ZOO'S PRINT

Communicating Science for Conservation

Vol. XXXIV, No. 6, June 2019
ISSN 0971-6378 (Print); 0973-2543 (Online)

Magazine of Zoo Outreach Organization
www.zoosprint.zooreach.org

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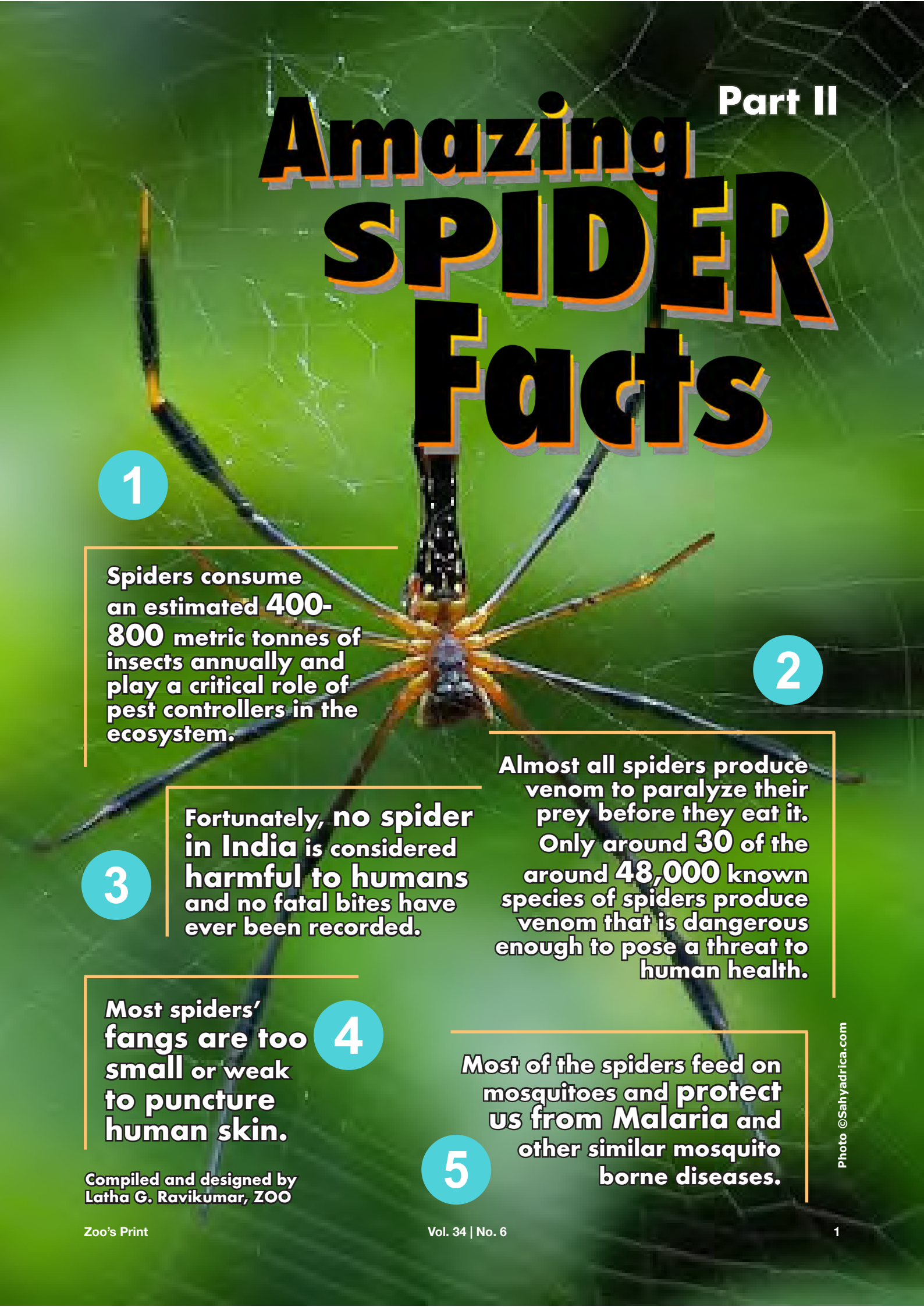
Cover design by Latha G. Ravikumar, Zoo Outreach Organization, Coimbatore

Part II

Amazing SPIDER Facts



1

Spiders consume an estimated **400-800** metric tonnes of insects annually and play a critical role of pest controllers in the ecosystem.

2

Almost all spiders produce venom to paralyze their prey before they eat it. Only around **30** of the around **48,000** known species of spiders produce venom that is dangerous enough to pose a threat to human health.

3

Fortunately, **no spider in India** is considered **harmful to humans** and no fatal bites have ever been recorded.

4

Most spiders' **fangs are too small** or weak **to puncture human skin.**

5

Most of the spiders feed on mosquitoes and **protect us from Malaria** and other similar mosquito borne diseases.

Photo ©Sahyadrica.com

Compiled and designed by
Latha G. Ravikumar, ZOO

6

The spider **silk material is not only stronger than iron and tougher than Kevlar**, the usual bulletproof material. This material offers the possibility of improving on products from bike helmets to parachutes to bulletproof jackets to airplane wings to earthquake-resistant building.

They **eat harmful insects, pollinate plants**, and **recycle dead animals and plants** back into the earth.

7

8

Spider web is extremely rich in **Vitamin K, have natural antiseptic and anti-fungal properties** that help keep wounds clean and free of infection. Their healing properties were popular with the Ancient Romans and Greeks hundreds of years ago.

They are also a **valuable food source** for many small mammals, birds, and fish.

9

10

Spiders **eat more insects than birds and bats combined.**

11

The mud wasps, many pollinators, lizards and some birds feed their younger ones with spiders as they are **rich in simple proteins.**

Some spiders like tarantulas make burrows in soil that **help in water percolation.**

12

Spider silk is **biocompatible, biodegradable and does not cause** any **immune, inflammatory or allergic reactions.** A group of scientists developed an antibiotic synthetic spider silk that can be used in a variety of medical applications.

13

14

A pesticide made from **spider venom has been found to kill nuisance insects without harming honebees** that are most important pollinators.

Spider silk has already entered the marketplace in some cosmetics and medical devices.

15

German scientists have manufactured **guitar strings from spider silk.**

16

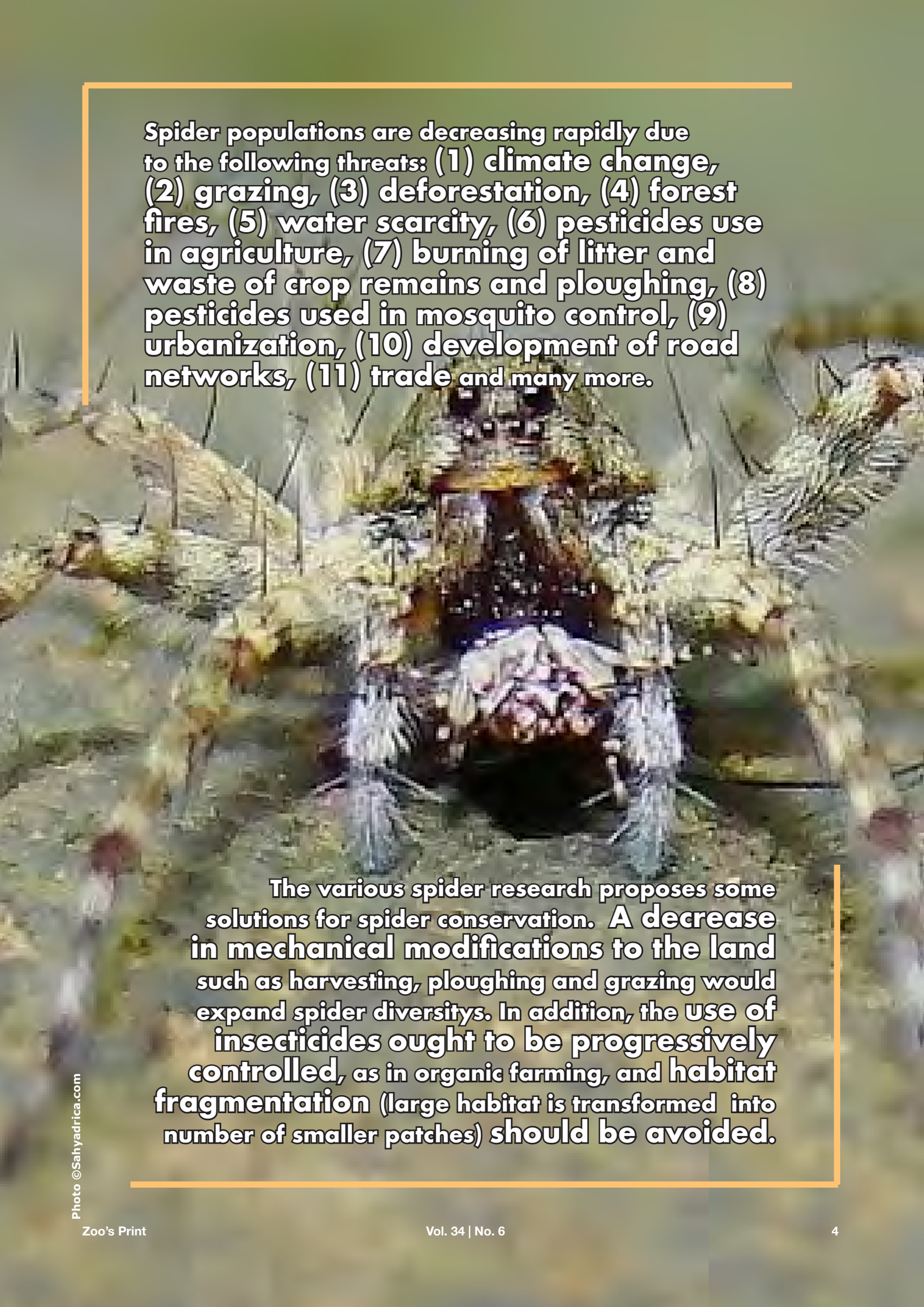
Spider venoms may occupy a role in the development of **anti-cancer drug.** It is supposed to kill the cancer cell without affecting the rest of the cells.

17

Because **spider silk is smooth and antibiotic,** most birds line their nests internally by spider silk to avoid bacterial infection.

18

Spider populations are decreasing rapidly due to the following threats: (1) climate change, (2) grazing, (3) deforestation, (4) forest fires, (5) water scarcity, (6) pesticides use in agriculture, (7) burning of litter and waste of crop remains and ploughing, (8) pesticides used in mosquito control, (9) urbanization, (10) development of road networks, (11) trade and many more.



The various spider research proposes some solutions for spider conservation. A decrease in mechanical modifications to the land such as harvesting, ploughing and grazing would expand spider diversitys. In addition, the use of insecticides ought to be progressively controlled, as in organic farming, and habitat fragmentation (large habitat is transformed into number of smaller patches) should be avoided.

Photo ©Sahyadrica.com

Parvati Kunda Wetland: threatened or thriving?

By Jessie Moravek. Published in Jottings on 09 June 2019

Three hundred meters above the village of Gatlang in Rasuwa, Nepal, Parvati Kunda sits like a jewel in the forest. Situated at 2,600m, the small wetland is not only a reservoir of biodiversity but also a major source of water for 400 households in Gatlang Village and a religious site that draws hundreds of visitors to festivals each year [1].

Parvati Kunda, however, faces many threats. Climate change could alter the rhythms of rain and snowfall and jeopardize sensitive wetland habitats [2–5]. Additionally, pollution from manure and fertilizers can cause certain plants to grow too fast, crowding out other species [6–9]. Such pollution could also contaminate the wetland with bacteria, making the water unhealthy to drink for people in the village.

Given all these threats, it is important to understand the plants and animals that live in Parvati Kunda now so that we can predict how the ecosystem may change in the future. This knowledge will help us protect Parvati Kunda and the species that live there for many years to come.

Aquatic insects are one of the best ways to tell if a wetland is polluted or clean. Certain insect species are extra-sensitive to pollution and can only be found in very clean wetlands. The absence of these sensitive species can suggest that a wetland is polluted [10]. When aquatic insects were surveyed in Parvati Kunda, very few sensitive species were found—suggesting that the water in Parvati Kunda is already quite polluted.

Parvati Kunda Wetland in spring. © Jessie A. Moravek.

This pollution probably comes from livestock waste in the area surrounding the wetland but exactly where, when, and how much pollution comes from livestock is uncertain. And, although we do not fully understand what problems pollution will cause for plants and animals in Parvati Kunda, it is clearly a major threat to the wetland and the people that drink the water.

It is important to keep the wetland clean to protect the species that live there and the people living in the nearby Gatlang Village. Even with polluted water, there are currently 25 species of wetland plants in Parvati Kunda, including *Acorus calamus* and a rare type of peat moss called *Sphagnum palustre*. Around the wetland, we observed 37 different types of birds and six different species of mammals including Grey Langur monkeys, Barking Deer, and Yellow-throated Martens. The water from Parvati Kunda is also piped down to village taps, although the water in those taps is contaminated with bacteria [11].

School children from Gatlang enjoy learning about Parvati Kunda Wetland's biodiversity during an educational program. © Mohan B. Shrestha.

Overall, it is important to continue surveying the plants and animals in Parvati Kunda. Now that the wetland species have been recorded once, it will be easy to monitor how pollution and climate change impact the wetland habitat in the future. It will also be easy to measure how local conservation actions help protect wetland species. Parvati Kunda is a beautiful example of a Himalayan wetland and understanding Parvati Kunda will help us protect and conserve other wetlands throughout the region.

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This science communication was originally published as an article in JoTT at https://doi.org/10.11609/jott.4481.11.6.13734-13747.

This jotting was originally published in Jottings at https://threatenedtaxa.org/jottings/ecology/parvati-kunda-wetland-threatened-or-thriving/.

CONSERVING LIVELIHOODS AND THE CHAMBA SACRED LANGUR

Did you know that the Hindi word 'langur' (pronounced 'lungoor') is used all over the world to refer to leaf-eating monkeys? The Chamba Sacred Langur, too, is such a monkey which loves to feast on leaves—especially on young leaves and lots of them—but also on buds, bark, fruits, roots, seeds, cones, and flowers. To spice up their meal of leaves and bark, Chamba Sacred Langurs sometimes lick rocks and soil from under trees. This dietary adventure is usually undertaken in groups and is known to supplement their diet with essential salts and minerals.

Chamba Sacred Langurs love to groom and to be groomed and spend most of their resting hours doing just that. Grooming glues social bonds while also providing a tasty snack of those pesky lice—talk about an added advantage!

CSL licking mud
Shot by Vishal Ahuja.

CSL grooming
Shot by Vishal Ahuja.

CSL eating leaf
Shot by HLP.

CSL grooming
Shot by Brenda deGroot.

Follow the Himalayan Langur Project: facebook.com/HimLanPro/

Text by Vidya Mary George, ZOO.

Instagram

INSTAGRAM IMAGES

The eye-catching, metallic blue-green Peacock Tarantula was rediscovered in 2001 a century after its first description in Andhra Pradesh. While the male crawlies of the big, hairy species roam about in search of mates with their sharpened spidey sense, the females live, lay eggs, and raise their babies in tree holes in old growth forests. Shot at Andhra Pradesh by S. Molur, ZOO; posted on 04 Jun 2019.

The perennial shrub Yellow Flax (बसंती, प्याउली) is found in the Himalayan and Western Ghats hotspots and belongs to the genus Reinwardtia, the only member of its family of flowering plants, in recognition of the 19th Century botanist Reinwardt. The scented golden yellow flowers have fine reddish veins in their throats and are used for dyeing clothes and making paints. Shot at Chamba by S. Molur, ZOO; posted on 27 May 2019.

Sea Cucumbers are "ultra cool" nutrient recyclers of the sea—these squishy fleshy superheroes live in shallow rock pools as well as at incredible depths of the sea floor, feeding on microscopic organic matter to keep the nutrient cycle going. Don't be misled by their dull appearance or slow movement, as these cool cucumbers have strange funky habits that few other animals match up to—breathing through their anus, squirting out their innards to deter predators, and simply regrowing those parts—talk about Wolverines of the ocean! Shot at Rameshwaram by B. Ravichandran, ZOO; posted on 04 May 2019.

Picking up his sweeping train off the floor, the male Common Peafowl fans out his quills and rustles them in a spectacular display of colours—all for the benefit of the girls in the block! As for the peahens, they have their eyes trained on the mesmerizing 'eye' spots at the end of his quills—the more spots there are, the better the chance he stands at sweeping the girls off their feet! Shot at Coimbatore by B. Ravichandran, ZOO; posted on 30 Apr 2019.

We bring to you every week shots and tidbits of incredibly diverse species from around the natural world! Follow us on Instagram to be part of a growing community that celebrates our natural heritage: https://www.instagram.com/threatenedtaxa/
Follow B. Ravichandran on Instagram: https://www.instagram.com/discoverravi/
Follow S. Molur on Instagram: https://www.instagram.com/molursanjay/
Captions by Vidya Mary George, ZOO.

A fate of a carcass in a natural forest

Many of us do not realize how important an animal carcass in a natural forest is for wild scavenging animals. Carcass in the wild provides key food resources for wild scavengers (Selva et al. 2005). This report presents a situation where wild scavengers feed on the remains of a tiger kill (a horse carcass) in Phrumsengla National Park (27.43389N, 90.83833E), at an elevation of

Large-billed Crows feed on the carcass of the horse. © Phrumsengla National Park (PNP).

2,664m. The carcass was left untouched in the forest from 29 March to 06 April 2018 to examine what type of wild scavengers feed on it, using a camera trap. The camera trap (Cuddeback Digital) was fixed on a live tree to systematically record the activities of the animal species visiting the carcass. Large-billed Crow *Corvus macrorhynchos* was the first to detect and feed on the carcass

A Wild Boar pulls apart the flesh of the carcass while Large-billed Crows feed on the ectoparasites. © Phrumsengla National Park (PNP).

followed by a solitary Wild Boar *Sus scrofa*, Asian Red Fox *Vulpes vulpes*, and Himalayan Griffon Vulture *Gyps himalayensis*. The Large-billed Crows found the thick skin of the carcass hard to penetrate with their beaks. Therefore, they started feeding through the puncture marks left on the neck of the carcass by the tiger. That source of

An Asian Red Fox appears at the site but retreats from the carcass. © Phrumsengla National Park (PNP).

A Himalayan Griffon Vulture lands at the site and feeds on the carcass. A Large-billed Crow sits on its back and feeds on the ectoparasites on the vulture's body. © Phrumsengla National Park (PNP).

feeding, however, was insufficient for the large flock of Large-billed Crows. They flew back soon after sunset. At the onset of night, a solitary Wild Boar came in and spotted the carcass. It approached the carcass, bite and tore the abdominal parts apart, and fed on the carcass. The next morning, the Large-billed Crows made their way to the carcass and found it easier to feed on the

The Wild Boar comes in, monitors the remains of the carcass and leaves. © Phrumsengla National Park (PNP).

opened carcass. A few minutes after the Wild Boar went out of the scene, the large flock of Large-billed Crows flushed in and completed their feeding. On the second night, an Asian Red Fox marched in, sniffed the carcass, but retreated.

The next day, again, the same solitary Wild Boar stepped in, bit and pulled the skin apart, exposing fresh meat of the carcass. Thereafter, the flock of crows fed on the

Himalayan Griffon Vultures land in a flock at the site and finishes off the carcass. © Phrumsengla National Park (PNP).

carcass alongwith the boar. The boar was found busy feeding on the flesh whilethe crows engaged themselves feeding on the ectoparasites found on the boar and on the carcass. Amidst this feeding spree, a solitary Himalayan Griffon Vulture landed near the carcass and started feeding alongside the flock of crows. The crows boldly sat on the back of the vulture and started to feed on the ectoparasites on its body. After a few

minutes, the vulture flew away. The crows were still found feeding on the exposed carcass left by the vulture. Once again, the boarcame in, rolled back the carcass, and started feeding on it. This action further provided easy food access to the crows.

The next day, a flock of Himalayan Griffon Vultures landed at the carcass site and started feeding on the carcass along with the crows. It was observed that the crows were found perched on the back of griffons, feeding on the ectoparasites on their bodies. Bigger openings were made on the carcass by the boar, which the flocks of vulture and crows benefited from. The whole carcass was eaten up within seven days by the continuous feeding of the boar, crows, and vultures. The boar was the last to visit and leave the carcass.

From the above observation, we must understand that there is strong inter-specific mutualism in feeding among Wild Boars, Large-billed Crows, and Himalayan Griffon Vultures in a natural forest ecosystem. There may be so many such close interactions of feedings in the wild which we might have not personally sighted. Therefore, any dead animal or kill would be vital for wild animals as a food source. With this understanding, we must encourage our local community to avoid consuming or poisoning carcasses to prevent the killing of other animals in the wild. In this case, Himalayan Griffon was one of the large scavenging birds who fed large portion of carcass. The Himalayan Griffon Vulture is known to use its energetically soaring flight to travel long distances from nests and roosts in search of carcasses (Houston 1974). This bird is listed as Near Threatened in the world (BirdLife International 2017). Poisoning carcasses would pose serious threats to its survival in the wild. Nature take its own course in disposing off carcasses.

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Acknowledgement: I am thankful to Kunzung Tshering, Park Ranger, and Tashi Wangchuk, Sr. Forester of Phrumsengla National Park, for accompanying me in visiting and making the tiger kill investigation. They cooperated with me to install and retrieve camera traps from the field.

Jangchuk Gyeltshen
Phrumsengla National Park, Department of Forests and Park Services, Royal Government of Bhutan.
Email: jangyel_mangdip@yahoo.com

Citation: Gyeltshen, J. (2019). A fate of a carcass in a natural forest. Highlight, In: *Zoo's Print* 34(6): 11–13.

First record of *Acridotheres ginginianus* (Latham, 1790) (Passeriformes: Sturnidae) in Iraq

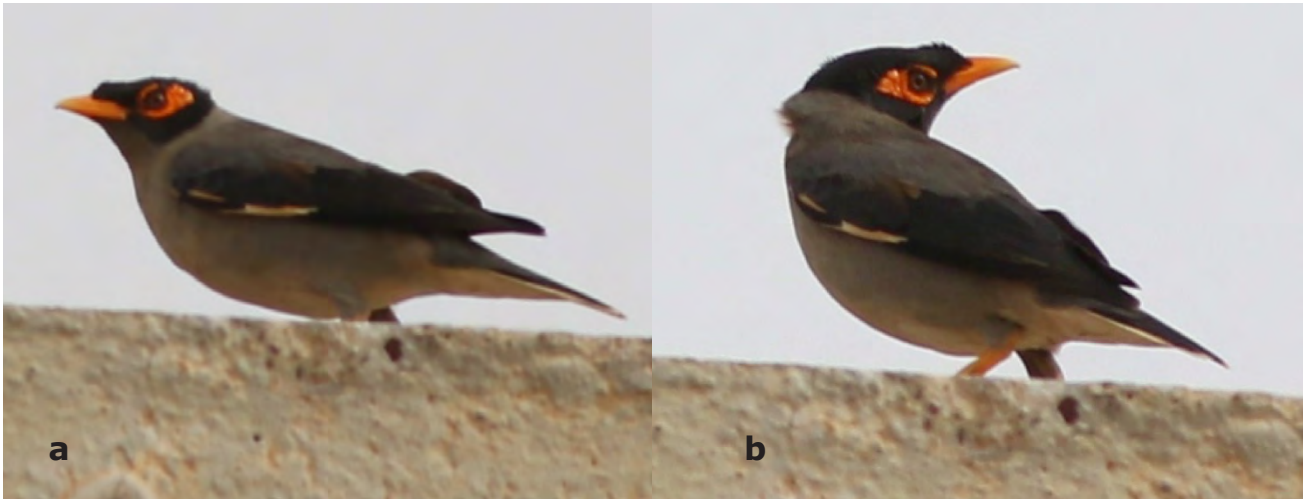

Image a & b - Bank Myna *Acridotheres ginginianus* in Al-Majara dumpsite in southern Iraq. © Al-Barazengy.

Bank Myna *Acridotheres ginginianus* (Latham, 1790) occurs in the northern Indian subcontinent from central Pakistan and the Himalayan foothills east to south of Nepal and Assam, south to Sind, northern and central India (Gujarat, central Maharashtra, south of Madhya Pradesh, and West Bengal), and west of Bangladesh (Craig & Feare 2018).

In the Middle East, Bank Myna populations originated from escapees. Breeding populations established from escapees in Kuwait, Saudi Arabia, United Arab Emirates, and Oman (Porter & Aspinall 2010). It is vagrant to Iran, where a flock of 10 individuals was recorded in April 2017 (Shokouhi et al. 2018).

On 29 March 2015, two adult individuals of the species were sighted foraging and perching frequently on concrete embankment in Al-Majara dumpsite (31.004^{0}N & 47.642^{0}E), ca. 17km to the southwest of Al-Nashwa Village in Majnoon area, Basra Province, southern Iraq.

The birds were observed for 20min from ca. 30m away. One of the individuals was photographed using a Canon ESO 7D Mark II with lens Canon EF 400mm (f 5.6). The birds resembled the Common Myna *Acridotheres tristis* (Linnaeus, 1766) but were rather smaller. Each individual had a slate-grey body, a black head with a short crest on the crown and bare, bright orange-red patch around the eyes, and a deep orange heavy

bill. In flight, the birds had large rusty-buff patches across bases of primaries feathers and pale edges in the outer tail feathers.

Bank Myna is not listed in the avifauna of Iraq (Salim et al. 2012); therefore, this is the first confirmed occurrence of this species in southern Iraq. Moreover, it has not been recorded as one of the cage birds in the local animal markets in southern Iraq. The observed Bank Mynas are vagrants to Iraq and probably originated from the nearest breeding population in Kuwait that requires confirmation.

IUCN Red List status: Least Concern

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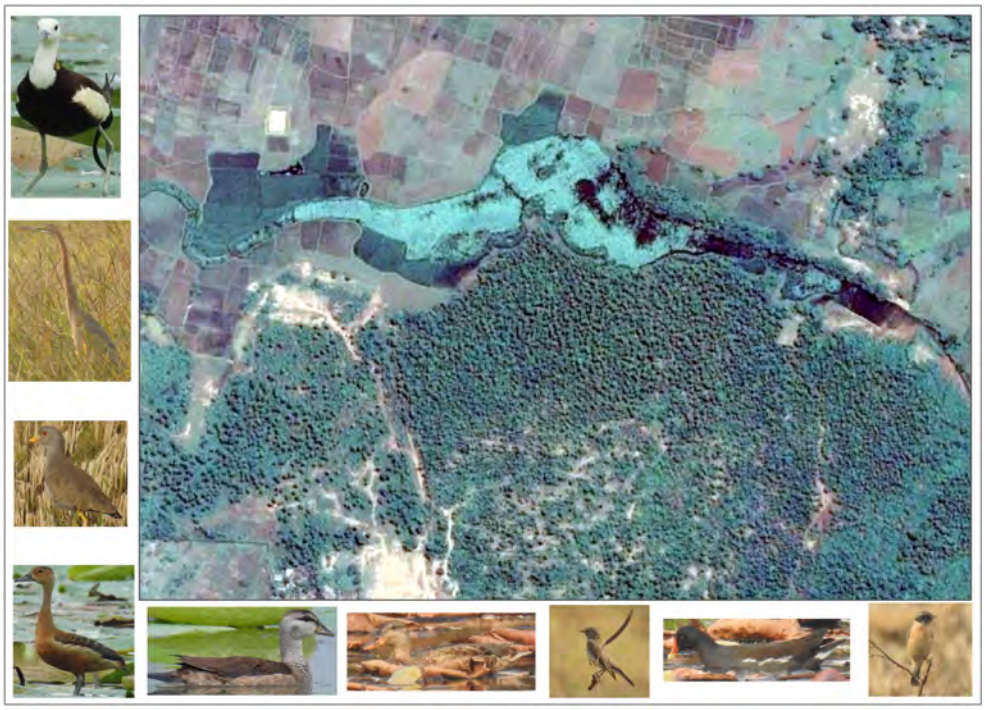
Ali N. Al-Barazengy[1] **& Omar F. Al-Sheikhly**[2]
[1]Department of Marshes and Sustainable Management of Natural Ecosystem, Iraqi Ministry of Health and Environment, Baghdad, Iraq. Email: ali_bio_84@yahoo.com (Corresponding author)
[2]College of Science, University of Baghdad, Baghdad, Iraq. Email: alsheikhlyomar@gmail.com

Citation: Al-Barazengy, A.N. & O.F. Al-Sheikhly (2019). First record of Bank Myna *Acridotheres ginginianus* (Latham, 1790) (Passeriformes: Sturnidae) in Iraq. Bird-o-soar #29, In: *Zoo's Print* 34(6): 14–15.

Rajbandh Wetland in Midnapore, West Bengal, India: a potential migration trap



Rajbandh Wetland and adjoining vegetation with few migratory birds.

Food sources and nesting locations are two primary demands for birds. As winter looms and the accessibility of insects and other food drops, the birds move to areas of high or increasing resources (Kasper et al. 2017). Migration is an enthralling study and there is much yet to discover. Some places of their migration route can act as 'migration traps' (Kaiser 1999). Local weather conditions, an abundance of food or the local topography are the two chief criteria for migration traps. These migration traps have become very admired with birders, even earning national and international reputation. India has a number of wintering grounds that attract nearly 25–50% of the world population of these winged visitors (Javed et al. 2000; Hawkes et al. 2013). The Central Asian-Indian Flyway comprises numerous important migration routes of water birds, most of which extend from the northernmost breeding grounds in Siberia to the southernmost non-breeding wintering grounds in India, western Asia, and Maldives.

Rajbandh Wetland (22.576N & 87.338E) is situated in West Midnapore District under the state of West Bengal in India. This place

Table 1. The local birds found in Rajbandh Wetland

	Common name	Scientific name	IUCN Red List (3.1)
1.	Spotted Dove	*Spilopelia chinensis*	Least Concern
2.	Common Kingfisher	*Alcedo atthis*	Least Concern
3.	White-throated kingfisher	*Halcyon smyrnensis*	Least Concern
4.	Stork-billed Kingfisher	*Pelargopsis capensis*	Least Concern
5.	Little Cormorant	*Phalacrocorax niger*	Least Concern
6.	Black Drongo	*Dicrurus macrocercus*	Least Concern
7.	Little Egret	*Egretta garzetta*	Least Concern
8.	White-breasted Waterhen	*Amaurornis phoenicurus*	Least Concern
9.	Indian Pond Heron	*Ardeola grayii*	Least Concern
10.	Common Hawk-cuckoo	*Hierococcyx varius*	Least Concern

is a prime attraction for migratory birds, both waterbirds as well as land birds. Rich food source along with peaceful weather (during the winter season, temperature varies from 10 to 25 degree, little or no rainfall) and situated one km from high road makes the place a suitable one for migratory birds.

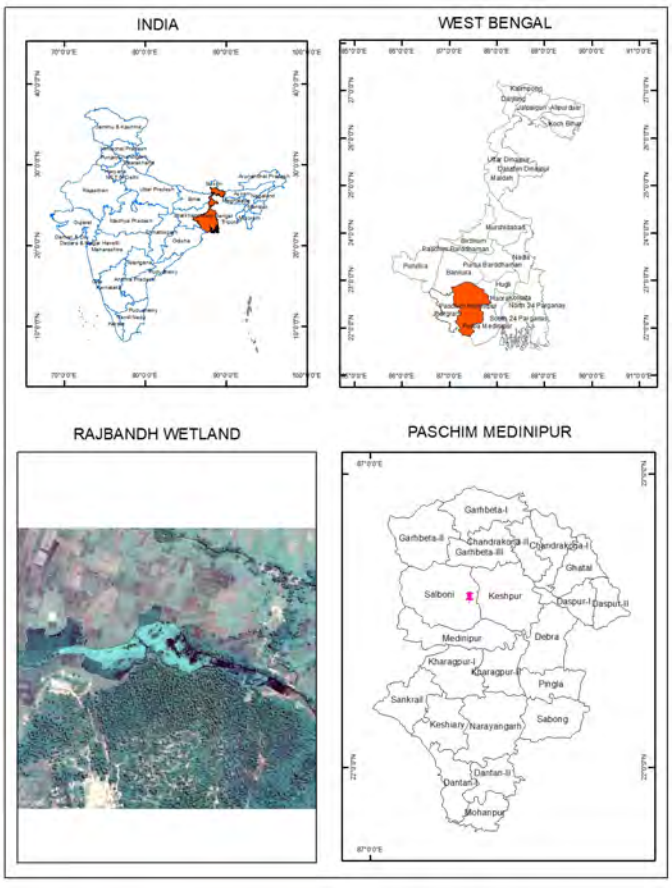
We visited the site every month for the last two years (2017 November to 2019 April) and surveyed (data were collected by walking around the wetland and searching for birds. Observations were carried in the morning) it once a week during the winter season. We spent 3–4 hours on an average to cover the whole area. We used a binocular (Olympus 10×50) along with Canon DSLR and Nikon P900 for photography. We consulted the literature for the proper identification of the birds (Ali 2003; Praveen et al. 2018a; Praveen et al. 2018b).The two-year study documented 14 species of migratory birds (Table 2) from this area along with more than 10 numbers of local birds (Table 1). No previous study was conducted from this part of India about migrant species and hence this report is the first from this region.

In 2015, Asad Rahmani, Director of Bombay Natural History Society informed us there has been a massive decline in migratory birds like small waders (common greenshank and curlew sandpiper) and ducks (Ferruginous Pochard and Red-crested Pochard) in India. Climate change along with destruction of wetlands and extensive hunting can be blamed for this (Rahmani 2015).

The National Action Plan for conservation of migratory birds and their habitats states the national priority and specific actions required to ensure healthy populations of migratory species in India, within their range across the flyway. The Union Environment Ministry in

Table 2. The migratory birds found in Rajbandh Wetland

	Common name	Scientific name	Month of occurrence	Number	IUCN Red List (3.1)
1	Lesser Whistling Duck	*Dendrocygna javanica*	Oct–Dec	40±5	Least Concern
2	Cotton Teal	*Nettapus coromandelianus*	Oct–Jan	25±	Least Concern
3	Common Moorhen	*Gallinula chloropus*	Jan	3±1	Least Concern
4	Pheasant-tailed Jacana	*Hydrophasianus chirurgus*	Nov–Feb	6±1	Least Concern
5	Purple Heron	*Ardea purpurea*	Mid-Jan	2±1	Least Concern
6	Grey-headed Lapwing	*Vanellus cinereus*	Late Jan	2	Least Concern
7	Gadwall	*Mareca strepera*	Late Dec	2	Least Concern
8	Taiga Flycatcher	*Ficedula albicilla*	Late Dec–Jan	6±1	Least Concern
9	Siberian Stonechat	*Saxicola maurus*	Jan	4±1	Least Concern
10	Grey Wagtail	*Motacilla cinerea*	Jan	2	Least Concern
11	Yellow Wagtail	*Motacilla tschutschensis*	Early Jan	2	Least Concern
12	Brown Shrike	*Lanius cristatus*	Late Nov–Feb	7±2	Least Concern
13	Common Snipe	*Gallinago gallinago*	Mar–Apr	3±1	Least Concern
14	Painted Snipe	*Rostratula* sp.	Late Mar–Apr	2	Least Concern



Rajbandh Wetland situated in Salboni Block, West Midnapur, West Bengal, India.

2018 identified 20 wetlands and nine wetland clusters for conservation as those are congregation sites for several migratory water bird species (MoEF 2018). Small patches of wetlands are equally important for such large-scale conservation of migratory birds. We have already taken a few steps, such as raising public awareness to restore the ecological balance of Rajbandh Wetland (Rajbandh is not a part of government current wetland conservation scheme), to

conserve the birds along with its stopover habitat in this region.

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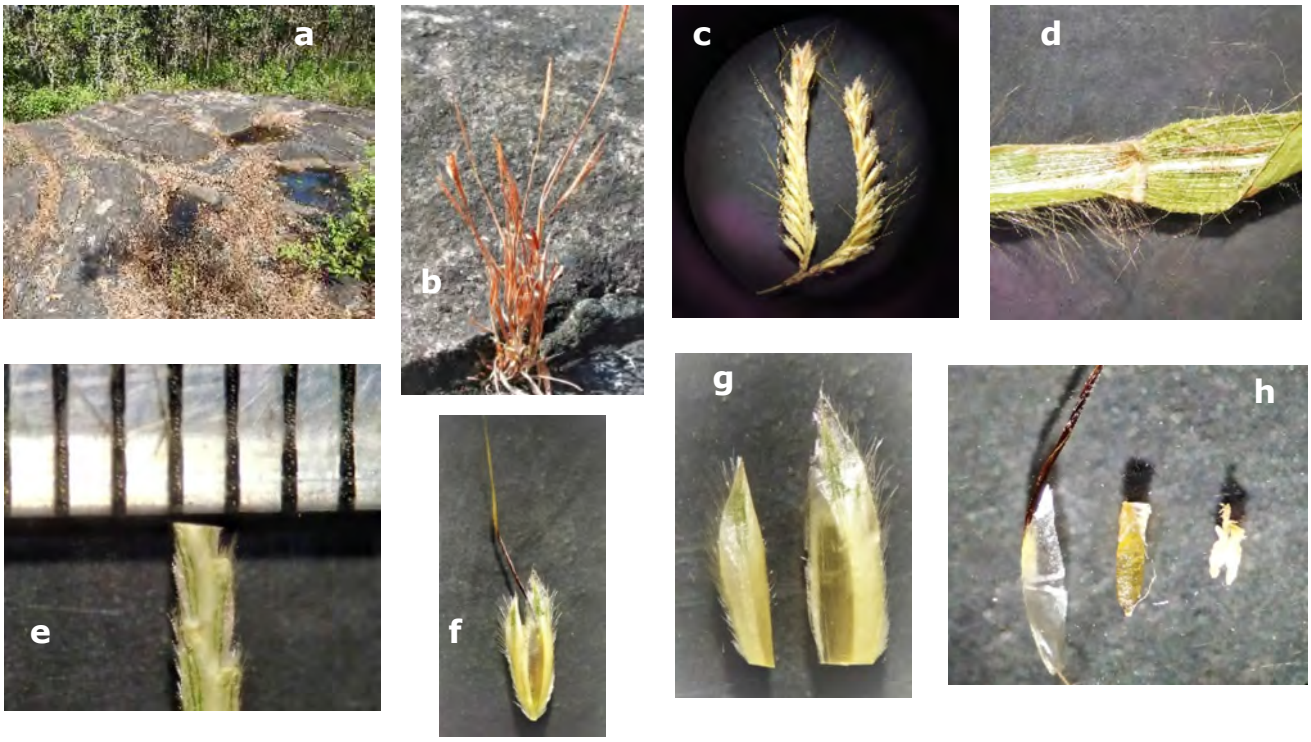
Suman Pratihar[1], Nirupam Acharyya[2] & Niloy Mondal[3]

[1,3] Department of Zoology, Sukumar Sengupta Mahavidyalaya (Keshpur College), Keshpur, Midnapore, West Bengal 721150, India.

[2] Department of Remote Sensing GIS, Vidyasagar University, Midnapore, West Bengal 721102, India.

Citation: Pratihar, S., N. Acharyya & N. Mondal (2019). Rajbandh Wetland in Midnapore, West Bengal, India: A potential migration trap. Bird-o-soar #30, In: *Zoo's Print* 34(6): 16–19.

New distribution record of *Dimeria connivens* Hack. (Poales: Poaceae) and addition to the flora of Karnataka



***Dimeria connivens* Hack.: a - habitat, b - habit, c - raceme, d - leaf blade and ligule, e - rachis, f - spikelet, g - glume, h - palea with awn, caryopsis, and anther. Photo by H.U. Abhijit.**

The genus *Dimeria* belongs to the subtribe Dimerinae. This genus is globally represented by 65 species commonly distributed in tropical Asian regions, among which 40 are found in India (Bor 1960; Kiran Raj et al. 2015). In India, the genus was recorded from Odisha, Bihar, and Maharashtra (Bor 1960; Potdar et al. 2012). This paper presents the first record of the species from Karnataka.

In 2017 Chandramohan & Prasanna reported a new variety of *Dimeria connivens* Hack. var. *roxburghiana* Mohan & Prasanna based on the width of the rachis and glume shape, but this is not a unique character for varietal separation and this variety does not exist in Plant list.

Dimeria Robert Brown (1810) is a well-known paleotropical grass characterized by solitary spikelets, tough and flat raceme rachis, keeled glumes, absence of tuft of hairs above the middle on the back, and equal and divergent binate racemes. These key characters separate the *Dimeria* genus from other andropogons genera (Kiran Raj 2008; Potdar et al. 2012; Chandramohan et al. 2017). The authors collected and prepared herbarium specimens and deposited them in the Western Regional Center, Botanical

Survey of India, Pune, and also in the Department of Applied Botany, Kuvempu University, Karnataka.

Dimeria connivens Hack. in DC. Monogr. Phan. 6: 689. 1889; Hook. F., Fl. British. India 7: 104. 1896; Bor, Grass. Burma Ceylon India Pakistan 140. 1960; Laxmi. In Sharma et al. (eds.) Fl. Maharashtra Monocot. 467. 1996; S. Moulik, Grass. Bamb. India 1; 281. 1997; Naik, Fl. Marathawada 2: 1023. 1998.

Annual erect herb with 10–40 cm height. Nodal region of the culms having hairs, leaf sheath terete and having tubercle-based hairs, leaf blade 8–10 cm long and 0.2–0.3 cm wide, linear, ovate, acuminate apex. Raceme 2, erect, 2.5–3.0 cm long. Spikelets awned, length 4.4mm without awn and 10mm with awn. Rachis flattened, 1mm long. Lower glumes sub-coriaceous, narrowly ovate, 3.5–4.0 mm × 0.4–0.5 mm, 2-keeled, keels hairy, slightly corky winged. Upper glume sub-coriaceous, oblong, 3.8–4.0 mm × 0.8–1.0 mm, 1-keeled, 1-nerved, corky winged with long hairs. Lower lemma hyaline, narrowly obovate, ciliated margin 1.5mm × 0.1mm, nerveless, acute apex. Palea absent. Upper lemma membranous, elliptic and two-toothed apex, geniculated awn arises from the sinus 6–8 mm long. Palea hyaline, narrowly ovate. Lodicules 2. Stamens 2, anthers 1.0mm × 0.2mm. Pistil 1.5mm long (Potdar et al. 2012).

Flowering and fruiting: August–October.

Habitat: Open rocky areas of dry deciduous forests.

IUCN Red List status: Data Deficient

Specimens examined: KUABYLK-453, 06 ex., 21.ix.2018, India, Karnataka, Chikkamagalur, near Pura Reserve Forest and parallel to Bhadra Wildlife Sanctuary, Maridibba-Balekoppa Road, 13.719^{0}N, 75.546^{0}E, 706m (3m error), coll. H.U. Abhijit.

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Acknowledgements

The authors are thankful to Prof K.G. Bhat, retired professor, Poorna Prajna College, Udupi, and Karnataka Forest Department for providing permission to enter the forest area. HUA thanks DST, Government of India, for awarding INSPIRE fellowship.

Hanchali Udayashankar Abhijit[1] & Yelugere Linganaik Krishnamurthy[2]

[1&2] Department of Applied Botany, Kuvempu University, Jnanasahyadri, Shankaraghatta, Shivamogga, Karnataka 577451, India. Emails: [1]abhitrogon@gmail.com, [2]murthy_ylk@yahoo.co.in (corresponding author)

Citation: Abhijit, H.U. & Y.L. Krishnamurthy (2019). New distribution record of *Dimeria connivens* Hack. (Poales: Poaceae) and addition to the flora of Karnataka. Plantasia #13, In: *Zoo's Print* 34(6): 20–21.

Exposure to plant identification to foresters at Chamba, Himachal Pradesh

A day of exposure visit was organized for ACF trainees from the Central Academy of State Forest Service (CSFOS) Dehra Dun in Khajjiar-Kalatop Wildlife Sanctuary on 30 May 2019. A team of 36 trainees were led by DFO Mrs. Sarita Kumari, guest faculty at CSFOS Dehra Dun. Vishal Ahuja, working as a researcher with Wildlife Information Liaison Development (WILD) Society on the Himalayan Langur Project was invited as a resource person to provide general information about the local flora and geography of wildlife sanctuaries located in Chamba District. Mr. Raj Kumar and Mr. Himanshu, forest guards from Kalatop guided the group through the 5-km trek from Dinkund to Jot. The trek started with a brief introduction to the history and present status of the Himalayan Langur Project run by WILD in and around the wildlife sanctuary. During the trek the trainees were able to identify 27 plants from 17 genera with Vishal's help. The team started at 11:30 morning from Lakkarmandi and reached Khajjiar at 4 in the evening. The one day

Plants recorded during one day exposure visit

	Species	Family	Habit
1	*Viburnum grandiflorum*	Adoxaceae	Shrub
2	*Chrysanthemum leucanthemum*	Asteraceae	Herb
3	*Taraxacum officinale*	Asteraceae	Herb
4	*Euphorbia wallichii*	Euphorbiaceae	Herb
5	*Euphorbia wallichii*	Euphorbiaceae	Herb
6	*Trifolium repens*	Fabaceae	Herb
7	*Trifolium dubium*	Fabaceae	Herb
8	*Indigofera heterantha*	Fabaceae	Herb
9	*Indigofera heterantha*	Fabaceae	Herb
10	*Quercus semicarpifolia*	Fagaceae	Tree
11	*Gentiana argentia*	Gentianaceae	Herb
12	*Podophyllum hexandrum*	Berberidaceae	Herb
13	*Berberis lyceum*	Berberidaceae	Shrub
14	*Podophyllum hexandrum*	Berberidaceae	Herb
15	*Berberis lyceum*	Berberidaceae	Shrub
16	*Thlaspi Montana*	Brassicaceae	Herb
17	*Micromeria biflora*	Lamiaceae	Herb
18	*Oxalis corniculata*	Oxalidaceae	Herb
19	*Abies pindrow*	Pinaceae	Tree
20	*Picea smithiana*	Pinaceae	Tree
21	*Rumex nepalensis*	Polygonaceae	Herb
22	*primula denticulata*	Primulaceae	Herb
23	*Aquilegia pubiflora*	Ranunculaceae	Herb
24	*Fragaria nubicola*	Rosaceae	Herb
25	*Sorbaria tomentosa*	Rosaceae	Shrub
26	*Valeriana jatamansi*	Valerianaceae	Herb
27	*Viola indica*	Violaceae	Herb

exposure visit was ended after the guest lecture from DFO Chamba, Mr. Nishant Mandhotra (IFS).

Submitted by Vishal Ahuja, Researcher, WILD.
Email: vishal@zooreach.org

World Sparrow and Butterfly Week Celebrated at University of Lucknow

Institute for Wildlife Sciences, University of Lucknow in collaboration with UP State Biodiversity Board (UPSBB), CEE Lucknow, TSA, India, Butterfly Research Center, Bhimtal and Uttar Pradesh Forests Department celebrated Butterfly and Sparrow week from 14th March (Butterfly Day) to 20th March (World Sparrow Day). There was a one-day workshop on butterflies and sparrows on 14 March 2019 in which Prof. Amita Kanaujia delivered lectures to the school students.

Prof Amita Kanaujia delivered a Lecture on Sparrow and Butterfly.

On the occasion, awareness campaigns were conducted from 15 to 19 March 2019 in Ashiyana, Alambagh, Aishbagh, Bijli Pasi quila, Aashiyana, Gomti Nagar Chowk, Jankipuram areas of Lucknow under the supervision of Amita Kanaujia with student volunteers of Biodiversity and Wildlife Conservation Laboratory. A teams of 30 volunteers went in different directions of the city and rural areas to create awareness about the celebrations. Approximately 10,000 were reached while the students of various schools, colleges as well as common people were appealed to count the sparrow sightings on the 15 March 2019.

School students made aware during the campaign.

On 16 March 2019, poster, poem, collage, rangoli, tattoo, photography, essay, slogan, and power point presentation competitions were organized at Riverside

Academy School, Gomti Nagar, in which more than 100 students participated. The winners were given certificates and medals.

To create awareness among the visitors, sparrow nest boxes, feed and sparrow host plants were displayed in the distribution stall at University Gate No. 4. At the Lucknow Zoo awareness material were distributed and nest boxes, and bird feed were displayed. A photography exhibition by Rajeev Rawat was also organized at Lucknow Zoo. On 20 March, on the sparrow count day about 70 respondents from all around the city submitted their sparrow count to the institute.

Submitted by Amita Kanaujia and Adesh Kumar University of Lucknow, Lucknow, Uttar Pradesh. Email: kanaujia.amita@gmail.com

Announcement

INTERNATIONAL ELEPHANT FOUNDATION.ORG

ADVENTU WITH ELEPH

16th International Elephant Conservation & Research Symposium, October 21-25, 2019

Presented by: International Elephant Foundation
Hosted by: Adventures with Elephants

Venue: Zebula Golf Estate and Spa, Limpopo, South Africa

CALL FOR PAPERS

We invite elephant conservationists and researchers from around the world to present conservation projects and research outcomes, new technologies in field conservation and conflict mitigation, studies in disease, reproduction and behavior, and other issues that impact the long-term survival of African and Asian elephants.

Abstracts (no more than 500 words)

But there are a few speaker spots still open in the category of field conservation, human-elephant conflict and mitigation, and anti-poaching strategies. Please submit abstracts for potential presentations as soon as possible."

Registration on or before Aug 1, 2019 (Registration will be limited to 150).

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For any questions, contact: Deborah Olson <dolson@elephantconservation.org> or Sarah Conley <sconley@elephantconservation.org>

https://elephantconservation.org/16th-international-elephant-conservation-and-research-symposium/

International Biodiversity Day Celebration at TATA Zoo, Jamshedpur

To promote the conservation and sustainable use of biodiversity, Tata Steel Zoological Park in association with Artist forum of Jamshedpur, celebrated the International Biodiversity day from 22 to 25 May, 2019, by organizing 'Art in Nature' workshop cum exhibition.

This year's theme "Our Biodiversity, Our Food, Our Health" aims to leverage knowledge and spread awareness of the interdependency of our food systems, nutrition, and health on biodiversity and healthy ecosystems. The multitude of resources and processes directly and indirectly supplied by the ecosystem (known as ecosystem services) are all contributed to human well-being. Thus, ecosystem services are the transformation of a set of natural assets (soil, plants and animals, air and water) into things that we value.

Mrs. Purbi Ghosh, Social worker inaugurated the workshop on 22 May, 2019. Dr. Mrs. Seema Rani shared the importance of biodiversity with the artists which set in motion the three day extravaganza of art from 09:00AM to 05:00PM daily that witnessed the participation of more than 40 artists; both professional & amateur, from Jamshedpur, Ranchi, Kolkata, the Jamshedpur School of Art and the Tagore Academy.

Inauguration of Art in Nature workshop by Mrs. Purbi Ghosh, Social Worker.

During the workshop, artists were able to capture the message which was the interdependency of human well-being and natural biodiversity and made the general public awestruck with their exemplary display of skill and mettle on the canvas. Thereafter, the art and the creations were exhibited on the 25th May and was formally inaugurated by Mr. Amit Kumar Chakrabarti, visual artist and Ms. Radhika Singh, Hon' Secretary, TSZS. The end of the programme saw the felicitation of participating artists by the Zoo Director, Mr. Bipul Chakrabarty.

The programme could be considered as success and made a ripple effect in the Art landscape and also made a deep impact in the general public of the city of Jamshedpur.

Submitted by Seema Rani, Biologist cum Education Officer Email: cmarani00@rediffmail.com

World Environment Day celebration at Sundarvan, Ahmedabad

Nature Trail walk for Ahmedabad Mirror Event.

World Environment Day is celebrated since 1974; 'Beat Air Pollution', was the theme for this year. Sundarvan celebrated the day with multiple events based on wildlife education and beat air pollution.

One of the most important entertaining and enthusiastic media partners "Ahmedabad Mirror" celebrated World Environment Day with great enthusiasm and oaths to spread the word among the city to save and conserve the environment with Sundarvan on 30 May, 2019. They involved many other local citizens and children in this event.

There were three major aspects to the event, first was 'nature based treasure hunt ' where children learnt about trees, water conservation and birds. Second session was a Nature trail walk which conducted after the adventure activities to sensitize participants about the wildlife of Sundarvan enclosure. The third and most interesting session was 'Bat Awareness program'. In which participants learnt different things on Bats like- Diversity, Myths, Communication Medium and interesting facts and figures.

In this increasing Global warming and Degradation of trees scenario growing more and more plant is an important aspect, understanding this need and creating a healthy awareness, DACC - Decathlon Ahmedabad Cycling Community, Decathlon Sports India and Sundarvan, Ahmedabad did a "Cycling and plantation drive" on 2

Echolocation Game for Bat Awareness program for Ahmedabad Mirror Event.

awareness program in which introduction on snakes, diversity in India, venomous & non-venomous, caution to avoid snake bite, snakebite and treatment, importance of snakes, threats and conservation measures and myths and facts were delivered to the audience.

June, 2019, where participants cycled a distance of about 10kms and planted around 30 saplings at Sundarvan campus. Later they were briefed about Sundarvan and its activities, also they were informed about importance and reason to celebrate World Environment Day (WED) and also they were introduced to its theme for the year "Beat Air- pollution".

The participants took a pledge which aimed to collectively work towards conserving environmental resources and keep the earth clean and green. The session got ended with Nature Trail walk where participants got a chance to learn interesting facts and figures about Sundarvan's wildlife.

Sundarvan celebrated the World Environment Day (WED) on 5 June to sensitize citizens about current environmental issues as well as the theme "Beat Air Pollution".

Around 150 participants have joined the celebration. We conducted snake

After that Nature Trail walk was conducted in which interesting facts and figures as well as myths associated with the enclosure animals were delivered and got cleared out.

Bat awareness program was also conducted in which facts and figures on bats were delivered and also myths associated with bats got cleared out. The session was followed by a wildlife documentary screening to sensitize the citizens about wildlife.

Submitted by Deep Shah, Education Officer; Naim Akhtar, Park Manager, Sundarvan. Email: deep.shah@ceeindia.org

World Sparrow Day at Lalitpur, Uttar Pradesh

Skit on Sparrows by students.

Like every year, Manav organization celebrated World Sparrow Day on 20th March 2019 in Lalitpur, Uttar Pradesh. The event was celebrated jointly by Manav Organisation, Indian Biodiversity Conservation Society, Gau Putra Sena and Nehru P.G.College in Lalitpur.

Various competitions such as drawing and poem writing were organized at district level for the students of teen age groups. On 20 March, painting exhibition was arranged for the public in order to create awareness. The event was inaugurated by Manvendra Singh (District Magistrate) and Ms. Gajal Bhardwaj (SDM). Team Members Swatantra Vyas, Sachin Jain, Rajesh Pathak, Rishi Hiranandani, Prashant Shukla and Abhishek Namdev interacted with the public and disseminated House Sparrow conservation messages. The students of Nehru Mahavidhyal, Kolkata Academy, Sidhi Sagar Academy, Pahlwan Gurudeen and St. Donomic school actively participated in the event. They not only participated in the drawing competition, but also prepared various models related to House sparrow and their nests. The students presented skit on house sparrows which demonstrated how to save sparrows by three simple acts- providing spaces for nesting, planting native shrubs and trees, lastly by providing water.

All the participants were felicitated by appreciation certificate.

The public showed great enthusiasm to be part of the program and they were provided with artificial wooden nest boxes, earthen nest boxes and earthen pots to keep water for birds. Manav organization has been actively taking the initiatives for conservation of House sparrows in Lalitpur in the past 3 years. The public has been sensitised to save this little bird and the nest boxes have been successful in improving their breeding success. The people regularly report about the house sparrows adapting to the artificial nest boxes. All the initiatives undertaken by Manav Organization have been taken to the mass public with the kind co-operation and interest of Press media.

Chief Guests appreciating the efforts of students.

Wooden Nest boxes distributed free of cost to the public.

Submitted by Pushpendra Singh Chauhan, Rajeev Niranjan, Akhilesh Kumar and Sonika Kushwaha. Email: ibcsforall@gmail.com

International Conference
on
ADVANCEMENTS IN VETERINARY SCIENCES FOR WILDLIFE CONSERVATION
&
13th Annual Meeting of Association of Indian Zoo and Wildlife Veterinarians

November 13-15, 2019

Organized by Laboratory for the Conservation of Endangered Species (LaCONES), CSIR-Centre for Cellular and Molecular Biology, Hyderabad, India

Laboratory for the Conservation of Endangered Species (LaCONES), CSIR- Centre for Cellular and Molecular Biology (CCMB), Hyderabad extends a cordial invitation to participate in the International Conference on ***"Advancements in Veterinary Sciences for Wildlife Conservation"*** and the 13th Annual Meeting of the Association of Indian Zoo and Wildlife Veterinarians (AIZWV) at Hyderabad on 13th - 15th November, 2019. The objectives of the conference are to highlight new research developments in conservation and management of endangered Indian wildlife with focus on wildlife health, conservation breeding and management, conservation breeding and management, conservation genetics and reproductive technologies. The conference will bring together zoo and wildlife veterinarians, wildlife conservationists, Zoo and wildlife veterinarians, wildlife conservationists zoo managers and biologists working in different parts of the world to deliberate on recent scientific developments in this important area.

LaCONES is a dedicated laboratory of CSIR-CCMB, Hyderabad for wildlife research and conservation in India. LaCONES was established in 2006 with the collective efforts of CSIR-CCMB, Ministry of Science and Technology, Central Zoo Authority, Government -of India, and the then Andhra Pradesh Forest Department. LaCONES is uniquely placed among various National Institutes to have wild animal holding facilities to carry out modern biotechnological research on them within its campus. Over the years, LaCONES, has made significant contributions in wildlife research especially a better understanding in basic biology of highly endangered animals both *in-situ* and *ex-situ*, DNA fingerprinting, DNA-based wildlife forensics, monitoring of genetic health and genetic resource banking. Further, the research at LaCONES has led to successful live births in ungulates and birds by artificial insemination. LaCONES is committed to partnering with other stakeholders who implement conservation breeding of wildlife in the country.

Association of Indian Zoo and Wildlife Veterinarians (AIZWV) was established in 1991 and currently has 250 accredited life members across the country representing zoo and wildlife veterinarians, academicians, scientists and research scholars. The association strives to bring together professionals working in various facets of wildlife biodiversity conservation, management and healthcare, and provides a common platform to exchange technical observations and scientific findings. AIZWV organizes workshops, conferences and symposia to keep members updated with latest advances in wildlife research and management.

THEMES OF THE CONFERENCE

This conference summit serves as a platform to gather a number of scientists and experts in various branches of wildlife conservation biology. Zoo and wildlife veterinarians, young scientists and students can utilize this opportunity to interact with eminent scientists in this field.

IMPORTANT DATE TO REMEMBER

Early bird registration last date: August 30, 2019
Abstract submission last date: September 30, 2019
Acceptance of abstract: October 15, 2019

For more details: http://e-portal.ccmb.res.in/ADVETCON2019/

CONTACT INFORMATION

Dr. Sadanand D. Sontakke, Mobile: +91-7674843969
Dr. B. Sambasiva Rao, Mobile: +91-9885370644
Email: advetcon2019@gmail.com; Fax: +91-40-24006441

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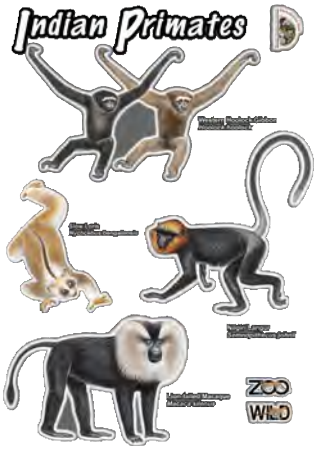
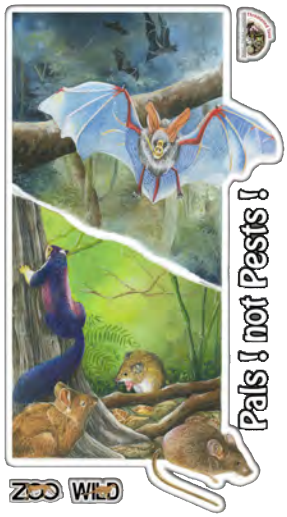


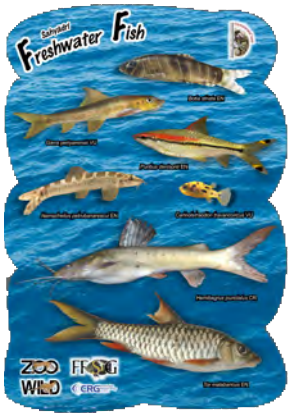
Design 1: Primates

Design 2: Bat & Rat



Design 4: JoTT

Design 5: Spiders



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Communicating science for conservation

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We welcome articles from the conservation community of all SAARC countries, including Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan, Sri Lanka and other tropical countries if relevant to SAARC countries' problems and potential.

Type — Articles of semi-scientific or technical nature. News, notes, announcements of interest to conservation community and personal opinion pieces.

Feature articles — articles of a conjectural nature — opinions, theoretical, subjective.

Case reports: case studies or notes, short factual reports and descriptions.

News and announcements — short items of news or announcements of interest to zoo and wildlife community

Cartoons, puzzles, crossword and stories

Subject matter: Captive breeding, (wild) animal husbandry and management, wildlife management, field notes, conservation biology, population dynamics, population genetics, conservation education and interpretation, wild animal welfare, conservation of flora, natural history and history of zoos. Articles on rare breeds of domestic animals are also considered.

Source: Zoos, breeding facilities, holding facilities, rescue centres, research institutes, wildlife departments, wildlife protected areas, bioparks, conservation centres, botanic gardens, museums, universities, etc. Individuals interested in conservation with information and opinions to share can submit articles ZOOS' PRINT magazine.

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Publication Information

ZOO'S PRINT, ISSN 0973-2543
Published at: Coimbatore
Owner: Zoo Outreach Organisation, 12, Thiruvannamalai Nagar, Saravanampatti - Kalapatti Road, Saravanampatti, Coimbatore, Tamil Nadu 641035, India.

ZOO'S PRINT magazine is informal and newsy as opposed to a scientific publication. ZOO'S PRINT magazine sometimes includes semi-scientific and technical articles which are reviewed only for factual errors, not peer-reviewed.

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Coimbatore, Tamil Nadu 641035, India
Phone: +91 9385339862 & 9385339863
E-mail: zooreach@zooreach.org
Website: www.zoosprint.zooreach.org,
www.zooreach.org

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