NEWSLETTER of the NILGIRI NATURAL HISTORY SOCIETY

ISSN: 2395-065X

For private circulation only
ISSUE 9.1 - June 2020

For membership and other details contact :

NILGIRI NATURAL HISTORY SOCIETY,
144-A, Bee Museum, Club Road. Opp. Hill Bunk,
Ooty -643 001, Nilgiris, Tamil Nadu,India,
email: contact@nnhs.in,
Phone No: +919442619577

Translucent Cobra Lily
(Arisaema translucens)
Kundah, Nilgiris

A distinctive cobra like hood gives these lilies their common name of cobra lily. The Arisaema is a large and diverse genus with species distributed across temperate and tropical areas of all continents, except Australia, Europe and South America. The A.translucens is a rare, endangered and endemic flowering plant species with only a few hundred plants, found and recorded from the Nilgiris. It derives its name from the beautiful translucent spathe which is unique to the species. First recorded by E.Barnes in 1932 from Thiashola, it had not been recorded since. That is, up until, its rediscovery over 85 years later, from its type locality of the shola forest, by Indian naturalists.

Photo Credit : S Jeevith, Ooty, Nilgiris

'This issue of the newsletter is supported by a grant from Rohini Nilekani Philanthropies to Keystone Foundation'

EDITORIAL

The summer edition of our newsletter comes to you at a time when the entire world is still grappling with the coronavirus pandemic and re-exploring the intimate human connections with the natural world. Now, more than ever, humans are becoming more aware of the interconnectedness of all things in nature – be it the transmission linkages of this particular virus from animals to humans, or other complex webs of relationships in nature. A realization for an approach that takes into consideration the health of our environment, in order to ensure the health and safety of the human race.

This edition is therefore timely in its showcasing of the lesser known, smaller and endemic species among the biodiversity around us, which are critical for the functioning of ecosystems. Unique endemic plants from the western ghats – be it the cobra lily that went unreported for over 80 years, or the pearly everlasting that are unique to the montane grasslands, but hardly much is known about them. Endemic frog species that are a common sight, come the monsoons, but are increasingly getting threatened with habitat loss. Snakes that were known from the drier plains are now getting reported as roadkills higher up the mountains warranting a relook at possible climate change shifts of species.

Get to know the butterflies of the Nilgiris - they range from the common to the rare, the colourful to the monotones, the large to the small. But they are all unique to this landscape and depend on specific plants for completion of their life cycles. The colourful plates of the endemic plants will have you looking for these species, the next time you head out into the woods. These come to you from the newly formed Western Ghats Plant Specialist Group, an IUCN Species Survival Commission specialist group. All the while reminding you how unique and diverse the Nilgiris landscape is.

The year also saw the arrival of the dreaded desert locust swarms in India and this edition gives you an overview on why and how such swarms may develop. The pandemic also saw emergence of resilience in local communities and we share a story of hope and self sustenance in the Sathyamangalam forest with a conservation agreement success story. Nothing is more inspiring than local stories of nature exploration and this edition talks to you through the eyes of a Nilgiris photographer in our natural historian section.

In NNHS diary, we engaged a group of undergraduates in a field immersion experience of the Nilgiris; we got community members to come together for a new phenology monitoring protocol workshop that can provide valuable plant seasonality data for climate change studies. The bee safari continued to be a popular trail and we were able to take our members on one safari into the world of bee-keeping, before the lockdown came into effect. Despite the social distancing limitations that are very much necessary in the ongoing effort to stem the further spread of the virus, NNHS continues to stay busy, through online channels – webinars on a weekly/ fortnightly basis, online participatory events for all citizens and nature related posts on the social media platform. NNHS continues to strive to bring you interesting stories from the natural world and the people behind it. We hope you find the reading insightful and it provides you with mindspaces to reflect on the current times.

2020 has started off as a roller coaster for all, with the corona virus struggle. But hope is a powerful thing and challenging times can test our mettle and call upon our fortitude. All of nature, including humans, is naturally resilient, and capable of coming out of this, with the wisdom needed to live on this planet, in a better way. Until next time, stay safe and maintain social distancing.

Sharada Ramadass,
NNHS Co-ordinator

LIKE A FROG OUT OF WATER

Chaitanya R

As you ascend the mountainous road to Ooty from the Mudumalai Tiger Reserve, vast expanses of Eucalyptus and Acacia plantations obtrude the scenery like a bothersome eyesore, not to mention the boundless green swathes of tea that drape the rolling hills like an insipid carpet.These plants, now almost synonymous with the Nilgiris,are alien to this landscape and were introduced here a little less than 200 years ago. Interspersed amidst these are the ancient, native forests of these lands that are now confined to little patches that seem to get consistently littler with time. These natural forests composed of shola and deciduous trees were once the dominant vegetation in this landscape until the Britisharrivedand decided that their national preoccupation with an aromatic beverage was indisputably more important.These highly fragmented native-forest"*islands*" atop the mountains are really temples of our natural heritage that must be preserved with abounding devotion.They are home to the original inhabitants of this land —animals that colonized this region many million years ago, much before natural selection even rolled the evolutionary dice in favour of a lineage leading up to humans.

Among these ancient organisms was a lineage of diminutive bush-dwelling frogs of the genus *Raorchestes* whose ancestors purportedly originated in south-east Asia, dispersed into India and eventually colonized the Western Ghats circa 40 million years ago. These frogs were highly adapted to living in the mountainous regions of the tropics. A significant evolutionary change they underwent just to be able to live in these tropical montane forests is direct development —the ability to hatch out of eggs as metamorphosed miniature adults, completely by passing the free-swimming tadpole stage characteristic of amphibians.Tropical montane forests scarcely hold lentic (standing) water bodies which are essential for the development of tadpoles, and direct development therefore is an

evolutionary detour that absolves these frogs of that dependence.

With over 50 known species, *Raorchestes* is the most diverse amphibian genus in India. The number is expected to grow in the near future considering the recent uptick in amphibian research in the country. The genus itself was named in honour of C.R.N Rao, who studied these frogs and described as many as eight species in the late 1930s from the central Western Ghats region. The hill massifs of the Nilgiris are home to over a dozen species of *Raorchestes* and the commonest among them is the Cross-backed bush-frog (Scientific name: *Raorchestes signatus*).

A few years ago, Caleb Daniel, a friend working then on lizard ecology in the Nilgiris,needed help identifying a frog from his field site. With remarkable brevity, he described the frog over the phone as "An average frog. But such trippy eyes!" and I immediately knew what he was talking about! This frog was formally described in 1882, by Belgian-British naturalist George Albert Boulenger, who noted an 'X' shaped mark on the back of all individuals of this species giving it the common name"Cross-backed bush-frog". I secretly prefer Caleb's description though.

These frogs can be seen occupying shrubs or mud walls along the roadsides. You would see them frequently in Ooty and Coonoor during summer or monsoon nights, hopping across roads adjacent to forest patches. And if you don't see them, you sure will hear them! The males voice their advertisements to attract potential mates with their distinctive '*tiktiktik*' calls, that pepper an otherwise soundless nightscape. Tracking them down to their perch just with their calls however, is a non-trivial task as they seem to have mastered the art of ventriloquism.

According to the International Union for Conservation of Nature (IUCN), *Raorchestes signatus* is an endangered species.It is endemic to the Nilgiris region and its survival therefore is singularly correlated to the preservation of natural forests in these hills. Its distribution today is discontinuous as a consequence of fragmentation of the native forests it inhabits, and there appears to be a continuing decline in the extent and quality of its habitat.

So, the next time you're vacationing in Ooty or Coonoor to escape the brutality of Indian summer, make sure you take a walk at night, shine your torch, and look out for those "trippy eyes" before they become hard to find, if not vanish completely from that rapidly degenerating landscape.

Chaitanya R
is an independent researcher, herpetologist.

ROADKILL OF A RACER

Photo Credit: Asish M

Record of Nagarjunasagar Racer [*Platyceps bholanathi*] from Kunjapanai region of the Nilgiris District, India.

Nagarjunasagar Racer – *Platyceps bholanathi* (Reptilia: Squamata: Colubridae) is a lesser-known, rare and endemic snake of India. It was first described by Sharma (1967) [from the Nagarjunasagar hills (16°31'N; 79°14'E; 105masl) in the Guntur region of Andhra Pradesh], as a diurnal snake, occupying rocky scrublands and deciduous habitats. Dissection of a female specimen showed the remains of Brooke's House Gecko or Spotted House Gecko (*Hemidactylus brookii)*. Even after almost half a decade, this snake seems quite elusive and our knowledge of it remains to be of a meager degree due to lack of sightings. Some of the previous records from Southern India were mainly from the Seshachalam Hills (Guptha *et al*., 2012), Golconda Fort Complex (Seetharamaraju & Srinivasulu, 2013), Hosur, Nalagonda districts of Tamil Nadu and Telangana respectively (Ganesh *et al.*, 2013), the Gingee Hills, Villupuram district in Tamil Nadu (Smart *et al.*, 2014), Rishi Valley School, Madanapalle (Deshwal & Becker, 2017), and Sigur Plateau, the Nilgiris District (Samson *et al.*, 2017). Thought to be a snake belonging primarily to the Eastern Ghats, it is still challenging our understanding of it due to its expanding range of distribution.

The following is an opportunistic and fleeting (roadkill) record of *Platyceps cf. bholanathi* (a comparable phenotype) from the ghat roads of the Nilgiris based on just the photograph (uncollected specimen). During the sunny, late-morning of Feb 13th, 2020, the roadkill of a snake was observed near the Kunjapanai checkpost (11°21'33.6"N; 76°55'54.5"E**;** 823 masl) on the middle of the road that connects Mettupalayam and Kotagiri. The specimen was already dead but showed noticeable cadaveric spasms. Due to fast moving traffic and lack of safe parking spots (to carefully examine the snake) along the ghat roads, only a quick photograph of the specimen was possible. The photograph was later used to identify the specimen to be phenotypically identical to the Nagarjunasagar Racer. But, due to the lack of morphological measurements, scale counts and DNA samples, it couldn't be conclusively documented as a "reportable" sighting of the species.

The racers are an elegant species of snakes and it is a delight to watch them navigate different terrains with ease and grace. It was both startling and disheartening to see such a graceful animal as a victim of roadkill on the ghat roads.

References:

Deshwal, A., & Becker, B. (2017). New Locality Record of Nagarjunasagar Racer (*Coluber bholanathi*)(Squamata: Serpentes: Colubridae) from Near Rishi Valley School, Andhra Pradesh, India. *Russian Journal of Herpetology*, *24*(3), 245-247.

Ganesh, S. R., & Adimallaiah, D. (2013). New locality records of Nagarjun Sagar racer snake, *Coluber bholanathi* Sharma, 1976/Nuevos registros de localidad para la serpiente corredora Coluber bholanathi Sharma, 1976. *Herpetotropicos: Tropical Amphibians & Reptiles*, *9*(1-2), 9-13.

Gupta, B., Prasad, N. V. S., & Veerapan, D. (2012). Rediscovery and range extension of *Coluber bholanathi* Sharma, 1976 from Seshachalam hills, Andhra Pradesh, India. *Herpetology Notes*, *5*, 447-448.

Samson, A., Santhoshkumar, P., Ramakrishnan, B., Karthick, S., & Gnaneswar, C. (2017). New distribution record of Nagarjunasagar Racer *Platyceps bholanathi* (Reptilia: Squamata: Colubridae) in Sigur, Nilgiris landscape, India. *Journal of Threatened Taxa*, *9*(3), 10014-10017.

Seetharamaraju, M., & Srinivasulu, C. (2013). Discovery and description of male specimen of *Coluber bholanathi* Sharma, 1976 (Reptilia: Colubridae) from Hyderabad, India. *TAPROBANICA: The Journal of Asian Biodiversity*, *5*(1).

Sharma, R. C. (1976). Some observations on ecology and systematics of *Coluber bholanathi*, a new species of snake (Reptilia: squamata: Colubridae) from India. *Comparative Physiology and Ecology*, *1*(3), 105-107.

Smart, U., Smith, E. N., Murthy, B. H. C. K., & Mohanty, A. (2014). Report of Nagarjunasagar Racer *Coluber bholanathi* Sharma, 1976 (Squamata: Serpentes: Colubridae) from the Gingee Hills, Tamil Nadu, India. *Journal of Threatened Taxa*, *6*(4), 5671-5674.

THE NILGIRI BUTTERFLIES

Manoj Sethumadhavan and Franklin Sukumar, Wynter Blyth Association (The Nilgiris)

Cirrochroa thais (Fabricius, 1787)

Common name : Tamil Yeoman

Family : Nymphalidae

Habitat : Foothills of and within moist evergreen forests.

Distribution : Endemic to south India and Sri Lanka.

Description : A beautiful large brush-footed butterfly, it is bright reddish yellow with dark borders on the upperside. A prominent whitish thin band runs across, on the underside. Called the 'Tamizh Maravan' (Tamil Warrior), it was declared the state butterfly of Tamil Nadu in 2019. During breeding season, you can see in large numbers in the shola and evergreen forests of the Nilgiris, where its larval host plant *Hydnocarpus pentandra* are found. As a defensive mechanism the eggs are laid one above the other in a spindle on the underside of the leaves of its host plant. It is a high flier with an erratic and gliding flight, and can be seen sun basking on the canopy.

Photo Credit: Franklin Sukumar, WBA

Colias nilagiriensis (C. & R. Felder, 1859)

Common name : Nilgiri Clouded Yellow

Family : Pieridae

Habitat : Found only in the higher altitudes.

Distribution : Endemic to western ghats.

Description : A small beautiful butterfly from the yellows and whites family, its nearest relative is found in the north-east called the large clouded yellow. A fast flier, it can be seen everywhere in the hills, flying close to the ground. The species is sexually dimorphic – the male is lemon-yellow bordered with a thin pink line, a prominent white spot encircled in pink, while the female is whiter in colour. It has beautiful green eyes and seen along the mountain grass slopes where its host plant, *Parochetus communis* (blue oxalis) are to be found. The WBA has recently reported a new host plant, the *Trifolium repens* (white clover).

Photo Credit: S Jeevith, WBA

Parantica nilgiriensis (Moore, 1877)

Common name : Nilgiri Tiger

Family : Nymphalidae

Habitat : Found only in the higher altitudes

Distribution : Endemic to western ghats

Description : A large yet inconspicuous butterfly, the Nilgiri Tiger is endemic to the higher mountains of south India. Described from the Nilgiris in , it is listed as 'near threatened' in the IUCN red list. It belongs to Danaid group that includes many other tiger butterflies. On walks, one can see this butterfly singly with a rapid, oscillating and erratic flight looking for a probable mate, nectaring on flowers or basking on tree tops in the morning sun. The butterfly has a dark brownish colour with white streaks and spots. It can sometimes be seen puddling along the sholas and evergreen forest clearings and forest brook edges.

Photo Credit: Manoj Sethumadhavan, WBA

Ypthima chenu (Guérin-Méneville, 1843)

Common name : Nilgiri Four-ring

Family : Nymphalidae

Habitat : Found only in the higher altitudes.

Distribution : Endemic to western ghats.

Description : The largest among the rings (Genus Ypthima), the butterfly belongs to the Nymphalidae family. A true high-lander, it is an endemic species inhabiting the highest mountains north of the Palghat gap and was described from a Nilgiris specimen. The upperside is dusky brown in colour with large yellow ringed blue black spots. The underside is brown with white striations with a chestnut band near the margin upon which the rings are placed. It has a slow hopping flight sticking closer to the ground along the mountain grass lands.

Photo Credit: Manoj Sethumadhavan, WBA

Argynnis hybrida (Evans, 1912)

Common name : Nilgiri Fritillary

Family : Nymphalidae

Habitat : Found only in the higher altitudes.

Distribution : Endemic to western ghats.

Description : A beautiful large butterfly of the Nymphalidae family, this is also a dimorphic species. While males are orange yellow with black spots on the upperside greenish brown stripes on the underside, the female upper forewing has a pink-dark blue shade speckled with black and white spots. The butterfly is confined to high elevation shola clearings and adjacent to mountain streams where its host plant, *Viola pilosa* is often seen. On a sunny day, it can often be seen flying fast and closer to flowers or basking in the sun.

Photo Credit: Franklin Sukumar, WBA

Hypolycaena nilgirica (Moore, 1884)

Common name : Nilgiri Tit

Family : Lycaenidae

Habitat : Found only in the higher altitudes.

Distribution : Endemic to western ghats

Description :A very rare beautiful small butterfly from the blues (Lycaenidae) family a high flyer was described based on the specimen from the Nilgiris some 130 years ago. The butterfly is a South Indian & Sri Lankan endemic. The upper forewing of the male is bluish with black border while that of the female is golden brown. The underside is clear white with black markings and conspicuous tails. The butterfly with an erratic flight, rarely comes to the ground for puddling and can be met basking on early morning sun. It is a resident of dense evergreen forests on the slopes.

Photo Credit: Vinod Sriramulu, WBA

Wynter Blyth Association, located in the district strives to study butterflies of the region and their migration patterns, create awareness amongst children and public at large and also participates in butterfly conservation efforts.

FOOD FOR ALL FROM A **CONSERVATION AGREEMENT** IN COVID TIMES

Mahadesha, Keystone Foundation

177 farmers who were part of a unique project in the core area of Sathyamangalam tiger reserve have nutritious food to offer their neighbours who are landless and had for several reasons beyond their control, stopped growing food, opting for wage work. Approximately 1500kgs of organic Ragi (millet) flour has been distributed to 270 local villagers in a joint effort between local farmers, Tamil Nadu Forest Department and Keystone Foundation.

Dr V Naganathan, IFS Field Director Sathyamangalam Tiger Reserve, enquired if there was support that could be given to the local people from Keystone Foundation and this lead to the idea of procuring Ragi from the local farmers and distributing to the landless and wage work dependant local people who live in the periphery of the tiger reserve area.

Approximately 7 indigenous villages located in the core area of the Sathyamangalam tiger reserve with an estimated 500 households have been ancient residents of this landscape. They belong to Irula, Kurumba and Soliga indigenous groups, both Irula and Kurumba fall under the Particularly Vulnerable Tribal Groups also. On their landholding which may range from one acre to three acres per household they grow beans as a cash crop (April-June), and traditional millets, corns, beans, pumpkins and gourds (July to January) for food. These communities are self-sufficient for food and take the additional benefit of the Public distribution system to keep them healthy and self-reliant. The cattle they keep are of utmost importance to pursue organic agriculture.

Keystone has been working with indigenous communities of Sathyamangalam since 2006 to support natural resource based sustainable livelihoods in the area. The farmers came together in 2018 July to sign on the very first 'Conservation Agreements' being implemented in their landscape. Keystone Foundation along with Conservation International's – Conservation Stewardship Programme reached out to the traditional indigenous farmers of Dhimbam hills which is part of the Sathyamangalam tiger reserve (since 2013). (A detailed article about this can be found in NNHS newsletter 8.2 December 2019).

During the COVID 19 lockdown when access to food was a serious concern for many, within the protected area a joint effort co-ordinated by the forest department, approximately 270 households received a 5 kg bag of millet flour. The people were overjoyed to receive this as this was a food they remember from their childhood and they are well aware of its health benefits. Another consignment of the same flour was distributed amongst indigenous villages in the Nilgiris also.

Supporting indigenous and local food growing systems proved to be a vital factor in these unforeseen times. It re-emphasised the importance of food sovereignty and security, because of which relief was organised within the region itself. Many communities like the farmers of Dhimbham grow food around the boundaries of protected areas, against many odds. Today they stand proudly since they were able to feed themselves and their neighbours through their own efforts.

THE WESTERN GHATS PLANT SPECIALIST GROUP (WGPSG)

GOING WILD ABOUT WILD PLANTS

A team bunch of taxonomists, ecologists, habitat restoration experts working in the Western Ghats felt the dire need to get on board and start working together to increase conservation planning for areas with high levels of plant endemism in this mega diverse region. This resulted in us drawing up a proposal to set up the Western Ghats Plants Specialist Group (WGPSG) which was formally approved in the International Union for Conservation of Nature (IUCN) in October 2019. Led by Anita Varghese from Keystone, with Aparna Watve (Independent Researcher) and R. Ganesan from ATREE (Ashoka Trust for Research in Ecology and the Environment), it was supported by Shiny Miriam Rahel from Keystone Foundation and Navendu Page from Wildlife Institute of India.

The IUCN has 6 commissions of which the Species Survival Commission (SSC) is a science based network of 140 specialist groups and thousands of experts who volunteer their expertise and time to undertake species conservation. This is primarily through conducting red list assessments to identify threats and conservation needs of each species on the planet.

Through the WGPSG we intend to bring together experts to share methods of assessments and standardized protocols, through which we will be able to conserve species and their habitats bringing recognition for their special status. Our mission is to improve the conservation status of wild plants in the Western Ghats.

The membership is steadily increasing as we speak - today we have 35 members, spread across all 6 six states of the region Tamil Nadu, Kerala, Karnataka, Goa, Maharashtra and Gujarat. As part of the launch, we did a series about the endemics of the Nilgiris - which we present in this photo essay (contributed by Keystone Foundation) - on the beautiful plant life of the Western Ghats. For the complete photo series, visit us on social media (Facebook Page @ The Western Ghats Plant Specialist Group)

On IUCN, we are at https://www.iucn.org/commissions/ssc-groups/plants-fungi/plants/plants-h-z/western-ghats-plant

Anita Varghese,
Director - Keystone Foundation, WGPSG Chair

WGPSG#10
Impatiens pendula (Balsaminaceae)
Distribution : Western Ghats, wet rocks, amongst mosses and cliffs.
Conservation Status : Not Evaluated

WGPSG#11
Decalepis nervosa (Apocynaceaa)
Distribution : Western Ghats, Evergreen forest, Margins of montane evergreen forest.
Conservation Status : Not Evaluated

WGPSG#13
Rosa leschenaultiana (Rosaceae)
Distribution : South Western Ghats, Margins of montane evergreen forest and grasslands.
Conservation Status : Not Evaluated

WGPSG#14
Rhododendron arboreum Subsp. nilgiricum (Ericaceae)
Distribution : South Western Ghats, Margins of high altitude montane evergreen forest and grasslands.
Conservation Status : Not Evaluated

WGPSG#15
Impatiens leschenaultiin (Balsaminaceae)
Distribution : South Western Ghats, Margins of montane evergreen forest and grasslands.
Conservation Status : Not Evaluated

WGPSG#16
Impatiens clavicornu (Balsaminaceae)
Distribution : Western Ghats, Rock crevices in grasslands.
Conservation Status : Not Evaluated

WGPSG#9
Strobilanthes wightiana (Acanthaceae)
Distribution : South Western Ghats, High elevation to montane evergreen forest.
Conservation Status : Not Evaluated

WGPSG#12
Psychotria nilgiriensis (Rubiaceae)
Distribution : Evergreen forest, Margins of montane evergreen forest.
Conservation Status : Not Evaluated

BEHIND THE LENS

Anandi Chandran

Serpent eagle

Look deep into nature and then you will understand everything better - Albert Einstein

"What makes someone a natural historian? Well, it can be anyone who has a keen interest in nature and a sense of conservation to the place they live in. Just about anyone who can put an effort in preserving nature as such", says Anandi Chandran, as she looks out from her terrace, at the landscape around her – one of rolling hills, covered by trees. A small shola patch peering out around Doddabetta, while the rest is a mix of non-natives - Eucalyptus and other plantations. Born and raised in the Nilgiris, Anandi is proud to call herself a Badaga and a native of this beautiful landscape that is the cynosure of many eyes, evident from the tourists who throng this small hill town, come summer, every year. She dons multiple hats, moving from one to another with ease – be it as a social worker, member of Rotary club of Nilgiris, INTACH, NNHS, a Green brigade or an amateur photographer.

She calls herself amateur, but her still images capture the essence of the landscape with brevity and beauty. As a bird photographer, she finds herself making pictures of birds in their natural habitats. "Why? To inspire and motivate people to understand the beauty of nature" she says. And it is not just the bird that she strives to capture, but a sliver and slice of the landscape that the bird calls home for she believes the foreground and background need to talk to one another to evoke emotions and understand the true meaning of nature in its element. Be it observing the kingfisher take its time, to poise, and dive for its catch, or the thrushes moving about in the leaf litter back home, or the flycatchers swoop dive for their meal, there's more to the story than the bird portrait itself, she reveals. A naturalist need not be an outdoors person alone, she indicates, talking of the so many ways that women can and have been contributing, significantly, to conservation. Be it as the brains behind sustainable practices such as waste segregation or as pioneers of green menstruation (waste disposal ad management being significant problems in the hills). During the early years, she and her friend made daily rounds to the Municipal office in Ooty in an attempt to help improve the waste collection/ disposal system. They would walk different routes in the town, observing and making note of where garbage was getting dumped and not cleared. Over time, with the help of like-minded civic aware citizens, they were able to get the local administration to take notice and improve the clearing and management of waste. It was

around that time, 5 years ago, that Ooty formed its active citizen group, Make Ooty Beautiful (MOB) and Anandi was amongst some of its earliest members, working for various social causes in the region. The association with the Rotary club later brought her to work on the green menstruation program in the Nilgiris – first initiated with the Chamraj group as a CSR funded project and now it is going places, around the Nilgiris, she proudly announces.

As a wife and mother, taking care of family was a priority in the early years. In 2013, she joined the Nilgiris Library which brought her in contact with many other fellow naturalists and triggered deeply embedded nature interests in her. While working at INTACH with Ms. Geetha Srinivasan, she got more involved in heritage and history of the Nilgiris – a hitherto new perspective for her, as to what heritage meant – not just confined to architectural buildings, but also culture, language and cuisine which define heritage of the indigenous communities of the Nilgiris. A later stint with the Nilgiri Natural History Society as its co-ordinator got her closer to nature through talks and treks. And she has also worked with a private school as a librarian, conducting activities for students. All through, photography has remained a constant in her life as she now continues to work as a freelance photographer. But it has not been an easy task, juggling household duties with the calls of nature photography which requires travelling distances and getting up and about in early hours of the day to get the right lighting and shots. She also recalls gender biases that crept in when people did not consider that local women could take to nature photography and recalls a few close friends who supported her during those early travails. But the effort is worth it when you see your beautiful picture draw up a smile on your face and the heart fills with happiness. And moreover, to achieve what you aspire for, one has to work at and for it, she says, emphatically.

The inspiration to be around nature has been all through, she says, fondly recalling childhood vacation visits to her grandparents' native village. "Walking through the farms and estates, crossing the river in between, I would listen to bird sounds – I did not even know which bird it was or whether it was a resident or migratory species. But that didn't really matter then. Watching the sunrise and sunset from behind the hills, and the summer showers with the huge roar of thunder and lightning, I knew deep down this is where my heart was", she reminisces, travelling down memory lane.

But going into forests and waiting for hours for birds, while being alert to other movements of wildlife has been scary as well, she adds. Photography teaches you patience and perseverance. And without it, she might not have been this entrenched in nature, she believes. Learning out of interest and her own mistakes, she had friends who were helpful to assist while a short 1-week class in photography helped with learning the technical details of the task. To pursue one's passions against all odds is essential for achieving anything, she stresses, while imploring the people of Nilgiris to preserve this world-famous landscape that they call home. This bird is now ready to spread wings and fly, she tells me, about her recent trips outside of the Nilgiris – be it to photograph flamingos in Chennai, or a birding road trip to Rameshwaram. Birding across India, is now on the cards, she reveals. On a closing note to women, in particular, she parts with words, learnt from experience –"All those who said No to me earlier, actually helped me grow into the person I have become. And I am thankful for that. If you want to do something, go ahead and do it yourself. After all, at the end of the day, we live for ourselves and not for others". As told to Sharada Ramadass

Banded cuckoo

Blue bearded bee-eater

Miles to go

BREWING UP A SWARM

Sharada Ramadass, NNHS

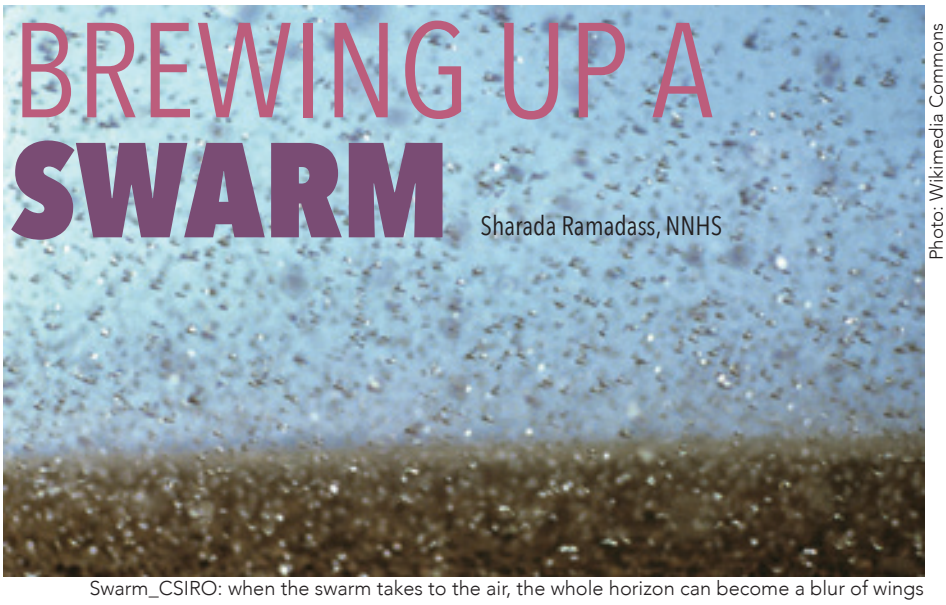

Photo: Wikimedia Commons

Swarm_CSIRO: when the swarm takes to the air, the whole horizon can become a blur of wings

Photo: Wikimedia Commons

Starling murmuration: A murmuration of starlings

Photo: Wikimedia Commons

Locust damage: when hungry hordes like this descend upon crop fields, crop loss and damage are inevitable

For a human society that thrives on socialising, 2020 brought in the shocker of social distancing with the occurrence of the coronavirus pandemic. No crowding (or social aggregation) was the mantra chanted everywhere. A social aggregation is when a collection of people are at the same place at the same time but do not necessarily have a connection to one another (for instance, at a restaurant or at a shopping mall).

In nature, however, aggregating together is a common collective behaviour exhibited by many species – from fishes, birds to insects and not excluding humans. Insects of course are the most famously known for what is termed as 'swarming'. While many animals that live in groups, show swarm behaviour, even solitary animals can come together to swarm, under certain environmental conditions. It is the outcome of a collective motion of a large number of self propelled entities (in the field of biology, individuals) with simple rules followed by the individuals. Interestingly enough, it does not require or involve any central coordination, but yet as a whole, the swarm behaves in a highly coordinated manner. The subject has been a topic of fascination and study as it is still unclear why this behaviour evolved in the natural world. Scientists believe it is a complex trait that increases chance of survival, and so it has gained importance in the modern field of artificial intelligence and robotics, for understanding the evolution of intelligence as a complex trait favouring survival.

Come winter, many birds such as the starlings, come to roost together, before migration, not just in hundreds but in as large a group as thousands or more. Looking at the sky, one might observe them swooping as one enormous swirling mass, a spectacle known as 'murmuration'. While the primary motivation for migration is often food, the flocking behaviour helps save energy costs in flying, as the birds use the updraft from the birds ahead to minimise effort needed to keep flying. Similar swarming behaviour is also seen in fish shoals which can also include mixed species groups. In these animals, it is believed that it helps dilute predation chance and also improves hydrodynamic efficiency. A Michigan State University study using models showed that predator confusion was enough of a selection pressure to evolve swarming behaviour in prey. Swarming thus allows groups of animals to accomplish tasks that they can't do alone, in this instance, defending themselves from a much larger predator.

How often have you observed in the late evening light, a hairdo of small flies hovering atop our heads, over a bush or a pool of water! These are midge flies that are swarming to attract mates, and in this case, is a ritual by 'consensus', of all in the swarm. Honey bees form swarms when they are scouting for or taking to new nest locations. But some swarms do take on the role of a plague, such as the locusts. All locusts are grasshoppers but all grasshoppers are not locusts. In the case of locusts, what is fascinating is the fact that they can be solitary innocuous grasshoppers going about their business in the desert or gardens. But every so often, when there is a flush of vegetation in their breeding locations (usually after rains) they can breed rapidly, becoming gregarious and take to the skies. During this time they undergo a reversible temporary 'swarm' phase as adults, while the nymphs form bands and join them. This phenomenon

Photo: Wikimedia Commons

Desert locust: the infamous and feared desert locust, *Schistocerca gregaria*.

known as locust phase polyphenism is a phenotypic (observable characteristics) plasticity where they can change in physical appearance and behaviour in response to environmental conditions. The notoriety of this behaviour is best known in the desert locust, the *Schistocerca gregaria*, a swarming short horned grasshopper in the family Acrididae and considered one of the most devastating migratory pests anywhere in the world. As we write this, the locust has been on its migratory war march from East Africa, into Pakistan and India on the western side with high alert issued in the states of Rajasthan, Madhya Pradesh and Delhi. These swarms damage crops over lakhs of hectares as they ravage the landscape bringing untold miseries to the farmers with a threat of famine to human populations.

The human loss notwithstanding, this Jekyll and Hyde transformation is a hot topic of study, because much is still unknown. In the solitary phase when the population density is low, the hoppers are green in colour and repel each other with no interest of coming together. However, in the gregarious phase when the population density is high, they change colour to brown, have an increased metabolic rate and are attracted to each other, forming cohesive units. This has been seen associated with an increased level of serotonin, caused by tactile stimulation of the hind legs - it can be a simple case of encountering too many individuals, i.e., overcrowding. Under these environmental conditions, the migrating swarm can surge to over a billion individuals. In some cases, like the desert locust mentioned above, scientists believe there might be an innate predisposition to aggregate as a species. A study by the Max Planck Institute of Ornithology, stumbled upon some fascinating information on this, through laboratory experiments with the insects. They showed that the locusts are more driven by the fear of being cannibalized by others in the swarm than any other kind of cooperation. In their experiments it was found that when there is overcrowding and they run out of food, the locusts turn on each other and each individual attempts to eat the one in front of it, and to avoid being eaten by those behind. This results in the whole horde moving en masse, in a sort of forced march/ flight, towards more food – a classic case of eat or be eaten.

Photo: Sharada Ramadass

Brownspotted_locust: the brown spotted locust (*Cyrtacanthacris tatarica*) may be easily mistaken for its cousin, the desert locust

However, not all grasshoppers go through the swarm phase in their lives, and oftentimes, it is very easy to mistake one for the other because of the similarity in external appearance. This can create confusion, as was seen in the Nilgiris, when the desert locust swarm hit the west of India early this year. The brown spotted locust (*Cyrtacanthacris tatarica*) is widespread across India, but not swarming in nature and is easily confused for its cousin, the desert locust. The case of mistaken identity kicked up a panic in the district, when people started reporting what they thought was the desert locust in the district, with fear of crop loss. After examining the specimens caught from the district, entomologists had to allay the fears among people explaining that these were not the desert locust species, but the brown spotted locust instead.

Photo: Wikimedia Commons

Why or how does all of this matter, one might ask? For one, unreasonable panic (due to mistaken identities) can be dangerous as grasshoppers play a very important role in nutrient cycling and are good indicators of the health of the local ecosystems. It is therefore important to not target all species (as pests), because of a few problematic ones. For the swarming species, on the other hand, current pest control measures - bio pesticides or mechanical measures, are limited in the face of the sheer numbers of the swarm and the harmful side effects of chemical based pesticides. Understanding the intelligence behind swarms (causality triggers for a swarm and the behaviour patterns within a swarm) can inform us better to prevent them in the first place or evolve measures to minimise its impact on humans. Finally, swarms, even when they occur are not all bad news - swarm intelligence (collective skills that can improve the performance as a group) has been shown to enable groups to make faster and smarter decisions; understanding this from the natural world holds answers to modern human dilemmas – from robotics and congestion management to cancer growth in human cells.

Reference literature

1. Buhl, J., Sumpter, D. J., Couzin, I. D., Hale, J. J., Despland, E., Miller, E. R., & Simpson, S. J. (2006). From disorder to order in marching locusts. *Science*, *312*(5778), 1402-1406.

2. https://researchfeatures.com/2017/06/30/locust-swarms-powerful-force-nature/

3. https://www.mpg.de/11357042/W004_Environment_climate_062-069.pdf

4. https://cdn2.researchfeatures.com/wp-content/uploads/2017/06/Dr-Hojun-Song-Green-Texas-AM-University-Ecology.pdf

5. https://www.thehindu.com/news/national/tamil-nadu/grasshoppers-mistaken-for-locusts-across-tn/article31708690.ece

THE BUZZ

NNHS DIARY

Classroom session

Participants involved in a tree activity

Observing the surroundings activity

2020 was not like any other. For it started out on an ominous note with the news of the newly discovered corona virus (covid-19) and its spread across the globe.

Schools and College visits

Dakshin Endeavours, Bengaluru had been in touch with us for a possibility of including a Kotagiri socio-cultural experience in their planned itinerary for their Australian students. After some discussions, it was decided to offer a one-day experiential visit to Kodithenmund and Banagudi shola on 11th February. The field trip was followed by a short campus tour at Keystone. The team enjoyed the experience immensely and was keen to extend their visit in the coming years.

Trails and Workshops

We ran the bee safari to Semmanarai again this year on popular demand and made it just in time, on March 1st, before the lockdown restrictions set in. We had a large group of visitors from far and wide who joined us on this trip. Knowing about bees from experienced hands is always a pleasure and this experience holds a lot of promise in the years to come.

After a bit of back and forth on the dates, we ran the first Seasonwatch workshop for Nilgiris, along with Keystone Foundation, on Monday, the 9th of March. It was a small group of about 10-11 Barefoot ecologists from the Keystone centres at Sigur and Sathyamangalam, and school teachers from Kotagiri schools. The workshop was conducted by Swati Sidhu from Seasonwatch, with local language support from the NNHS co-ordinator. The workshop included classroom sessions followed by field activities on how to collect data for Seasonwatch. All participants found the workshop useful as well as enjoyable.

Looking forward, with hope

The beginning of the year is always a busy one for schools, with exams looming around the corner. And

Photo: Dakshin Endeavours

Lunch with a view

Photo: Dakshin Endeavours

Admiring the toda embroidery art form

with the corona virus lockdown set in motion since March, field based activities have come to a halt. However, NNHS continues to interact, share and encourage natural history observations through online channels – be it social media (Facebook), or the world wide web (website, mail). Interesting natural history notes go up weekly on the Facebook page to keep people curious.

Handling the hive with Justin

In celebration of bee day in May, a weeklong online engagement was underway. It started with an art event on making bees with natural materials, followed by daily activities to draw awareness towards insects in general (bees in particular) and their ecological roles and functions. The activities included knowing about bees and their behavior, nesting patterns, types of bees and beekeeping. With social distancing still in play, NNHS continues to operate through the online channel, organising webinars on various themes relating to nature and the environment.

The pandemic has taken the world by shock and one has to persevere and wait for this to tide over, to pick up from where we left off. Or realign to a new normal. It is in these times that we can take comfort from these wise words of J. R. R. Tolkien – "*The world is indeed full of peril, and in it there are many dark places; but still there is much that is fair, and though in all lands love is now mingled with grief, it grows perhaps the greater.*"

The newsletter of the Nilgiri Natural History Society (NNHS) aims to cover the many dimensions of natural history - conservation issues, lay observation, cultural representations and traditional knowledge. The newsletter will carry communications about research in Keystone Foundation in the areas of conservation, environmental governance, culture, livelihoods and enterprise. In keeping with the pan Nilgiri Biosphere Reserve (NBR) nature of the Society, space will be allocated for reporting of events/views from elsewhere within the country and from outside the country. Additionally a section will be devoted to research summaries by students who work in the region of the NBR. Guest editors will be invited for special editions. News items gleaned from printed sources about the NBR will be featured. Separate sections will carry information on NNHS and Bee Museum activities. The species focus will feature species of special conservation status, endemic to the Western Ghats and present in the NBR.

SUBMISSION OF ARTICLE

The NNHS newsletter articles are reviewed by the Chief Editors and a member of the editorial board. Articles are invited for the following section: i. Natural History News from India (400 words); ii. Natural History News from the World (400 words); iii. Research Initiatives in the NBR - student contributions (400 words); iv. Species focus (250words). Articles should be submitted by email to: **contact@nnhs.in**

Authors should provide complete information including an email address and phone numbers. Articles needs to be submitted in standard word processor formats only. Rich text content and other forms are not accepted. Figures and texts need to be sent in seperately with adequate labelling and numbering in context to the articles sent. Pictures in the manuscript also need to sent in seperately in TIFF, JPEG or PNG formats with resolution not less than 250 dpi

Reference style:

Papers in Journals and other periodicals

Hanely, T.A. and Hanley, K.A. 1982. Food resources partitioning by sympatric ungulates on Great Basin rangeland. Journal of Range Management 35: 152-158. Papers in Edited Books, Symposia Proceedings, etc

Cole, D.W. and Rapp, M. 1981. Elemental cycling in forest ecosystems. pp. 341-409. In: D.E. Reichle (ed.) Dynamic Properties of Forest Ecosystems. Cambridge University Press, Cambridge.

Books

Lieth, H. and Whittaker, R.H. (eds.). 1976. Primary Productivity of the Biosphere. Springer-Verlag, Berlin.

Reports, Dissertations, etc

Sollins, P.,Reichle, D.E. and Olson,J.S. 1973. Organic Matter Budget and Model for a Southern Appalachian Liriodendron Forest. Oak Ridge National Laboratory, Oak Ridge, U.S.A.

SPECIES FOCUS

Anaphalis neelgerryana (DC.) DC.

Anaphalis neelgerryana is an herbaceous perennial belonging to the Asteraceae family. The genus Anaphalis are commonly known as pearly everlasting and of the 110 species found under this genus, majority are native to central and southern Asia. This small woody plant is endemic to the south western ghats of the Indian peninsula. The plant is found in the high altitude montane grasslands, which is its natural habitat, a threatened and vanishing landscape. The plant has many branches and is covered in fine cottony hairs. Not much has been studied about this species which is believed to be an indicator and typical representative for montane grasslands.

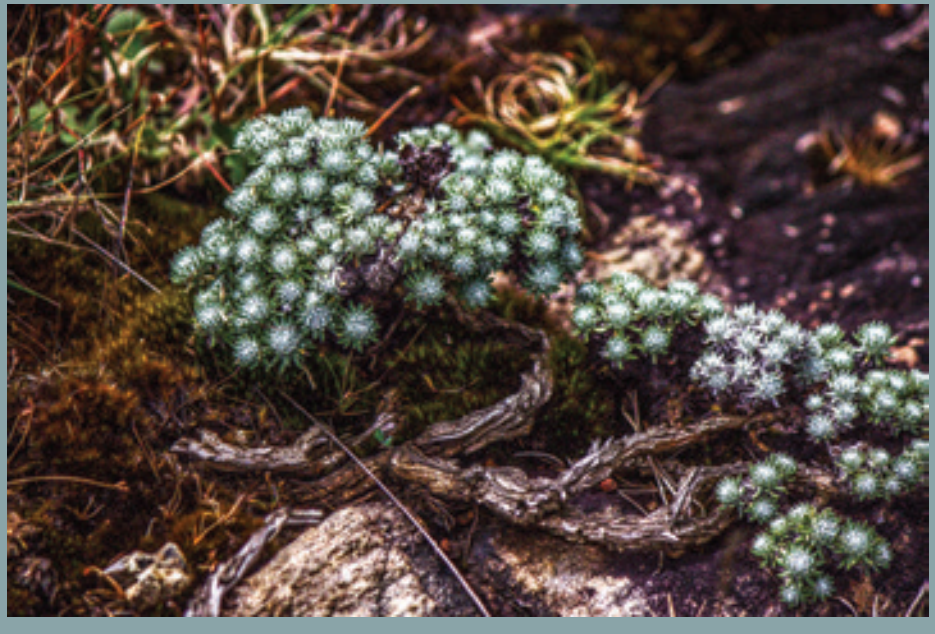

Photo credit: Sharada Ramadass