ZOODRIVE

2022

Department of Zoology

Raidighi College

EDITOR'S COLUMN....

Mid-way through editing and designing a pile of articles which I was nose deep in and with the thoughts of the zillion things that "JUST HAD TO BE DONE"; I pulled at my hair for the very first time. This was the first of many such moments!!!! Putting a magazine together was no cake walk. I along with my editorial team members have spent sleepless nights to make this magazine stand out.

So here you have ZOODRIVE, the long awaited magazine of Zoology Department for the year 2022.The name of the magazine, ZOODRIVE may seem strange, but it shows the richness and diversity of wild-life in the nature. This magazine is a platform that exhibits the literary skills and innovative ideas of the students. ZOODRIVE presents the hard work and dedication of students and contribution of teachers.

I would like to thank all my editorial team members for helping me pull this through. These contributions have required a generous amount of time and effort. It is this willingness to share knowledge, concerns and special insights with fellow beings that has made this magazine possible.

Thank you all!!

EDITOR OF COLLEGE MAGAZINE

FROM PRINCIPAL'S DESK

Raidighi College, situated by the largest mangrove of the world, strives continually towards enlightening the inhabitants of this remote, rural landscape—with the dream of spreading higher education among the needy enthusiasts belonging to the Schedule caste and tribes, mostly. A view into their daily choirs would place the matter in a more appropriate perspective. Raidighi is surrounded by a number of rivers, riverinlets and dense vegetation of the Sundarbans that nurture a large number of floras and faunas, the most beautiful and the fiercest of them being the Royal Bengal tiger, obviously. Hence, inhabiting for almost hundred years now, the people of this land live perpetually on a trapeze, with life and death on either side. 90% of the total population live below the poverty line, and they often have to put their lives at stake to secure a living – be it by fishing, or by collecting honey or by cultivating crops in these hostile, muddy lands. Despite being only 100km. away from the Eastern metropolis Kolkata, due to a weak conveyance, it has not been easy for Raidighi to get a sustained taste of the urban lifestyle and culture. Yet, it must be acknowledged that Raidighi throbs with its own unique dialect, philosophy and folk idiom.

The college encourages a warm and cordial relationship among the teachers and staffs, as well as between the teachers and the students. Organizing seminars, workshops, educational tours and picnics at a regular basis has made Raidighi College a place for exchanging ideas, thus, opening up new horizons. The college helps, in whatever ways it can afford, the poor farmers and their families every monsoon, in this flood-infested lowland which was once bruised by Aila, and more recently, by Amphan – the devastating cyclones. Water, woods and unique way of life– these are the things that define Raidighi, even amidst the technological boom of the twenty-first century. And as far as the question of higher education is concerned, back in the city, we endorse it; here, they still confront it. Hence, obstacles are many for Raidighi College; but we believe, even more is the possibility of a better outcome. We strive only for that.

Dr. Sasabindu Jana

Principal

Raidighi College

MESSAGE FROM HEAD OF THE DEPARTMENT

It gives me great pleasure that the Department of Zoology is publishing the magazine ZOODRIVE . This gives an opportunity to students to share their ideas and thought with other students and teachers. Not only that their writings enhance their creative skills and enrich their knowledge base, the magazine also highlights their achievements which give inspiration to other students. The teachers/faculty is always there to guide them in their academic endeavors.

This is a pride moment for the Zoology Department that our 6th as well as last semester students have shown their potential and capabilities through this magazine.

Our Department have been planned numerous programmes, especially for students, department-wise and inter-disciplinary to enhance their knowledge, skills and scientific temperament.

The Department is making all efforts to enrich the academic caliber of the students and the faculty by creating an academic environment, increasing their capabilities and enlarging their knowledge. I wish a bright future of our students.

PINTU MONDAL

Assistant Professor

HOD of Zoology Department

Raidighi College

University of Calcutta

MESSAGE FROM FACULTY

Teaching is an art of awakening the natural curiosity of young minds for the purpose of satisfying it afterwards. It was my cherished desire to be a dedicated teacher like my father, in a reputed College/University. Most fortunate I was, when got selected through College Service Commission and joined in this esteemed institution, Raidighi College. The students like you and administration were added feathers to the crown of my aspiration in teaching. I did serve with zeal and zest as teacher to teach you which is a pleasurable journey to me. The motto of our college is —Progress of Learning‖. Students of the institute will get good education; learn discipline, communication skills through proper guidance and counseling by expert teachers to equip them to face further challenges. They are found serving good position in the society. Students of our institute always distinguished, which makes us hold our head high. In the quote of Kaviguru Rabindranath Tagore —The highest education is that which does not merely give us information but makes our life in harmony with all existence.

After all, many of you have thanked me for teaching you; it seems that the course was pretty popular. I'm glad about that, but I want you know that a great semester requires great students as much as it requires great teachers. It is immensely important to acknowledge the genuine involvement of energetic management, teachers, students and parents in the novel attempt. I wish you a very good luck for all your life, may you get all your desires and get success on every single step. And I congratulate the team of semester VI for their tireless efforts that have come to fruition in the form of this magazine. I wish it all success and hope that this tradition that has been set by the current students will be carried through by the following generation of students to come.

Dr Ishita Samajdar

Assistant Professor

Department of Zoology

Raidighi College

University of Calcutta

I am quite pleased to learn about the forthcoming issue of the college magazine, ZOODRIVE. No doubt this creative endeavor will bring out an array of artistic and scientific expressions with distinct individual signatures. I do appreciate and applaud all the students of 6th semester for their successful completion of this tedious yet daunting task of putting together their thoughts and dreams into the pages. Good luck for the future.

Ashraful Alam

SACT II Teacher

Success comes when you believe in yourself and trust your instincts. You will win. May you have a wonderful life, I wish you very good luck for the future and achieve all your dreams. I applaud the editorial team for the hard work and dedication they have invested in realizing this goal, and wish all the success for their magazine.

Safika Sultana

SACT II Teacher

I welcome you all to your well thinking to publish a colorful magazine from the students of 6th semeste, zoology department. We have beautiful memories over these 3yrs journey. We are proud of your many achievement, various accomplishments in almost all curricular & extra- curricular activities. You have left behind a very good legacy for the juniors & incoming students to follow. Wish you gets lots of success in life & best of luck for bright future.

Manjushree Das (Saha)

SACT II Teacher

Nurturing creativity and inspiring innovation are two of the key elements of a successful education, and a college magazine is the perfect amalgamation of both. Hence, I am gratified to know that the students of our department is bringing out the magazine ZOODRIVE of this academic session.

I take this opportunity to congratulate all the students. May all our students soar high in uncharted skies and bring glory to the world and their profession with the wings of education. I wish them all success.

SK Abul Kasem

SACT II Teacher

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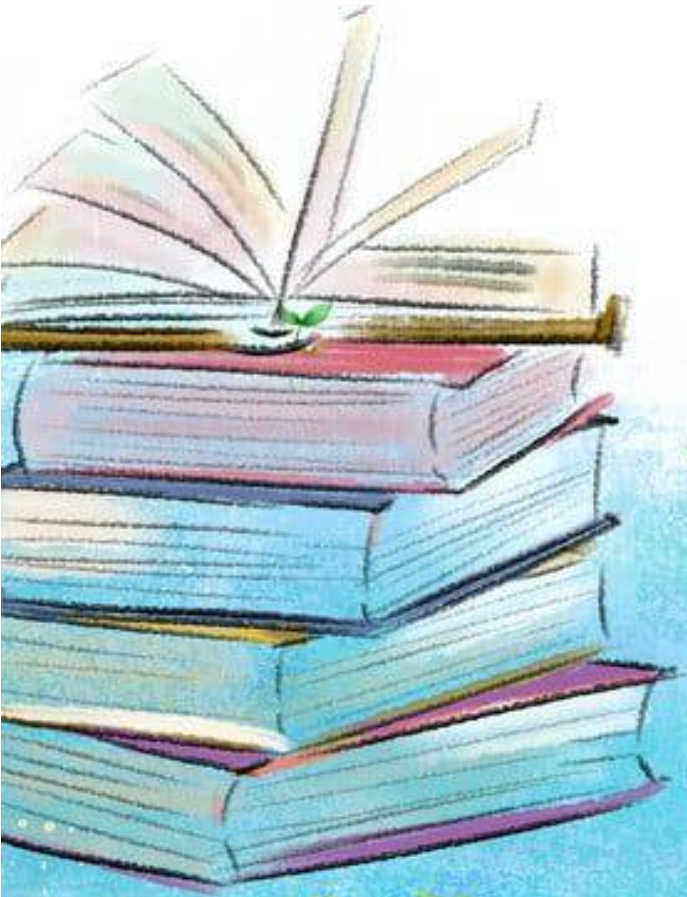


LIFE IN EXTREME ENVIRONMENT

From deep ocean trenches and the geographical poles to outer space, organisms can be found living in remarkably extreme conditions. Insights in Biological Capability provides a captivating account of these systems and their extra ordinary inhabitants, 'extremophiles'

UNIQUE ANIMALS IN HARSH CONDITIONS

Emperor penguin

These hardy flightless birds spend the mating season in Antarctica, where temperatures routinely drop to −40 °F (−40 °C). The colony survives such life-threatening cold by gathering together in a huge group to share warmth and minimize individual exposure to the elements. At regular intervals, the penguins at the outer fringes of the huddle are brought into the middle so every member is given the opportunity to warm up.

Sahara Desert Ant

The Sahara Desert is famously one of the hottest and driest places on Earth, but it's far from completely void of life. A record-breaking ant, known in scientific circles as cataglyphis bicolour, can forage on the bone-dry sandy surface in temperatures of up to 70°C for short periods. Even at the hottest time of the day, the Sahara Desert ant will leave its burrow to scavenge and forage, while using its sense of smell and even counting its own footsteps to quickly find its way home to prevent overheating.

Pompeii worm

Pompeii worms are among the most heat-tolerant complex animals known. They are unique to hydrothermal vents deep in the Pacific, forming colonies right beside emissions of acidic water that's super-heated to 570 degrees Fahrenheit or hotter.
The worms grow in slim tubes up to five inches long, affixed near vents from which they protrude feathery heads into cooler water, probably to feed on microorganisms. The worms exude sugary mucus from glands on their backs, which feeds bacteria forming a thick, fleecy looking "blanket" that helps insulate against the heat.

Caribou

While caribou are circumpolar, nowadays they are wild or semi-domesticated reindeer in northern Europe and Russia, and the last great wild herds occur in North America, where they are the only deer living year-round north of the treeline.
Caribou are superbly adapted to extreme weather, with hollow hairs providing an insulating coat, and large hooves that both act like snowshoes, and enable them to dig through snow to find the lichen they depend on throughout winter.

Northern viper

The northern viper is among the most widespread venomous snakes, found across much of Eurasia from the Mediterranean to the Arctic Circle. The viper has such a large range partly as it can hibernate during winter and is remarkably tolerant of cold temperatures. Researchers have found northern vipers can survive being chilled to 23 degrees Fahrenheit and can still move when *temperatures fall to 29 degrees.*

Tardigrade

These amazing microscopic organisms have yet to find an environment they can't survive. Also known as water bears, the bizarre eight-legged creatures have been found in deserts, glaciers, and hot springs and at the top of the world's highest mountains. Under extremely harsh conditions, tardigrades survive by falling into a desiccated deathlike state known as cryptobiosis. They can remain in this condition for decades and still return to active life when exposed to water.

Himalayan jumping spider

The "omnisuperstes" in this species' Latin name means "highest of all," reflecting the fact no animals are known to live out their lives as high as Himalayan jumping spiders, climbers have found which at 22,000 feet on Mount Everest.Like all jumping spiders, they have sharp eyesight thanks to an array of four large eyes on the face, enabling them to spot insects the wind has blown up the slopes, and leap onto their prey.

Arctic lemming

Arctic lemmings are small rodents found on arctic tundra from north Europe to northeast Russia. They have thick, long fur that helps insulate against the cold. Rather than hibernate, they remain active throughout winter, avoiding the worst of the cold by forming runs and tunnels beneath the snow cover, so they can search for roots and bulbs to eat.

Water-holding frog

In times of plenty, southern Australia's water-holding frogs roam grasslands and temporary swamps while feeding on insects and small fish. But when the weather turns hot and dry, they show a remarkable ability that enables them to survive. Water-holding frogs then burrow into the mud and secrete mucus around their skin. This mucus forms "cocoons", and the frogs remain ensconced within. There, the frogs' metabolisms slow as they remain in a hibernation-like state. When rains return, the frogs break through their cocoons, dig to the surface, and resume their lives.

Snailfish

In December, 2014, the Schmidt Ocean Institute carried out an exhibition to the deepest point of the Earth's oceans, the Marianas Trench. There it found a new species of sailfish living a staggering five miles (8 km) beneath the waves in an environment where the pressure is over 1,000 times higher than that at sea level and shrouded in perpetual darkness. The record-breaking fish is the deepest one ever found, so deep in fact that the animal would bloat up and rupture if it were to swim to the surface.

European adder

European adders are the most northerly snakes in the world. They can be found across most of the European continent, from Great Britain all the way west into Russia.
In warmer climates, the hibernation periods for the adder are either reduced or nonexistent. In Great Britain, for example, they hibernate up to 180 days of the year. In colder places like Sweden, they are known to hibernate for up to nine months out of the year.

Sleeper shark

Sleeper sharks can be found in deep water seas near continental shelves and slopes all around the world, from the extreme north of Greenland to the southern fringes of South Africa.

The sleeper shark contains an anti-freeze protein that enables them to survive in cold waters. Sleeper sharks remain in deep water during the day and moves toward the surface at night. Some species of sleeper sharks can endure incredible water pressures by diving down to depths of around 12,000 feet.

Spectacled eider

The Spectacled eider is a sea duck that breeds in coastal tundra in Alaska and northeast Russia and feeds mainly on mollusks such as clams and polychaete worms. In winter, the entire world population of around 370,000 individuals congregates in waters around 200 feet deep within the Bering Sea, forming flocks in open patches between sea ice, where their insulation helps withstand the cold.

Common fangtooth

The common fangtooth is a widely distributed, deep-sea specialist found at depths below most other fish—down to 16,000 feet, where the water is near freezing and the pressure is around 500 times that at sea level. Relative to its size—which is only up to around six inches long, the fangtooth has larger teeth than any other ocean fish. Living in permanent gloom and with poor eyesight, it perhaps uses these teeth to bite whatever it bumps into, hoping this might be a crustacean or another fish of suitable size.

RARE SNAKES IN THE WORLD

Aruba Island Rattle Snake

Crotalus Unicolor or Aruba Island Rattle snake is an endangered rattlesnake species. It is mainly found in the Caribbean Island of Aruba, located just off the coast of Venezuela. They are mainly seen in the hot summer months during the early morning and late afternoons. It is a viviparous snake and according to annual survey it is said that only 230 adult Aruba Island Rattle snake exists in the world.

Short-nosed Sea-snake

The short-nosed Sea-snake , also called the Sahul reef snake of the Arafura Sea is a venomous and extremely dangerous snake for human being. But the various activities of human beings have put this species endangered.It is found mostly within Ashmore along with Cartier Islands and Ningaloo Reef. In the event that it was not since the last 15 years, scientists are worried that it may disappear.

Round Island Boa

Round Island boa is mainly found in the Round island of Mauritius. At present their total population in the world is 1000 in an approximate value. Nowadays they are also found in the island of Gunner's Quoin. They are generally dark brown in color and the lower portion of their body is lighter in color with smattering dark spots.

Blind Snakes with lines or stripes

It is our 2nd selection in the list of the most rare snakes in the world due to the fact that it is extremely rare not just by numbers but also because of the secluded characteristic of the animal.It is part of the Ramphotyphlops species. They are typically found in the regions of Indo-Asia.They are found in the soil, particularly in the soil of lowland. To make it easier to get into the soil, they sport an elongated face. It's hard to tell their head from their body. In 2019, it was found after 172 years of being in Singapore.

Saint Lucia Racer

Erythrolamprus ornatus, also called Saint Lucia Racer is the most rare snake in the world that only 20 individuals are living on the planet. Their ancestral habitat is in the east of Caribbean and is found in Saint Lucia.

They lived in peace, however with the arrival of mongooses invading the area their numbers are drastically reduced.

The serpent is tiny in size. Authorities begin eradicating predators, including mongooses, from Saint Lucia to save the threatened species. Don't worry since the most rare snake on earth isn't venomous or dangerous to humans.

Darevsky's Viper

It is one of the most venomous snakes of northwestern Armenia and north eastern turkey. When last counted there were only 500 individuals left in the earth. They are generally found in the mountainous regions and high altitudes.

Alcatrazes Lancehead

The scientific name of this snake is Bothrops Alcatraz. It lives in the south eastern coast of Brazil. It originally belongs to the pet viper family. And amazingly they have a heat sensing organ and they can find its prey through it. They are deadly poisonous and said as just a few number of this species is still alive.

Cyclades blunt-nosed Viper

Macrovipera Schweizer often referred to by the name of Milos viper and Cyclades sharp-nosed viper is an endangered species found on Cyclades Island which lies within Cyclades Island, which is located in the Aegean Sea.

Its distribution species is very limited since it can be found only in four Islands. In 2009, the government listed the species as a strictly protected species due to the persecution and torture of humans, it is a species that is in danger.

Tancitaran dusky rattlesnake

It is the most rare species that is part of an venomous species of viper. According to recent research, the species is confined to just five regions and continues decline. They are most commonly seen throughout Michoacan's West center of Michoacan.

It is important to protect it as the sounds that comes from its tail animal is not enough to ward off the predators that have become invasive.

SNAKE VENOM

Snake venom is a highly toxic saliva containing zootoxins that facilitates in the immobilization and digestion of prey. This also provides defense against threats. Snake venom is injected by unique fangs during a bite, whereas some species are also able to spit venom.

The glands that secrete zootoxins are a modification of the parotid salivary glands found in other vertebrates and are usually located on each side of the head, below and behind the eye, and enclosed in a muscular sheath. The venom is stored in large glands called alveoli in which it's stored before being conveyed by a duct to the base of channeled or tubular fangs through which it's ejected. Venom contains more than 20 different compounds, which are mostly proteins and polypeptides. The complex mixture of proteins, enzymes, and various other substances has toxic and lethal properties. Venom serves to immobilize prey. Enzymes in venom play an important role in the digestion of prey, and various other substances are responsible for important but non-lethal biological effects. Some of the proteins in snake venom have very specific effects on various biological functions, including blood coagulation, blood pressure regulation, and transmission of nerve or muscle impulses. These venoms have been studied and developed for use as pharmacological or diagnostic tools, and even drugs.

VAMPIRE BAT

Vampire bats are sanguivores, organisms that feed upon the blood of other animals. They are the only mammals that feed exclusively on blood. Despite horror-movie depictions, vampire bats very rarely bite humans to feed on their blood. They feed primarily on domestic livestock, due to their abundance, and to a lesser degree on wild mammals and birds. They are very small animals, with wingspans of about 12-15 inches, and weigh less than 2 ounces. Vampire bats have heat-sensing "pit organs" near its nose that allow the bat to detect blood flow near the surface of the skin. The lower lip is curved downward in the centre to accommodate the tongue as it licks up blood.

Common vampire Bats around the world

The common vampire bat is found in parts of Mexico, Central America, and South America, as well as the Caribbean islands of Margarita and Trinidad.

They can be found as far north as 280 kilometres (170 mi) south of the Mexico–United States border.It prefers warm and humid climates, and uses tropical and subtropical woodlands and open grasslands for foraging.

Variety of Vampire Bats Around Us

Common Vampire Bat (Desmodus rotundus)

This species is the most abundant and most well-known of the vampire bats. Desmodus feeds mainly on mammals, particularly livestock. They occur from northern Mexico southward through Central America and much of South America, to Uruguay, northern Argentina, and central Chile, and on the island of Trinidad in the West Indies.

White-winged Vampire Bat (Diaemus youngi)

This species feeds mainly on the blood of birds. They occur from Mexico to southern Argentina and are present on the islands of Trinidad and Isla Margarita. White-winged vampire bat, Diaemus youngi.

Hairy-legged Vampire Bat (Diphylla ecaudata)

This species also feeds mainly on the blood of birds. They occur from Mexico to Venezuela, Peru, Bolivia, and Brazil. One specimen was collected in 1967 from an abandoned railroad tunnel in Val Verde County, Texas. This specimen (now in the Museum's Mammal Collection of the Natural Science Research Lab) is the only record of a vampire bat ever documented from the United States.

Bats As food Safe For Us!

Bats are eaten by people in parts of some Asian, African, Pacific Rim countries and cultures, including China, Vietnam, Seychelles, the Philippines, Indonesia, Palau, Thailand and Guam. Half the megabat (fruit bat) species are hunted for food but only eight percent of the insectivorous bat species are. In Guam, Mariana fruit bats (Pteropus mariannus) are considered a delicacy.

But, is eating bats really safe for us?

Different evidence suggests that bats are putative reservoir hosts and play a major role in the transmission cycle of some deadly viruses. These viruses are described below.

Nipah Virus

Nipah virus, scientific name Nipah henipavirus, is a bat-borne virus that causes Nipah virus infection in humans and other animals, a disease with a high mortality rate. Numerous disease outbreaks caused by Nipah virus have occurred in South and Southeast Asia. Nipah virus belongs to the genus Henipavirus along with the Hendra virus, which has also caused disease outbreaks. Symptoms of infection from the Malaysian outbreak were primarily encephalitic in humans and respiratory in pigs. Later outbreaks have caused respiratory illness in humans, increasing the likelihood of human-to-human transmission and indicating the existence of more dangerous strains of the virus. Other symptoms include Fever, headache, muscle pain (myalgia), vomiting, sore throat.

Ebola Virus

The genus Ebolavirus comprises some of the deadliest viruses for primates and humans and associated disease outbreaks are increasing in Africa. Different evidence suggests that bats are putative reservoir hosts and play a major role in the transmission cycle of these filoviruses. Thus, detailed knowledge about their distribution might improve risk estimations of where future disease outbreaks might occur. A MaxEnt niche modelling approach based on climatic variables and land cover was used to investigate the potential distribution of 9 bat species associated to the Zaire ebolavirus. This viral species has led to major Ebola outbreaks in Africa and is known for causing high mortalities.

A study done at the National Institute of Virology, South Africa has shown that Ebola can replicate in fruit bats and other bats in the Tadarida genus, inoculated with Ebola and can then pass through their stool.

bats are the presumptive reservoir hosts of Ebola viruses (EBOVs) (genus Ebolavirus, family Filoviridae). When transmitted to humans and nonhuman primates, EBOVs can cause hemorrhagic fevers with high case-fatality rates. Initial symptoms include fever, headache, muscle pain and chills. Later, a person may experience internal bleeding resulting in vomiting or coughing blood.

Disease

Rabies is a viral disease that causes encephalitis in humans and other mammals. Rabies can be transmitted to humans by vampire bat bites. It is caused by lyssaviruses, including the rabies virus and Australian bat lyssavirus.

Early symptoms can include fever and tingling at the site of exposure. These symptoms are followed by one or more of the following symptoms: nausea, vomiting, violent movements, uncontrolled excitement, fear of water, an inability to move parts of the body, confusion, and loss of consciousness. Once symptoms appear, the result is virtually always death, regardless of treatment.

Since dogs are now widely immunized against rabies, the number of rabies transmissions by vampire bats exceeds those by dogs In Latin America, with 55 documented cases in 2005. The risk of infection to the human population is less than to livestock exposed to bat bites. Only 0.5% of bats carry rabies, and those that do may be clumsy, disoriented, and unable to fly. In the Americas, bat bites are the most common source of rabies infections in humans, and less than 5% of cases are from dogs. Rodents are very rarely infected with rabies.The disease can be diagnosed only after the start of symptoms.

Among the 89 infections acquired in the United States, 62 (70%) were attributed to bats. The most recent rabies death in the United States was an Illinois man who refused treatment after waking up in the night with a bat on his neck; the man died a month later. Occurring in 2021, it was the first case of human rabies in the United States in nearly three years.

Impact on Public Health

Historically, human mortality due to rabies transmitted by vampire bats has remained low because bats do not usually attack humans. However, prior to the 1970s, there had been 150 human deaths reported that were attributed to transmission by vampire bat attacks. Aggression, in the form of blood feeding by D. rotundus, is currently the main cause of human rabies in Brazil. In the absence of livestock, humans can become victims of vampire attacks, particularly if sleeping outdoors or in buildings to which bats can gain access. Buildings occupied by indigenous peoples, or those who make temporary visits to the Amazon jungle such as loggers and miners, are often temporary structures and provide no barriers to vampire bat entry. Bites are to exposed areas of the skin such as toes and the face. In 2013, four out of nine human rabies cases reported to the Pan-American Health Organization were transmitted by hematophagous bats. A recent human case of rabies resulting from the bite of a vampire bat was reported from the US state of Louisiana in a migrant worker from Mexico.

Amazing Facts About Vampire Bats

(1) Vampire bats tend to live in colonies in almost completely dark places, such as caves, old wells, hollow trees, and buildings.

(2) These creatures are nocturnal and most active in the early night.

(3) Vampire bats roost alone, in small groups, or in colonies of thousands.

(4) Vampire bats are believed to be the only species of bats in the world to 'adopt' another young bat if something happens to the bat's mother.

(5) They are very clean animals that frequently groom themselves as well as other bats.

(6) Vampire bats generally fly about one metre off the ground.

(7) Like the legendary monster from which they get their name, these small mammals drink the blood of other animals for survival.

(8) They feed on blood from sleeping cows, pigs, horses, and birds. Though uncommon, vampire bats occasionally bite humans for blood.

(9) Vampire bats have such good eyesight that they may be able to see a cow from a distance of 130 metres.

(10) They don't remove enough blood to harm the animal, but their bites can cause nasty infections and disease.

(11) Unlike some other species of bats, vampire bats can walk, run, and jump. They have very strong hind legs and a special thumb that helps them take off after feeding.

(12) Each night, vampire bats drink about half of their body weight in blood.

BIOLUMINESENCE

Bioluminescence is the production and emission of light by living organisms. It is a form of chemiluminescence. Bioluminescence occurs widely in marine vertebrates and invertebrates, as well as in some fungi, microorganisms including some bioluminescent bacteria, and terrestrial arthropods such as fireflies. In some animals, the light is bacteriogenic, produced by symbiotic bacteria such as those from the genus Vibrio; in others, it is autogenic, produced by the animals themselves.

BIOLUMINATING ANIMALS

Firefly

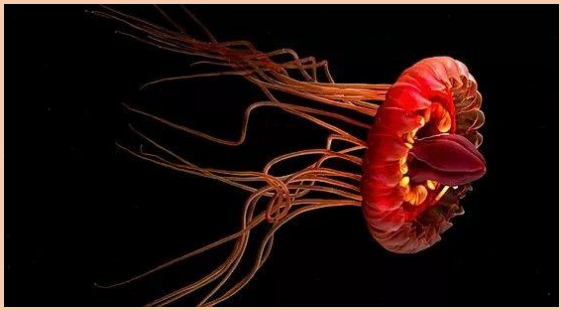
Fireflies usually light up their body to attract comrade and prey. There are around 2,000 species of fireflies but only a few of them have the ability to light up their body. There is a light-producing chemical reaction in all bioluminescent animals known as bioluminescence. The chemical reaction depends on an enzyme called luciferase. Most of the bioluminescent species are marine animals, Fireflies is one of the terrestrial species capable of producing light. Bioluminescence needs calcium, adenosine triphosphate, chemical luciferin and luciferase inside the light organ of an organism.

Anglerfish

One of the terrifying deep sea creatures, Anglerfish are usually seen 2000m deep inside the ocean. It is also known as humpback black devil or Johnson's anglerfish. They love to swim in mid-water and to attract its prey they light up their strange antenna known as lure situated at the top of the head. The lure can also be moved around just to attract prey and then it can be swollen with the help of their largemouth. The lightning in lure comes from small bacteria called phytoplankton. Anglerfish can be seen in the Pacific, Atlantic and Indian Oceans.

Coronate Medusa

It is also known as Atolla jellyfish. It can be seen in almost all the oceans around the world. Atolla jellyfish is deep red in color. Coronate Medusa has 20 marginal tentacles on the body and one large hypertrophied tentacle compared to marginal ones used to capture prey. Atolla jellyfish is one of the Bioluminescent animals on planet Earth because when attacked it launches a series of flashes that attract predators who will more interested in attacker than the jellyfish and hence it is also known as "alarm jellyfish". You will also find interesting reading about aquatic animals with mind-blowing superpowers.



Black Dragonfish

Black Dragonfish usually seen in deep sea oceanic waters and that too in absolute darkness. It has a light producing photophore called barble. Dragonfish uses lightning to attract its prey and when it comes closer to their fang-like teeth come into action by killing prey instantly. The photophores located at the back of the eye will act as a headlight for catching its prey.Black Dragonfish is mostly seen in the Pacific, Atlantic, and Indian oceans.

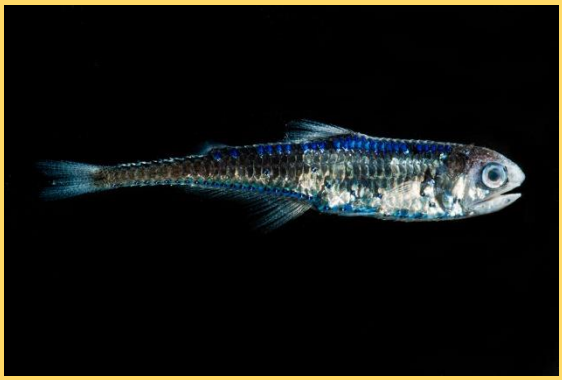
Click Beetle

The Pyrophorus is a type of click beetle found in the Americas, also known as fire beetles because of their bioluminescence. Their glow is similar to the firefly, though they do not flash, but rather maintain a constant glow from the two luminescent spots on their back. At night they use their light to attract other insect prey to eat. Their eggs and larvae are also luminous.

Lanternfish

Lantern fish are fairly small fish, ranging from just 2 to 30 centimeters in length. They are very common and numerous deep-sea fish, with over 200 species found in oceans worldwide.

Each species has its own unique lighting pattern that's used in communicating and mating. Shallow-living species are bright bluey-green or silver, while deeper-living species are dark brown to black.



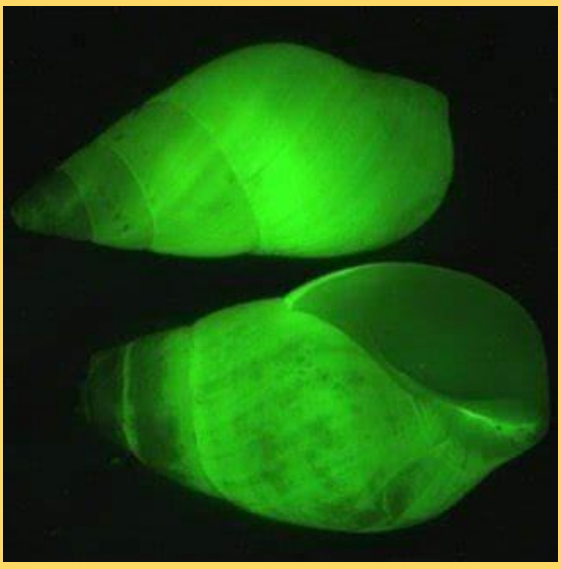
Motyxia Millipede

One of the few known bioluminescent millipedes is the Motyxia. They're found in forests and meadows in the southern mountain range of California, USA, reach 4 centimeters long, and produce cyanide.

In a study, their bright glow was found to strongly deterred nocturnal mammalian predators, and it's thought the bioluminescence evolved as a warning signal to predators that their body contained cyanide.

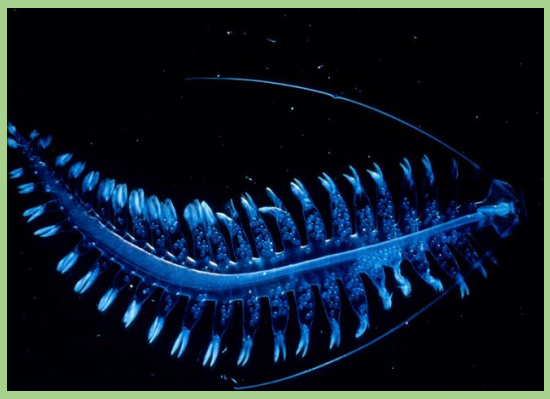
Sea Snail

One of the most electric-looking creatures on this list, the sea snail is one of the dozens of species that use bioluminescence. It's thought that sea snails actually use their opaque shells to diffuse and spread bright bioluminescent light in all directions, seemingly enlarging themselves to predators. Another school of thought says that sea snails use their glow for communicating without needing to leave the safety of their shell.



Tomopteris

It is one of the bioluminescent animals that are yellow-luminescent. Only a few known marine animals used to glow yellow. Their glowing mechanism is not clear but one thing is clear it does not glow with the help of light-emitting compound known as Luciferin.When disturbed, Tomopteris is known to release bioluminescent particles from their two different organs. It is believed that tomopteris used this to distract predators. Talking about the size, they can grow upto few centimetres in length. Also, read about the most beautiful fishes in the world.



Moon Jellyfish

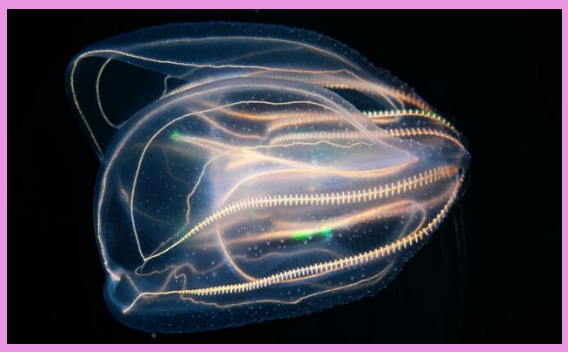
Moon Jellyfish one of the beautiful species of Jellyfish usually seen in warm and tropical waters near the sea coast. However, they are visible in all oceans across the world. It is called by several names such as moon jelly, common sea jelly, saucer jelly and violet moon Jellyfish. Moon Jellyfish made up of 95% water and has only one largemouth and digestive system. It is also one of the bioluminescent animals that produce light by some chemical reaction inside their body.These chemicals are known as luciferin and luciferase. When luciferin triggered it gets oxidized by luciferase and hence it will make jellyfish glow in dark places.

Squid

Most species of squid produce bioluminescence, using it for a variety of purposes. Some deep sea squids excrete a glowing ink to confuse predators, the bobtail squid uses bioluminescence as a form of camouflage and the firefly squid uses thousands of tiny lights on its body to lure prey.

Comb Jelly

Most bioluminescent creatures are found in the ocean, often at depths below the reach of sunbeams. Some species of comb jellies, or Ctenophora, are examples of this. The comb jelly produces blue or green light, but the movement of its combs can scatter the light, producing a rainbow effect. The light produced by comb jellies can be used to both confuse and attract predators.



Krill

Most types of krill, tiny shrimp-like creatures, are bioluminescent. Their light-emitting organs are driven by an enzyme reaction. Near the bottom of the food chain, krill feed on plankton and are the primary food source for many ocean animals.

Krill, which travel in great numbers, may use bioluminescence to communicate. These creatures are responsible for the amazing effect of glowing waves that can be seen in the video below.

Sea Salp

Salps are marine animals that resemble jellyfish, but they are actually chordates or animals with a dorsal nerve chord. Shaped like a barrel, these tiny free-swimming animals drift in the ocean individually or form colonies that stretch several feet in length. Salps are filter feeders that feed primarily on phytoplankton, such as diatoms and dinoflagellates. Some salp species are bioluminescent and use light to communicate between individuals when linked in vast chains. Individual salps also use bioluminescence to attract prey and potential mates.

BIRD MIGRATION

Migration is critical in the life cycle of birds, and without this annual journey many birds would not be able to raise their young. Birds migrate to find the richest, most abundant food sources that will provide adequate energy to nurture young birds. If no birds migrated, competition for adequate food during breeding seasons would be fierce and many birds would starve. Instead, birds have evolved different migration patterns, times, and routes to give themselves and their offspring the greatest chance of survival.

Types of Bird Migration

Latitudinal migration

The latitudinal migration usually means the movement from north to south, and vice versa. Most birds live in the land masses of the northern temperate and subarctic zones where they get facilities for nesting and feeding during summer. They move towards south during winter. An opposite but lesser movement also occurs in the southern hemisphere when the seasons are changed. Cuckoo breeds in India and spends the summer at South-east Africa and thus covers a distance of about 7250 km.

Longitudinal migration

The longitudinal migration occurs when the birds migrate from east to west and vice- versa. Starlings (Sturnus vulgaris), a resident of east Europe and west Asia migrate towards the Atlantic coast. California gulls, a resident and breed in Utah, migrate westward to winter in the Pacific coast.

Altitudinal migration

The altitudinal migration occurs in mountainous regions. Many birds inhabiting the mountain peaks migrate to low lands during winter. Golden plover (Pluvialis) starts from Arctic tundra and goes up to the plains of Argentina covering a distance of 11 250 km.

Daily migration

Some birds make daily journey from their nests by the influence of environmental factors such as temperature, light, and humidity also. Examples are crows, herons and starlings.

Total migration

When all the members of a species take part in the migration, it is called total migration.

Vagrant or irregular migration

When some of the birds disperse to a short or long distance for safety and food, it is called vagrant or irregular migration. Herons may be the example of vagrant or irregular migration. Other examples are black stork (Ciconia nigra), Glossy ibis (Plegadis falcinellus), spotted eagle (Aquila clanga), and bee eater (Merops apiaster).

Seasonal migration

Some birds migrates at different seasons of the year for food or breeding, called seasonal migration, e.g., cuckoos, swifts, swallows etc. They migrate from the south to the north during summer. These birds are called summer visitors. Again there are some birds like snow bunting, red wing, shore lark, grey plover etc. which migrate from north to south during winter. They are called winter visitors.

Partial migration

All the members of a group of birds do not take part in migration. Only several members of a group take part in migration. Blue Jays of Canada and northern part of United States travel southwards to blend with the sedentary populations of the Southern States of U.S.A. Coots and spoon bills (Platalea) of our country may be example of partial migration.

Navigation in Migration

Visual landmark

The scene of direction has been attributed to obvious topographical features or landmarks, such as great rivers, rivers, river vallys, costal lines, chains of oceanic islands, mountain ranges, etc. But a vast majority of birds migrate at night when they cannot easily make use of landmarks. Moreover, for birds crossing great stretches of seas, there are no sea-marks for them to follow.

Telluric current

Others have suggested the action of telluric currents. Certainly the air - currents, must be very obliging and highly ingenious.

Homing instinct

Some have spoken of a homing instinct, enabling the birds to return to a goal, as in the case of ants, bees and carrier pigeons. But homing experiments with carrier pigeons have proved the importance of vision in navigation.

Earth's magnetic field

Some workers, such as Von Middendroff and Henry L. Yeaglev, advanced the idea that navigation through responses to earth's magnetic field and their inner ear reacts to the mechanical Coriolis effect produced by the rotation of the earth. But there is no reliable evidence of magnetic or any other esoteric direction sense in birds.

Experience

A few naturalists have suggested that the birds learn by experience. Some older members, benefiting by a tradition following a path in past several years, become leaders to guide the younger generation. However, birds certainly do not learn their route from elders, as some of them do not fly in flocks at all. In many cases, young birds make their first journey independently, without the guidance of the adult parents. They are evidently guided by instinct impressed on their nervous system in some way through countless generations.

DIFFERENT MIGRATORY BIRDS IN THE WORLD

Demoiselle Crane

They are birds of Eurasia and can also be found in Turkey. These cranes are migratory birds and those from the western Eurasia fly in to spend their winter in Africa and those from Asia, Mongolia and China will fly in to spend the winter in the Indian subcontinent. They tend to play in important role in the cultures of Indian and Pakistan and are known by the name koonj.

Great White Pelican

Here is another name of migratory bird for you to remember. They are birds of pelican family and breeds from Europe through Asia and Africa.Great White Pelican is a widely huge flocks. They enjoy fish and their short and strong webbed feet allow them to wade in the water and find their pray. You can find them in Andhra Pradesh, Kolluru lake.

Great Cormorant

These are winter migrants and often fly away to comfortable temperatures. These birds have a long body and long neck with a length of 84-90cm. They love to feed on fish and tend to breed along rocky maritime coasts. They are also known to drive into the water to chase their prey.

Northern Pintail

The Northern Pintails are one of the most beautiful species of ducks that are found around the lakes and ponds. These Northern Pintails are long necked ducks with some large pointed tails. These birds generally dabble on the water surface of different lakes and ponds and one can also find them near the agricultural fields and they mostly feed on the insects and the seeds. These Pintails are the highly migratory and they normally migrate during the winter season to the southern regions of their breeding places which include Asia, North America and Europe.

Greater Flamingo

They are the largest species of the migratory birds. They are differentiated based on their colour. The species found along the cost of west indies and sometimes into Florida is bright red and the other found in Africa and East India pink. During the colder climate, these birds migrate to warmer climates, usually to India and Iran. They honk like a geese and feed mainly on fish.

European White Stork

This migratory bird is a large one in the stork family, about 100-115 cm in length. It is carnivores and feeds on reptiles, amphibians, fish, and small birds. This winter migrants prefer warmer climates and this glide longer distances between Europe and Sub-Saharan Africa. They tend to be noisy and clutter their beaks to make sounds.

CUCKOOS

The Cuckoos are the family/group of birds which includes the Koels,couas, European cuckoos,malkohas etc.These are the medium sized birds and most of them prefer to live on the trees.These Cuckoos generally feed on the fruits, insects and on other kind of animals. The majority of the species live in the wood areas. They normally migrate to the oceanic islands of Indian and Atlantic Oceans. In UK, you can find them in between April to May Month and they migrate from Africa in these months.

JOUANIN'S PETREL

This migratory bird is a lesser known spices.An average Petrel ranges from 30-32cm in length with a wingspan of 76 to 83 cm. They are dark and have a wedge-shaped tail.Further, they are known to make noisy grunts and known to enjoy squids for their meal. They are known to move to Red sea, Gulf of Aden and are summer migrants.

Common Green-Shank

Here we have a Subarctic bird called the common Green-Shank which breeds across the Northern Europe and Asia. Generally these birds prefer to breed on the dry ground. These common green-shanks consist of the long greenish legs. Just like most of the other birds they prefer to eat invertebrates and also the small fish. These species comes under the list of migratory birds coming to India during the winter season and they also migrate to Australia and Africa.

White Wagtail

These white wagtail birds are the open country birds which are also insectivorous. In the urban areas these birds prefer some open places like car parking spots where they can find some food. These birds generally nest on the man-made structures like stone walls. The wagtail is the national bird of Latvia. The diet for these wagtails includes the various aquatic and terrestrial insects and small snails and beetles. The wagtails mostly migrate to the Africa during the winters.

Northern Shoveler

The Northern Shoveler which is simply called as the Shoveler is one of the most common duck. The shovelers prefer to feed on fish and other small marine creatures in lakes and rivers. They mostly prefer to nest in the grassy regions which are away from the open areas. The shovelers are considered as fairly quite birds when compared with other noisy species. These shovelers are also examples of migratory birds that come to India.

Ruff

This is medium sized bird with a long neck, small head and a long reddish leg. These ruffs are mainly found on the east and south coasts of the UK during the spring and the autumn. The male birds in these species are much more larger than the female birds. These birds mainly feed on the insects and also on worms and seeds. During the winter season these migratory birds migrate to Africa, Australia, Western and Southern Europe.

Blue Throat

As the name itself indicates the blue throat got its name from the colour of its throat and the size of this bird will range from 13-14 cm. When it comes to their gender difference, the appearance of the male will differ from the appearance of the female bird. These species are also commonly called as the chats due to their voice. These are the beautiful migratory birds that visit the Indian Subcontinent and North Africa during the winters.

Asian Koel

The koel is the most common migratory birds in India and other countries of Asia. The Asian koel is also known as a brood parasite which lays its eggs in the nest of crows and other birds that raises its eggs. This bird is a mostly referred symbol in the Indian poetry. These Asian koels are more likely to eat the various kind of insects and some other small vertebrates. Some of these species migrate to some longer distance and they mostly breed in Southern China, Bangladesh etc.

Common Teal

Common teal is one of the most fastest flying birds. There birds belong to the family of ducks and they breed mainly on the marshes and small pools of the Northern and Central Asia and also in Europe. The common teal mainly feeds on the aquatic vegetarian from the surface. The common teals are one of the noisy species. This migratory bird is also known as the Eurasian teal and is from the Eurasia and it migrates to the South in the winter season.

THE JOURNEY OF HUMAN EVOLUTION

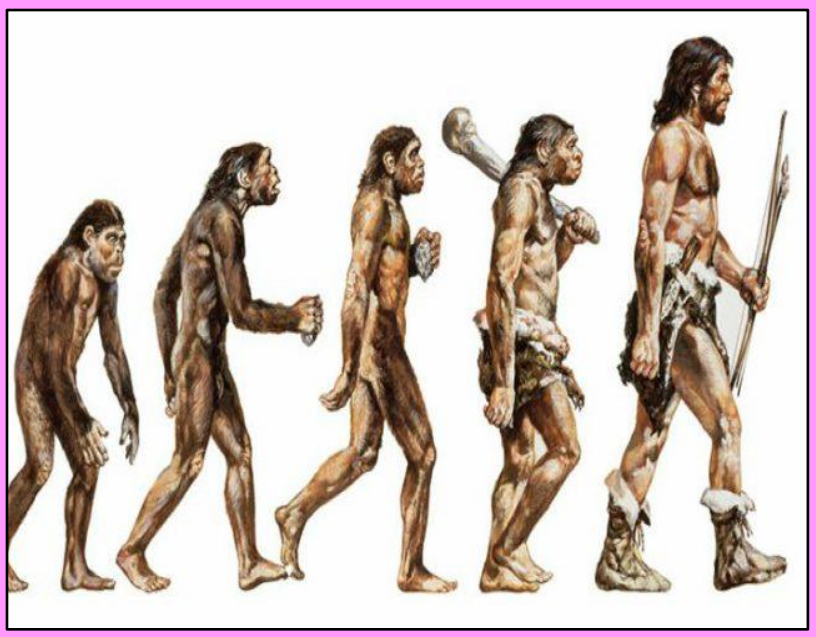
The journey of human evolution, Homo sapiens, has been a topic of great biological interest. The idea that man is a creation of a super-natural power prevailed for a long time. However, biologists view the process of human evolution using knowledge on morphology, physiology, embryology, and fossil records. The face is flatter with a less protruding lower jaw. There is a continuous growth of long hair on the head which is spare and short on the body. Generalized hands with well-developed thumbs and long legs with a non-opposable big toe. Man is terrestrial by nature and walks erect on two feet. They surpass all animals by possessing the exclusive 'human features'. There is no scientifically accepted research that shows that humans have stopped evolving.

Evolution is certainly still occurring and will continue to occur in humans. Humans exhibit differences in reproductive success, which directly leads to evolution. Humans still face challenges to survival as well, and exhibit variation in heritable traits, all characteristics of evolution. Some of the confusion on this topic likely arises because modern humans have not existed for an extensive period of time, evolutionarily speaking. Many of humanities most esteemed innovations have happened in the past decade or century, merely a few generations at most. However, no innovation will change the fact that humans exhibit varying reproductive success and challenges to survival, the components of evolution.

TIME AND PLACE OF ORIGIN OF MAN

According to primate molecular clock, sometime between 6 and 7 Mya two offshoots diverged from a common primate ancestor. They developed into Chimpanzee line and human line. Humanization started about 4 to 5 Mya. The earliest fossil of genus Homo were Homo habilis. They lived about 2.3 Mya in the Tanzania and coexisted with australopithecines. Genus Homo erectus appeared around 1.5 to 1.0 Mya. There Hominin species coexisted approximately 600,000 years ago, namely Homo heidelbergensis, Homo neanderthalensis and Homo sapience. The oldest fossil of Homo sapiens were obtained from Ethiopia. They were 160,000 to 195,000 years old. Cromagnon man belonging to Homo sapiens replaced heidelberg and neanderthals about 35,000 or 40,000 years ago.

The fossil of pre human and ancestral human forms have been obtained from widely diverse regions of Africa, Asia and Europe which indicates man's centre of origin was probably in Africa and Asia. More precisely man has originated in Africa and migrated to central Asia.



COMMON ANCESTORS OF MAN AND APE

Proplilopithecus

The fossil of first known ape was obtained from the Fayiim deposits of Egypt. It was described under the name Propilopithecus. It lived about 30-35 million years ago in oligocene period. It is represented by the fossil jays and teeth. No doubt more or less ape-like, Propilopithecus were short saturated with monkey like teeth. Their dental formula was 2,1,2,3. Their incisor teeth were vertical rather than directed forward and molars had 5 cups each.

Dryopithecus

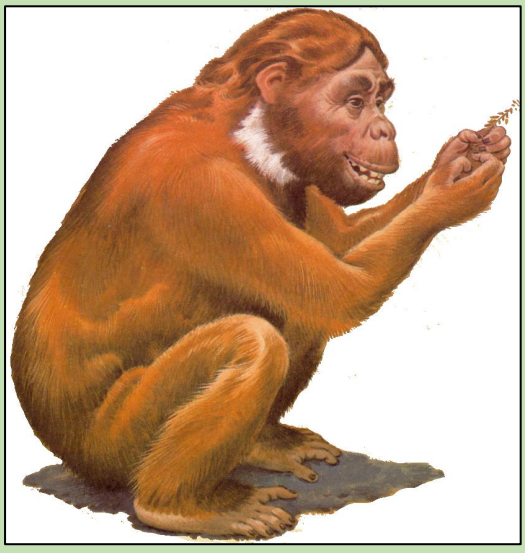
In early Miocene Period about 25 million years ago, there exsisted a group of apes, collectively known as Dryopithecines.

Dryopithecus africanus,formerly known as Proconsul, exhibited close similarity to chimpanzee and is considered to be a common ancestor of man and apes or a direct forerunner of man. Although ape-like, it had arms and legs of the same length and its legs and heels indicate that it must have assumed a semi-erect posture. It has large canines and incisors, feeding on fruits and leaves.

Ramapithecus

Ramapithecus *Late Miocene an d early Pliocene ape, known from fragmentary fossils from E. Africa, south-eastern Europe, and northern India and Pakistan, dating from 14–10 Ma ago, and apparently identical or very similar to the E. African Kenyapithecus. Ramapith ecus is regarded by many as transitional between the true Miocene apes (the Dryopithecinae) and the later Hominidae. If this is so, then the human and ape lines diverged prior to the late Miocene, 15–25 Ma ago. More recent evidence, however, suggests that Ramapithecus and the related or identical Sivapithecus are nearer to the evolutionary line that led to the orang-utan.*

The first Ramapithecus *fossils were discovered in 1932 in fossil deposits in the Siwālik hills of northern India.*



Australopithecus

Australopithecus (from Latin australis, meaning "of the south," and Greek pithekos, meaning "ape") is a group of extinct hominids that are closely related to modern humans. They were widespread in eastern and southern Africa from about 4 million years ago (mya) to 2 mya, appearing during the Pliocene epoch. As characterized by the fossil evidence, members of Australopithecus *bore a combination of humanlike and apelike traits. They were similar to modern humans in that they were bipedal (that is, they walked on two legs), but, like apes, they had small brains. Their canine teeth were smaller than those found in apes, and their cheek teeth were larger than those of modern humans. They were hunters and cannibals.*

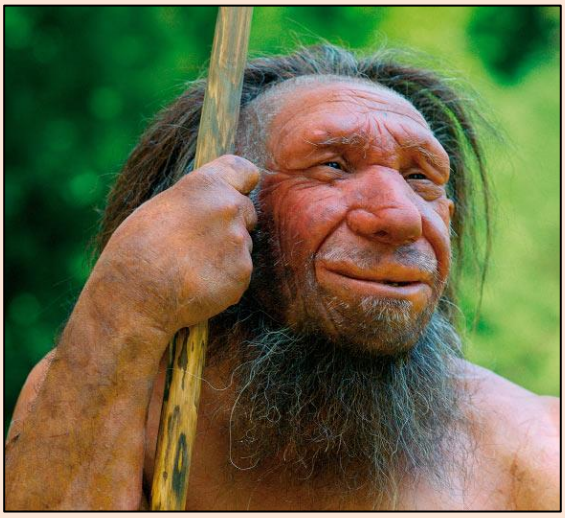
Homo erectus

The first fossil of Homo Erectus was found in Java in 1891. These were named as Pithecanthropus Erectus. These were considered as the missing link between the man and apes. Another discovery made in China was the Peking man. This specimen had large cranial capacities and is believed to have lived in communities. Homo erectus used tools comprising quartz. Tools made of bones and wood were also discovered. There is evidence of collective huntings. There is also evidence of the use of fire. The Homo Erectus is believed to dwell in caves.

Neanderthal Man

The Homo Erectus evolved into Homo Sapiens. During evolution, two sub-species of Homo Sapiens were identified-

Homo sapien Neanderthal and Homo sapiens sapiens. The cranial capacity of Neanderthal grew from 1200 to 1600 cc. Some small hand axes had also been discovered. This species of hominids could hunt big names such as mammoths.



Homo Sapiens Sapiens

The remains of Homo Sapiens were first discovered in Europe and were named Cro-Magnon. In these, the jaws are quite reduced, the modern man's chin appeared, and the skull was rounded. Their cranial capacity was about 1350 cc. They gathered food through hunting. Art first appeared during this time.

Down The Memory Lane

(Digha Excursion)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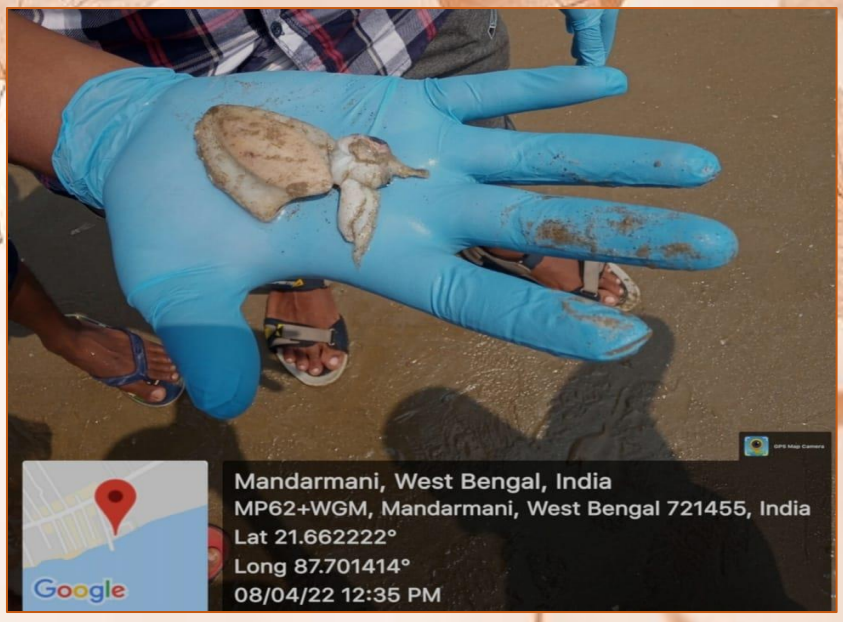
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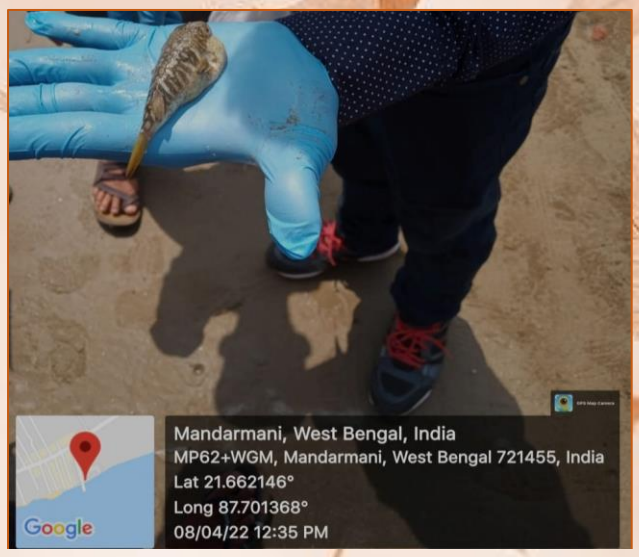
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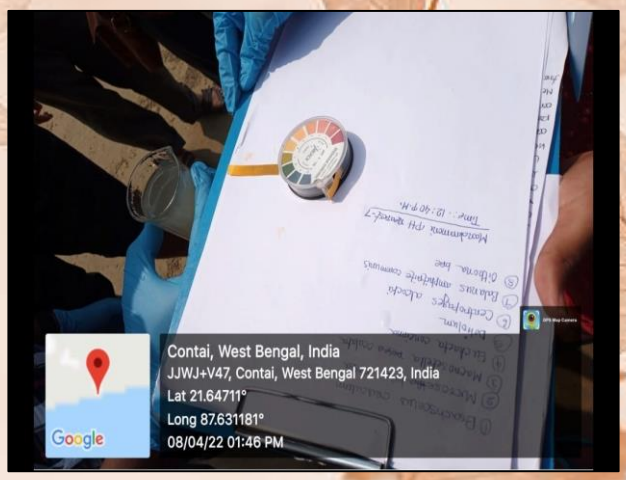
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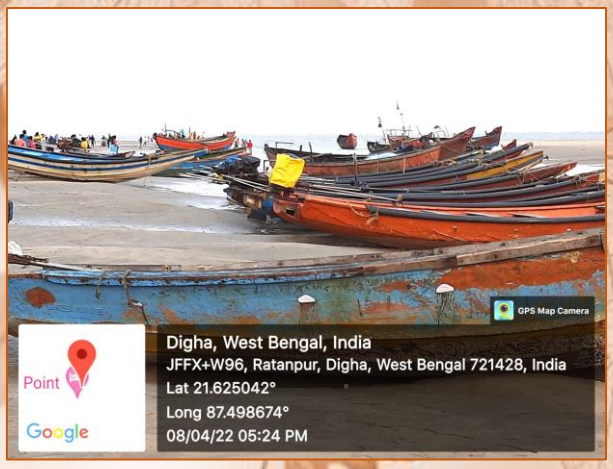
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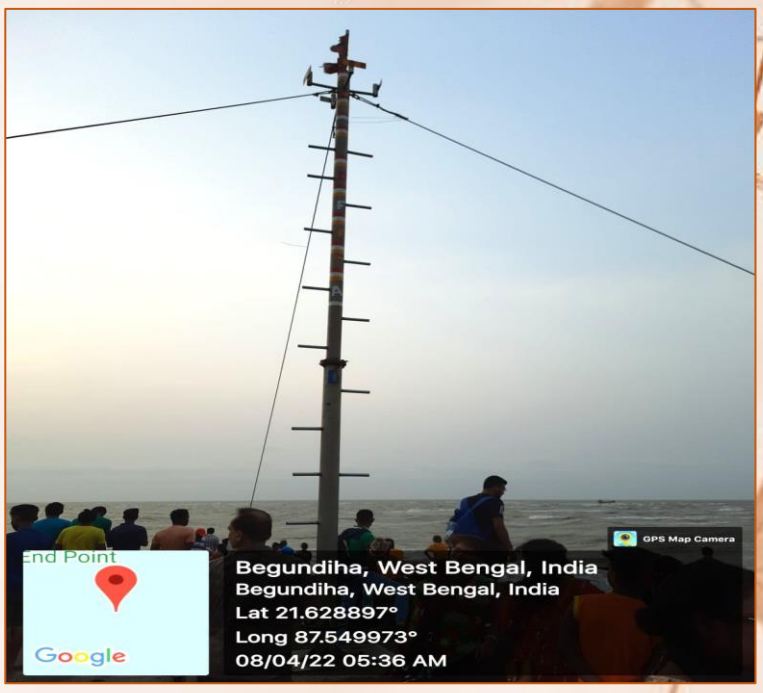
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