



CLOSING CEREMONY OF SACON SILVER JUBILEE CELEBRATIONS



Address by Chief Guest, Shri. Ajay Narayan Jha, IAS, Secretary, MoEF & CC, Dr. T. Chandni, Advisor, MoEF & CC, on stage



Welcome address by Dr. K. Sankar, Director, SACON

The year-long Silver Jubilee celebrations at SACON were formally inaugurated by the Hon'ble former Union Minister of Environment, Forest and Climate Change (MoEF & CC), Shri. Prakash Javadekar, on 28th January 2016. The closing ceremony of SACON's Silver Jubilee celebrations was conducted at SACON Campus on 24th March, 2017 with Shri. Ajay Narayan Jha, IAS, Secretary, Ministry of Environment, Forest and Climate Change, Government of India as the Chief Guest. He commended SACON's contributions to the field of biodiversity conservation in our country and reiterated MoEF & CC's continued support to SACON in the coming years.

The Secretary, MoEF & CC, laid the foundation stone for the Central Instrumentation Laboratory and Post Graduate (PG) Students Hostel on SACON campus. He also released a book on "State Birds of India", being published by SACON to commemorate its Silver Jubilee year. On this August occasion, five information brochures on SACON's Nature Trail and the campus biodiversity were also released by dignitaries. During the function, winners of Salim Ali Nature Trophy Competitions held among the schools of Coimbatore district were awarded prizes in different categories by Dr. T. Chandni, Scientist-G & Advisor, MoEF & CC. Another highlight of the function was the felicitation of Dr. P. Balasubramanian and Dr. S. Muralidharan, Sr. Principal Scientists, Mr. A. Devaraj, Office Attendant and Mr. R. Ravi, Driver, who have completed 25 years of service in SACON. In recognition of their service, the Secretary, MoEF & CC presented mementoes to them.



Laying the foundation stone of PG Students Hostel by Shri. Ajay Narayan Jha, IAS, Secretary, MoEF & CC

To mark the year-long Silver Jubilee celebrations, SACON, under the leadership of Dr. K. Sankar, Director, conducted various events. The Silver Jubilee publications of SACON include compendiums of SACON's research work in both Andaman & Nicobar Islands and the Western Ghats of Kerala, a comprehensive monograph on flora and fauna of SACON campus, information brochures on the newly established SACON Nature Trail and its biodiversity, and an illustrated book on State Birds of India. In addition, a two-day Silver Jubilee seminar was organized at Port Blair in Andaman and Nicobar Islands in November 2016 to showcase SACON's research projects on the Andaman and Nicobar Islands.

INAUGURATION OF NATIONAL ORNITHOLOGICAL DATABANK (NOD) CELL

The National Ornithological Databank (NOD) Cell, established as part of SACON's Silver Jubilee Celebrations, was formally inaugurated on 24th March, 2017 by Shri. Ajay Narayan Jha, IAS, Secretary, MoEF & CC, Government of India in the presence of Dr. T. Chandni, Scientist-G and Advisor, MoEF & CC and Dr. K. Sankar, Director, SACON.

It may be recalled that establishing a national facility for housing ornithological database was a long-pending mandate of SACON and it has finally come to fruition at a time, when SACON is celebrating its 25 years of service to the nation. The main objectives of the NOD Cell are:

- To collate, organize, authenticate, curate, generate, and update key information/data on Indian ornithology
- To serve as a single-window clearing house on Indian ornithology and natural history
- To publish a serial '*Indian Ornithological Abstracts*' that would give a periodical abstracting service of all the publications on various aspects of Indian ornithology
- To publish a quadrennial '*State of Indian Birds*' report that would summarize the current conservation status of Indian birds and their habitats



From the Director's Desk

The current issue of newsletter, January to March 2017 which is the last quarter of the financial year 2016-2017, outlines several activities of SACON and also include an interesting article on Lion Tailed Macaque by Dr. H. Sushma, Adjunct Scientist, SACON. Our year-long Silver Jubilee Celebration was concluded on 24th March, 2017 in a grand function presided over by Shri. Ajay Narayan Jha, IAS, Secretary, MoEF&CC, Govt. of India. Infrastructure developments such as laying new tarmac roads and construction of a vehicle parking facility were completed during this period. We have installed a kitchen waste composing unit and a green house on campus. The roof top garden now grows organic vegetables which are being used in our Canteen. The National Ornithological Data Bank Cell, a facility to house Indian ornithological data base which was a long pending mandate of SACON has now been established. Two new buildings, a post-graduate hostel and a Central Instrumentation Facility laboratory are coming up on campus.

I am very happy to share with you that SACON is going to offer a full-fledged 2 year Masters Course in Ornithology and Conservation Biology from the academic year 2018 onwards, which was again the mandate of SACON since its inception. I take this opportunity to thank my colleagues for their active support and cooperation extended to me to achieve these targets in a record time.

Dr. K. Sankar
Director

Director, SACON is the Nodal Officer of the NOD Cell and he will be assisted by a team comprising Dr. Rajah Jayapal, Principal Scientist (Ornithology) & Coordinator-NOD Cell, Mr. M. Manoharan, Librarian In-charge, and Ms. R. K. Niveditha, Programme Fellow in executing the database work and administering the Cell.

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WILDLIFE PAINTING EXHIBITION

An exhibition of wildlife paintings by Dr. V. Gokula, a renowned artist and alumnus of SACON, was conducted at SACON on 24th March, 2017

along with the Silver Jubilee valedictory function. Dr. Gokula, currently working as an Associate Professor and Head of the PG and Research Department of Zoology, National



College, Tiruchirappalli is an internationally known painter and cartoonist. Being a wildlife researcher himself, with a Ph.D from SACON, and having significant scientific publications in the fields of Ornithology and wildlife in general, most of his artistic work revolves around nature and wildlife themes.

The paintings on display mostly depicted Indian birds with a few on other wildlife including big cats and an impressive portrait of Dr Sálím Ali, the Bird man of India. On the occasion, thirty-five original paintings (water colour on canvas) by Dr. Gokula were on display at a venue adjoining the main venue of the Silver Jubilee Valedictory function.

Dignitaries of the function, Shri. Ajay Narayan Jha, IAS, Secretary, MoEF & CC along with Dr. T. Chandni, Scientist-G and Advisor, MoEF & CC were among the distinguished visitors along with other guests and school children to visit the exhibition. The wildlife photo exhibition was a unique feat that inspired people to venture out to know more of our spectacular wildlife. The exhibition was well received and appreciated by all.

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INAUGURATION OF NATURE TRAIL

Shri. Ajay Narayan Jha, IAS, Secretary, MoEF & CC inaugurated the Nature Trail developed on SACON campus on 24th March 2017. The Nature Trail is 1.8 km long with a paved pathway having 11 signages made on acrylic boards and installed on pedestals along the trail on which details of biodiversity of SACON Campus are highlighted. A brochure on Nature Trail and campus biodiversity was released on the occasion of SACON Silver Jubilee Valedictory ceremony.

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‘TO EAT OR NOT TO EAT’: PRIMATE FORAGING STRATEGIES AND NUTRITIONAL ECOLOGY

Tropical forests are home to a vast majority of primate species. As primary consumers of plant resources, primates play significant functional roles in the forest ecosystem as seed dispersers, folivores, seed predators, and pollinators. Their foraging patterns are known to influence plant species distribution and community composition. Primates occupy a wide spectrum of feeding niches from omnivory to being predominantly folivorous. Therefore, a study of foraging behavior is fundamental to understanding their ecology and conservation needs. However, there are complex processes involved as foraging in a heterogeneous forest ecosystem requires critical decisions. These decisions have implications for the species' survival and fitness. Foraging decisions are influenced by various factors such as spatio-temporal distribution of resources, resource availability, presence of competitors, predators and nutritional quality of resources. Understanding these processes would provide newer insights into species-habitat relationships and elucidate their functional roles in the ecosystem.

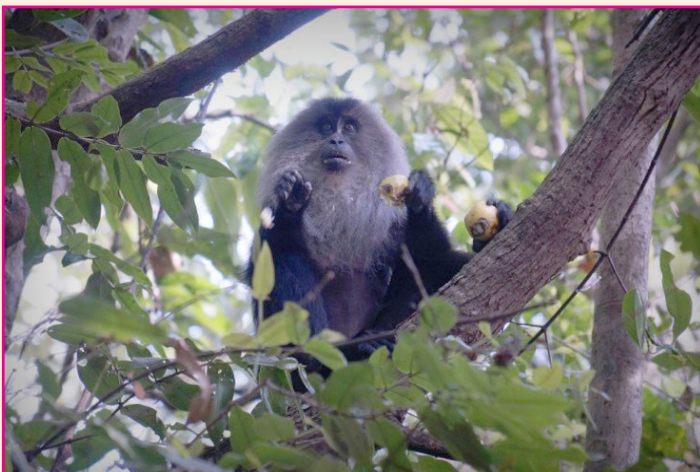


LTM dropping epicarp of ripe *Caryota urens*
Photo credits: Yashvardhan Singh Sengar

Plant parts are not merely nutrient rich parcels. Although they constitute a major portion of a primate's diet, structural and chemical defenses present in these foods such as fiber, secondary compounds, and toxins pose a huge challenge while foraging. In addition, digestion inhibitors, e.g. lignin and tannins, preclude digestion and nutrient absorption. This necessitates physiological adaptations on the part of the forager. In primates, food selection is largely determined by digestive anatomy and physiology. For example, the Old World folivorous monkeys are polygastric. They have enlarged forestomach that hosts microflora. This adaptation helps them to break down cellulose and toxins present in plant parts. However, despite these challenges primates also need to meet their daily nutritional targets. Nutrient balancing in many primates is achieved by selection of resources that have higher protein to fiber ratio, and low concentration of secondary

compounds. In many animals including primates, “protein leverage effect” or “protein dominated macronutrient balancing” is reported. Accordingly, primates maintain a stable protein intake while varying in the intake of other nutrients such as carbohydrates and lipids. However, the amount of nutrients an individual requires depends on the age, sex, and physiological condition of the forager.

Apart from the considerable differences in nutrient composition among different plant species, field studies have also demonstrated within species spatio-temporal variation in nutritional quality. However, to what extent this variation influences foraging patterns is yet to be understood. Nonetheless, food selection is often more complex and has other associated costs. Many frugivorous primates depend on resources that are limited by seasonality. Searching or traveling to distant food patches not only results in higher energetic costs but also increases the risk of predation. This requires the forager to locate and re-use food patches in a manner that optimizes net energy gain. Therefore, foraging efficiency requires resource tracking on both spatial and temporal scales. There could also be an interplay of many socioecological factors such as group size and presence of other conspecific groups. Sometimes, even differences in the ripening rates of fruits between trees determine food patch use behavior. Often, among primates and other frugivores that depend on patchy resources, ‘scouting’ behavior is common. So, essentially, primates might travel to a place within their home range but that visit may not result in feeding. In folivores, however, it is assumed that their food resources are ubiquitous and hence they do not face the same challenges as frugivores *e.g.* low resource availability. A year-round supply of leaves ensures that there is always something to eat. But, this comes with a huge cost of having a specialized digestive anatomy to be able to extract nutrients from an otherwise heavily defended resource. Leaves, especially from the evergreen trees, contain high amounts of secondary metabolites and toxins. Mature leaves are high in fiber in addition to these toxins. So, the quantity a folivorous primate must ingest in a day is huge in order to achieve nutrient balancing. However, these primates must feed on small quantities of a variety of food plants to avoid saturation of specific secondary metabolites. A diet of leaves requires a longer time to digest and longer gut passage time. Therefore, folivorous primates have prolonged periods of resting and passivity. These primates incur higher energetic costs for digesting leaves rather than for searching. Whereas, frugivorous primates that feed on ripe fruits do not have to deal with toxins as ripe fruit flesh is rich in simple sugars, lipids, and micronutrients. However, they must deal with seasonality of resources and compete with other foragers for these resources. Fleshy fruits are also generally considered poor in protein. While folivorous primates obtain protein mainly from leaves and seeds, frugivores must supplement their diet with insects and other animal prey. Therefore, they need to constantly forage for fruits and insects in order to achieve their nutritional targets. Consequently, they incur significant energetic costs owing to increased travel to locate fruiting patches. They also must expend their energy for capturing prey as not all foraging results in successful captures.



LTM feeding on ripe fruits of *Chrysophyllum lanceolatum*
Photo credits: Yashvardhan Singh Sengar

The Lion-tailed Macaque (LTM) is an endemic primate of the Western Ghats. Its diet mainly consists of fruits, insects, small vertebrates, flowers, and other minor plant items. Foraging for insects usually occurs when they are traveling to a fruiting patch. During periods of low fruit availability, they switch to predominantly insectivorous diet spending major part of the day foraging for insects from a swathe of area along their travel routes. Moreover the number of plant species that contribute to the diet during these periods is low. Studies have indicated that insects, which primates feed on, are rich in lipids and protein. They also contain micronutrients. Hence, these nutrient dense food parcels compensate for low fruit availability. Among plant resources, the Lion-tailed Macaque feeds predominantly on fleshy fruits, seeds, and flowers. They also opportunistically feed on mushrooms, tender pith,

and nectar. In the central Western Ghats, previous studies have reported about 20 major food plant species. In the current study, we have so far recorded feeding events on 12 species. Of these, two species *Artocarpus heterophyllus* and *A. hirsutus* form a substantial part of their plant diet. These fruits are large and fleshy. Other fleshy fruits that contribute in terms of

quantity are *Mangifera indica*, *Chrysophyllum lanceolatum*, and *Syzygium cumini*. The macaque also spends substantial amount of time searching and feeding on ripe fruits of *Caryota urens*. Though *C. urens* fruits are not fleshy, the macaques eat the thin mesocarp layer around the seeds. They typically fill their cheek pouches with the mesocarp and seeds after discarding the epicarp. While they travel to the next feeding site, they start chewing and separate the seed from the mesocarp, spitting out the seeds. Seed dispersal of *C. urens* by palm civets and bats is well-known. However, whether the macaques are dispersers for this species is yet to be ascertained. Similarly, there are a few other species that the LTM exploit for ripe fruit flesh and likely to disperse the seeds while traveling.

While, spatiotemporal variation in nutritional quality in these fruits is yet to be confirmed, there seems to be a pattern of patch use by these macaques. Currently, our understanding about whether LTMs track nutritional quality in addition to fruit availability is poor. But, from field observations, the macaques seem to visit only a subset of these fruiting trees in their home range. However, there could be several potential factors such as the extent of nutritional quality influencing food patch selection which requires disentangling of deterministic factors. The study on determinants of spatial foraging patterns of the LTM primarily aims to examine how spatiotemporal variation in nutritional quality of fruits influences foraging strategies in conjunction with socioecological factors. The study aims to examine if LTMs have preference for specific food patches in a season and if this preference is influenced by nutrition. Therefore, examining foraging patterns in the context of 'nutritional landscape' (between and within plant species variation across spatial and temporal scales) would help us understand the macaque's habitat requirements. In a larger context, such a study will also provide cues to understand how drastic changes in the nutritional landscape would affect foragers. It is also important to understand the mechanism behind how species locate and re-use patches. Hence an integrative framework wherein both processes and factors examined, is crucial to understand foraging patterns. The results of the study will have implications for LTM habitat conservation in degraded landscapes and understanding its nutritional ecology will have implications for management of *ex situ* population of the macaques.

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NATIONAL NATURE CAMPING PROGRAMME AT SACON

SACON has conducted the first National Nature Camping Programme for this year (2017) between the 1st and 3rd February 2017. This residential Nature camp is a programme supported by the MoEF & CC, Govt. of India. Thirty children from Helix Open School, Salem, Tamil Nadu, (working towards the support of children with dyslexia) along with their teachers participated in the camp. Scientists and research scholars of SACON interacted with children on all the days. We conducted many activity based programmes to introduce the concepts of nature such as camouflage and mimicry, identification of indirect and direct signs of wildlife in forests, communication among animals through scent and sounds and the importance of



biodiversity. Most of the teaching was through various games and activities. The programme was planned to develop their observation skills, curiosity and to engage them with natural elements. The participants were taken on nature walks at dawn and dusk every day and they enjoyed learning to watch and identify birds and butterflies. During the camp, participants expressed the understanding they received on the environment through their creativity in drawings and skits.

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VISIT OF DR. AMITA PRASAD, IAS, ADDITIONAL SECRETARY, MoEF&CC AND INAUGURATION OF CONSERVATION GENETICS LABORATORY AT SACON



Dr. Amita Prasad, Additional Secretary, MoEF&CC, inaugurating the Conservation Genetics Laboratory

Dr. Amita Prasad, Additional Secretary, MoEF & CC, Government of India, visited SACON on 27th January 2017. She was welcomed to SACON by the Director, Faculty and Staff of SACON and presented with a bouquet by Dr. Shomita Mukherjee. After a brief introduction of Faculty and Sectional Heads, Dr. K. Sankar, Director made a presentation on the activities of SACON. Following this, Dr. Amita Prasad inaugurated the 'Conservation Genetics Laboratory' at SACON and Dr. Shomita Mukherjee showed the facilities within the Laboratory. A short discussion on the future prospects of training and research through the Conservation Genetics Laboratory were discussed. This was followed by a visit to the Ecotoxicology Laboratory where Dr. Muralidharan explained the importance of the research and training conducted here

and its contribution towards conservation issues. Contact: Shomita Mukherjee, shomitam@gmail.com

TRAINING PROGRAMME ON "INSTRUMENTATION AND ANALYTICAL TECHNIQUES"

A training programme on "*Instrumentation and Analytical Techniques*" was organized between 13th and 17th March 2017 by the Division of Ecotoxicology at SACON. Professor M. G. Sethuraman, Head, Department of Chemistry, Gandhigram Rural Institute-Deemed University, Dindigul inaugurated the programme in a function presided over by Dr. K. Sankar, Director, SACON. Twenty three candidates from different streams such as chemistry, environmental sciences, environmental management, and wildlife biology from institutions, namely GITAM University (Vishakapatnam and Bengaluru), Periyar University (Salem), Defense Research Development Organization – Bharathiar University (Coimbatore), Avinashilingam University (Coimbatore) and AVC College (Mayiladuthurai) participated in the training course. During the five-day long programme, participants were exposed to the basic principles and working mechanism of analytical instruments, namely Gas Chromatograph, High Performance Liquid Chromatograph, Atomic Absorption Spectrophotometer, UV Spectrophotometer and Ultracentrifuge. Experts in the field of Analytical chemistry, namely



Professor Avudainayagam, Head, Department of Environmental Sciences, Tamil Nadu Agricultural University, Mr. K. Chandrasekar, Application Scientist, Agilent Technologies, Dr. R. Jayakumar, Assistant Professor, Department of Environmental Studies, GITAM University (Bengaluru) delivered lectures as resource persons to highlight the applications of the instruments in ecotoxicological research. Dr. Rajah Jayapal, Principal Scientist, SACON, delivered a special lecture on statistics at the programme. Director, SACON distributed certificates to the participants at the valedictory function.

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TRAINING PROGRAM ON "MONITORING AND MANAGEMENT OF WETLANDS"



Inauguration by Dr. Rajeev K. Srivastava, IFS, Director,
Tamil Nadu Forest Academy

The MoEF & CC sponsored training program on "Monitoring and management of wetlands" for the midlevel forest officers from southern states of India, viz. Tamil Nadu, Telangana and Karnataka was conducted by SACON during 27th and 28th March, 2017. The program was inaugurated by Dr. Rajeev K. Srivastava, IFS, Director, Tamil Nadu Forest Academy, Coimbatore, in the presence of Mr. Chandan Singh, Dy. Director, MoEF & CC, Govt. of India, New Delhi and Dr. K. Sankar, Director, SACON. The inaugural program was attended by the faculty, staff and researchers of SACON and TNFA. The program schedule included nine class room sessions, one laboratory session and two field visits. Presentations were made by eminent wetland scientist, policy and decision makers including S. A. Hussain. SACON faculty also shared their expertise

Dr. E. J. James, Dr. Brij Gopal, Dr. Rithesh Kumar and Dr. S. A. Hussain. SACON faculty also shared their expertise on wetlands during the training program. The topics covered include management of river basins in relation to the wise use of wetlands; Population monitoring, census techniques of wetland birds; Vegetation profile of wetlands; Wetland habitat assessment and management practices; Ecotoxicological assessment of wetlands using birds as indicators; Environmental impact assessment in the context of wetland conservation; Integrated wetland management; What are wetlands and why manage them and how?; Ecology and management of Keibul Lamjao National Park, Manipur; case study with special reference to the aquatic ecosystem. The participants were introduced to mist netting and bird-ringing techniques, and were also taken to Ukkadam and Perur Lakes in Coimbatore city for an understanding of important characteristics urban wetlands and bird census techniques. During the valedictory function, the participants expressed their satisfaction on the course content while emphasizing on the need to have a longer duration of training programs.

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RELEASE OF BOOK TITLED 'A BIBLIOGRAPHY ON SACON'S RESEARCH WORK IN KERALA STATE'

A book titled "A bibliography on SACON's research work in Kerala State" was released by Dr. Balakrishna Pisupati, Vice-Chancellor, Trans Disciplinary University, Bangalore, during the inaugural session of the 3rd National Biodiversity Conference organized by Kerala State Biodiversity Board held at Thiruvananthapuram on 23rd February 2017 which was inaugurated by Dr. Amita Prasad IAS, Addl. Secy. MoEF & CC, Govt. of India. The same was received by Dr. M. Chandra Dattan, Scientific Advisor to Chief Minister, Govt. of Kerala. The publication was compiled by M. Manoharan, R. K. Niveditha, & M. Jayageetha. Mr. M. Manoharan, Librarian in charge and Dr. P. Pramod, Principal Scientist participated in the book release function on behalf of SACON.

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Dr. Balakrishna Pisupati, Vice-Chancellor, Trans Disciplinary
University, Bangalore, releasing the book

REPUBLIC DAY CELEBRATIONS – 2017



Sixty eighth Republic Day of India was celebrated on 26th January 2017 at SACON with aplomb. Dr. K. Sankar, Director, SACON hoisted the flag and delivered the Republic Day speech. He exhorted the faculty and staff of SACON to strive to uphold the ideals of the constitution by working towards achieving the goal of environmental conservation. Volleyball matches and tug of war competitions were conducted among the Faculty, Administrative Staff and Research Scholars of SACON as part of the celebrations.

ECO AWARD FOR SACON FOR THE YEAR 2016-17

SACON received ECO Award for the year 2016-17 in appreciation of its efforts in encouraging and motivating students towards nature conservation. The said award was presented by the District Collector, Shri T. N. Hariharan, Coimbatore during the function organized by Nature Conservation Society, Coimbatore.



सल्लल अली पक्षिविज्ञान एवं प्रकृति विज्ञान केन्द्र
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To,

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