ZOOSCOPE

E - Magazine

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THE HOD SPEAKS

- SEEMA P. AJBANI
(HEAD OF DEPARTMENT OF ZOOLOGY)

Hello Readers
Welcome to the very first edition of ZooScope, our E-Magazine for the academic Year 2019-2020! I consider myself very fortunate to be among a very talented group of students and teachers with diverse backgrounds and interests. Their ideas, enthusiasm and creativity are what make the environment in our department a very vibrant one. Some of them are nature lovers and budding photographers, others very passionate about studying animals in the wild and still others aspiring to become researchers. Their energy and versatility is truly amazing. Every student is different and has a story to tell. This magazine is an effort to provide our students a platform to showcase their talent, discover the hidden writer or photographer within themselves, chronicle their experiences and thereby transform and enrich their personality.

It also provides us an opportunity to highlight the various activities undertaken by the department throughout the year and also acknowledge the achievements of staff and students alike. Moreover, our alumni continue to remain associated with us and actively contribute in diverse capacities to inspire and mentor the current generation of students. This magazine also includes invited articles spanning different fields with a focus on the latest developments in research and trends in education.

I thank all those who have participated in this journey and hope we can work together in a spirit of cooperation and collaboration to foster and nurture the immense talent that we are blessed with. I am also immensely grateful to our esteemed principal Dr. Manju Lalwani Pathakk who is a source of constant support and encouragement. Last but not the least, I hope that reading this magazine will be an enjoyable experience and harbinger of everlasting change.

Seema P. Ajbani
Head, Department of Zoology

EDITOR'S HUB....

- Anurag Nashirabadkar (Alumnus)

This is the first edition of the Zooscope magazine and being the first editor is a proud moment. As an ex-student and a BSc. Graduate, the main thing I learnt was the aspects of zoology were always practical oriented and more of demonstrations and experiments. Zoology covers a vast scope of science and to inculcate the same for us as well as for the students is a tough job. The subject deals with the immense knowledge of human anatomy, wildlife and environment, physiology and taxonomy. To restrict ourselves to the theory or the syllabus is a mere injustice to this subject is what we understood. Other topics have experiments based on them and thus can be revised or understood through the practicals. But wildlife and nature conservation cannot be constricted to the books alone!

Being introduced to wildlife at an early stage, I have been in this field for the last 8 years. It all started with the bird race, where interacting with the experts, going on field and actually observing birds led to the birth of an interest for the field in the then me. As time passed by, I became a core member of an NGO and thus was lucky to visits various national parks and wildlife sanctuaries throughout the subcontinent. Wildlife photography was an important part of this journey as I kept documenting various natural shots.

As I look by, I may have been lucky to be able to get into this field at that age and to observe and study wildlife practically. But not all can and could have the privilage to experiences hese things at will.

Thus the concept of an e-magazine to demonstrate the wildlife and nature around us to everyone through a format was proposed. This magazine is first of its kind in this institute and we at the department of zoology are proud to be a part of it. We will thrive to be a cause for environmental conservation awareness to a large mass of the undergraduate and graduate students who further can carry out the process. Lets join hands to be together in this process of nature conservation!

HIGHLIGHTS OF OUR DEPARTMENTAL ACTIVITIES IN 2019-20

The department of Zoology of the C.H.M. college organized various events and activities throughout the year 2019 - 20. They included various academic competitions, college level workshops, field visits and excursions for the BSc zoology students. Furthermore the zoofest, an extravaganza of a competetion and fest with prizes to be won was also organized by the students.

One-Day Workshop for Peer Review of Zoology Textbooks and Practical books

Our department organized a One-Day Workshop for Peer Review of Zoology Textbooks and Practical books (Semester II, IV and VI) for teachers in association with BOS in Zoology, University of Mumbai on 23rd December, 2019 in our College in which faculty of Zoology from different Colleges participated along with students and BOS members , UOM, Zoology.

Seminar on Careers in Wildlife and Scenario of Indian Wildlife

T.Y.BSc batch 2019-20 with Kayden

Speaker - Mr Kayden Anthony
Date-19th December, 2019

Lecture was based on the Indian scenario on wildlife threats, diversity, interesting phenomenon's and careers that are possible in wildlife for potentially interested students as well as students who are unclear about their goals but have taken up zoology because they are interested in animal welfare, conservation or similar fields.

Seminar by Kayden on Indian Wildlife

Visit to Karnala Bird Sanctuary

As per the requirements of University of Mumbai curriculum of F.Y.B.Sc Zoology, a study tour to Karnala Bird Century, Panvel, Navi Mumbai was organized by the Department of Zoology with permission of our esteemed Principal, Dr. Manju Lalwani Pathak on Saturday 11th January, 2020.

A group of 135 FY B.Sc. Zoology students proceeded for this one day study trip and were accompanied by four teaching staffs Dr. Sandeep Garg, Dr. Meena Poonja, Mr. Rajiv Shirke and Ms. Roshni Pahuja and three support staff Mr. Devendra Shinde, Mr. Kiran Khirsagar and Mr. Anand Thadani.

Visit to Phansad Wildlife Sanctuary

Department of Zoology conducted a two days-one night excursion on 8th and 9th JANUARY 2020 for T.Y BSc Zoology students to Phansad Wildlife sanctuary.

Total 38 students were accompanied by 3 staff members. The students sighted a total of 45 bird species and 24 butterfly species. Along with the wildlife sanctuary the students also visited the Kashid beach to study the invertebrates like sea anemone, sea urchins and different molluscs.

Visit to Homi Bhabha Centre

We encourage visits to research institutions such Homi Bhabha Center for Science Education, TIFR to promote development of research culture among the students.

Our S.Y. B. Sc. students participated in the Orientation Session on CUBE (Collaborative Undergraduate Biology Education) in the CUBE LAB at the Homi Bhabha Centre for Science Education (TIFR) Mumbai during the months of August and September. It was an initiative to sensitize our undergraduate students with fundamental research aptitude.

CUBE LAB

THE HOTSPOT OF SCIENTISTS!

- Siddhesh Thorat (T.Y. BSc.)

Cube lab is one of the places where no one is a student no one is a teacher but everyone is collaborator.We visit the lab as student, teacher but come out being Lerner & become a member of CUBIST family.

Collaborative Undergraduate Biology Education (CUBE) is an initiative of the Gnowledge Lab of HBCSE (Homi Bhabha Centre for Science Education), a national centre of TIFR(Tata Institute of Fundamental Research).Lab organizes various national level work shops for graduates, under graduates and school students where we get introduced to various model organism to explore such as

Drosophila (Fruit Flies) to study neural degenerative diseases ,

Hydra , Planaria , Earthworm to study regeneration ,

Moina to study epigenetics ,

Phyllanthus (Leafflower),for sleep wake cycle (circadian rhythm)

Mango Mapping ,Mosquitoes , Nematode ,Rotifers , Snail , Butterfly , Cardamine hirsuta (Hairy bittercress) and many more yet to be in the list .

My experience as cubist starts with Dr Sharda Vaidya Madam of SMT.C.H.M.College. She introduced us about CUBE in one of the lecture when I was in FY BSc. My first visit to cube was in CUBE diwali workshop in 2017 where I came across *Moina* as epigenetic model organism and now also I'm culturing *Moina* for further experiments. One of the interesting fact I would like to share is in cube we don't study, we learn .

We start thinking on our topic , we put forth hypothesis for the experiment (yes now those who get stuck on Hypothesis, we have also started with the concept of understanding what is the hypothesis), we learn to design the experiment, we perform experiments, we collect the data , and the best session starts and it is Causaries where we discuss our project , activities done on the day , results , their significance and we learned a lots of concepts which cannot be done through theory and reading the books . It also encourage students to discuss the problem to understand the solution. For me, Dr.Shashibhal Pandey Sir and Dr Sandeep Garg sir both are a blessing to understand concepts regarding any experiment to evaluate their results and to make plan of action .

One of the thing that I learned from G. Nagarjuna sir is the 3C's that is the Culture, Continuity, and Collaboration - culturing of both organisms and thoughts keeping continuity in the work we are doing and to collaborate with every possible person to learn to find out solutions. Also M C Arunan Sir taught me to develop the discussion of the topic and to find out solution by discussion and also the keep everyone updated by sharing our results and on daily basis on communication platforms such as STEMGames .

We encourage our friends to visit the cube lab and also to establish such lab at college level to start working in college level and even at home as per convenience and follow the Culture Continuity Collaboration.

OUR PRIDE AND JOY!

Faculty and Staff Achievers

Our Assistant Professor of zoology Dr. Shashibhal Pandey won the **D D Kosambi Teacher Mentor Award 2019** for his exemplary contribution to collaborative biology research.

Our senior lab assistant Mr. Devendra Shinde was felicitated at the College annual day for his dedicated service of 25 years in the Department of Zoology.

Our visiting faculty Ms. Barkha Choithani cleared the National Entrance Test (NET) and the State Entrance Test (SET) for lecturership this year.

Student Achievers

Rukhsar Sheikh from the T.Y. BSc batch 2018-19 was awarded as the first rank holder of the academic year 2018-19.

Komal Saroj from the T.Y. BSc batch 2018-19 was awarded as the second rank holder of the academic year 2018-19.

The BSc Zoology team of the C.H.M. college won the Bandra bird race organized by the Bandra college in January 2019. The winning team members were Anurag Nashirabadkar, Ameya Kulkarni, Jatin Joshi, Siddhesh Thorat and Amruta Chutke.

Our students from S.Y.BSc batch 2018-19 were awarded as the rank holders for the current academic year.

Shumayla Mallick (left)
Arhama Syed (right)

Welcoming the monsoons in Matheran!

- Anurag Nashirabadkar (Aluminus)

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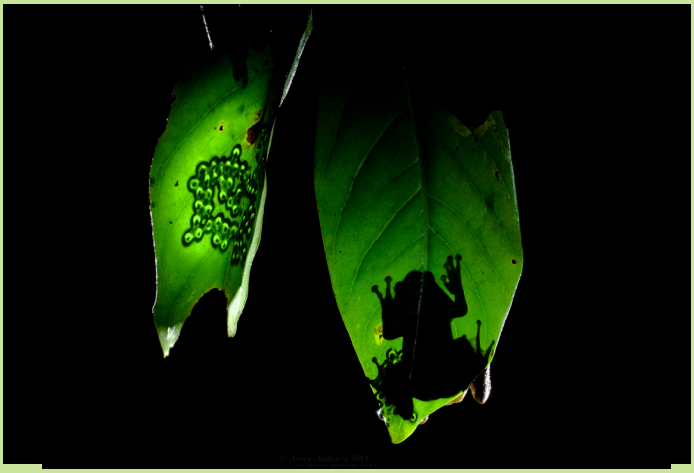
Biodiversity is the variety and variability of life on earth. The qualitative and quantitative documentation of this biodiversity is an important aspect of the nature and wildlife conservation. These documentations are carried out on various scales in different habitats of this subcontinent. A number of naturalists or even the nature enthusiasts carry out these surveys as per the requirements and available resources. If we think it through the official or the government level, India hosts the largest wildlife census in the world in all the wildlife sanctuaries and national parks. These censuses are mostly carried out by the forest officials and researchers. Now to assist it at the local level, various nature teams or environmental conservation groups perform the same process in the urban or rural biodiversity hubs. An urban biodiversity hub is a habitat or a place which is situated just at the periphery or the outskirts of the city and exhibits a sufficient amount of flora and fauna. One of such urban biodiversity hubs is the Matheran!

Matheran is an ancient hill station situated at the outskirts of the Neral city, in the Karjat tahshil, in the Raigad district of state of Maharashtra. It is the smallest hill station in the country located at an elevation of 800 m from the sea level. The total area of survey site is 7 sq.km. As it lies at an elevated level, it comprises of a cooler and less humid climate, with annual temperature ranging from 12o C to 32o C. The average rainfall in Matheran ranges from 3955 to 4075 mm. annually. The area is categorized as a semi-evergreen forest and is a part of the narrow northern belt of the Western Ghats or the Sahyadris. The area comprises of hilly terrain and uneven topography. It covers the terrestrial habitats such as grasslands, valleys, hills, dense evergreen patches, cliffs, and aquatic habitats like stream, waterfall, pond and lake. Being a semi-evergreen forest seasonal bifurcations are seen at small stages and include fruiting and blossoming of particular trees and shrinking or expansion of natural water sources. The primary and vital plant species comprise of evergreen trees like Anjani, Jambhul, Hirda, Mango, Sugran, Kadamb, etc. which are found in abundance. The area under survey consisted of dense forest habitat suitable for the arboreal avifauna biodiversity.

But the Western Ghats are always at their best when it comes to the monsoons! The sudden blooming of the jungle as the lower vertebrates start to dominate majority of the food chains in the forest is what makes the Western Ghats a dream destination for herpetologists and wildlife experts. The season starts in around mid June and hence it marks the arrival of the dwelling species. Majority of the avifauna biodiversity prepare for the breeding season ahead while the mammalian group prefers to stay in the core parts, given the sufficient availability of water and other necessary resources. The calling of birds is taken over by the Bombay bush frogs (*Raochestes bombayensis*) as they start their way towards successfully finding a mate. Apart from this, various frog species start vocalization in different parts of the forest. If you pass by the streams, deep dense inside the forest, you can hear the Bombay night frog (*Nyctibatrachus humayuni*) calling at night on a leaf hanging over the stream.



Nyctibatrachus sp. guarding the eggs

But not only the prey but even the predators become active at the same time. Though Matheran is known to be one of those lesser known places to exhibit reptile biodiversity throughout the year, the monsoons really exhibit a great numbers of them. As you pass through the arboreal part of the forest you tend to see a Vine snake (*Ahetulla nasuta*) or the famous Bamboo pit viper (*Trimeresurus gramineus*) clinging on to the steams or thin branches of the trees. Suddenly the most venomous snake from the subcontinent decides to show up through the leaf litter as we observe the elegant Common krait. As one approaches the muddy patches the most beautiful Bombay sheildtail (*Uropeltis macrolepis*) makes the surprise appearance. Some of the other prominent species in this season are the Travancore wolf snake, Ceylon cat snake, Green keelback, etc.
The invertebrates also mark their presence in numbers as the forest fore as well as the arboreal habitats are filled with them. The fresh water crabs can be seen in numbers as they find their hunt. The tree trunks are already been booked by the spiders such as the daddy long legs, the yellow legged tarantula or the brown widow. One can observe tiny holes in the muddy walls inside the forest which consists of the (*Heterometrus bengalensis)*. Other than these, the butterflies are always an eye pleasing entity of the nature. The season marks the breeding period of the Monkey Puzzle and the Yam flies, thus exhibiting their beautiful colors. The species like Common bluebottle, Common nawab, and Black Rajah can also be seen in numbers.
Thus the monsoons bring out the true colors of the nature and it exhibits various wonders of the floral and faunal biodiversity. But as we speak by, such a rich biodiversity needs to be checked upon and preserved for the betterment and sustainability of the environment. Numerous anthropogenic activities pose a threat to such biodiversity hubs and such interferences can cause huge alterations in the biological chains. Though various environmental organizations are already working hard for the conservation of such areas, it is time we thrive for the purpose of preserving the real national heritage. Let us start a mission to try and maximize our efforts to save such areas and create more awareness so that more number of people join to preserve, protect and finally see what the nature really looks like. Thus we can live in harmony with the nature where we try to save what is left!

Thank you!

A Bamboo pit viper from Matheran.

AILING OF GANGES

DUE TO TRADITIONS OR SOMETHING ELSE?

- Tanmoy Bandopadhyay (S.Y. BSc.)

The Ganges is considered as one of the holiest rivers as per the Indian culture. This river originates at the Gangotri glacier and follows a 2,525 km long course and finally meets the Bay Of Bengal completing its journey. The course of river Ganga has quite significant effect on the settlement of human population. The Gangetic plains contributes one of the most fertile soil in this country and is the prime site for the agricultural activities since the ancient ages. This fertile land led to the settlement of large number of population in the gangetic plain and as a result, the the human encroachment and several other anthropogenic activities showed an ever increasing graph due to the exploding population.

Since the past century, a typical problem was seen arising. This the excessive pollution of the Ganga river. With the dawn of an age of man's technological advancements, the nature seems to be the most vulnerable one sacrificing itself satiating the demands of mankind. In this age of intellectual advancements, man seems to have left behind his ethical ideas and started an era of expoitation to make his living comfortable. The results are slowly appearing now with each passing day in a more massive way. One of the first indications of this was that river Ganga was seen to lose its transparency. This was first noticed in the 20th century. Gradually the river started losing its width. With dawn of the era of modernisation, the rate of deforestation increased exponentially. As a result, the soil started eroding away and now we find excessive silt deposition in the river which has resulted in excessive flooding during the rainy season and stagnation of water/ slower pace of flowing water during the dry seasons.

Many blame religious practices to be a significant reason for depletion of the river's water quality. If we go by this point, we observe that most of the religious wastes constitute of flowers and garlands, which when immersed in the river is accompanied in its flow. Most of this waste settles in the banks of the river and often the herbivores are seen to be browsing over it. If there are left overs, then its degraded biologically into the fertile soil. The ones that remain in the river serve as the food for several aquatic organisms. The left over are insignificant to cause serious pollution. In line of traditional practices next comes the immersion of idols. Accorading to the old traditions, the idols of deities immersed after religious festivals are to lifted up after completion of ritual to be used as the foundation for idol next time when the festival arrives. Use of vermillion (sindoor) seems to cause a great pollution but again, it due to the use of heavy metals such as lead (Pb) in the modern times which creates the real problem. Earlier vermillion was made out of floral parts which did not cause any significant side effects. Traditionally it is said that bathing in the Ganga river makes one's body healthy and frees from diseases which has created a practice of sick people bathing in the river. Now-a-days this has caused a wide spread belief that this practice causes upsurge of harmful microbial populations in the water. But, this is just a belief and does not have any reation with the reality. In 1896, British physician E Hanbury Hankin observed that cholera microbes died within three

hours in its water, but thrived in distilled water. Accorading to The Institute of Microbial Technology -Imtech (one of the laboratories of the CSIR) , more than 20 types of bacteriophages are found in water of Ganga river which has the ability to fight micro- organisms that cause diseases like T.B., pneumonia, cholera and urinary tract infection, among others. The bacteriophages may be responsible for killing many harmful bacterias. Dr. Shanmugam Mayilraj, Senior Principal Scientist at the CSIR-Institute of Microbial Technology, Chandigarh said that the fresh water sediments from the Ganges houses several novel viruses, which were never reported earlier. These bacteriophages are active against certain clinical isolates, or viral strains and can be used against multi - drug resistant or MDR infections. Numerous researches claim that the Ganges have a special factor which results in its unusual oxygen content. It's interesting to note that the Ganges water have 25 times higher oxygen level than any river in the world. All these explains the self healing abilities of the Ganges water.

Even there are no past records of Ganges acting as a microbial reserve and spreading epidemics in previous centuries for which this practice can be solely blamed.

So, traditional practices in their true essence are not very significant factors affecting the water quality otherwise despite following these practices for previous thousands years how could the river survive for so long in healthy condition until the industries came up in large scale? On the other hand, accorading to recent analysis of CPCB the domestic sewage constitutes for more than 80% of Ganges pollution. Along the main river course there are 25 towns with a population of more than 100,000 and about another 23 towns with populations above 50,000. In addition there are 50 smaller towns with populations above 20,000.

Approximately 3 billion litres of raw, untreated sewage are dumped in the river on a daily basis. The amount has more than doubled in the last 20 years and experts predict another 100% increase in the following 20 years. Five states where Ganga flows through are directly pumping 12,000 million liters day sewage in the river which holds the treatment capacity of 4,000 million liters day and actually 1,000 million liters day was operational.

There are also about 100 identified major industries located directly on the river, of which 68 are considered as grossly polluting. CPCB has published "A Plan on Conservation of Water Quality of River Ganga- A Segmental Report" in December 2015 indicates that on an average, the sewage (which is mostly untreated) has a BOD level of 64, while even the treated effluent has four times (i.e. 263) BOD levels. From GPI average BOD value from sewage varies as 200-400. The fecal coliform level of the river is far more shocking than the sewerage stats. According to Central Pollution Control Board (CPCB), the safe level of coliform should be 500 MPN/100ml (most probable number) for bathing and domestic purpose and 50 MPN/100ml for drinking. But in Haridwar, the MPN/100ml is 1,600. In Allahabad it is 48,000, 70,000 in Varanasi and 1,30,000 in Kanpur. In Bihar the level is 1,60,000. In West Bengal's Howrah, it is a shocking 2,40,000.

There are also about 100 identified major industries located directly on the river, of which 68 are considered as grossly polluting. Fifty-five of these industrial units have complied with the regulations and installed effluent treatment plants (ETPs) and legal proceedings are in progress for the remaining units. These industries were discharging 260 × 103 m3 per day of wastewater into the river. The natural assimilative capacity of the river is severely stressed.

The cluster of polluting industries in Kashipur and Moradabad discharge their effluent in river Ramganga and that of Meerut and Modinagar in river Kali which act as tributaries for Ganges. The rivers such as Yamuna which merge with the Ganga also add pollutants to it. So to clean Ganga it is necessary to clean these merging rivers also. Countless mills, distilleries, slaughterhouses, and hospitals also contribute to the pollution of the Ganges by dumping untreated waste into it. Industrial effluents constitute about 12% of the total volume of effluent discharged in the Ganges.

The establishment dams also cause significant amount of damage to the river as these obstruct the flow of river and cause stagnation. Also chemical fertilizers gets washed away with the rain water and cause significant pollution to the Ganges. In addition to it adding tons of plastics, polybags and other non biodegradable wastes in the river cause the such losses to nature that it takes a huge time to recover.

In reality, it is the attitude of man which is responsible for both losses and benefits. One must be conscious about one's deeds. In ancient times, even Harrapan civilization was developed but they did not have practice of releasing raw waste in water bodies .If then that was possible then why not now? Neither traditional practice nor modernization is going to harm our Mother Nature until and unless it is carried out with careless and negligent attitude.

ODD EGRET OUT!

- Harshali Kulkarni (S.Y. BSc.)
harshalikulkarni2010@gmail.com

An ordinary morning converted into thoughtful journey!! I was waiting for my regular morning practical to start and suddenly I saw a flock of egrets. Yes a flock of egrets!! But my eyes were captivated by only one, the Pink one. It was unique and it was ODD.

I was surprised and I took a picture of it then I asked my birder friend who shared that picture with his colleagues. After some observations, we concluded that though it was pink, it was an egret.

The pink egret as seen in the college campus.

I started wondering, why was it pink? later on I observed that the flock of this egret which roost in our college campus, flew off and went to the shore of Ulhas River for food. Ulhas river is one of the most popular rivers and well known because of its polluted water. Every factory water outlet is connected to the Ulhas river and as we know that Ulhasnagar is crowded with small factories which manufacture clothes, food and dyes. The industries always pour their dye which they use for clothes or other purposes directly into the river. Everyday the Ulhas river changes it's colour, sometimes blue, green, red, pink and sometimes violet also.

The egret may have gone to hunt or to find its food in the river or the shore and got dyed pink. After some days I found that egret dead in my college campus. And i am pretty sure it had happened due to pollution. Water pollution done by humans. And that pretty pink egret got run *OUT* from his life while struggling with pollution.

Lets protect our water bodies,
They may protect us.
LETS NO WAIT UNTIL OUR DEATH!!

THE SUBURBAN SAVANNAH!

- JATIN JOSHI (S.Y. BSC)

Malang gad is located in outskirts of Badlapur and situated near Dombivli. The habitat comprises of the huge Malang gad and surrounded by rocky hills. The area also consists of the farmlands of the local people. The area is full of huge grasslands, forest and small rocky hills which attracts some beautiful resident birds, winter migrants and summer migrants also. Mainly the birds which are attracted are winter migrants comprising of raptors, small grassland birds, etc. The Malang gad villages primarily depend on farms which attract the rodents, insects and small birds to feed on the grains. These components further attract the raptors which prey on these lesser animals. The area has electric poles which give a simple and high perch to the eagles where by they can protect their territory and can hunt easily. The farm attracts mice and other rodents which attract snakes and we can observe Short toed snake eagle which mainly feeds on snakes. Thus the area shows numerous food chains which inhibit in this environment.

The raptors population mainly consists of Steppe eagle, Greater spotted eagle, Bonelli's eagle, Eastern imperial eagle, Harriers, Buzzards, etc. The majority of farming consists of maize and wheat. This habitat attracts small grassland birds Bunting, Black breasted weaver, Rose finch, Grasshopper babbler, Stone chat, Bushchat are the birds which mainly feed on grains and insects. The bird variety contains all types of feeder like frugivorous, carnivorous, grainivorous, insectivorous birds.

The habitat also attracts some rarity like Eurasian hobby, Amur falcon, European roller, etc. The resident birds contain Indian roller, Indian eagle owl, Scaly breasted munia, Shikra, Indian spotted eagle, Spotted owlet, Barn owl etc which live simultaneously.

The habitat also contains some mammals like Indian grey mongoose, Black nape hare, Jungle cats, Golden jackals, Porcupines, Field mouse which are mainly from grassland habitat. Malang gad also shows some promising sightings of reptiles such as huge Monitor lizards, Saw scaled vipers, Russell's viper, Common cat snake, Banded kukri, Checkers keel back snake, Trinket snake, Brooks geckos which gives them a perfect rocky and open land.

The late monsoon brings various beautiful colors through flowers and butterflies. Butterflies are the major component of nature in pollination. The habitat mainly attracts Blue pansy butterfly.

Imperial eagle perching on a pole

the Blue tiger butterfly

Along with this Plain tiger, Stripped tiger, Common mormon, Common crow, Salmon Arab are some other butterflies are also sighted. Other invertebrates like Painted grasshoppers, Hooded grasshoppers, Indian red scorpion, Bengal black scorpion, Wolf spiders are also seen in this region.

Every habitat has some individuals and every individual have life threats. Similarly the Malang gad region have these threats like bushfires, continuous farming, over use of fertilizers. The bush fires destroy the entire habitat and lead to habitat loss for these individuals. We have to spread awareness about these threats. We should spread some knowledge about the importance of these individuals in regulating the eco-cycles.

THE UNSAVOURY HUNT!

Ameya Kulkarni (T.Y.BSc)

As we go on to talk about the environment and the various aspects of its conservation, one of the biggest paradigm is of the undesirable interference! We have always objectified it as anthropogenic or human interferences which harm or alter the natural balance. But as naive it may sound, intranatural obstacles can also cause into disrupting the environmental harmony.

One of such incidents happened while i was in thol in the migrants season in 2016. Thol, known for the wetland habitats and ducks migration is situated in Gujarat. As we were moving through a trail observing the birds, we spotted a bluebull grazing among the flock of birds. We were busy clicking some photos when suddenly it became alert and started staring in a particular direction. At first we thought it could have been us, but soon we got to see the real culprit. A pack of feral dogs appeared out of nowhere and started chasing the bluebull. Just like there brother species i.e the wild dogs, they came in as a group and tried to trap the bluebull from all the sides! This chase continued for some time after the bluebull finally running into the thick canopy, out of their sight.

Such cases of interferences of the canines with wildlife has caused problems at many places throughout the subcontinent and their increasing populations will continue to do so! Sharing one of the shots of this epic chase!

ANCIENT BEASTS CLASSIFIED BY COLLAGEN!

- Dhiren V. Sharma (F.Y. BSc)

Protein extracted from ancient fossils which were identified by Darwin as some of the "strangest animals ever discovered" places the creatures amongst horses, tapirs, and rhinos on the tree of life.

Macrauchenia, a humpless camel with an extended snout

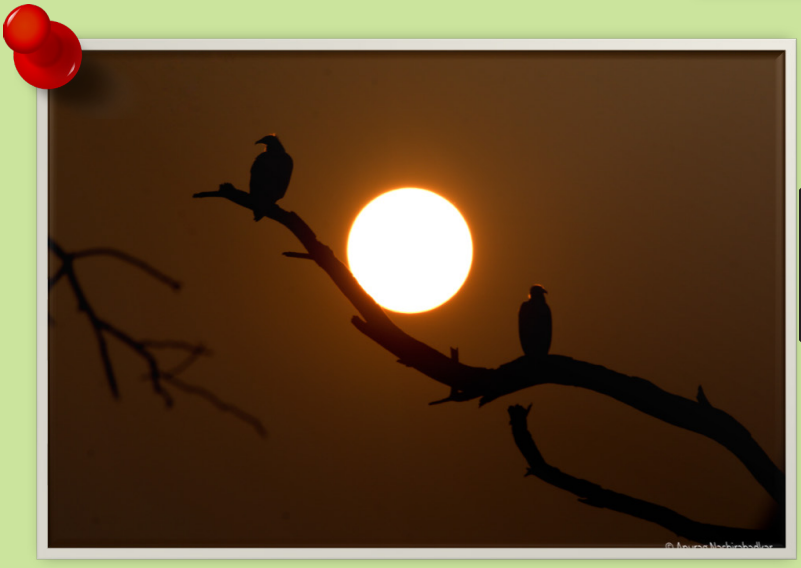
Unable to isolate DNA from ancient fossils of the so-called South American ungulates, researchers turned to collagen, a major structural protein of bone that survives some 10 times longer than nucleic acids. Comparing the protein's sequence with that of extant species, the Researchers placed the extinct beasts—which included two 12,000-year-old specimen of Toxodon, a sort of hippo-rhino hybrid with rodent-like teeth, and two camel-like Macrauchenia specimens, which could not be dated—among the Perissodactyla (Mesaxonia - the true odd-toed ungulates), a clade made up of horses, tapirs, and rhinos. The results, which refute earlier suggestions that the beasts belonged among elephants and manatees as part of the group."Compared to DNA, there's absolutely tons of [collagen]." Museum in London, suggested that protein sequencing could be a complementary approach to DNA sequencing for studying ancient species, and one that allows them to look further back in time: to date, the oldest DNA ever recovered is between 4,50,000 and 8,00,000 years old, but proteins could be recovered from specimens millions of years old.

In addition however, some critics pointed out that, because collagen changes relatively little over time, the amount of information one can glean from its sequence is limited. Still, "it's good to see something come out on Macrauchenia at last,"

THROUGH THE LENSE

Bamboo Pit Viper Yellow Morph
Ameya Kulkarni
Amboli, September 2018

The lazy tiger - Ameya Kulkarni
Pench National Park, May 2019



Egyptian vultures at sunset
Anurag Nashirabadkar
Bharatpur Bird Sanctuary
January 2020

Deccan Banded Gecko - Jatin Joshi
Matheran, September 2019

Tadpole of Ornate Narrow Mouth Frog
Anurag Nashirabadkar
Amboli, July 2019

Malabar Pit Viper - Jatin Joshi
Mahabaleshwar, June 2019

USE OF SIMPLE MODEL ANIMAL IN UNDER-GRADUATE BIOLOGY EDUCATION AND RESEARCH: A COLLABORATIVE PROSPECT

- Dr. Shashibhal Pandey (Assistant Professor)

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Much of our knowledge on heredity, development, physiology and the underlying cellular and molecular processes is derived from the studies of model, or reference organisms. Despite the great variety of life, a common base of shared principles could be extracted by studying a few model organisms, selected on the basis of their amenability to experimental studies. In recent past we have introduced these simple model animals at undergraduate level to develop analytical thinking among the zoology students. These animals include a freshwater zooplankton Daphnia , fruitfly Drosophila melanogaster, Earthworm, Giant African snail and Crow to address certain key question of behavioral plasticity, neuronal plasticity, epigenetics, Gustatory response and Regeneration. Daphnia offer a variety of benefits for the study of epigenetics.

Daphnia's parthenogenetic life cycle allows the study of epigenetic effects in the absence of confounding genetic differences. Earthworms, hermaphrodite segmented animals offer great opportunity to study regeneration and decision making in response to environmental stressors. A new study suggests that crows have unusually large brains for their size. "It is relatively the same size as the chimpanzee brain.

The report suggest that that crows and apes both think about their social and physical surroundings in complex ways, using tool use as an example. This cosmopolitan bird provides an opportunity to study by graduate students, And the findings can be contributed to metasudio initiatives "Behaviour Watch at Home". Lastly giant African snail (a garden pest) has been used to study learning, memory and neuronal plasticity in animals.

Through our collaborative efforts at various colleges across the country it has been realized that these simple animals can be used in many ways at undergraduate and postgraduate zoology education and research. Furthermore rearing and culturing of these animals is cost effective and easy while they can also be used to answer cutting edge question of modern biology.

TEACHING AND LEARNING SCIENCE: A PERSPECTIVE

- Dr. Shashibhal Pandey (Assistant Professor)

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Science is a way of knowing, a method of learning about nature. In other words science is the concerted human effort to understand, or to understand better, the history of the natural world and how the natural world works, with observable physical evidence as the basis of that understanding.

Rooted in common sense, its formal, systematic method is called scientific inquiry. The product of scientific inquiry is the body of scientific knowledge. Scientific knowledge takes four forms: hypotheses, facts, laws, and theories. Hypotheses are tentative statements about relationships between variables in nature. Long ago the rotation of the earth on its axis and the orbit of the earth about the sun were hypotheses. Over time and through scientific inquiry, hypotheses may become facts. Facts are scientific observations that have been tested and confirmed repeatedly.

Scientific knowledge can be gathered in two ways. One, by observation and second by conducting experiments. Commonality between the two is making and recording observations of nature, or of simulations of nature, in order to learn more about how nature, in the broadest sense, works. Those who do this are called scientist.

So why do Science?

Education in science serves three purposes. First, it prepares students to study science at higher levels of education. Second, it prepares students to enter the workforce, pursue occupations, and take up careers. Third, it prepares them to become more scientifically literate citizens. The relative priority and alignment of these three purposes varies extensively across countries and cultures. Regardless of the setting, a sound education in science emphasizes that science is both a way of knowing and a body of knowledge; it also emphasizes integrating scientific inquiry with scientific knowledge.

Why do societies support science?

If you see the TV advertisements of health products such as toothpaste, body lotions, sunscreams, chavanprash, multivitamins and some detergents you find a common modus operandi that a person bearing white lab coat appears on TV screen to claim the authenticity and superiority of the product. This speaks about the credibility of science in society. Societies support science because of simple curiosity and because of the satisfaction that comes from knowledge of the world around us. Few of us will ever derive any economic benefit from knowing that the starlight we see in a clear night sky left those stars thousands and even millions of years ago, so that we observe such light as messengers of a very distant past. However, the awe, perspective, and perhaps even serenity derived from that knowledge is very valuable to many of us. Likewise, few of us will derive greater physical

Convener of Workshop Dr. Shashibhal Pandey interacting the BOS members on the Dias at the Valedictory function

well-being from watching a flowing stream and from reflecting on the hydrologic cycle through which that stream's water has passed, from the distant ocean to the floating clouds of our skies to the rains and storms upstream and now to the river channel at which we stand. However, the sense of interconnectedness that comes from such knowledge enriches our understanding of our world, and of our lives, in a very valuable way. By understanding the stars in our sky and the rivers under our bridges, we better understand who we are and our place in the world. When intangible benefits like these are combined with the more tangible ones outlined above, it's no wonder that most modern societies support scientific research for the improvement of our understanding of the world around us.

What form is the science taught in?

In our university science is taught in form of a syllabus/curriculum. And the amount of effort teacher has to pour in teaching is calculated as workload. . In last 11 year of my teaching career I have noticed that syllabus have least effect on understanding science, less because of its content and more because of the way it is taught in schools and colleges. No amount of lectures and tutorials can compensate for knowledge that is derived by doing an experiment in a scientific manner. Group discussions and literature survey on different topics are the most popular way of validating scientific inquiry.

What is the responsibility of Science students?

Today's students must learn how to do scientific inquiry and use scientific information to make decisions that will affect their personal lives, careers, and societies.

Deep understanding in science goes well beyond memorization of isolated facts and concepts. Deep scientific understanding includes a coherent system of facts, concepts, scientific inquiry, and strong problem-solving ability.

Students must learn that learning is social and cultural process and is not an incident to happen someday. Therefore it should be done in an incremental manner. Regular studies and good reading habit should be accompanied by individual learners' interactions with their peers for learner's active construction process and the group process. The construction of deep scientific knowledge results from actively practicing science in structured learning environments.

What is the responsibility of Science teachers?

All teachers hold personal beliefs and dispositions about teaching, learning, and learners. Some teachers believe their responsibility is to teach the material, and the students' responsibility is to learn what is taught. If students struggle or fail to learn, the responsibility rests

only with the students. The degree of responsibility they accept depends on the students' level of effort to learn. The teacher should also be able to modify instruction to help struggling and failing students improve.

Learning relies on a complex synthesis of biological maturation, prior knowledge and experience, reasoning ability, and instruction. Students' learning capabilities at any age depend heavily on their prior knowledge and experiences, which can help or hinder them from learning something new or have no effect.

This extensive range of knowledge and experience stems from learners' socioeconomic status, gender, ethnicity, culture, native language, and other factors. Different learners require different kinds of explicit instructional support and guidance to understand and do scientific inquiry and to understand the body of scientific knowledge. Science teachers must discern the roots of students' struggles to learn and simultaneously provide instruction that is challenging but not overwhelming. Asking questions during instruction is an effective strategy for assessing students' difficulties.

Teachers should take the viewpoint that the goal of effective science teaching is to have students understand, not to have them believe. For example when teaching evolution, teachers should deemphasize their use of words such as "true" and "believe". Students' prior knowledge of truth and belief is often based on their religious views, in which truth is absolute, ultimate, and unchanging, and to believe means to think of something as absolutely true. Teachers should emphasize that scientists accept evolution on the basis of several independent lines of scientific evidence that have developed over nearly 150 years.

Therefore one should be sensitive to students' verbal and nonverbal behaviour when teaching a unit that students may perceive as containing controversial ideas. Clarify the difference between understanding and believing. One can also use peer-group discussions to help students become aware of other students' thoughts about the concept. Last but not the least emphasize the explanatory power and predictive ability of a concept and encourage students to think about concepts as tools for solving scientific problems.

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APOLLO 13: SUCCESSFUL FAILURE MISSION BY NASA

- Raj Kumar Yadav (Research Scholar)

Apollo 13 was based on the real –life crisis that occurred April 13,1970 on board the Apollo Spacecraft.Apollo 13 was to be the third mission to land on the Moon. An explosion in one of the oxygen tanks crippled the spacecraft during flight and the crew were forced to orbit the Moon and return to the Earth without landing.

The Apollo 13 mission was launched at 2:13 p.m. EST, April 11, 1970 from launch complex 39A at Kennedy Space Center. Apollo 13 Launch The space vehicle crew consisted of James A. Lovell, Jr. commander, John L. Swigert, Jr., command module pilot and Fred W. Haise, Jr. lunar module pilot

The Apollo 13 Mission was planned as a lunar landing mission but was aborted en route to the moon after about 56 hours of flight due to loss of service module cryogenic oxygen and consequent loss of capability to generate electrical power, to provide oxygen and to produce water.

As a result of these occurrences, the CM was powered down and the LM was configured to supply the necessary power and other consumables.

All LM systems performed satisfactorily in providing the necessary power and environmental control to the spacecraft. The requirement for lithium hydroxide to remove carbon dioxide from the spacecraft atmosphere was met by a combination of the CM and LM cartridges since the LM cartridges alone would not satisfy the total requirement. The crew, with direction from Mission Control, built an adapter for the CM cartridges to accept LM hoses.

This mission was called “a successful failure,”in that they returned safty,but did not make it to the moon.

SAY CHEESEEEEE!

A snap of the team "Zoofest" 2020! It was all smiles as the team finally assembled after the day's work!

ZOOFIESTA!

Inauguration of the fest with the hands of our cheif guest Dr. Parvish Pandya and our principal Dr. Manju Lalwani Pathak


The cheif guest Dr. Parvish Pandya wearing the mala to the Amma statue as a tribute.


Dr. Parvish Pandya with our Zoology staff, HOD Ms. Seema Ajbani and Vise Principals of all faculties.


Dr. Parvish Pandya and Dr. Manju Lalwani Pathak at the poster presentation with our volunteers.


The whole Zoofest team of volunteers along with the cheif guest Dr. Parvish Pandya.


Our volunteers working hard as the Zoofest goes on!

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THANK YOU!