SACON News

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In this issue

Institutional events

- ✓ Meeting of Research, Monitoring and Advisory Committee of SACON
- ✓ Proposed Collaboration between University of British Columbia and SACON
- ✓ Review of ENVIS activities of SACON
- ✓ Training on Government e-Marketplace
- ✓ Coimbatore Bird Race
- ✓ Workshop on Conservation Genetics
- ✓ Workshop on captive care and breeding of rusty - spotted cat
- ✓ Sálim Ali Trophy for Nature Competitions
- ✓ Lectures delivered by subject experts to MSc students
- ✓ Workshop on Vulture Conservation and Reintroduction Programme
- ✓ World Wetlands Day 2019
- ✓ SACON's Scientist elected for the prestigious "Indian National Young Academy of Sciences"
- ✓ Workshop on DIOXIN INDIA 2019
- ✓ Participation in the conference on Understanding Behaviour at IISER, Kolkata

Popular articles

- ✓ Cave - The Unexplored World of the Andaman Islands
- ✓ Opuntia as an emergency summer fodder for the chital
- ✓ A negligible tale with many twists and turns

From the Director's Desk

This newsletter, January to March 2019 issue covers lots of institutional activities of SACON and mesmerizing popular articles from researchers covering both mainland and Andaman island.

With the growing movement of SACON, collaborative research meeting was held with Mr. Jorma Neuvonen, Director of Special Projects, University of British Columbia, Canada. A faculty member was elected for the prestigious "Indian National Young Academy of Sciences", New Delhi for possible science exchange in various thematic areas. Dr. Anandi Subramanian, Principal Advisor, MoEFCC and Dr. Ramakrishna, Chairman and members of Research, Monitoring and Advisory Committee of SACON reviewed ENVIS activities of SACON and research activities respectively, and interacted with Faculty Members and Post grad Students. The visit by subject experts from Indian Institutes of Science Education and Research, Nature Conservation Foundation and representative of IUCN Hyena Specialist Group taught SACON MSc course in Ornithology and Conservation Biology on various topics. Faculty conducted workshop/training on Conservation Genetics, and captive care and breeding of rusty-spotted cat. SACON conducted Nature Education activities: Sálim ali Trophy for Nature Competitions and Coimbatore Bird Race to enhance the basic knowledge on ornithological aspects among younger generations through training and motivation. During the Sálim ali Trophy for Nature Competitions for school children, SACON organized the event with 2000 school students from 40 Schools which shows SACON's contribution to Nature Conservation through students participation. SACON has also celebrated the World Wetlands Day 2019 wherein Honourable State Rural Development Minister, Mr. S.P. Velumani released a poster on "Wetlands and Climate Change". In addition, the faculty and researchers participated in various workshops nationally. I wish SACON community with good luck in execution of successful research work across the country.

- **Dr. K. Sankar**

Meeting of Research, Monitoring and Advisory Committee of SACON

The 31st meeting of the Research, Monitoring and Advisory Committee (RMAC) of SACON was held under the chairmanship of Dr. Ramakrishna, Director (Retd.), Zoological Survey of India on 28th March 2019 at SACON, Coimbatore. During the meeting, the RMAC reviewed the progress of the ongoing research projects of SACON funded by the MoEFCC and other external agencies, and also recommended the Annual Work Plan of SACON for 2019-20 to the Governing Council for its approval.

Proposed Collaboration between University of British Columbia and SACON

Mr. Jorma Neuvonen, Director of Special Projects, University of British Columbia (UBC), Canada, visited SACON on 13th February 2019 and had discussion with faculty members of SACON regarding possible collaboration between the UBC and SACON in various academic fields such as faculty & students exchange programme for capacity building,

collaborative research in the field of Climate Change impact studies on birds, Human-wildlife conflicts, Extension and Nature Education, GIS and Remote Sensing and Advanced Research Techniques.

Review of ENVIS activities of SACON

Dr. Anandi Subramanian, Principal Advisor, MoEFCC visited SACON on 28th February 2019 to review the ENVIS activities of SACON. Dr. Goldin Quadros, Principal Scientist, SACON gave a presentation on the activities / programmes under ENVIS. Dr. Anandi Subramanian also visited the facilities of SACON, and interacted with Faculty Members and PG Students.

Training on Government e-Marketplace

A one-day training programme on Government e-Marketplace (GeM) Version 3 was conducted on 05th March 2019 at SACON by Institute of Government Accounts and Finance (INGAF), Chennai. In total, 21 faculty, staff and Inspire Fellows have participated in the training programme.

During the training, the procurement of goods through Government e-Marketplace (GeM) was explained in detail with demo, covering all the aspects including types of procurement, creation of bids and reverse analysis, technical and financial evaluation, consignment receipt, acceptance certificate, processing, creation, approval and payment confirmation of bills.

At the end of the training programme, all the participants were awarded with certificate of participation by INGAF, Chennai.

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Coimbatore Bird Race

In collaboration with M/s Hongkong and Shanghai Banking Corporation (HSBC) & M/s Yuhina Canopy, Mumbai, SACON (under SANF Programme) organized the 8th Coimbatore Bird Race, on 13th January 2019 at Coimbatore, Tamil Nadu. This is a dawn-to-dusk event where a large gathering of experienced and budding birdwatchers spent an entire day from 6.00 am to 6.00 pm on spotting and identifying birds in an effort to record as many species of birds as possible in and around Coimbatore city and submitted their data to the Coordinator of the event.

Workshop on Conservation Genetics

SACON conducted the 2nd Conservation Genetics Workshop from 21st to 25th January 2019 at SACON, Coimbatore. This course is specifically designed as a primer for students and teachers who wish to initiate research in the field of Conservation Genetics. The workshop covered the theoretical and practical aspects on the theme of Conservation Genetics. Eight researchers participated in the workshop. Dr. Vishnupriya Kolipakam, Scientist, Wildlife Institute of India, Dehra Dun and Dr. Robin Vijayan, Assistant Professor, Indian Institute of Science Education & Research (IISER), Tirupati and Faculty Members of SACON provided inputs in the Workshop as Resource Persons.

Training workshop on captive care and breeding of Rusty-spotted Cat

SACON organized a training workshop, funded by the Forest Department of Maharashtra during 28th to 30th January 2019 for the Forest Staff of Sanjay Gandhi National Park Mumbai, on captive care and breeding of Rusty-spotted cat as part of Maharashtra Forest Department's plan to update their captive breeding facility. Mr. Neville Buck, Aspinall Foundation, Kent, United Kingdom was invited to the workshop as a key resource person to train the Forest Department Staff in the care and upkeep of the cats and plan the breeding program in Sanjay Gandhi National Park. Mr. Buck has been involved with captive care and breeding of small wild cats, and is the Section Manager for small carnivores at the Port Lympne Wild Animal Park, United Kingdom.

Sálim ali Trophy for Nature Competitions

SACON organized the Sálim ali Trophy for Nature Competitions for school children on 20th January 2019 at G.D. Matriculation Higher Secondary School wherein nearly 2000 school students from 40

Schools participated in the above-mentioned

competitions. As part of competitions, painting, pencil drawing, essay writing, elocution, bird watching and quiz were held. The prize distribution function was organized in the Central Academy for State Forest Service (CASFOS) on 7th March 2019. Bharathi Matriculation Higher Secondary School, Coimbatore won the Sálim ali Trophy for Nature – 2019 with 57 points for the consecutive second time while Kongu Vellalar Matriculation Higher Secondary School and GD Matriculation Higher Secondary School were declared 1st Runner and 2nd Runner Ups of the Trophy respectively.

Lectures delivered by subject experts to MSc students at SACON

Dr. V.V. Robin, Assistant Professor, Indian Institutes of Science Education and Research (IISER), Tirupati delivered a talk on "How we can use bird songs and genetics to understand the biology of birds - Lessons from Shola Sky Island birds" on 23rd January 2019 at SACON.

Mr. Arumugam, member, IUCN Hyena Specialist Group visited SACON as a Guest Faculty and gave a lecture to the MSc students as part of the "Habitat Ecology Module" on 28th January 2019. Mr. Arumugam shared his knowledge and expertise on the habitat use of dholes and striped hyaena in the Western Ghats.

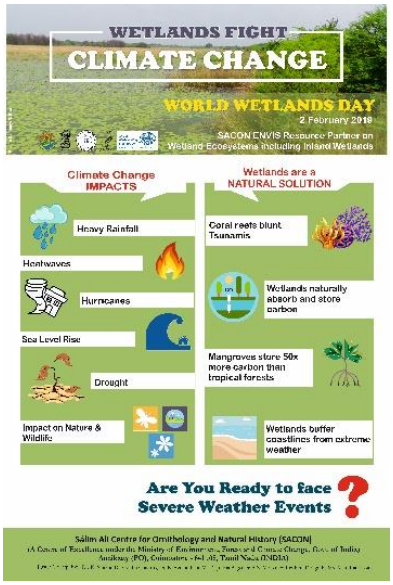
Dr. Suhel Quader, Senior Scientist, Nature Conservation Foundation (NCF), Bengaluru delivered a Guest Lecture on "Learning about birds through Citizen Science" on 18th March 2019 at SACON.

Workshop on Vulture Conservation and Reintroduction Programme

Dr. Riddhika R. had presented a talk on the "Large mammal prey base in Protected Areas in India and its relevance to vulture reintroduction programme" as a participant of the vulture workshop at Jalpaiguri, West Bengal held from 22nd to 24th February 2019. The workshop was organized by the Bombay Natural History Society (BNHS) in collaboration with Buxa Tiger Reserve and MoEFCC. The workshop was inaugurated by Mr. Ravi Kant Sinha (IFS), PCCF, Wildlife and Chief Wildlife Warden, West Bengal, Dr. Deepak Apte, Director, BNHS and Sri Soumitra Dasgupta (IFS), Inspector General of Forests, MoEFCC, Dr. Vibhu Prakash, renowned vulture conservationist who is also the Deputy Director of BNHS along with Mrs. Nikita Prakash, Scientist, BNHS were the main coordinators of this workshop and the vulture captive breeding centers across the country. There were seven technical sessions with eminent speakers from BNHS, Royal Society for Protection of Birds (UK), Indian Veterinary Research Institute (Izzatnagar), Drug Controllers, Dept. of Animal Husbandry and Forest and Wildlife Departments from West Bengal, Assam, Meghalaya and Tripura. The topics of brainstorming discussions pertaining to vulture conservation ranged from population estimates of vultures in the wild, status of vultures in the captive breeding centres to the preparations for vulture reintroductions and regulations on the use of harmful drugs in 10 km vulture safe zones.

Vulture Conservation participants and resource personnel

World Wetlands Day 2019



The SACON ENVIS Resource Partner celebrated the World Wetlands Day 2019 (WWD 2019) by participating in the "Ecological Festival for Saving the Western Ghats - National Conference 2019" organised by OSAI Environmental Organisation in collaboration with the Sri Krishna Arts & Science College, Kuniamuthur, Coimbatore from 1st to 3rd February 2019.

On 2nd February 2019 SACON ENVIS RP promoted the message of WWD 2019 at the event by releasing a poster on the theme "Wetlands and Climate Change". The poster was released by Honourable State Rural Development Minister, Mr. S.P. Velumani.

SACON ENVIS RP put up a stall to showcase the ENVIS publications and the knowledge products which were distributed to almost 2000 students from schools, colleges and the public who visited the stall. The Green Skill Development Programme (GSDP) brochure was also distributed.

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SACON's Scientist elected for the prestigious "Indian National Young Academy of Sciences"

Dr. T. Ramesh has been inducted as a member by the Chairman of INYAS

Indian National Young Academy of Sciences (INYAS), a body of Indian National Science Academy (INSA), Govt. of India, New Delhi, provides a platform and encourages freedom of exchange of ideas/collaborations among young scientists and voice of young scientists across India to be heard by senior academicians and policy makers of the country. INYAS aims to collaborate with young academies across the globe and connecting young outstanding scientists from India with the rest of the world to exchange new ideas. In recognition of the same, this is part of global initiative to establish 'Young Academies' and now there is a Global Young Academy (GYA), based in Germany. As part of it, INYAS organises Global Young Academy meet in May 2020 in India. INYAS elects 20 new outstanding scientists every year not exceeding the age of 40 years for the tenure of five years from broad subject areas; Biological Sciences, Chemical Sciences, Earth & Atmospheric Sciences, Engineering Sciences, Mathematical Sciences, Medical Sciences, Physical Sciences in India. In such prestigious academy, Dr. T. Ramesh has been inducted as a member by the Chairman of INYAS under Biological Sciences for the tenure of 2019 - 2023 (http://insaindia.res.in/INYAS/news-events/inyas-new-members-2019-2023) during the General Body Meeting of INYAS held on 22nd February 2019. During the meet, Prof. Anurag Sharma, Vice-President, INSA, New Delhi and Prof.

INYA's members during the General Body Meeting at INSA, New Delhi

S.C. Lakhotia, Banaras Hindu University gave talks on "What is Science" and "Ethics in Science" respectively.

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Cave -The Unexplored World of the Andaman Islands

Dhanusha Kawalkar, Amruta Dhamorikar and Manchi Shirish S.

Sandy and rocky beache of Andaman Islands

'Untouched Paradise' is often used when one talks about Andaman and Nicobar Islands, a neckless of approximately 570 islands in the Bay of Bengal. These are the submerged hilltops of a mountain range, nestled between mainland India and Southeast Asia along the Arakan Yoma range. Due to their isolation, the Andaman and Nicobar Islands have a diverse and endemic flora and fauna. With high endemism, there are various rare and endangered species found on these islands, giving them the status of one of the Global Biodiversity Hotspots of the world and identified as an Important Bird and Biodiversity Area. The islands are dominated mainly by tropical evergreen, moist deciduous forests, littoral forests, mangrove swamps and coastal areas. Geologically, the Andaman and Nicobar Islands are primarily composed of grey sandstone and soft limestone rock. A region with dolomite or limestone rocks that are influenced by hydrological activities such as wave action, rainwater seepage, and groundwater movement is called "karst". These hydrological interactions are responsible for the evolution of the caves in the Earth's crust – a subterranean wonder.

Setting aside the prerequisite of natural resources, the curiosity and insatiable need for information has always led humans to explore and discover new things in every part of this world. One such sensation discovered by humankind is the subterranean world- the caves. A cave is nothing but a hole in the earth which can be accessed by humans. Caves were initially used as shelter by humans in earlier times. Explorers and adventurists later considered them a hostile place where devilish creatures live. Gradually through further expeditions and revelations, it was discovered that caves hold some of the most significant natural systems. Even today most caves are visited by explorers, and very few are studied scientifically. Speleology, the study of caves, is an interdisciplinary subject towards the study of cave chemistry, geology, hydrology, physics, meteorology, biology and cartography. A cave is like a nutshell, a world in itself, a home for many creatures small and large. Caves are some of the most extreme habitats on the planet, especially to humans, as they are mostly inaccessible and frightening due to the absence of light. The subterranean system runs with minimum energy inputs required for survival of life. We are talking about necessities such as sunlight and vegetation; life without which seems rather complicated. Such a habitat which has sparse energy resources is called an oligotrophic habitat.

A typical cave has three major zones. The entrance zone is influenced by sunlight, which leads to variation in temperature. As one goes further into the cave, there comes a nearly dark region, where some light persists, rightly called the twilight zone. This zone leads to the ultimate dark zone which is permanently under darkness, meaning zero light. While to some extent the temperature varies in the twilight zone, the dark zone has a stable environment at any time of the day. Variation in temperature and humidity is negligible and extreme environments such as lack of oxygen can be observed in the dark zones of some caves. While the entrance and twilight zone have a more or less constant supply of energy, the dark zone has very sparse energy sources. It is for this dark yet stable environment that caves are called natural laboratories, a place where laboratory experiments can be conducted without creating any artificial conditions. After all, what is needed in a laboratory setup is a stable setting with constant temperature, humidity, and other environmental factors. Many biological phenomena such as evolution, environmental adaptations, and lifecycles of animals can be studied in this natural laboratory.

Caves can be classified into different types based on various morphological features. The study of the

A sea cave in the Andaman Islands

morphology of caves including the measurement of different cave features from the entrance till the end of the cave is called cave morphometry. Caves can be broadly classified as (i) inland and (ii) coastal caves. The coastal caves by their morphometric analysis are further divided into three - (a) flank margin, (b) sea, and (c) tafone caves, which are generally made due to the wave action on the weaker layer of the rocks. By their shape, caves are divided into three types - (i) Horizontal, (ii) vertical, and (iii) complex multi-level caves. Depending on the number of branches or passages present inside caves, they are categorised into four types - (i) Branchwork, (ii) Network, (iii) single passage and (iv) Raniform or Spongework caves.

Helectites in caves of Baratang Island

The hydrological activities that lead to the formation of caves also form unique structures in the caves – commonly known as speleothems or cave decorations. Rainwater, wave action, underground rivers and streams meander through the rock layer, dissolving carbon dioxide which is converted into carbonic acid. While groundwater movement and wave actions hollow out the limestone bedrock to form caves, other related actions decorate the caves. Many minerals saturate the seeping water from epigean environments as it travels through the limestone walls and surfaces, depositing these minerals on the cave surface, creating the decorative features of a cave. Among various forms of speleothems, the most well-known of all being stalactites and stalagmites. Stalactites grow from the seeping water in the roof of a cave. The water that deposits on the ground from the stalactites gradually forms stalagmites. Small stalactites are called helectites. Other speleothems are drapers, flowstones, columns, straws, and others. These structures form unique microhabitats for organisms such as crabs, spiders, ants and beetles as they provide shelter and safety from predators. Speleothems are identified as the indicators of past climate in a region. They hold in them the climatic history. Many scientists are now studying the speleothem deposits to study climate change and the environmental threats we face today. Recently the historical information from the stalactite in the cave of Meghalaya unveiled that we are presently living in the Meghalayan Era of the geological time scale.

Cave decorations in a cave at Baratang Island

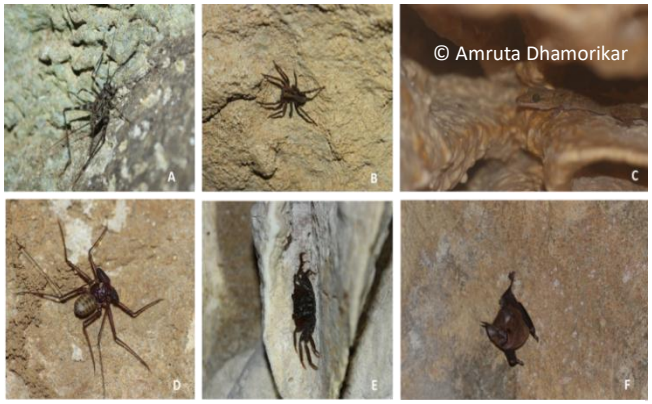
In Andaman and Nicobar Islands, Late Dr. Ravi Sankaran, the pioneer of cave exploration in these islands, surveyed caves. With the help of the local people, he explored 385 caves, amounting to 38% of India's known caves. The local people here were found frequently visiting these caves to collect the nests of a bird locally known as "Hawabill," i.e. the Edible-nest Swiftlet. This bird is famous as the producer of one of the most expensive natural resources in the world.

The Edible-nest Swiftlet is a magnificent yet tiny bird with unique characteristics of navigating in the dark by echolocation. Similar to bats, these birds use sound waves to navigate in the dark. This character allows them to live and breed in the dark zones of the caves. The fascinating character of the species, which is also responsible for its name, is the nest they produce. The

swiftlet nest is built exclusively using the bird's saliva, which hardens when exposed to air. Both male and female have adapted to have enlarged salivary glands, helping them to produce enough amount of saliva for the nest. The bracket-shaped nest is attached to the roof and wall of the cave. The edible nest, having been made entirely out of saliva, is known to have medicinal properties known to cure many respiratory problems and also act as an anti-ageing element. It is famed in Chinese cuisine as an aphrodisiac. Throughout its distribution, the unmonitored collection of the nests has put a strain on the population of this species. The population in Andaman and Nicobar Islands is not an exception. However, in these tropical islands of India, SACON, along with the Andaman and Nicobar Forest Department, has been determined to bring the population to be normal yet practising sustainable harvesting.

The Edible-nest Swiftlet on its nest

In the womb of these scary caves live not only swiftlets and bats but also the specially adapted mega and micro-fauna. As caves are usually without sunlight, and hence plants cannot grow here. Therefore, the food or energy sources for the animals are organic matter brought by the rainwater, organic matter in soil, fungi and algae growing in the minimum or no light conditions. Other organic matters such as dead animals and micro-organisms are also the food source for many cave-dwelling organisms. Animals that live in caves or subterranean habitats are called cavernicoles or hypogean species; and based on their ecological and evolutionary use of caves, they are classified as – trogloxenes, troglophiles and troglobites. Trogloxenes are the organisms that are frequent visitors to the cave but do not depend on the cave. Himalayan masked palm civets, brown hawk owl, Andaman barn owl, certain frogs, geckos and snakes are typical examples of trogloxenes known from the Andaman Islands. The organisms that partially depend on caves for essential biological functions such as foraging or breeding are called troglophiles. The perfect examples of a troglophile are swiftlets and bats. These animals, though they spend their whole life inside caves, need to come out of the caves for food. The obligate cave-dwellers are called troglobites. Troglobitic species spend their entire lifecycles in caves and over the years have developed special characters to survive in this extreme habitat, called troglomorphism. A troglomorph generally lacks features such as eyes and pigmentation. The organism may have extended limbs or lack of parts such as wings. It is true that life survives anywhere as the troglobitic fauna can be seen exclusively in the dark zones of caves, where survival without adaptation is not possible. Some troglobitic crabs and fish have been described from India. Invertebrates being most common fauna in caves, insects and spiders are the most abundant fauna. Ecologically, trogloxenes are the most dominant fauna distributed in the caves with the highest faunal density observed in the entrance and twilight zones.



A) Common Cricket, B) Wolf spider C) Gecko D) Whip scorpions E) Crabs & F) Bats in the cave of Andaman islands

Caves are undoubtedly a unique habitat, with their mechanism of energy production and conservation. An island is an isolated land surrounded by the water, isolation being the keyword. From an ecological perspective, specific habitat patches which are surrounded by another habitat on all sides can also be considered as an island. Due to their isolation and remoteness, each cave functions like an island on a landmass, separated from the adjoining caves. These underground islands in the tropical islands of India are yet to be explored for the biological diversity they hold.

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Opuntia as an emergency summer fodder for the chital

Ashish Kumar, T. Ramesh and Riddhika Ramesh

The continuous changes in the land-use pattern have severely altered the concurrent climatic dynamic around the globe. This human-induced climate change has become a matter of concern for both human and wildlife owing to a substantial increase in surface temperature and uncertainty of the rainfall. This affects the distribution, demography and life history of species. This undesirable change reduces the fitness of native species and provides ecological space to more tolerant invasive flora and fauna. Preexisting harsh geo-climatic condition coupled with climate change and invasion exacerbate the problem and exert severe threat to native biodiversity. Mudumalai Tiger Reserve (MTR) is situated at the tri-junction of Tamil Nadu, Karnataka and Kerala states. The rainfall has a marked east–west gradient, with the eastern areas (scrub jungle) getting the least amount of the heaviest rains (600–800 mm), and the scrub jungle part largely under rain shadow area of the reserve. Its harsh climatic feature makes it more prone to invasion of weeds and climate change that aggravate its effect. It has experienced a massive infestation of exotic species like Lantana and Opuntia.

Opuntia dillenii is native to Central America and it was introduced in India as an ornamental plant. It is a xerophytic unpalatable weed species which became invasive and can withstand minimal water and hot temperature. This resilient feature of the species helps it to occupy a larger spatial extent in the scrub jungle of MTR. During our field visit to MTR in the dry season in March, the period that coincided with the peak fire season, we were astonished to find herds of chital feeding on the succulent phylloclades of Opuntia in several occasions in the scrub jungle (Figure 1 & 2). This probably happened because most of the waterholes dried up and water sources mainly limited to Sigur, Singara and Moyar rivers and these deer species might find difficult to travel several miles and access it. If you are thinking of the cause of this stunning incidence then it is very obvious because Opuntia is very low in its nutritional value and has elongated thorny spines which can injure the deer very badly. There could be plenty of reasons which can compel the deer to eat this partially palatable shrub but it will be unjust to speculate the cause based on single time and site-specific observation. The proximate cause can be understood by taking a broader spectrum of this aspect into the account. There are few species like White-tailed deer, mule deer, and camel which are known to feed on the different species of the *Opuntia* genus. All these mammalian species are found to be dependent on the succulent plants like Opuntia for meeting their requirement of water and fodder during a harsh climatic condition when water and fodder are sparsely available in their habitat. This is the reason, Opuntia is known as emergency fodder plant in some of the arid countries. Likewise, the abrupt elevation in the temperature coupled with scanty rainfall due to climate change has affected the water and forage availability of chital in MTR severely during the drier season and the instinct of survival might have driven the species to opt *Opuntia dellenii* as an alternative source of water and food. Due to the perennial and

Figure 1: Partially browsed *Opuntia dellenii* by Chital in the scrub jungle of Mudumalai

invasive nature of Opuntia, it is readily available during the harsh condition of summer. It consists of 90% of water which can compensate the water requirement of the deer. This adaptational cause is not new to the world of biota. In the past between 2005 and 2011, Drs. Ramesh and Riddhika haven't seen this kind of feeding patterns of chital during their field days in MTR. This indicates that animals are ever evolving with their changing environment particularly during harsh environments.

The afore-discussed arid zone mammals like mule deer, white-tailed deer, and camel have adopted to many physio-chemical changes in their body during the course of evolution. All mammalian species have papilla in their mouth but during the course of evolution, camel developed its papilla into hard conical shaped structured to help them forage on

Opuntia species beset with long needles without any injury. Such type of physio-chemical adaptations are absent in Chital. Thus, there is a high likelihood that consumption of Opuntia may affect chital's digestive system adversely. This brings an urgent need to study the digestive efficiency of Chital post-foraging bouts of Opuntia as an emergency fodder.

Figure 2: Habitat reveals the dry and harsh climatic conditions of the scrub jungle of Mudumalai Tiger Reserve

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Workshop on DIOXIN INDIA 2019

The Analytical laboratory at the Division of Ecotoxicology is being revamped and upgraded to a state- of-the- Art facility with all the top end analytical equipment. To see if there was scope in expanding our boundaries to include more contaminants with the equipment, we (Dr. Nambirajan K. and Ms. Mythreyi Devarajan) attended the DIOXIN INDIA 2019 workshop organized by CSIR-National Institute for Interdisciplinary Science and Technology (NIIST) and Agilent Technologies, held in Thiruvananthapuram, Kerala, between 19th and 21st February 2019. The workshop aimed at providing a deep understanding of sampling, sample preparation and quantification of dioxins and dioxin like Polychlorinated Biphenyls (PCBs).

Dioxins and dioxin-like PCBs are priority pollutants linked to developmental problems, immune system damage and cancer. Periodical monitoring of contaminants is crucial for their control and elimination from the environment. The workshop focused on India's perspectives on dioxins, isokinetic stack sampling, sample preparation strategies, significance of semi-automated clean-up, sample preparation and analyses using GC-MS/MS, standard preparation and preservation, validation of data on fish and sediment samples, reporting and troubleshooting.

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A negligible tale with many twists and turns

C. Divyapriya

Living in SACON hostel is an astounding experience. Magnificent mountains, ear probing bird calls, sunrises and sunsets, breezy mornings, dripping rainy days and of course frequent elephants' visits, especially tusker's arrival that no one could escape seeing him or hearing his trumpet sound. And several parallel natures' acts that we miss. And here is one of such negligible events.

On 2nd April around 6.15 pm in my hostel room, I

found a strange insect making feeble movements with white on half of the body and shiny dark reddish brown the other half. This weird combination made me curious. When I took a closer look, I found it was a cockroach nymph in its action of withering the outer shell (moulting). Almost the entire body has come out with anal circi and styles remaining with the shell. I wouldn't want to miss the climax of complete detachment. At the next moment, we got a visitor - a spider! He approached and tried to pull the shell out. I was amazed to see a species' uninvited service to the other. I was appreciating the spider for a while, but the spider had some other intend.


Spider injecting its fangs on the moulting cockroach

The spider moved towards the nymph and injected the fangs into the cockroach's abdomen. Spiders have two feeding strategies, either bite, inject the paralyzing digestive juice or venom into the prey body and sucks the contents out. Or by wounding silk (swathing) and wrapping the prey. This spider species is of first type and immobilized the prey. It was half the way to devour it, but nature had some other plans.

A huge flock of spiders was marching to invade my balcony corners. This is a common scenario these days in many corners of SACON buildings, as they aggregate for mass cuddling. That's a strategy during winters to provide this cold-blooded species, some warmth. The single spider didn't expect this invasion and immediately carried the prey towards the rim of the balcony and was hanging with front legs and the cockroach in rear legs. Unable to hold the prey for longer, he dropped it down. There came several black ants to quench on it. The unfortunate lone spider moved away from the scene. Nature staged a different climax.

This negligible story lasted for about an hour only but had many twists. One could assume that cockroach will move away after the moult, but with new actors like single spider, invading cluster of spiders, the story got more interesting and the climax of the play by colonies of black ants changed the direction of the play. Nobody can assume the ending until reading the last page.

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Participation in the conference on Understanding Behaviour at IISER, Kolkata

A three-day conference on "Understanding Behaviour" was organized by Indian Institute of Science Education and Research (IISER), Kolkata between 11th and 13th of January 2019. The programme is co-partnered by Department of Biological Sciences, Behaviour & Ecology Lab and Fish Ecology & Behaviour Lab of IISER Kolkata. It was a wholesome behaviour conference that covered taxa from bees, termites, ants, wasps, crickets to birds, fishes to squirrels, porcupine, macaques, dogs and elephants.

The researchers and PhD students working on behavioural aspect had gathered in IISER, Mohanpur campus. Ms. C. Divyapriya, PhD student, SACON working on acoustic communication of birds had presented a poster on the topic "Necessity over signal loss – syllable analysis to grasp the communication approach of Common Iora in Anaikatty hills, Coimbatore". The choice of syllable and frequency over the female partner association in Common Iora (*Aegithina tiphia*) was dealt in the poster. SACON alumni Dr. Aditi Mukherjee & Dr. Arijit Pal attended and presented their research works.

Dr. Raghavendra Gadagkar's spoke about the altruistic behavior of eusocial worker wasps that had direct and indirect fitness. The first day had several invited talks on the broad topic 'Behaviour' that included cricket vocal signals, Indian music influence on elephant behavior, fitness of solitary foundress and future wasp queens in new nest colonizations, intentional food requesting calls and referential hand gestures of Wild Bonnet Macaques, relocation dynamics of ants *Diacamma indicum* and ecto and endo-symbiosis in southern Indian termites.

The second day of the conference opened with a session 'Field based Behaviour' which included the social structure of female Asian elephants, the signal of floral colour change to bees, food provisioning and parasite prevalence in Indian Peafowl, and distance-dependent phonotaxis response in bushcricket vocal communication.

Another session on 'Networks in Behaviour' included olfactory pathways in honeybees and grasshoppers, coding capacity of olfactory networks, and joint family system in free-ranging dogs Another session on "Behavioural studies" included the molecular mechanism of honey bee foraging, adaptability of dogs in city, and male-benefitting traits and the corresponding response that shapes the selection of reproduction with model species fruit fly (*Drosophila melanogaster*). The last session on 'Behavioural modelling', included cooperation and conflict in microbial ecosystem, aggression behavior between two Indian ant species *Camponotus compressus* and *Tetraponera rufonigra.*

The three-day conference was fully loaded with information, theories, experimental proofs of various behavioural ecology concepts.

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