Department of Zoology

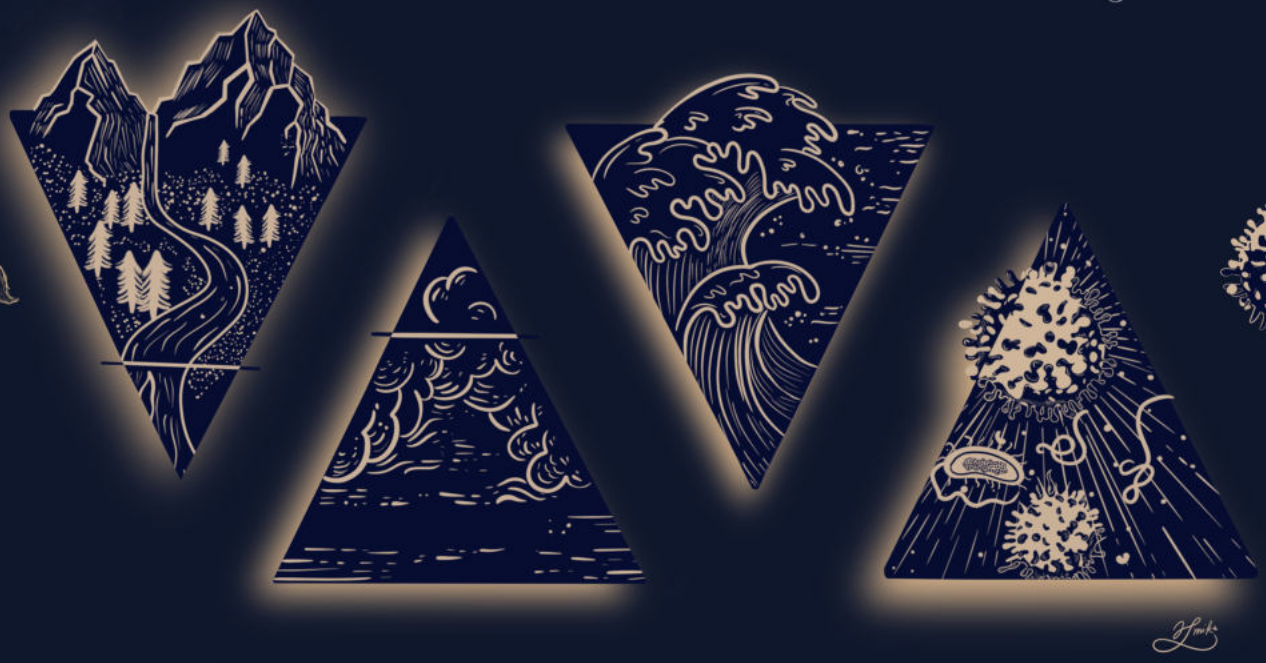
Sri Venkateswara College

presents

PHOENIX

Eleventh Edition

2022-2023



PANORAMA

"Animal vistas across this limited sphere"

Green grass, - yellow flowers, yellow bees

Oh! How wonderful nature can be

Dolphins flowing, rivers growing

A nature we hope to feel

Sandy hills, sandy seas

This range of beauty unseals

I grow old, I grow young

I break, I create

I balance it all

Sad, mad, glad, I feel it all

I harmonize it all

Nowhere, is where you see me

Everywhere is where you find me

Oh! How exotic places this nature has created

The ones we spend years looking

We love it at times

At times its hard

This beautiful nature

Is a gift of god

~Ranjanee Aron

Art by Bhoomika Saklani

MEMBERS

PATRON

PROF. C. SHEELA REDDY
(PRINCIPAL)

EVOLVERE

CONVENOR
Dr.ANITA VERMA

CO-CONVENOR
Dr. P. JAYARAJ
Dr. RICHA MISRA

COMMITTEE MEMBERS
Dr. RAJENDRA PHARTYAL
Dr. NAMITA NAYYAR
Dr. MOHITA BHAGAT
Dr. ANANDHA RAO
Dr. PRIYA SINGH

PRESIDENT
RANJANEE ARON (TZH)

VICE PRESIDENT
SHIVANGI GUPTA (SZH)

TREASURER
PARITOSH SHARMA (TZH)

JOINT TREASURER
PAWAN KUMAR (SZH)

GENERAL SECRETARY
DEEPANSHU (TZH)
ANSHITA VIJ (TZH)

JOINT SECRETARY
ADITYA SINGH (SZH)
TILAK RAJ (SZH)

EXECUTIVE HEAD
MADHAV GUPTA (TZH)
KANAK KHATANA (TZH)
ANUSHKA DHIMAN (SZH)

VOLUNTEER
PREETIKA SINHA (TZH)
BIBHM TIWARI (TZH)
ADITI SINGH (TZH)
MAHIMA RATHEE (TZH)
PREETI YADAV (TZH)
MADHUMANTI DAS (TZH)
KRITIKA (SZH)
KHUSH SHARMA (SZH)
MAYANK KUMAR (SZH)
MANTOSH KUMAR MANDAL (SZH)

PHOENIX

CONVENOR
Dr.RAJENDRA PHARTYAL

CO-CONVENOR
Dr ANITA VERMA
Dr NAMITA NAYYAR

COMMITTEE MEMBERS
Dr. P. JAYARAJ
Dr. PREETI KNANDELWAL
Dr. SUKRAT SINHA
Dr. PRIYA SINGH

EDITOR-IN-CHIEF
SHALINI RAMAN (TZH)
ANUVRINDA SHARMA (TZH)

DESIGNER IN CHIEF
SRIANSHU KUMAR PANDA (TZH)

MANAGING EDITOR
TANYA GOEL (TZH)
SHWETA PAGARIYA (SZH)

CREATIVE HEAD
BHOOMIKA (TZH)
SONIYA (TZH)

EDITOR
KUNAL (TZH)
BHAVISH (TZH)
ABHIJEET (SZH)
SHWETA (SZH)
TANVI (SZH)
MUSKAN ANTHAL (SZH)
JASLEEN KAUR (SZH)
SIMRAN (SZH)

DESIGNER
ISHA YADAV (SZH)
ANUBHA RAWAT (FZH)

FROM THE

PRINCIPAL'S DESK

Tirumala Tirupati Devasthanams
శ్రీ వేంకటేశ్వర కళాశాల
Sri Venkateswara College
(University of Delhi)
NAAC Grade A+

Prof. C. Sheela Reddy
Principal

From The Principal's Desk

I welcome the 11th Edition of the Annual Magazine "PHOENIX" released by the Department of Zoology, fuelled by persistent hard work and determination of the students and teachers. The magazine provides a wonderful platform to combine science with enthusiasm and creativity creating an amalgamation of knowledge. The Department of Zoology never fails to prove excellence due to the passionate faculty and students of the Department. The teachers function as mentors for students' channelling their dedication, creativity and intellect therby helping them evolve into multifaceted individuals, through exposure to academic and extracurricular opportunities.

This 11th edition of the magazine beautifully captures the skills and creativity of students as well as the evolution of the Zoological Society "Evolvere" over the years from a humble beginning. The society has been responsible for conducting various events ranging from informative talks, seminars and webinars by influential speakers of national and international repute, workshops, fun sessions and activities. "Phoenix" documents different comprehensive aspects of the field in itself along with the plethora of perspectives this discipline holds in the young minds.

I appreciate the efforts done by the entire team and would once again like to congratulate the Department of Zoology for the successful release of 11th edition of their magazine.

I wish them all the best in their future endeavors!

FROM THE CONVENERS' & CO- CONVENERS' DESK

Convener
Dr. Rajendra Phartyal

Co-Convener
Dr. Anita Verma
Dr. Namita Nayyar

From The Conveners' & Co- Conveners' Desk

'Creativity is the power to connect the seemingly unconnected' by Ed Bennett stands truly justified as this edition of PHOENIX is a collection of different ideas from our students with the magic of creativity and inspiration. The Department of Zoology excels in both curricular and co-curricular aspects and has been an epitome of innovation and excellence throughout its diversified chronicle of five decades.

Each year is marked by the remarkable execution of the society events organized and coordinated by Phoenix and Evolvere teams. All these events have given us amazing opportunities to interact with students who not only ace in studies but also organize well-coordinated events. The Society and the Magazine have been evolving every year with fresh students who are keen in keeping the tradition of magazine and activities alive with the help of our dedicated and motivating teachers who contribute to the success of every event.

The Department has conducted many successful events even during the pandemic. Our events are glorified with the presence of many eminent national and international speakers. The release of 9th Edition of the magazine marks a special day for us as the event was graced by the world-renowned primatologist, Dr. Jane Goodall. The celebration for the 10th edition magazine release was another special event as the department celebrated a decade of its magazine legacy which was graced by the presence of Douglas J. Futuyma an American evolutionary biologist.

We proudly present the 11th edition of our magazine, 'PHOENIX'. Our magazine explores the "PANORAMIC" view in various vistas of the animal world across the biosphere. This beautiful magazine is a concoction of curiosity, interesting facts, artworks and creativity that continues to fascinate our readers every year.

We express gratitude to Prof. C. Sheela Reddy, our honorable Principal, for her unwavering guidance and encouragement. We sincerely thank our students and teachers for being a part of this arduous journey and making this magazine come out so well. We wish to keep inspiring our students and their talented minds to keep this legacy alive for years to come!

FACULTY OF

DEPARTMENT OF ZOOLOGY

Dr. Anita Verma
Specialize in - Entomology and Physiology

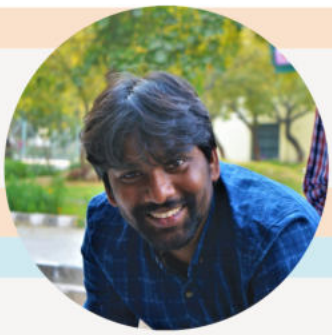
Dr. Vartika Mathur
Specialize in - Insect-plant-microbe interaction

Dr. Om Prakash
Specialize in - Fish Biology and Proteomics

Dr. Ajaib Singh
Specialize in - Molecular Biology

Dr. Rajendra Phartyal
Specialize in - Fish Endocrinology and Protein purification

Dr. Mansi Verma
Specialize in - Molecular Biology and Bioinformatics



Dr. P Jayaraj
Specialize in - Cancer Biology and Reproductive Biology

Dr. Riyaz Bakshi
Specialize in - Neurophysiology and Medical Diagnostics

Dr. Vagisha Rawal
Specialize in - Entomology

Dr. Richa Misra
Specialize in -Tuberculosis Biology and Human Gut Microbiome

Dr. Namita Nayyar
Specialize in - Molecular Biology and Biotechnology

Dr. Preeti Khandelwal
Specialize in - Cell and Molecular Biology

Dr. Sadqua Shameem
Specialize in- Ichthyology and Fisheries

Dr. Aarti Seherawat
Specialize in- Entomology

Dr. Nawaz Alam Khan
Specialize in - Stress Biology & Dietary Supplements, Larviculture

Dr. Amarjeet Singh
Specialize in - Fish Biology

Dr. Pooja Vijay
Specialize in - Fish Endocrinology

Dr. Dinesh Raj Pant
Specialize in - Fish Reproductive biology

NEW FACULTY MEMBERS

Dr. Sukrat Sinha
Specialize in immunology, cell signaling and computational biology of infectious diseases.

Dr. Mohita Bhagat
Specialize in molecular biology, biochemistry and oncology.

Dr. Obaiah Jamakala
Specialize in Animal Physiology and Environmental Toxicology.

Mr. C. Sreenivasa Reddy (PhD)
Specialize in Biochemistry

Dr. Priya Singh
Specialize in Neurosciences

Dr. Anjali S. Nawani
Specialise in Reproductive Physiology and Endocrinology.

Dr. Sumit Raj
Specialize in recombinant DNA Technology, Molecular biology and Biochemistry.

Dr. Anandha Rao
Specialize in Ecotoxicology and Endocrinology

C O R E

SHALINI RAMAN, TZH
EDITOR-IN-CHIEF

Nature, a divine creation of almighty, is a beautiful orchestration of assorted life forms that seem to co-exist in this limited sphere. Phoenix, is art in its true sense, a memoir of tireless efforts and innovation that has manifested through scattered ideas of young minds of our very own authors, designers and editors, which were then streamlined into paragon of virtue by our dear mentors. The 11th edition deals with the miscellany within this colossal sphere encompassing several entities despite an ironical limitation that it holds. I am evoked by nostalgia to now realize that this would be my last tale to share, as editor-in-chief of this iconic legacy of our department, Phoenix. My throat hurts as I bid adieu to this decorated platform and present you an exquisite exposition of pen and brushes!

In 2020, with the barricades covid had placed on our lives, Phoenix presented itself as the first opportunity in college that promised freedom to navigate and venture out to discover and nurture new skills. The title 'Chief-Editor' was something I couldn't be thankful enough for. To pick up parts of Zoology and amplify it to the audience, while reflecting the passion behind it was something everyone in the team was striving towards. The magazine holds a plethora of knowledge that stems from an individual's interest in the discipline of Zoology itself, thus providing an insight into the various doors it holds open for different people. Having the opportunity to work together with a group of talented and dedicated people only made the process an even more enjoyable experience. From frantic discussion, to billions and billions of synonym searches, the Phoenix has laid itself as a core memory in my resting heart.

ANUVRINDA SHARMA, TZH
EDITOR-IN-CHIEF

As I look back on my journey from being the photographer of EVOLVERE to becoming the Designer in Chief of PHOENIX, I am filled with a warm nostalgia for all the beautiful memories that will remain with me forever. College days were a time of learning and growth and I'm so grateful for having been given the opportunity to explore and develop my skills in design - something I have always loved doing. I feel privileged to be in this position today and to have been given the honor of working with a talented team who have worked together like a family to create incredible things. A good design has the power to speak volumes and it has been an absolute pleasure working with everyone on this collective endeavor.

SRIANSHU KUMAR PANDA, TZH
DESIGNER-IN-CHIEF

T E A M

The charm of being in college is truly an amazing experience filled with loads of cheer and joy with sometimes sorrow being a part of it! Out of all the different episodes I've had in the college, Phoenix was one of the best adventures that I was a part of. From starting my journey as a rookie, being the editor to having the title of Managing Editor, it was enthralling and magnificent. Phoenix has taught me the wisdom of words, the importance of division of labour and how to challenge yourself at every bit and piece. At times, for sure the work turned strenuous and burdensome, but with the efforts of such an enthusiastic team, the bearers for support and motivation, who at every step urge you to work diligently, this wonderful magazine came out to be true just like an incredible dream. So, hang on and fasten your belts as this edition of Phoenix is about to take you on an escape journey never lived before, plugged in with enlightening chapters of knowledge, zest and sparkle!

TANYA GOEL, TZH
MANAGING EDITOR

Having the opportunity to work as the Managing Editor for the 11th edition of this magazine was an incredible experience. All of the meetings and discussions, as well as editing the articles and finally seeing the results in the magazine, make me very happy and fill my heart with joy. A huge thank you to the entire team who worked tirelessly day and night to pull everything together. The finished output is truly outstanding. For me it would not have been possible without the assistance of my seniors. All of the members' hard work and dedication were noticed, and I am confident that it will continue to pay off in the future as well. Working as an editor was a truly rewarding experience for me and working with such talented people brings out the best in me, which I may not be aware of. This magazine is a reflection of the excellent work done by each member. I hope you enjoy our publication.

SHWETA PAGARIYA, SZH
MANAGING EDITOR

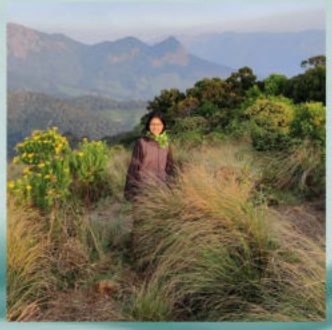
Being a part of this society helped me in a lot of ways i was having a hard time adjusting in college but because of this i was able to meet some amazing and talented people. This journey gave me confidence to lead, multitask and get out of my comfort zone.Putting a magazine together is very a challenging and tedious task but with the team work of our whole group we made it possible. I can see how my skill and interest in graphic designing is flourishing. Am really grateful for this opportunity and the whole team for their support

BHOOMIKA SAKLANI, TZH
CREATIVE HEAD

In first year I gave my name for magazine society and I was selected as volunteer I gave my all efforts and hard work. And now I become a creative head of Phoenix. It was very happy moment when I was chosen as creative head for magazine. I am very grateful to all my seniors who helped me whenever I needed and make me able to do such a perfect designing .we were already presented the 10th edition of Phoenix last year and this year we are going to present 11th addition. This is not possible without the help of our seniors and entire team of Phoenix .Truly I am very grateful to all the editors, designers, my seniors, all my teachers and the entire team of Phoenix.

SONIYA PANWAR, TZH
CREATIVE HEAD

Evolvere team



PRESIDENT

Ranjanee Aron, TZH

VICE PRESIDENT

Shivangi Gupta, SZH

GENERAL SECRETARY

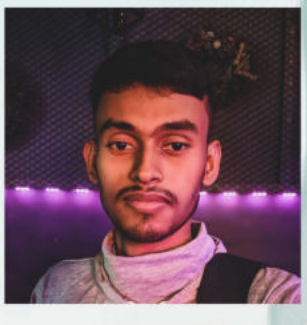
Deepanshu, TZH

GENERAL SECRETARY

Anshita Vij, TZH

TREASURER

Paritosh Sharma, TZH



JOINT TREASURER

Pawan Kumar, SZH

JOINT SECRETARY

Aditya Singh, SZH

JOINT SECRETARY

Tilak Raj, SZH

EXECUTIVE HEAD

Anushka Dhiman, SZH

EXECUTIVE HEAD

Madhav GUpta, TZH

EXECUTIVE HEAD

Kanak Khatana, TZH

VOLUNTEER
Aditi Singh, TZH

VOLUNTEER
Bibham Tiwari, TZH

VOLUNTEER
Khush Sharma, SZH

VOLUNTEER
Preeti Yadav, TZH

VOLUNTEER
Mahima Rathee, TZH

VOLUNTEER
Madhumanti Das, TZH

VOLUNTEER
Mantosh, SZH

VOLUNTEER
Anubhav, FZH

VOLUNTEER
Arth, FZH

VOLUNTEER
Shreya, FZH

VOLUNTEER
Shreya Singh, FZH

VOLUNTEER
Harshita Jha, FZH

VOLUNTEER
Meena, FZH

VOLUNTEER
Ananya, FZH

VOLUNTEER
Anubha, FZH

Phoenix Team

EDITOR-in-CHIEF

Shalini Raman, TZH

EDITOR-IN-CHIEF

Anuvrinda Sharma, TZH

DESIGNER-IN-CHIEF

Srianshu Kumar Panda, TZH

MANAGING EDITOR

Tanya Goel, TZH

MANAGING EDITOR

Shweta Pagaria, SZH

CREATIVE HEAD

Bhoomika Saklani, TZH

CREATIVE HEAD

Soniya Pawar, TZH

EDITOR

Kunal Rao TZH

EDITOR

Bhavish Saini TZH

EDITOR

Abhijeet SZH

EDITOR

Jasleen Kaur SZH

EDITOR

Muskan Anthal SZH

EDITOR

Tanvi SZH

DESIGNER

Isha, SZH

EDITOR

Simran, SZH

ZOOLOGY DEPARTMENT COMMITTEES

Examination Planning & Date-sheet Committee
Prof. Om Prakash
Dr. Preeti Khandelwal
Dr. Amarjeet Singh
Dr. Sukrat Sinha

Students Grievance Committee
Dr. Anita Verma
Prof. Vartika Mathur
Prof. Om Prakash
Dr. Rajendra Phartyal

Alumni Committee
Dr. Namita Nayyar
Dr. Anita Verma
Dr. Rajendra Phartyal

NAAC Co-Ordinator Committee
Dr. Preeti Khandelwal
Dr. Amarjeet Singh

Library Book Purchase and Book Bank Committee
Dr. Rajendra Phartyal
Dr. P Jayaraj
Dr. Shreenivasa Reddy
Dr. Anandha Rao

Chemicals and Glass-ware Purchase Committee
Dr. Richa Misra
Dr. Anjali Nawani
Dr. Obaiah Jamakala

Instrument & Equipment Purchase Committee
Prof. Om Prakash
Dr. Preeti Khandelwal

Department Development & Maintenance Committee
Dr. Namita Nayyar
Dr. Amarjeet Singh
Dr. Sukrat Sinha
Dr. Priya Singh

Admission Committee
Teacher-in-charge (TIC)

Museum Specimens and Slides Sorting Committee
Dr. P. Jayaraj
Dr. Rajendra Phartyal
Dr. Namita Nayyar
Dr. Sumit Raj
Dr. Mohita Bhagat
Dr. Anandha Rao
Dr. Priya Singh

Instruments & Equipments Upkeep Committee
Dr. Sumit Raj
Dr. Shreenivasa Reddy
Dr. Amarjeet Singh
Dr. Sukrat Sinha
Dr. Obaiah Jamakala

Zoology Society and Seminars & Festivals Planning Committee
Dr. Anita Verma
Dr. P Jayaraj
Dr. Richa Misra
Dr. Rajendra Phartyal
Dr. Namita Nayyar
Dr. Mohita Bhagat
Dr. Anandha Rao

Zoology Magazine Committee
Dr. Anita Verma
Dr. Rajendra Phartyal
Dr. Namita Nayyar
Dr. P. Jayaraj
Dr. Preeti Khandelwal
Dr. Sukrat Sinha
Dr. Priya Singh

Educational Tours & Excursions Planning Committee
Prof. Om Prakash
Dr. Rajendra Phartyal
Dr. Preeti Khandelwal

Work-load-cum Time Table Planning Committee
Prof. Vartika Mathur
Dr. Richa Misra
Dr. Namita Nayyar

TEAM EVOLVERE

TEAM PHOENIX

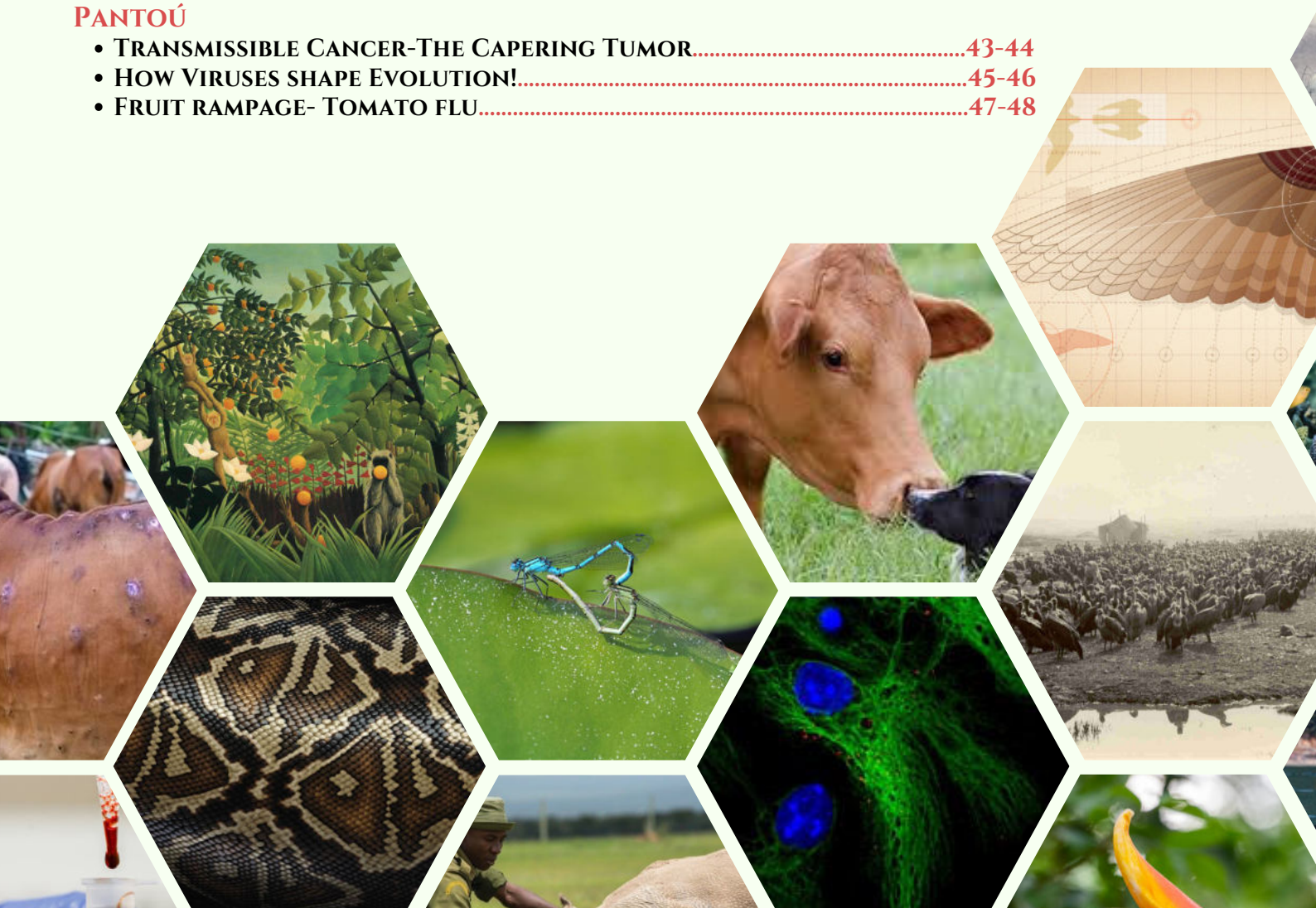
CONTENTS

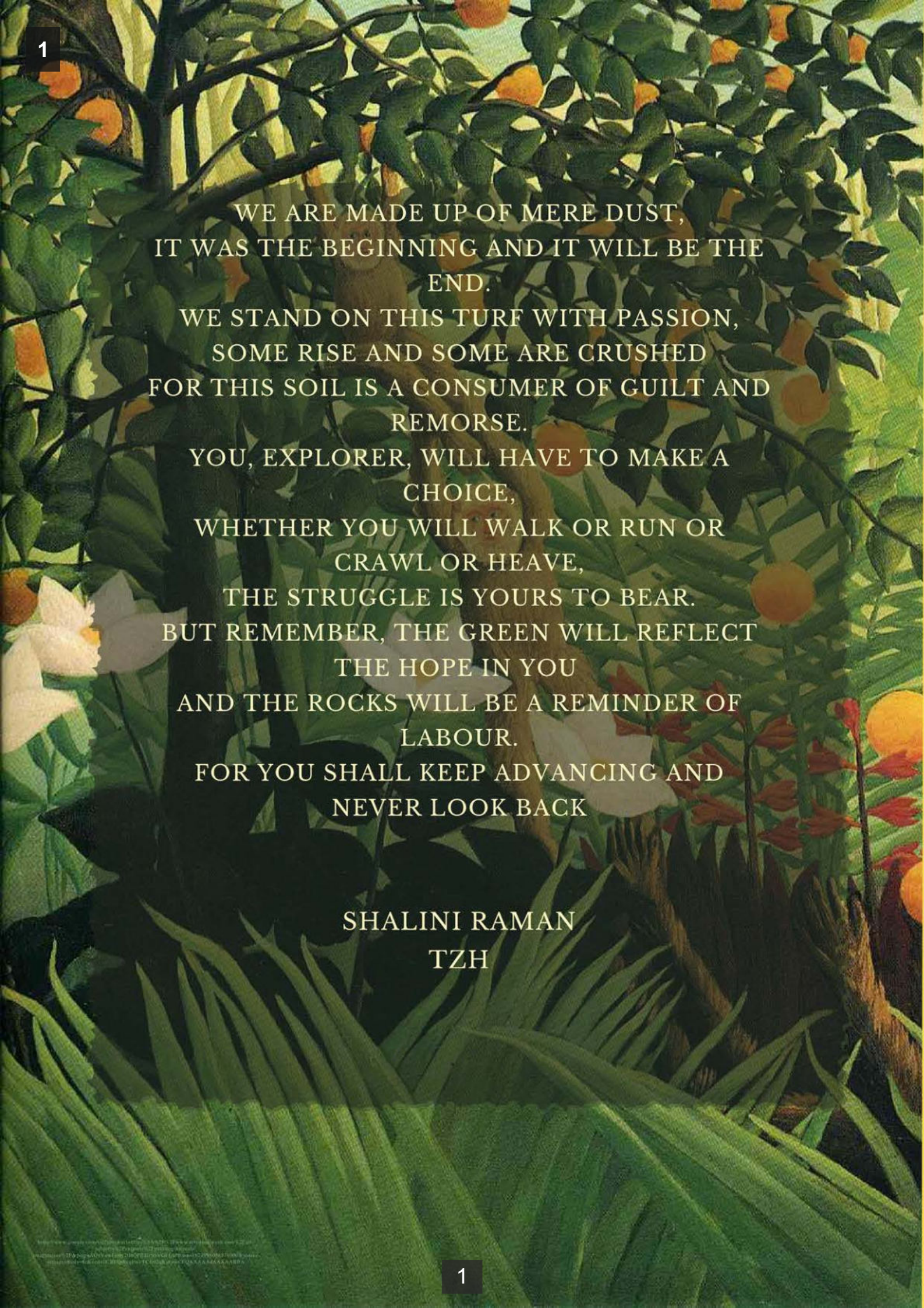
TERRA

AÉRAS

AQUA

PANTOÚ



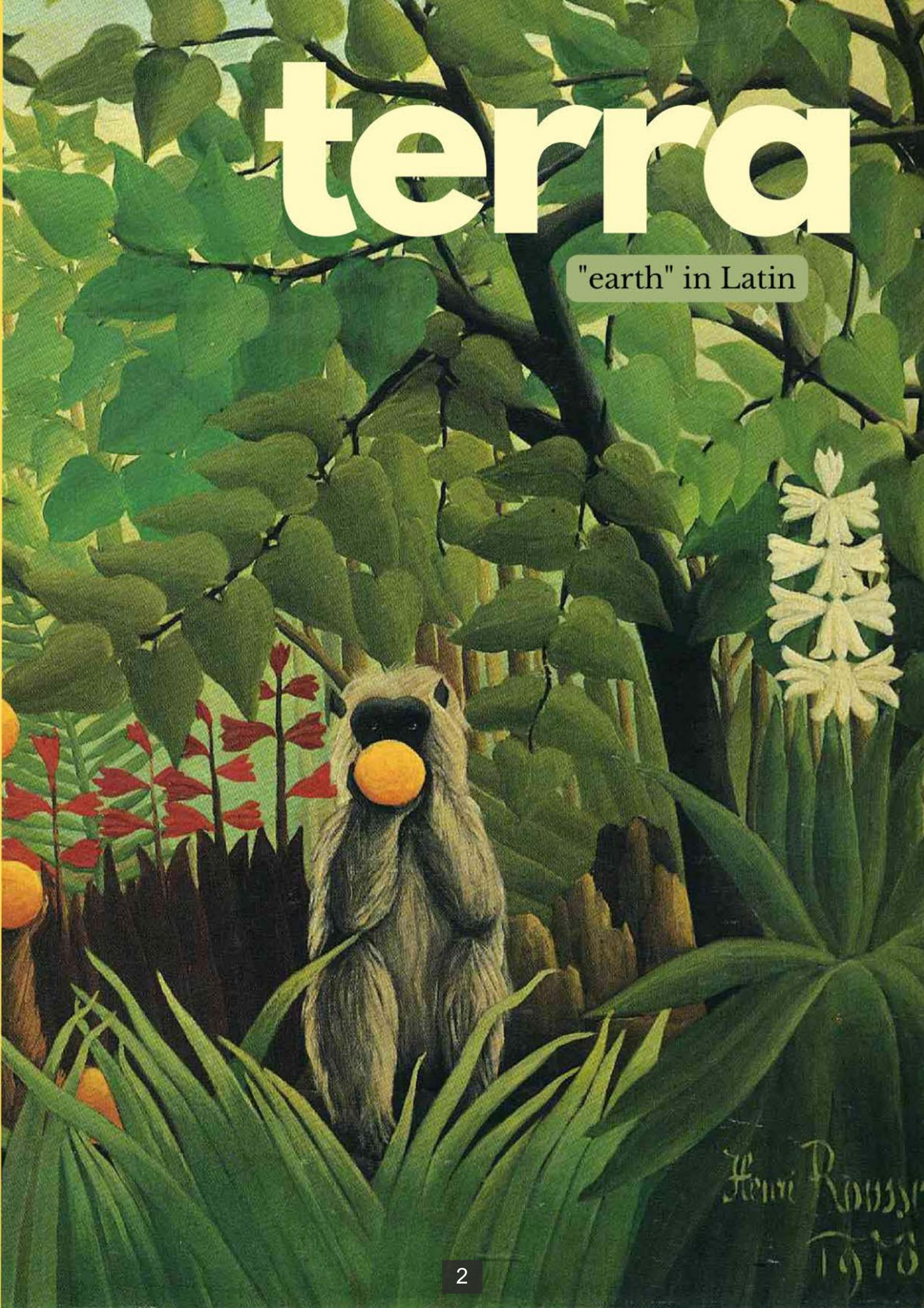


WE ARE MADE UP OF MERE DUST,
IT WAS THE BEGINNING AND IT WILL BE THE END.
WE STAND ON THIS TURF WITH PASSION,
SOME RISE AND SOME ARE CRUSHED
FOR THIS SOIL IS A CONSUMER OF GUILT AND REMORSE.
YOU, EXPLORER, WILL HAVE TO MAKE A CHOICE,
WHETHER YOU WILL WALK OR RUN OR CRAWL OR HEAVE,
THE STRUGGLE IS YOURS TO BEAR.
BUT REMEMBER, THE GREEN WILL REFLECT THE HOPE IN YOU
AND THE ROCKS WILL BE A REMINDER OF LABOUR.
FOR YOU SHALL KEEP ADVANCING AND NEVER LOOK BACK

SHALINI RAMAN
TZH

terra

"earth" in Latin



Realm of Radiant Reptiles

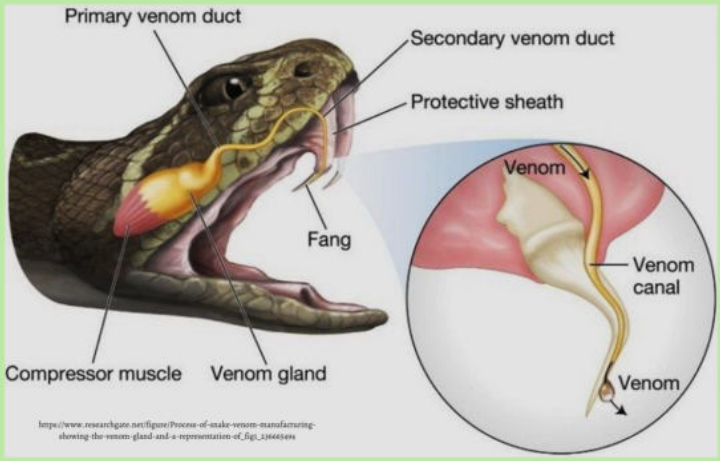
~TANYA GOEL, TZH

Venom or Reptiles – seem to go hand in hand especially when the image of snakes is perceived in our minds. But as commonly mistaken, snakes are not the only members in the class reptilian that are venomous. Yes! Rightly guessed, Lizards are also credit holders in that aspect. From a giant polar bear to a teensy little otter, many snakes and lizards have the capability to kill them whether by venom injection or constrictions.

Venom is a functional trait, used by one organism to clobber the other, and for achieving that, some systems, and mechanisms must be required. Therefore, true venom systems are evolved twice in two extant species – sometimes prompt in Helodermatid Lizards subsequently followed in complex snakes (Colubrids, Viperids, Elapids and Atractaspidids). Colubrids Family includes the common snakes like Grass Snake, Corn Snake, Ladder Snake; Viperids are Pit Vipers, Gaboon Vipers, Common European Vipers; Cobras, Kraits, Sea Snakes, Death Adders belong to the Elapids while Mole Vipers, Stiletto Snakes or Burrowing Asps belong to the Atractaspidids Family. The venom glands in Helodermatids lie in the lower jaw and along with multiple teeth, emptying within the mouth. Feeding largely on eggs and nestlings, the venom system in these plodding animals is presumably a part of the protection game plan. Within venomous snakes, the temporal region is the one which harbours the venom gland. In Viperids and Elapids, the venom systems consist of the main venom gland, which is pressurized during the strike by directly attached striated muscles, associated with an accessory duct with connecting ducts, eventually emptying into the hollow fang. Only a main venom gland is present in Atractaspidids which is pressurized by the striated muscles. In contrast, Colubrids snakes have a relatively lower-pressure system based on Duvernoy's Gland (present posterior to the eye, encased in a thin cover of connective tissue and consists of serous cells) lacking a large reservoir which releases venom more slowly into oral epithelia adjacent to teeth. In Viperids, Elapids and Atractaspidids, a bolus of venom is quickly discharged by the venom system to dispatch the prey. Such differences in the deployment of these oral glands account for variations in gland structure and in the composition of their secretions.

Significant variation of glands is known to be present in and around the oral cavity of reptiles. Having precise locations, some are in the tongue, along the upper and lower lips, near the nasal cavity or adjacent to the eye; while others are specialized to contribute selective secretions to the mouth. The glands associated with the nasal cavity and eye, keep them moist and perform some peculiar related functions yet to be discovered. The secretions released immediately into the oral cavity help to lubricate the food to ease its passage during swallowing.

The venom apparatus in Helodermatids (Gila Monster, Mexican Beaded Lizard etc.) serves as a defensive mechanism evidently, as these lizards are slow-moving, having the lowest metabolism of all lizards. Prey for these lizards are birds, juvenile mammals, and reptilian eggs which are swallowed by little resistance.



The venom secretions in helodermatids evolved independently. Contrasting to venomous snakes, the venom gland, a specialized mandibular gland, lies along the lower jaw, opening into single or multiple ducts that conduct venom to the mandibular tooth row. Mandibular and maxillary teeth are grooved, not tubular, thus aiding the flow or distribution of oral secretion. Multiple lobules are cocooned by the venom gland emptying into a slightly expanded central lumen without any acknowledgement of reservoirs, storing large volumes of venoms.

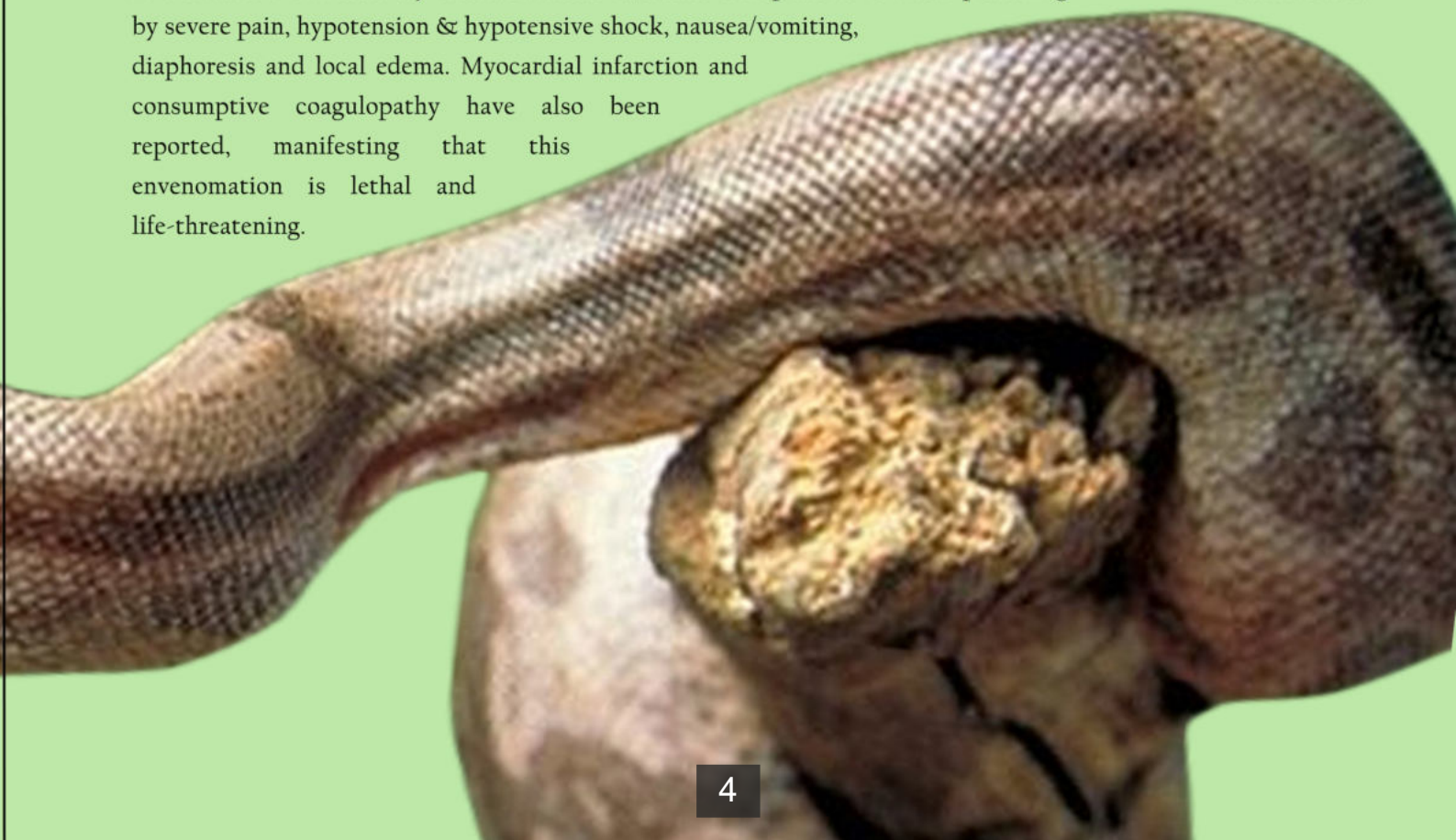
In contrast to Helodermatid lizards, the venom of Elapids, Viperids and Atractaspids is produced in and delivered by a specific venom apparatus along the upper jaw that includes speciation of glands, muscles, teeth, venom and behaviour.

Elapids' (sea snakes and allies) and Vipers' venom glands exhibit some variability in morphology and size, but the same basic design is shared i.e., the presence of the main venom gland with an accessory gland. In vipers, the secretions of the main venom gland empty via a single primary duct into the accessory gland, from where through a secondary duct the secretions go into the base of the tubular fang, whereas, the accessory gland surrounds the primary duct and is situated adjacent to the main venom gland in Elapids.

Different venom gland arrangement is present in Atractaspidids. The centrally located lumen is elongated and surrounded by spoke-like tubules. The gland may be located in the temporal region in some species while in other, it extends posteriorly out of the region and along the sides of the body. It is accompanied by striated compressor muscles involved directly in emptying the gland. Unlike Vipers and Elapids, the venom gland of Atractaspidids lacks a discrete accessory gland with the gland compressor muscle, being derived from the adductor externus medialis.

Reptiles are truly fascinating creatures. Belonging to the same class, yet they are so different from each other. Either way, after knowing about their venom glands and their properties, we dare not mess with them!

The glycoprotein gilatoxin (present in Gila Monster and thus the name) exhibits a murine IV lethal potency. Evenomations inflicted by Helodermatids fabricate conspicuous clinical poisoning delineated by severe pain, hypotension & hypotensive shock, nausea/vomiting, diaphoresis and local edema. Myocardial infarction and consumptive coagulopathy have also been reported, manifesting that this envenomation is lethal and life-threatening.



LUMPY SKIN DISEASE IN CATTLE

Lumpy Skin Disease (LSD) is a viral disease that affects cattle and can cause skin nodules, fever, and reduced milk production. It is a non-zoonotic disease or contamination as a result of lumpy pores and skin ailment virus(LSDV).It is a viral ailment that impacts cattle. It's far transmitted via blood-feeding bugs consisting of sure species of flies and mosquitoes and ticks.

Lumpy Skin Disease (LSD) is caused by the lumpy skin disease virus (LSDV), a member of the poxvirus family. It is primarily spread through direct contact between infected and susceptible animals, as well as through insect vectors such as biting flies.

Lumpy skin disease caused by capripox virus

https://www.siasat.com/lumpy-skin-disease-test-station-set-up-on-karnataka-telangana-border-2468755/

https://www.bbc.com/news/world-asia-india-62474457

Lumpy skin disease caused by Capripox virus

LSDV is closely related to other Capri poxviruses, including sheepdog virus and goatpox virus that infect wild ruminants, suggesting that it may have originated from these hosts and then jumped to cattle. The exact mechanisms by which the virus evolved and became capable of causing disease in cattle are not clear, but may involve mutations or recombination events that allowed the virus to adapt to a new host and cause disease. This may have occurred through genetic exchange or recombination events between these viruses.

Infection with LSDV can cause a wide range of symptoms, including skin lesions, fever, weight loss, and decreased milk production. LSD is a significant problem for the cattle industry, as it can lead to significant economic losses, as well as have negative impacts on animal welfare and food security.

To control LSD, it is important to implement measures to prevent the spread of the virus, such as vaccinating susceptible animals, implementing strict biosecurity measures, and controlling the movement of infected animals and contaminated materials between farms. In addition, rapid diagnostic tests and effective treatments are also important tools for controlling LSD.

WHAT'S happening IN INDIA?

The first reported case of lumpy skin disease (LSD) in India was in 2016. The disease was reported in the state of Gujarat, in the western part of the country. Since then, LSD has been reported in other states in India, including Maharashtra, Madhya Pradesh, and Rajasthan. LSD has had a significant impact on the cattle industry, causing significant economic losses due to decreased productivity and decreased market value of affected animals. Lumpy skin disease (LSD) is a viral disease that primarily affects cattle.

The symptoms of LSD can vary in severity and duration, but common clinical signs include:

Skin nodules: The most distinctive symptom of LSD is the formation of nodules or lumps on the skin, which are firm, raised, and irregular in shape

https://www.gymple.qld.gov.au/lumpy-skin-disease

Infected cow showing skin nodules

- Swelling: Affected animals may develop swelling of the face, neck, and other parts of the body.
- Fever: Fever is a common symptom of LSD and can be accompanied by a decrease in appetite and a decrease in milk production.
- Eye discharge: In some cases, LSD can cause conjunctivitis, leading to eye discharge and inflammation.
- Respiratory signs: LSD can also cause respiratory symptoms such as coughing and nasal discharge.
- Reproductive problems: In severe cases, LSD can cause infertility and reduced fertility in infected animals.
- In addition, some infected animals may show no clinical signs but can still shed the virus and spread the disease to other animals.
- The Indian government has taken steps to control the spread of LSD, including implementing strict biosecurity measures, improving surveillance and diagnostic capabilities, and vaccinating susceptible animals.Despite these efforts, LSD continues to be a challenge in India, and ongoing efforts are needed to improve our understanding of the disease and develop more effective control strategies. This includes ongoing research into the epidemiology, transmission, and control of LSD, as well as the development of new diagnostic tests and vaccines.

IS THERE A VACCINE FOR LUMPY skin disease?

Yes, there is a vaccine against viral infection. The ICAR-countrywide research Centre on Equines (ICAR-NRCE) in collaboration with ICAR-Indian Veterinary research Institute (IVRI) has evolved a vaccine against Lumpy skin sickness. Lumpi-ProVacInd. The indigenous vaccine Lumpi-ProVacInd has been developed to protect livestock from Lumpy Skin disease.

The vaccine has been developed by the National Equine Research Center, Hisar (Haryana) in collaboration with the Indian Veterinary Research Institute, Izzatnagar (Bareilly). Goat pox , sheep pox and LSD belong to the same Capripoxvirus genus of Poxviridae family. Lumpi-ProVacInd is a homologous vaccine made with the same virus as the disease.Ever since the disease came to India in 2019, research institutes have been engaged in developing the vaccine.

High Minister Narendra Modi, addressing the problem of the viral outbreak amongst animals said, “we are committed to one hundred consistent with vaccination of farm animals through 2025, for foot and mouth sickness. Our scientists have also organized an indigenous vaccine for Lumpy skin disorder.”

-Tanvi ,SZH

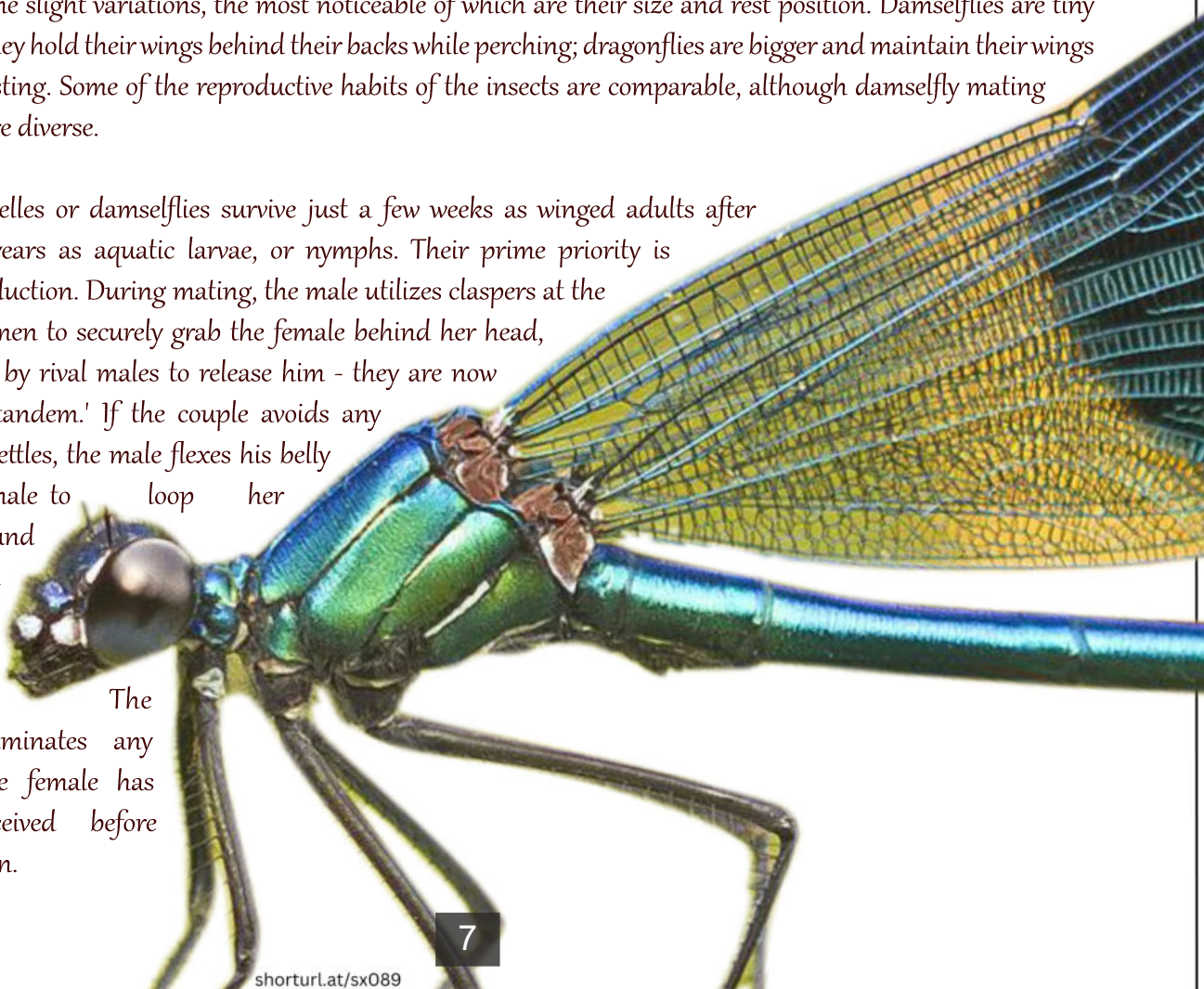
LOVE IS IN THE AIR

~SRIANSHU KUMAR PANDA, TZH

It was a frigid winter morning around 8 a.m., and I went seeking for insects to shoot as a leisure pastime during the lockdown. Then I found these lovely creatures mating on a twig. It was such an athletic sight that I was taken aback to observe such an unusual action. I watched them for maybe a half an hour or so. Then, as the wind speed rose, they began to fly. Their flight astounded me more than their mating rituals. I had seen that they were mating in the air as well, and I was so astounded by the whole affair that millions of strange questions flooded my mind at that time. Some of the puzzles that have been bothering me include: how they achieve such a coupling position, who is the male and who is the female, how they both fly together, what is the specific mechanism of their copulatory flight, how the male and female cope with one other's speed, and so on. I took photographs and videos and felt very fortunate to be there. After returning from there, I attempted to find answers to all of my inquiries on the internet. Many of the answers from certain study publications astonished and delighted me.

Dragonfly and damselfly sex is a very visible occurrence, distinguished by the heart-shaped "wheel" formation of mating couples. Dragonflies and damselflies are closely related insects that belong to the Odonata order. The two insects have some slight variations, the most noticeable of which are their size and rest position. Damselflies are tiny and thin, and they hold their wings behind their backs while perching; dragonflies are bigger and maintain their wings spread while resting. Some of the reproductive habits of the insects are comparable, although damselfly mating systems are more diverse.

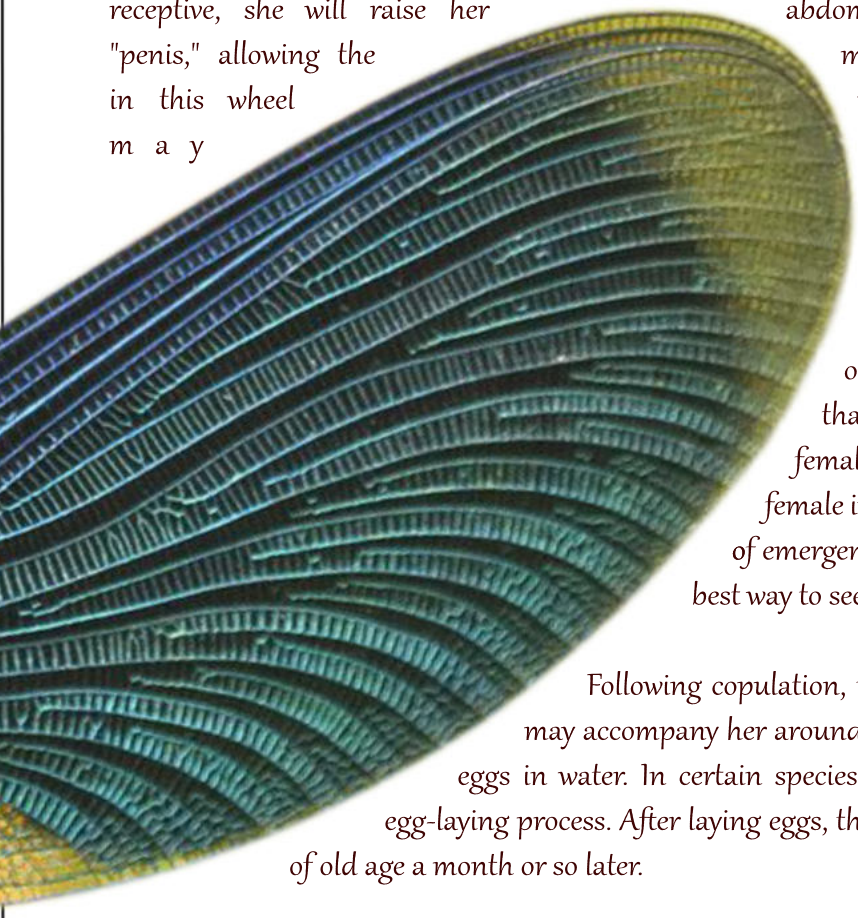
Banded demoiselles or damselflies survive just a few weeks as winged adults after spending two years as aquatic larvae, or nymphs. Their prime priority is currently reproduction. During mating, the male utilizes claspers at the tip of his abdomen to securely grab the female behind her head, resisting efforts by rival males to release him - they are now said to be 'in tandem.' If the couple avoids any intruders and settles, the male flexes his belly to urge the female to loop her abdomen around and interlock with him, forming the 'wheel' posture. The male first eliminates any sperm that the female has previously received before inserting his own.



A MAJESTIC RITUAL OF DAMSELFLY MATING

Male dragonflies are fiercely territorial, defending their little breeding region from other males. They will grip and bite each other's wings and heads during combat, inflicting possibly lethal wounds. Females travel to male territory near ponds, rivers, and streams to mate with the finest combatants. Some damselfly species establish territories as well, while others do it in a different fashion. Some species' males fly about looking for suitable mates. According to Guillermo-Ferreira, the most reproductively successful males are often the greatest flyers and searchers. Other damselflies have brightly colored wings that they employ to both scare other males and seduce females.

To mate, the male initially holds the back of the female's neck using claspers at the end of his abdomen, which fit into species-specific grooves in the female. From here, the two may fly about in tandem. If the female is sexually receptive, she will raise her abdomen, bringing her "vagina" into touch with his "penis," allowing the male to deposit his sperm. Some species will only stay in this wheel posture for a minute. Others, on the other hand, may remain in formation for several hours as the male attempts to scoop out any sperm from previous males the female may already have in her. Mating in banded demoiselles (Damselflies) takes less than five minutes, although it can take longer in other damselfly and dragonfly species. Following that, the pair separates, but the male protects the female from rivals while she lays her eggs. Because the female inserts them into aquatic plants, looking for patches of emergent vegetation in slow-flowing streams is typically the best way to see this intriguing activity.



Following copulation, the male may release his mate and fly away, or he may accompany her around to protect her from other males while she lays her eggs in water. In certain species, the couple will remain together throughout the egg-laying process. After laying eggs, the odonates will breed a few more times until dying of old age a month or so later.

AGONY BEHIND THE WOOFS AND THE MOOS

Occupied by various kinds of novel diseases breaking new grounds everyday with their new variants, causes and symptoms that are causing harm to mankind, we often tend to turn a deaf ear to adversities that the other part of this civilization has to go through. Not a very commonly known but yet a very concerning newly identified disease, **Neosporosis**, is emerging amongst dogs and cattle worldwide. It is a parasitic infection caused by a cyst forming coccidian *Neospora caninum* parasite that was identified as a species in 1988.

Studies suggest that there are mainly three stages in the life cycle of this parasite: tachyzoites, tissue cysts, and oocysts. Dogs act as both the intermediate and definitive host for *N. caninum*, tachyzoites and tissue cysts are the stages found in the intermediate hosts and they occur within the intracellular region. Domestic dogs are the only known definitive host for *N. caninum*. This disease has often been misdiagnosed as Toxoplasmosis, since *N. caninum* oocysts are morphologically similar to *Toxoplasma gondii* and *Hammondia hammondi* oocysts in cat feces and broadly resemble oocysts of *Hammondia heydorni*-like parasite in dog feces. Throwing light on the structure and origin of this parasite, let us now look at how it is bringing agony to the lives of such whimsical creatures like dogs.

Beginning as un-sporulated oocytes, neosporosis parasites are transmitted through faeces, water, food, or soil. They become sporulated and live in the body after being consumed. The last and most lethal stage is when they have fully developed into tachyzoites. As previously mentioned, domestic dogs act as a definitive host for the parasite, this is because the owners who feed their pet dogs with raw elements in their diet, jeopardize their health by easy ingestion of this parasite which might be present in its un-sporulated form.

Similar to the majority of parasitic infections, signs may not always be obvious until it is too late. When symptoms do manifest, they do so abruptly and start getting worse. Hind limb paralysis (commonly in puppies) Ulcers, Pneumonia, Peritonitis - an infection of the lining of the abdomen after a rupture Hepatitis, staggering slow reflexes or reaction time blindness are some of the common signs and symptoms that indicate the suffering of the animal because of the parasite.
Not much is known about the transmission of this parasite but the parasite can be transmitted transplacentally in several hosts and the vertical route is the major mode of its transmission in cattle. Carnivores can acquire infection by ingestion of infected tissues.

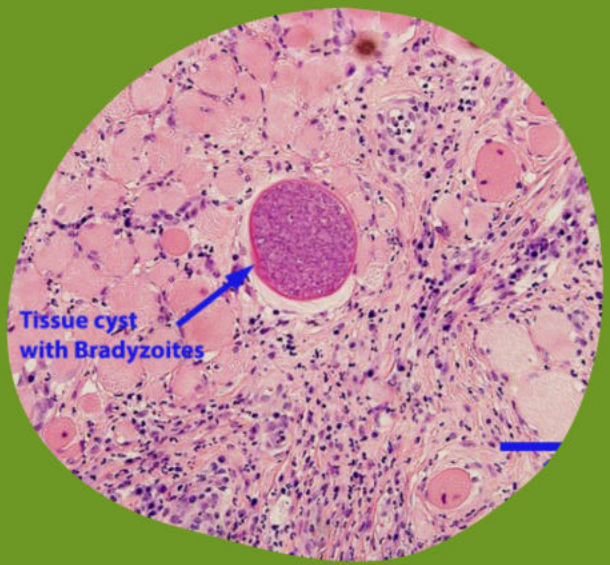
Both dairy and beef cattle experience abortions due to *Neospora caninum*. From the third month of pregnancy until term, cows of any age can abort. The majority of neosporosis-induced abortions take place between the fifth and the sixth week of pregnancy

Foetuses can be born alive with clinical symptoms, stillborn, resorbed, autolyzed, or clinically normal but chronically infected. Abortions brought on by neosporosis happen all year round. Seropositive (antibody-carrying) cows are more likely to miscarry than seronegative (antibody-negative) cows, and this is true for both dairy and beef cattle.
Calves infected with *Neospora caninum* may exhibit neurologic symptoms and be underweight. Both the forelimbs and the hindlimbs may be flexed or hyperextended. Ataxia, weakened patellar reflexes, and a lack of conscious proprioception may all be discovered during a neurological examination. Calves' eyes may appear asymmetrical or to have exophthalmia. *Neospora caninum* can even lead to birth abnormalities such as hydrocephalus and spinal cord constriction.

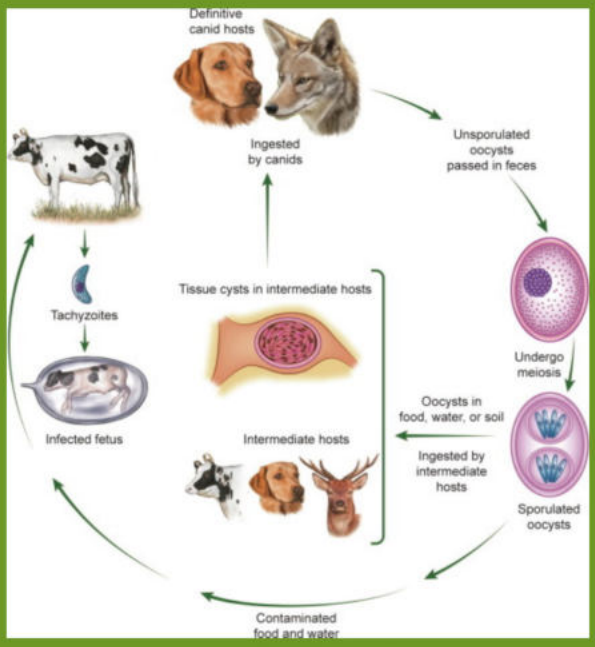
In the intermediate hosts following ingestion of sporulated oocysts, sporozoites invade the intestinal wall and develop into tachyzoites, which divide asexually and disseminate during the body. After approximately three weeks, tissue cysts containing bradyzoites begin to form. Congenital contamination (vertical transmission) happens in puppies and intermediate hosts whilst tachyzoites go to the placenta. This can be a result of new infections, or from recrudescence of a pre-existing Neospora contamination. In puppies, only a few of the domestic dogs born to inflamed dams end up inflamed prenatally. An inflamed dam can skip the parasite to the foetuses at some point of numerous successive pregnancies, however the chance of contamination decreases with every pregnancy. It is likewise viable that colostrum and/or milk are critical routes of transmission for domestic dogs.

Unfortunately, there is no complete cure for neosporosis. Once a small puppy, young dog, or an older dog is paralyzed, it's too late. There are many medications that can be administered to relieve symptoms and provide comfort to the infected animal, but it's unlikely for them to fully recover. A commonly prescribed drug is clindamycin which can be administered for up to 4 to 8 weeks. Other medicines like trimethoprim sulfadiazine and pyrimethamine can also be prescribed.

TISSUE CYST WITH BRADZOITES



HETEROXENOUS LIFE CYLE



PREVALENCE

Most regions of the world, including Australia, New Zealand, Europe, Korea, Japan, Thailand, and the Americas, have documented cases of *Neospora caninum* infections. Argentina, Australia, Belgium, Brazil, Canada, Costa Rica, Denmark, France, Germany, Hungary, Ireland, Israel, Italy, Japan, Korea, Mexico, the Netherlands, New Zealand, Poland, Portugal, Spain, South Africa, Sweden, United Kingdom, USA, and Zimbabwe have all reported neonatal mortality and bovine abortion linked to neosporosis.

Shalini Raman TZH

THE LAST RHINO

Rhinos are the mother nature's most iconic creations. They are keystone species, and known as the engineers of their ecosystem. They are integral for maintaining a healthy environment and to keep balance because losing them would cause a cascading effect of species loss. They are huge and surpassed only by elephants when it comes to size. Fortunately, they tend to be gentle and calm.

They are the second largest land mammal found on the earth. They are mostly more of dark grey colour rather than white. They have got a very good sense of smell and hearing. Their leathery skin, huge bodies and keratin horns often remind dinosaur lovers of Triceratops in prehistoric times.

There are now five rhino species living in the world: the black rhino and the white rhino, which are found in Africa and the others are Sumatran, Javan and Indian rhinos, which live in Asia. White rhinos are divided into two subspecies - southern and northern. Among them, the northern white rhino is the most endangered, with only two females left in the world and they have been driven to the very brink of extinction. The last two rhinos are named Najin and Fatu, both of which are female live in Ol Pejeta conservancy in Kenya. The cause of this extinction is due to the years of poaching for the rhino horn. Ol Pejeta is also home to forty-two southern white rhinos and the largest population of black rhinos in East Africa. While we know that there are only two northern white rhinos are left but on the other hand southern white rhino which is another sub species have great success story.

Southern white rhino is the only of the rhino species that is not endangered. Their number rise from 200 animals to more than 20,000 today through protective measures implemented by committed government and conservationists in Southern Africa. Ol pejeta is home to over 200 endangered rhinos. Now to keep them safe from poachers they must live out their days under constant armed guard. It is our moral duty to save this incredible species. The origin of the modernmodern day African rhinos date back to around 17 million years ago. Sadly, the illegal trade for rhino horn had decimated rhino population. In the black market rhino horn is more valuable than diamonds. With no males survivors left and both females unable to carry pregnancy, many people consider northern white rhino to already be extinct. The story of the last two northern white rhinos is very tragic.

Decades of poaching and habitat loss have reduced this once-thriving subspecies from a population of thousands to basically nothing , we can call it a state of doom which is known as functional extinction. The last male died in 2018. So finally, an innovative approach to save northern white rhinos has been proposed . The strategy combines assisted reproductive technology and stem-cell technique. The good news is that researchers have successfully developed 22 northern white rhino embryo which gives us a ray of hope. They are created by utilizing Fatu's eggs and the preserved sperm and they are stored in liquid nitrogen for future embryo transfers.. The power of in-vitro fertilisation is the multiplication factor. Oocytes, or egg cells, are harvested from Najin and Fatu, and are fertilized by sperm collected from deceased northern white rhino males. Later the embryos have been transferred to their surrogate mothers – southern white rhinos, who are genetically close to northern white rhinos because they have the same gestation period of 16 to 18 months. Therefore, they are expected to give birth to a new generation of northern white rhinos.

Besides this, researchers have another option called stem-cell technique. This process begins with collecting cells from skin tissue of these rhinos and followed by converting skin cells to potent stem cells using genetic reprogramming. Hence it is important to celebrate these achievements and achievements and remind ourselves that together we are and we can make a difference.

We should not forget that the best protectors are often local communities. The efforts are ultimately are ultimately the best immunization against forces that threaten the wildlife.
We can sustain this growth by investing in local communities by enforcing antipoaching operations, stopping illegal wildlife trade and implementing climate change mitigation strategies. The more we can help rhinos to thrive, the more our ecosystem, communities and other species benefit.

Shweta Pagariya
SZH

NERVE STEM CELLS

Kunal Rao
TZH

Humans are the most highly developed organism in the course of evolution. Their whole body takes shape from a single cell called zygote, which contains embryonic stem cells. These cells are totipotent in nature. The concept of stem cells was first given by Dr. James Till & Dr. Ernset McCulloch. As we know that the bone marrow contains hematopoietic stem cells, which form the blood cells. The liver also contains stem cells thus has the capacity to regenerate to some extent. These stem cells have a low capacity to proliferate and differentiate into new cells as compared to embryonic stem cells. Human brain is a highly complex and least understood organ of the body. It consists of nerve cells or neurons and glial cells. It was believed that the brain doesn't contain any stem cells and if any brain injury or neurodegenerative diseases occur then the neurons can't regenerate.

But in the 1960s nerve stem cells were discovered. Initially, their role was not well understood. Now, we know that these cells are present in the quiescent state. Neuro-epithelial cells (nerve stem cells) proliferate and increase their number in case of trauma. They differentiate into Radial Glial Progenitors and show Astroglial markers. Radial Glial Cells (type B) reside in Ventricular – Subventricular Zone (V-SVZ) in the lateral ventricles. Radial Glial Cells (type 1) reside in the Subgranular Zone (SGZ) of the hippocampal dentrate gyrus. These sites provide the microenvironment niche for the proliferation and differentiation of nerve cells. The latest studies provide evidence of neurogenic niche in the circumventricular organ surrounding 3rd and 4th ventricles.

Now the question comes up that how do these NSCs (nerve stem cells) switch from the quiescent phase and start proliferating? Is there some sort of signalling pathway or any stimulus which trigger it? With recent research, scientists have been able to solve the mystery of NSCs but some part of the puzzle is still missing. Physical exercise, drug administration, or injury may provide the stimulus to NSCs for the exit of the quiescent phase. Stress, anxiety and, age reduces the proliferation capacity of NSCs.

Role of Endothelial cells in activating NSCs:

At the time of injury, the endothelial cells secrete betacellulin, which activate protein kinase B pathway by acting upon the epidermal growth factor receptor (EGFR) which triggers the proliferative stage in NSCs. Hormones like erythropoietin and prolactin have a positive effect in activating proliferation. But, these hormones have a differential effect on both V-SVZ and SGZ due to changes in factors present in both niches. These factors are still unknown. Vascular endothelial growth factor-C (VEGF-C) activate the protein kinase B signalling pathway, which activates NSC during hippocampal neurogenesis. It activate transcription ? such as ERK for mitogen stimulated proliferation & translation such as mTOR & S6K signal, which regulate cell survival and cell fate decision. Vascular endothelial growth factor receptor 3 signalling is conserved in humans.

Epigenetics modification plays a critical role in directional differentiation of stem cell:

Studies show that Tet enzyme and Tet mediated 5hmc modification (methylation) result in proliferation and differentiation of NSCs. How Tet protein, Tet interacting factor DNA 5hmc in target gene interact is still unknown. BAF complex exert genome wide control on both active H3K4me2 and repressive H3K27me3, they supress neuro-epithelial cell by induce heterochromatin formation at loci of cell cycle proliferation, Wnt-related genes and facilitate the expression of neural differentiation related genes by establishing euchromatin at related genomic regions respectively. These chromatin remodelling BAF complexes are epigenetically regulated.

HYO-LINGUAL APPARATUS OF *Chameleon*

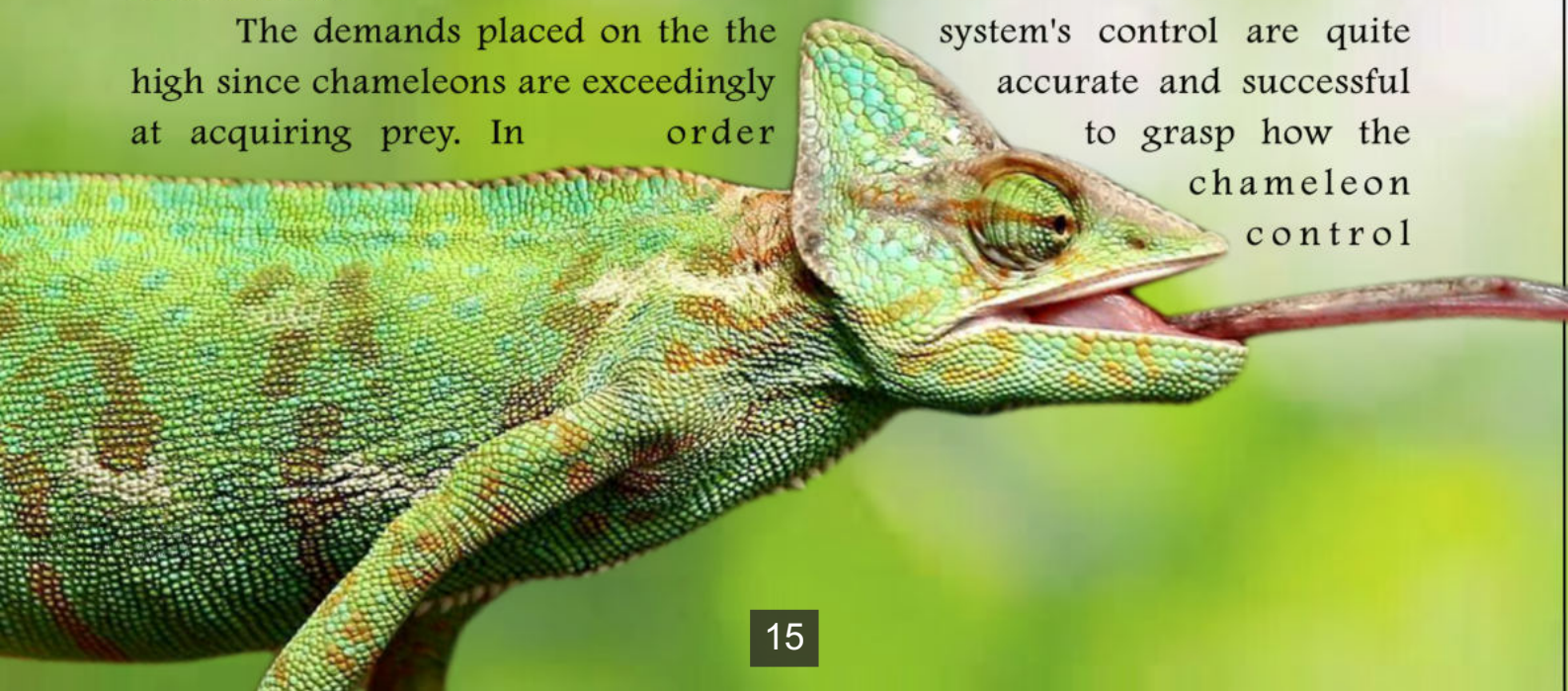
MADHAV GUPTA, TZH

Chameleons are intriguing animals with extraordinary traits. Their feet contain opposable toes that give them the appearance of tongs and allow them to securely grasp branches. Their autonomous eye movements allow them to see in all directions. Its skin's colour is actively tuned by a nanocrystal lattice found in some cells. Yet their ballistic tongue, which enables them to catch far-off prey, is undoubtedly their most remarkable feature.

The hyo-lingual apparatus is unquestionably an all-or-none biological mechanism. It could only have been created by a meticulous Engineer as it couldn't have developed its precise characteristics gradually. "The chameleon tongue's ballistic projection is an extreme illustration of an animal's ability to discharge energy quickly." Chameleons can accelerate their tongues up to 500 m s-2 and project them ballistically up to 1.5 body lengths to catch prey. The accelerator muscle surrounds the cylindrical tongue skeleton at the center of a chameleon's tongue.

Several features of the tongue projection mechanism of this lizard remains unexplained amidst the more recent researches. Addressed is the purpose of the rapid hyoid protraction seen shortly before to the start of projection. Furthermore, Chameleon prey acquisition demonstrates that these animals "grasp" prey objects rather than using the traditional agamid or iguanid prey prehension systems. This suggests that their tongues must slow down and halt just before making contact with the prey (within a few millimetres).

The demands placed on the the system's control are quite high since chameleons are exceedingly accurate and successful at acquiring prey. In order to grasp how the chameleon control



and utilises its tongue, we'll try to comprehend the morphological characteristics of the hyoid, the tongue cushion, as well as the hyolingual musculature in this study.

The Chameleon tongue is far more sophisticated than is typically supposed. At least five different groups of muscles make up the intricate intrinsic musculature. The anterior ventral section of the muscle is distinguished from the main body of the muscle by an unique connective tissue septum, which was previously unknown. The anterior ventral part of the muscle is divided anteriorly into a dorsal and a ventral noncircular component. Thus, this anterior ventral component can be viewed as a distinct entity in terms of function. Additionally, the muscular activity patterns from this muscle are drastically different from the patterns from the rest of the muscles. The functional relevance of this muscle section is yet unclear, though.

Given that chameleons are extremely visual animals, scanning electron microscopy of the tongue pad of Chameleo melleri revealed few taste buds, as was predicted. Taste buds were seen on or near the tongue tip in C. melleri. The usage of substrate touches by chameleons, in which just the tips of the tongue are extended and made in connection with the substrate, can be connected to this. Thus, it is conceivable that the animals collect chemical traces from the substrate to detect the presence of related species, predators, or other unidentified characteristics.

Histochemistry

In chameleon, only rapid glycolytic fibers make up around half of the muscles. Certain muscle fibers are both rapid oxidative glycolytic and quick glycolytic. Interestingly, no slow oxidative nor tonic fibers are seen in any of the hyolingual muscles. As there is little information on the histochemical characteristics of the hyolingual apparatus in other lizards, it is practically difficult to evaluate the importance from in a comparative framework. Current research on the histochemical properties of a few frog hyolingual muscles demonstrates that tonic fibers are also lacking in these muscles. It appears that the functional characteristics of lingual feeding organisms are dictated by the limitation on tongue retraction to swiftly draw the prey up into the mouth.

FIRST TRANSFUSION OF LAB-GROWN BLOOD

Jasleen Kaur SZH

United Kingdom scientists have performed the first transfusions of red blood cells grown in a lab-based clinical trial to test how long these cells can live. These Lab-grown cells might help patients with blood disorders and rare blood types according clinical research.

The team grew blood from stem cells that they had separated out from donated blood. When placed in a nutrient solution, the stem cells, which can mature into any kind of cell in the body, multiplied, and the researchers coaxed them to turn into red blood cells. So far, two trial participants have received mini-transfusions of lab-grown blood, and neither has reported "untoward side effects,". At least ten people will eventually receive mini-transfusions as part of this stage of the research. The trial is "a really important step along the way" to wider medical use of lab-grown blood

> Prof Ashley Toye, from the University of Bristol, said some groups were "really, really rare" and there "might only be 10 people in the country" able to donate.
> At the moment, there are only three units of the "Bombay" blood group - first identified in India - in stock across the whole of the UK.

Red blood cells carry oxygen to tissues in the body, which use it to produce energy. But for people with conditions like sickle cell anemia, red blood cells don't move easily through blood vessels and can block blood flow. Blood transfusions help treat conditions such as this, and they can also be given to people who have lost a lot of blood. But patients can only receive transfusions from others with a compatible blood type. The researchers theorize that lab-grown cells could last longer than donated ones. Since these cells are newly made, the researchers anticipate they might survive the full 120-day lifespan of red blood cells in the recipient's body. Regular donated blood, on the other hand, contains both young and old cells, and therefore might not survive as long.

Longer-lasting blood could mean that patients requiring regular transfusions could receive them less often. This would reduce the risk of complications from frequent transfusions, such as the buildup of iron in the body.

Participants in the trial will receive a five- to ten-milliliter mini-transfusion of standard blood and another of lab-grown blood at least four months apart. The cells will be marked with a radioactive substance to measure how long they survive in the body.

Normal transfusions are much larger than this. Researchers still need to figure out how to grow larger quantities of red blood cells in the lab. Before they can produce clinically significant amounts of blood, they'll have to do more research. The question remains how much a transfusion of lab-grown blood would cost. A blood donation costs the British National Health Service (NHS) around £130 (roughly $150), and a lab-grown transfusion would cost vastly more.

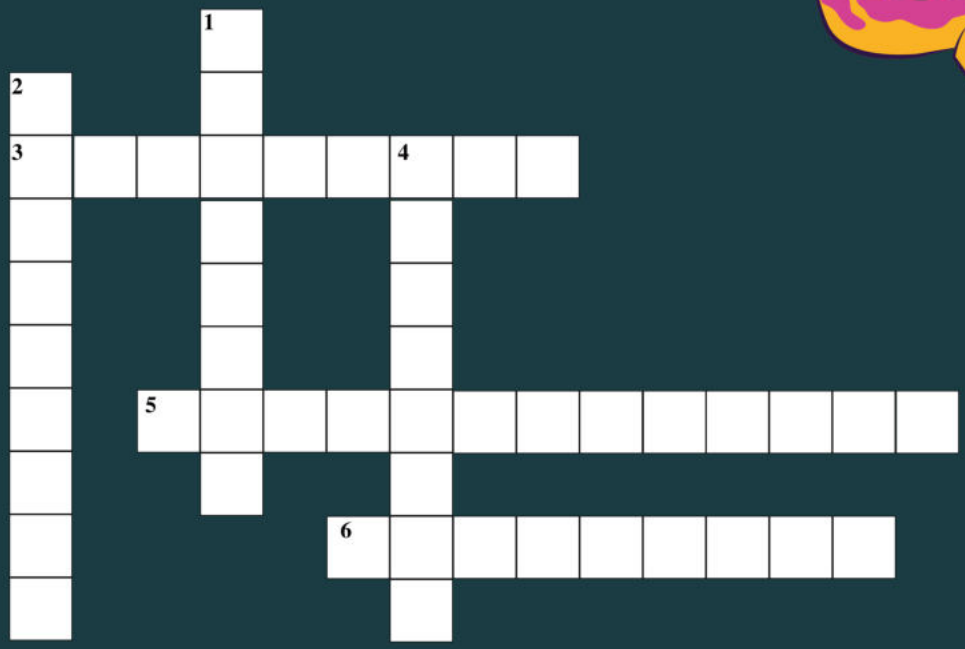
A spokesperson for NHS Blood and Transplant, a collaborator on the trial, tells CNBC that "if the trial is successful and the research works, then it could be introduced at scale in future years, meaning that costs would fall."

The lab-grown blood kept in a facility in **Bristol**

Blood grown in a laboratory has been transfused into humans for the first time in a landmark clinical trial.

Most transfusions will continue to be of regular blood donations. But the hope is that one day, lab-grown blood cells could supplement those donations to help patients with blood disorders and rare blood types.

CONNECT THE CONNECTING LINKS



ACROSS

3. Velvety link between Annelida and Arthropoda.

5. Extinct link between Reptiles and Aves; Jurassic Park.

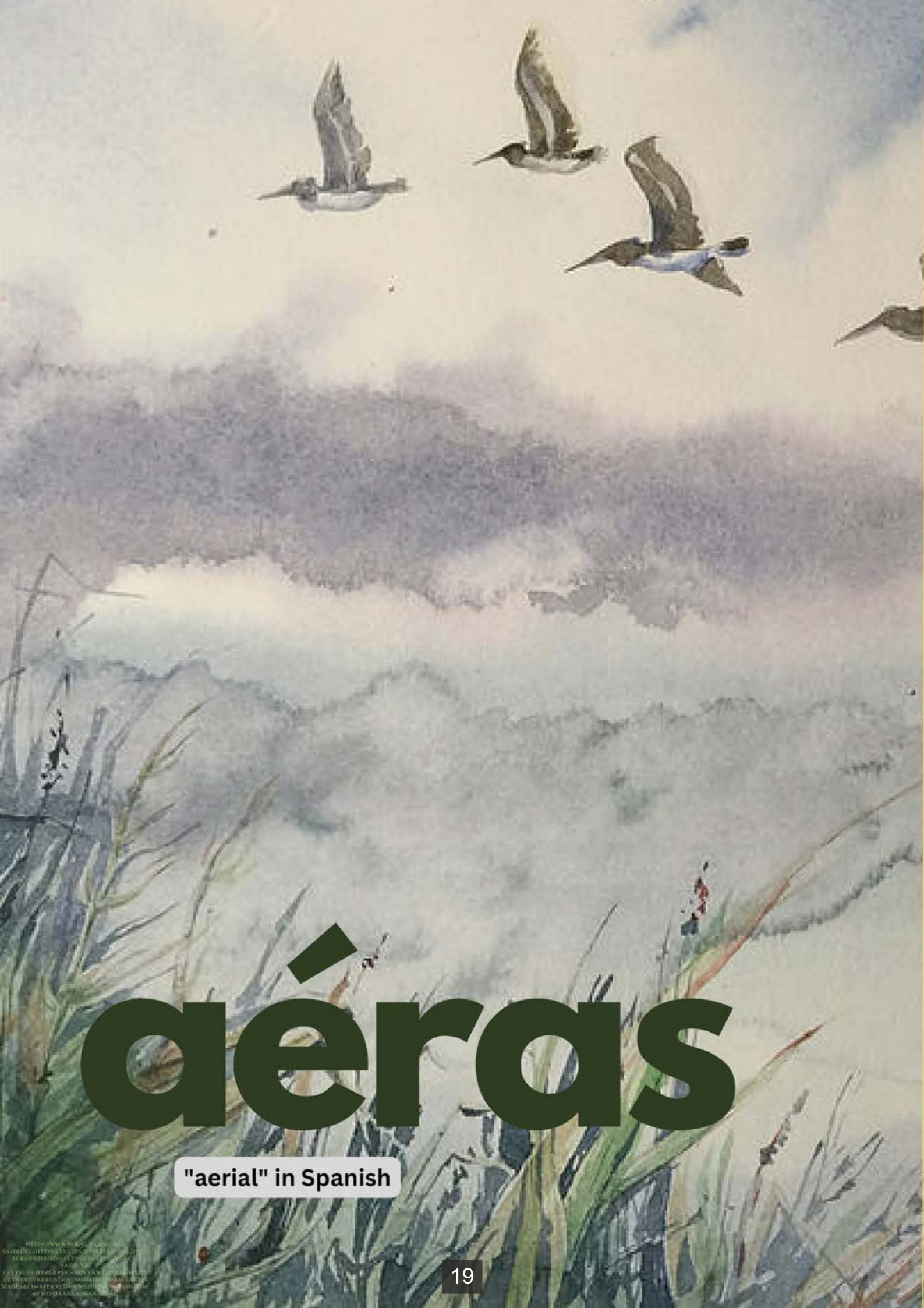
6. Extinct tetrapod-like link between Amphibians and Fish.

DOWN

1. Existing link between Cartilaginous fish and Bony fish; shares its name with a mythical creature.

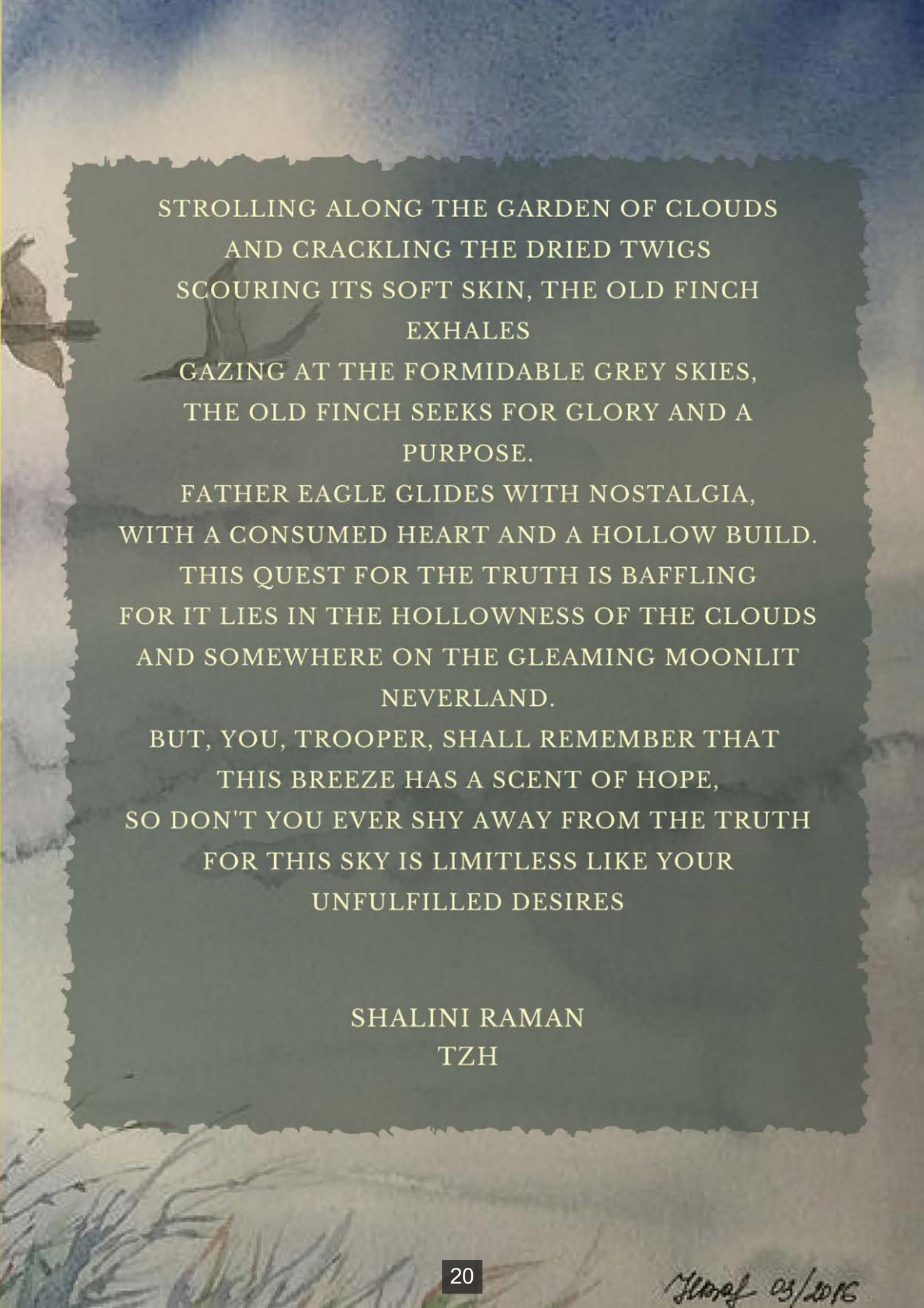
2. Connecting link between Reptiles and Amphibians; not an iguana.

4. Hypothetical link between Echinodermata and Chordata



aéreas

"aerial" in Spanish



STROLLING ALONG THE GARDEN OF CLOUDS
AND CRACKLING THE DRIED TWIGS
SCOURING ITS SOFT SKIN, THE OLD FINCH
EXHALES
GAZING AT THE FORMIDABLE GREY SKIES,
THE OLD FINCH SEEKS FOR GLORY AND A
PURPOSE.
FATHER EAGLE GLIDES WITH NOSTALGIA,
WITH A CONSUMED HEART AND A HOLLOW BUILD.
THIS QUEST FOR THE TRUTH IS BAFFLING
FOR IT LIES IN THE HOLLOWNESS OF THE CLOUDS
AND SOMEWHERE ON THE GLEAMING MOONLIT
NEVERLAND.
BUT, YOU, TROOPER, SHALL REMEMBER THAT
THIS BREEZE HAS A SCENT OF HOPE,
SO DON'T YOU EVER SHY AWAY FROM THE TRUTH
FOR THIS SKY IS LIMITLESS LIKE YOUR
UNFULFILLED DESIRES

SHALINI RAMAN
TZH

WHY CAN'T SOME BIRDS FLY?

PARITOSH SHARMA, TZH

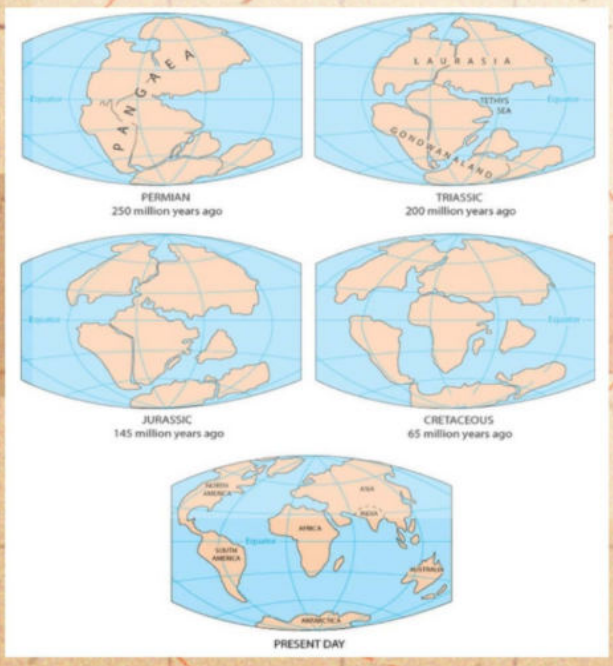
Birds are well renowned for having the only vertebrate flight capabilities (apart from bats). Birds developed the capacity to fly over millions of years of evolution, long before they were even recognized as such, and for reasons and processes that are still not fully understood.

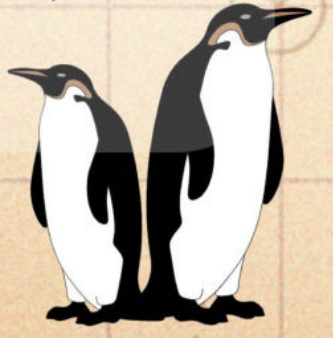
There is no ultimate objective or result in evolution, as there is in all processes. As a result, characteristics and adaptations develop and then have the potential to vanish if they are no longer advantageous to the organism or would serve its fitness in a different way. Flight is no exception, and over recent geological time, numerous bird species have lost their capacity to fly.

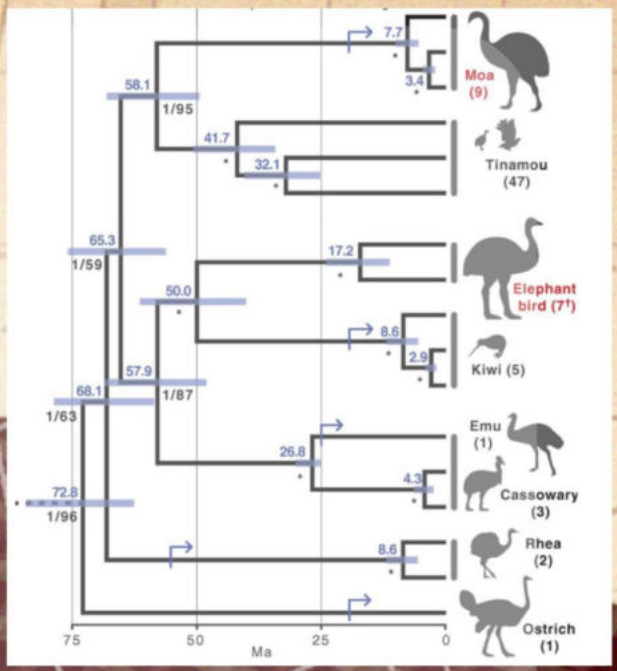
Numerous species of birds have evolved to lose their ability to fly, but one group stands out: the ratites, or more correctly, the paleognaths (of the infraclass Palaeognathae), which include the largest living birds like ostriches, emus, and cassowaries that can occasionally weigh as much as a person. In fact, they resemble some herbivorous dinosaur species that lived during the Cretaceous Period, such as ornithomimus and the oviraptorids.

Many ratites are flightless brutes that directly contend with many of the other huge animals, in contrast to many flightless birds that evolved that way because they were isolated on an island without predators. Their prehistoric features and large size may make them incredibly interesting animals, but the ratites also have a very mysterious evolutionary history. They are closely related flightless birds yet today they are distributed across most of the southern continents and Islands. They share their ecosystem with being known to kill animals as large as cheetahs. In fact, the paleognaths are not just the largest Birds but some of the last living large land animals that aren't mammals.

The Latin word rattus, which means raft, is where the name Ratites comes from. Ostriches, emus, cassowaries and the tinamous that live in South America, as well as the kiwi, are all members of the ratite family. However, because ratites evolved away from being flightless for many millions of years, they have lost their keel, which is why they are known as rafts in Latin because they don't have a keel. The enormous paleognath moa, which had mammoth two-meter legs and a skull that towered over an ostrich of the present, was once common in New Zealand. There are even fossils of an ancient ratite known from Antarctica that would have lived there around 40 million years ago when it wasn't so cold so being flightless. How do they get to these remote places? In the past, it was hypothesized that they might all be descended from a single common ancestor who lived on an ancient supercontinent made up of the southern land masses about 190 million years ago, during the early Jurassic Period, the giant supercontinent Pangea started to break apart, but when this happened, it didn't immediately break apart into separate continents and instead the southern continents were the first to break apart.





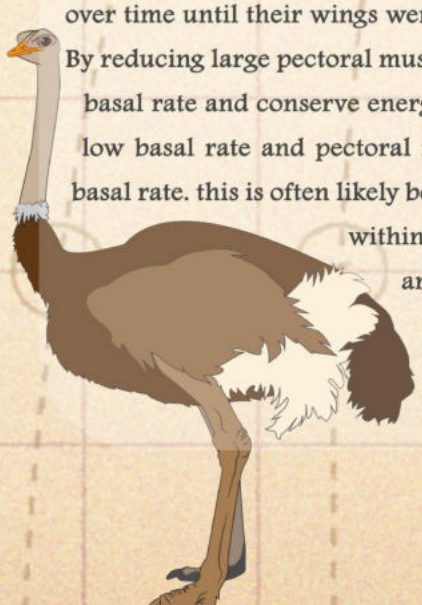


a large spread throughout the southern parts of the globe. This seems to be a perfect fit. Then, when this small supercontinent broke apart around 100 million years ago in the Cretaceous, the modern continent began to take shape.

Although the paleognaths are one of four unique bird lineages that survived the catastrophic extinction that wiped out the non-avian dinosaurs, it is now known that this couldn't be accurate because the dates don't match up. The paleognaths can be traced back to a time before the dinosaurs were extinct. In addition, DNA evidence reveals that these birds' relationships are very different from what you would expect if they all descended from a single large supercontinent that once existed. For example, the tiny kiwi is actually more closely related to the giant elephant bird in Madagascar than it is to any other ratite, including the cassowaries and Emu despite living much closer and sharing a common ancestor.

What are the chances that a typical bird-like ancestor would spread and settle on several continents and land masses throughout the world, including at least twice in New Zealand, and that all but one of them tinamous would separately lose their ability to fly, and then many of them would independently change into many of the largest birds that have ever existed? Considering that this theory depends on an astonishing degree of convergent evolution occurring to the same group of animals, it would seem that the odds are quite slim.

In order to fly, animals must be extremely specialized, which comes with a lot of trade-offs. It takes a lot of energy, so flying animals like birds and bats need to have incredibly lightweight bodies to do it efficiently. Flying animals are also burdened their wings which are prone to various types of injury that make the evolutionary pathway of losing flight considerably more likely for these ancestors. Since the niches were occupied previously by large reptiles, which could not fly. This meant the ratite that filled them, lost their ability to fly, and became more reliant on their feet for transportation. It also correlates with an increase in overall size, as ratite are and were some of the large birds. As the birds began to fill those niches, their reliance on flight would have decreased. It is inefficient to supply a part of the body that is not being used with energy for tissue. Limited resources cannot be wasted on wings that are not used; they have to be allocated for other things that are necessary for life. Eventually, birds with smaller wings would have had a higher efficiency of resource use and thus fitness, resulting in the population's overall wing size to decrease over time until their wings were functionally non-existent



By reducing large pectoral muscles that need a big amount of overall metabolic energy, ratites decrease their basal rate and conserve energy. A study watching the basal rates of birds found a big correlation between low basal rate and pectoral mass in kiwis. On the contrary, flightless penguins exhibit an intermediate basal rate. this is often likely because penguins have well-developed pectoral muscles for hunting and diving within the water. For ground feeding birds, a cursorial lifestyle is more economical and allows for easier access to dietary requirements. Flying birds have different wing and feather structures that make flying easier, while flightless birds' wing structures are well adapted to their environment and activities, like diving within the ocean.

THE UNIQUE

Rhinoceros Hornbill (*Buceros rhinoceros)*

The rhinoceros' hornbill has a name as impressive as its unbelievable bill. Atop its bill is a feature calleda casque, whichhas a striking upward curve like a rhino horn, which justifies the bird's common name. The strong bill is used for reaching fruit from thin tree branches, and that impressive casque, made from keratin, is used as a resonatingchamber to amplify the bird's loud calls. This bird can only be found in peninsular Malaysia, as well as the islands of Java, Borneo,and Sumatra.

Red Crossbill *(Loxia curvirostra)*

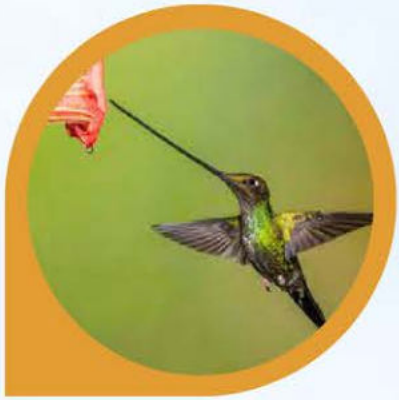
The red crossbill sports a bill that would be viewed as a deformity in most other finch species.But for thisspecies, it is the perfectway to get at its primary food source: the seeds held within pinecones. Even tightly closed cones can be accessed thanks to the unusual shape of their bill. The bird places the tips of the bill under a cone scale and bites down, which pushes the scale-up and exposes the seed. These birds tend to live in mountainous conifer and borealforests.

Shoebill *(Balaeniceps rex)*

Like the spoonbill, the shoebill's name has a rather obvious source.This stork-like bird has a bill shapedlike a large shoe, which is the bird'smost notable feature. The sharp edges of the mandibles help the shoebill kill its fishy prey and also discard vegetationcaught along the way. It also has a sharp hook at the tip, making it possible for the bird to grip, crush, and pierce prey all at once. In other words, this bird is as tough as it looks. It lives in swamps in Africa and is considered a relative of the pelican and heron. Sometimes it clatters its bill to communicate withothers.

Long-billed curlew *(Numenius americanus)*

The long-billed curlew is a North Americanshorebird that spendswinters on the coast and breeds in grasslands.Its long bill is adapted for both places, catching shrimp and crabs living in deep burrows in tidal mudflats, and also snatching up earthworms in pastures.The bill is one of the longest of any shorebird, rivaling that of the far eastern curlew.The female has a longer bill than the male, and hers has a slightly different shape. While the male'sbill curves along its entire length,hers is slightly flatter on top witha more pronounced curve at the tip.



Sword-Billed Hummingbird *(Ensifera ensifera)*

The sword-billed hummingbird has the longest beak relative to the body size of any bird in the world. In fact, it's the only bird that sometimes has a bill longer than its body. The bill is so long, that this hummingbird must groom itself with its feet. It also has to perch with its head tilted at an upward angle to be able to balance. But the upsideis that it can feed on flowers with particularly long corollas, reaching nectar that is unavailable to other hummingbird species. It lives in South America.

BEAK CLUB

Toco Toucan *(Ramphastos toco)*

its amazing bill accounts for between 30% and 50% of its entire body surface area. Good for reaching things that would otherwise be too far away, the toucan's bill may also be good for peeling skin from the fruit, intimidating other birds, and scaring off predators. The beak has a long, flat tongue inside that helps the bird to eat lizards, frogs, and insects. The bill is made of a honeycomb of keratin, so it is not particularly heavy nor strong.But that structure also helps it regulatebody temperature. Research has suggested that by adjusting blood flow to the bill, toucans can release more body heat and stay cool. The bird is native to South America.

American White Pelican *(Pelecanus erythrorhynchos)*

Pelicans have truly amazing bills. With a pouch of skin, called a throat sac, connected to the lower mandible to act as a net, they are able to catch fish and filter out the water. They "upend" like a duck to hunt, rather than diving like a brown pelican. What's interesting about the American white pelican is that during the breeding season, it makes its bill extra-flashy. Thesepelicans grow a "horn" on theupper bill, which is shed after they lay their eggs. It's the only pelican speciesto grow such an appendage.

Kiwi *(Apteryx)*

The kiwi is the only bird to have its nostrils at the tip of its beak. Other birds have the nostrils higher up, usually near the base of their face. But not the kiwi. It has the second largest olfactory bulk relative to the size of its forebrain (the condor having the largest), meaning it has an exceptional sense of smell. By contrast, its eyesightis poor.The kiwi uses this sense of smell and these specially placed nostrils to locate food in leaf litter. There's evidence that it even uses its external nose to detect the movement of prey below the soil—even an earthworm that's an inch down. As it walks, the kiwi probes the earth and sniffs then use its beak as a lever to widen the hole.

Woodpeckers *(picidae)*

Species of woodpeckers, such as the golden-fronted woodpecker (Melanerpes aurifrons), drum with their beak to establish their territories and attract mates.The high-speed pecking motion causes a tremendousamount of stress force on the animal. However, the woodpecker has a specialized beak that helps to prevent physical and neurological trauma by diverting forcesaway from the brain. Its beak will absorb and divert forces2-8 times greaterthan that of the skull.

SHALINI RAMAN
TZH

Electro-smog Disturbing The Magnetoreception Of Birds

Mukaan Anthal
SZH

A news published "Electro-smog Disturbing The Magnetoreception of Birds". I wonder how electro-smog could be a barrier to the migration of birds. Before further moving towards the topic a question always strikes my mind, "What's Electro-smog"?????

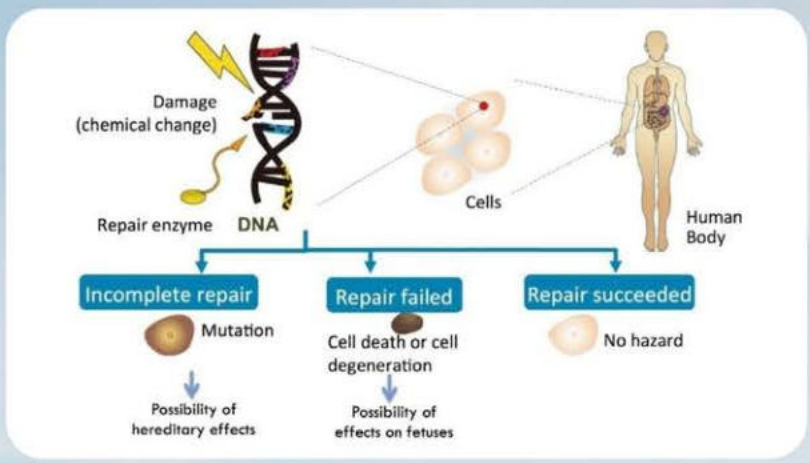
The answer to this may be as simple as electrosmog is widely used to describe all technically generated electrical and magnetic fields.
In 21st century mobile phones have become a major part of our life. From the new born to the old aged all are severely involved in the use of mobile phones. But things are beyond our imagination, these mobile phones are a major threat to environmental especially to the aphonic birds

It has been known for 40 years that birds possess a magnetic compass and they navigate using light and earth's magnetic field. The presence of "Magnetic Compass" remains a mystery. Research in homing pigeons suggests it may derived from an iron-rich crystal in their beaks magnetite. In the experimental studies German scientist found that the migrating robins became disoriented when exposed to electromagnetic fields at levels far lower than the safety threshold for humans. The exposure of birds to weak electromagnetic fields, distract the flights of birds which even harm the navigational abilities of birds. A large number of birds like pigeons, sparrows, swans are getting lost due to their interference from the unseen enemy "Mobile Towers". It is also found that animals used near mobile towers are prone to various dangers and threats to life including still births, spontaneous abortions, birth deformities, behavioral problems and general decline on overall health. The tests also show a reproducible effect of anthropogenic noise on the behavior of an intact vertebrates.
Electromagnetic radiations are released by the cell phone towers. More are the number of antennas, more will be the intensity of radiations in the nearby areas.

The signal intensity is higher in the areas near the towers and it reduces as we move away. These electromagnetic power radiations effect birds and bees. In comparison to humans, birds have larger body ratio and lesser fluid content due to which they get heated up easily and absorb more radiations. Not only this, a large number of birds die each year from electromagnetic radiation or collisions with telecommunication masts.

How does the Cell Phone tower's Radiation effect humans??

Electromagnetic radiation may cause physical and psychological changes in human beings due to thermal effects generated from the absorption of microwave radiations. The reproduction of birds get effected which can even cause defects in genetics of birds. Further more it can effect the central nervous system also.



EMR can also non- thermal effects which are caused by radio frequency fields at levels too low to produce significant heating and are due to movement of calcium and other iron across the cell membrane.

Need of the time

The Government has brought into light about the effect of radiations from cell phone towers. It has laid down precautionary measures that should be followed by stakeholders still, a lot needs to be done to implement the guidelines and sensitize the people regarding the perils of radiations. Some Pollution Control Boards, Department of Health and Welfare and Department of Environment of some states including West Bengal, Tripura, Assam, Delhi, Himachal Pradesh, Maharashtra and Kerala have prescribed guidelines for safe installation of mobile phone towers and safety exposure limiting for the electromagnetic radiations. However many states are yet to comply.

The agencies will have to play a proactive role I'm granting permission to the operators monitoring the radiations emitted and disseminating awareness among the masses.

- Administration should notify the impacts of communication towers for regulation of norms for notification of standards for safe-limit of EMR.
- Regular monitoring and auditing in urban localities, hospitals, industrial reside ntial areas and ecological sensitive areas should be done.
- Departments and local administrative units must be assigned with the task of providing a regular awareness among people about the norms on cell phone towers and damages of EMR from them.
- Avoid overlapping of high radiation fields, new towers should not be permitted with a radius of one kilometer of the existing tower.
- The location and frequency of all cell phone towers and other towers emitting EMR should be made in public domain.
- GIS mapping of all cell phone towers to be maintained to monitor the population of birds and bees in and around the world life protected areas

A Case Study

Seven years ago the Oldenburg researchers were surprised to find that European Robins (Erithacus Rubecula) became confused when they made to stopover on the university campus.

To find out the reason scientist prepared a wooden hut with aluminum sheeting on its walls and earthed by a cable to the ground. This virtually eliminated electromagnetic radiation in the range from 50 kilohertz to 20 megahertz range but had no effect on earth's magnetic field.

Over seven years, experimental showed that when the screening was in place, birds in the hut adopted their normal position from migration. But when the birds were exposed to gadget emitting background electromagnetic noise, they were disorientation.

The disruption occurred from weak electromagnetic signals at levels equivalent to birds flying at a distance of around 5km from a 50 kilowatt AM radio transmitter.

The researchers were convinced that the disruption was man-made and not from natural sources.

Vulture Species Crisis

-Soniya,TZH

There are total nine species of vultures which are found in India, but most of them are declining rapidly and now have become endangered. For example, there are three Indian vulture species in the genus Gyps: the long-billed (Gyps indicus) and slender-billed (G. tenuirostris) which had a decreasing rate of 97%, while the third species, the white-rumped (G. bengalensis), had a more catastrophic decline at a rate of 99.9% between 1992 and 2007. The decline of the vulture species is due to many factors, like poaching and habitat destruction, but the major contributing factor to the declining population of vultures is the widespread use of drugs such as dichlorofenac. The IUCN has been finding vultures "critically endangered" since 2002 due to the rapid decline of their population.

Dichlorofenac is a common anti-inflammatory drug that is administered to livestock, and the drug is also used to treat the symptoms of inflammation, fever, pain, etc. It was widely used in India at the beginning of the 1990s.

Vultures are scavengers feeding on dead bodies, and cattle carcasses are common food for vultures. It seems that the vultures died after feeding on carcasses of animals that were recently treated with the drug dichlorofenac, which is very fatal to the vultures and leads to the death of vulture species.

The dramatic decline in vultures observed across India posses a range of ecological threats and is also affecting the numbers and distribution of other scavengers. An increase in the number of feral dogs has been reported across India, which poses a greater risk of related diseases such as rabies to humans and wild animals. India already has very high rates of rabies, and a shortage of high-quality rabies vaccines in rural areas could exacerbate the problem. Likewise, increased crow populations at slaughter sites near settlements pose a risk of infecting poultry, domestic birds, and humans.

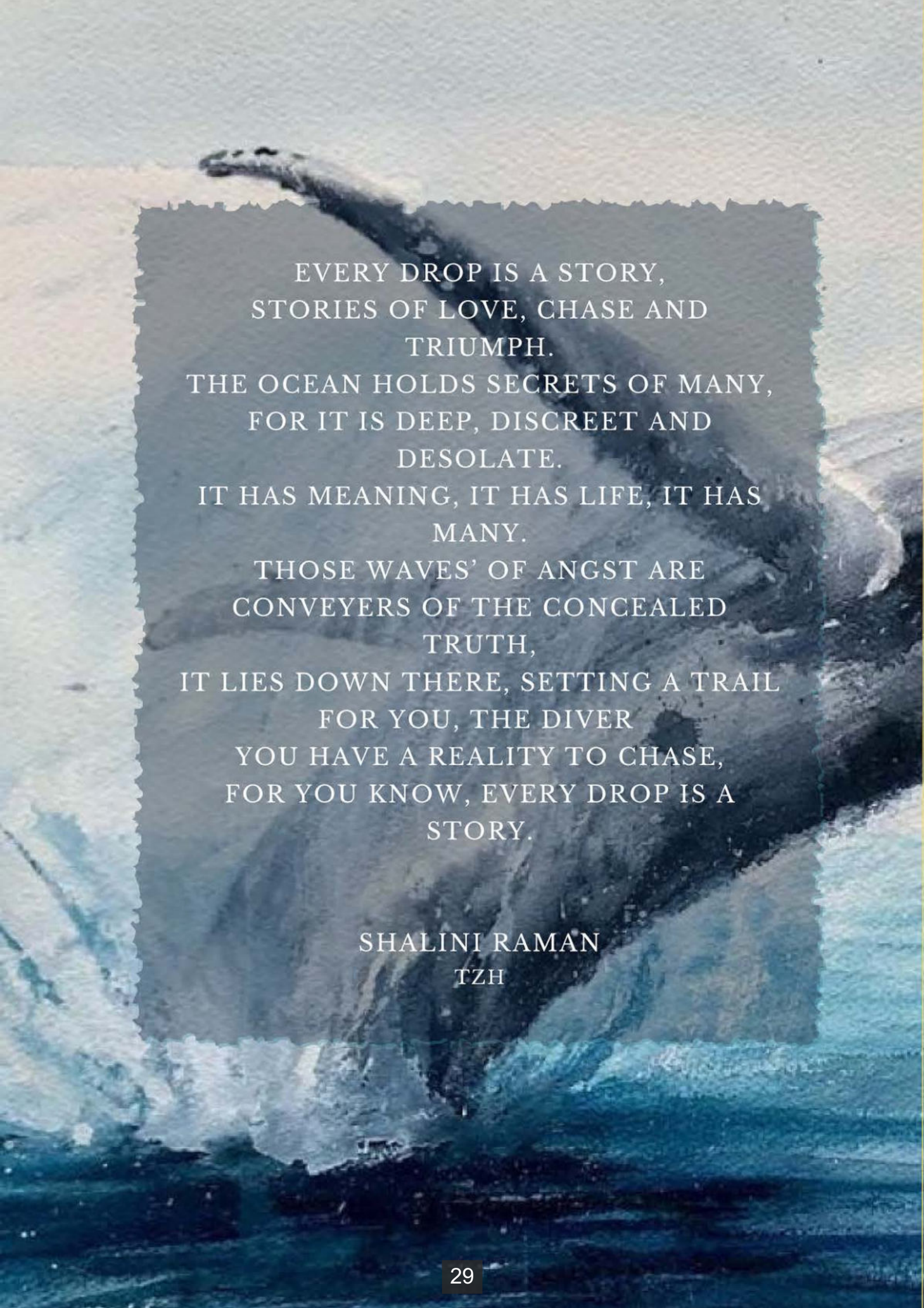
The prevalence and concentration of diclofenac residues in ungulate carcasses are important for the endangered vulture population in India. A small percentage (0.8%) of ungulate carcasses containing diclofenac at lethal levels was enough to cause the rapid decline in vulture populations to be observed.

Vultures previously played an important role in public sanitation in India, but their disappearance has caused several problems. But it is a good thing that the government has started some actions for the recovery of declining populations of vulture species. In 2006, the vulture action plan was initiated by the environment ministry and banned the veterinary use of dichlorofenac.

Save the Animals

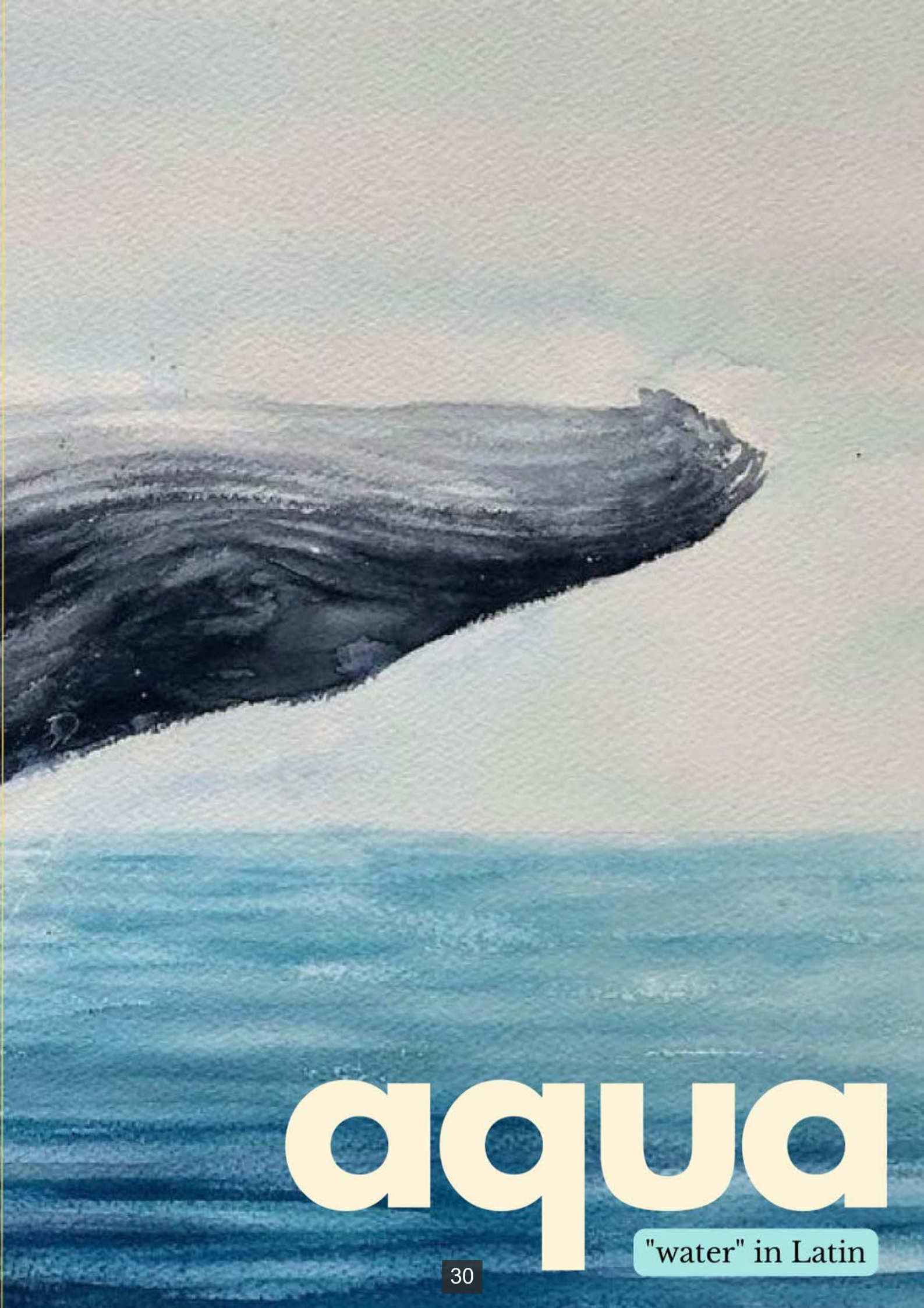
E T W E T N L J W T Q O H M P S X S K Q A M V
R J Q M O N E J C Z J F A V U N I V C I M M M
D H A G B F L J L J Q M W K B Y I J U X S F T
J G L P C S J A V A U Y K Z Z Q J N U Q T D C
J A L W A L O Q P X A N E Y T T C D O D O K N
B A G J I S L I I B G B S E D F S P H V B V Z
R V J Y F I Z B V W G Z T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

SEAOTTER
GREATAUK
QUAGGA
MONKSEAL
DUGONG
HAWKESTURTLES
DODO
SPERMWHALE
BOTO



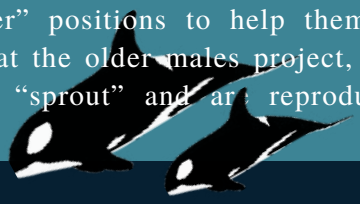
EVERY DROP IS A STORY,
STORIES OF LOVE, CHASE AND TRIUMPH.
THE OCEAN HOLDS SECRETS OF MANY,
FOR IT IS DEEP, DISCREET AND DESOLATE.
IT HAS MEANING, IT HAS LIFE, IT HAS MANY.
THOSE WAVES' OF ANGST ARE CONVEYERS OF THE CONCEALED TRUTH,
IT LIES DOWN THERE, SETTING A TRAIL FOR YOU, THE DIVER
YOU HAVE A REALITY TO CHASE,
FOR YOU KNOW, EVERY DROP IS A STORY.

SHALINI RAMAN
TZH


aqua
"water" in Latin

Orcas, or more viciously known as the Killer Whales, fall under a category of marine mammals that reflects a social structure that is on par with that of the current sapiens. This exact point has also left humans enamored by orcas and their behavior, providing an inexcusable and irrational reason for their exploitation. But, leaving the confinement of human structured walls, these mammals follow a complex social structure with a hierarchy that places the oldest female on the top. Both male and female offspring stay with their mothers even after successfully reproducing.

They arrange themselves primarily in pods, which differ in numbers depending on the nature of their drifting, such that resident pods housing multiple families spanning 3-4 generations, with the offspring's staying with their mothers for their entire life, while transient pods consist of an adult female and her offspring. They are further categorized into clans depending on their acoustic interactions and pods from different clans interact with each other in a community.
Now, their familial closeness rubs off even when pertaining to their sexual knowledge, as developing females learn from their mothers and grandmothers and are given “babysitter” positions to help them grow. Males also mirror sexual approaches that the older males project, but are taken seriously by females after they “sprout” and are reproductively accessible.



While the next few steps in their reproductive journey follow the same basic protocol, these animals aren't as straight as they seem. While they mate with females, their sexual orientation can be regarded as bisexual with a phase of homosexuality observed in all males. There have been recorded instances of males engaging in arousing activities, including belly rubbing, genital nuzzling, with visible erections.

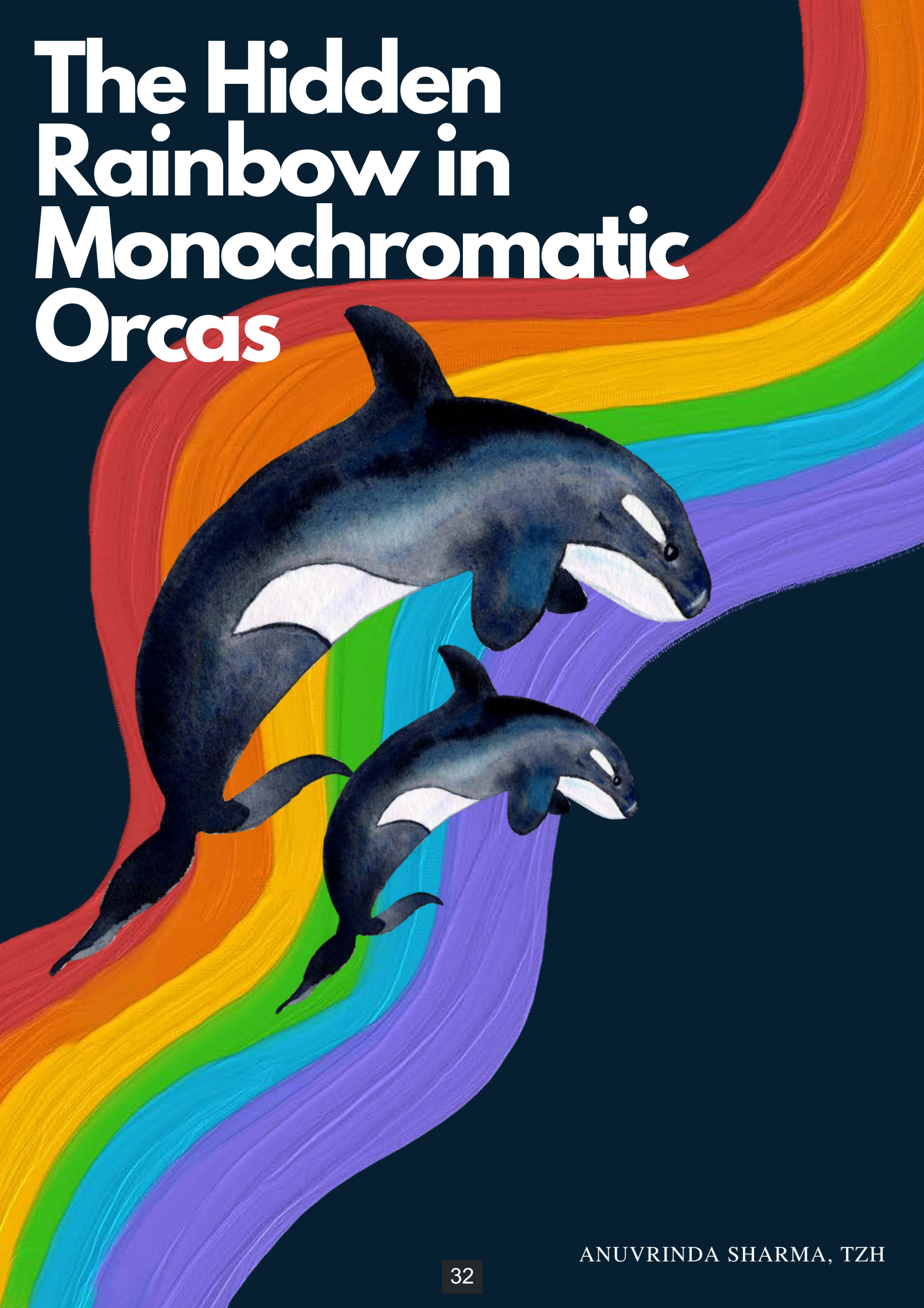
Males separate from pods and form an all male pod where they partake in feverous activities. Although, the primary reason associated with the hierarchical structure to promote cooperative feeding, communal care of offsprings, reproductive success, and non-conceptive sexual interaction is another unique behavior exhibited by these marine mammals. This behavior has been recorded to last for a few minutes to a few hours, with preference based interaction as well as multi-individual interactions. There have been observation of "pedophilic" interactions too wherein adult males and calf engage in activities that help both reach a point of epiphany.
Further, these non-conceptive sexual interactions have also been observed in the highly researched bottle-nose dolphins, walruses, apes, manatees, harbor seals etc. Harbor seals express a behavior wherein they mount and embrace one another, keeping their bodies in contact. Orcas show a delicate dance, followed by nuzzling and belly rubs which may or may not lead to an erection.

Penis erection by male calf PI while he and adult male OV were swimming belly-to-belly

Penis erection by adult male OV with PI above him

Thus, through these animals we understand that sexual behavior in quite a few animals is a gender-less activity that is practiced as commonly as in humans, in a more inclusive and open environment. Thus, we can say that epiphanic blue waters also flutter the rainbow flag.

The Hidden Rainbow in Monochromatic Orcas



ANUVRINDA SHARMA, TZH

Corals Ensnared

Tanya Goel, TZH

'Corals'! Just as this name sounds somewhat pleasing to the ears, their appearance is also magnificent to the eyes. Corals or Coral Reefs are fabulous type of underwater ecosystem marked by reef-building corals composed of the skeletons of colonial marine invertebrates. The coral species building reefs are known as 'herma typic' or 'hard' corals as they extract calcium carbonate from seawater in order to create a flinty and substantial exoskeleton that helps protect their soft, sac like bodies. The skeleton of an individual coral is known as corallite. Corallite is secreted by the epidermis of the lower part of the body and initially forms a cup surrounding this part of the polyp. Radially aligned plates or septa are found in the inferior of the cup projecting upwards from the base. All modern coral skeletons are composed of calcium carbonate in the form of crystals. The topmost layer or sclera is the one which is the main victim of ***Terpios hoshinota***, which is the sponge that encrusts this layer and prevents the corals to breathe and release the symbiotic zooxanthellae.

The outbreak of the encrusting coral-killing sponge *Terpios hoshinota* engender consequential decrease in the population of the living corals in the tropical reefs. After the first outbreak of *T. hoshinota* being reported in The Great Barrier Reefs, the invasion of this species is witnessed to be expanding its geographical range and causing mortality to many coral genera. The prominent victims of this pernicious expropriation are **American Samoa, the Philippines, Japan, Taiwan, Indonesia, India, Maldives, Mauritius and the Great Barrier Reef.**

Being an aggressive space competitor and thin encrusting sponge, which overgrows on stony corals, Terpios hoshinota when once begins, it expands its reach because of some possible reasons which are – (i) its rapid blooming behaviour on live corals (two-fold higher growth rate than corals); (ii) its deep-rooted essence in the reef environment which mitigates coral larvae settlement and (iii) the extent of larvae mass production eases the spread of the larvae to nearby locations. The sponge has been seen to have a linear growth rate of 11.0-25mm/month which pose serious threats to the coral reefs on the kilometre scale.

Terpios hoshinota is a photosynthetic sponge which requires sunlight-derived energy for its reproduction, survival and growth. It has been observed through recent studies that there is high abundance of photosynthetic symbionts in the mesophilic portion which leads to the progressive growth of the sponge. Herewith, management action to halt the invasion and outbreak of Terpios hoshinota could be achieved through scraping off the nutritional symbionts (cyanobacteria) that rely on sunlight for photosynthesis to arrest the outspread of Terpios.

Although many diverse safeguarding mechanisms against their benthic neighbours are incorporated in corals, still they are defenseless on encounters with T. hoshinota. In a research paper by P. Byron, it was stated that toxins released by the sponge and their light-blocking phenomenon are responsible for the killing of the corals. T. hoshinota is considered a predator and a parasite as it is known to kill the stony corals and suck up the energy or nutrients from them. This sponge is known to marvelously adopt an encrusting morphology which is adaptive in shallow waters as the low-lying shape of the sponge allows better resistance to wave actions and for sunlight reception by symbiotic cyanobacteria to access light.

Let's save what we have ruined because even though we are the prime destructors but we're also the core changers and bring back corals to their original beauty!

Cyanobacteria constitute a phylogenetically coherent group of evolutionary ancient, morphologically diverse and ecologically important phototrophic bacteria. These are demarcated by their ultimate potential for carrying out photosynthesis. It has been observed that the sponge-associated bacterial community is mainly 61-98% composed of cyanobacteria, with approximately 15% of these are alphaproteobacterial and gammaproteobacterial. Prochloron sp. are hard-fought related with the presiding isolated group of Cyanobacteria. During researches being done at the Palk Bay, India, it was observed that providing in-situ shading possibly alter the efficiency of preventing growth through affecting the physiological and biochemical characteristics of cyanobacterial cells. In-situ shading experiments conducted in Palk Bay, showed that a dark brown banded mat, was associated with *Terpios* progression characterized by cyanobacterial biomass. These shadings effectively reduced the Chl a content with disappearance of 1mm thick active brown banded sponge tissue. This was indicative of the fact stating that *T. hoshinota* was entirely dependent on the association with cyanobacteria. *Terpios* regeneration was also not noticed suggesting that shading of this sponge is effective in impairing the nutritional symbiont and irreversibly reducing the cyanobacterial biomass, thus the growth of *Terpios hoshinota.*

Despite shading not being possible at large geographical scales, the shading strategy was been successfully adapted to rescue critically endangered species from an emerging bleaching threat. The unearthing results of this research were evident that the artificial shading is efficacious in attenuating the sponge growth on live corals without taking hold of coral homeostasis.

In recent decades, outbreak of coral killing sponge, Terpios hoshinota is frequently expanding its geographical range and is emerging as a threat to one of the most important coral reef eco-systems worldwide (30 to 80% mortality in coral reefs of various geographical locations). During Terpios outbreak, coral mortality increases as the sponge unveil more coherent photochemical potency compared to under thermal stress corals. For instance, Palk Bay, a reef ecosystem under unprotected status, is prone to both environmental (climate change-driven coral bleaching) and anthropogenic (nutrient in flow, trap fishing) stresses. The onset of coral bleaching was due to increased sea surface temperature which would eventually pose further detrimental effects on corals through outbreak of invasive sponges.

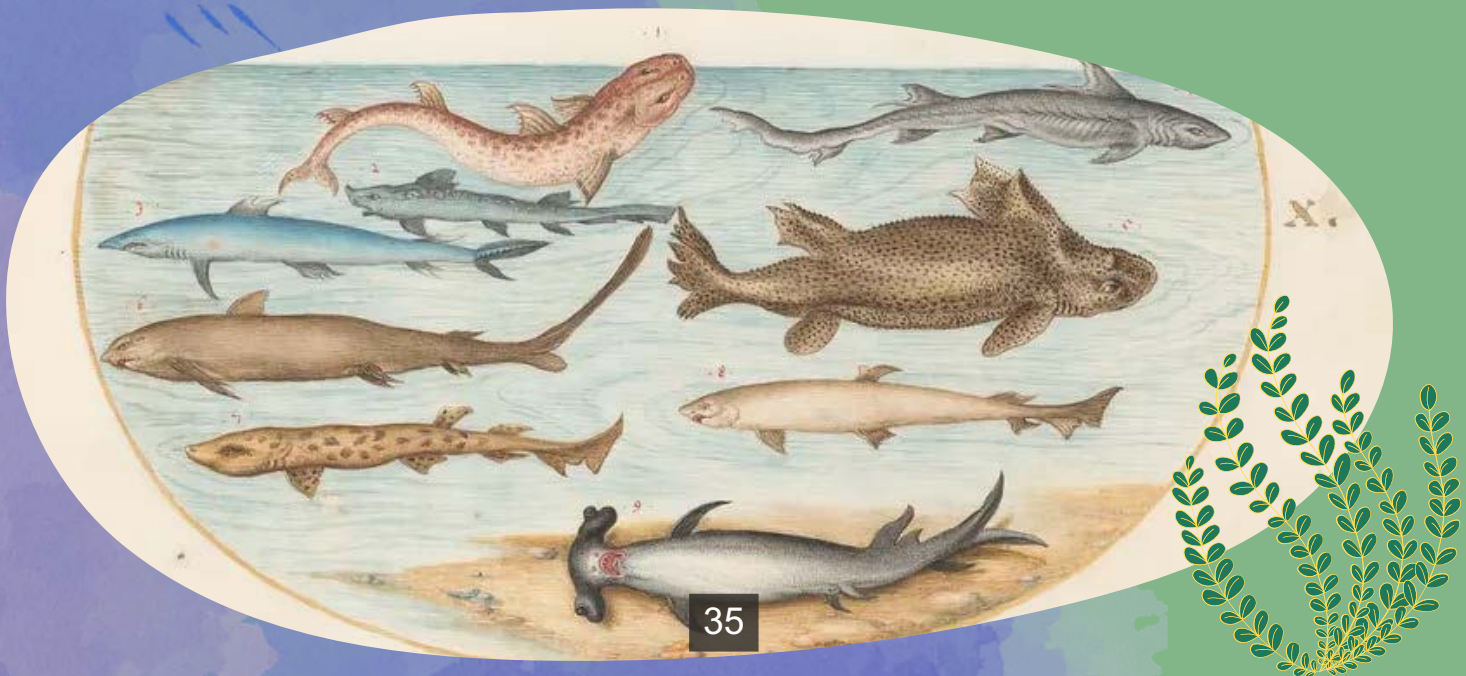
More or less, these destructions and the parasitic growth are sheer recklessness on human part and it is high time to provide an aid to this catastrophic scenario.

A Comparative Account of Electroreception as a Sixth Sense between Hammerhead Sharks and Platypus

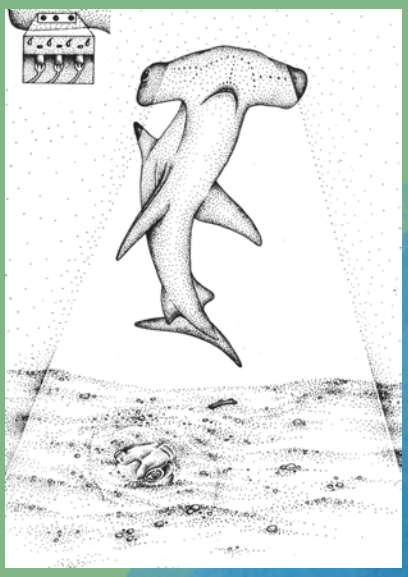
RANJANEE ARON TZH

Sharks have been on the planet for more than 450 million years now, on the contrary, the platypus has been present for 120 million years 1,2 . Irrespective of their vast evolutionary gap, both organisms evolved electroreception as a sensing mechanism independently. This article provides a comparative analysis between hammerhead sharks and the platypus concerning their electroreception as a sixth sense. By gaining an insight into the differences and similarities between these contrasting organisms, a deeper comprehension of evolution as a process can be made. Besides this better tactics for conservation techniques and policies can be equipped and implemented.

Electrical fields are present in both terrestrial and aquatic surroundings. Animals have targeted evolved mechanisms with which they detect these electrical impulses. The ability of an organism to detect and identify these stimuli in its nearby environment is called electroreception. Electroreception can be categorized into two fundamental divisions, namely, passive electroreception and active electroreception. Passive electroreception principally is the organisms' capability of detecting ecologically prevalent electrical fields already present in the surrounding environment. The electrical signals identified also include those which originate from abiotic sources and situational fields generated by other organisms. Active electroreception is the detection of distortions of the organisms; self- generated electrical fields. These electrical fields are generated by nearby organisms and objects. Detection of signals from other active organisms that are looking for communication are also a part of this.



Despite being evolutionarily distinct, both hammerhead sharks and platypus have evolved the same mechanism of electroreception. Displaying a degree of convergent evolution, the platypus and sharks in addition have incremental modifications to enhance the said ability according to their prey requirements, habitats, geographical locations, etc. Besides the prevalent morphological differences between the two animals of study, there are alterations in the ampullae structure of those found in platypuses and those in hammerhead sharks. For example, due to the head morphology of the hammerhead shark, the ampulla tubule is longer as compared to that of platypus. Along with electroreceptors, mechanoreceptors also offer assistance in a more fine-tuned determination of prey's location in the case of platypuses. Platypuses also hunt solely relying on electroreceptors as their primary sense organ, whereas sharks also rely on other senses such as smell, sight and sound. Sharks have been known to be able to detect Earth's magnetic field and use it during migration. No such indication for platypuses perceiving the Earth's magnetic field has been provided.



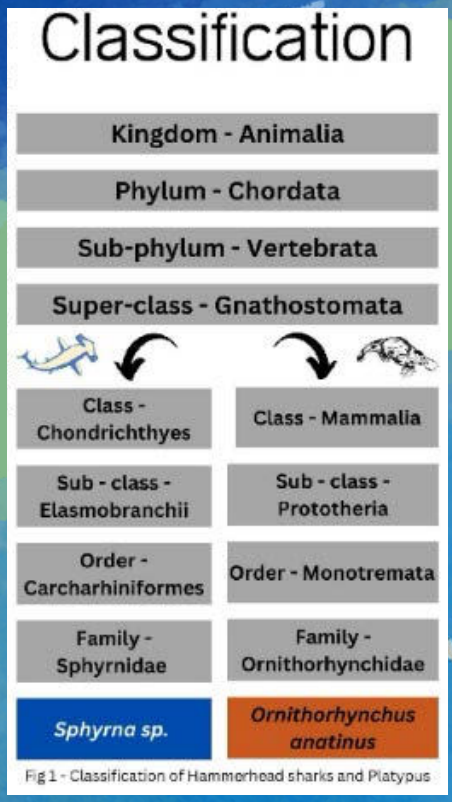
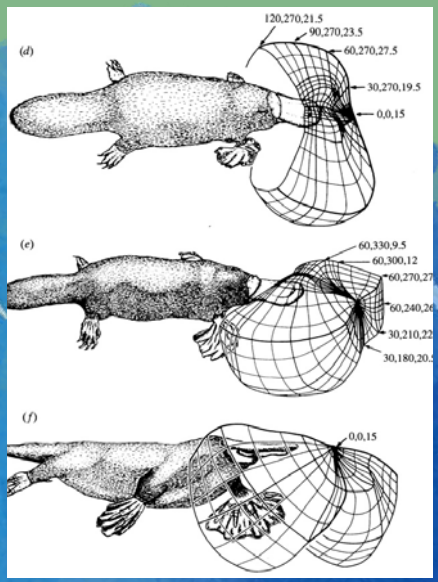
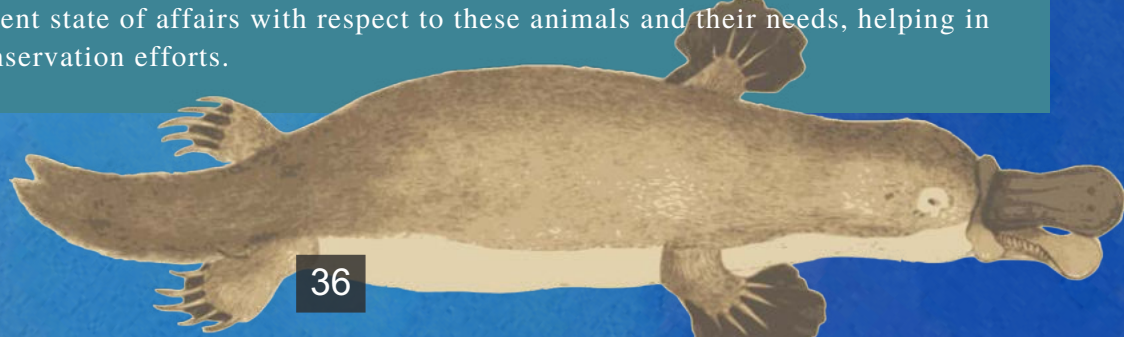


Fig 1 - Classification of Hammerhead sharks and Platypus



Electroreception as a sense is an extremely capable and useful sense mechanism, which rids the organism of their dependency on external environment conditions such as light. Even in the presence or absence of other sensory systems such as vision, touch or sound, the organism is still capable of pinpointing the location of its target with remarkable precision. Despite its discovery in fishes and its well known popularity in fishes, electroreception is present across vertebrates and in some invertebrates.

To understand a comparative account of such a sense mechanism across two animals belonging to different classes displays the beauty and marvel of evolution as a theory. Understanding such aspects of evolution could provide a foresight into the futuristic path of evolution as a working system and instill insight into the past and current state of affairs with respect to these animals and their needs, helping in better policy making and conservation efforts.



BATESIAN MIMICRY

in banded sea snakes and zebra sharks

A banded sea snake Laticauda colubrina fromWakatobi, Indonesia, Highlighting the distinctive banded pattern (photo: K. Knezick).

Most of us are well acquainted with the concept of natural selection, this adaptation has brought about various kinds of notable traits in different species which are unique to them all. One such trait is that of mimicry. It enhances the existence of an individual by granting them the luxury of avoiding challenging acts like predation or increased reproductive output by resembling another species through colouration and patterning, body form, behaviour and scent. A type mimicry known as "Batesian mimicry" occurs when a species develops the ability to duplicate the warning signs of a harmful species that are intended for a mutually exclusive predator.

In elasmobranchs, Batesian mimicry was first observed in juvenile zebra shark (Stegostoma fasciatum) which seems to micmic a banded sea snake (family Elapidae) in colour, basic morphology and swimming behaviour. S. fasciatum is a medium-sized member of the order Orectolobiformes (carpet sharks) and is found throughout shallow coastal waters of the tropical and subtropical Indo-West Pacific. S. fasciatum undergoes a strong ontogenetic shift in colour pattern.

This is likely to be connected to a shift in habitat preferences from extremely shallow waters, often over sea grass or close to mangrove stands, to deeper sandy areas near coral or rocky reefs (subadults and adults). But compared to these other species, this alteration in S. fasciatum is certainly far more extreme. S.fasciatum juveniles have generally been seen swimming around the surface in these shallow coastal locations. They swim in a way similar to sea snakes by propulsion with their flattened tails, which results in an undulating movement of the body.

The majority of the at least 65 recognised species of sea snakes are found in the central Indo-Pacific region, which closely intervenes with the concentration of the population of S. fasciatum. The majority of sea snakes are extremely poisonous, an adaptation that is thought to have developed mostly in reaction to prey acquisition but also provides defence from predators. Banding colouration is believed to function as a warning sign to predators. It is likely this feature that S. fasciatum mimic to increase their chance of survival during the vulnerable juvenile stages.

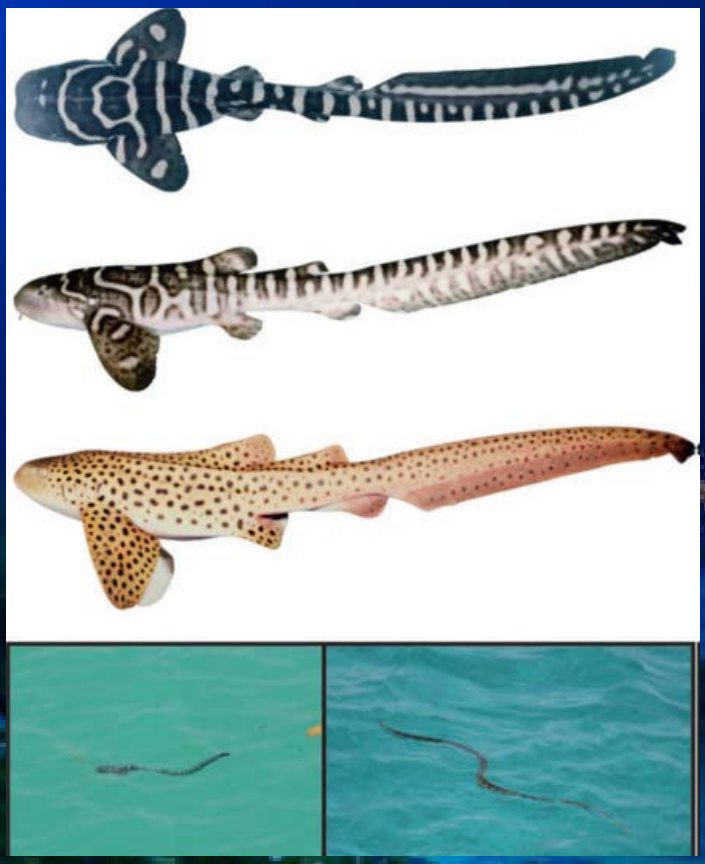
There are six criterion that justify the Batesian mimicry adaptation in any species. This observation in S.fasciatum seems to.

Firstly, according to the Batesian mimicry theory, the model species, whose activity is being mimicked is quite undesirable to the potential predators due to various kinds of obnoxious traits, like in this case it is that the banded sea snakes are highly venomous in nature. Hence, the result in being unfit for consumption for many predator fishes. Secondly, the mimic species make quite a desirable sustenance for other predators, but due to this mimicry adaptation of the species, the predators are deceived and do not hinder the lives of mimic species by making them prey. Thirdly, it is found that the mimic species are less abundant as that of the model species, as in this case, albeit the limited information on this, it has been recorded that in areas where the population of sea snakes is found in high number, the zebra sharks are found to be sparsely populated.

The next criteria is rather obvious, as it states that the mimic species is present the same time and location as that of the model species, while exhibition this mimicry. S. fasciatum is currently found in the Indo-West Pacific Ocean's tropical and subtropical seas. These waters are also home to almost all of the about 65 species of sea snakes, with the waters of the Coral Triangle being thought to be the region with the greatest variety. As obligate air-breathers, several species of sea snakes favour shallow waters and are frequently seen in inshore areas of moderate to high turbidity over soft substrate such as sea grass, mud, and sand substrates, for example, in the Gulf of Carpentaria, as well as over coral reefs.

The fifth aspect states that both model and mimic species are conspicuous and their presence is known to the predators. The sae snakes are obligate air breathers and are hence always found on the surfaces, however reason for the zebra sharks to be found in shallow is unknown.

Batesian models typically exhibit warning coloration, like as bright colours and black banding, which likely makes them noticeable to their predators and acts as an association of unpalatability. Juvenile S. fasciatum and banded sea snakes both have strikingly distinct black banding patterns. Several species of banded sea snakes also feature yellow colouring, including S. fasciatum, which has yellow-tinged stripes between its black bands. Finally, as a matter of fact, it is observed that the predators associate the undesirability in the model species to that of the mimic species, which solves the purpose of this very adaptation. Despite the strength of these arguments, it is imperative to acknowledge that this theory has to be empirically tested. The first step is to identify which species of banded sea snakes is/are the model species and which potential predators the deception is intended to fool. Then, in addition to focusing on the collecting of ecological and evolutionary data, tests can be created to assess the predators' behavioural and physiological responses to model and mimic species.



Colour pattern changes in Stegostoma fasciatum: (a) 40.5 cm total length (TL) newborn from Bahrain (photo: J. Randall); (b) 58 cm TL from Bahrain (photo: J. Randall); (c) ,220 cm TL adult from northern Australia (photo: CSIRO). (d) Newborn Stegostoma fasciatum swimming at the surface in shallow inshore, turbid waters off the Kimberley coastline of north-western Australia (photo: M. Pember); (e) a sea snake on the swimming on the surface in Shark Bay, north-western Australia (photo: W. White)

Shalini Raman
TZH

Sexual Parasitism in Angler fishes

"MAKE ME A PART OF YOU"

-ANUVRINDA SHARMA TZH

Sexual parasitism refers to an evolutionary adapted version of reproduction that functions as a cross between sexual and asexual reproduction. As termed, it is a form of reproduction that propagates a particular genetic lineage, thus, providing evidence on selfish genetic elements, degradation of clonal genomes and various other parasitic-interaction based phenomena. Sexual parasites have evolved to be clonal, sexual or asexual in nature depending on the process of reproduction they follow.

Hybridogenesis is one such process, wherein the males and females undergo copulation and the embryo expresses the genetic material of both the parasite and the host, but this inheritance is transient as the host genome is lost in the subsequent meiotic cycle. Another such phenomena is Gynogenesis, wherein the female requires the male to fertilize her egg, but discards the male genome in the offspring (Poecilia formosa) also termed as pseudo fertilization. Thus, it functions as a form of sexual reproduction that promotes asexuality. Androgenesis or male cloning is a form of reproduction, wherein the offspring houses only the male genome while utilizing the female host for her resources, while males maintain an aclonal or hemiclonal mode of reproduction, thus, justifying the term parasitism.
Again, overexploitation, being synonymous with parasitism, plays a major role in organisms displaying sexual parasitism as it could lead to the eventual death of both host and parasite owing to lack off resources. The sex of the host is a species-specific feature, with both male and female as potential targets, with their main role to provide a suitable environment and gametes to the parasite.

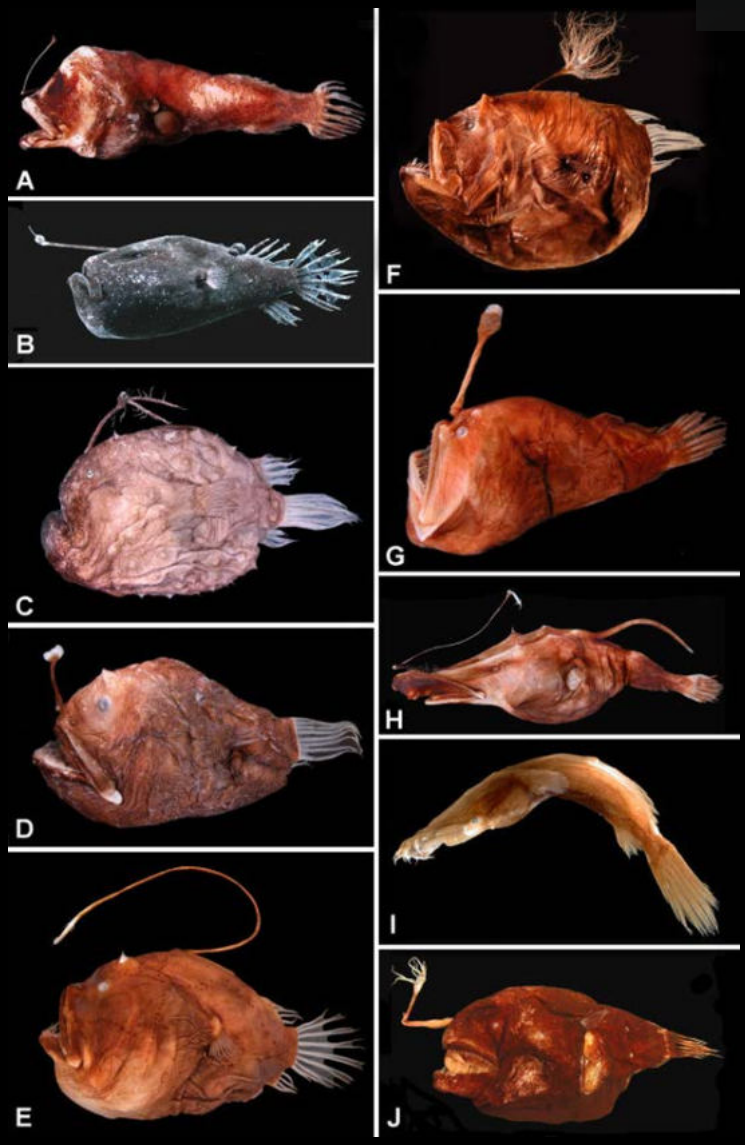
In Anglerfishes, the males and females can be easily differentiated in most species, owing to their size alterations. Females are larger and plumper when compared to the dwarfed males, which is a developmental feature when observing their parasitic reproductive ability. Angler fishes reproduce through sexual parasitism wherein the male parasite attaches to the female host and becomes a part of her system, depending on the nature of attachment. *Ceratias holboelli,* housing the most extreme size dimorphism, has been recorded with female specimens 60 times the size of males, along with being a million times the weight of a male. Males of this species lack the luring apparatus but instead are equipped with well-developed eyes and nostrils that function to detect pheromones expressed by the conspecific females. As discussed earlier, attachment of males to host females can be either temporary or permanent, with tissue fusion being a result of this. Fusion is also concordant with merging of the male circulatory system with the female, thus, defining a functional transfusion. Males undergoing permanent fusion show the presence of an extra structure present under the snout and tip of the lower jaw, which eventually fuses with the female body. Further, in few species the female papilla extends into the mouth of the male, completely obstructing the pharynx. Owing to their parasitic form of life, males are sustained for as long as the female survives. Subsequently, the number of parasitizing males are generally one, but various species show presence of more than one male attaching to the female, with a record of up to 8 male parasites found attached to a single host.

Experimental research carried out on the physiological aspects of attachment rendered results that include tissue transfusion. Observation of the longitudinal section from the general area of attachment showed continuous vascularized fibrous tissue outgrowths along with a complete fusion of the tissues from the female to the male. Further, a longitudinal flow was detected in the transfused couple, with the female host nourishing the parasitic male. Surrounding the fused area, there is also development of intercommunicating thin-walled blood-sinuses that are histologically similar to the ones supplying the skin and tissues of snout and jaws in males. Another feature observed in transfused males was the presence of gills and lateral mouth-openings which concluded that the parasitic males only depend on the host for nourishment and 0not for gaseous requirements. The enlarged liver present in males, contrary to the reduced alimentary canal functions to store the same nourishment it extracts from the female, thus, causing a terminology switch.

It was observed that Angler fishes depend on olfactory and visual cues to identify potential mates. This observation was synonymous with the presence of large,well-developed eyes and nostrils in free-living males and the same degenerate on the offset of parasitic attachment. The well-developed eyes and nostrils primarily detect bioluminescent and olfactory cues released by the conspecific females.
A lot of studies state that males show presence of either well-developed, highly sensitive olfactory senses or sensitive eyesight, expressing a combination of developed nostrils and under-developed eyes or visa versa.

Thus, on identification of a potential female mate, the free-living male parasitizes the host, by biting onto the female body. Over-time, on attachment, the epidermal tissues of both the organisms fuse along with a subsequent fusion of the circulatory systems. Thus, the male functions as a conventional parasite, feeding on the host's nutritional cycle. The female, in turn, functions as a self-fertilizing hermaphrodite host to the parasitic male whose internal organs deteriorate, except for the testes that assist fertilization. Anatomical shifts are also observed in attached males, with darker and spiny skin being one such characteristic.

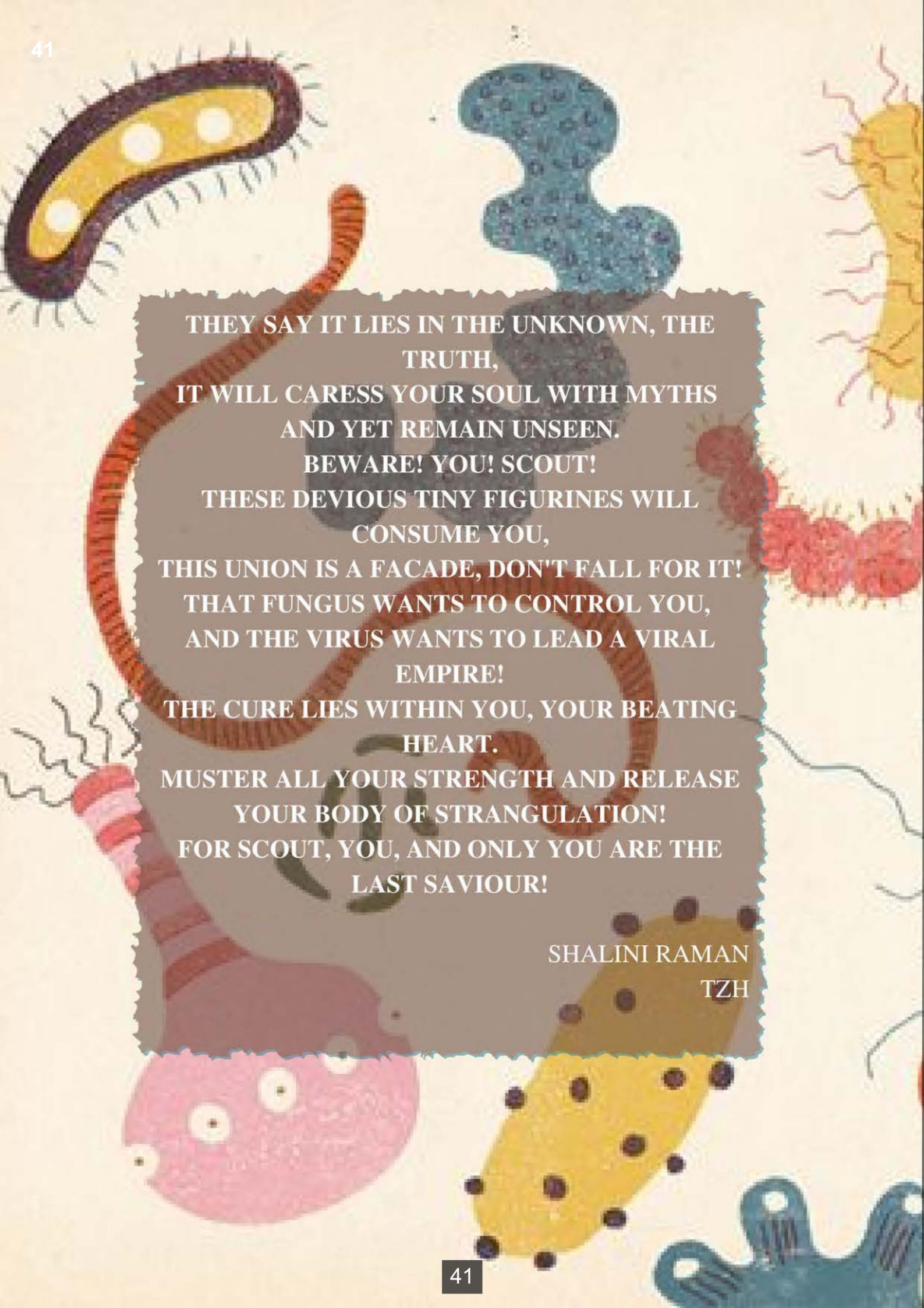
In anglerfishes expressing obligate sexual parasitism, (Caulophrynidae, Lyniphrynidae and Neoceratiidae families) reproduction is initiated only after attachment of male to female. It was also observed that upon metamorphosis, free-living males depend upon the female hosts for reproduction and survival, through a parasitic dependence and hence, have an under-developed dentary structure and alimentary canal. This led to the understanding that after metamorphosis, males are incapable of sustaining themselves and thus, are entirely dependent on females for their survival.



(A) Centrophrynidae: Centrophryne spinulosa Regan and Trewavas, 136 mm SL, LACM 30379-1; (B) Ceratiidae: Cryptopsaras couesii Gill, 34.5 mm SL, BMNH 2006.10.19.1 (photo by E. A. Widder); (C) Himantolophidae: Himantolophus appelii (Clarke), 124 mm SL, CSIRO H.5652-01; (D) Diceratiidae: Diceratias trilobus Balushkin and Fedorov, 86 mm SL, AMS I.31144-004; (E) Diceratiidae: Bufoceratias wedli (Pietschmann), 96 mm SL, CSIRO H.2285-02; (F) Diceratiidae: Bufoceratias shaoi Pietsch, Ho, and Chen, 101 mm SL, ASIZP 61796 (photo by H.-C. Ho); (G) Melanocetidae: Melanocetus eustales Pietsch and Van Duzer, 93 mm SL, SIO 55-229; (H) Thaumatichthyidae: Lasiognathus amphirhamphus Pietsch, 157 mm SL, BMNH 2003.11.16.12; (I) Thaumatichthyidae: Thaumatichthys binghami Parr, 83 mm SL, UW 47537 (photo by C. Kenaley); (J) Oneirodidae: Chaenophryne quasiramifera Pietsch, 157 mm SL, SIO 72-180. Courtesy of the American Society of Ichthyologists and Herpetologists.

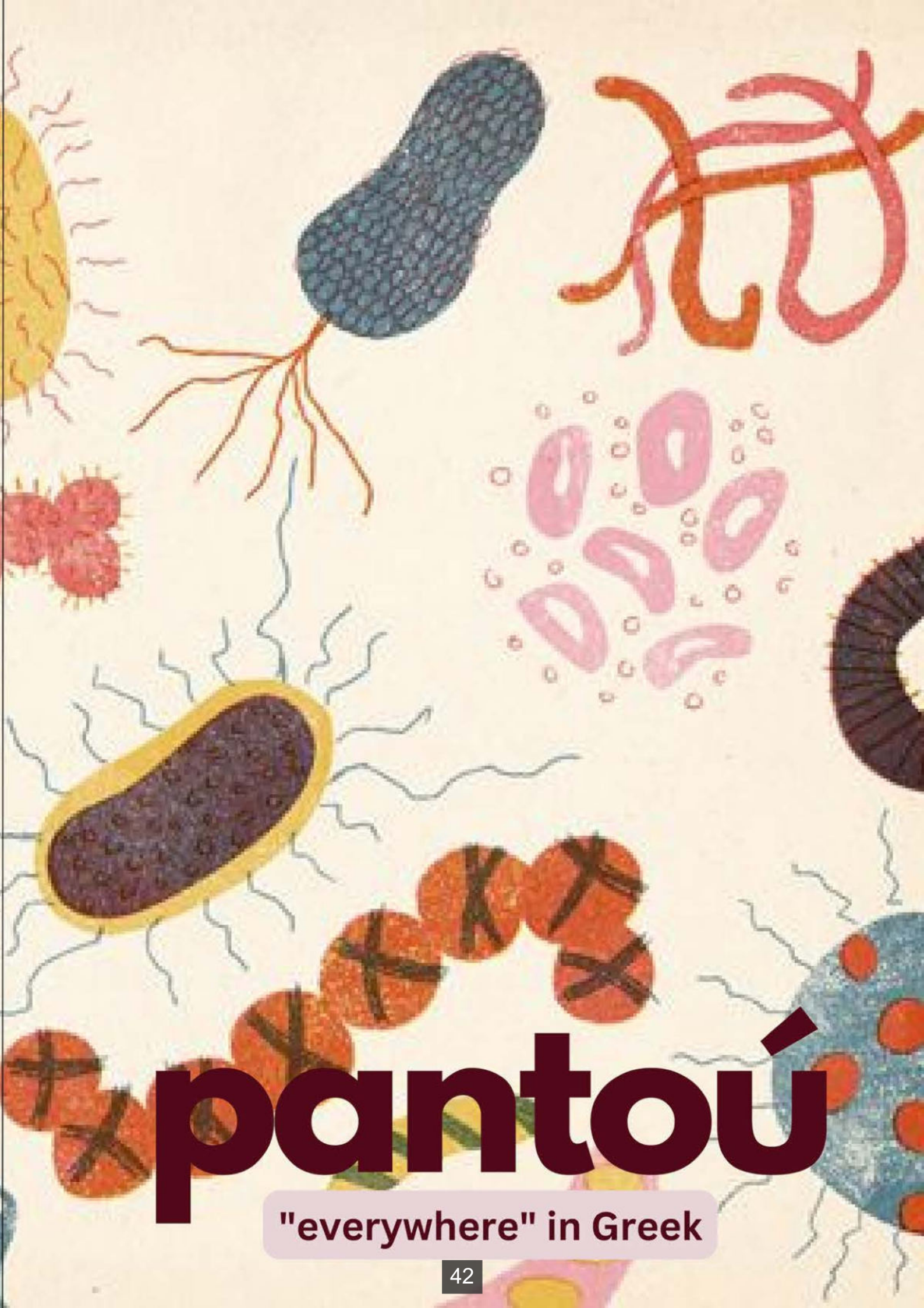
Photocorynus spiniceps, 46-mm female, with a 6.2-mm parasitic male, SIO 70-326

https://doi.org/10.1643/CI-13-035



THEY SAY IT LIES IN THE UNKNOWN, THE TRUTH,
IT WILL CARESS YOUR SOUL WITH MYTHS AND YET REMAIN UNSEEN.
BEWARE! YOU! SCOUT!
THESE DEVIOUS TINY FIGURINES WILL CONSUME YOU,
THIS UNION IS A FACADE, DON'T FALL FOR IT!
THAT FUNGUS WANTS TO CONTROL YOU,
AND THE VIRUS WANTS TO LEAD A VIRAL EMPIRE!
THE CURE LIES WITHIN YOU, YOUR BEATING HEART.
MUSTER ALL YOUR STRENGTH AND RELEASE YOUR BODY OF STRANGULATION!
FOR SCOUT, YOU, AND ONLY YOU ARE THE LAST SAVIOUR!

SHALINI RAMAN
TZH


pantoú
"everywhere" in Greek

Transmissible Cancer

THE CAPERING TUMOR

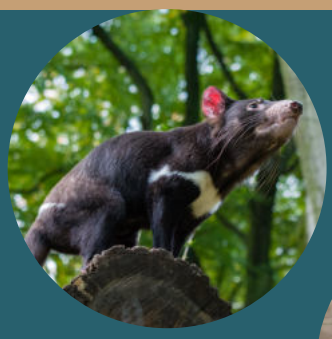
-ANUVRINDA SHARMA TZH

The wicked nature of cancer has been identified primarily as a contained-malignancy, with all the tumor cells contained to a single individual's body, expressing zero transmission. Transmissible cancer deals with infectious cancer cells that spread and initiate tumorigenesis in the unaffected individuals, allowing it to spread through a population. The observed transmission pathway in populations is either through direct contact; eg. biting, sexual interactions in dogs and Tasmanian devils or through medium-based transfer; eg. through water as seen in bivalves. The parental lineage or these transmissible cancerous cells can be mapped easily owing to the clonal transmissible nature observed in the population.

Transmissible cancer has been observed primarily in Tasmanian devils (Devil Facial tumor disease), Dogs (Canine Transmissible Venereal Tumor) and in Bivalves (Bivalves Transmissible Neoplasia). The occurrence of transmissible tumors in these endemic Tasmanian marsupials caused an 80% decline in numbers, leading to IUCN declaring them as endangered species.

Two independent cancers have been recorded, DFT1 and DFT2, with DFT1 first identified in 1996 and subsequently DFT2 in 2014. The cancer is restricted to the face, neck and oral cavity, with characteristic tumor lesions observed on epidermal and mucosal layers with cell transfer through direct contact through biting or interaction involving the facial region.

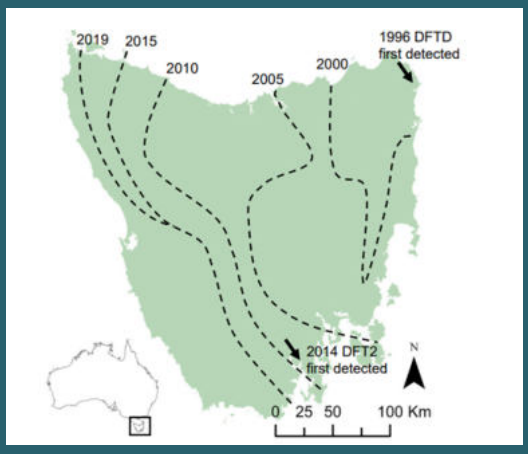
Investigatory research on DFT1 was carried out, to understand its immune- evading capability. Evolutionary data showed that Tasmanian devils expressed limited genetic diversity, prominent at the MHC loci, owing to a founder effect observed in these animals. Further, this reduced variety in MHC was taken up and MHC-1 was analyzed revealing that their DFT1 cells did not express MHC-1 antigens thus, inconspicuously evading the immune system. Other factors contributing to this mechanism was the reduction of dendritic cells, under-expression of tumor suppressing molecules, over- expression of tumor-stimulating cell surface signaling pathways and establishment of tumor microenvironment.



TASMANIAN DEVIL

A Tasmanian Devil is captured exhibiting advanced signs of the Devil Facial Tumor Disease

A male Tasmanian Devil (R) bites a female (L) as part of a mating ritual at the Tasmanian Devil Conservation Parkat in Taranna, 02 May 2007



Canines transmissible venereal tumor is another prevalent form of transmissible cancer, and it is also the oldest cell lineage known. Gain transmission of the clonal tumor cells is through direct contact, with extra manifestation of tumor lesions on the genitalia as copulatory motions with infected individuals, exposes the mucosal lining of the unaffected individual, facilitating transfer. Investigations of these cells were carried out to identify sub clonal lineages for possible diversions, though population analysis of these cells revealed no such sub-branches leading to a conclusion stating that these cells have survived since 11,000 years with the founder canine being an ancient breed. This survival capability is attributed to the parasitic nature adopted by these histiocytic tumor cells allowing them to thrive in any population. Transfer is directed only into pupation expressing the same MHC as the infected cell or into immunocompromised cells. Thus, the spread of this cancer extends worldwide, with control posing difficulty owing to the reservoir-like nature of strays. Treatment ranges from chemotherapy to radiotherapy, depending upon the severity of the case.

CANINE

Transmission through mating

infected canine

BIVALVE

Infected clam

As observed above, transmissible cancer originates in a parent species and spreads horizontally, thus defining a lineage. This infectious malignancy has been identified within two lineages of bivalves, both derived from the same parent species, *Mytilus trossulus*. *Mytilus* bivalve transmissible neoplasia 2 has been recently recorded in various populations of mussels, with M. edulis and M. chilensis being a prime example. These two species found in two opposite ends of the world, namely Europe and South America were found infected with the same tumor genotype, derived from *M.trossulus*. This inter-species infectious ability of the cancer is proved through phylogenetic research that stated that *M. chilensis* is closely related to M. edulis such that it is considered a subspecies, *M. edulis* platensis. It is also known that *Mytilus* complexes are able to hybridize, thus loweringthe barrier to cross-species transmission.

This characteristic is also primarily responsible for genetic chimerism in the infected individuals. Genetic chimerism, as the name suggests, refers to the presence of multiple genomes in the cells of a single organism. This feature is concordant with the aneuploid nature of the cancer cells. Further, this feature of the cancer cells is also used as a distinguishing feature as all differential genes of tumorous cells express 2 sets of alleles- one owned by the organism and the other expressed/ carried by the cancer cells. Physiological effects of this infectious neoplasia include tissue emaciation, pale digestive gland, gonadal atrophy, and mantle recession, suggesting nutritional stress, reduced energy intake, or a possible metabolic burden imposed by the neoplastic cells on the host. Further, owing to its proliferative nature, it often results in the death of the individual. Highest frequency of neoplastic diseases in bivalves are found in areas with high levels of heavy metals, polychlorinated biphenyls, a polycyclic aromatic hydrocarbons.

Thus, this form of infectious tumors has been observed only in selective species, with humans-based occurrences at a zero. Despite the phylogenetic differences, the commonality remains the extent of destruction this form of cancer instigates. The smallest of oncogenic cells hold the capacity of infecting a major population, throwing it into a state of turmoil.

How Viruses Shape Human Evolution!

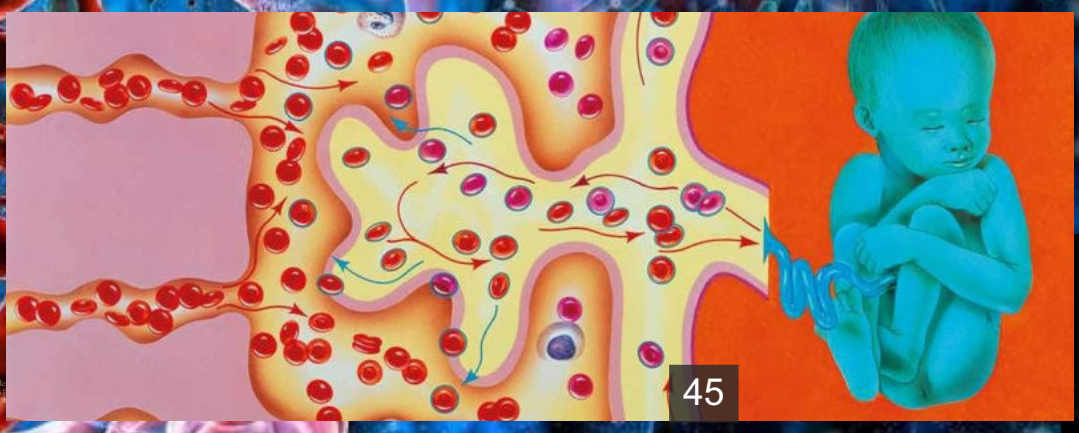
BY- BHAVISH SAINI,TZH

You Strive because we thrive!

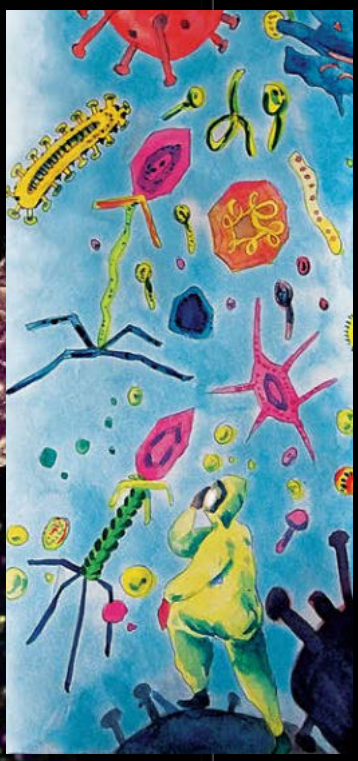
Around 8% of all our genetic information is from viruses infecting us and leaving their genome inside ours and the really weird thing is that we probably wouldn't be alive without one of these ancient viruses inside us. In fact, humanity likely wouldn't exist at all without an infection tens of millions of years ago. Much of the ancient viruses in us have turned to DNA fossils viral genomes that have accumulated so many mutations that they are not functional and are buried in our DNA. But parts of these viruses are still very functional and in use. Our cells have taken some of the genes from the virus infecting us and turned them into our own tools.

A retrovirus can make a home in our genome it doesn't get passed on to our children. This is because they don't usually infect the germline cells: the eggs and the sperm but sometimes retroviruses have ended up infecting our germline cells and have been permanently made part of our genome. These integrated viruses pass on from generation to generation. This is why our genome has the remains of ancient viral infections that make up that 8% of our DNA (human endogenous retroviruses). With viral genes available in us, our cells have made use of one viral gene in a really revolutionary way. The envelope glycoprotein coded by the env gene gives the retroviruses a way to fuse their outer membrane with the membrane of the cell they are infecting. The envelope glycoprotein or env protein recognizes a cellular membrane protein, anchors itself to the protein and slips inside the cell. With the viral env gene adopted cells gain the ability to fuse together. They can fuse together to make a sheet of cells that have multiple nuclei and share all cell organelles. Though this only happens if the cells also have the membrane protein recognized by env on the cell surface. Both are needed for fusion. This sheet of cells opens up completely new possibilities for embryonic development, allowing for the formation of the placenta. More and more evidence supports that adopting the env gene turned our ancestors from egg-laying mammals to placental mammals! Drastically changing the way the embryo develops. With the evolution of the placenta and embryo does not need to be in an egg facing the outside world but stay safe inside the mother.

Inside the womb, the foetus' blood flows through the umbilical cord to the placenta where only a thin lining of tissue separates the foetus' blood from the mother's blood outermost on this very thin tissue layer is the syncytiotrophoblast. A layer of cells fused together via syncytin 2 protein. Syncytin 2 is the name of the domesticated env gene in our genome. The fused-together syncytiotrophoblast cell sheet is invasive and is what implants the embryo to the wall of the mother's womb. Later the syncytiotrophoblast facilitates the flow of nutrients and oxygen between the mother and the foetus and it also produces hormones that regulate the immune response and protect the foetus from pathogens.



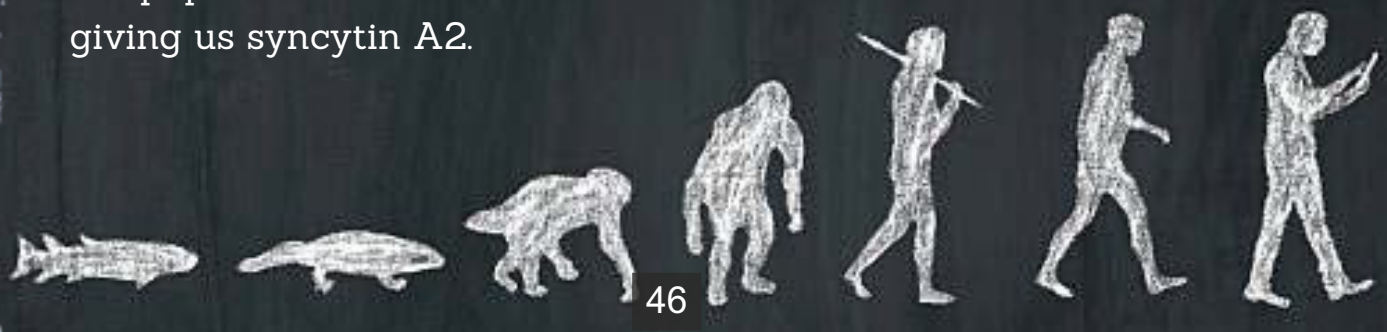
In a separate rare event around 25 million years ago another retroviral infection gave us syncytin 1, another viral env gene that became part of us. The role of syncytin 1 is not as clear but the two likely work together to fuse cells into the syncytiotrophoblast. More and more evidence supports the key role of virally derived syncytin in placental formation. The cells forming the syncytiotrophoblast can't fuse when syncytin are blocked. Removing mice syncytin completely disrupts the formation of their placenta.



Syncytin was originally a viral protein. Virus used syncytin to fuse with cells so it can infect them. And sometimes in past during one of those viral infections, a virus inserted the gene of syncytin into the genome of its host. Once it was inherited that gene may have remained dormant for generations. But it was eventually repurposed by evaolution to fuse cells together in the placenta. The interesting thing is that in some way the developing foetus is a little bit like a virus. That it exists inside the body of another organism, where it tries to avoid detection by the immune system. So perhaps its fitting that syncytin, which helps the placenta to invade the womb, originally helped the virus to invade its host.

We, humans, have two virally derived syncytins: Syncytin 1 and Syncytin 2. Placental mammals are many, but most placental mammals don't share our syncytin. Instead, the incorporation of retroviral *env* gene for mammalian placental formation has happened over and over at least 10 times our knowns so far. So far a syncytin gene has been found in every mammal studied with different syncytin fusing placental cells in different mammalian groups. A model proposed by Thierry Heidmann and colleagues from the Gustave Roussy Institute explains the findings like this. The first syncytin gene domesticated came from a retrovirus infection around 150 million years ago the syncytin gave rise to all the central mammals. The first syncytin has since been replaced by newer syncytin unique to each mammalian group. Each new syncytin has given these species an evolutionary advantage. With enough time millions of years more rare germline infections leading to virus gene domestication have taken place, giving mammals a variety of syncytin genes. This model is supported by findings like the *env v* syncytin, a domesticated env gene that seems to be crucial for placental formation in old world monkeys like Macaques. This gene is found in the human placenta as well but has lost its ability to fuse cells together. The human *env v* could be a syncytin gene that has been replaced in humans by syncytin 1 and syncytin 2 but is still functioning in old-world monkeys. Not only have retrovirus infections likely initiated and shaped the evolution of the placenta of mammals they have done so in non-mammals as well recently the Mabuya lizard that has a placenta and gives live birth was found to have a syncytin gene of its own.

We probably wouldn't be here if it wasn't for a rare event around 14 million years ago a retrovirus infected our ancient ancestor and its genome happened to end up in the germline cells and spread through the population it inserted itself in chromosome 6 giving us syncytin A2.



Fruit rampage

TOMATO FLU

Muskan Anthal,SZH

As per the proper theory laid by Charles Darwin – Survival of the fittest - Humans, being social animals need to make advancement in every aspect of life. From the stone age to the present 21st Century, humans have accomplished major extents of development and one such fascinating progress lies in the field of science and technology. Because of Science and technology, we have cures for a remarkable number of diseases whether they are life-threatening or contagious; and one such deadly disease, which is known to have an outbreak is the 'Tomato Flu'.

Many may wonder how can a beautiful vegetable, which is like an important part of our food, can be the cause of a disease? Well, Tomato flu is a Coxsackie A16 Virus, belonging to the enterovirus genus having infectious properties. This flu was first detected in a four-year-old child from Kollam district, a village near Kerala-Tamil Nadu Border, India on May 6th 2022, and more than 82 children below 5 years were infected as of July 26th 2022.

Tomato Flu is synonymous to 'Tomato Fever' and is considered as a 'Hand, Feet and Mouth Disease', affecting cattle, sheep and swine. It is also observed in humans, mostly affecting children below age group seven and adults including pregnant women. The infection is transmitted to a person by having a direct contact with the infected person, their saliva, blister fluid, nose and throat secretions and stools having the virus. Tomato Flu is regarded as a highly contagious disease which can be prevented from spiraling out of control. Common symptoms include high-grade fever, dehydration, skin rash & irritation, nausea & vomiting, swollen & painful joints and large spherical & reddish blisters on various parts of the body. Other symptoms are runny nose, sneezing, frequent coughs, fatigue, abdominal pain, cramps and patches with discoloration of various body parts like hands, buttocks & knees.

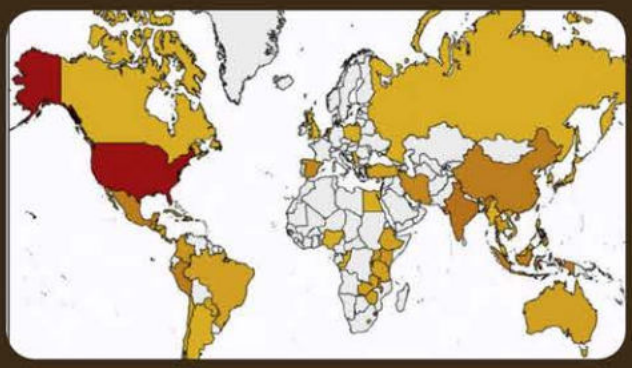
The flu is self-limiting fever, usually reduced in approximately 7-10 days and isolation of infected individuals is recommended for 5-7 days. Currently, there is no specific medication and antibiotics against the flu. The symptoms can be eased using antipyretics and analgesics. Antibiotics are not taken until the blisters are purulent and frequent intake of fluids is suggested as dehydration is prominent during the infection. The best solution is the maintenance of proper hygiene and sanitization of surrounding as well as isolating and preventing the infected children to share their clothes, food, toys and other accessories.

MOUTH SOARING

In United Kingdom, the first case was reported in a 13-year-old girl and her 5-year-old brother after a week of their return from Kerala in May 2022. Viral swabs sent for testing confirmed the presence of an enterovirus named Coxsackie 16, common cause of HFMD. Reports from Singapore indicated a polio-like illness, causing paralysis and neurological disorders.

TOMATO FLU AROUND THE WORLD

In United Kingdom, the first case was reported in a 13-year-old girl and her 5-year-old brother after a week of their return from Kerala in May 2022. Viral swabs sent for testing confirmed the presence of an enterovirus named Coxsackie 16, common cause of HFMD. Reports from Singapore indicated a polio-like illness, causing paralysis and neurological disorders.



OUTBREAK IN INDIA

In India, cases of Tomato Flu are profound in Southern States including Kerala, Tamil Nadu and Odisha. Around 80 children below 5 years were reported to be infected by local government hospitals in Kerala; 26 children infected aged between 1-9 years, were reported in Odisha by RMRC Bhubaneshwar.

TOMATO FLU AND OTHER INFECTIONS

With seasonal change , increase in flu and other infections is witnessed, all of them having more or less the same common symptoms. Though the primary symptoms observed in children infected with tomato flu are similar to the symptoms of dengue, monkey pox and chicken pox. But it cannot be assumed that tomato flu is related to these diseases.

According to reports stating the difference between tomato flu, a variant of HFMD , "most importantly, monkey pox is uncommon in children whereas HFMD infect majorly the children below age group 7 .Rashes observed in HFMD are mostly over the palms ,soles and oral cavities and can be spread over the buttocks and thighs also but never observed all over the body .These rashes are always mild and a resolved without treatment"

The Center after analyzing all the reports issued by advisory stated the tomato flu is not related to SARS- CoV-2(COVID-19) , monkey pox and dengue.

RANK HOLDERS

Batch of 2022

MYSA CHANDNI
9.60

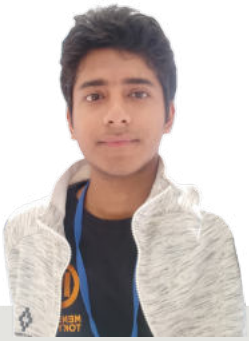
RITIKA SEMWAL
9.37

GARIMA
9.23

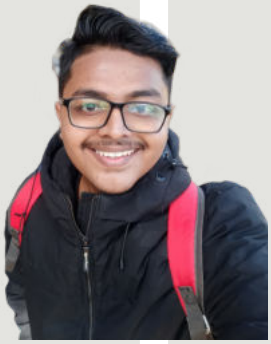
Batch of 2023

ANUSHKA PURI
9.25

PRABHJOT KAUR
9.25



GAURAV DUTTA
9.25



SRIANSHU KUMAR PANDA
9.14

ANSHITA VIJ
9.04

Batch of 2024

CHETNA SHARMA
9.09

JASLEEN KAUR
8.91

POOJA KHATRI
8.60

ECA CORNER

Jeevanesh Sawhney TZH
Effulgence, Conquiztadors

Shivangi Gupta SZH
Eco Club - PR Head, AARAMBH NGO- Coordinator Head

Abhijeet SZH
Eco Club- Creative Head

Aditya singh SZH
EXORDIUM

Tilak Raj SZH
Eco Club- Secretary, Empathise, AARAMBH NGO

Debjeet Ray SZH
Crescendo WMS- Genral Secretary

Muskaan Sharma TZH
NSS- Executive Head

Supriya Singh TZH
VERVE- Core Member

SCIENTIFIC

Magic mushshroom drug to treat severe depression

A compound named Psychedelic also known as magic mushshrooms are significantly proven to be useful in treating severe depression for upto 12 weeks. A 25mg tablet puts the patient in a dream like state, which enhances the physiolocal therapy.

The Magical Fairy wrasse

Maldives coral reefs are filled with a hundred of species of fishes but a mesmerizing addition is the rainbow colored fish called *Cirrhilabrus Finifenmaa* or Rose- Vielded Fairy Wrasse. It can live 160 to 500 feet under water in coral ecosystem called "The Twilight Zone".

The Blanket Octopus

The blanket octopus belonging to ingdom Animalia gets its name from the female counterpart: rarely-found and super-sized. It has fleshy 'cape' enclosing the tentacles. A female weighs about 40,000 times more than a female.

Artificial Titanium Heart

Heart failure stands as one of the most prominent form of death the world faces, with prescribed drugs and medications that help an individual only till a point. The point beyond drug-based treatment demands a heart transplant which is a science that has finally been achieved. An Australian research has created a BIVACOR, a titanium heart that uses a single spinning disc to derive blood to the lungs and body. The magnets levitate the high- tech rotatory pump resulting in zero mechanical work.

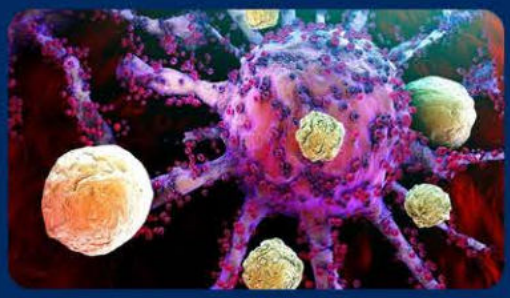
Fastest Supercomputers

The 59th edition of Top 500 list of world's most powerful supercomputers published that Frontier from US, a supercomputer built by using Hewelett Packard Enterprise (HPE) architecture and equipped with Advanced Micro Devices (AMD) processors as the world's most powerful supercomputer.

BREAKTHROUGHS

Regeneration of immune cells shown to fight off melanoma

The human body, with it conglomerate functions, expresses an immune response in the presence of any immunogenic stimulus. This complex system is controlled by a number of immune cells, which in turn have been selected as prime targets cells to help shrink or destroy tumorigenic cells, especially melanoma cells, that pose a problem in treatment. Scientists utilized artificially engineered miniature capsules called protocells that transformed the target immune cells into a state of increased efficiency, helping regulate and destroy the cancerous cells.

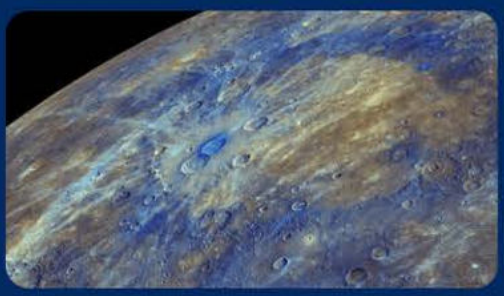


Nobel prize in Physiology 2022

For his research on the genomes of extinct hominins and the history of humanity, Svante Pääbo received the 2022 Nobel Prize in Physiology or Medicine.

Jeffery W Kelly Scripps Research Institute

He elucidated the molecular basis of neurodegenerative and cardiac transthyretin disease and for developing tafamidis, a drug that slows down the progression.



Surface of mercury covered with diamond dust

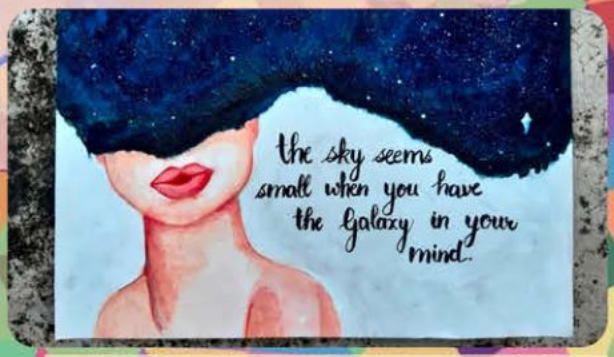
Magma ocean is one of the most prominent factor for the formation of Mercury. Magma ocean has lead to the formation of graphite, a pure form of carbon that might have been converted into diamond in the presence of high pressure.

James Webb Space Telescope

James Webb Space Telescope is the most sensitive telescope ever for detecting infrared cosmic light(wavelength just longer than those which humans can see). It is the largest optical telescope in space. It can view objects too old, distant or fain for Hubble Space telescope.

Kaleidoscopic

Shalini Raman, TZH



Anushka Dhiman, TZH

Isha Yadav, SZH

Isha Yadav, SZH

Shweta Pagariya, SZH

Anubha Rawat, FZH

Reverie

Reflection

Sitting in a library,
Going through the pages hidden with stori's of evolution
The anthropological scene is shifting and I see your eyes from the book lifting
To meet the oceans perspective on its well being
A little trouble taking but worthy of its creation – mankind, the 'finest' product in its making
Page turn, the rain starts its song against the windowpane
A flower field sneaks in my mind, forming from the perspiration of civilized life
The higher the buildings rise, the deeper I fall into the ground - earth
Magnifying how he writes his mind, so transparently – opaque
Activism to save the marine bay
To live longer or to read more
My mountains, my oceans, my moon, my stars, my sun
Sovereignty, protection, my children
Page turn, hearts merge
The writer and I have become one
The earth and I have become one
Glittering sunshine adds a hymn
To the ballroom where I shall regain my purpose of sound
Taking the writers courage, locking eyes with experience disguised as coldness,
I whisper
"Will you accompany me to the islands of alliance?"

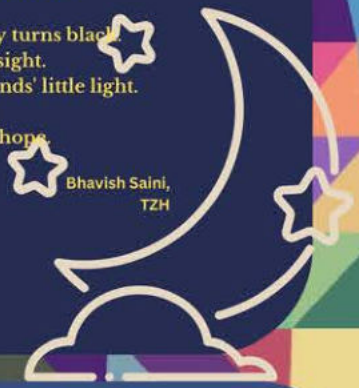
Ranjanee Aron,
TZH

Counting Stars

You say to count stars
But I lost it beyond par.
In this clumsy chaotic world
Horizon is only a word.
I try to catch it
But it hazes away.

I love moon for its light
But focusing it is the only plight.
Sunlight reminds and throws me back
Into the struggle of this fight.
I aim at kites I can't see.
This world is a wicked polluted sea.

And whenever the grey sky turns black
I look above... beyond my sight.
Darkness dissipates diamonds' little light.
Fetish moon mourns me;
And the only star burning hope.



Bhavish Saini,
TZH

IMAGEginary

I stare into the mirror
Only to walk into it
To glimpse what's on other side
Assuming the place is what i wanna make this:
A thousand flowers flowing with flair
Under the blue-white sky holding the pungent green grass
Where I count the rays up high
Looking for a window above
Hoping to find a well beneath
Wearing sheashy shealth i ride
Towards a shrine shining in sight

Bhavish Saini, TZH

एक तू ही तो है मेरे पास
मैं किसी और से क्यों करूं कुछ भी आस
मां मिली मुझे जब ली थी मैंने मेरी पहली सांस
बताते हैं मुझे न जाने क्यों मैं रोया न था,
पर मेरे अलावा कोई वहां मौजूद कोई ऐसा न था जो रोया न था
इस बीच कोई था जिसके विश्वास से मेरी सांस चलती रही
मुझे हर पल उसने छांव दी और खुद धूप में जलती रही
मैं बिल्कुल ठीक हो जाऊंगा इसी आस में तारीख बदलती रही

फिर जब काफी मशक्कत कर वह किलकारी छूटी
तब सभी के मन की बेचैनी गई और हरेक कोने में परेशानियों की घड़ियां टूटी
परेशानी में बिना कुछ खाए उसकी कई शाम ढल गई
आखिरकार मैं ठीक हुआ और उस बेजान चेहरे पर फिर से हंसी चल गई।

Khush Sharma,
TZH

WONDERSTRUCK

Central bearded Dragon
Dr. Anita Verma

Ghatixalus asteropus
Ranjanee Aron, TZH

Damselfly
Srianshu Kumar Panda, TZH

Dragonfly
Abhijeet, SZH

Metallic Bee
Srianshu Kumar Panda, TZH

Asian Elephant
Jeevanesh Sawhney, TZH

CAPTURES

Nilgiri Tahr
Ranjanee Aron, TZH

Loriini
Dr. Anita Verma

Manta ray
Dr. Anita Verma

Red-tailed black cockatoo
Dr. Anita Verma

Snow Leopard
Jeevanesh Sawhney, TZH

Bar Headed Goose
Jeevanesh Sawhney, TZH

RESEARCH

PUBLICATIONS

Prof. Vartika Mathur published two research articles titled, 'Microbial metabolites beneficial to plant hosts across ecosystems.' and 'Pharmacological potential of ants and their symbionts.'

Dr. Rajendra Phartyal and **Dr. Mansi Verma** have 3 published research articles titled, 'Comparative docking studies of drugs and phytocompounds for emerging variants of SARS-CoV-2.', 'Changing Dynamics of SARS-CoV-2: A Global Challenge.', 'Intra-genomic heterogeneity in CpG dinucleotide composition in dengue virus.' and 1 publication along with **Dr. Perumal Jayaraj** titled 'Microbial Journey: Mount Everest to Mars.'

Dr. Richa Misra has 4 publications titled 'Evaluating the efficacy of stool sample on Xpert MTB/RIF Ultra and its comparison with other sample types by meta-analysis for TB diagnostics.', 'Emerging frontiers of antibiotics use and their impacts on the human gut microbiome.', 'A Cross-Sectional Questionnaire Based Study to Evaluate Subjective Sleep Quality among Undergraduate Students in India.' and 'A review emphasizing on utility of heptad repeat sequence as a tool to design pharmacologically safe peptide-based antibiotics.'

Dr. Perumal Jayaraj had 4 publications titled 'Eyelid sebaceous gland carcinoma, validation of AJCC 8th edition T staging-a retrospective study from North India.', 'Immunohistochemical and mutational status of telomerase reverse transcriptase in conjunctival squamous cell carcinoma.', 'Establishment of patient-derived xenografts of retinoblastoma and choroidal melanoma on the avian chorioallantoic membrane.' and 'Veritable evaluation and inspection of PCOS and its apropos medicaments.'

RESEARCH@SVC

Advanced Research Laboratories in Dept of Zoology

- Animal Plant Interaction Lab (Prof Vartika Mathur)
- Fish Immuno- Toxicology Lab (Prof. Om Prakash)

SRI VIPRA

Sr. no.	PROJECT TITLE	MENTOR	NO. OF STUDENTS
1	Microbial Culture Techniques	Dr. Om Prakash and Dr. Ajaib Singh	9
2.	Immunohistochemical detection of anti-apoptotic marker and differential mRNA network analysis of Rhabdomyosarcoma	Dr. Perumal Jayaraj	10
3.	Comparative Genomics and Proteomics of Dengue and Zika Virus	Dr. Mansi Verma	10
4.	Functional characterization of endosymbionts of pants and animals	Prof. Vartika Mathur	3
5.	Principles of Scientific writing	Dr. Richa Misra	4
6.	Awareness about the importance of food and lifestyle choices on reproductive health of males and females	Dr. Namita Nayyar	11

The Department of Zoology, SVC has alwayas been actively involved in research. Under the aegis of SRIVIPRA(Sri Venkateswara Internship Program for Research in Academics) the faculty of department took 47 students of our college at undergraduate level under 6 research projects

GRANTS

Investigation of Insect behavior on machinery part.
- Duration of the project: 6 months
- Funding agency: Honda Car Pvt Ltd
- (Non-Government)

Scientific monitoring of reforestation project at Barapullah Drain area
- Duration of the project: 3 years (2021-2024)
- **Funding agency:** Indraprastha Gas Limited (IGL)
- (Non-Government)

PRINICIPAL INVESTIGATOR: Prof Vartika Mathur
- Department of Zoology, SVC
- Total Sanctioned amount: ₹ 41,48,560

Determination of trail-following pheromone and mechanism of the function of gut microbiome of termites
- Duration of the project: 3 years (2021-2024)
- Funding Agency: Indo-Uzbekistan Joint Project-Department of Science & Technology (DST), Government of India
- (Government)

Pre and Post Lockdown Microbial Monitoring of Delhi roadside plantation: An Initiative for 'One Health'
- Duration of the project: 2 years (2021-2023)
- Funding agency: Cadilla Pharma
- (Non-Government)

DIARIES

POSTER PRESENTATIONS

Anita Verma, Mansi Singh, Kajal Gupta, Rajendra Phartyal on "Study of the effect of restrictions due to Covid -19 on Pre-teens" during the 7th Annual international conference of INSCR , NOVEMBER 8-11, 2022

Dr. Perumal Jayaraj Oral presentation in the Ocular Pathology, Oncology & Tumors - I FP-11 session for paper entitled "Patient-derived xenografts of ocular carcinomas on the avian Chorioallantoic membrane" at 15th South Asian Academy of Ophthalmology held at India Habitat Centre, New Delhi from 11th to 13th November 2022.

Pranjal, Perumal Jayaraj, Seema Sen, E-poster presentation "Twinning of bioinformatics and genomics: resort to study trends of familial ocular melanoma[FP38]"at 15th South Asian Academy of Ophthalmology held at India Habitat centre, New Delhi from 11th to 13th November 2022

Under mentorship of Dr. Perumal Jayaraj, Anuvrinda Sharma presented a Poster Presentation on "Identifying key genes involved in EMT metastasis pathway along with associated mi-RNA's in gastric cancer through juxtaposition of gastric cell-line versus tumor data, proclaiming cell line an ideal tumorigenic model" in National Symposium on Frontiers in Biomedical Research 2022 (FBR 2022) ACBR, New Delhi

ACHIEVEMENTS

Dr. Vartika Mathur is a fellow of Delhi School of Climate change and Sustainability, Institute of Eminence (IoE), University of Delhi from June 1, 2022 till date.

Dr. P. Jayaraj was awarded Best Research Paper Award for the year 2020-2021 by Sri Venkateswara College, University of Delhi for the paper entitled ""Immunohistochemical and mutational status of telomerase reverse transcriptase in conjunctival squamous cell carcinoma." Published in Indian Journal of Ophthalmology. Date 28.02.2023

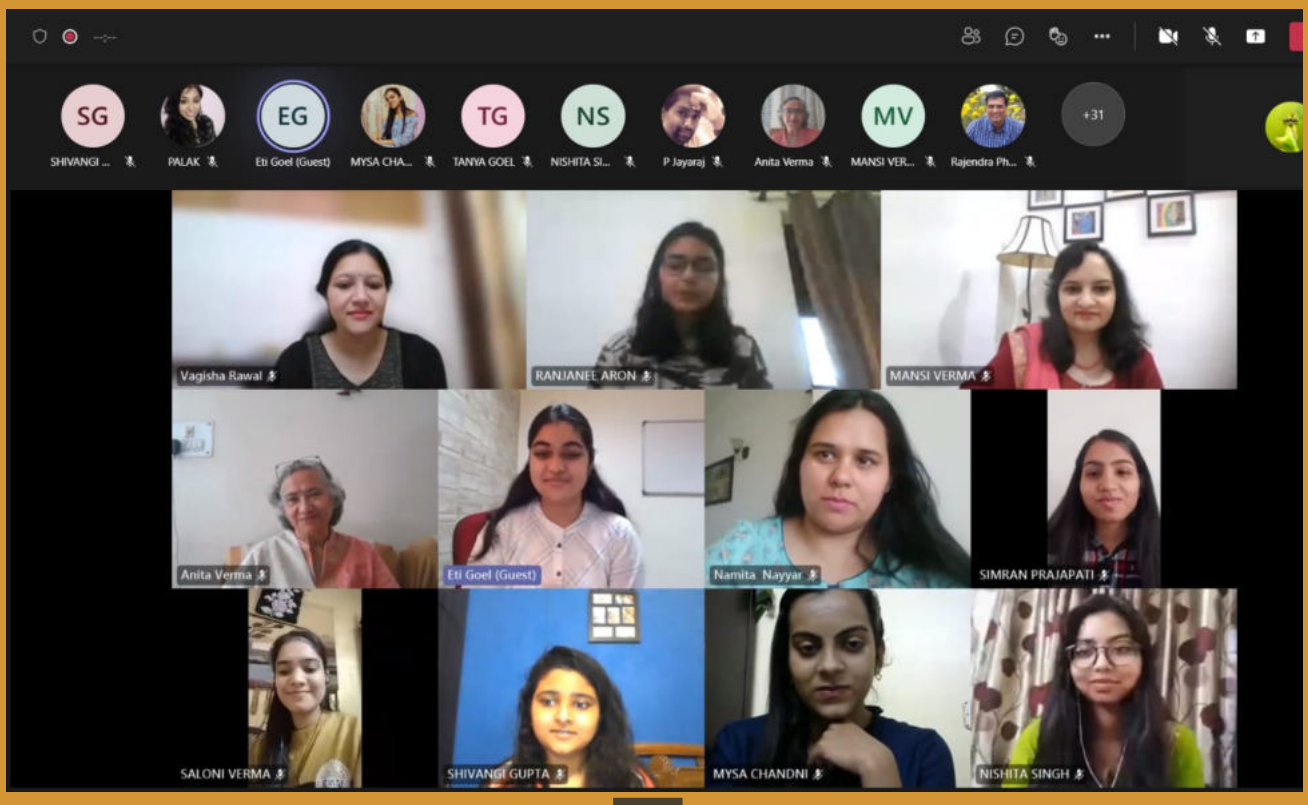
Dr. P. Jayaraj was Best free paper presentation winner in the Ocular Pathology, Oncology & Tumors - I FP-11 session for paper entitled "Patient-derived xenografts of ocular carcinomas on the avian Chorioallantoic membrane" at 15th South Asian Academy of Ophthalmology held at India Habitat Centre, New Delhi from 11th to 13th November 2022.

Comprehensive Episodes of the Department of Zoology

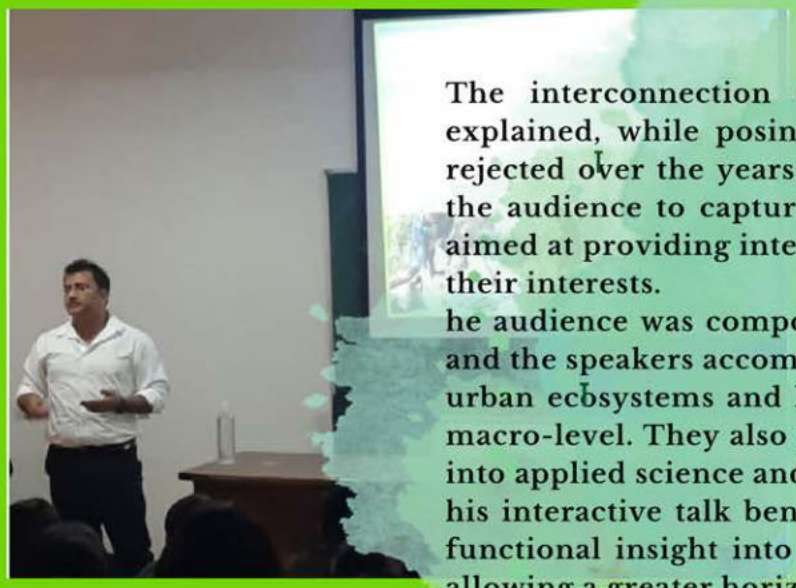
Emoaid Event

An Interactive online session on " De-stress to refresh techniques" was organized on 17th March 2022 by the Department of Zoology, Sri Venkateswara College. Phoenix, the Zoological Society conducted it under the coordination of Dr. Mansi Verma and Dr. Anita Verma. The topic was delivered by Ms. Eti Goel, a Psychologist at CCAW. The event was held in order to enhance emotional knowledge and provide a holistic educational environment with techniques to overcome stress.

The session discussed various methods of expression of one's emotions and feelings. Allowing a more accepting and open environment for people to grow themselves. Through this interactive session, people grew more confident, expressive, and enlightened. The collected feedback was highly positive and encouraging.



People, Animal and Waste System

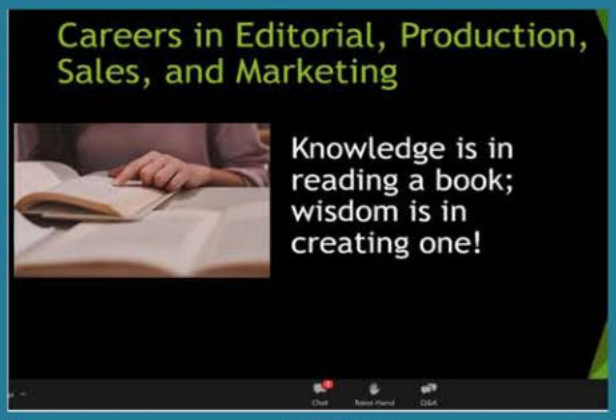


The interconnection of raptors and human waste disposal was explained, while posing different hypotheses that were accepted or rejected over the years. The interactive nature of the session allowed the audience to capture more than just words. Further, the talk also aimed at providing internship opportunities to the students by gauging their interests.

he audience was composed of students from all disciplines of science and the speakers accommodated accordingly, providing an insight into urban ecosystems and how its functioning, on a molecular level, to a macro-level. They also provided career cognizance and thus an insight into applied science and future prospects in the same direction

his interactive talk benefited both teachers and students, providing a functional insight into waste disposal and its effects on animals and allowing a greater horizon of ideas to emerge and seek a similar path.

The Road Less Taken



The department organised a stirring and much-needed webinar on "Taking the Road Less Travelled, " on 8 August 2022; emphasising the journey of offbeat career options in science. Helping undergraduate students explore and create an unconventional career field in science that is in tune with their skills and their job expectations.

The event consisted of Dr Ipsa Jain, Science Illustrator, Educator & Faculty, Srishti Manipal Institute of Art, Design and Technology; sharing her engrossing career journey in becoming an art illustrator in science. She shared her experiences of working at various institutes and motivated students to opt for such artistic careers in science. She was followed by Ms Ranjana Sharma, Content development, Elsevier, taking us through her enthralling journey from a confused undergraduate student to a publisher, following freelancing content writing and educating herself.

The resource persons of the webinar skillfully expounded: the job opportunities available for students after graduation in these fields and the various skills one needs to develop for it.

Through the medium of this talk, turning one's interests and burnishing their skills and talents into a career is enlightening, which encourages students to explore offbeat careers and to create one for themself. This provided a wide outlook on the scope of not-so-practical undergraduate knowledge and skills.

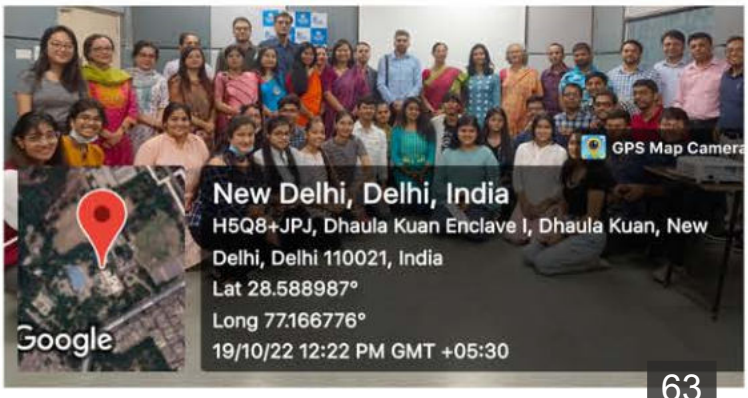
This was followed by an interactive question and answer session which elicited an active and open interaction between the speakers and the students.

Evolvere

SEMINAR ON POST COVID WORKPLACE ERGONOMICS AND HEART HEALTH

A seminar on Post-Covid Workplace Ergonomics and Heart Health in association with Indraprastha Apollo Hospitals was organised by our Zoological Society-Evolvere on 19th October,2022. The objective of this event was to educate students on the importance of correct postures and workplace ergonomics post pandemic along with heart health. The event consisted of two talks - the first talk was related to workplace related postures and the second talk was about the increased rate of heart health related issues. The session was highly interactive with the audience participating in certain physiotherapy related exercises as well.

The session discussed various new applications and advances on improving daily habits which would be beneficial for one's health. The talk provided a basis and connection to the audience and aided in their holistic growth. This interactive session developed a deeper understanding of workplace ergonomics and heart health. This was followed by an interactive question and answer session.



Fest

PLASMODIUM FERTILISATION ALUMNI TALK

An alumni seminar on plasmodium fertilization, a tale of two gamete fusogens was organised by our zoological society- Evolvere on 17th October 2022. The objective of this event was to educate students on the recent research on malaria causing organism - Plasmodium falciparum, its sexual stages and gamete fertility and simultaneously hold a prospective career counselling session to impart possible career paths and the future. This helped the audience to grow and understanding of both signs and their prospective futures .The alumni talk also provided emotional connect for the students and developed a deeper understanding of malaria and its causative organism .This was followed by an interactive question and answer session at the end.

Outreach Program

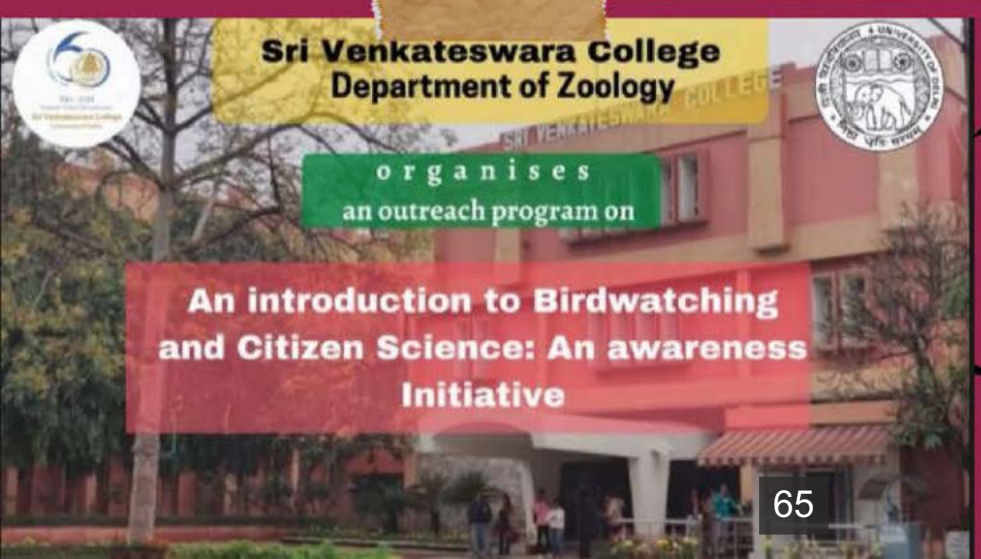
An outreach program on Introduction to Birdwatching and Citizen Science: An awareness initiative was organised by the Department of Zoology on 26th February 2022 at 10:30 AM.

The program was hosted by Ms. Misha Bansal, an alumnus of Sri Venkateswara College, who is a project assistant at Nature Conservation Foundation. She is a nature educator and spiritedly devotes herself towards letting people know about the true wonders of nature and the beauty it holds.

The speaker managed to get the full attention of the participants by engaging them in a quiz-like talk which focused on different kinds of beautiful birds found in our nature. Participants were enlightened by showing them different pictures of birds, asking their names and then briefing them about their characteristics.

The program was more intriguing because of the special attraction: Unveiling of the E-Museum of the Department of Zoology. Fascinating videos and photos of the E-museum were presented to mark the occasion which were highly appreciated. Lastly, a bird collage competition was held as a fun activity which got a zealous participation from the students.

The webinar was a remarkable event offering significant knowledge, amazing virtual bird watching experience to not only the students but also to the teachers.



PHOENIX 10th EDITION

On 4th March 2022, Phoenix, the Magazine Society, Department of Zoology from Sri Venkateswara College (D.U) had released the 10th edition of the magazine. Dr. Douglas Futuyma (Prof. Department of Ecology and Evolution, University in Stone Brook, New York) was invited on the occasion of magazine release. Dr. Anita Verma (Coordinator, magazine society) introduced the society to our esteemed guest, Dr. Douglas and audience and enlightened everyone with the journey of Phoenix and how it started and the motive behind it.

Dr. Douglas also gave his speech on the evolution of humans, which was fascinating for the audience and they loved it and a small round of question & answer occurred with Dr. Douglas. It was the 10th edition of the magazine, so the previous students of magazine society were also invited on this occasion. Phoenix had also organised a quiz on topic 'Evolution: The most important theory of biology.' The quiz was conducted in 2 rounds, the preliminary round was in Google form and final round was interactive on the day of magazine release. Dr. Mansi Verma (co-convener, magazine society) announced the winners of the quiz. Vote of thanks was given by Dr. Rajendra.

DEPARTMENT OF ZOOLOGY

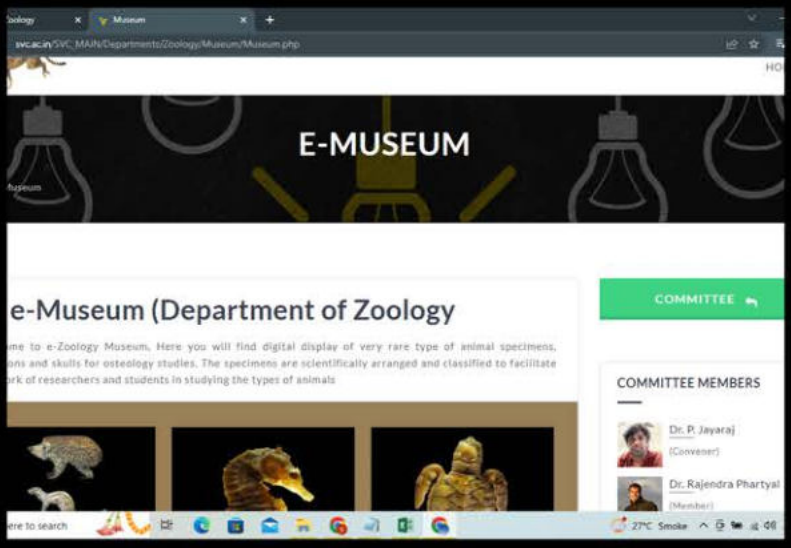
E-MUSEUM

The museum of the department of zoology is a prized possession to the department with an assorted collection of very rare types of animal specimens, skeletons and skulls for osteology studies.

The department unveiled its E-museum on 26th February 2022 which is a digital display of all the specimens present in the museum. These specimens are of a wide variety ranging from non chordata, protochordata to chordata species. More than 500 specimens have been maintained and preserved for over years within the premises of the department.

Rana
(True Frog)

Photo Credits -
Tanya Goel
Shalini Raman



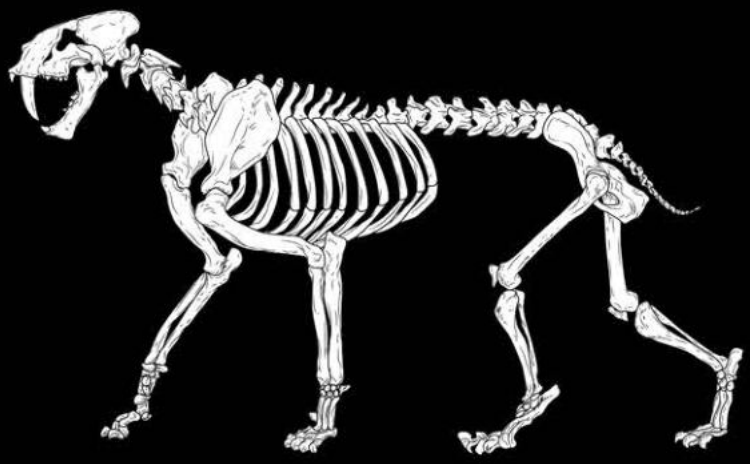
SKELETON OF RABBIT

These specimens are not just the ones that are stored in jars filled with formalin, but there is also a variety of permanent histological slides related to physiology and developmental biology available for observational purposes.

COLLECTION OF BEAKS

The specimens are scientifically arranged and marked by QR codes for scanning, which would direct the user to a website with further information about the specimen. It remains a legacy for the teachers and students of the department since it's establishment

COELENTRATA



Link to the "E-museum"

http://www.svc.ac.in/SVC_MAIN/Departmeants/Zoology/Museum/eMuseumGallery/Gallery/Gallery.php

Teachers' Day

A very joyous and heart-warming event was organised by the students of the Department of Zoology dedicated to the splendid faculty that the department is blessed with. The event was exhilarating and was an exciting package of delight and jubilation. It diffused euphoric energy amongst the zoology family which had gathered together for the celebration. The stage was lit by outstanding performances and fun activities planned for the dear teachers. The musical ambience faded all the limits when the stage was greeted by some mischievous mimicry acts. It is very rightly quoted by Mark Van Doren that, "The art of teaching is the art of assisting discovery." The teachers of our department are always indulged in extensive research in a variety of scientific disciplines, and their welcoming hearts always provide the students to work under their guidance and use their orchestrated knowledge into building something new!

Farewell 2k22

Bidding *adieu* to the beloved and ever-supporting seniors is one the most heart-throbbing events that is supposed to be executed in the happiest way possible. Farewell 2022 was themed "Bonne Vitesse " and was a very wholesome and yet a zealous event, organised by the students of Department of zoology for their seniors. This day was graced by the girls of the final year in their beautiful sarees draped with utter elegance along with the chic ethnic outfits of the boys, as per the strict dress code. The event had a series of thrilling and dramatic activities along with power-packed performances. The event was also graced by the presence of some of the faculty of our department, who were the judges of the titles for Mr Bonne Vitesse and Ms Bonne Vitesse. The event was followed by teachers felicitating the students with graduation hats and mementos which was all then captured in camera for us to cherish forever. The department of zoology has always been known to have nurtured and trained some of the most brilliant minds in the field of science or other, and they have all seem to have turned out well in their lives ahead. We owe the seniors to have selflessly helped and guide us juniors towards the path of righteousness and knowledge.

Chopta

Monumental mountains made us feel small yet provided the thirst to reach great heights. The peaks exhibited us the result of resilience and continuity. The nirvana of temples shook the heavenly love for life and beings!

Tungnath

A mesmerising department trip was organized in the first week of November '22 to Tungnath , Uttrakhand. It was a 6 KM trek from our Camp Site at Chopta. Trekking in the majestic mountains of the Himalayas, surrounded by astonishing flora and eye-catching fauna is an experience that elicited immense love and respect for mother nature and wildlife.

Tungnath being the third of Panch Kedar temples was ecstatic. It was awakening and numbing in Sanskrit chants, ringing bells, blowing conchs, the scent of floral incense, bright breezes, and the hymns of prayers. The final 1 Km trail was from Tungnath temple to Chandrashila. Nothing matches the tranquility at the peak of Chandrashila. It was serene and breathtaking! The overwhelming span of mountains fading into the blue sky left us quietude in its exquisite.

On the way back from the lung-wrenching, resilience-remarking trek; a spell of snow embellished our path. In the quietness of the settling sun, a cheep from a Himalayan Monal ringed us. The long, metallic green crest, coppery feathers on the back and neck, and the prominent white pump was astonishing. The iridescence of the bird threw us in trance!

On our way back from the hypnotic trek we attended The Ganga Aarti at Rishikesh. The sheer energy of the place: circling chandelier diyas kindling flames flowing in waving chills of breeze over the silently slithering Ganga. The Ghat robust with Sanskrit mantras, beating manjhira, thudding dholak, ringing kartal and bells and squealing conchs was ironically soothing.

HEURISTIC EXCURSIONS

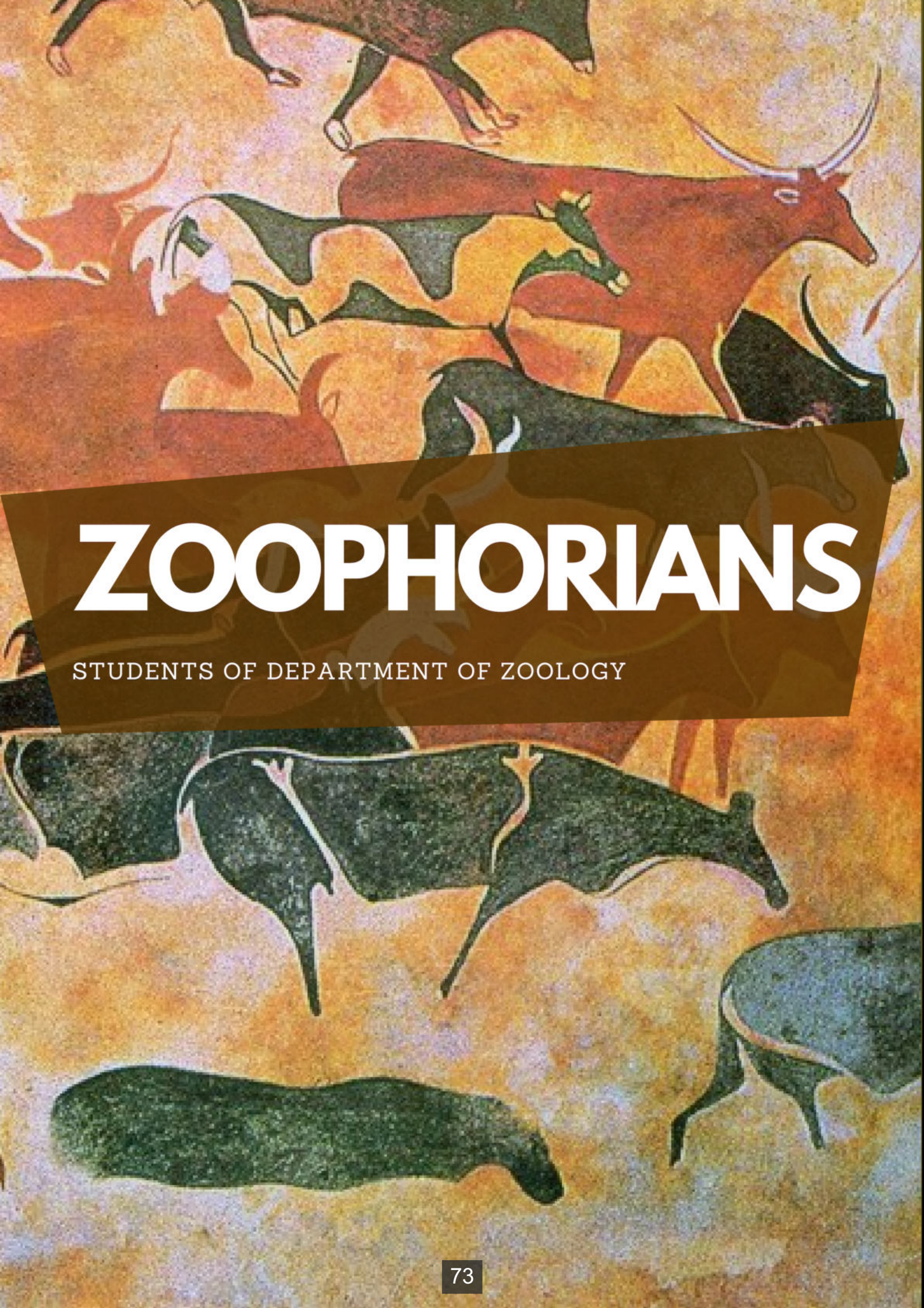
2022

Sultanpur National Park

To experience and learn more about the behaviour and protection of our precious flora and fauna, about whom our textbooks are filled with, a trip to Sultanpur National Park, Haryana, was organised by the Zoology Department, Sri Venkateswara College on 31st October 2022.

35 different species of birds were spotted that day showing different behaviours, like, Rose-Ringed Parakeet, Painted Stork, Jungle Babbler.Birds were not the only one to be witnessed. Tadpoles, damsel flies and butterflies also made the trip a memorable one. Skull and bones of Nilgai were found lying on the trails leading to a spine-chilling event. Some students collected feathers of different bird species as souvenirs.

This educational trip was a successful ordeal giving students a chance of spending time with the beloved nature, learning more about its different aspects, functioning and most importantly, its worth.



ZOOPHORIANS

STUDENTS OF DEPARTMENT OF ZOOLOGY

Third Year Zoology Honours Batch of 2023

SECOND YEAR ZOOLOGY HONOURS BATCH OF 2024

FIRST YEAR ZOOLOGY HONOURS BATCH OF 2026

Sneak peak gallery

AN INSIGHT INTO THE NATURAL HABITAT OF THE DEPARTMENT OF ZOOLOGY

Bookmarks

TEAR AND USE !

This is a tale about the journey of our reader through this sublime planet exploring the greens that dictate the pursuit of land, then, diving deep down into the depths of astonishing shades of blue, gliding through the skies while revealing some flabbergasting secrets and finally discovering the blatant cruelty of tiny entities that govern the fate of massive creatures. Understanding the origin holds a great meaning as it is crucial for man to realise the importance of existence. This tale is a panoramic reflection of our limited sphere which holds secrets behind the quiddities of our origin and is a potential source of enlightenment of the charismatic reality that lies right in front of us and yet, is unseen!

Smika