

## *FROM THE EDITOR'S DESK:*

When it comes to designing 'Nature' is the best buddy to look up to! Biodesign is one such upcoming field that talks about intersecting technology with nature.

Hello Readers and welcome to the third and the last edition of Life: E-Newsletter for the year 2019-20. The theme this year is Biodesign. In this last edition, we bring to you some absorbing articles and beautifully clicked photographs by our fellow students.

This edition includes an article which talks about how nature has inspired textiles around the globe. Antibiotic Resistance is one topic that is gaining high importance and hence we decided to include an article about the same. This academic year, the Department of Zoology had some great excursions planned for the second year and third-year students and we have two articles that talk about them. Don't miss out on the 'Photo Galleria' as we have tried incorporation some of the best shots this time.

So, sit back, relax and enjoy this journey of reading with us....

Happy Reading!

**SAKSHI POOJARY**

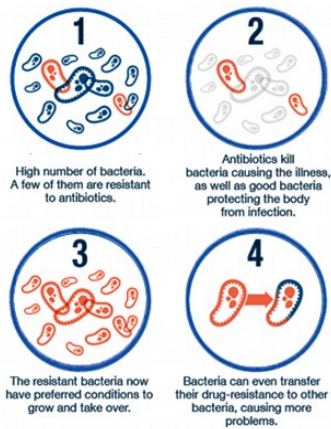
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# LIFE: E-NEWSLETTER

## CURRENT AFFAIRS AND THE NEWS IN BIODESIGN

### How does antibiotic resistance occur?



### Graphical explanation of antibiotic resistance

## THE GLOBAL RESISTOME

*The redundant use of antibiotics has made the pathogenic bacteria resistant to it.*

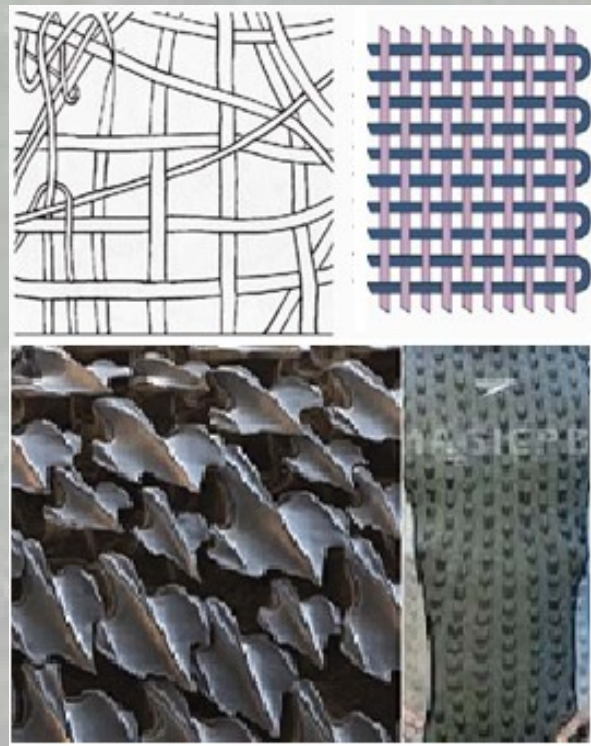
"The time may come when Penicillin can be brought by anyone in the shops. Then there is the danger that the ignorant man may easily underdose himself and by exposing his microbes to non-lethal quantities of drug, make them resistant", isn't this the sad situation of this era? The above lines were a warning given by Alexander Fleming in his Noble Prize acceptance speech in 1945. Indeed, we are in the era where antibiotics are used very frequently and increasing the danger of its resistance every single day. It is sad to see that even if a person is down with fever or is having cough, he/she ends up taking some antibiotics. We shouldn't forget that our body has its natural defense system against these bacteria and unnecessary use of antibiotics end up reducing the ability of the immune cells to fight against them. There was a time when antibiotics were rarely used. People used Penicillin only if the disease was lethal but nowadays it has become a daily pill for some. The redundant use of antibiotics has made the pathogenic bacteria resistant to it. Gradually bacteria are modifying themselves in order to make themselves antibiotic resistant. Antibiotics were discovered to kill these bacteria but sadly they are the bacteria which are becoming resistant and not humans!

"During the last 70 years bacteria have shown the ability to become resistant to every antibiotic that has been developed. And the more antibiotics are used, the more quickly bacteria develop resistance", said Dr. Steve Solomon, Director of CDC's Office of Antimicrobial Resistance.

Antimicrobial resistance poses a serious global threat to human health. The threat is due to the spread of Multidrug Resistance (MDR) in bacteria giving rise to 'Superbugs'. One of the many reasons why antibiotic misuse is so high is the poor understanding between bacteria, viruses and other pathogens. For small or rather easily curable viral infections, one must allow the bacteria to decrease their multiplication itself. Also, when treated with antibiotics one must ensure completion of the dose to avoid these bacteria to thrive.

So, it's time to understand the threat and act wisely upon it!

- RAKSHANDA VALANJU, FYBSc



**TOP:** (Left) Weave structure of a weaverbird nest. (Right) plain weave structure.  
**BOTTOM:** (Left) SEM of shark skin (Right) and Fastskin Fsii (FS2) swimsuit, mimicking shark skin

## The one where we mimic nature

Biodesign as the word itself suggests, is copying the extravagant designs that nature has to offer and applying it to our merchandize. This review article speaks about the mimicry carried out in order to perfect the textile products, so that it causes less harm to the nature and is more durable. The three important assets of human civilization are food, clothing and shelter and each of it is undergoing major advancements. In this day and age of innovation, turning to mother nature for revolutionizing seems like the apparent choice. From the spinnerets of a spider to the placoid scales of a shark, the applied aspects for textiles are numerous.

**Weaving:** Although the technique of weaving was into existence for 20,000 years, the inspiration for it is rather a surprising one. The weaver bird found in the south and southeast Asia builds its nest by weaving twigs and leaves together. ! Weaverbird uses stitching, knotting and weaving actions during the building of its nest. In this way, its actions are similar to the weaving and knotting process adopted by human. The only difference being that these guys do not need a handloom to make a sublime artwork for attracting its mate

**Shark skin effect:** Olympic swimmers follow a strict regime to stay in peak condition. have to maintain a steady diet, train almost every day and intake supplements for having a shot at the medal.

Even then they do not come close to the ocean's fastest swimmer- The Shark. When the skin of the shark is observed under a microscope, a detailed and dynamic design is seen which helps it to reduce the drag while swimming and hold the title for one of the deadliest predators. Many swimsuits are designed by mimicking the shark skin. It is also used to impede bacterial growth over surfaces. Coating a surface with sharklet restricts growth of infection causing bacterial colonies.

**Dry Adhesion-Gecko feet:** The Gecko is a subspecies of lizard who have amazing feat that are adapted to adhering to almost any surface be it smooth or rough. The Gecko has millions of fine hair like structures that can create dry adhesion against a surface. Many attempts have been made to mimic the dry adhesion of the gecko by synthesizing their feet like material using silicon, polyvinyl, siloxane and carbon nano tubes. It has applications in lifting heavy stuff without using much external force

Humans have a never-ending thirst for a better, optimal lifestyle. The *freaks* of nature provide a good source of inspiration for the unsettling needs of Mankind.

- RAWLIN LOBO  
SYBSc, A

## 2019-20 EXCURSIONS WITH THE ZOOLOGY DEPARTMENT:

### *A trip to remember: Excursion to Dapoli*

**SAKSHI POOJARY,  
SYBSc- A**

The Tuesday morning of 22nd of January witnessed a different energy among some students assembled at the college foyer. This unusual hustle-bustle was due to the Second Year students of Zoology who were all set to embark their journey to – Dapoli, a city in Ratnagiri district which is about 125 km from Mumbai. The ones who signed-up for the excursion were exhilarated ever since it was announced by the department.

All of us kept chattering while we were still eagerly waiting for our bus to arrive near the college gate. As the bus arrived, we quickly started our journey to explore the beauty of Dapoli. Even the long eight-hour journey couldn't kill the excitement within us.

Finally, after the long journey we reached Dapoli late that afternoon and had to quickly sit for lunch. We soon had to leave for our first planned destination- Harnai Port which is a fish landing centre. We were fortunate enough to reach there during the fish auctions. Every evening hundreds of fishing boats come back after fishing and gather an auction for their catch. We came across all possible types of edible fishes, crustaceans and molluscs in the fish market. Some of the commonly seen were –

Ribbon fishes, Sting rays, Hammerhead sharks, different types of Pomfrets, huge Spiny Rock lobsters, Mud crabs, Cuttle fishes, Prawns of different species etc. We also came across a huge Manta ray and cart full of Lunar tail puffer. Most of our time was spent identifying each fish, their characteristic features and clicking their photographs. After spending a good long time, it was time for us to return to our Stay home.

The next morning, everyone was bright and ready, waiting to leave for the Bird watching trail. We carried our cameras, binoculars and some bird reference books and were all set for the trail. We spotted birds like the Golden-fronted leafbird, Purple sunbirds, Red vented bulbul, Drongos, Black-hooded Oriole, and many more. Late that morning we left for our last destination- Murud Beach. It was indeed a beautiful experience of admiring the colourful shells, identifying them and exploring the rock pools.

We were fascinated seeing a beautiful sea anemone in one of the rock pools.

With this, the trip had come to an end! It was now time for us to leave for Mumbai. Although the trip was over, but it left us with immense memories to cherish.

We never thought that this study excursion could be this fun, informative and become – A Trip to Remember!



### *Excursion to Dandeli: Summary of TYBSc Excursion to Dandeli*

**ANOUSHKA KUMAR,  
TYBSc**

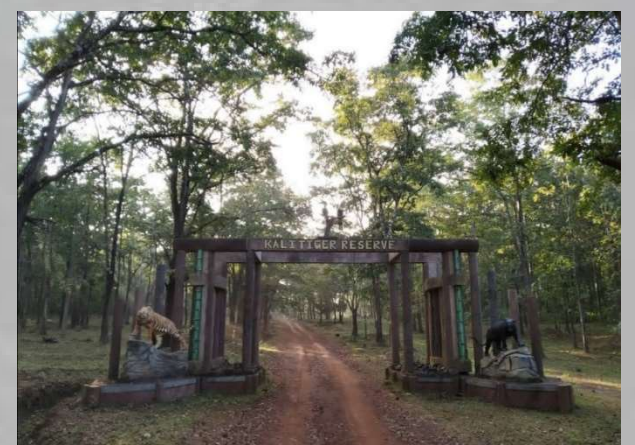
According to Francis Bacon an English philosopher, travelling is a part of education. An excursion is not just a pleasure trip, but also enhances the knowledge of the students beyond the four walls of the classroom. Educational tours are part and parcel of the life of students. It can provide them solace and help them form an escape route from the tedium of their nerve-wrecking hectic schedule of activities. To provide such an enriching experience to students, our department, Department of Zoology, embarked on another milestone journey through its many such endeavour across the Indian landscape, as Dandeli excursion, with the objective of wildlife and bird watching. Dandeli excursion was special and unique in more ways than one, in that it was conducted through teaching and learning on-wheels, where students were collectively guided to spot and identify the species by our professors, Dr. Aditya Akerkar and Dr. Rupali Vaity, along with the field guides who tagged along.

This kept them constantly involved, thinking, observing and correlating their academic curriculum with the current real wildlife scenario.

Location were carefully and diligently chosen through an extensive iterative process so as to ensure their relevance and significance to applied knowledge and ranged from diverse fields and subjects relating to study of ecology, ethology, identification of animal, biodiversity, culture and tradition. The aim of this excursion was to develop skills in students to undertake further studies on wildlife biology.

Apart from this, students were also given the opportunity to relish the bewitching beauty of sunrise near river Kali and other aesthetic sceneries. Various activities like boating and river rafting were the cynosure of the trip. The day was to end with warm and cosy bonfires in the chilly weather with ambient music.

The endeavour was a unique experience since apart from offering the students a deeper insight into this particular field hereby making them explore this beautiful plethora of wilderness, it also facilitated the students to broaden the outlook towards the outside world



## PHOTOGALLERY

*Submissions from our own community of students*



ORIENTAL GARDEN LIZARD: *Calotes versicolor*  
AKSHITA KONDA SYBSc



MALABAR GIANT SQUIRREL *Ratufa indica*  
JEMIMA MOSES TYBSc



GREEN VINE SNAKE *Ahaetulla nasuta*  
SATYAM GUPTA TYBSc - C



GRASSHOPPER,  
SHREYA THORAT, SYBSc



RED COTTON BUG (*Dysdercus cingulatus*)  
Mahesh Acharya FYBSc C



TIGER  
SARVESH DALVI, TYBSc