing or sneezing for patient with respiratory illness can be a preventive measure.

VECTOR BORNE DISEASE

Ms. Jane Sanjeevi, Clinical Nurse Specialist, National Health Services, Northampton, United Kingdom,

Host- Organism that serves as the habitat for a parasite, or possibly for a symbiont. A host may provide nutrition to the parasite or symbiont, or simply a place in which to live.

Vector- Any agent, living or otherwise, that carries and transmits parasites and diseases. Also, an organism or chemical used to transport a gene into a new host cell. In epidemiology, a *disease vector* is any agent that carries and transmits an infectious pathogen into another living organism. Most agents regarded as vectors are organisms, such as intermediate parasites or microbes, but it could be an inanimate medium of infection such as dust particles.

Vector-Borne Diseases- Disease that results from an infection transmitted to humans and other animals by blood-feeding arthropods, such as mosquitoes, ticks, and fleas. Examples of vector-borne diseases include *Dengue fever, West Nile Virus, Lyme disease, and Malaria.*

Fast Facts

- Commonly found in tropical and sub-tropical regions of the world.
- Vector borne diseases account for 17% of the estimated global burden of all infectious diseases.
- Most deadliest vector borne disease: Malaria
- World's fastest growing vector borne disease : Dengue

Malaria: What causes malaria?

Malaria can occur if a mosquito infected with the *Plasmodium* parasite bites you. There are four kinds of malaria parasites that can infect humans: *Plasmodium vivax*, *P. ovale*, *P.malariae*, and *P. falciparum*. *P. falciparum* causes a more severe form of the disease and those who contract this form of malaria have a higher risk of death. An infected mother can also pass the disease to her baby at birth. This is known as congenital malaria. Malaria is transmitted by blood, so it can

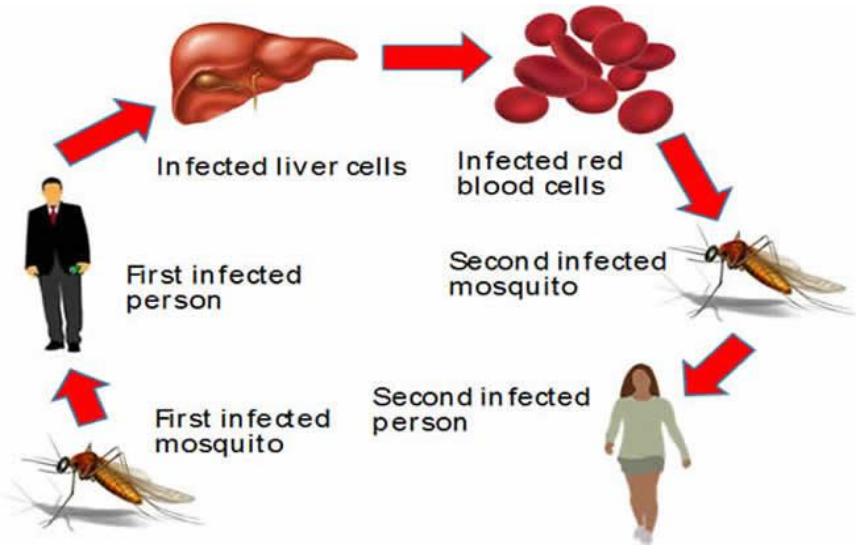
also be transmitted through an organ transplant, a transfusion and use of shared needles or syringes.

What are the symptoms of malaria?

The symptoms of malaria typically develop within 10 days to 4 weeks following the infection. In some cases, symptoms may not develop for several months. Some malarial parasites can enter the body but will be dormant for long periods of time.

Common symptoms of malaria include: Shaking chills that can range from moderate to severe, high fever, profuse sweating, headache, nausea, vomiting, abdominal pain, diarrhea, anemia, muscle pain, convulsions, coma and bloody stools.

Malaria transmission cycle



Prevention

There's no vaccine available to prevent malaria. Talk to your doctor if you're traveling to an area where malaria is common or if you live in such an area. You may be prescribed medications to prevent the disease. These medications are the same as those used to treat the disease and should be taken before, during, and after your trip. Talk to your doctor about long-term prevention if you live in an area where malaria is common. Sleeping under a mosquito net may help prevent being bitten by an infected mosquito. Covering your skin or using bug sprays containing DEET may also help prevent infection.

Treatment: The types of drugs and the length of treatment will vary, depending on:

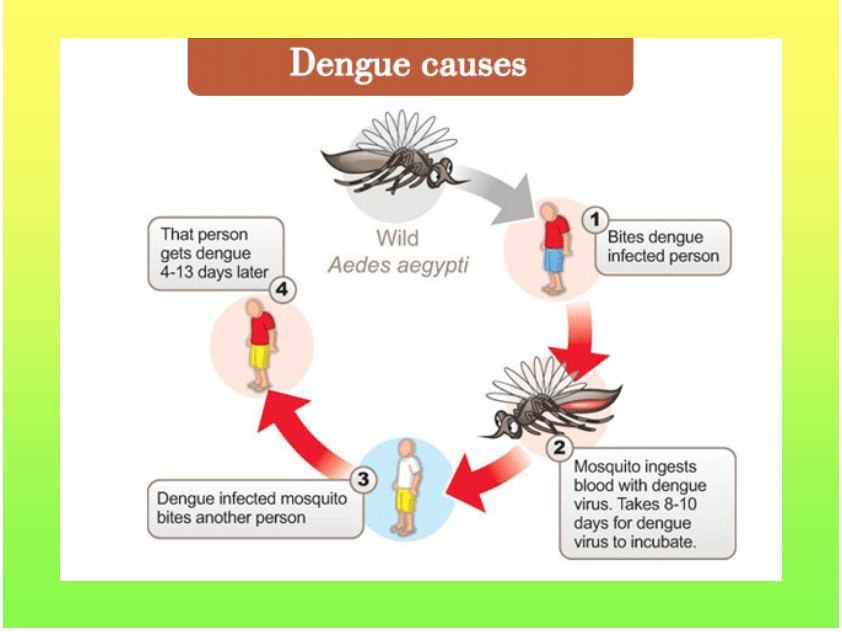
- Which type of malaria parasite you have
- The severity of your symptoms

- Your age
- Whether you're pregnant

Medications: The most common antimalarial drugs include:

- Chloroquine (Aralen)
- Quinine sulfate (Qualaquin)
- Hydroxychloroquine (Plaquenil)
- Mefloquine
- Combination of atovaquone and proguanil (Malarone)

Dengue Fever: Dengue fever also known as "Break Bone Fever" is a mosquito borne viral infection caused by Flavi virus transmitted by *Aedes aegypti*.



Signs and symptoms: Mosquitoes spread dengue fever. Symptoms vary depending on the severity of the disease.Mild dengue fever. Symptoms can appear up to 7 days after being bitten by the mosquito that carries the virus.

They include:

- aching muscles and joints
- body rash that can disappear and then reappear
- high fever
- intense headache

- pain behind the eyes
- vomiting and feeling nauseous

Symptoms usually disappear after a week, and mild dengue rarely involves serious or fatal complications.

Treatment: Dengue is a virus, so there is no specific treatment or cure. However, intervention can help, depending on how severe the disease is.

For milder forms, treatment includes: Preventing dehydration: A high fever and vomiting can dehydrate the body. The person should drink clean water, ideally bottled rather than tap water. Rehydration salts can also help replace fluids and minerals. Painkillers, such as Tylenol or paracetamol: These can help lower fever and ease pain. Non-steroidal anti-inflammatory drugs (NSAIDs), such as aspirin or ibuprofen, are not advised, as they can increase the risk of internal bleeding.

More severe forms of dengue fever may need:

- intravenous (IV) fluid supplementation, or drip, if the person cannot take fluids by mouth
- blood transfusion, for patients with severe dehydration

Hospitalization will allow the individual to be properly monitored, in case symptoms get worse.

Prevention: No vaccine can protect against dengue fever. Only avoiding mosquito bites can prevent it. Anyone who lives in or travels to an at-risk area can use a number of ways to avoid being bitten.

Clothing: Reduce the amount of skin exposed by wearing long pants, long-sleeved shirts, and socks, tucking pant legs into shoes or socks, and wearing a hat.

Mosquito repellents: Use a repellent with at least 10 percent concentration of diethyltoluamide (DEET), or a higher concentration for longer lengths of exposure. Avoid using DEET on young children.

Mosquito traps and nets: Nets treated with insecticide are more effective, otherwise the mosquito can bite through the net if the person is standing next to it. The insecticide will kill mosquitoes and other insects, and it will repel insects from entering the room.

Door and window screens: Structural barriers, such as screens or netting, can keep mosquitoes out.

Avoid scents: Heavily scented soaps and perfumes may attract mosquitos.

Camping gear: Treat clothes, shoes, and camping gear with permethrin, or purchase clothes that have been pretreated.

Timing: Try to avoid being outside at dawn, dusk, and early evening.

Stagnant water: The *Aedes* mosquito breeds in clean, stagnant water. Checking for and removing stagnant water can help reduce the risk.

To reduce the risk of mosquitoes breeding in stagnant water:

- turn buckets and watering cans over and store them under shelter so that water cannot accumulate
- remove excess water from plant pot plates
- scrub containers to remove mosquito eggs
- loosen soil from potted plants, to prevent puddles forming on the surface
- make sure scupper drains are not blocked and do not place potted plants and other objects over them
- use non-perforated gully traps, install anti-mosquito valves, and cover any traps that are rarely used
- do not place receptacles under an air-conditioning unit
- change the water in flower vases every second day and scrub and rinse the inside of the vase
- prevent leaves from blocking anything that may result in the accumulation of puddles or stagnant water

CANCER

Mrs. Rosaline Rhenius, Lecture, Medical surgical nursing, College of nursing, CMC, Vellore - 4.

The lecture was very effective and interactive which mainly focused on the Cancer as a Genetic Disease, risk factors for Cancer, cancer as a global Health Problem, avoidable Cancer Risk. The converse gained the reasons for cancer and the alternative food habits and life style that avoid cancer. Eventually, Proto Oncogenes & Tumour Supressors- Normal Functions was discussed.

Carcinogens are the general food additives, cosmetics, dyes which we constantly come across our day to day life. Another main reason would be obesity. So it’s advisable to get rid these things. Awareness was given about the various screening techniques available for cancer before it could lead to extreme stage. As the address was among female students, self physical

examination of breast cancer and mammogram screening was explained to them, the world's top most cancer amongst women community. In India majority of women are suffering from cervical cancer where the main reason is hygiene issues. Hence it is important to keep up the hygienic practice. She advised us to create awareness in our family and surroundings about cancer and also to get rid of carcinogen.

The take home message is one person should eat at least half kilogram of fruits or vegetable per day to make our body's cellular machinery function in controlled way, to stay away from uncontrolled cell division.

THE BASICS OF BIOINFORMATICS

Dr .Febin, Assistant professor, Department of Biotechnology, School of Biosciences and Technology, VIT, Vellore - 6.

The Lecture was on the basic structure of protein, carbohydrates, lipid and the structural model of DNA and RNA. Similarity of nucleic acid Vs protein using informatics tool, sequence identity, pair wise alignment using a scoring matrix to quantify the nucleic acid was explained. Additionally, local versus global alignment was explained, Global alignment, entire sequence is aligned – end to end; suitable for similar sequences (and durations). Local alignment, only the most similar parts of the sequences are aligned; suitable for sequences with only a few points of similarity (e.g. exons in genes), and replacement of one aminoacid residue within a protein by another that has been accepted by natural selection. It is also referred as accepted point mutation. It is used in aligning aminoacid sequences based on the phylogenetic model. It is estimated as the protein ancestral state.

The knowledge about the search engines of bioinformatics like PAM, FASTA, BLOSSUM, BLAST etc., PAM The explanation cleared about the working and importance of PAM in research. Followed by that, search tool BLOSUM, block substitution matrix was discussed. It is used in the alignment of distantly related proteins. Moreover, they also gained the knowledge about data banks and its significance in sequencing of proteins, aminoacids and nucleotides especially in distant related proteins. Some DNA banks such as EMBL, DDBJ & NCBI were explained in brief. Various reference website for this analysis was given to the students.

RESEARCH ACTIVITIES

RESEARCH ACTIVITIES 2018-2019

M.Sc. SUMMER PROJECT:

The first batch of summer project was successfully completed by the M.Sc. Zoology students and on 11.7.2018 Project Viva Voce was conducted. Dr. Arivoli, Assistant Professor of Zoology, Thiruvalluvar University, Serkadu, Vellore was the external examiner and Dr. A. Mary Agnes Associate Professor of Zoology Auxilium College was the Internal Examiner.

S.NO	NAME & REGISTER .NO	TITLE
1.	AMMU.J 30517P23001	Presence of microbes in water sample and soil sample from leather industries area near by Visharam and Vaniyambadi.
2.	ANNAPOORANI.R 30517P23002	Bacterial flora in barnacles.
3.	ANUPRIYA.M 30517P23003	Isolation of *Bacillus subtilis* from slaughter house waste water located in Viruthambut,Vellore.
4.	ASHWINI.M 30517P23004	Comparative study on the heavy metals present in industrial waste water and drinking water in sipcot, Ranipet.
5.	D.CHEVVANTHI 30517P23004	Data comparison among male and female diabetes patients.
6.	DIVYA. T 30517P23006	A survey on various species of medicinal plants in Vellore district.
7.	L. GAYATHRI 30517P23006	Data collection of lipid profile in Sri Narayani Hospital and Research centre.
8.	KEERTHIKA . N 30517P23008	Analysis of physico chemical parameters in water and germination of seeds in soil collected from Ranipet.
9.	MEEHA BEGUM N 30517P23009	Comparative study on the growth of plants using human urine, nitrogen fertilizer and nursery manure.
10.	MOHANA E. 30517P23010	Identification of *Brevibacillus reuszeri* present in the drinking water near chromate factory at Sipcot, Ranipet Vellore.
11.	NARMADHA.B 30517P23011	Evaluation on efficacy of the natural antimicrobial and synthetic antimicrobial agents.
12.	NIVETHA.B 30517P23012	Survey on species of fishes in Vellore fish market.
13.	A F. PHILOMINA 30517P23013	Cell variation study of umbilical cord Wharton`s jelly derived mesencymal stem cells in male and female babies using confocal microscope.
14.	M.SHANMUGA PRIYA 30517P23014	Comparison of kitchen waste compost and chemical fertilizer in the growth of *Lablab purpureus.*
15.	M.THAMAYANTHI 30517P23015	Data collection on liver function test in Sri Narayani Hospital, Vellore.
16.	R.THAMIZHBHARATHI 30517P23016	Effects of organic manure and chemical fertilizer on the growth of *Amaranthus tricolor* and *Hibiscus cannabinus.*
17.	VISHALI .D 30517P23017	Deciphering cell differentiation of male and female babies umbilical cord tissue using histopathology.

THESIS SUBMITTED: Ph. D

S. No	Name of The Candidate	Topic	Name of the Guide	Date of Submission
1.	Santhosh Kumar. M	Biogenic characterization and eco-friendly method for the synthesis of pallodium nanoparticles (Pd NPs) using an aqueous solution of medicinal plants for their anticancer activity against Human Hela Cell lines.	Dr. Sr. Regina Mary	06.06.2018
2.	Sandhya .C	Biosynthesis and characterization of gold nanoparticles using south Indian Medicinal plants and its biomedical applications.	Dr. Sr. Mary Josephine Rani	24.09.2018
3.	Lakshmi Priya. G	Gastro and cytoprotective activity of Indian Medicinal plants against experimentally induced gastric Ulcer in Rats.	Dr.Sr. Mary Josephine Rani	24.10.2018

Ph. D VIVA VOCE EXAMINATION

S.No	Name of The Candidate	Topic	Name of the Guide	Date of examination	External Examiner
1.	P. Rajiv Gandhi	Biofabrication of metal oxide nanoparticles using botanical extracts and its efficiency on Plasmodium falciparum	Dr. (Sr.) Regina Mary	29.08.2018	Dr. Arulsamy Jebanesan, Professor of Zoology, Annamalai University, Chidambaram.

M. Phil VIVA VOCE EXAMINATION

S. No	Name of The Candidate	Topic	Name of the Guide	Date of Submission
1.	Sapna. M.H	Biosynthesis and Characterization of Titanium Dioxide Nanoparticles using Leaf extracts Abutilon indicum and Cardiospermum halicacabum against Human Breast Adenocarcinoma (MCF-& Cell Line).	Dr. Sr. Regina Mary	04.09.2018
2.	Susithra A.S	Green synthesis and characterization of Gold Nanoparticles using Leaf Extracts of Aegle Marmelos and coccinia glands and its anticancer activity against human Breast Adenocarcinoma cell line (MCF- 7).	Dr. Uma Chandra Meeralakshmi	04.09.2018

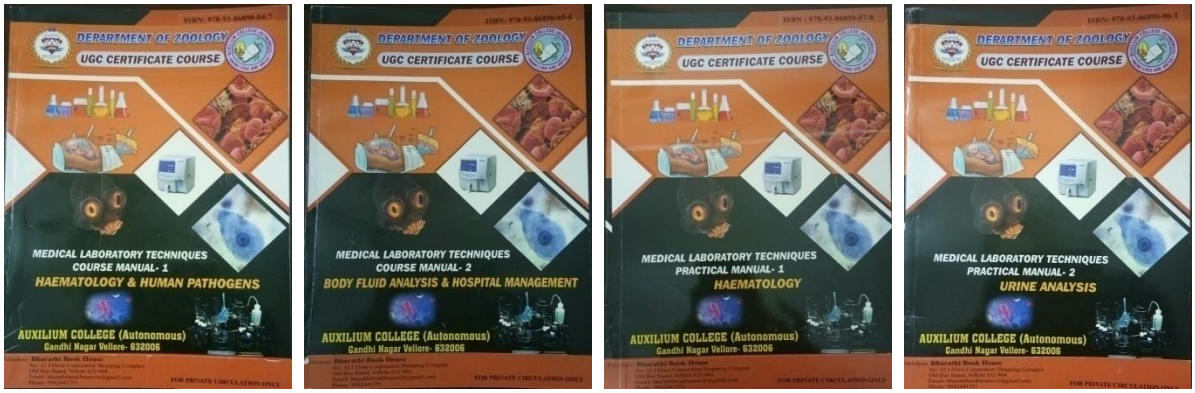
DEPARTMENT PUBLICATIONS

DEPARTMENT PUBLICATION

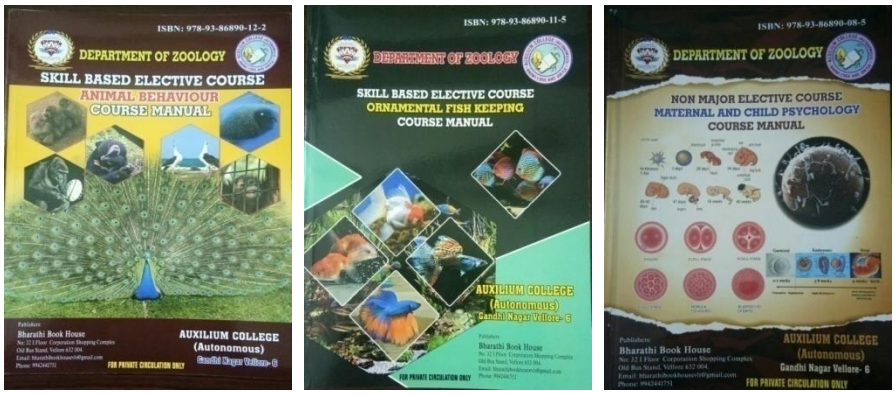
1. Course Manuals and Practical Manuals were prepared for UGC Certificate course Medical Laboratory Techniques.
2. Course manuals for SBE and NME offered by the department were prepared.

S. No	Name of the Author	Title	ISBN
1	Dr. A. Mary Agnes Dr. J.S. Arockiamary	Sericulture – Skill Based Elective Course Manual	978-93-86890-09-2
2	Dr. A. Mary Agnes Dr. J.S. Arockiamary Dr. A. Rajalakshmi	Public Health and Hygiene - Skill Based Elective Course Manual	978-93-86890-10-8
3	Dr. A. Mary Agnes Dr. J.S. Arockiamary Mrs. K. Vidhya	Ornamental Fish Keeping – Skill Based Elective Course Manual	978-93-86890-11-5
4	Dr. A. Mary Agnes Dr. J.S. Arockiamary Mrs. Hannah Elizabeth	Maternal and Child Psychology – Non Major Elective Course Manual	978-93-86890-08-5
5	Dr. A. Mary Agnes Dr. J. S. Arockiamary Dr. Uma Chandra Meeralakshmi	Animal Behaviour- Skill Based Elective Course Manual	978-93-86890-12-2
6	Dr. A. Mary Agnes Dr. J.S. Arockiamary Ms. Rebecca Vinolia Mrs. K. Vidhya	Haematology and Human Pathogens Medical Laboratory Techniques Course Manual -1	978-93-86890-04-7
7	Dr. A. Mary Agnes Dr. J.S. Arockiamary Ms. Aseena Dr. A. Rajalakshmi	Body Fluid Analysis and Hospital Management Medical Laboratory Techniques Course Manual - 2	978-93-86890-05-4
8	Dr. A. Mary Agnes Dr. J.S. Arockiamar	Haematology Medical Laboratory Techniques Practical Manual - 1	978-93-86890-07-8
9	Dr. A. Mary Agnes Dr. J.S. Arockiamary	Urine Analysis Medical Laboratory Techniques Practical Manual - 2	978-93-86890-06-1

UGC CERTIFICATE COURSE – MLT COURSE MANUAL AND PRACTICAL MANUAL



SBE AND NME BOOKS



ONLINE COURSES

DETAILS OF THE ONLINE COURSES COMPLETED IN 2018-19

S. No	Register no	Name	Completion date	Title of the course	Institution
	II PG				
1.	30517P23001	Ammu. J	31.7.2018	Food, Nutrition & Your Health	Open 2 Study
2.	30517P23003	Anu Priya. M	31.7.2018	Food, Nutrition & Your Health	Open 2 Study
3.	30517P23004	Ashwini Manoharan	31.7.2018	Foundations of Psychology	Open 2 Study
4.	30517P23005	Chevvanthi. D	04.9.2018	Food, Nutrition & Your Health	Open 2 Study
5.	30517P23006	Divya. T	31.7.2018	Food, Nutrition & Your Health	Open 2 Study
6.	30517P23007	Gayathri . L	31.7.2018	Food, Nutrition & Your Health	Open 2 Study
7.	30517P23008	Keerthika. N	31.7.2018	Food, Nutrition & Your Health	Open 2 Study
8.	30517P23009	Meeha Begum	31.7.2018	Food, Nutrition & Your Health	Open 2 Study
9.	30517P23010	Mohana. E	31.7.2018	Food, Nutrition & Your Health	Open 2 Study
10.	30517P23011	Narmadha .B	04.9.2018	Microbiology and Forensic Science	Open 2 Study
11.	30517P23012	Nivetha. B	31.7.2018	Food, Nutrition & Your Health	Open 2 Study
12.	30517P23012	Nivetha. B	04.9.2018	Understanding the origins of Crime	Open 2 Study Griffith University
13.	30517P23013	Philomina. A. F	31.7.2018	World Music	Open 2 Study James cook University Australia
14.	30517P23015	Thamayanthi. M	31.7.2018	Food, Nutrition & Your Health	Open 2 Study
15.	30517P23016	Thamizhbharathi.R	04.9.2018	Foundations of Psychology	Open 2

					Study RMIT University
16	30517P23017	Vishali . D	31.7.2018	Foundations of Psychology	Open 2 Study RMIT University
17	30517P23014	Shnamugapriya M	09.10.2018	Microbiology and forensic science	Open 2 Study
18	30517P23002	Annapoorani R	13.11.2018	Food, Nutrition & Your Health	Open 2 Study
	I PG				
19	30518P23001	Annakili V	13.11.2018	Food, Nutrition & Your Health	Open 2 Study
20	30518P23002	Christy Samuel	31.7.2018	Understanding Common Diseases	Open 2 Study University of Wollongong
21	30518P23002	Christy Samuel	15.8.18	Marine & Antarctic Science	Open 2 Study University of Tasmania
22	30518P23003	Dhiya Ephisia	09.10.2018	Food, Nutrition & Your Health	Open 2 Study
23	30518P23005	Iswariya Sridhar	31.07.2018	Food, Nutrition & Your Health	Open 2 Study
24	30518P23008	Priyanka Palani	13.11.2018	Food, Nutrition & Your Health	Open 2 Study
25	30518P23009	Rajakumari	13.11.2018	Food, Nutrition & Your Health	Open 2 Study
26	30518P23010	Sindhu Jagannathan	13.11.2018	Food, Nutrition & Your Health	Open 2 Study
27	30518P23004	J Irine Towle	25.12.2018	Marine & Antarctic Science	Open 2 Study University of Tasmania

STUDENTS CORNER

ALBINO ANIMALS

Ms. Priyanka Palani
I M. Sc Zoology, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

Albinism, (from the Latin *albus*, meaning "white"), hereditary condition characterized by the absence of pigment in the eyes, skin, hair, scales, or feathers, a variable but characteristic change in eye development. Pigmentation research has shown that albinism is a complex genetic disorder. Animals lacking this pigment can either be pure or partial albinos, depending on how defective their inherited genes are.

Albino animals are extremely rare and unusual. They have all the characteristics of others of their species except they are all white in color. Not one inch of their natural coloring comes through as their bodies are unable to produce a pigment known as melanin. Melanin creates the normal pigmentation and coloring in an animal's skin, fur or scales. This lack of melanin generally results in the animal looking bleached all over, appearing white or pink.

Being white doesn't mean an animal is albino. The true test is in the eye coloration. All albino animals have pink/red eyes. Albinos are rare because the genes which cause albinism are recessive and rarely occur.

Albinism is caused by a mutation in a gene called tyrosinase. The tyrosinase protein is needed to make pigment. One normal tyrosinase gene makes enough protein to make pigment, so to be albino an organism must have two mutant tyrosinase genes. This makes the trait albinism a recessive trait.

Pathophysiology

These diseases present with a generalized complete or partial loss in pigmentation of the skin and the hair. Mutations in genes that regulate the multistep process of melanin synthesis, distribution of pigment by the melanocyte, and/or melanosome biogenesis are the basis for these diseases. There are currently five known genetic types of albinism, the most common being Oculocutaneous type1(OCA1) and type 2 (OCA2). Oculocutaneous means affecting the eyes and skin ("oculo" meaning eye and "cutaneous" meaning skin).

Patients with OCA1 have mutations in a gene called TYR that is responsible for creating the enzyme tyrosinase, used by cells to convert the amino acid tyrosine into pigment molecules that color the skin, hair, and eyes.

The *TYR* gene provides instructions for making an enzyme called tyrosinase. This enzyme is located in melanocytes, which are specialized cells that produce a pigment called melanin. Melanin is the substance that gives skin, hair, and eyes their color. Melanin is also found in the light-sensitive tissue at the back of the eye (the retina), where it plays a role in normal vision.

Tyrosinase is responsible for the first step in melanin production. It converts a protein building block (amino acid) called tyrosine to another compound called dopaquinone. A series of additional chemical reactions convert dopaquinone to melanin in the skin, hair follicles, the colored part of the eye (the iris), and the retina.

The proteins/gene products (and respective gene) affected in each form of oculocutaneous albinism are as follows

- Oculocutaneous albinism type 1 – Tyrosinase enzyme
- Oculocutaneous albinism type 2 – P protein

Etiology

The causes of these diseases are mutations in specific genes.Oculocutaneous albinism type 1 results from mutations in the tyrosinase gene, which maps to band 11q14-3 and is inherited as an autosomal recessive trait. The tyrosinase gene encodes an enzyme that initiates the synthesis of melanin using the substrate tyrosine. Specifically, tyrosinase hydroxylates tyrosine to dihydroxyphenylalanine (DOPA) and subsequently dehydroxylates DOPA to DOPA-oxidase. More than 70 mutations have been identified in tyrosinase that result in the dysfunction or lack of synthesis of this enzyme. Most patients with oculocutaneous albinism type 1 have compound heterozygosity for mutations in the tyrosinase gene. Oculocutaneous albinism type 2 results from mutation in the *P* gene, which maps to band 15q12 and is inherited as an autosomal recessive trait. The *P* gene encodes a 110-kd protein with 12 putative transmembrane domains localized to the limiting membrane of the pigment granule (ie, melanosome). The function of the P protein in melanin synthesis has yet to be determined. Oculocutaneous albinism type 2 results from mutation in the *P* gene, which maps to band 15q12 and is inherited as an autosomal recessive trait. The *P* gene encodes a 110-kd protein with 12 putative transmembrane domains localized to the limiting membrane of the pigment granule (ie, melanosome). The function of the P protein in melanin synthesis has yet to be determined

Epidemiology:Frequency

The approximate incidences of these diseases are as follows:

- Oculocutaneous albinism type 1 – One case per 40,000 population
- Oculocutaneous albinism type 2 – One case per 36,000 population, except in Africans and African Americans, in whom the incidence is 1 case per 10,000 population

In animals

Approximately three hundred species across North America have albino members. There have been sightings of albino snakes, 49accoons, frogs and deer. It's believed for every 10,000 mammals born, 1 will be albino and this shows how rare the condition really is.

Prognosis

Oculocutaneous albinism types 1, 2, 3, and 4 and ocular albinism are not associated with mortality and/or morbidity outside of cutaneous sensitivity to solar irradiation and the associated visual defects

The Difficult Life of Albino Animals

- It affects their physical development.
- The absence of melanin in the eyes results in abnormal development, which often means that those with albinism struggle with depth perception. Depth perception is the visual ability to perceive the world in three dimensions and the distance of an object.

- Some animals aren't as negatively physically impacted by albinism, like the squirrel. Its retina differs from all other mammals, so albinism affects their eyesight less than normal.
- Fish, like this catfish, don't have melanin in their inner ear, meaning that their hearing is less likely to be affected by albinism than in mammals.
- Many albinos classified as predators die from starvation because they lack their natural color camouflage. Would-be prey can easily see them coming, and therefore have time to plot an escape
- Likewise, animals that are more likely to be prey lack the natural coloring that helps them hide from predators, so they are more apt to be seen and killed.
- The condition also has social effects, which is problematic when it comes time to mate. Many albino animals are outcast by their peers.

Some cultures worship albino animals, and believe that they are good luck charms. Many of these tribes abided by one common principle: the albino animal is not to be killed. If the albino animal were killed, its killer would be cursed. The underlying thinking was that, as its coloring makes it an easier mark, it is unfair game for the hunter.

VEGANS, SAVING OUR PLANET EARTH

Ms. Christy Samuel

I M. Sc Zoology, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

Veganism is a way of living which seeks to exclude, as far as is possible and practicable, all forms of exploitations of, and cruelty to, animals for food, clothing or any other purpose. Veganism is kinder to animals, to people and to our planet's future. While vegetarians choose not to eat animals, Vegans also avoid eating dairy, eggs, honey as well as not wearing fur, leather, wool or any products tested or animals.

Veganism, is the natural extension of vegetarianism, is an integral component of true cruelty-free lifestyle.

Animals are used and exploited for human's selfish needs.

1. Animals used for Clothing

One of the purposes for which "non-human" animals are routinely made to suffer and killed in production of materials for clothing.

2. Animals used for Entertainment

The most significant ways are hunting, sport-fishing, circus and other shows with animals, Bull fighting. Life for all those animals is like a life sentence. Every year billions of animals suffocate or die in one or other painful ways.

3. Pets for Leisure

Many people don't see this as a form of using animals since they may have a close relationship with them. Yet this is not always the case, there are many abandoned animals are around the world.

4. Animals as Workers and Tools

All these animals often lead a life full of suffering and hardship and are killed when they are not in use.

5. Animals for Meat

This is by far the most severe exploitation of animals.

6. Invading their natural habitat

Many wild animals invade and come inside the cities and villages, and this leads to destruction of homes and localities. It will us who are responsible for this, as we are disturbing their natural habitat and building huge apartments, multiplexes, industries, etc which leads to deforestation, as a result animals tend to invade human habitat in search of food and resources.

Reasons for becoming vegan:

Preventing the exploitation of animals is not only the reason for becoming vegan, but for many other reasons.

For your Health

- Going vegans is a great opportunity to learn more about nutrition and cooking, and improves your diet. Getting your nutrients from plant food allows more room in your diet.

For Environment

- One of the most effective things an individual can do is lower their carbon footprint and to avoid all animal product.

For People

- A plant based diet requires only one-third of land needed to support meat and dairy diet. Avoiding is not just one of the simplest ways an individual can reduce the strain on food as well as other resources

For Animals

- Most importantly animals, as they have their rights to live. They bed joy, affection and pleasure as well as fear, grief and sadness.

Animal statistics shows that 15 million warm-blooded animals worldwide, are tortured. These animals are used for research purposes and kept in the most inhumane condition. They are left to die and suffer while researchers are busy finding the cure to free mankind of its trouble.

Tens of thousands of whale, birds, seals and turtles are killed every year from plastic bag litter; this gets ingested in their gut and is not digested. Not only for environment, it is harmful for mankind.

Nobody really knows that cruelty on animals is actually a punishable offence;

Section 11 (1) (a) to (o) of the prevention of cruelty to animals act, 1960 prescribes and encounters the forms of cruelty and its punishable- People should avoid hunting animals, and if anyone see someone getting tortured, the other person can stop him and take legal actions against it.

Veganism is the single biggest way to reduce environmental impact on our planet, by not only saving animals but also cleaner water, save energy and provide equally nourishment. Take tiny steps towards saving our planet Earth and make it a beautiful place to live in.

BLOOD GROUP SYSTEMS AND PERSONALITY

Sr. Irine Towel,
I M. Sc Zoology, PG and Research Dept. of Zoology, Auxilium College, Vellore-6

BLOOD GROUPS			
A	**B**	**AB**	**O**
• Kind and compassionate, put others interests and needs before their own. • Calm on the outside, they often suffer from inner turmoil and anxiety. • Cooperative, sensitive, clever, passionate, smart and well-organized. • Excellent listeners and make good friends. • Get along with others quite well, it is often achieved at expense of their own balance and happiness. • Bottle up their emotion, which takes its toll on their nervous system. • Compatible with their own type or AB type.	• Outgoing and friendly, people person. • Unlike type A, type B doesn't do that at the expense of their own feelings and well-being. • Contact with people doesn't wear them off • They well do great as leaders or at any type of job that requires dealing with people. • They are highly adjustable people. • They are into body language and other methods of deciphering others. • They rely on their intuition and trust themselves. • They are empathetic, easily able to understand others point of view, yet often hesitating to challenges.	• Tend to be very charming and popular • Freedom-loving AB's are strong and rational people. • They don't like to fit in anyone else's "boxes". • Can be seen as spiritual people. • They don't worry about little things. • Can assess their life challenges without emotions getting in the way.	• Responsible, practical, organized and rule-conscious people. • They make excellent leaders and their determination helps them achieve their goals. • Liked by other people, but they are loners and need a lot of time alone. • They are physically strong and active and have a well developed physique and can find success in sports. • They are intuitive, focused, self-reliant and daring. • They can handle stress better than other blood types. • They dislike taking orders. They are most happy with their own type or AB type

TRAITS: Obedient, Careful, Sympathetic, Self-Sacrificing, Polite, Honest, Loyal, Emotional, Introverts and Nervous.	**TRAITS:** Cheerful, Optimistic, Active, Sensitive, Kind, Forgetful, Unorganized, Noisy and Egocentric.	**TRAITS:** Social, Easy-Going, Sympathetic, Diplomatic, Outgoing, Laid-Back, Creative, Unpredictable, Artistic, Flexible, Moody and Brooding.	**TRAITS**: Confident and strong-willed, Proud, Dedicated, Sociable, Energetic, Extroverted, Frank, Realist, Showy, Flighty, Positive, Independent, Risk-Takers, Insecure, Stubborn and Self-centered.
ATTENTION: They have a very sensitive constitution. Too much stress weakens their immunity more quickly than other blood types.	**ATTENTION**: Immunity is strong, but they are more prone to slow-growing viral infections. (Lupus and chronic fatigue). Symptoms can include: Double vision, Weakness.	**ATTENTION**: Their capacity to react to stress is poor.	**ATTENTION**: They tend to have a sluggish blood flow, so exercise is a must for them.

BURYING BEETLE

Ms. MEEHA

II M. Sc Zoology, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

INTRODUCTION

The American burying beetle also known as the "giant carrion beetle" is the largest member of its genus in North America. Most adults are 1.2 inches in length though they vary from 1.0-1.4 inches. This beetle can be easily identified by its distinctive orang red on shiny black coloration. One colored mark covers the frons an upper frontal head plate and a similarly colored plate exists just behind the head. Both contrast sharply with the black body color. Wings are black with two pairs of scalloped red spots and the tips on the antennae are orange. The sexes can be distinguished by a distinctively shaped orange-red facial mark below the frons. Males have a large rectangular mark while females have a smaller triangular mark.Burying beetles often carry swarms of orange colored mites on their body. They help keep beetles and carcasses clean of microbes and fly eggs.

LIFE HISTORY

American burying beetles are active from late April through September. Adults are nocturnal active when temperature exceed 15C. Most reproductive activity and carcass burial occur in June and July. Reproduction depends on the avail ability to carrion. American burying beetle select carcasses larger than other burying beetles. The carcasses of larger species are used as a food source during the breeding season. Optimum weight are between 100 and 200 grams. Carcass weight is critical to successful reproduction larger is better. Males find carcasses at night soon after it is dark. They then emit pheromones to attract females. Males and females complete amongst themselves for a carcass with size generally determining.

The beetle move a carcass by lying on their backs and balancing the carcass above them than walking their legs to move the load forwards as if on a conveyor belt. A brood chamber is constructed adjacent to the carcass while it is being buried. About two days after burying the carcass the female lays her eggs in an escape tunnel leading off the brood chamber. One parent usually the female stays with the eggs.

Larvae hatch in approximately four days and are cared for and fed by the adult. This larval of parental care is quite rare for a non-social insect. Development of larvae is usually completed in 6-12 days at which time the brood disperse to pupate in the soil nearby. They emerge as adults 48-60 days later in July and August then disperse with their parents. The young now adults reproduce the following June or July. The parents die off after reproduction or during the subsequent winter.

HABITAT

The American burying beetle has been found in various habitat types from open fields to grasslands to different types of forest.

RANGE

The historical distribution of the American burying beetle included the eastern half of North America. It is currently found in eight states Rhode Island, Massachusetts, South Dakota, Nebraska, Kansas, Arkansas, TexaS and Oklahoma.

THREATS

This beetle is seriously threatened by habitat loss and fragmentation including the destruction of habitat that would results from the construction of the proposed Keystone XL pipeline. The beetle is also endangered by diseases, pesticides and artificial lighting that affects populations of nocturnal insects.

POPULATION TREND

There are perhaps fewer than 1000 individuals in the only remaining population east of Mississippi River and the Oklahoma, Arkansas and South Dakota populations are of uncertain size. South Dakota estimates over 500 square miles of occupied habitat with high population density.

A GREEN ALTERNATIVE FOR FOSSIL FUELS

Ms. B. Narmadha, II M.Sc. Zoology.

INTRODUCTION:

India will overcome the deficit of the economy rapidly if, the import of the fossil fuels is reduced says, "Mr. ANJAN RAY Director, (INDIAN INSTITUTE OF PERTOLEUM). He also says that 49 billion dollars is been used to import petroleum from the Arabian countries. There is increasing demand for the fossil fuels unfortunately there are only less production of fossil fuels. Fossil fuels are non-renewable energy resources and it will be exploited very soon. So, there should be a alternative or a substitution for fossil fuels to meet the increasing demand of people.

ALTERNATIVES FOR FOSSIL FUELS:

Since the fossil fuels are non-renewable resources it should be substituted with some other energy or other fuels. If there is a best alternative for fossil fuel, definitely it should be biofuels and biogas energy. Biofuels and biogas are the resources which are obtained from the biomass. If the production of biofuels and biogas are increased, importing the petroleum products from the Arabian countries can be ceased and the use of biofuels can be brought into action.

SOURCES – AS SUBSTITUTES FOR FOSSIL FUELS:

The main source for the production of fossil fuels is the biomass which includes both plants and animals. But, most frequently the plants are been used.

PLANTS AS A SOURCE

A wide variety of plants can be used to produce the biofuels. Plants directly do not produce any biofuels, instead when it is processed physically chemically or mechanically, it can be turned out into a fuel which is ready to use.

SUGARCANE:

Sugarcane is the rich source of fructose. The fructose can be converted into ethanol or methanol chemically and it can be used as the substitute for fossil fuels or can be blended with the petroleum or diesel to reduce the usage of fossil fuels.

JATROPA CURCAS:

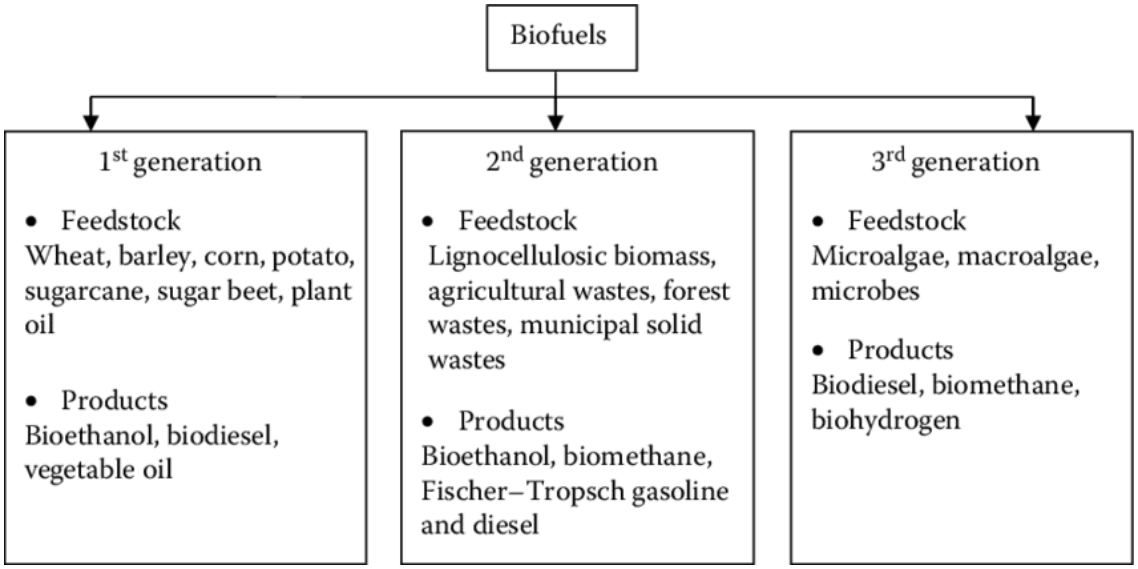
Jatropacurcasis the plant which grows almost in every places. It is the rich source of the oil and this oil can be used as the transportation fuel for cars and other vehicles.
Camelina, ***Myophyllum sp***. ***Pongamiapinnata***, ***Azadirachtaindica***(neem), thuthi can be used for the production of biofuels.

MAHUA AND WATERMELON
Mahua is a plant which is rich in sugar. It contains about 79.2% of sugar from which the ethanol and methanol can be produced.Watermelon which are misshaped are not used by the people for consuming and it is thrown away. These watermelons can be used to produce fuels at very low cost. The unique feature of melon is that it contains L-citrulline, an amino acid which can detoxify ammonia.

ALGAL SOURCES:
The Biotechnologists and scientists usually use the microorganisms to meet their needs. The algae are used for the production of biofuels by altering the DNA. The microalgae are used for fuel production like ***Botryococcusbraunii,*** chlorella etc are been used. They just require suitable temperature and nutrition for their growth and development.
PRODUCTION OF BIOFUELS:Biofuels can be produced by the chemical process such as

- Gasification
- Pyrolysis
- Esterification
- Fermentation

They are divided into three and are produced accordingly.



RECENT RESEARCH AND DEVELOPMENT:
Many researches are going on to improve the production of biofuels and less usage of petroleum. Green energy, which could be an alternative source where the renewable resources like sun's

energy and the thermal power. A flight which used blended ethanol and petroleum fuel is operated from Dehradun to Delhi for about 45 minutes, which was successful.

National policies on biofuels is been implemented by Mr. Narendra Modi, Prime minister of India which states that production lands should be increased so that these plants can be used for biofuel production. Therefore by 2020, India should alter the usage of petroleum with the biofuels.

CONCLUSION:

Considering all the points mentioned above, it is concluded that, the algal source is the best source for the production of biofuels because it does not produce ant toxic gases and it is easy to grow and harvest. 40% of the dry algae are used as the source of biofuel production. Though the fossil fuels are easily available, it greatly affects the economy of the country and it also creates pollution to the environment by releasing toxic sulphurdioxide. The usage of biofuels can substitute the fossil fuels, where it does not create any harm to the environment.

DID YOU KNOW ?

A.GAYATHRI

II B. Sc., Zoology, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

- ✓ The only animal born with horns are giraffes.
- ✓ Beaver teeth are so sharp that native Americans once used them as knifes.
- ✓ A chimpanzee can learn to recognize itself in a mirror, but monkeys can't.
- ✓ A group of cobra is called querer.
- ✓ A group of crow is called murder.
- ✓ A group of owl is called wisdom.
- ✓ Cats see so well in the dark because their eyes actually reflect light.
- ✓ A chameleon tongue is twice the length of its body.
- ✓ The most dangerous animal in the world is housefly.because they transmitting many disease.
- ✓ Snakes are true carnivorous because they eat nothing but other animals.they do not eat any type of plant material.
- ✓ Children have 300 bones as they grow it fuse together.
- ✓ The blue whale produces sounds upto 188 decibels . it can hear upto 560 miles.
- ✓ we are about 1cm taller in morning than the evening.
- ✓ People say "Bless you" when you sneeze because your hearts stop for a millisecond.

FACTS ABOUT DREAMING

Ms. K. Anbarasi

II B.Sc. Zoology, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

- The average person has about 1,460 dreams a year. That's about four per night.

- Most of us dream every 90 minutes, and the longest dreams (30-45minutes) occurs in the morning.
- The scientific study of dreams is known as oneirology.
- Most of the dreams that is during sleep tend to follow negative emotions. Less likely to find positive dreams.
- Women who experience nightmare during pregnancy have easier births than women who don't.
- Raramuri people of northern Mexico believe that dreams are the result of one soul or waking. They often wake up and discuss their dreams during the night.
- Reptiles also experience brain activity during sleep that suggests they too may dream.
- Average amount of time spent dreaming per night 11/2 to 2 hours.

FASCINATING FACTS

Ms. Revathi.V
II BSc Zoology, PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

- ❖ Ancient doctors believed that different organs controlled certain moods, for example happiness came from the heart, anger from the liver and fear from the kidneys.
- ❖ Forcing a smile can make you happy. If you want to make yourself happy, all you have to do is force you face into a smile for around 30 seconds and you will instantly feel happier. It's that simple.
- ❖ When a person cries and the first drop of tear comes from right eye it's from happiness, but the first drop of tear comes out from left eye, it's pain.
- ❖ People are more likely to cry at night because lack of sleep makes emotion hard to control.
- ❖ Smells have quite an effect on our emotions, especially unpleasant smells trigger the negative emotions immediately.
- ❖ And that flutter of butterflies in your tummy is actually your stomach crying for help, because all the blood is rushing to the muscles & stomach isn't getting enough supply.
- ❖ Love at first sight. it just takes 4 minutes to fall in love.
- ❖ Bad feelings are good for your well being. Experiencing negative emotions such as fear and anger is important for mental health and help us to evaluate our experience in a positive way.
- ❖ Fear makes us actively use more muscles than we usually do, as it prepares our body for anything bad that might come.
- ❖ And we can actually smell fear scientists say, a chemical pheromone is released in their sweat when people are afraid, and other people can smell, even if they are unaware of it.

- According to scientists, there are 8 primary innate emotions: joy, acceptance, fear, surprise, sadness, disgust, anger and anticipation. Other important emotions like love are results of permutation and combination of these 8.
- When it comes to love it's all about chemistry; love has a lot more to do with chemistry than you might think, certain chemicals such as dopamine, and endorphins are released and these have a big influence in relationship that we choose.
- Sometimes, when someone is on verge of tears their lip will begin to quiver. This is because your brain is pulling on muscles in the face to cause the motion. The emotional sad side of the brain is battling with the logical side that is trying to hide the emotion.
- Everything you eat can affect your mood. Chocolate, fish and tea are all known for boosting levels of happiness.
- The phrase "dress for success" isn't just for job interviews. The clothes you wear can affect your mood, and express the way you feel about yourself. Studies have also shown that people who dress well feel better about themselves and are generally happier.
- Anger can make people physically sick. Anger increases the long term risk of heart attack and strokes and weakens the immunity system.
- Just 1% of the population can hide their emotions successfully.
- Emotions can last from less than a second to several minutes. Sad emotions tend to affect you for longer than the positive ones.

INTERESTING FACTS ABOUT ANIMALS

Ms. M. Thamayanthi
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- The heart of a shrimp is located in its head.
- A snail can sleep for three years.
- Slugs have four noses.
- Elephants are the only animal that cannot jump.
- A rhinoceros horn is made of hair.
- It takes a sloth two weeks to digest its food.
- Nearly three percent of the ice in Antarctic glaciers is penguin urine.
- A cow gives nearly 200,000 glasses of milk in a life time.
- Bats always turn left when leaving a cave.
- Giraffes have no vocal chords.
- An ostrich eye is bigger than its brain.
- Around 50 percent of orangutans have fractured bones, due to falling out of trees on a regular basis.
- One group of aquatic beetles uses a special spine on their to pierce underwater plants giving them access to oxygen while remaining submerged.

- Dragonflies and damselflies form a heart with their tails when they mate.
- Flamingos are naturally white- their diet of brine shrimp and algae turns them pink.
- The axolotl can regenerate its limbs.
- Fruit bat do not use echolocation-they have excellent senses of sight and smell.
- Female bats give birth while hanging upside down, catching the baby in their wings as it drops.

THE MOST AMAZING NESTS BUILD BY BIRDS

Ms. B. Sindhu

I M.Sc Zoology ,PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

1. Ruby throated humming bird- *Archilochus colubris*.

These humming birds build a tiny knot like structure attached to a tree branch with spider silk .The nest structure is crafted from bark leaf strands and slik fibres which make it strong and stretchable. It is decorated on the outside with lichen for camouflage and lined on the inside with hair or feathers for insulation.

2. Edible nest swiftlet -*Aerodramus fuciphagus*

This nest is made exclusively out of the bird's salaiva.It is build in layers usually over protruding rocks on inclined walls of dark sea cave.Swiftlets nest in colonies of thousands .Their nests are harvested to make a Chinese delicacy:bird's nest soup.

3. Sociable weaver - *Philetairus socius*

As their name suggest these birds nest and brood in groups. They build a gigantic nest with a nest structure attached to tress and poles. A compound nest can house over 100 breeding pairs each contributing to its construction maintenance and repair. Living in groups means someone is always on the lookout for danger.

4. European bee-eater - *Merops apiaster*

This bird digs a horizontal cavity into the sand on a river embankment. To built a nest a bee-eater hovers over a suitable site drills a hole with its bill alright and them excavates a burrow using its feet to scoop out sand .The bird chooses the nest site with the utmost care as the soil has to be soft yet safe from caving in.

5. HOORED COOT - *Fulica cornuta*

Pairs of these birds build their nests in shallow waters using pebbles carried from the shore in their beaks .The result is an island of pebbles weighing about 1.5 tonnes topped with vegetation .The mound keeps the nests safe from water currents.

6. MALLEEFOWL - *Leipoa ocellata*

The mallee fowl's nest is a heap of decaying leaves covered in a layer of sand. The heat from this compost incubates the eggs. The bird controls the temperature by adding or removing soil.

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S.DIANA

II B.Sc., ZOOLOGY PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

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M.DIVYA PRIYA

II B.Sc., ZOOLOGY PG and Research Dept. of Zoology, Auxilium College, Vellore-6.

DEPARTMENT ACTIVITIES

DEPARTMENT OF ZOOLOGY ACTIVITIES 2018-2019

JULY

On 9.7.2018 UGC Sponsored Medical Laboratory Techniques – certificate course was inaugurated.

On 11.7.2018 Summer Project Viva Voce for II PG students was conducted. Dr. Arivoli, Assistant Professor from Thiruvalluvar University, Serkadu, Vellore was the external examiner.

On 13.7.2018, College Union Inauguration. K. Kanimozhi I B.Sc Zoology, M. Jennifer II B.Sc Zoology, Annie Puspha III B.SC Zoology, S. Janani I PG Zoology, Ammu K II PG Zoology took charge as Leaders. Gayathri M III B.Sc Zoology – Department Secretary for UG and Vishali D II PG Zoology - Department Secretary for PG.

On 16.7.2018 Inauguration of Zoology Association and Sr. Helen Fernanaz Endowment lecture was conducted for all the Students of the Department. Inaugural talk was given on "Microbes and Environment" by Dr.Aruliah Rajesekar, Assistant Professor and Ramalingaswami Fellow, Department of Biotechnology, Thiruvalluar University, Serkadu, Vellore.

AUGUST

On 23.8.2018 Sr.Regina Colombo Endowment Lecture was conducted for II B.Sc. Zoology Students. Dr.M . Job Gopinath, Assistant Professor, PG and Research Department of Zoology, Voorhees College, Vellore, delivered a Lecture on the topic, "Co-Evolution'.

On 29.8.2018 Public Viva voc: P. Rajiv Gandhi student of Dr. (Sr.) Regina Mary, successfully awarded with Doctorate. He defended with PH.D thesis on the topic "Biofabrication of metal oxide nanoparticles using botanical extracts and its efficiency on Plasmodium falciparum. The external examiner was Dr. Arulsamy Jebanesan, Professor of Zoology, Annamalai University, Chidambaram.

S. Jayashree, R. Lavanya of I PG Zoology participated in the International Conference on Recent Advance in Biomedical and Technology (RABT 2018) at Thiruvalluvar University, Serkadu, Vellore between 19.8.2018 and 30.8.2018.

SEPTEMBER

On 4.9.2018 M.Phil Viva-voce was held. Dr. Arivoli Assitant Professor, Department of Zoology, Thiruvalluvar University, Serkadu, Vellore was the external Examiner.

On 6.9.2018 Sr.Antoinette Aloysius Endowment Lecture was Conducted for III B.Sc. Students' Ms.Thamariselvi, Guest lecturer, Oscar College of Paramedical Sciences, Vellore, delivered a lecture on "Healthcare associated infections".

On 10.9.2018 A General Health camp was organized in collaboration with Sri Harii Sapthagiri Clinical Laboratory powered by Thyrocare. Various test profiles including Haemogram, Diabetes, Iron Deficiency, Lipid, Liver, Renal, Thyroid Profile and Blood pressure were tested for Staff and Students.

OCTOBER

On 10.10.2018 Prayer Service and Month Value presentation: Department of Zoology animated the month value 'RESPECT'. Students presented the value of treating everyone with respect through Songs and Skit. Members of the AICUF presented a skit on "Avoid Thermocol".

Sr.Maria Fino Endowment Lecture was conducted for I BSc Zoology Students. Ms.Jane Sanjeevi, Clinical Nurse Specialist, National Health Services, Northampton, United Kingdom,. delivered a Lecture on "Vector Borne Diseases."

On 16.10.2018 Sajida Banu, Varsha of I B.Sc Zoology participated in the Inter departmental Hindi Patriotic Son competition.

On 15.10.2018 Queency Reena and Ramya of II B.Sc Zoology won 3rd Prize in the Face painting competition conducted by Enviro Club.

On 24.10.2018 Essay writing Competition was conducted for all the Students on the Topic – "Green Alternatives for fossil fuels" and "Models from waste" were made by the students on various types of "Ecosystem". Thamizh Bharathi II PG Zoology won 1st Prize; Usha Mary M II B.Sc Zoology won 2nd Prize in Model from Waste. Narmadha B II PG Zoology won 1st Prize, Revathi V II B.Sc Zoology won 2nd Prize and Madhiha Tabasum II B.Sc Zoology won III Prize in Essay Writing.

DECEMBER

Sr. Ethelvina Endowment Lecture was Conducted on 05.12.2018 for PG Students Dr. Febin Associate Professor Department of Biotechnology VIT Vellore the topic " Introduction to Bioinformatics".

On 06.12.2018 R.Gifta Priyadharshini, S. Gomathi and R.Nishanthini Maryann Jose attended a workshop on Medical Bioinformatics held at Sri Ramachandra University, Porur Chennai. They learnt about current applications and scope of Genomics and proteomics.

On 11.12.2018 IIB.Sc Students visited the blind School Vellore as part of Extension activity. Students were Divided into groups and interacted and distributed Blankets the students and made them Cheerful.

Visit to Ranipet, Vellore SIDCO finished leather effluent treatment plant on 11.12.2018. The PG Students had an Industrial Visit to Ranipet SIDCO finished leather effluent treatment Company Ranipet, there they explained how the effluents are collected from tanneries and how the effluents are recycled by Physical, Chemical and Biological methods ,the recycled water is used for industrial purpose.

On 13.12.2018 II B.Sc Students Visited the Govt. Primary School at kangeyanellur as part of Extension activity. Students presented the importance of Health and hygiene through Skit, Dance, Songs and presented Chats on eating habits and hygiene to the School students and gifts were Distributed.

On 18.12.2018 M.Phil Disaster Management Lecture was organized for all the M.Phil students by the Department of Zoology and YRC. Mr. Kirubanatham Head Master, Arcot Boys Govt Hr. Sec School, Arcot was the resource person.

Visit to VIT, Vellore. Sewage water treatment Plant and Molecular Biology laboratory on 18.12.2018.The PG Students had an Industrial Visit to VIT, Vellore Sewage water treatment , there they explained how the sewage water is collected ,aerated , setting of solid particles ,removal of solid particles, filtration and removal of chlorine is done the recycled water is used for miscellaneous purpose like toilets and gardening. Molecular Biology lab visit: Various instruments like centrifuge, spectrophotometer, Laminar airflow Chamber, PCR Instrument , Shakers ,incubator, Gel Staining Apparatus and SEM were explained .

On 20.12.2018 A.A Mahalakshmi II B. Sc Zoology participated in the National Wide competition on Women's Right.

JANUARY

Sr. Cleofe fassa Endowment Lecture was conducted on 22. 01.2019 for PG Students Mrs. Rosaline Rhenius Professor Medical surgical nursing College of nursing CMC, Vellore-4 deliverer a lecture on the topic "Carcinogenesis and its prevention"

Life Science Quiz Competition was held on 23.01.2019 for UG and PG Students on the topic General Science Narmadha .B, Shunmugapriya .M and Vishali. D of II M. Sc Zoology won prize respectively.

FEBRUARY

11.2.2019 Common Parents Teachers Meeting was conducted to discuss on the rules and regulation of the college and of the examinations. Odd semester mark statement was issued.

2.2.2019-3.02.2019 Staff and students of the department attended 6th National DNA day 2019, Symposium and Workshop at School of Biosciences and Technology VIT, Vellore.

OTHERS

General Counseling was given by Mrs. Ruby Martin, Counselor to III B. Sc Zoology on 26.10.2018, I B.Sc Zoology on 11.12.2018 and for II B. Sc Zoology on 5.12.2018.

SPORTS

Loshini D.S, Anushiya of I B. Sc Zoology, A.A. Mahalakshmi of II B. Sc Zoology were runner up in Intramural Basketball tournament held on 11.7.2018.

Mary Linsy I B.Sc Zoology, A.A. Mahalakshmi, M. Usha Mary of II B.Sc Zoology, Sathya M III B.Sc Zoology won the Intramural Kabadi tournament held on 16.7.2018.

A.A. Mahalakshmi II B.Sc Zoology won the Intramural Shuttle Tournament held on 17.7.2018.

V.Swathi III B.Sc Zoology won 2nd Prize in 200 mts Running race.

A.A. Mahalakshmi II B.Sc Zoology won the Intramural hockey Tournament held on 20.7.2018.

A. A. Mahalakshmi II B.Sc Zoology participated in the Interdivision level hockey tournament held between 17.9.2018 and 18.9.2018.

A. A. Mahalakshmi II B. Sc Zoology participated in the Intercollegiate hockey tournament held between 13.10.2018 and 15.10.2018 at Sacred Heart's College, Thirupattur.

Extra Curriculars

S. Diana II B.Sc Zoology won Special Prize in the singing Competition on Bharathiyar held on 18.7.2018, conducted by Tamil Mandram.

Dr. Sr. REGINAMARY
PRINCIPAL

FACULTY OF THE DEPARTMENT 2018-19

LAB ASSISTANTS 2018-19

M.Phil 2018-19

II M. Sc ZOOLOGY

I M. Sc ZOOLOGY

III B. Sc ZOOLOGY

II B. Sc ZOOLOGY

I B. Sc ZOOLOGY

PG SUMMER PROJECT VIVA VOCE- 2018-19 M. Phil VIVA VOCE – 2018-19

Ph. D SCHOLARS 2018-19

OFFICE BEARERS **HEALTH CAMP -2018-19**

WEALTH FROM WASTE – 2018-19

MONTH VALUE ANIMATION- 2018-19

PARENTS TEACHERS MEETING – 2018-19

ALUMNI MEET – 2018-19 **FRESHERS WELCOME – 2018-19**

EXTENSION ACTIVITIES 2018-19

ART GALLERY

ART GALLERY - II M. Sc Zoology

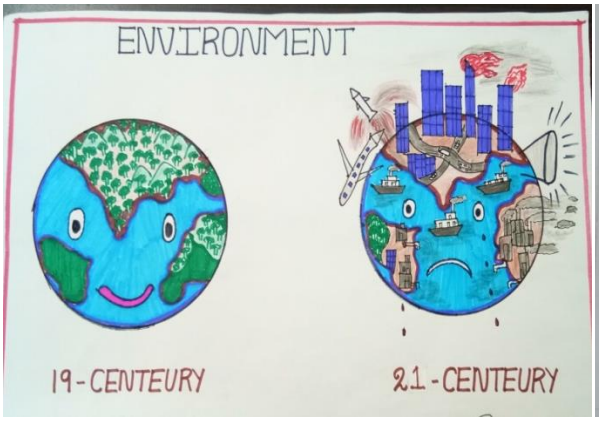
Ms. MEEHA BEGUM

Ms. AMMU.J

Ms. ANUPRIYA.M

Ms. NIVETHA.B

Ms. S. ANUSUYA I B. Sc Zoology



Ms. USHA MARY II B. Sc Zoology

Ms. SIVA SAKTHI II B. Sc Zoology

II M. Sc Zoology