

VOLUME 1 (2021)  
ISSUE 10 (OCTOBER)



# NATURA ZOOLOGIA

THE OFFICIAL NEWSLETTER OF  
NATURAL SCIENCE ASSOCIATION  
ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE



Image source: [iNaturalist.org](https://www.inaturalist.org)

Species of the Month: *Nacaduba sinhala ramaswamiii*

# CONTENTS

<b>EDITORIAL</b>	<b>3</b>
Chief Editor   Associate Editor	
<b>GUEST EDITORIALS</b>	<b>4</b>
NABHOJYOTI CHATTOPADHYAY	
MALAVIKA K. AMARNATH	
<b>HIGHLIGHTS OF NSA</b>	<b>6</b>
WILDLIFE WEEK-OCT'21	
<b>ALUMNI CORNER</b>	<b>17</b>
ROHAN SHARMA	
<b>RESEARCH EXPERIENCE</b>	<b>18</b>
NIKHITHA D.	
<b>ZOO-REVIEW</b>	<b>21</b>
ZOHA SHARIFF	
<b>EXPERT'S INPUTS</b>	<b>24</b>
Dr. VIDYA ATHREYA	
<b>Gallery &amp; CREATIVE CORNER</b>	<b>26</b>
YUVARAJ KAMATHAD	
MALAVIKA K. AMARNATH	
<b>SPECIES OF THE MONTH</b>	<b>35</b>
<u>Nacaduba</u> <u>sinhala</u> <u>ramaswamii</u>	
<b>TRIVIA</b>	<b>37</b>

# EDITORIAL

**Dr. M JAYASHANKAR**  
Chief Editor



**Kishan Nag M P**  
Associate Editor



# GUEST EDITORIAL

**NABHOJYOTI CHATTOPADHYAY**  
**19CZBT37018**



St. Joseph's is an institution that promises structural development of its students without any boundaries that would hinge their true potential and NSA upholds this virtue to its fullest. Natural Science Association is a department that promotes interdisciplinary interactions and introduces its fellows, a creative approach towards the field of science. It has armored me with confidence to adapt constructive criticism and allowed me to be inquisitive to notice the intricacies in life sciences.

Natura Zoologia is Dr. M Jayashankar's vision that encapsulates the year-round efforts of NSA to make science available and accessible to everyone. This October issue is the summation of various activities that were organized by the department and it is a collection of science through different perspectives. As an invited editor of this month, I enjoyed the creative freedom to curate this issue with a sense of both, a participant and a spectator. This opportunity to document and share our perspective amidst the wildfire ignited by the pandemic, has given us a podium to connect.

I hope this issue finds a way for its readers to connect with the NSA and help to catch up with the tireless efforts that the members of NSA have made to continue learning even in contactless times due to the pandemic. Enjoy Scrolling!

# GUEST EDITORIAL

**MALAVIKA AMARNATH**  
**19CZBT37017**



The Natural Science Association is a group of eager learners guided by Dr. Jayashankar of St. Joseph's College (Autonomous), Department of Zoology. This organisation serves as a platform for students to participate in a range of activities in order to broaden their knowledge and experience. Invited editors have been invited to write monthly editions for the newsletter, *Natura Zoologia*. This has introduced students to various subject matters and allowed them to approach their topic from a journalistic perspective.

The goal of the newsletter is to provide readers with a comprehensive list of all of the Natural Science Association's events, as well as information about various species and educational trivia. Due to the unfortunate circumstances, this month's newsletter features a majority of online conferences.

It has allowed the public to interact with prominent guest speakers as well as our esteemed faculty.

NSA has always promoted acquiring knowledge and giving back to environmental and social causes. It's important to remember that everything has an influence on the environment and the people that live in it. Through this newsletter we intend to reach out to as many people as possible, to remind and urge them to play an active role in broadening their horizons which will help them give back to the scientific community in their capacity.

# MONTHLY HIGHLIGHTS OF NSA

## OCTOBER 2021

**Faunal Friends in our surroundings:** The Natural Science Association (NSA) of St. Joseph's College (Autonomous), Bengaluru organized an event named "Faunal Friends in our surroundings" which asked students to click the pictures of faunal friends found in their backyard. The interested participants were told to register through the link given in the shared brochure. The Event displayed a lot of wonderful photographs of the enthusiastic students of our college. It was very creative of the participants that they also added wonderful captions to their photographs. Each participant then spoke for two minutes about what inspired them to click the respective photograph. The students in charge of this event were Michelle and Selvapriya of the Natural Science Association and the teacher coordinator of NSA, Dr. Jayashankar M conducted the event. There was a good turnout of participants showcasing their skills and admiration to the natural world which fulfilled the goal of The NSA to spread love and awareness to the Natural World.

**Creative Writing:** The Natural Science Association organized 5 events to celebrate wildlife week from October 3rd to October 8th. The creative writing event was organized under the wildlife week. The prompt give for this event was: What are three animals you think will be extinct by 2025. The participants were free to write poems, short essays and use posters but were allowed to use only one page. They had to ensure to convey the information about the endangered animals and the reasons in one page while ensuring it's efficiency. They were also allowed to use drawings, sketches and insert pictures to highlight their content. A total of 20 submissions were received. Some participants used sketches while others used images. The entries received were well written and highlighted the issue of endangered animals. Five entries were selected to be published on the NSA Instagram page.

**Fauna Through the Lens:** The Natural Science Association (NSA) of St. Joseph's College (Autonomous), Bengaluru organized an event named "Fauna through the Lens" which asked students to film the fauna of their surroundings. The interested participants were told to register through the link given in the shared brochure. The documentary filmed were not to be more than 2-3 minutes long, the participants face had to be seen at least once during the video and they were not allowed to film their pet animals. The entrants had to submit the video by 5th October to the given email in the form of a google drive link with their name and registration number mentioned in the mail. All the participants would then receive a certificate after the event. The student in charge of this event was Abhishek Mishra of NSA and the teacher coordinator of NSA Dr. Jayashankar M conducted the event. There was a good turnout of participants showcasing their skills and admiration to the natural world which fulfilled the goal of NSA to spread love and awareness about the Natural World.



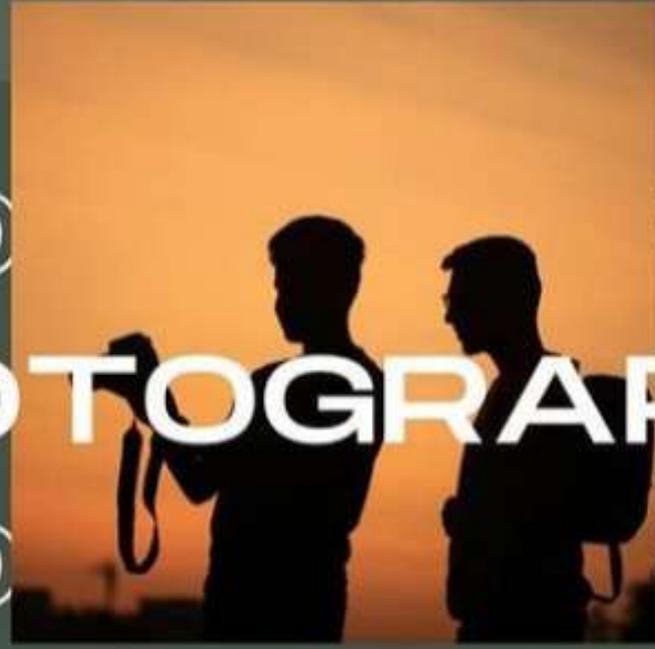
**Snake Rescue Webinar:** The Natural Science Association (NSA) of St. Joseph's College (Autonomous) had organised a webinar titled, 'Snake Rescue webinar' as a part of the 'Call of The Wild' series which is to celebrate the national wildlife week. The webinar featured Mr. Sanjeev Pednekar of the Prani: the Pet Sanctuary and Mayur of St. Joseph's College as the resource persons. The webinar had the themes pertaining to the need for snake conservation as well as the steps and precaution to be followed to avoid snake conflict and the necessary steps to be taken when encountering a snake in closed spaces. The speakers also emphasized on the need to educate the general public on the same themes. The first aid after the snake bite as well as the prophylactic measures to be followed was also touched upon. The students in charge of the event were Yeshwanth and Rakshith of the Natural Science Association. The teacher coordinator of NSA Dr. M Jayashankar conducted the event. A good number of participants were present. Several participants reached out to the speakers to have their doubts and queries cleared during the question-answer section.

**Talk on Wildlife Photography:** The Natural Science Association (NSA) of St. Joseph's College (Autonomous) organized an event named 'A Talk on Wildlife Photography' which had two eminent speakers who discussed their techniques and experiences of wildlife photography. The first speaker for the event was Mr. Harsha Narasimhamurthy, an extraordinary wildlife photographer who is popularly known as, 'the cat man' among his colleagues for acute sense in tracking big cats. He shared his experiences, memories and some of his breathtaking and stunning photographs of cat families such as the Indian and African tigers, leopards, cheetahs, and lions. He also described the nature and behavior of the members in each family of cat. His intelligence and knowledge about these animals and his perfectly timed photographs amazed the audience. The second speaker for the day was Mr. Prabhav Benera. He is a first-year student at St. Joseph's pursuing his BSc. degree. At this young and promising age, he had a lot of technical details and important tips on wildlife photography that he shared. His entire journey on exploring wildlife photography and his achievements were quite inspirational. There were a good number of students from our college and other colleges who actively participated in the event. The students in-charge of the event was Michele and Selvapriya of Natural Science Association. The teacher coordinator of NSA, Dr. M Jayashankar conducted the event.



Winners of Faunal Friends in Our Surroundings

PHO  
**PHOTOGRAPHY**  
PHO



A BACKYARD PHOTOGRAPHY EVENT





**W  
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Winners of Wildlife Documentary

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FAUNA THROUGH THE LENS

1. PRABHAV BENARA
2. RAJHANS
3. BHARGAVI PRAKASH



PROMPT - BY 2025, WHAT THREE ANIMALS DO YOU THINK  
WILL BE EXTINCT?

# CREATIVE WRITING

— “ —  
THE TOP 5 BEST  
SUBMISSION  
— ” —





PROMPT: BY 2025, WHAT THREE ANIMALS DO YOU THINK WILL BE EXTINCT?

1. **Hoolock gibbon:** It is an endangered primate species, distributed across North - East India, Bangladesh, Myanmar, and China. One of the major threats to these primates are due to several tribes of Northeast India killing and using its body parts for preparing traditional medicine. The paste obtained from the fresh brain tissue of the *Hoolock gibbon* is applied as a remedy for tooth ache and is consumed orally to cure headache. The fresh blood obtained from these primates are believed to cure various illnesses such as: liver cirrhosis, asthma, tuberculosis, malaria, and weakness caused due to hypovolemia (decreased blood volume). The bones are used for the treatment of rheumatism and hernia.



[https://upload.wikimedia.org/wikipedia/commons/1/18/Gibbon\\_Hoolock\\_de\\_P537onest.JPG](https://upload.wikimedia.org/wikipedia/commons/1/18/Gibbon_Hoolock_de_P537onest.JPG)

2. **Assamese macaque:** It is a macaque native to South Asia. The threats to this species are due to various anthropogenic activities, which mainly include trapping and hunting for sport, and the killing of these macaques for medicinal purposes. Consuming the fresh brain of these animals is believed to enrich physical strength, cure nausea and balance blood pressure. Dried bone of Assamese Macaque is used to cure mumps. The flesh is consumed by the tribes against pathogenic diseases such as: Typhoid and smallpox. It is also used as a pain killer and is believed to help in painless parturition. The gall bladder of this species is used as a remedy against diabetes.



<https://www.shutterstock.com/1207720>

<https://theecostoremediasa.org/index.php/InTT/article/view/9873/2997>

3. **Sun bear:** It is the smallest bear and is distributed across the tropical forests of South Asia. It is mainly hunted for its gall bladder. The bear bile is used in traditional Asian medicine as it contains high levels of ursodeoxycholic acid (UDCA) known to cure liver and gall bladder related ailments. It is also believed to cure cancer, cold and other ailments, though there is no scientific proof.



[https://www.panda.org/discovers/our\\_focus/wildlife\\_practice/profiles/mammals/sun\\_bear/](https://www.panda.org/discovers/our_focus/wildlife_practice/profiles/mammals/sun_bear/)

Apart from these traditional medical practices that are passed on to the next generations, lack of proper health care facilities in the remote/rural areas are also one of the major reasons for the prevalence of such practices. Conservatory measures must be taken immediately to protect these species and other vulnerable species. People must be educated and efforts to increase the habitat of these organisms must be implemented.

KEERTHANA GANESH (19CBZ31033)  
St. JOSEPH'S COLLEGE (AUTONOMOUS)



## EDGE OF EXTINCTION: Animals most likely go extinct by 2025!



**Gharials** are fish eating crocodiles from India. They have long thin snouts with a large bump on the end which resembles a Ghara (pot) and hence the name. Gharials spend most of their time in freshwater rivers, only leaving the water to bask in the sun and lay eggs. Declared critically endangered by International Union for Conservation of Nature (IUCN) less than 200 of them are left in the wild at present. The damming and diversion of the rivers on which they depend threatens their habitat. The illegal extraction of sand from the riverbanks is destroying their nesting habitats and depletion of fish numbers due to overfishing by humans is a major threat. Gharials often die after being caught in fishing nets. The last refuge of the Gharial is the Chambal River in northern India, where the vast majority of the remaining wild population survives.



The **Amur leopard** is a nocturnal animal that lives and hunts alone – mainly in the vast forests of Russia and China. These magnificent animals have thick, luscious, black ringed coats and a huge furry tail that wraps around them to keep them warm. Being the top predators, they are crucial for maintaining the right species balance.

Over the years the Amur leopard hasn't just been hunted mercilessly, its homelands have been gradually destroyed by unsustainable logging, forest fires, road building, farming, and industrial development. These activities have given Amur leopards the title of 'world's most endangered big cat'. It is estimated that their current wild population has reduced to less than 100 individuals. Due to the small number of reproducing individuals in the wild, Amur leopards face the risk of inbreeding depression.

The **Pangolin** lovingly known as 'pinecone with legs' is the only mammal with scales. Some pangolins are as small as a house cat while others may be as big as a medium-sized dog. Their body is covered by as many as 1000 scales to protect them from predators such as the big cats. Unfortunately, these very scales attract their biggest predators – humans. Labelled as 'the most trafficked mammal' statistics show more than a million pangolins have been poached in the past decade. Pangolin meat is regarded as a symbol of social status as only the wealthy can afford it. Pangolin scales, powdered or made into paste, are prescribed for traditional medicines for ailments ranging from arthritis and epilepsy to financial rituals and spiritual protection. These practices have zero scientific basis. In fact, pangolin scales are made from keratin, the same material found in human hair and nails!



Dealers of pangolin scales are part of world-wide criminal networks that are also driving elephants and lions to extinction. Habitat loss and slow reproduction rate (a pangolin gives birth to only one baby each year) are also major causes for concern. Extinction of pangolins would be an ecological and economic disaster for the locals as they eat termites that otherwise destroy crops and buildings. Countries must work together to reduce demand and enforce laws against poaching. Otherwise, these gentle creatures may disappear even before most people know they exist.

"The message is simple: love and conserve our wildlife". This short yet impactful quote by famous Australian zookeeper and conservationist, Steve Irwin, encapsulates the fundamental obligation of us humans. Let us spread awareness, encourage community participation, discourage animal products/cruel practices, and be vigilant. **Remember, wildlife conservation is the conversation!**



# BE AWARE AND PROTECT EXTINGUISH CREATURES IN THE WORLD

Angelin Rubavathi P, M.Sc Chemistry, Bishop Heber College(Autonomous), Tiruchirappalli-620017, TN, India

Reference: WWF

### INTRODUCTION

Natural science expects "Gorilla, Suda tiger, Sumatran Elephant(GTE)" to be possible extinct animals by 2025. The reason behind the extinction and protection for the above are discussed.

### IMPORTANCE OF GTE IN THE WORLD.

- \*Gorilla is essential to the composition of the rainforest due to their seed distribution.
- \*Sunda Tiger is an important indicator of forest health and biodiversity.
- \*Sumatran Elephant essential to a healthy ecosystem.



### WHY EXTINCTION?

- \*Gorilla: Hunting for food, pets and their body part are used in medicines.
- \*Sunda tiger: Accelerating deforestation and rampant poaching is the main threat.
- \*Sumatran elephant: Deforestation, human-elephant conflict, loss of genetic viability resulting from small population size and isolation.

### APPEARANCE OF GTE

- \*Gorilla(Western Lowland Gorilla) found in west-central Africa are smaller than other subspecies with brown-grey coats, Auburn chests, wider skulls brown ridges and small ears.
- \* Sunda Tiger(Panthera Tigris condica) found in Sunda Island in Indonesia are heavy black stripes on their orange coats giving them the perfect camouflage to mimic the light reflection on the forest floor.
- \* Sumatran elephant(Elephas maximum sumatranus) found in Indonesia island of Sumatra which is smallest Asian elephant with bright skin.

### HOW MUCH GTE ARE LEFT?

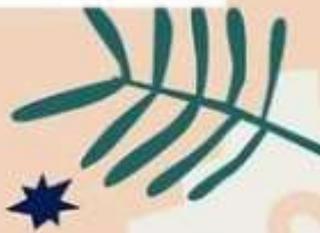
- \*Gorilla: 100,000 individuals are left.
- \*Sunda Tiger: 80% are dying each year.
- \*Sumatran Elephant: 24,00 and 2,800 are remaining.

### LIFE SPAN OF GTE

- \*Gorilla: 30-40 years. (Captivity:50years)
- \*Sunda tiger 15-20 years (captivity:25 years)
- \*Sumatran elephant: 10- 15 years

### PROTECTION OF GTE

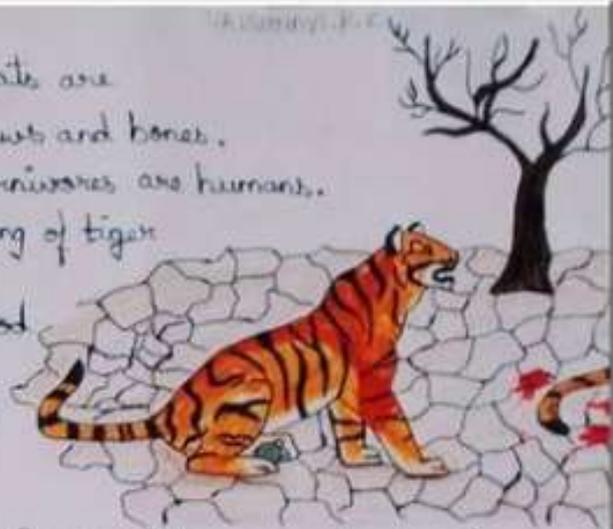
- \*Gorilla can be protected by encouraging sustainable forestry and limiting illegal logging.
- \*Sunda Tiger by the effort to curb poaching.
- \*Sumatran elephants can be prevented from hunting and dismantle traps.





### TIGER (*Panthera tigris*)

These orange and black striped cats are hunted for their pelts, teeth, claws and bones. The cardinal predators of these carnivores are humans. Poaching of tigers and illegal trading of tiger parts continue to this day. As humans continue to shed the blood of these felines for the sake of their own contentment and greed, the endangered tigers are on the verge of extinction.



### GIANT PANDAS (*Ailuropus melanoleuca*)

The bamboo-eating giant bears have been endangered for years due to several specific reasons, including diet, habitat loss, and poaching.

As ninety-nine percent of their diet consists of bamboo, pandas cannot flourish outside bamboo forests.

Habitat encroachment, clearing of bamboo forests, poaching and illegal killing for their dense fur are the threats encountered by giant pandas which might bring about their extinction.



### SEA TURTLES (superfamily Cheloniidea)

These ancient mariners have swum the oceans since the age of dinosaurs. But the increase in human population accompanied by pollution, coastal development, fisheries bycatch and climate change pose threats to the survival of sea turtles. Each year, the fishing industry causes the death of a large number of sea turtles. With climate change affecting their sex ratio, and the size of nesting beaches, the extinction of sea turtles is expected in the near future.

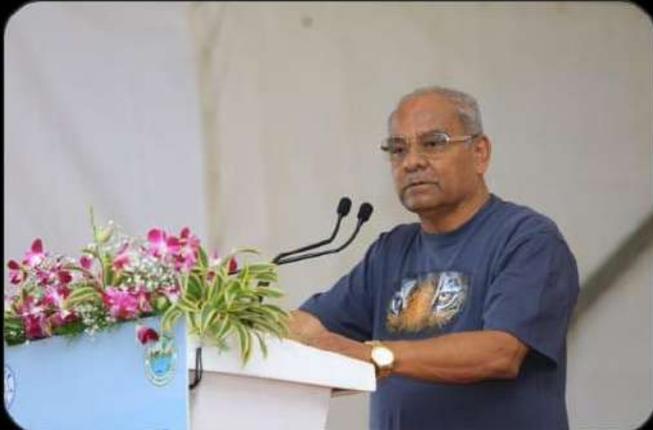




Karnataka Forest ... · 2 Oct 2021

Replying to @aranya\_kfd

The event was attended by honourable Forest minister Shri Umesh Katti, Member of Parliament Shri P.C. Mohan, MLA Shivajinagar Shri Arshad Rizwan, Additional Chief Secretary Shri Jawaid Akhtar, Hoff Shri Sanjai Mohan, PCCF(WL) and CWLW Shri Vijay Kumar Gogi.



On the occasion of the 67th Wildlife Conversation Day the members of NSA participated in a walk from Vidhana Soudha to Lalbagh, on the October 2nd, 2021. They were accompanied by senior officials of the Karnataka Forest Department, along with other volunteers, conservationists and large numbers of general public. The event was attended by the honourable Forest Minister Shri Umesh Katti, Member of Parliament Shri P.C. Mohan, MLA Shivaji Nagar Shri Arshad Rizwan, Additional Chief Secretary Shri Jawaid Akhtar, Hoff Shri Sanjai Mohan, BCCF (WL) and CWLW Shri Vijay Kumar Gogi. Everyone who was part of the walk was given a plant at the end to commemorate the Wildlife Conversation Day.



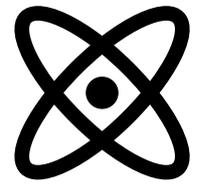
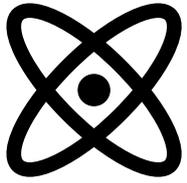
# ALUMNI CORNER

## ROHAN SHARMA

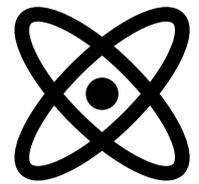
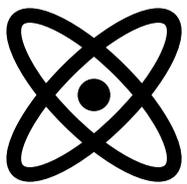
### BATCH-2020



In my years at St. Joseph's College, I actively participated in the extracurricular activities hosted by the National Science Association (NSA). As a student it is essential to do more than just what your curriculum requires, especially in your undergraduate course as it not just broadens your creativity but will also help in your future. The approach NSA has to wildlife and topics related to it, is thorough and in depth. Speaking from experience, this helps students get a hands-on experience and makes the learning process more interesting. I can say with great confidence that their conferences, seminars, webinars and other activities are very informative. I urge my juniors and anyone who gets an opportunity to be part of it, to participate actively and involve yourselves, to make the best of the level of expertise they bring in. This exposure has helped me further my career in the field of Natural sciences, hope that your involvement with NSA helps you to do the same.



# REAL-TIME RESEARCH



NIKHITHA D  
19CZBT37043

Biology has always been an escape for me. As a young child, who happened to constantly witness sufferings of cancer patients, I was always intrigued to explore better approaches in understanding complex diseases. I wanted to account for the genetic, physiological and environmental factors and their interactions which manifests in the disease. I did not want to limit myself into categorizing and targeting specific genes associated with heterogeneous diseases alone. I found the perfect amalgamation of my interests in the field of Systems Biology and I have been constantly working to understand and inculcate the vastness this field has to offer.

Undergraduate research opportunities at St. Joseph's, provided me my first platform to explore Systems Biology. I worked on formulating protein-protein interaction networks to relate mitochondrial dysfunction with Alzheimer's disease. I developed a keen understanding of the disease, the probabilistic effects of  $A\beta$  input into mitochondria and its effects on mitochondrial trafficking, biogenesis (fusion and fission of mitochondria), mitochondrial pore formation and oxidative stress which is manifested in the disease. I proposed to make a protein interactome with STRING inputs, after carefully selecting the proteins from various sources and using different algorithms to integrate the perturbations and finally visualize the data using cytoscape. Further this would be subjected to open source software which employs Boolean logic gates for functional analysis of this network to route the most possible association of mitochondrial dysfunction with the disease.

I was able to realise my theoretical understanding and I got the opportunity to translate them into reproducible results when I got selected to work under the unparalleled guidance of Dr. Moinak Banerjee at the Rajiv Gandhi Institute of Biotechnology, as an IASc summer research fellow. During the course of my internship over the months of July to October, I worked on identifying rare circadian rhythm variants in autism spectrum disorder.

Autism spectrum disorder (ASD) is a highly heterogeneous complex disorder affected by multiple genetic and environmental factors. Echolalia, repetitive behavioural patterns, restrictive movements are some of the common symptoms. Normal social functioning of a child is affected as they have difficulties in sharing thoughts and feelings. They have physiological difficulties including gastrointestinal problems, immune system dysfunction, abnormal sleep patterns and irritability. Many of these coincide with circadian rhythm dysfunctional symptoms. Whole exome sequencing in patients with ASD in Kerala, confirmed prevalence of rare and deleterious variants of circadian rhythm genes. During my stay at the facility, I tried to catalogue ASD in terms of epidemiology and contributing risk factors, including genetic and environmental factors. I was introduced to profuse methods and protocols involved in sample collection and diagnosis. I had the privilege to gain first-hand experience in DNA quantification using nanodrop method and whole-genome sequencing using Agilent: SureSelect protocol. As my research was based on specific and sensitive data, the results have to be made confidential for privacy concerns of patients and the institution.

Science education at St. Joseph's is a collective effort to extrapolate the affinity of the students towards the subject while enabling them to criticize concepts and extoll anomalies. The encouragement and attention that students receive is incomparable. The holistic approach to administer learning at St. Joseph's is a testament to us, natural science enthusiasts, that this is the BEST time to study biology!

# ZOO- REVIEW



ZOHA SHARIFF  
19CZBT37069

# Our Planet-Review

'A vision of a rather destructive future and an inevitable doom, an evidence rich witness statement, a glimpse into an inescapable reality and a hope for change', is my personal one line review of 'A Life On Our Planet' by David Attenborough. The Film is a Netflix Original Documentary that I believe does justice to its name. The film has a very authentic and autobiographical narrative; it is a wonderfully put together series of gravely dangerous and unplanned human errors and their after effects, a stark warning that tells us how reckless development can leave behind life threatening impacts on the future of our planet, reminding us that these mistakes have not only put our lives but also the lives of other living species at stake, the main purpose of the film is to educate, warn and bring about a wave of sensible awakening amongst the people who care about the future of our natural world.

The narration of events and lived experiences from the filmmaker's life make the film convincingly real, authentic and believable, he aims to bring the concept of climate change and the challenges of declining biodiversity to the attention of common people.

Attenborough uses the examples of tonnes of human errors in planning, mishaps, habitat and biodiversity destructions and their impacts over the decades as proof to gauge and study the dangers ahead. Tales of the ever changing world, comparison of the past to the present and the rising pace of change and development and an impending glimpse into the past through a decade oriented timeline that shows population changes, carbon emissions in 'parts per million' and 'remaining wildlife percentages' over the years are all aspects of a very strong historical past that help inflict a great deal of realisation in the minds of the audience.

There has been a fair use of scientific facts and findings and statistical data which helps the viewer envision the sickening reality of the future that lies ahead. Sir David uses a lot of "Negative" seeming words like 'ignorance', 'human errors', 'mistakes' etc in a very inspiring context, this method of narration allows the viewer realise the harsh realities of today and motivates one to take more conscious steps towards a sustainable future.

The documentary ends in a rather inspiring manner; David Attenborough suggests renewable and inexhaustible alternatives, already implemented ideas and cites examples of leading countries/cities that have succeeded in sustainably and feasibly developing their lands, leaving behind a cleaner environment and stepping towards renewable green energy solutions. Attenborough believes that if each of us realised the importance of starting individually, we could inflict and drive a larger and ever increasing wave of positive and sustainable changes soon that would make us the pioneers of a green, sustainable and a biologically rich and diverse future.

The film leaves a positively scarring impact on the audience, as it reminds us to make a call to action before it's too late, it acts as a reminder for both, people who can understand the facts and on those who believe what they see. Filmed evidences act as stepping stones towards positive realisations and mass awakening. The film aims to educate the youth in power and action realize the gravity of climate change and biodiversity loss. It also emits a sense of hope towards the end, a set of sustainable and feasible solutions that once accepted and applied can help change the future of our planet for the better.

# BIOMIMICRY

Biomimicry Levels as an Approach to the Architectural Sustainability. Biomimicry essentially means innovation inspired by nature, it is a branch and study of sciences that deals with nature's models and designs and takes inspiration from them to solve human problems. There are three main levels of Biomimicry:

- 1) Copying The Shape/Structure of the Biological Organism
- 2) Copying a Biological Process
- 3) Mimicking the Biological process at the Ecosystem level

The research paper highlights the importance of learning from nature, it discusses how nature solves complex problems effortlessly yet effectively and how we as humans can always draw innovative inspiration from the models, processes and organism of nature. The paper mentions three levels of biomimicry and cites examples of their applications in the real world. These applied solutions require extensive and elaborate biological research and only the most apt, feasible, relevant and effective solutions are chosen to help solve the described problems/ Issues.

Biomimicry Methodology:

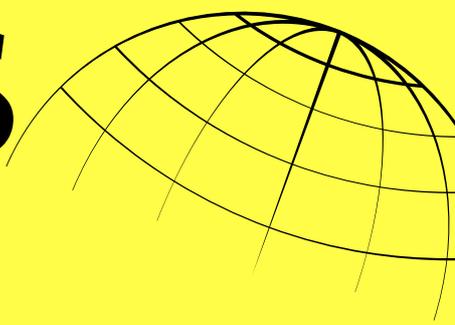
- 1) Problem identification
- 2) Biological research
- 3) Solution identification
- 4) Definition of biological solution
- 5) Principle extraction
- 6) Reframing an effective and suitable solution
- 7) Principle application of the identified solution to the described problem

Conclusion:

Biomimicry/Biomimetics As an area of scientific research and problem solving has emerged as one of the most effective ways of easing complex human problems. Biomimetic solution have proven to be greatly regenerative and eco-friendly, these solutions allow humans and nature to thrive in complete commensalism and harmony.



# EXPERT'S INPUTS



**Dr Vidya Athreya.  
WCS India.**

# Leopards that Never Change their Spots

If you ask me who has taught me the most I would call the leopard my guru! Not only did I learn so much from them about their ecology but I also learnt to unlearn a lot of my perceptions about wild animals from this really smart and intelligent creature. The reason is they are the most successful of all large cats (the tiger, the snow leopard and the Asiatic lion are their other cousins in India), because they occur all over India. From the cold hills of Uttarakhand, Himachal Pradesh, to the arid landscapes of Rajasthan to the forests of south India. More importantly they are ubiquitous in the human used landscapes such as croplands of Maharashtra, tea gardens of Tamil Nadu and the tea gardens of West Bengal, sharing their space with high density of humans.

When I started out as a young biologist my training and books taught me that the only place where wildlife should be is the forests. However, as I have found over the years, India is a special country where people and wildlife have shared spaces historically. The boundaries of forests are drawn by humans on a map for human administrative purposes and wild animals do not recognise these boundaries. Which is why the leopard is in villages, at fringes of cities trying to get the dog, the pig, the goat and anything it can find.

I often say that this is a story about two extremely adaptable species sharing the same space; humans and leopards. Let us take the case of Mumbai. Did you know that the density of people in Dharavi is 1 lakh per sq km? That the minimum density of people in Mumbai is about 20,000 people per sq km. Then you have humans occurring at about 20 people per sq km in parts of north east India. Which is the right one? Which is the appropriate habitat for humans? What is their correct food? We have no single metric for this because we are so adaptable and that is why we are so successful. The same is with the leopards. Although pure carnivores, they will eat anything be it a rodent, a cat or a deer. They will stay in croplands, cold zones, rainy forests. Their home ranges which are areas they use can differ from a few ten of sq km to about 400 sq km, which is dependent on the food resources there (just as ours).

We also to have remember that leopards are so ubiquitous because they are adaptable, if they were highly specialized, they would not adapt and extinction would be imminent.

Meanwhile we also found in our studies that many groups of people have relationships with the leopards. Since they have shared space with them for so long, they are aware of the animal, in their own little way, in their own knowledge systems which make it easier for them to accept the animal. This is a lesson for all of us, that it is fear that makes us unaccepting of wildlife and it is understanding that increases our acceptance of them.

My experience of a career in wildlife sciences has been extremely fulfilling. India is an amazing country for wildlife and gives us so many opportunities to do good and new work. A common avenue for getting into the wildlife field is to do your BSc in Zoology and then a Masters in Ecology/Wildlife/Environment and then a PhD. There are also many options to work in the NGO sector in the field of conservation apart from academia.

Personally I would recommend that if you want to find out something new, there is great scope but you have to have an open mind and not allow past ideas to stop you from thinking creatively.



GALLERY  
&  
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YUVARAJ'S

LENS

YUVARAJ KAMATHAD

19CZBT37002



Green lynx spider (*Peucetia viridans*)



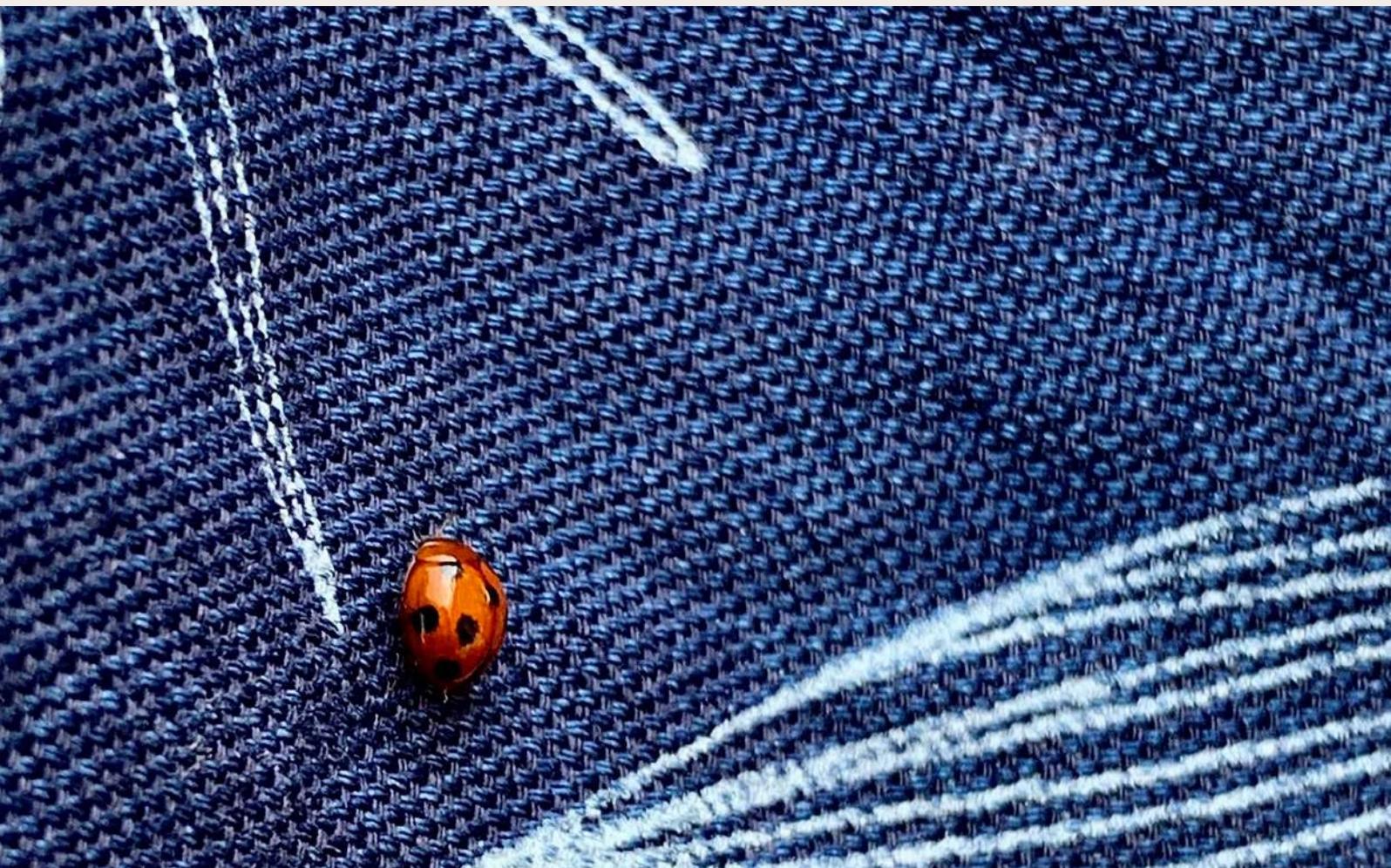
*Telamonia dimidiata*



Orbweaver spider (Araneidae)



White crab spider (*Thomisus spectabilis*)



Ladybug (*Coccinellidae*)



Branded Swifts (Pelopidas)



Jumping spider (Afraflacilla)



Caterpillar of the fruit piercing moth *Eudocima phalonia*



Crane fly (Tipulidae)



Brown marmorated stink bug (*Halyomorpha halys*)



Stingless bees (*Meliponini*)

# MALAVIKA'S MUSINGS

~ The Flame Skimmer Dragonfly ~

The darkness in world recognises the flame you  
ignite,

Brightening the place with hope for the future,  
eliminating one's fright.

The veins of a leaf recognise the veins of your wing  
Calling you to approach it, to appreciate the beauty  
that you bring.

Sitting there with your wings spread, catching one's  
eye

Patiently waiting to explore the world, with the  
freedom to fly.

Up and down you go, striking through the wind  
Serving as an example to those stuck in a whirlwind.  
Known as the Romanian devil's fly or the Angels in  
the sky

A perfect example of how both sides of a coin unify.  
The intricate patterns on your wings and your  
symbolism of change in perspective  
mirrors the ability of a pattern to encourage one's  
behaviour to be more receptive.

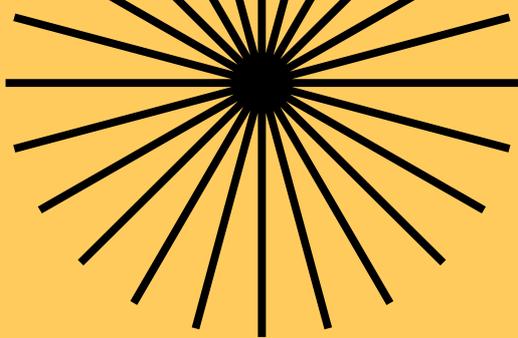
A short life lived yet a significant role you play  
An example you've been setting for us, over decades.

MALAVIKA AMARNATH  
19CZBT37017



PIC COURTESY: MALAVIKA K AMARNATH

# SPECIES OF THE MONTH



A new subspecies of six rows of blue butterflies called *Nacaduba sinhala ramaswamii* has been discovered in the Southwestern Ghats, contributing to the fauna of Indian butterflies and the Western Ghats of Tamil Nadu and Kerala. Four researchers explain this species: Kalesh Sadasivan and K. Baige of the Travancore Natural History Society (TNHS), Rahul Khot of the Bombay Natural History Society (BNHS), and S. Ramasamy Kamayaniker of Teni's Banam. It was released in March, published in 2021 in the Journal of Threatened Taxa.

The new butterfly species is named after Lord Rama. This means connecting to Sri Lanka across the sea. It's also a coincidence that one of the authors who led to the discovery was called Ramasamy, an avid butterfly watcher in Tamil Nadu, and his joint efforts led to the explanation of the new taxon. This lycaenid butterfly belongs to the genus *Nacaduba*, and its common names are Ramaswamy lycaenid butterfly and Ceylon Valayaneeri.

Ramaswamy explained the difficulty that they had to overcome to catalogue the complexity of such a small group of butterflies. And it took a very long time to distinguish species discovered by British and Japanese researchers or in collaboration with local researchers.

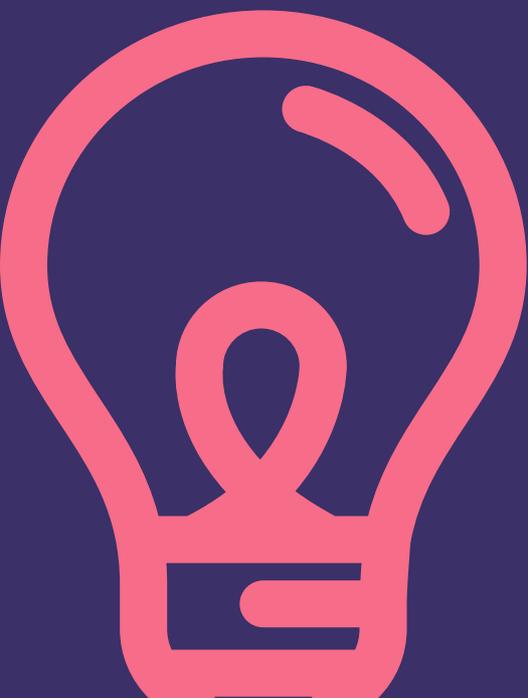
The research team examined the leaves of the butterfly host plant, the longan, from various stages of larva to the final stage of the larvae. Raised larvae and recorded details of adults. Anatomy of the male genitals revealed that they were different from the known *Nacaduba* from South India.

Further investigation revealed that they were consistent with the Sri Lankan species *Nacaduba sinhala ormiston*. However, the male genitals were structurally different. This is the first confirmed evidence of these taxa found in the Western Ghats, and thus in mainland India, as explained in the journal. The distribution of linear blue butterflies extends from India and Sri Lanka to all of Southeast Asia, Australia and Samoa. They have hairy eyes, anastomosis of veins 11 and 12 of the anterior wings, they have purple shiny wings and on the upper parts they represent dull whitish stripes.

# TRIVIA



1. How many species of insect have been identified in the world?
2. How many days (on average) does a bumblebee live for?
3. How many different species of ladybird are there in the world?
4. How big is the largest known ant colony?
5. What insect was the first living creature to be sent into space?
6. How many eyes do caterpillars have?
7. How many flowers do honey bees have to visit in order to make one pound of honey?
8. Which part of the body, does the butterfly use to taste?
9. Name the loudest insect in the world.
10. What is the largest butterfly in the UK?





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