

ZOO'S PRINT



Communicating Science for Conservation

Vol. XXXIV, No. 5, May 2019
ISSN 0971-6378 (Print); 0973-2543 (Online)



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

ZOO'S PRINT

Communicating science for conservation

Vol. XXXIV, No. 5, May 2019

ISSN 0971-6378 (Print); 0973-2543 (Online)

Contents

Fantastic Facts

Amazing Spider Facts, Part-I,
-- Latha G Ravikumar, Pp. 1-4

Jottings

These plants are thriving in extreme cliff conditions – here's how
-- Vidya Mary George, Pp. 5-6

Instagram

Instagram images, P. 7

Highlight

Review of dinosaur egg fossils from Gujarat State, India
-- Raju V. Vyas, Pp. 8-17

Bird-o-soar

Protective tactics of the Red-wattled Lapwing
-- B. Ravichandran, Pp. 18-19

REPTILE RAP

Distribution record of *Python bivittatus* in Amangarh Tiger Reserve, Uttar Pradesh, India
-- Prajakta Hushangabadkar, Meraj Anwar & Shariq Shafi, Pp. 20-22

Bugs R All

Red Helen of the evergreen forests found for the first time in western West Bengal
-- Kalyan Mukherjee, Pp. 23-24

Record of the aquatic leech *Poecelobdella manilensis* from Porur Lake, Chennai
-- Muthukaruppan Gobi & Richard Thilagaraj, Pp. 25-26

Mammal Tales

Colour abnormality of *Macaca radiata* at Grizzled Giant Squirrel Wildlife Sanctuary, Tamil Nadu, India
-- R. Deepan, B. Vickram & A. Samson, Pp. 27-28

Field Report

Tata Steel Zoological Park, Jamshedpur, Jharkhand - Residential Nature Camp on Awareness on Biodiversity & Wildlife Conservation and Earth Day 2019 celebrations
-- Seem Rani, Pp. 29-31

Workshop on Climate Change and Wildlife at Institute of Forestry, Pokhara, Nepal
-- Prabhat Kiran Bhattarai, Pp. 32-34

Workshop on House Sparrow: Concern and Conservation in District Institute of Education and Training (DIET)-Lalitpur, Uttar Pradesh
-- Akhilesh Kumar, Sonika Kushwaha & Pushpendra Singh Chauhan, Pp. 35-36

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

Amazing SPIDER Facts

Arachnids are found wherever from blasting deserts to solidifying climes, displaying outrageous strength, adaptability and has unique survival mechanisms. Broadly, spiders are divided into two categories: **Mygalomorphs or big spiders and Arnaeomorphs or small spiders**. There are two main types of spiders, **hunting spiders** that don't build webs and **web weaving spiders**. Depending on how they feed, their bodies and their eyes are different shapes and sizes.

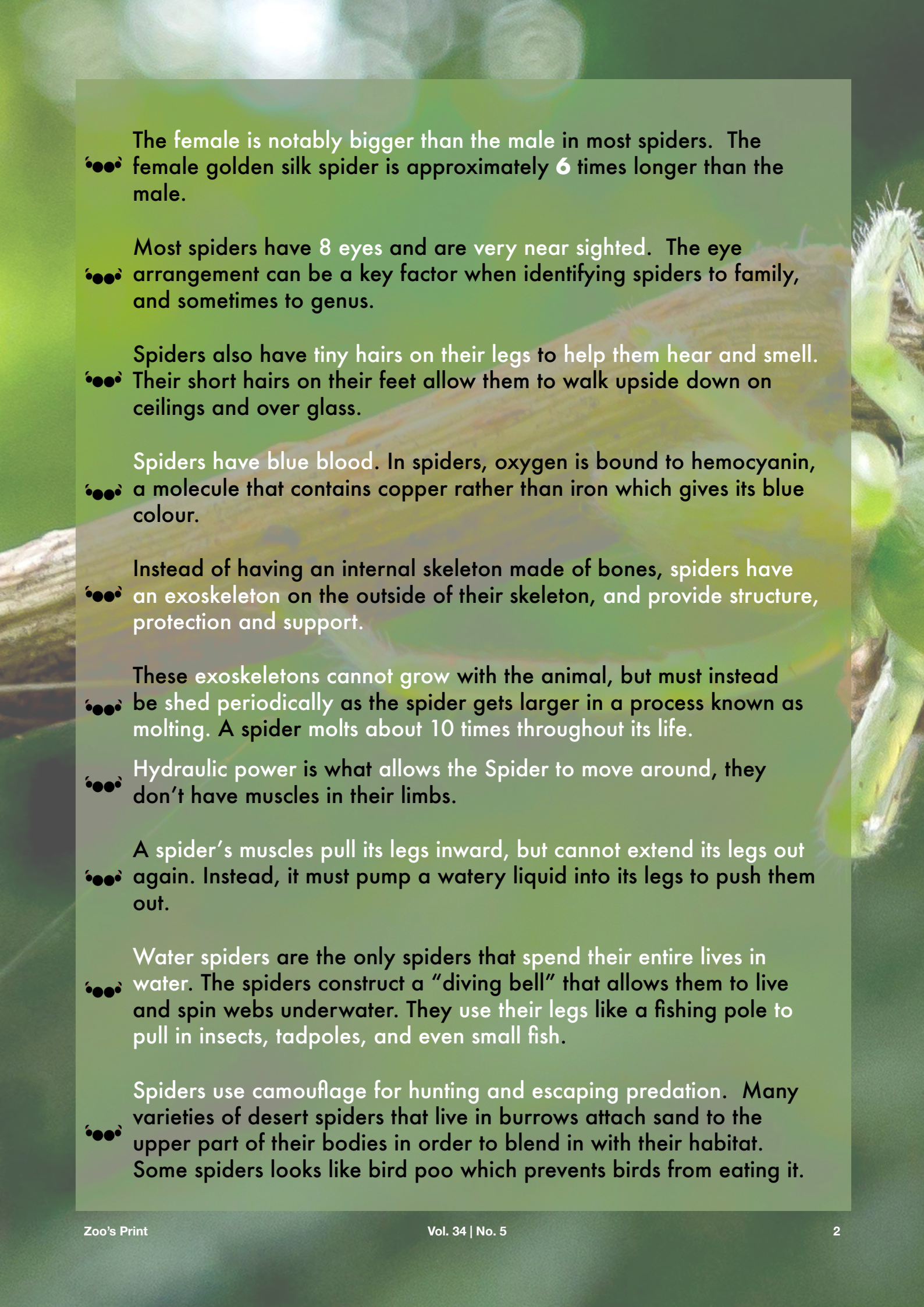
There are about **48,000** different species of spiders and there are probably many more to be discovered. India is home to about **1685** spiders from **438** genus and many yet to be discovered.

Spiders are not insects. Spiders are known as arachnids because they only have two body segments instead of three. Other arachnids are scorpions, mites, and ticks. Spiders have **8 legs** while insects have 6. They don't have antennae.

Spiders usually found in plants, shrubs, grasses, flowering plants, leaf litter and sometimes under stones. Most spiders live on land, but a few, like the raft spiders, live in and on water. These spiders can "run" across the water's surface.

Compiled and
designed by Latha
G. Ravikumar, ZOO

Photo ©Sanjay Molur



‘●●●’ The female is notably bigger than the male in most spiders. The female golden silk spider is approximately **6** times longer than the male.

‘●●●’ Most spiders have **8 eyes** and are very near sighted. The eye arrangement can be a key factor when identifying spiders to family, and sometimes to genus.

‘●●●’ Spiders also have **tiny hairs on their legs** to help them hear and smell. Their short hairs on their feet allow them to walk upside down on ceilings and over glass.

‘●●●’ Spiders have **blue blood**. In spiders, oxygen is bound to hemocyanin, a molecule that contains copper rather than iron which gives its blue colour.

‘●●●’ Instead of having an internal skeleton made of bones, spiders have an exoskeleton on the outside of their skeleton, and provide structure, protection and support.

‘●●●’ These exoskeletons cannot grow with the animal, but must instead be shed periodically as the spider gets larger in a process known as molting. A spider molts about 10 times throughout its life.

‘●●●’ Hydraulic power is what allows the Spider to move around, they don't have muscles in their limbs.

‘●●●’ A spider's muscles pull its legs inward, but cannot extend its legs out again. Instead, it must pump a watery liquid into its legs to push them out.

‘●●●’ Water spiders are the only spiders that spend their entire lives in water. The spiders construct a "diving bell" that allows them to live and spin webs underwater. They use their legs like a fishing pole to pull in insects, tadpoles, and even small fish.

‘●●●’ Spiders use camouflage for hunting and escaping predation. Many varieties of desert spiders that live in burrows attach sand to the upper part of their bodies in order to blend in with their habitat. Some spiders looks like bird poo which prevents birds from eating it.



‘●●●’ The average life of a spider is one to 2 years. Although the female tarantula may live up to 20 years!

‘●●●’ Mother spiders can lay as many as 3,000 eggs at one time. Baby spiders are called spiderlings. While most mother spiders do not stay with their babies, the wolf spiders carry their babies on their backs.

‘●●●’ Jumping Spiders are able to jump up to 50 times their own length. This is possible due to increasing the amount of blood pressure found in the back limbs.

‘●●●’ Spider silk covering the egg sacs of spider reflects UV rays that protects the tiny delicate eggs.

‘●●●’ An abnormal fear of spiders is called ‘arachnophobia’.

What do Spiders eat?

‘●●●’ Spiders are voracious eaters. They are capable of preying on insects many times their size. In addition to eating insects (ants, flies, mosquitoes, and bees, some spiders) will also eat very small animals like birds, frogs, lizards, and centipedes. Some male spiders give dead flies to the females as presents.

‘●●●’ In many spider species, females eat the males. This spider cannibalism is known as araneophagy.

‘●●●’ The hair on a spider’s first pair of legs are sensitive to taste. The spider “tastes” its prey by touching it.

‘●●●’ Web weaving spiders are agile and patient. They wait for their food by hanging on the webs they build, and they don’t rely on eyesight to find their prey. Hunting spiders have good eyesight, strong muscular legs and they have modified and padded feet that allow them to climb walls, run quickly, and jump on prey.

Spiders do not have teeth, so they cannot chew their food, instead they have fangs which inject venom. Their venom contains many chemicals that helps to immobilise insects by attacking their nervous systems and break down the tissue so they can ingest a liquefied meal.

Spiders do not eat plants as they are not able to digest the cellulose. A species of jumping spider, Bagheera kiplingi, seems to be the world's only known plant-eating spider.

Spider Silk (a fibre secreted by spiders)

All spiders spin silk, but not all spiders spin webs. They have between two and six spinnerets at the back of their abdomen. Each one is like a tiny showerhead that has hundreds of holes, all producing liquid silk. Spiders are the only group of animals to build webs.

Spider silk is lighter than cotton but 4 times stronger than steel. Thinner than a human hair, but handles loads 100s of time its size. Additionally, a spider's body has a special oily substance that keeps it from getting stuck in its web.

Spiders spin webs to catch other bugs to eat. On average, it takes about 60 minutes to spin a web. Some spiders eat their webs and some use their web to resting ground to revisit.

Spider silk has a unique combination of both strength and elasticity. A vast group of scientists found a method to mimic spider silk into artificial or synthetic spider silk to make fiber.

When the spider releases their silk, it becomes solid and forms a thread. Web-weaving spiders have 2 or 3 claws at the tip of each leg that they use to swing from strand to strand without getting stuck in the sticky part of their web actively hunt their prey and pounce.

Grass spiders build a web on top of the grass. Their webs form a funnel shape, which is not sticky.

While most spiders build a new web every day, the web of the gold orb can last several years and can even catch birds.

These plants are thriving in extreme cliff conditions – here's how

By Vidya Mary George. Published in Jottings on 06 April 2019



It's steep, it's dry, and there's little nutrients, yet a great number of endemic and threatened plants call the cliff habitats of the northern Western Ghats in India their home.

Hostile habitats

India's northern Western Ghats, probably the largest rocky surface area on Earth, is also one of the most unforgiving habitats on the planet. With steep vertical surfaces, an eight-month-long dry season, and scarcity of nutrients, life on the cliffs of the northern Western Ghats is extremely hard even for the hardiest species. Among other factors, the extreme environments and inaccessible terrain have severely restricted our knowledge of the species in the area—to the extent that there are almost no studies available concerning its floristic richness, which in turn hampers conservation efforts.

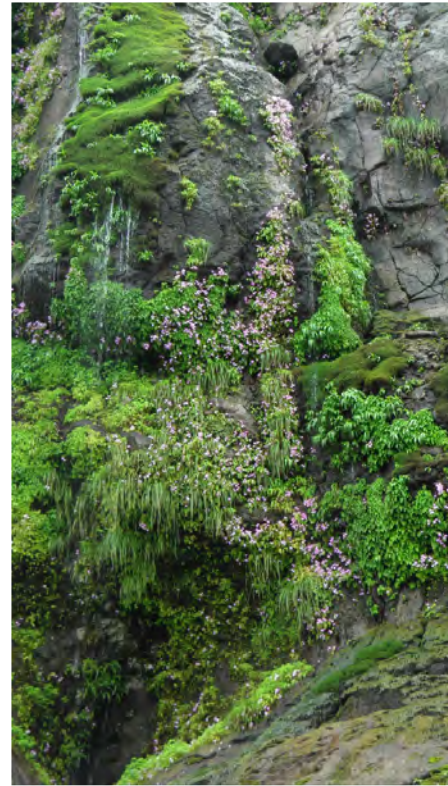
The wild game of survival

To understand how plants have adapted to the harsh cliff environments, two scientists from Maharashtra dared the elements to survey various microhabitats of the northern Western Ghats between 2008 and 2016. Their field studies revealed a whopping 102 species of plants in the area, of which 55 were endemic and 27 grew exclusively on cliffs. Curiously, the unique characteristics of the ecosystem were reflected in the diversity and life strategies of its species, which were particularly tailored to cope with the seasonal dryness and nutrient scarcity experienced in their habitat.

The classic adaptation shown by most cliff species to seasonal climate was an ability to limit their growing and reproductive phases to the monsoon season. This feature, known as geophytism, enabled the species to remain underground as tubers, bulbs, or rhizomes until the next monsoon.

To survive periodic water stress, some species opted to lose water from their tissues to become dry and shrivelled at the beginning of a dry spell, only to 'resurrect' and resume normal growth at the availability of the smallest amount of water. This unique and highly specialized adaptation known as poikilohydry helped these plants to not only tolerate the dry period but also become the dominant colonizers of their habitat.

Other cliff-dwelling species figured out how to survive by adopting features such as growing specialized organs in the form of dry cottony balls next to the soil surface at the base of the stem, succulence, and even carnivory.



The human havoc

Although the landscape may be harsh and the weather may be extreme, these are not the only threats to the cliff species. Though the cliffs themselves are less intensively used by humans, the hill slopes are used for grazing livestock. Another major threat comes in the form of manmade fires, lit for developing scrub grasslands or for cultivation—but which often escape to burn down surrounding habitats and the accumulated humus on which the cliff species depend heavily. Landslides and habitat loss due to the expansion of roads and railway tracks are making it even tougher for the established cliff vegetation to hold on in the hostile habitat they call home.

- » More research is needed on floristic, ecological, and ecosystem processes and services to take the necessary steps for conservation.
- » More studied need to be conducted to understand if adaptations related to wind velocity, radiation, or any other factors are also present in the cliff habitats.

Reference

Datar, M.N. & A.V. Watve (2018). Vascular plant assemblage of cliffs in northern Western Ghats, India. *Journal of Threatened Taxa* 10(2): 11271–11284. <https://doi.org/10.11609/jott.3611.10.2.11271-11284>

This post was originally published in *Jottings* at <https://threatenedtaxa.org/jottings/conservation/these-plants-are-thriving-in-extreme-cliff-conditions-heres-how/>.

INSTAGRAM IMAGES



Bronze Grass Skinks commonly hang out in leaf-litter, warming up their solar-powered bodies, catching a meal of choicest insects, and scurrying up holes or crevices—or even dramatically dropping their tails—at the sight of a predator. Come breeding season, the adult males show off their bronzed slender bodies, the vivid bands on their sides, and a stunning orange-red throat patch in the bargain. Shot at Coimbatore by B. Ravichandran, ZOO; posted on 23 Apr 2019.



The Pied Crested Cuckoo is a slender, long-tailed bird adorned in handsome black-and-white robes, a distinctive crest, and a white-on-black wing patch that makes it unmistakable even in flight. In many parts of India, the cuckoo is considered a harbinger of the monsoon showers, which it waits for to quench its thirst. Shot at Coimbatore by B. Ravichandran, ZOO; posted on 15 Apr 2019.



Argiope spiders are silk spinners of the undergrowth acclaimed for embellishing their circular webs with their statement pieces—white silken banners in stunning zigzag patterns called stabilimentum, the function of which continues to baffle the scientific world. Shot at Coimbatore by B. Ravichandran, ZOO; posted on 08 Apr 2018.



With large white or pink flowers that open wide at night, and hairy stems and underside of leaves that give it its name, the Hairy Water Lily *Nymphaea pubescens* floats perennially in shallow tropical freshwater wetlands. Shot at Kozhikode by S. Molur, ZOO; posted on 15 Nov 2018.

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.

Review of dinosaur egg fossils from Gujarat State, India



A real life size model of Sauropod Dinosaurs *Rajasorus narmadensis* at the Fossils Park, Indroda, GEER Foundation, Gandhinagar, Gujarat. This dinosaur's fossils were excavated at Narmada River Valley area. (Photo: Raju Vyas)

Abstract:

Literature surveys show nine oospecies, excluding three (uncertain) identified dinosaur eggs, recorded from various localities across India. Global research on the subject indicates the presence of some of these or similar oospecies in Europe (France), South America (Argentina), and Africa (Morocco). Such affinities and similarities in egg taxa suggest close phylogenetic relationships as well as the probable existence of a terrestrial connection for dinosaur fauna between erstwhile landmasses of present-day India, Europe (France), South America

(Argentina), and Africa (Morocco) during the Late Cretaceous in between Gondwanaland and India.

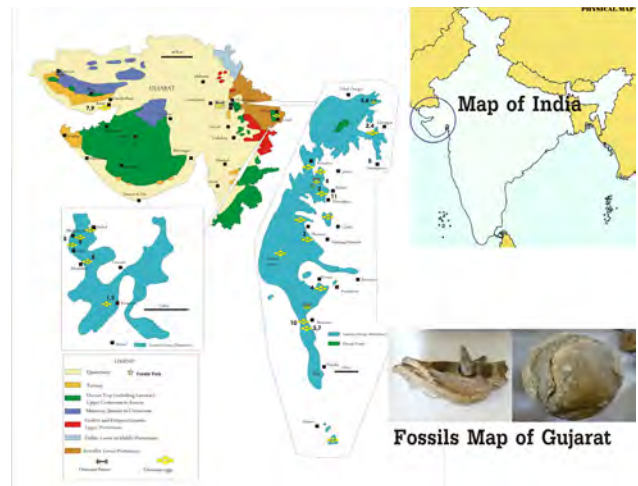
Dinosaurs and their egg fossils

A reptilian egg is one of the most significant evidence of evolutionary history tracing the origins of life. Reptiles were the first tetrapod vertebrates that vacated the waters to begin terrestrial life on earth, thus evolving advanced reproductive mechanisms through the process of laying calcareous eggs. The study of fossilized reptilian eggs, especially those of dinosaurs, is most essential

Highlight

and warranted for scientists to know the evolutionary histories of life in terms of the rise and fall of the dinosaurian era on Earth. By studying dinosaur eggs, we can infer upon not only the reproductive system and behaviour of dinosaurs but also the palaeo-environment, palaeo-climate, and palaeo-ecology in which they once lived. Moreover, dinosaur eggs are useful for stratigraphic division and correlation as well as paleo-biogeographic interpretations.

Dinosaurs and other dinosaur-remnant animals evolved on our planet about 200 million years ago, during the early Permian period and later diversified/ flourished during the Jurassic period of the Mesozoic era. There were a number of theories about their mass extinction, with the most popular theories explaining an extra-terrestrial impact, such as an asteroid or comet, or a massive bout of volcanism. Either scenario would have choked the skies with debris that starved the Earth of the sun's energy, throwing a wrench in photosynthesis and sending destruction up and down the food chain. Once the dust settled, the greenhouse gases locked in the atmosphere would have caused the temperature to soar, a swift climate swing that toppled much of the life that survived the prolonged darkness. Most of the dinosaur fossils, however, occur with sediment rocks. These sediments are Triassic, Jurassic, and Cretaceous sediments indicating that at least these systems must be post-flood (Garner 1996).



Gujarat State with various excavation sites of dinosaur fossils and egg fossils. Numbers from 1 to 12 correspond with Table 1 showing locations of each oospecies (map revised and compiled after Mariela et al. 2014)

Extinction of dinosaurs

Across the globe, the last batch of dinosaurs could not survive the climatic catastrophic event known as the Cretaceous-Tertiary boundary (KTB) mass extinction event, which is dated to have occurred 65 million years ago. In the Indian context, this age has a special implication as it not only corresponds with one of the peak activities of the Deccan volcanic eruptions but is also coincidental with the Chicxulub Impact crater in the Central Americas (Adatte et al. 2014). Both these events, though did not occur simultaneously, must have added to the deterioration of climatic and environmental factors leading to the destruction of nearly 65–70 % of all life on Earth.

Fossils of dinosaur eggs

Eggs are the reproductive byproducts of an environmental adaptation within a distinct phase of vertebrate evolutionary history. The evolutionary trend, i.e., concluding mode, was obtained from the lowest grade to the highest. There were six basic types of amniote vertebrate eggshells, namely Geckoid, Crocodyloid, Testudoid, Dinosauroid-spherulithic, Dinosauroid-prismatic, and Ornithoid. Among these, the last three types are considered dinosaur eggs (Hirsch 1994). On the basis of para-taxonomy of eggshell structure, the work done at present helps to divulge and place the observed dinosaur eggs in their proper systematic position and to correlate evolutionary history. The mould of dinosaur eggs possesses sediments, which helps to



The highest number of dinosaur egg fossils were found from a scrubland of Rahioli Village, Mahi Sagar District, Gujarat, India. This site is now called Fossil Park and is one of the best sites for the study of dinosaur fossils (Photo: Raju Vyas).

know the Cretaceous mode and trends of climatic fluctuations. Applying microscopy, new research has been done in recent years on the fossil dinosaur eggs. The results come out with the discovery of extreme diversity in microscopic structures of eggshells. If a comparison of the cross-sectional study is being done to establish the taxonomic position, potentially consistent evolutionary direction and ancestral relationship could be erected. Chinese palaeontologist Zhao (1975, 1979) made a para-taxonomic classification for classifying dinosaur eggs and the material of eggshells. He classified them into seven distinct families. The para-taxonomic classification was combined with the structural classification of fossil eggs and their shells. Taxonomically valuable features of the eggshell, ultra-structure, and histo-structure are its base. Three hierarchical categories—oofamily, oogenus, and oospecies—were taken into account in classifying fossil egg parataxa. The usual morphological features like sculpture, shape, size, and colour of the egg and ranges of shell thickness and its detailed micro-structures can be used as keys of central importance for preliminary specimen identification (Mikhailov 1987, 1991; Mikhailov et al. 1996).

Dinosaur fossils in Gujarat

Classification of the Indian dinosaur eggs and eggshell material was established in an entirely new manner by Khosla & Sahni (1995) and Mohabey (1998). They proposed a new para-taxonomic scheme for the classification

of dinosaur eggs and eggshell material. This para-taxonomic scheme is on the basis of the description of the new oospecies and is in contrast with their previous acquainted forms. Several oospecies were reported from India and were consigned to the oofamily Megaloolithidae of Sauropod (lizard-hipped) and Theropod (beast-footed) group to the oofamily Subtiliolithidae of avian group. Palaeontology study demonstrates that five dinosaur fossils occur (*Titanosaurus indicus* Lydekker, 1877; *T. rahioliensis* Mathur & Srivastava, 1987; *Rajasorus narmadensis* Wilson et al., 2003; *Rahiolisaurus gujaratensis* Novas et al., 2010; and *Indosuchus* sp. Huene & Matley, 1933, along with dinosaurs eating the snake *Sanajeh indicus* Wilson et al., 2010) where from most oospecies fossils are excavated in the state. It is, however, most difficult to further demonstrate oospecies and its prenatal connection (their parent producers) or the origins from any specific species of dinosaurs.

Diversity of oospecies

High and rich diversified fossil eggs of various species of dinosaurs were found at different locations of Gujarat, including Kutch, Kheda, Mahi Sagar, Panchmahal, and Dohad districts. All these locations are formations from Jurassic and Upper Cretaceous periods of Lameta group (limestone) and inter-trappean beds, broadly during the Mesozoic era. The literature surveys indicate nine eggshell oospecies, excluding two indeterminable forms, Problematica? *Megaloolithus* (Waniawao,



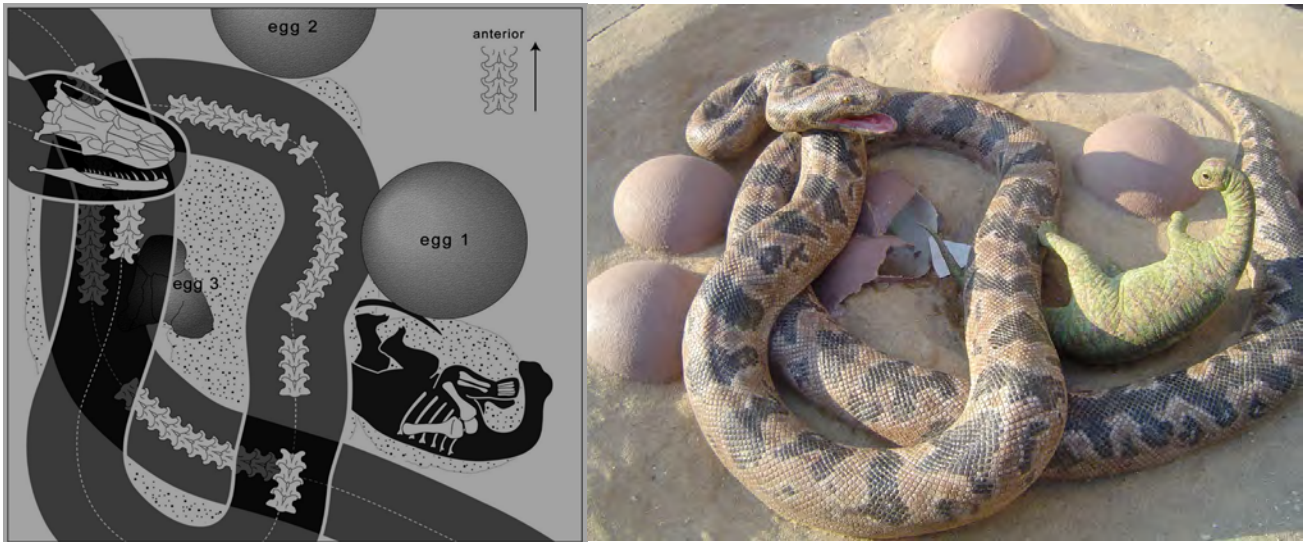
Egg fossils of the Sauropod dinosaur *Megaloolithus dhoridungriensis* along with its baby hatchling and fossils of few vertebrae of the snake *Sanajeh indicus*, which probably predated on dinosaur babies. 'Scale bar = 5cm' (Image: Wilson et al. 2010).

Dohad District) and *Trachoolithus* sp. (Lavariya Muwada, Dohad District), and an Incertae sedis (Dolidungri, Mahi Sagar District) recognized from Gujarat (Table 1).

Records of Oospecies from Gujarat

1. ***Megaloolithus jabalpurensis***: (Synonym: *Megaloolithus matleyi* Mohabey, 1996; type locality: Pavna, Chandrapur District, Maharashtra). The species was described on the basis of 250 fossils of broken eggshells found under Lameta formation sites in Bara Simal Hills, Jabalpur. Similar egg fossils were also found from Dholiya, Bagh Cave, and Padiyal, Dhar District, Madhya Pradesh, along with very similar megascopic characteristics of the spherical-

Highlight



The imaginary graphical representation of predation of a dinosaur hatchling by a snake in the Late Cretaceous period, after fossils of Sauropod dinosaur eggs were found from Dholi Dungari, Mahi Sagar District, Gujarat, India (Image credit: Wilson et al. 2010).

shaped dinosaur eggs having a diameter of 140–160 mm as recorded earlier from Waniawao, Dohad District, Gujarat. The name '*jabalpurensis*' is derived from the name of the closest excavation locality site town, Jabalpur.

2. ***Megaloolithus cylindricus***: (Synonym: *Megaloolithus rahioliensis* Mohabey, 1998; type locality: Rahioli, India). The species was described on the basis of fossils of broken eggshells found under Lameta formation sites of Chui Hill and Pat Baba Mandir, Jabalpur District, and Dholiya, Dhar District, Madhya Pradesh. Similar egg fossils were also found from Khempur Village on the edge of Aravalli Hills in Mahi Sagar District, Gujarat. This fossil site (Khempur) is at a distance of 8km from the present Fossil Park at Rahioli, Gujarat. The name '*cylindricus*'

is derived from the cylindrical shape of the spheroliths.

3. ***Megaloolithus mohabeyi***: (Synonym: *Megaloolithus phensaniensis* Mohabey, 1998; type locality: Phenasani Lake, Gujarat). The species was described on the basis of three eggshell fragments/ fossils of broken eggshells found under a sandy carbonate bed of Late Cretaceous Lameta formation site of Dholiya, Dhar, Madhya Pradesh. Also, similar eggshell fossils were found from Lameta formation of Phensani, near Balasinor, Sonipur, Maha Sagar District and Waniawao, Dohad District. The name '*mohabeyi*' is in honour of Dr. D.M. Mohabey, Nagpur, Geological Survey of India.

4. ***Megaloolithus khempurensis***: The species was described on the basis of a

Table 1. Dinosaur egg fossils (ooespecies) and its records from different locations in Gujarat State, India.

*	Ooespecies & type locality	Fossils location site in Gujarat	Source/ reference
1	<i>Megaloolithus jabalpurensis</i> Khosla & Sahni, 1995 Bara Simla Hill, Jabalpur, Madhya Pradesh	• Waniawao, Dohad	Mohabey & Mathur 1989 Fernandez & Khosla 2014
2	<i>M. cylindricus</i> Khosla & Sahni, 1995 Chui Hill, Jabalpur, Madhya Pradesh	• Dhoridungi (23° 7'55.32"N & 73°23'5.93"E), Mahi Sagar	Mohabey 1998
3	<i>M. mohabeyi</i> Khosla & Sahni, 1995 Dholiya, Dhar, Madhya Pradesh	• Khempur (23° 6'14.92"N & 73°23'12.79"E), Lunawa-da, Mahi Sagar • Raholi (23° 2'52.10"N & 73°20'20.46"E), Mahi Sagar	Khosla & Sahni 1995 Mohabey 1998
4	<i>M. khempurensis</i> Mohabey, 1998 Khempur, Mahi Sagar, Gujarat	• Balasinor (22°57'0.88"N & 73°19'50.92"E), Mahi Sagar • Waniawao, Dohad	Khosla & Sahni 1995
5	<i>M. megadermus</i> Mohabey, 1998 Dholidhanti, Dohad, Gujarat	• Phensani (23°1'31.50"N & 73°19'20.15"E = Felsani), Mahi Sagar • Khempur (23° 6'13.79"N & 73°23'14.12"E) • Werasa (22°59'25.25"N & 73°19'54.30"E), Mahi Sagar	Mohabey 1998 Mohabey 1998
6	<i>M. dhoridungriensis</i> Mohabey, 1998 Dholi Dungri, Mahi Sagar, Gujarat	• Dholidhanti, Dohad • Paori, Dohad • Daulatporia (23° 5'31.92"N & 73°23'33.04"E = Dolatpoyda), Mahi Sagar • Dholidungri (23°7'55.29"N & 73°23'5.93"E), Mahi Sagar	Mohabey 1998 Mohabey 1998 Wilson et al. 2010
7	<i>Fusioolithus baghensis</i> (Khosla & Sahni, 1995) Bagh Caves, Jabalpur, Madhya Pradesh	• --- • Anjar (23° 7'7.57"N & 70° 0'50.36"E), Kutch	Khosla & Sahni 1995 Khosla & Sahni 1995
8	<i>Ellipsoolithus khedaensis</i> Loyal et al., 1998 Lavaria Muwada, Mahi Sagar, Gujarat	• Balasinor (22°57'0.88"N & 73°19'50.92"E), Mahi Sagar • Jetholi (23° 4'18.10"N & 73°21'3.10"E), Mahi Sagar • Dhuvadiya (23° 1'52.40"N & 73°20'58.35"E), Mahi Sagar	Mohabey 1998
9	<i>Subtilioolithus kachchhensis</i> Khosla & Sahni, 1995 Viri Village, Anjar, Kutch, Gujarat	• Kevadiya (23° 4'11.74"N & 73°19'7.04"E), Mahi Sagar • Raholi (23° 2'52.10"N & 73°20'20.46"E), Mahi Sagar • Anjar (23° 7'7.57"N & 70° 0'50.36"E), Kutch	Mohabey 1998 Loyal et al. 1998 Khosla & Sahni 1995
10	? <i>Megaloolithidae problematica</i>	• Balasinor (22°57'0.88"N & 73°19'50.92"E), Mahi Sagar • Phensani (23° 1'31.50"N & 73°19'20.15"E), Mahi Sagar • Sonipur (22°50'38.77"N & 73°21'31.57"E), Mahi Sagar	Mohabey 1998
11	<i>cf. Trachoolithus</i>	• Raholi (23° 2'52.10"N & 73°20'20.46"E), Mahi Sagar	Mohabey 1998
12	Incertain sedis (of uncertain placement)	• Dhoridungi (23° 7'55.29"N & 73°23'5.93"E), Mahi Sagar	Mohabey 1998

* Numbers correspond with map

Highlight



Dinosaur egg fossils of *Megaloolithus balasinorensis* (now synonymous with *Fusioolithus baghensis*) found from the quarry of Balasinor, Mahi Sagar District, Gujarat, India (Photo: Raju Vyas).

complete but fragmented egg and eggshell debris found from Lameta formation site of Khempur, Mahi Sagar District, Gujarat. Similar eggshell fossils were found in Werasa, Mahi Sagar. The Type-4 eggshells from Aix-

en-basin, France (William et al. 1984) and *M. siruguei* are closely similar. *Megaloolithus khempurensis*, however, differs in having shell units that are moderately long and a broad and shallow-arched roof that is faintly tuberculate. The shell units tend to be cylindrical, taper into broad basal cups, and are mostly consistent in shape and size. The name '*khempurensis*' is derived from the excavation locality site village, 'Khempur', previously a tehsil of Kheda District but now part of Mahi Sagar District.

5. ***Megaloolithus megadermus***: This species was described on the basis of numerous fossils of fragmented eggshells found under Lameta Formation of Dholidhanti and Paori, Dohad Panchmahal District, and Daulatporia, Mahi Sagar District, Gujarat (Mohabey 1998). These share a fairly close resemblance with the eggshells described from the Dansle Basin, France (Kerourio 1987), thus assigning eggshells to the titanosaurid *Hypselosaurus*.

6. ***Megaloolithus dhoridungriensis***: This oospecies was described on the basis of a complete egg, broken eggs, and egg debris fossils found from Dhori Dungri along with a fossilized snake skeleton of *Sanajeh indicus*. These egg fossils were excavated from Lameta Formation exposed near Dhori Dungri, Kheda, Gujarat. The skeleton of *Sanajeh* was preserved in close association with three Sauropod eggs of the oospecies *Megaloolithus dhoridungriensis* and a partial sauropod hatchling.

Highlight

7. ***Fusiolithus baghensis***: (Synonym: *Megaloolithus balasinorensis* Mohabey, 1998; type locality: Balasinor, India). This species was described on the basis of numerous fossilized broken eggshells found under Lameta formation sites of Bagh Cave, Dhar District, Madhya Pradesh, Pisdura, Chandrapur, Maharashtra, and Ottakovil, Kallamedu, Ariyalur District, Cauvery basin in Tamil Nadu southern India. Also, similar egg fossils were found from a quarry in Balasinor, Mahi Sagar and Anjar, Kutch District, Gujarat. The name '*baghensis*' is derived from the excavation site name Bagh Cave, Bagh Town, MP. The oospecies of these eggs have been related to Sauropod dinosaurs.

8. ***Ellipsoolithus khedaensis***: The species was described on the basis of numerous fossils of broken eggshells found under Lameta formation sites of Lavaria Muwada

and Kevadiya Village. The fossil site is at a distance of 1.5km from the limestone quarries of Rahioli Village, Mahi Sagar District. The name '*khedaensis*' is derived from the excavation locality site district name though the locality is part of Mahi Sagar District. The oospecies of these eggs have been related to Theropod dinosaurs.

9. ***Subtilolithus kachchensis***: The species is described on the basis of numerous fossils of broken fragmented eggshells found under Deccan inter-trappean beds site at Viri Village, Anjar, Kutch District. The name '*kachchensis*' is derived from the excavation locality site name.

Indian oospecies and its affinities

Many of the palaeontology studies describing oospecies from other countries depict the possibility of shared geographical connections between the

Table 2. Oospecies taxa and their global distribution

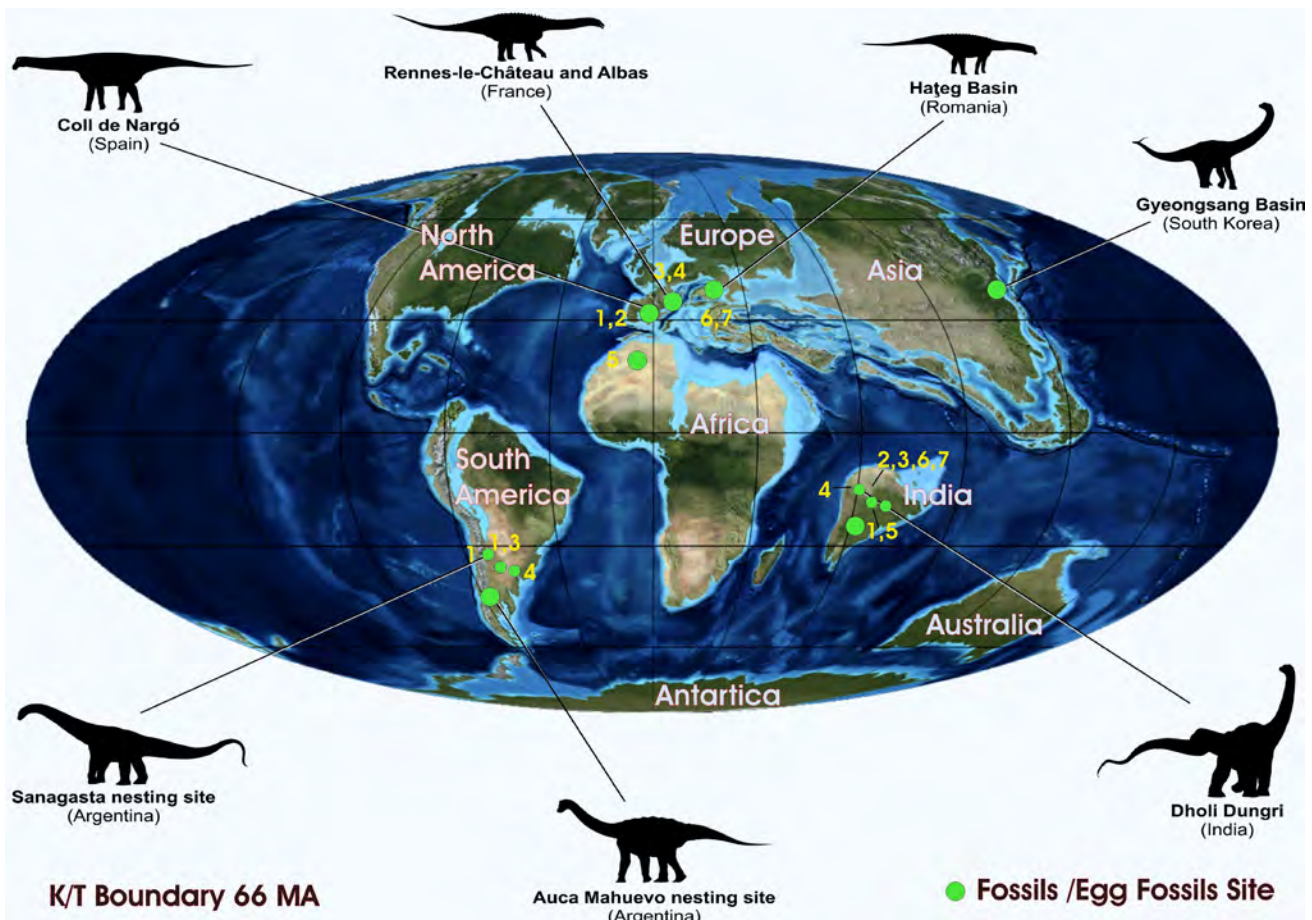
*	Oospecies taxa	Global distribution			
		State in India	Europe	South America (Location)	Africa
1	<i>Fusiolithus baghensis</i>	MP & G	Les Bre'guie'res	Argentina (Salitral Moreno)	
2	<i>Megaloolithus jabalpurensis</i>	MP & G		Argentina (Patagonia)	
3	<i>M. cylindricus</i>	MP & G	France	Argentina (Bajos de Santa Rosa, Ri'o Negro)	
4	<i>M. megadermus</i>	MP & G		Argentina (Ri'o Negro)	
5	<i>M. mohabeyi</i>	MP & G			Morocco (Achlouj)
6	<i>M. padiyalensis</i>	MP	France		
7	<i>M. dholiyensis</i>	MP	France (La Cairanne)		

* Numbers correspond with map; MP - Madhya Pradesh, G - Gujarat

Highlight

Indian subcontinent and other continents in the past. The palaeo-biogeographic and site maps of fossils oospecies depict a picture of a consolidated landmass from Late Cretaceous periods. A few oospecies recorded from India and other countries were similar or same, suggestive of those oospecies being much widely distributed across the globe. The comparisons between *Megaloolithus* oospecies described by Khosla & Sahni (1995), Mohabey (1998), and Dhiman et al. (2018) with those described by Vianey-Liaud et al. (1994, 1997), Garcia

& Vianey-Liaud (2001), and Garcia et al. (2003) well demonstrate close similarities between specimens from different parts of the world (Table 2). Such close affinities and similarities in egg taxa, however, suggest close phylogenetic relationships as well as the probable existence of a terrestrial connection for dinosaur fauna between India, Europe (France), South America (Argentina), and Africa (Morocco) during the Late Cretaceous as between Gondwanaland and India.



Late Cretaceous paleobiogeographic continents showing the distribution of *Tetrapoda dinosaur* oospecies from India with similarities with oospecies from other parts of the world (denoted numbers correspond with oospecies mentioned in Table 2; compiled and revised after Dhiman et al. 2018).

A fossil study of the *Surapoda* genus *Titanosaurus* supports that this genus was very widely distributed and found across Argentina, Europe, Madagascar, India, and Laos and throughout 60 million years of the Cretaceous (Wilson & Upchurch 2003); the same hypothesis is well-presented by Hechenleitner et al. (2015).

References

- Adatte, T., A. Fantasia, B. Samant, D. Mohabey, E. Font, G. Keller, H. Khozyem & B. Gertsch (2014).** Deccan volcanism: a main trigger of environmental changes leading to the K/Pg mass extinction? *Comunicações Geológicas* 101(3): 1435–1437. <https://www.ineg.pt/iedt/unidades/16/paginas/26/30/185>
- Dhiman, H., V. Guntupalli, R. Prasad & A. Goswami (2018).** Parataxonomy and palaeobiogeographic significance of dinosaur eggshell fragments from the Upper Cretaceous strata of the Cauvery Basin, south India. *Historical Biology* 30(1): 101–113. <https://doi.org/10.1080/08912963.2018.1450408>
- Garcia, G. & M. Vianey-Liaud (2001).** Nouvelles données sur les coquilles d'oeufs de dinosaures Megaloolithidae du Sud de la France: systématique et variabilité intraspécifique. *Comptes Rendus de l'Académie des Sciences, Paris* 332: 185–191.
- Garcia, G., R. Tabuce, H. Cappetta, B. Marandat, I. Bentaleb, A. Benabdallah & M. Vianey-Liaud (2003).** First record of dinosaur eggshells and teeth from the north-west African Maastrichtian (Morocco). *Palaeovertebrata* 32: 59–69.
- Garner, P. (1996).** Where is the flood/post-flood boundary? Implications of dinosaur nests in the Mesozoic. *Gen Technical Journal* 10(1): 101–106.
- Hechenleitner, E.M., G. Grellet-Tinner & L.E. Fiorelli (2015).** What do giant titanosaur dinosaurs and modern Australasian megapodes have in common? *Peer J* 3: e1341. <https://doi.org/10.7717/peerj.1341>
- Hirsch, K.F. (1994).** Upper Jurassic eggshells from western interior of North America, pp137–150. In: Carpenter, K., K. Hirsch & J.R. Horner (eds.). *Dinosaur Eggs and Babies*. Cambridge University Press, Cambridge, 372pp.
- Kerourio, P. (1987).** Les nids de dinosaures en Provence. *La Recherche* 18: 256–257.
- Khosla, A. & A. Sahni (1995).** Parataxonomic classification of Late Cretaceous dinosaur eggshells from India. *Journal of the Palaeontological Society of India* 40: 87–102.
- Loyal, R.S., D.M. Mohabey, A. Khosla & A. Sahni (2000).** Status and paleobiology of the Late Cretaceous Indivian theropods with description of a new theropod eggshell oogenus and oospecies, *Ellipsoolithus khedaensis*, from the Lameta Formation, District Kheda, Gujarat, western India. *Gaia* 15: 379–387.
- Mariela, S., M.S. Fernández & A. Khosla (2014).** Parataxonomic review of the Upper Cretaceous dinosaur eggshells belonging to the oofamily Megaloolithidae from India and Argentina. *Historical Biology: An International Journal of Paleobiology* 27(2): 158–180. <https://doi.org/10.1080/08912963.2013.871718>
- Mikhailov, K.E. (1987).** Some aspects of the structure of the shell of the egg. *Journal of Vertebrate Paleontology* 3: 60–66.
- Mikhailov, K.E. (1991).** Classification of fossil eggshells of amniotic vertebrates. *Acta Palaeontologica Polonica* 36(2): 193–238.
- Mikhailov, K.E., E.S. Bray & K.F. Hirsch (1996).** Parataxonomy of fossil egg remains (Veterovata): principles and application. *Journal of Vertebrate Paleontology* 16(4): 763–769. <https://doi.org/10.1080/02724634.1996.10011364>
- Mohabey, D.M. (1998).** Systematics of Indian Upper Cretaceous dinosaur and chelonian eggshells. *Journal of Vertebrate Paleontology* 18(2): 348–362.
- Mohabey, D.M. & U.B. Mathur (1989).** Upper Cretaceous dinosaur eggs from new localities of Gujarat, India. *Journal Geological Society of India* 33: 32–37.
- Vianey-Liaud, M., K.F. Hirsch, A. Sahni & B. Sige (1997).** Late Cretaceous Peruvian eggshells and their relationships with Laurasian and eastern Gondwanan material. *Geobios* 30: 75–90.
- Vianey-Liaud, M., P. Mallan, O. Buscali & C. Montgelard (1994).** Review of French dinosaur eggshells: morphology, structure, mineral, and organic composition, pp151–183. In: Carpenter, K., K.F. Hirsch & J.R. Horner (eds). *Dinosaur Eggs and Babies*. Cambridge University Press, New York, 372pp.
- Wilson, J.A., D.M. Mohabey, S.E. Peters & J.J. Head (2010).** Predation upon hatchling dinosaurs by a new snake from the Late Cretaceous of India. *PLoS Biology* 8(3): e1000322. <https://doi.org/10.1371/journal.pbio.1000322>
- Wilson, J.A. & P. Upchurch (2003).** A revision of *Titanosaurus* Lydekker (Dinosauria – Sauropoda), the first dinosaur genus with a ‘Gondwanan’ distribution. *Journal of Systematic Palaeontology* 1(3): 125–160.
- Zhao, Z.K. (1975).** The microstructure of the dinosaurian eggshells of Nanxiong Basin, Guangdong Province (1): on the classification of dinosaur eggs. *Vertebrate Asiatic* 13: 105–117.
- Zhao, Z.K. (1979).** Progress in the research of dinosaur eggs, pp330–340. In: Nanjing-Dizhi & Gushengwu-Yanjiusuo (eds.) *Mesozoic and Cenozoic Red Beds of South China*. Science Press, Beijing, 432pp.

Raju V. Vyas

1 - Shashwat Apartment, Anand Nager, BPC Haveli Road, Nr. Splatter Studio, Alkapuri, Vadodara, Gujarat 390007, India. Emails: razoovyas@hotmail.com

Citation: Vyas, R.V. (2019). Review of dinosaur egg fossils from Gujarat State, India. *Highlight, In: Zoo's Print* 34(5): 8–17

Protective tactics of the Red-wattled Lapwing

WILD BITE

The Red-wattled Lapwing *Vanellus indicus* (Aves: Charadriiformes: Charadriidae) (Image 1) is an Asian Lapwing or Large Plover (about 35cm long) found in small groups around water bodies, agricultural fields, and dry land. It is distinctly marked with a black breast & throat and a red bill with a black tip. It is a ground bird incapable of perching. Its characteristic loud alarm call 'did-you-do-it' indicates human or animal movements. It is usually found in small groups around water bodies, agricultural fields, and dry land.

Around our office in Coimbatore, there is a good diversity of birds, butterflies and odonates I have been capturing on camera since 2017. I observed a pair of Red-wattled Lapwing (RwL) living in an open agricultural land opposite the office. On 27 April 2019, I observed two chicks and an adult but after two days only one chick was observed (Image 2). On 29 April, when an adult Peafowl *Pavo cristatus* came closer to the mound where the chick was, the parent RwL displayed an awesome protective tactic by opening its wings, making loud calls, and attacking the Peafowl with rapid agile flight until the Peafowl moved away ([Video 1](#)).

by B. Ravichandran, ZOO & WILD, ravi@zooreach.org



Photo (Red-wattled Lapwing) by B. Ravichandran

Distribution record of *Python bivittatus* in Amangarh Tiger Reserve, Uttar Pradesh, India



The adult Burmese Python *Python bivittatus* observed in Amangarh Tiger Reserve, Uttar Pradesh. © Prajakta Hushangbadkar, WWF-India

Pythons are non-venomous snakes belonging to the family Pythonidae. Out of the 31 species of pythons found worldwide, three, i.e., Reticulated Python *Malayopython reticulatus*, Indian Rock Python *Python molurus*, and Burmese Python *Python bivittatus*, are found in India. Earlier, the Burmese Python was considered as a subspecies of the Indian Rock Python (Whitaker & Captain 2004) but was later described as a new species by Jacobs et al. (2009). Morphologically, both species can be differentiated based on identification features given by Smith (1943), O'Shea (1998), and Whitaker & Captain (2004)—in the Indian Rock Python, the skin has a more yellowish tone, the sixth or seventh labial (supralabial) is in contact with the eye, the

lance-shaped mark on top of the head is indistinct, and the tongue is pink in adults while in the Burmese Python, the skin is light coloured with dark brown blotches bordered in black, the sixth supralabial is separated from the eye by a single subocular scale, the lance-shaped mark on the head is clear, and the tongue is blue-black in colour.

The Burmese Python is native to various parts of southeastern Asia and is reported to occur in eastern India, Nepal, Bangladesh, southern China including Hong Kong and Hainan, Myanmar, Laos, Thailand, Cambodia, Vietnam, and Indonesia (Barker & Barker 2008, 2010) and is absent in peninsular Malaysia, Borneo, and Sumatra (Barker & Barker 2008). In India, detailed information



Sighting location of the Burmese Python in Amangarh Tiger Reserve, Uttar Pradesh, India

on the distribution of the Burmese Python is yet to be well-documented; however, continuous efforts to understand the distribution of the species added three new records of its isolated subpopulation: (1) the Corbett-Rajaji subpopulation in Uttarakhand (Bhupathy 1995; Nawab & Srivastava 2008; Joshi & Singh 2015), (2) the northeastern subpopulation along the Brahmaputra (Barker & Barker 2008), and (3) the eastern subpopulation in Kolkata and Bhitarkanika National Park (Barker & Barker 2008). Moreover, the species was also reported from in and outside other Protected Areas of the country such as Hastinapur Wildlife Sanctuary in Meerut and Sumera Block in the outskirts of Aligarh in Uttar Pradesh

(Yadav et al. 2017; Rashid & Khan 2018).

The species is reported to thrive well in marshes and swamps; however, forested areas including mangroves and rainforests, grasslands, coastal plains, and rocky foothills also provide a good habitat for this snake (O'Shea 1998; Barker & Barker 2008). It feeds on various prey species according to its body size, preferring mostly small to large mammals, birds, reptiles, and amphibians (Daniel 2002). In India, the Burmese Python is protected under law and is listed as Schedule I species under the Indian Wildlife (Protection) Act, 1972. Habitat loss, poaching for skin, and use of body parts in traditional medicine declined the population of the species resulting in its categorization as Vulnerable in the IUCN Red List of Threatened species (Stuart et al. 2012). It is also listed under Appendix II of CITES.

We sighted an adult Burmese Python in Amangarh Tiger Reserve (hereafter ATR) on 09 December 2018. ATR is located in the Himalayan foothills in district Bijnor of Uttar Pradesh (29.4027°N & 78.865°E). When Uttarakhand was carved out in 2002, Amangarh remained in Uttar Pradesh and its whole 81km² area was notified as buffer of Corbett Tiger Reserve in July 2012. As part of the All India Tiger Estimation Program 2018, camera trapping was conducted in ATR to monitor its tiger population. During the routine checkup of deployed camera traps, we came across a python basking next to *Lantana* sp. bushes near Pili Dam in Lalpuri



Beat (29.3531°N & 78.8061°E). The bulge near its belly suggested that it had preyed on some small mammal species, which slowed down its movement and allowed us to click some images. The characteristics of the observed individual were later compared with those described by Smith (1943), Daniel (2002), and Whitaker & Captain (2004) and were found to be similar to that of the Burmese Python.

The population of the species is facing a rapid decline owing to unplanned development throughout its range. Intentional fires set by humans to burn agricultural residue may also pose a serious threat to this species by diminishing its prey (Stuart et al. 2012). Since little is known about the species, intensive studies on its ecology are needed to develop better management strategies for its long-term conservation.

References

- Barker, D.G. & T.M. Barker (2008).** The Distribution of the Burmese Python, *Python molurus bivittatus*. *Bulletin of the Chicago Herpetological Society* 43(3): 33–38.
- Barker, D.G. & T.M. Barker (2010).** The Distribution of the Burmese Python, *Python bivittatus*, in China. *Bulletin of the Chicago Herpetological Society* 45(5): 86–88.
- Bhupathy, S. (1995).** Distribution of *Python molurus bivittatus* in India. *Cobra* 21: 2–5.
- Daniel, J.C. (2002).** *The Book of Indian Reptiles and Amphibians*. Oxford University Press / Bombay Natural History Society, Oxford. 238 Pp 83–89.
- Jacobs, H.J., M. Auliya & W. Böhme (2009).** Zur Taxonomie des dunklen Tiger pythons (*Python molurus bivittatus*) Kuhl, 1820, speziell der Population von Sulawesi. *Sauria* 31(3): 5–16.
- Joshi, R. & A. Singh (2015).** Range extension and geographic distribution records for the Burmese Python, *Python bivittatus* Kuhl, 1820 (Reptilia: Pythonidae) in north-western India. *IRCF Reptiles and Amphibians* 22(3): 102–105.
- Nawab, A. & A.K. Srivastava (2008).** Record of Burmese Python *Python molurus bivittatus* and its conservation

status in Corbett Tiger Reserve, Uttarakhand, India. *Journal of the Bombay Natural History Society* 105(1): 100–101.

O'Shea, M. (1998). Herpetological results of two short field excursions to the Royal Bardia region of western Nepal, including range extensions for Assamese/ Indo-Chinese snake taxa, pp. 306–317. In: A. de Silva (ed.), *Biology and Conservation of the Amphibians, Reptiles and their Habitats in South Asia*. Amphibian and Reptile Research Organisation of Sri Lanka, Peradenya.

Rashid, S.R. & J.A. Khan (2018). Burmese Python: new sighting record of *Python bivittatus* in Sumera Block, Jawan, Aligarh, Uttar Pradesh, India. *Reptile Rap* #184. In: *Zoo's Print* 33(3): 19–22.

Smith, M.A. (1943). *The Fauna of British India, Ceylon and Burma including the Whole of the Indo-Chinese Sub-region*. Reptilia and Amphibia Vol. III. Serpents. Taylor and Francis, London. 108–109.

Stuart, B., T.Q. Nguyen, N. Thy, L. Grismer, T. Chan-Ard, D. Iskandar, E. Golynsky & M.W.N. Lau (2012). *Python bivittatus*. In: The IUCN Red List of Threatened Species: e.T193451A2237271. <https://doi.org/10.2305/IUCN.UK.2012-1.RLTS.T193451A2237271.en>

Whitaker, R. & A. Captain (2004). *Snakes of India: The Field Guide*. Draco Books, Chennai, India, 481pp.

Yadav, S.K., A. Khan & M.S. Khan (2017). Burmese Python: *Python bivittatus*: an addition to the reptiles of Hastinapur Wildlife Sanctuary, Uttar Pradesh, India. *Reptile Rap* #175. In: *Zoo's Print* 32(8): 25–29.

Acknowledgments: The authors are grateful to Mr. Ravi Singh (SG & CEO, WWF-India), Dr. Sejal Worah (Program Director, WWF-India), Dr. Dipankar Ghose (Director, Species & Landscape Program, WWF-India), Dr. A.K. Singh (Team Leader, TAL, WWF-India), and members of WWF-India's Haldwani Field Office, particularly Mr. Joy Dasgupta (Senior coordinator), for their constant support throughout the study. Our sincere thanks are due to Shri. Semmaran (Divisional Forest Officer, Bijnor Forest Division). We also thank all the frontline forest staff and our field assistants for their hardwork during the study.

Prajakta Hushangabadkar¹, Meraj Anwar² & Shariq Shafi³

¹ WWF-India Field Office, Shivpuram, Phase-I Kusumkhera, Haldwani, Uttarakhand 263139, India.

¹⁻³ WWF-India, 172 B, Lodhi Estate, New Delhi 110003, India.

Email: ¹phushangabadkar@wwfindia.net (Corresponding author)

Citation: Hushangabadkar, P., M. Anwar & S. Shafi (2019). Distribution record of *Python bivittatus* in Amangarh Tiger Reserve, Uttar Pradesh, India. *Reptile Rap* #194, In: *Zoo's Print* 34(5): 20–22

Bugs & ALL

Invertebrate Conservation & Information Network of South Asia (ICINSA)

Newsletter of the
Invertebrate Conservation & Information Network of South Asia (ICINSA)

Red Helen of the evergreen forests found for the first time in western West Bengal



Red Helen *Papilio helenus* sighted in Raibaghini in West Bengal, India

This paper presents the first record of Red Helen *Papilio helenus* (Insecta: Lepidoptera: Papilionidae) from Bankura in western West Bengal.

Papilio helenus (Linnaeus, 1758) is a black-bodied swallowtail butterfly. This butterfly is very common in evergreen heavy rainfall forests (Wynter-Blyth 1944; Gupta & Majumdar 2012). It was reported from western, eastern, and central Himalaya and from northeastern and peninsular India (Evans 1932; Wynter-Blyth 1957; Varshney & Smetacek 2015).

Opportunistic survey (Williams 2015) was carried out in Raibaghini (23°025N &

87°559E), a village under Kotulpur Block of Bankura District in West Bengal. On 15 August 2017, the author photographed a butterfly. The image was identified as Red Helen according to Evans (1932), Kehimkar (2008), and Bhakare & Ogale (2018).

There is no record of the species from Odisha and western or southern West Bengal (Goswami et al. 2018). The species was also not reported from Purulia District which is situated most west side of West Bengal and Kolkata which is situated on the East bank of Hoogly river (Mukherjee et al. 2015; Samanta et al. 2017). Therefore, this is the first record of the species from western West Bengal.

Bugs R All

Newsletter of the
Invertebrate Conservation & Information Network of South Asia (ICINSA)



Raibaghini in Bankura, West Bengal, India

References

- Bhakare, M. & H. Ogale (2018).** *A Guide to Butterflies of Western ghats (India) Includes Butterflies of Kerala, Tamilnadu, Karnataka, Goa, Maharashtra and Gujarat state.* Milind Bhakare (privately published), x+496pp.
- Evans, W.H. (1932).** *The Identification of Indian Butterflies.* Bombay Natural History Society, Madras. x+454pp.
- Goswami, R., O. Thorat, V. Aditya & S.N. Karimbunkara (2018).** A preliminary checklist of butterflies from the northern Eastern Ghats with notes on new and significant species records including three new reports for peninsular India. *Journal of Threatened Taxa* 10(13): 12769–12791. <https://doi.org/10.11609/jott.3730.10.13.12769-12791>
- Gupta, I.J. & M. Majumdar (2012).** *Handbook on Diversity in some of the Indian Butterflies (Insecta: Lepidoptera).* Zoological survey of India, Kolkata, 310pp.
- Kehimkar, I. (2008).** *The Book of Indian Butterflies,* Bombay Natural History society and Oxford University Press, Mumbai, India, xvi+497pp.
- Mukherjee, S., G. Aditya, P. Basu & G.K. Saha (2015).** Butterfly diversity in Kolkata, India: an appraisal for conservation management. *Journal of Asia-Pacific Biodiversity* 8(3): 210–221.
- Samanta, S., D. Das & S. Mandal (2017).** Butterfly fauna of Baghmundi, Purulia, West Bengal, India: a preliminary checklist. *Journal of Threatened Taxa* 9(5): 10198–10207. <https://doi.org/10.11609/jott.2841.9.5.10198-10207>
- Varshney, R.K. & P. Smetacek (eds.) (2015).** *A Synoptic Catalogue of the Butterflies of India.* Butterfly Research Centre, Bhimtal & Indinov Publishing, New Delhi, ii+261pp.+8pls.
- Williams, M.C. (2015).** Rearing and breeding techniques. In: *Practical Guide to the Study of Lepidoptera in Africa.* Lepidopterist's Society of Africa, 27pp.
- Wynter-Blyth, M.A. (1944).** *The Butterflies of the Nilgiris.* The Bombay Natural History Society, Bombay, India, 538pp.

Wynter-Blyth, M.A. (1957). *Butterflies of the Indian Region.* The Bombay Natural History Society, Bombay, India, 523pp.

Kalyan Mukherjee

Veterinary Pharmacist, State Animal Health Centre, P.O. - Amta, Howrah Dist., West Bengal 711401, India.
Email: kalyan.govt2009@gmail.com

Citation: Mukherjee, K. (2019). Red Helen of the evergreen forests found for the first time in western West Bengal. *Bugs R All* #171, In: *Zoo's Print* 34(5): 23–24

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA) edited by B.A. Daniel, published with the financial support of Zoological Society of London. For communication, Email: daniel@zooreach.org



Bugs R All

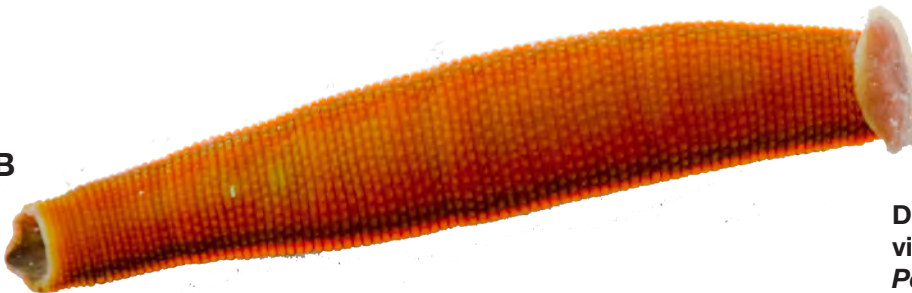
Newsletter of the
Invertebrate Conservation & Information Network of South Asia (ICINSA)

Record of the aquatic leech *Poecelobdella manilensis* from Porur Lake, Chennai

A



B



Dorsal (A) and Ventral (B) view of an adult individual of *Poecelobdella manilensis*

Leeches belonging to the class Hirudinea are parasitic annelids that suck blood from cattle and aquatic vertebrates. These leeches inhabit rice fields, swamps, ponds, tanks, streams, and springs. Currently, these are reported as threatened due to anthropogenic activities and environmental pollution (Mandal et al. 2013). Altitude distribution pattern of these leech species reveals that only two (*P. granulosa* & *P. manillensis*) out of the 12 species of freshwater leeches were collected from

higher elevation (mountainous regions) of Tamil Nadu in India (Mandal and Nandi, 2008). During our survey, we found buffaloes parasitized by these freshwater leeches and they were collected. This record could be a new distribution range for this leech species.

Poecelobdella manilensis (Poecilobdellidae) was obtained from Porur Lake, Chennai, Tamil Nadu (13.034°N & 80.150°E; average elevation 6.7m). The species belongs to phylum: Annelida, family: Metazoa,



Bugs R All

Invertebrate Conservation & Information Network of South Asia (ICINSA)

Newsletter of the

class: Hirudinea, order: Hirudiniformes. *Poecilobdella manillensis* is reported for the first time from Chennai. The distribution range of this leech is extended from Suchindram in Tamil Nadu (Mandal and Nandi, 2008). The International Union for Conservation of Nature and Natural Resources has categorized this species as Endangered (Groombridge, 1994; IUCN, 2006). It has been observed from our study, that *P. manillensis* population drastically reduced due to the lack of suitable host, habitat changes, heavy water pollution and ecological imbalances. Due to the above said reasons, the Porur Lake has to be restored in order to avoid the extinction of this species from the ecosystem.

Reference

- Groombridge, B. (ed.) (1993).** 1994 IUCN Red List of Threatened Animals. IUCN, Gland, Switzerland and Cambridge, UK. Lvi + 286 pp.
- IUCN (2006).** IUCN Red List of Threatened Species. A Global Species Assessment. IUCN, Gland, Switzerland and Cambridge, UK. Xxiv + 191 pp. <http://www.iucn.org/dbtw-wpd/edocs/RL-2004-001.pdf>.
- Mandal, C.K. & N.C. Nandi (2008).** Distribution of leech faunal diversity in freshwater wetlands of West Bengal and Tamil Nadu, pp1831–1839. In: Proceedings of Taal, 12th World Lake Conference, Jaipur, Rajasthan, India.
- Mandal, C.K., S, Dhani & M.Chakraborty (2013).** New locality record of the leech *Poecilobdella manillensis* from Darjeeling district, West Bengal, India. *Rec. Zool Surv. India*. 113(part-1): 231-233.

Acknowledgement

The authors gratefully acknowledge C.K. Mandal, Zoological Survey of India, Kolkata, for identification of the leech specimens.

Muthukaruppan Gobi¹ & Richard Thilagaraj²

^{1&2} Department of Biotechnology, School of Bioengineering, SRM University, Potheri, Tamil Nadu 603203, India.
Email: gobicc@gmail.com (Corresponding author)

Citation: Gobi, M. & R. Thilagaraj (2019). Record of the aquatic leech *Poecilobdella manillensis* from Porur Lake, Chennai. *Bugs R All* #172, In: *Zoo's Print* 34(5): 25–26

Bugs R All is a newsletter of the Invertebrate Conservation and Information Network of South Asia (ICINSA) edited by B.A. Daniel, published with the financial support of Zoological Society of London. For communication, Email: daniel@zooreach.org



Colour abnormality of *Macaca radiata* at Grizzled Giant Squirrel Wildlife Sanctuary, Tamil Nadu, India



Leucistic Bonnet Macaque with coconut at Grizzled Giant Squirrel Wildlife Sanctuary, Tamil Nadu

Observation of colour abnormalities among wild mammals is a remote event because these abnormalities are very rare (Robinson 1973; Caro 2005). Inherited colour defects, such as albinism and partial albinism (leucism), are well known in several animal species. On 29 March 2018, we observed a medium-sized male Bonnet Macaque feed on coconut wastage at Ayyanar Kovil Beat in Rajapalayam Range in Srivilliputhur Grizzled Giant Squirrel Sanctuary (9.509N & 77.455E, 140m), Tamil Nadu. It was totally pale golden-brown in colour, but the eyes

were normal coloured. There are very few records of colour aberration in macaques. Hill (1933) and Fooden (1979) reported total albinism in Toque Macaque *M. sinica* from Sri Lanka. Hill (1937) and Fooden (1981) also reported albinism in Bonnet Macaque *M. radiata* from Trivandrum Zoo, southern India, in 1936. Bahadur (1942) observed albinism in Rhesus Macaque *M. mulatta* from Pratabgarh (South Rajputana) in captivity. Anil et al. (2012) recorded total albinism in Bonnet Macaque from Goa. Leucism was also reported from Bonnet Macaque

in London Zoo by Ogilby in 1838. Fooden (1981) reported a pale golden-brown sub-adult female with reduced pigmentation in the US National Museum of Natural History, Washington, DC. Since our present finding corroborates with that of Fooden (1981), the Bonnet Macaque can be said to have been affected by leucism, a colour abnormality due to genetic variation on its coat.

R. Deepan¹, B. Vickram² & A. Samson³

^{1,2} Department of Zoology and Wildlife Biology, Government Arts College, Udhagamandalam, The Nilgiris, Tamil Nadu 643002, India.

³ Mammalogy and Forest Ecology wing, Department of Zoology and Wildlife Biology, Government Arts College, Udhagamandalam, The Nilgiris, Tamil Nadu 643002, India. Emails: ¹wildlifedeepan1999@gmail.com (Corresponding author)

Citation: Deepan, R., B. Vickram & A. Samson (2019). Colour abnormality of *Macaca radiata* at Grizzled Giant Squirrel Wildlife Sanctuary, Tamil Nadu, India. Mammal Tales #11, In: *Zoo's Print* 34(5): 27–28

References

- Anil, M., P.D. Rane & S.K. Pati (2012).** A case of total albinism in the Bonnet Macaque *Macaca radiata* (Geoffroy) from Goa. *Zoo's Print* 27(12): 22–23.
- Bahadur, R.S. (1942).** Some experiments in albinism. *Journal of the Bombay Natural History Society* 43(3): 523–524.
- Caro, T.I.M. (2005).** The adaptive significance of coloration in mammals. *BioScience* 55: 125–136
- Fooden, J. (1979).** Taxonomy and evolution of the *sinica* group of macaques: 1. Species and subspecies accounts of *Macaca sinica*. *Primates* 20(1): 109–140.
- Fooden, J. (1981).** Taxonomy and evolution of the *sinica* group of macaques: 2. Species and subspecies account of the Indian Bonnet Macaque, *Macaca radiata*. *Fieldiana: Zoology, New Series* 9: 1–52.
- Hill, W.C.O. (1933).** Albinism in Ceylon macaques. *Ceylon Journal of Science (B)* 17: 248–250.
- Hill, W.C.O. (1937).** The primates of Travancore. *Proceedings of Zoological Society of London, Series B* 107: 205–216.
- Ogilby, W. (1838).** The Menageries. *The Natural History of Monkeys, Oppossums and Lemurs, Vol 1. Knight, London*, 238pp.
- Robinson, R. (1973).** Acromelanic albinism in mammals. *Genetica* 44(3): 454–458.

Tata Steel Zoological Park, Jamshedpur, Jharkhand

Residential Nature Camp on Awareness on Biodiversity & Wildlife Conservation

Tata Steel Zoological Park for the past decade has been organizing “Residential Nature Camp for girl students on Biodiversity & Wildlife Conservation”. Its objectives are to promote each girl child’s personal development, to inspire the young women of today to become environmentally responsible and conscientious citizens of tomorrow. Like every year, this year too we tried to promote each girl child’s personal development by giving them the opportunity to act on their own and let them experience new things through fun, friendship and leadership in a supportive and non-competitive away from home.

This year’s camp began with the registration of participants and the distribution of camp kits. After that the camp was formally inaugurated by the Chief Guest Dr. Shukla Mahanty, Vice-Chancellor, Kolhan University, Chaibasa.



Inauguration of the Camp by Dr. Shukla Mahanty, Vice Chancellor, Kolhan University, Chaibasa

Dr. Mahanty addressed to the participants and stated the need for conservation of biodiversity and followed by an introductory session by camp coordinator Dr. Seema Rani.

Then the education session commenced with a presentation on “Tata Steel Zoological Park and its role in conservation of Wildlife- by Dr Sanjay Kumar Mahato, Curator. Thereafter, there was a very interesting and interactive session with the Tata Steel’s only lady pilot Capt. Harpreet Bains followed by the last interactive session

for the day, “Talk on Water conservation” by Mr. S. Mansoor Ali, Consultant: Environment, irrigation & Water management system.

On the second day, the camp had started with a yoga session, conducted by Radha Kumari from Karmakar Yoga School. Thereafter, the campers left for a field visit to Pisciculture Centre, Chandil dam accompanied by Dr. Mahato where modern techniques of fish culture were taught to them.

Upon returning to the Zoo in the evening, the campers



Bird-watching session being conducted by Mr. Sanjay Mahato at Dalma Wildlife Sanctuary

were divided into three groups for breakaway sessions on “Health & Care” led by Dr. Manik Palit – Deputy Director cum Veterinary Officer, “Animal Management” led by Mr. Sanjay Mahato – Curator and “Education & Research” led by Dr. Seema Rani – Biologist cum Education Officer. The teams were attached to these Zoo officers who took them on a field visit within the Zoo and demonstrated to them about their daily activities in the Zoo. There was a very interesting and interactive session on “Animal Welfare” by the city’s renowned animal activist, Mr. Kishore Oza later that day.

Day three began with the campers setting off for an early bird-watching session within the wild environs of

Dalma Wildlife Sanctuary. Dr Mahato, helped the campers identify a variety of passerine and non-passerine birds. Following this was an interaction with C.M.P. Sinha, Dy. Conservator of Forest and Director, Elephant Project, Jamshedpur along with a guided tour.

Upon their return to the Zoo in the evening, the closing

ceremony was organized. The participants were presented with certificates and a Zoo memento.

Earth Day 2019 celebrations

Tata Steel Zoological Park Jamshedpur commemorated the Earth Day 2019 on 23rd April by organising a programme “Making of Eco-friendly Nest” for school children in which over 70 school children from UMS, Hathinada of Chandil Block participated enthusiastically. The workshop was conducted with the help of Dr. S.K. Mahato, Curator and Mr. Dilip Day, keeper of Tata Zoo who were demonstrated in simple terms, the process to be followed at home to make Eco-friendly Nest for birds.



Breakaway session on “Health & Care” being conducted by Dr. Manik Palit

Earth day is the yearly occasion celebrated worldwide on 22nd April consistently. The theme of this year for Earth Day 2019 is 'Protect Our Species' especially the threatened and endangered ones. We already saw the extinction of several species. So, it is necessary to take the strict action to save wildlife mainly focusing on saving species which are on the verge of extinction due climate change, deforestation, pollution and illegal poaching.

Tata Steel Zoological Park constantly takes the opportunity to raise public awareness about the challenges regarding the well-being of the planet and



Camp participants at Chandil Dam to gain knowledge about the modern Pisciculture practices

all the life it supports .Apart from above activity we also tried to motivate the people of Jamshedpur to reduce the use of plastic bags to avoid the soil and water pollution, recycling and reuse of the waste materials through the activities like “Making of Pots from waste

plastic containers” etc. We also urge to them to say no to herbicides and pesticides and follow a plant based diet by developing kitchen garden at individual level. Dr. Seema Rani, Biologist and Education Officer alongwith her team member Mr. Pratap Gill, coordinated the programme.



Workshop on “Making of Eco-friendly Nest” and Hanging pots from waste bottles conducted by Dr. S.K. Mahato, Curator and Mr. Dilip Day, Keeper

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

Workshop on Climate Change and Wildlife at Institute of Forestry, Pokhara, Nepal

On 28th February and 1st March, a workshop on “Climate Change and Wildlife” was organized by Bat Friends Pokhara and Nature Conservation and Development Network. The theme of the workshop was ‘Shaping Conservationists for better future’.



Setting up camera traps

Climate change has adverse effects on biodiversity and the ecosystem. At present context, many of wildlife are in a precarious situation due to various anthropogenic threats and unpredictable climatic patterns. Especially the countries dependent on natural resources are facing many problems all around

the globe due to global climate change. From the melting of glaciers in the Himalayas to an enormous increase in invasive species in Terai belt of Nepal; our wildlife is at high risk. We lack appropriate research on the impact of climate

change on wildlife and conservation intervention to drench its effects. In order to do so, we need young energetic minds to work dedicatedly on these issues.

Nepal is prone to various other natural disasters due to above issues. Hence, this workshop was organized with the objective to aware young students about climate change and wildlife conservation and motivates them to become a future conservationist.

The workshop was organized productively at Institute of Forestry (IoF), Pokhara. IoF premise



Setting up mist net



Participants observing bats

include an area of 15 hectare college complex with 31.85 hectare of forest named “Banpale forest”. Its altitude varies from 750m at Seti river bed to 915m. Forty participants were selected from 87 applicants from different colleges around Nepal. Field-based training was organized at Banpale Forest. The participants were trained by Bat Friends Pokhara and Nature Conservation and Development Network. Presentations on Climate change and related issues were given by various keynote speakers before the field visit.

Students were divided into 4 groups, 10 participants on each group led by

trainers. These groups were Mammals Group, Bat Group, Birds Group, and Butterfly Group. Every participant was assigned with a species name, 10 species from each group. Individual works were given on the assigned species to every participant to enhance their curiosity and knowledge. Each group was provided with a Camera trap, GPS device, binoculars, camera, Butterfly net; reference book ‘ Bats of Nepal’, ‘Birds of Nepal’, ‘Butterflies of Nepal’ etc. Participants were taken to Banpale forest for camera trapping and mist netting. Mist netting and bat handling were demonstrated with the help of hand gloves, Vernier Callipers, bat bag, etc. Lepidoptera and bird

watching and identification were done.

Similarly, climate change issues on environment and forest management were taught to participants with main focus on its adaptation and mitigation measures. Various anthropogenic activities triggering global climate change and their tackling methods were also familiarized. Concept on Ecosystem based Adaptation (EbA) was educated through presentations and with the help of different examples and cases for building resilient communities and ecosystems so that they would be able to contribute on reducing communities vulnerability to climate change and improving their adaptive capacities.

During the field visit, twenty one (21) species of birds, 11 species of butterflies were recorded while no mammal was caught in camera trap. Three individuals of Greater Short-nosed Fruit Bat *Cynopterus sphinx*, were captured in a mist net; of which, 2 were male and 1

female. Identification keys of all recorded wildlife species were demonstrated in the field. With the aid of field visits, all participants learned to set up camera trap and mist net. They were also conscious about the consequences of climate change on wildlife, got motivated, and showed interests towards such issues.

At last, we would like to thank resource persons and volunteers hugely for

giving their precious time in making the programme effective and successful.

We are also grateful to IoF Dean Office and Annapurna Conservation Area Project, Head office for providing conference hall during our programs. And last but not least, we would like to thank every participant for their patience, discipline, and curiosity.

Submitted by: Prabhat Kiran Bhattarai, Bat Friends Pokhara Nature Conservation and Development Network, Tribhuvan University, Institute of Forestry (IoF), Pokhara, Nepal. Email: prabhatkiran79@gmail.com



Organisers with participants

Workshop on House Sparrow: Concern and Conservation in District Institute of Education and Training (DIET)-Lalitpur, Uttar Pradesh

With the initiatives of Nature Forever Society, 20 March is celebrated as World Sparrow Day since 2010. The event aims to raise awareness for conservation of House sparrow. The recent declines in the population of House sparrows is a matter of concern but unlike the big cats and master scavengers, the conservation of these little birds is possible with just our concern and small efforts.

To reach out maximum number of students, Indian Biodiversity Conservation Society and Manav Organization organized a one day workshop for the students of Basic Teaching Certificate (BTC) in District Institute of Education and

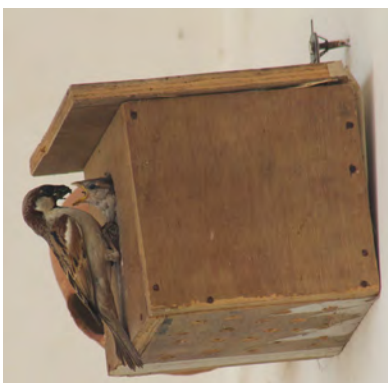


Powerpoint presentation on status of House sparrows

Training (DIET), Lalitpur. The workshop started with a PowerPoint presentation by Dr. Sonika, President, Indian Biodiversity Conservation Society that covered the important issues such as the scenario of house sparrows in India, the threats faced by them and the conservation measures. Through the talk she also shared the initiatives undertaken

by Indian Biodiversity Conservation Society for conservation of House sparrows particularly by installing the nest boxes to overcome the threat of reduced nesting places. The role of Press media was also highlighted.

After the presentation, Abhishek Namdev demonstrated how to make different types of nest boxes for the house sparrows using the discarded shoe boxes and earthen pots. Emphasis was given on the practically right way of installing the nest boxes. The students were asked to come up and try out to make and install the nest



Outcomes of installing artificial nest boxes

boxes themselves. The workshop was concluded by Mr. Pushpendra Singh Chauhan, President, Manav Organisation who briefed the participants about further events to be organized on 20th March in Lalitpur. He encouraged the trainees to participate in the painting competition on the theme of House sparrows. The team members and the BTC trainees then installed the artificial nest boxes in the DIET campus.

Seventy persons took part in the workshop. They were felicitated with the participation certificates and earthen pots and nest boxes for sparrows. These participants will be joining various Government schools in Lalitpur for teaching that is a part of BTC.



Student learning to prepare the nest box & mud pots

They were all sensitized to spread the message of sparrow conservation in their respective schools and install a minimum of 5 nest boxes. Each school is estimated to have 60-120 students strength that means even if the trainees cover 50 schools with 100 students each, they will reach 5000 students about

World Sparrow Day and install a minimum of 250 nest boxes. This was the target of the organizers on that day. The workshop achieved its aims with the kind cooperation of DIET Principal Shri Maharaj Swami, faculty (Kirti Shukla, Uma Chaubey and Jyoti Kushwaha), staff (Bhajan Lal) and team members Sahib Singh, Rishi Heranandi, Balram Kushwaha, Amit Lakhera and B.S. Kushwaha. All the concerned authorities were venerated with the wooden sparrow nest boxes.



Authorities and participants venerated with the artificial sparrow nest boxes

Submitted by Akhilesh Kumar, Sonika Kushwaha, Indian Biodiversity Conservation Society and Pushpendra Singh Chauhan, Manav Organisation. Email: ibcsforall@gmail.com

ZOO'S PRINT

Communicating science for conservation

ZOO'S PRINT Publication Guidelines

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 ZOO'S PRINT magazine.

Manuscript requirements

Articles should be typed into a Word format and emailed to zooreach@zooreach.org. Avoid indents, all caps or any other fancy typesetting. You may send photos, illustrations, tables.

Articles which should contain citations should follow this guideline: a bibliography organized alphabetically and containing all details referred in the following style: surname, initial(s), year, title of the article, name of journal, volume, number, pages.

Editorial details

Articles will be edited without consultation unless previously requested by the authors in writing. Authors should inform editors if the article has been published or submitted elsewhere for publication.

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.

Editors: Sally R. Walker and Sanjay Molur

Associate Editor: Daniel B. Ayyachamy

Managing Editors: Lathadevi Ravikumar & B. Ravichandran

Editorial Assistants: R. Marimuthu & S. Radhika

Copy Editor: Vidya Mary George

Zoo Outreach Organisation Trust Committee and Sr. Staff

Managing Trustee: Sally R. Walker

Executive Director Trustee: R.V. Sanjay Molur

Finance Director Trustee: Latha G. Ravikumar

Scientist: B.A. Daniel

Researcher: R. Marimuthu, Priyanka Iyer

Other staff: B. Ravichandran, K. Geetha, S. Radhika,

Arul Jagadish, K. Raveendran, S. Sarojamma

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.

Address

Zoo Outreach Organisation

Post Box 5912, 12, Thiruvannamalai Nagar,

Saravanampatti - Kalapatti Road, Saravanampatti,

Coimbatore, Tamil Nadu 641035, India

Phone: +91 9385339862 & 9385339863

E-mail: zooreach@zooreach.org

Website: www.zoosprint.zooreach.org,

www.zooreach.org



