

ZOO'S PRINT

Communicating Science for Conservation

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

FROGS MATTER



WHY DO FROGS (amphibians) MATTER SO MUCH ?

🐸 They are both predators and prey in the ecosystem ... they eat some animals and are eaten by others, thus ... they do useful jobs such as pest control.

🐸 Most frogs eat pesky bugs and insects which destroy crops that feed us and which carry deadly diseases that make us sick.


🐸 They provide food for a variety of animals - fish, crocodilians, turtles, birds, etc., some of which provide food for human beings and all of which are useful to ecosystems.


🐸 They are very useful in medical research because their insides are so much like other animals .. they are used to test new drugs. Students used to dissect them but now computers provide a similar experience without killing so many frogs.


🐸 Frog skin makes stuff offering possible medical cure for a variety of human diseases, including AIDS, heart ailments and cancer.




Fantastic Facts

 Frog skin soaks up matter so easily that harmful substances in the environment which could threaten human beings can be noted early .. scientists call them “nature’s indicators”.


 Frogs provide an “early warning systems” for environmental troubles .. they are the first kind of animals to be affected by problems in the environment.

 Frogs are a huge biological family with 6722 species in the world. Each species or “kind” holds unique genes, DNA, any of which could provide cures for illness or models for creating life saving chemical or mechanical items.

 Frogs make wonderful sounds at night, croaking and “ribbiting”. Almost any water body might have frogs in it providing comforting rhythmic music to fall asleep by. Frogs are (usually) friendly and safe providing a wonderful way to introduce small brothers and sisters to wildlife.

 Frogs have been culturally important for a very long time ... stories about them normally indicate good things.

 Frogs are irreplaceable as innocent ambassadors of the wild. Think how many things we use have frogs on them: stickpins, ties, underwear, pajams, jewelry, clothing, toys, table cloths, curio carvings ... on and on.

 Frogs are known for one bad thing only ... warts ... and that isn't even true.

 They are an integral part of Biodiversity.

SOUTH ASIAN AMPHIBIANS -- HOW MANY KINDS?

HOW MANY?

There are more than **600** kinds (species) of amphibians which occur naturally in South Asia. About **300** kinds of them occur **only in South Asia** and NOWHERE ELSE. We call these “**endemic**” ... found naturally in one place and no other place (naturally). Rest of these we call “non-endemic”. They occur in South Asia and other places as well.

The Three Groups of Amphibians are

Anura (frogs and toads)
-- normal looking froggy types



**Caudata
or Urodela
(newts and
salamanders) --**
lizardey-looking creatures



**Gymnophiona or Apoda
(caecilians -- Limbless
amphibians) – wormo-wallahs**



WHY WE SHOULD WORRY about frogs ?

There are so many Threats of Amphibians


Threats to Amphibians:


- increased UV radiation
- pollution & pesticides
- alien species
- climate change
- over collection
- as well as disease so





Aside from being so useful and charming ...
they are very very old in the world ...

 Frogs are older than your oldest elder and older than the human species on the earth.

 Frogs have lived on Earth for more than 36 crore years but NOW a third to half of all kinds could vanish in the next 2 decades !

 Remember dinosaurs? They vanished from the Earth. Now our Earth is in trouble like that again ...massive extinctions of frogs have been predicted.

 For amphibians (frogs) it is particularly bad ... 2 or 3 kinds face extinction for every one kind of threatened bird or mammal.

 We should protect them for the same reasons we respect and protect our grandparents and great grandparents.

Because it is our duty.

IS THERE A SOLUTION ?



- 🐸 There is a plan. If everyone does their part, it will be a solution.
- 🐸 All the amphibian scientists in the world have a strategy called the Amphibian Conservation Action Plan (ACAP).
- 🐸 ACAP consists of research, assessment, in-situ (on-site) conservation, frozen zoo, and education awareness.
- 🐸 All the scientific breeding facilities (zoos, research labs, private hobbyists, etc.) in the world have a plan to rescue species that can't be saved in the wild.
- 🐸 This plan is called the Amphibian Ark which will rescue frogs and keep them in "protective custody" until the threats have been overcome and then return them to the wild if at all possible. They may also collect samples for several frozen zoos in the world.
- 🐸 Under this plan, hundreds of kinds of frogs and other amphibians will be saved from extinction - they will NOT vanish.

CAN I HELP?

- 🐸 Yes, you can help by learning about the amphibian crisis ... the frog misfortune ... and tell others.
- 🐸 You can help by telling your friends, your teachers, your parents and your politicians and policy makers about it.
- 🐸 You can learn about frogs generally ... so that you can explain what we will lose by losing amphibians.

Compiled by Sally Walker and Sanjay Molur. Designed by Latha Ravikumar

Into the shadows: strategies for survival in ungulates of Malaysia

By Vidya Mary George. Published on Jottings on 17 October 2018



As ungulates form the major prey base for large carnivores, understanding their ecology can be useful for the conservation of their predators. The paper by Tan and team provides the first published baseline data of activity patterns of ungulates in peninsular Malaysia, which can be incorporated into future ungulate studies in the area.

The ecological sync

Larger carnivores selectively hunt larger prey when available. Ungulates are likely the major prey base for the Critically Endangered Malayan Tiger in peninsular Malaysia. A decline in large ungulate prey has been reported to be linked to a decline in tiger populations in the area. Understanding the status of large ungulate prey in the area is, therefore, important for tiger conservation.

Daily activity pattern can be potentially used to monitor the status of animals. Activity patterns of terrestrial animals may vary from year to year and may change in response to food availability, hunting, and habitat conversion and fragmentation. Several studies noted that the activity patterns of mammals were affected by hunting and human disturbance. Poached species became more nocturnal in response to high hunting pressure and leopards became more diurnal in the absence of tourist activity. A change in daily activity patterns of animals, particularly an increase in nocturnal activity,

therefore, can serve as a potential indicator of human disturbance and hunting in an area.

Strategies for survival

The ungulate species in the Endau Rompin Landscape (ERL) of peninsular Malaysia were studied in 2011, 2013, and 2015 using camera traps. The captures suggested that the Near Threatened Barking Deer, the Vulnerable Bearded Pig, and the Wild Boar were mostly diurnal, Mouse-deer species were crepuscular, and the Endangered Malayan Tapir were nocturnal.

The Barking Deer, Bearded Pig, and Wild Boar exhibited two activity peaks, in the morning after sunrise and in the late afternoon around sunset. There appears to be a reduction in activity in the afternoon, which could be driven by a biological requirement to cool their bodies, thus resting in shade or reducing their foraging activity. Previous studies have noted primates and flying foxes in tropical forests resting and fanning to cool their bodies, respectively, when the mid-day sun was at its strongest. The lull in activity, however, could also be exaggerated as the camera traps tended to be set up along logging roads and animal trails where shade was limited and hence avoided by the ungulate species.

The Bearded Pig and Wild Boar are known to forage in oil palm plantations that lie adjacent to forests. Considered as agricultural pests, they can be eradicated with permits under the Wildlife Conservation Act 2010 of Malaysia. The effect of such human activities on these species, however, has not been studied. If the activity patterns of these ungulate species are a result of such human disturbances, immediate studies would need to be undertaken to investigate the case.

- » The effect of hunting pressure along forest-plantation edge habitats on the occurrence of Bearded Pig and Wild Boar need to be studied.
- » A forest canopy cover study should be undertaken to reveal if ungulate avoidance of logging roads and animal trails depends on the amount of sunlight in the afternoon.

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Vulnerable adult female Bearded Pig with young in the ERL, peninsular Malaysia



A pair of Least Concern Mouse-deer sp. in the ERL, peninsular Malaysia



Endangered adult Malayan Tapir in the ERL, peninsular Malaysia



Least Concern male Barking Deer in the ERL, peninsular Malaysia



Vulnerable female adult Sambar deer in the ERL, peninsular Malaysia



Least Concern Wild Boar in the ERL, peninsular Malaysia

This write-up was originally published on [Jottings](https://threatenedtaxa.org/jottings/behaviour/into-the-shadows-strategies-for-survival-in-ungulates-of-malaysia/) at <https://threatenedtaxa.org/jottings/behaviour/into-the-shadows-strategies-for-survival-in-ungulates-of-malaysia/>

INSTAGRAM IMAGES



Bigger and bolder than the common House Rat, the inquisitive Sahyadri Forest Rat is a resident of the top storeys of the jungles of the Western Ghats, rarely making visits to the undergrowth, zooming across the dense canopy on the highways of tree vines in its nocturnal cruises, choosing between the options of its favourite insects, fruits, and bark on the menu for its supper. Shot at Palthope Estate by S. Molur, ZOO; posted on 27 Feb 2019.

Just like the curious chiaroscuro on its body and tail, the Ashy Prinia is a bountiful bundle of business and play. As it hops about among the bushes in search of its favourite insects, this small, reticent songbird will tease you with its sharp calls only to disappear just when you think you have spotted it! Shot at Coimbatore by B. Ravichandran, ZOO; posted on 09 Feb 2019.



Typically green or brown, the notorious 'preying' mantis is a master of disguise with a taste for live flesh. Its prominent forelegs, often folded together as it lies waiting in ambush, have formidable spikes with which it tells the fate of its hapless prey at lightning speed. Shot at Coimbatore by B. Ravichandran, ZOO; posted on 14 Jan 2019.

The Malabar Stream Lily, described in 2012, is found only in the semi-shaded stretches of four seasonal streams in Kasargod and Kannur districts in Kerala, India. This remarkable ecosystem architect is endowed with sweet-scented white flowers and large, flat, strap-shaped, 2-3m long leaves. Shot in Kerala by S. Molur, ZOO; posted on 22 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.

Past, present & future

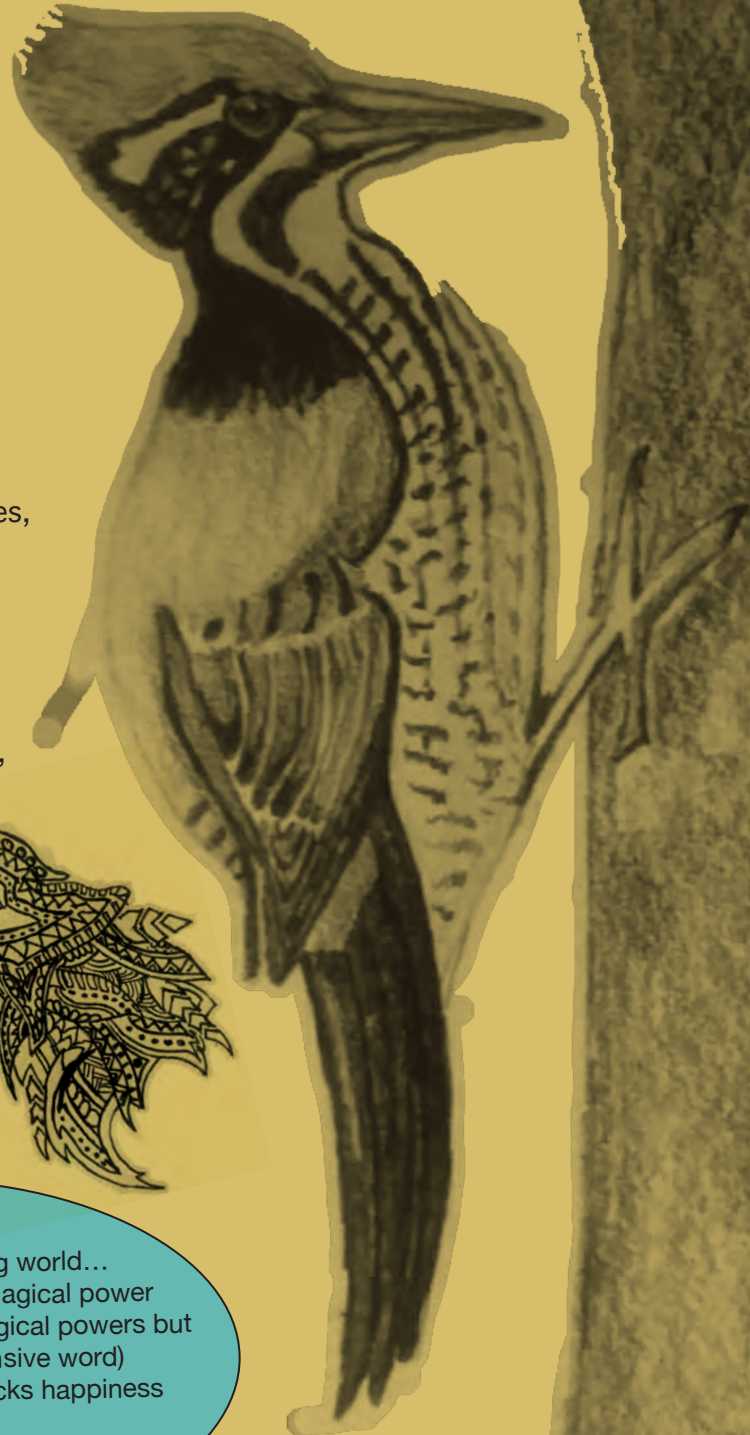
The wood dwellers are the woodpeckers,
We death eaters are the real wreckers.
Ribbons of the deep blues are the eels,
In our city of chaos, they end up as meals.

We torture the Great Indian Bustard,
Mother nature is gonna get us busted!
The crux of the ocean are the squids,
And all we have done is treat them as squibs.

Guardians of the jungle are the tribes,
Their power and unity keeps up the forests vibes,
Our tribes protect the Dholes;
but we dementors are ripping off their souls.

Wildlife is our host,
But we muggles have turned them into a ghost,
Are you concern about your life?
Then save our wildlife!

~ Visalia & Vibalia*



LEGEND

According to the wizarding world...

- Muggles** - humans without magical power
- Squibs** - creatures that have magical powers but cannot use it (wiz., an offensive word)
- Dementors** - creature that sucks happiness out of soul
- Death eaters** - Followers of dark magic or who possess evil thoughts

*Email: visaliaraj@gmail.com

The authors (twins) are school students based at Bengaluru, Karnataka. They both are passionate about wildlife conservation

TOKAY GECKO

Note on *Gekko gekko* (Linnaeus, 1758) with its recent sighting in Meghalaya



Tokay Gecko spotted in Nongkhrah, Ri-Bhoi District, Meghalaya. Photo credit: Ananta Rai

IUCN Red List:
Not Assessed

Reptilia
[Class of Reptiles]

Squamata
[Order of Scaled reptiles]

Gekkonidae
[Family of Geckos]

Gekko gekko
[Tokay Gecko]

Species described by
Linnaeus in 1758

Tokay gecko *Gekko gekko* (Linnaeus, 1758) is the second largest gecko belonging to the family Gekkonidae (Manthey & Grossmann 1997). This nocturnal gecko is found throughout southeastern Asia, including northeastern India and Nepal (Das 2010; Caillabet 2013). In India, it is mostly distributed in the northeastern states of Assam (Das et al. 2009), Mizoram (Lalrinchhana & Solanki 2015), Meghalaya (Schleich & Kästle 2002), West Bengal (Ahmed et al. 2009), and Tripura (Majumder et al. 2012). Though there are sporadic reports on the occurrence of Tokay Gecko in Meghalaya, Nagaland, and Manipur, there is no scientific documentation to date.

During the fieldwork in Meghalaya on 22 November 2018, a female Tokay Gecko was sighted in Nongkhrah in Ri Bhoi District (25.930°N & 91.885°E) at an elevation of 550m. The

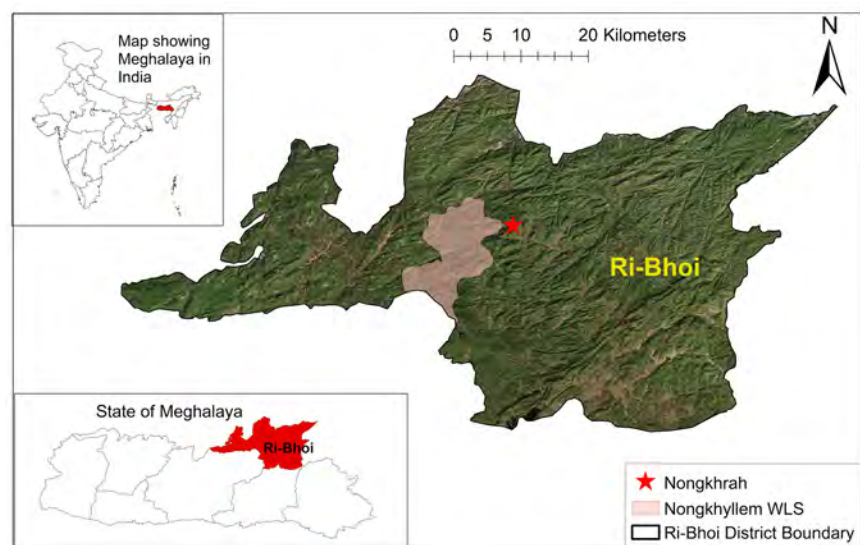
species was found inside the crevices of big stones and the root extension of a Guava tree. While attempting to catch it, it opened its mouth wide and produced a typical ‘to-kay’ sound. With much difficulty, the species was caught and the basic morphometry and pholidosis were noted after which it was released back into the natural habitat. Morphometry measurements taken by digital vernier callipers (precision 0.1mm) are as follows: snout-vent length (SVL) 160mm, tail length (TL) 71mm, jaw length (JL) 30.88mm, head length (HL) 43.29mm, head width (HW) 32.22mm, length of the longest hindlimb digit (fourth) 15.63mm, length of the shortest hind limb digit (first) 8.91mm, length of the longest forelimb digit (fourth) 13mm, length of the shortest forelimb digit (first) 8.18mm. Fourth toe lamellae 18 on both sides, first toe lamella 14 on both sides, 12 supralabial, 11 infralabial, three large internasal scales, and 28 supraciliary scales. Body with olive grey or brown tetrahedral granules intermixed with few large granules along with orange floral blotches. Six femoral pores on each side with a single scale separating them. Ventral scales larger than dorsal scales, imbricate with scattered orange blotches.

Global Distribution :

Native: Bangladesh, India, Nepal, Bhutan, Myanmar, Thailand, Cambodia, Laos, Vietnam, Malaysia, China, Philippines, Singapore, Hong Kong, Indonesia, Sulu Archipelago, Timor-Leste.

Introduced: USA, Martinique (Caribbean), Madagascar, Lesser Antilles and Belize (Caillabet 2013)

The species generally prefers trees with high basal areas and canopy cover. Due to a reduction in the number of trees, however, it shifted its habitat to human settlements, especially preferring cracked walls of mud houses. Deforestation, especially cutting of large canopy trees, is affecting the population of Tokay Gecko (Singh & Choudhury 2016). While habitat loss is the prime cause for most species decline, this species faces the additional threat posed by illegal trade in most of the countries. The species



Nongkhrach and Nongkhylllem WS in Ri-Bhoi District in Meghalaya, northeastern India



is claimed to have medicinal value and is used in the treatment of asthma, diabetes, skin ailments, cancer (Chuang et al. 1999), HIV/AIDS (Caillabet 2013), erectile dysfunction, and persistent cough (Nguyen 1993). In some countries, they are consumed in the form of an energy drink for vitality (Bauer 2009). They are also traded as pets, especially in Europe and USA (Caillabet 2013).

Various countries give conservation importance to the species – in peninsular Malaysia under Wildlife Conservation Act, 2010, in China in Appendix II under Wild Animal Protection Law of the People’s Republic of China (Yinfeng et al. 1997), and in Philippines under Republic Act No. 9147 or Wildlife Resources Conservation and Protection Act 2001 (Lim et al. 2012). In other countries like Thailand, Indonesia, and Vietnam, however, the species is not covered by any national law or act (Caillabet 2013). The population, in general, is under threat due to overexploitation despite its wide distribution, high fecundity, and ability to thrive in human-modified landscapes.

Northeastern states of India like Assam, Manipur, Mizoram, West Bengal, and Nagaland are the focal points for poaching and trading of this gecko to the neighbouring countries such as Myanmar and China. There were many incidences wherein geckos trapped illegally for trading were rescued by police authorities and forest officials in Manipur, West Bengal, and Assam (Sarkar 2018).

In India, Ministry of Environment and Forests, Government of India, enlisted it under Schedule IV of the Wildlife (Protection) Act, 1972. Despite all efforts by the government, wildlife trade still persists in India. Due to lack of comprehensive data, this species is not assessed by the IUCN Red List of Endangered Species. The proposal was submitted to CITES for its inclusion but has not yet been evaluated (Singh & Choudhury 2016). Since it is not listed in CITES, international trade of Tokay Gecko is not regulated. Many studies show a considerable decline in the population of the species in Bangladesh (Caillabet 2013), China (Chan et al. 2006), Indonesia, Thailand (Caillabet 2013), and Nepal (Shrestha 2000). Its status in other countries is still not evaluated.

Minor vertebrates always receive less attention in terms of conservation while protected areas designed for higher vertebrates may not do equal justice to them (Vasudevan et al. 2006). Hence, this study recommends higher conservation protection for this species than its current status.



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Ananta Rai¹ & Basundhara Chettri²

^{1&2} Department of Zoology, Sikkim University, Barad Sadan 5th Mile, Tadong, East Sikkim, Sikkim 737102, India.
Emails: ¹anantarye@gmail.com, ²bchettri01@cus.ac.in (Corresponding author)

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LINED SUPPLE SKINK

Notes on *Lygosoma lineata* from Rajkot City, Gujarat, India



Lined Supple Skink from Rajkot City in Gujarat

IUCN Red List:
Least Concern
(Srinivasulu &
Srinivasulu 2013)

Reptilia
[Class of Reptiles]

Squamata
[Order of scaled reptiles]

Scincidae
[Family of skinks]

Lygosoma lineata
[Lined Supple Skink]

Species described by
Gray in 1839

Reptiles are represented by 10,793 species worldwide (Uetz et al. 2018) of which 518 are found in India (Aengals et al. 2011). Of these 202 are lizards, apart from 75 species of Scincidae (Uetz et al. 2018). From Gujarat state 12 species of Scincidae are reported (Table 1).

Lined Supple Skink *Lygosoma lineata* was described by Gray in 1839 as *Chiamela lineata* and later allocated to the genus *Lygosoma* Gray, 1828 by Boulenger in 1887 (Smith 1935) and assessed as Least Concern. This lizard can be found in a variety of habitats including hilly areas, coastal forests, mix deciduous forest, grassland patches, scrublands, agriculture fields, gardens, and among large boulders (Srinivasulu & Srinivasulu 2013; Vyas 2014). This animal actively forages near termite mounds during cooler parts of the day. This lizard mostly shelters itself beneath rocks, woody material, or within leaf litter (Srinivasulu & Srinivasulu 2013). Lined Supple Skink is endemic to India. The species is distributed in the states of Gujarat, Maharashtra, Goa, Karnataka, Tamil Nadu, Andhra Pradesh,



Telangana, Chhattisgarh, Madhya Pradesh, Jharkhand, and West Bengal in India (Vyas 2014). In Gujarat, this species was recorded from Rajkot, Velavader, Bhavnager, Kalali, Kevadia, Samot, Ambli, Grimal, Naomiboaha (Vyas 2014), and Girnar WS (Srinivasulu & Srinivasulu 2013).

Global Distribution :
India (Gujarat, Maharashtra, Goa, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, Chhattisgarh, Madhya Pradesh, Jharkhand and West Bengal (Vyas 2014)

Rajkot is an important urban centre located in the centre of the Saurashtra region in Gujarat. The rapid industrial development and agriculture production coupled with a rise in population over the past decade have contributed to the large-scale increase in traffic in the city. The percentage of the industrial area to that of the total area and developed area are found to be 20% and 22.28%, respectively. Rajkot has a semi-arid climate with very hot and dry summer, wet monsoon,

Table 1. List of Scincidae recorded from Gujarat State, India

	Scientific name	Common name	Distribution in Gujarat	IUCN status
1	<i>Ablepharus grayanus</i> (Stoliczka, 1872)	Minor Snake-eyed Skink	Kutch (Alfred 2000) & Jassore WS, northern Gujarat (Vyas 2011a)	NA
2	<i>Novoeumeces schneideri</i> (Daudin, 1802)	Gold Skink	Kutch (Stoliczka 1872)	LC
3	<i>Eurylepis taeniolatus</i> (Blyth, 1854)	Yellow-bellied Mole Skink	Kutch (Alfred 2000) & Jassore WS, northern Gujarat (Vyas 2011a)	NA
4	<i>Eutropis allapallensis</i> (Schmidt, 1926)	Allapalli Grass Skink	Purna WS (Vyas 2007) & Shoolpaneshwar WS (Vyas 2011b)	LC
5	<i>Eutropis carinata</i> (Schneider, 1801)	Keeled Indian Mabuya	Widespread (Das 2002)	LC
6	<i>Eutropis dissimilis</i> (Hallowell, 1857)	Striped Grass Skink	Dry parts of the state (Daniel 2002)	NA
7*	<i>Eutropis macularia</i> (Blyth, 1853)	Bronze Skink	Widespread (Das 2002)	NA
8	<i>Lygosoma albopunctata</i> (Gray, 1846)	White-spotted Supple Skink	Gir Forest in Saurashtra region, central and southern Gujarat (Vyas 2010)	NA
9	<i>Lygosoma guentheri</i> (Peters, 1879)	Günther's Supple Skink	Central and southern Gujarat (Vyas 2014)	LC
10	<i>Lygosoma lineata</i> (Gray, 1839)	Lined Supple Skink	Saurashtra, central and southern Gujarat (Vyas 2014)	LC
11	<i>Lygosoma punctate</i> (Gmelin, 1799)	Common Snake Skink	Widespread (Das 2002)	
12	<i>Ophiomorus raithmai</i> (Anderson & Leviton, 1966)	Three-fingered Sandfish	Kutch (Alfred 2000) & Kathiawar (Khan & Papenfuss 2010)	LC

*This is a species complex in need of further taxonomic studies (Ganesh 2015). LC - Least Concern, NA - Data Not Available

Table 2. Details of Lined Supple Skink recorded from Rajkot City, Gujarat

	Location	Year	Habitat	Remark	Rescued/ observed by [#]
1	Near Nanavati Chowk (22.3070 N & 70.7671 E)	2004	Plot	Adult	B. Trivedi
2	Near Nana Mava Main Road (22.2724 N & 70.7669 E)	2005	Plot in between residency	Subadult	R. Jadav
3	Behind Big Bazar (22.2791 N & 70.7752 E)	2005	Plot	Adult	B. Trivedi
4	Limbudiwadi Main Road (22.2941 N & 70.7795 E)	28 Nov 2006	Under construction	Sub-adult	R. Ardesana
5	Near Nana Mava Main Road (22.2724 N & 70.7669 E)	25 Apr 2008	Plot in between residency	Sub-adult	R. Jhala
6*	Patidar Chowk (22.2938 N & 70.7550 E)	09 May 2008	Front yard of home	Juvenile	J. Ardesana
7*	Patidar Chowk (22.2938 N & 70.7550 E)	09 May 2008	Front yard of home	Juvenile	R. Ardesana
*Two juvenile specimens were recorded at same time and location on 09 May 2008. #All specimen were not examined.					

and cold winter. The temperature ranges between 10°C and 44°C according to the season. The city is located on the banks of Aji and Nyari rivers (Bhadja & Vaghela 2013; Ardesana et al. 2017).

We found seven specimens of Lined Supple Skink in Rajkot City between 2004 and 2008 (Table 2). These specimens were identified with the help of literature (Boulenger 1890; Smith 1935).

The hitherto literature survey indicates the distribution of the species to be wide and scattered in peninsular India, with the most western distribution limit marked at Rajkot in Gujarat, the southern limit in Chidambaram in Tamil Nadu, and the northern limit in Bisarampur in Jharkhand (Vyas 2014). Recently, in October 2017, Lined Supple Skink was found in Karnavati Hotel (21.6278 N & 69.9475 E) in Kutiyana, Porbandar District, Gujarat. This place lies to the west of Rajkot and, therefore, it is possible that the species is distributed in the adjoining districts of Rajkot and Porbandar. In parts of its range, forest and grassland habitats are under threat due to expanding human settlements. Hence, surveys are needed to investigate the impact of the threats to the habitat on the populations of this species and to establish both the limits of its distribution and its occurrence within its known range.



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Ravi Ardesana¹, Bhavesh Trivedi², Rajan Jadav³, Rajdeep Jhala⁴, Pratik Joshi⁵, Milan Bharad⁶ & Jigar Ardesana⁷

^{1,7} 54, Gunjan-Vihar Society, PatidarChowk, Sadhu Vaswani Road, Rajkot, Gujarat 360005, India. Emails:

¹ardesanaravi@gmail.com (Corresponding author), ⁷jigarardesana@gmail.com

² 'SHREE', 42, Malaviya Nagar, Gondal Road, Rajkot, Gujarat 360004, India. Email: bhaveshatrivedi@gmail.com

³ 'DATAR', Nana Mava Main Road, Rajkot, Gujarat 360005, India. Email: rdjadav@gmail.com

⁴ 'RAMNIVAS', 38/B Parnakuti Society, Rajkot, Gujarat 360001, India. Email: rajdeep.jhala@gmail.com

⁵ 'MADHVI', Raiya Gam, Opp. Old Gram Panchayat Office, Rajkot, Gujarat 360005, India. Email: taxxak@gmail.com

⁶ 'OM VARENYAM', Indian Park-2, Nr. Gulmohar Residency, Raiya Road, Rajkot, Gujarat 360005, India. Email: drmilanbharad@gmail.com

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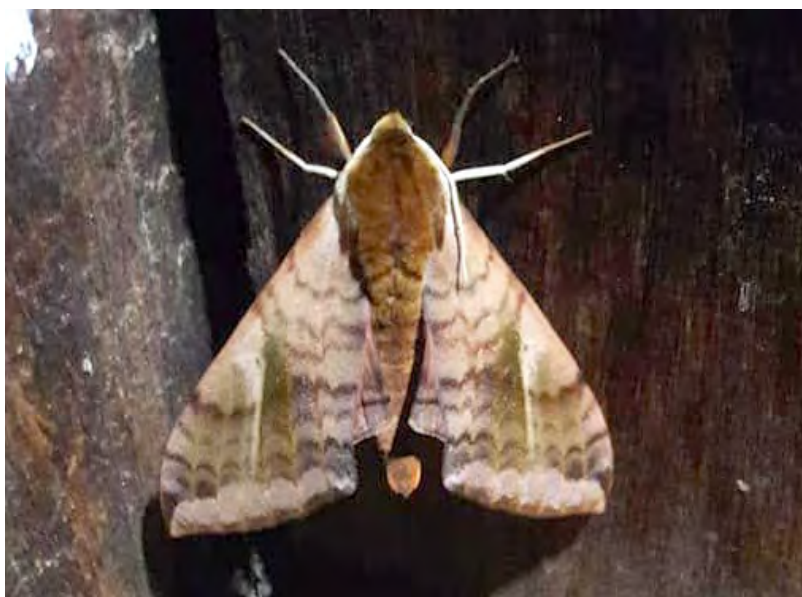
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Newsletter of the
Invertebrate Conservation & Information Network of South Asia (ICINSA)

WHITE-STREAKED HAWKMOTH

Report on the range extension of *Clanidopsis exusta* (Butler, 1875) from Bhutan



IUCN Red List:
Not Assessed

An adult *Clanidopsis exusta* (Butler, 1875) in Lungten Zampa Village, Trashigang, Bhutan. Photo credit: K. Jamtsho)

Insecta

[Class of Insects]

Lepidoptera

[Order of insect including butterflies and moths]

Sphingidae

[Family of Moths]

Clanidopsis exusta

[White-streaked Hawkmoth]

Species described by
Butler in 1875

The White-streaked Hawkmoth was described from Kunawur in Himachal Pradesh, India, as *Basiana exusta* Butler, 1875 (Butler 1876). Cotes & Swinhoe (1887) included this species under the genus *Clanis* (Hübner). Later, Hampson (1892) included the species in the genus *Ambulyx* Westwood based on its brief description. Finally, Rothschild & Jordan (1903) revised the species, proposed the new genera *Clanidopsis*, and included the species *Clanidopsis exusta* (Butler, 1875) as the single member of the newly proposed genus. *Clanidopsis* Rothschild & Jordan, 1903 belongs to the subfamily Smerinthinae of the family Sphingidae. It is distributed in the Oriental region and is

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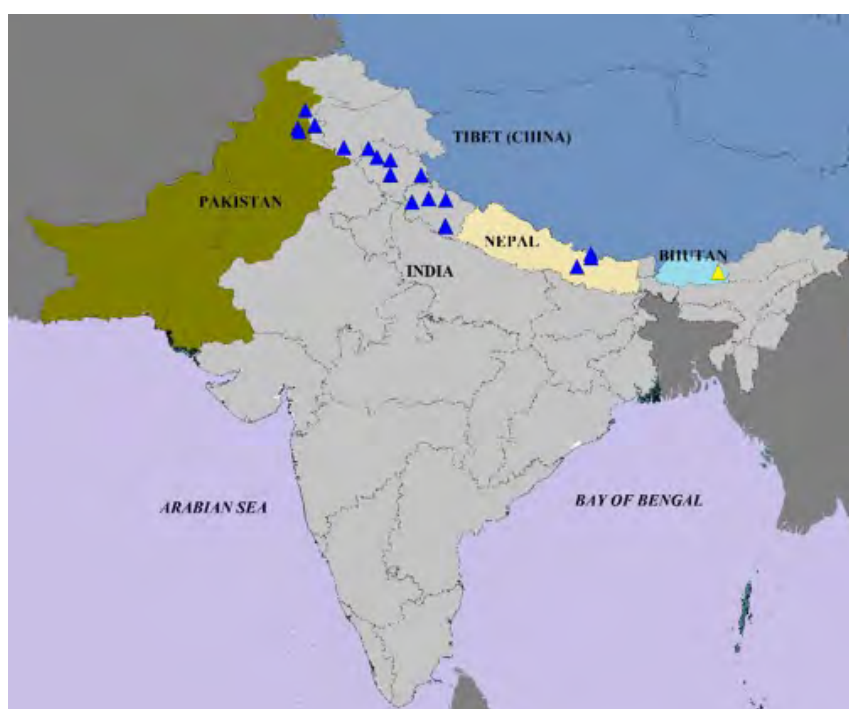
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monobasic (D'Abrera 1987). The species is known from Pakistan (Rafi et al. 2014; Younus & Kamaluddin 2015), India (Bell & Scott 1937; Bortolin et al. 1998; Smetacek 1994, 2008; Sanyal et al. 2018), central Nepal (Haruta 1992), and Tibet (China) (Pittaway & Kitching 2018) (Table 1).

The adult male of *C. exusta* has a length of about 76–96 mm and a wingspan of 96 mm (Bell & Scott 1937) and slightly resembles the

Global Distribution:
Northern Pakistan,
Northwestern India,
Central Nepal, China
(Tibet)



The distribution range of *Clanidopsis exusta* (Butler, 1875). Blue triangles - historical sighting localities, yellow triangle - new record from Lungten Zampa Village in Trashigang, Bhutan (prepared using DIVA-GIS 7.5.0 by J.S. Irungbam).

species of the genus *Clanis*. On comparison with the latter, however, *Clanidopsis exusta* is characterised by shorter proboscis, broader forewing, tibiae lacking spines, and absence of pulvilli and arolium (present in the species of *Clanis*). The upper side of the forewing is reddish-brown, dorsum of thorax is dark brown, forewing has a pale, irregular, indistinct submarginal band, and hindwing has two indistinct postmedian and

prominent submarginal and marginal dark lines (Bell & Scott 1937). The larvae of the species feed on the species of *Indigofera* (Fabaceae) (Bell & Scott 1937), but the caterpillar also feeds on the species of *Populus* (Salicaceae) (D'Abrera 1987).

Sighting of *Clanidopsis exusta* Butler, 1875

The moth was encountered on the night of 11 June 2018 at around 21.44h near a residential colony of Lungten Zampa Village (27.348°N & 91.619°E, 906m) under Samkhar Block, Trashigang District of eastern Bhutan. The vegetation in the neighbourhood is



Table 1: Sighting locations and distribution range of *Clanidopsis exusta* (Butler, 1875) (based on published literature)

	Location	Latitude	Longitude	Altitude	Reference
1	Lungten Zampa, Samkhar Geog, Trashigang, Bhutan	27.348	91.619	906	Present sighting
2	Kinnaur, Himachal Pradesh, India	31.650	78.475	3538	Type locality
3	Auli Forest, Joshimath, Uttarakhand, India	30.557	79.566	1771	Smetacek 1994
4	Gagar, Uttarakhand, India	29.415	79.544	2181	Smetacek 2008
5	Jones Estate, Uttarakhand, India	29.355	79.543	1420	Smetacek 2008
6	Kothi Guest House, Mandi, Himachal Pradesh, India	32.316	77.116	2521	Bortolin et al. 1998
7	Kara Forest, Mandi, Himachal Pradesh, India	31.683	77.116	1202	Bortolin et al. 1998
8	Bharmour, Chamba, Himachal Pradesh, India	32.442	76.532	2075	Bortolin et al. 1998
9	Bhanjiraru, Tissa, Himachal Pradesh, India	32.836	76.150	2000	Bortolin et al. 1998
10	Mussoorie, Uttarakhand, India	30.459	78.066	1987	Bell & Scott 1937
11	Northwestern Himalaya, Jammu & Kashmir, India	32.874	75.056	931	Sanyal et al. 2018
12	Western Himalaya, Uttarakhand, India	30.613	78.809	2934	Sanyal et al. 2018
13	Godavari Valley, Nepal	27.601	85.365	1439	Haruta 1992
14	Zhangmu, Tibet, China	27.987	85.983	2220	Pittaway & Kitching 2000
15	Nyalam, Xigaze, Tibet, China	28.155	85.982	3743	Pittaway & Kitching 2000
16	Kaghan Valley, Khyber Pakhtunkhwa, Pakistan	34.541	73.35	974	Rafi et al. 2014
17	Margala Hills, Islamabad, Pakistan	33.743	73.022	969	Rafi et al. 2014
18	Rawalkot, Pakistan	33.858	73.765	1670	Rafi et al. 2014
19	Ayub National Park, Rawalpindi, Pakistan	33.567	73.083	504	Rafi et al. 2014

dominated by chirpine (*Pinus roxburghii*) forest. The moth was attracted to the fluorescent light of a residential house. The first author captured the image of the moth and, later, the second author identified this species from the available literature (D'Abrera 1987; Haruta 1993; Pittaway & Kitching 2018). The status of a new record and range extension of the species to the country was confirmed by Mr. Peter Smetacek, Butterfly Research Centre, Bhimtal (India), (pers. comm. 12 June 2018).

Earlier studies show that this species of hawkmoth was not recorded from Bhutan. Additionally, while compiling the work on moths of Sikkim and Bhutan, Dudgeon (1901) did not record this species from the Bhutan. The expedition of the Natural History Museum, Basel (Switzerland), in 1972 did not encounter this hawkmoth in Bhutan (Dierl 1975). Recent studies of Irungbam & Kitching (2014) at Tsirang District of southern Bhutan and Gielis & Wangdi (2017) in eastern Bhutan also did not report the species from the country. The species, however, is quite common and frequently encountered in the northwestern and western part of Himalaya. Rafi et al. (2014) reported the presence of this hawkmoth from Kaghan Valley, Margala Hills, Rawalkot, and Ayub National Park of northern Pakistan. Younus & Kamaluddin (2015) also recorded the species from



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Khyber Paktunkhwa, Nathia Gali, Donga Gali (Azad Kashmir), and Rawalakot of northern Pakistan. In India, the species is reported from the states of Himachal Pradesh (Bortolin et al. 1998; Sanyal et al. 2018) and Uttarakhand (Smetacek 1994, 2008; Sanyal et al. 2018). In Nepal, the species is reported from the Godavari Valley of central Nepal (Haruta 1992). There, however, are no reports on the presence of the species in the neighbouring Indian states of Sikkim, Arunachal Pradesh, Assam, and West Bengal. Thus, the present sighting of the species in Trashigang District of eastern Bhutan is significant. It gives the first record on the presence of this species from Bhutan and the confirmed report of the species extending its distribution range eastward from its earlier range of distribution. It would be interesting to see the presence of the species in the neighbouring Indian states to check the further movement of the moth eastward.

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Karma Jamtsho¹ & Jatishwor Singh Irungbam²

¹ Trashigang Territorial Forest Division, Department of Forest and Park Services, Ministry of Agriculture and Forest, Trashigang District, Bhutan 42001.

² Faculty of Science, The University of South Bohemia, Ceske Budejovice, Branišovská 1760, Czech Republic 37005.

² Institute of Entomology, Biology Centre, Czech Academy of Sciences, Branišovská 1160/31, Ceske Budejovice, Czech Republic 37005.

Emails: ¹jamtshokarsel@gmail.com; ²jatishwor.irungbam@gmail.com (Corresponding author)

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For communication contact:

The Editor, ZOO/CPSG South Asia office

12, Thiruvannamalai Nagar, Saravanampatti PO, Coimbatore 641035 TN India

Phone: +91 9385339862; Email: daniel@zooreach.org



HIMALAYAN GRIFFON

Rescue and treatment of *Gyps himalayensis* in Odisha, India



IUCN Red List:
Near Threatened
(BirdLife International, 2017)

Rescued Himalayan Griffon (HGV) under study: A - Case 1 HGV during treatment period, B - Case 1 HGV housed with Long-billed Vulture after recovery, C - Case 2 HGV during treatment period, D - Case 3 HGV during treatment period, E- Case 4 HGV, F - Cases 1&4 HGVs housed together, G - Case 5 HGV during treatment. (Photo credit: A,C&G - Sarat Kumar Sahu; B,D,E&F - Rajesh Kumar Mohapatra)

Aves
[Class of Birds]

Accipitriformes
[Order of the diurnal birds of prey]

Accipitridae
[Family of birds of prey]

Gyps himalayensis
[Himalayan Griffon]

Species described by Hume in 1869

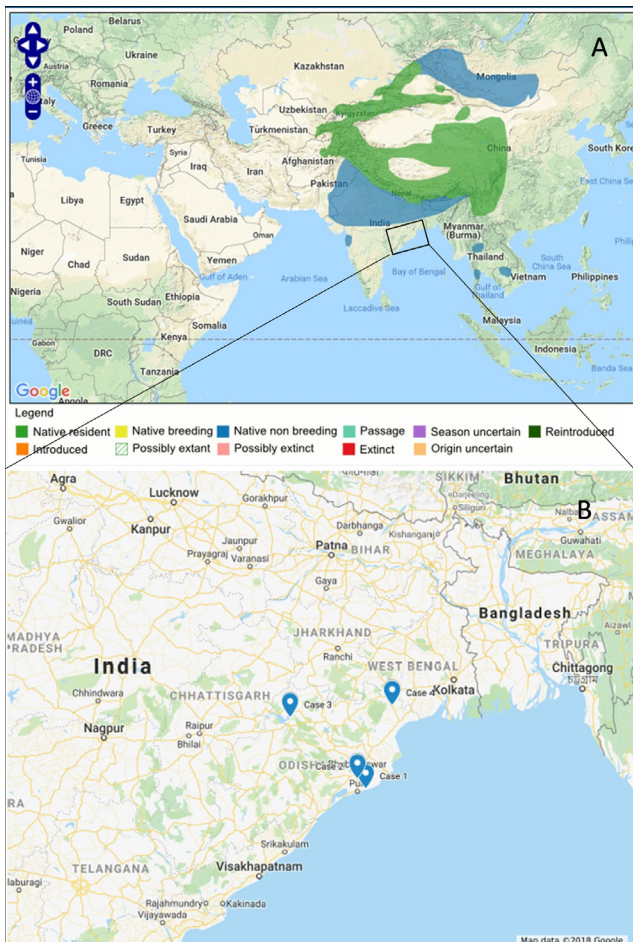
Five Himalayan Griffon were rescued during the period December 2014 to November 2018 from different parts of Odisha, eastern India. The rescued birds were brought to Nandankanan Zoological Park (NKZP), Odisha for treatment.

Case 1: An individual was rescued from Balukhand range in Puri forest division of Odisha on 20 December 2014 in a recumbent state. It was brought to the NKZP in a critical condition for treatment. At receipt, the vulture weighed 6.6kg with a wingspan

of 260cm. The bird was treated with administration of Intacef Tazo¹ 200mg, Melonex² 3.5mg intramuscular (IM), and local dressing of the wound. Vimeral³ and Polybion⁴ liquids were provided with drinking water. On 21 January 2015, the vulture had recovered from the injury, with a good health condition.

Global Distribution:
Native: Afghanistan, Bangladesh, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Malaysia, Mongolia, Myanmar, Nepal, Pakistan, Tajikistan, Thailand, Uzbekistan.
Vagrant: Cambodia, Singapore, United Arab Emirates (BirdLife International 2017)

Case 2: An individual was rescued from Pipili NAC, Balipatna Range under Khurdha Forest Division. At the time of receipt at NKZP on 30 December 2015, it was in lateral recumbence state with intermittent convulsion. Toes of



Distribution of Himalayan Griffion: A - global distribution, B - site of rescues in Odisha, India, during the study period

both limbs were curled up with soiled cloaca. The bird weighed 7.1kg with a wingspan 270cm. It was administered with Intacef Tazo 200mg daily IM for five days along with Melonex 3.5mg IM. After five days of treatment, it showed remarkable improvement in its health condition. It started taking chicken meat on the fifth day with improved activity. It was, however, again observed with dullness on the 19th day with anorexia, drooping of wings, and foul-smelling with watery droppings. Treatment was given with Mikacin⁵ 125mg daily IM with lactobasilus and electrolytes in drinking water. Unfortunately, the bird died on the 20th day. Postmortem examination revealed that death was due to hemorrhagic enteritis.

Case 3: An individual was rescued from Suleipal Village Forest, Rengali section, Kanihan range of Angul Forest Division and

¹Intas Pharmaceuticals Ltd. Ahmedabad, Gujarat 380054, India.
²Intas Pharmaceuticals Ltd. Ahmedabad, Gujarat 380054, India.
³Virbac Animal Health India Pvt. Ltd, Borivali (East), Mumbai, Maharashtra 400066, India.
⁴Merck Ltd., Vikroli, Mumbai, Maharashtra 400079, India.
⁵Aristo Pharmaceuticals Pvt. Ltd., Ballard Estate, Mumbai, Maharashtra 400001, India.

received at NKZP on 24 January 2017 in dullness with curled toes and drooping of wings and head. Physical examination of the bird revealed injury in the right wing. The bird weighed 6.8kg with a wingspan of 268cm. It was treated with Intacef Tazo 200mg daily IM along with Melonex 3.5mg IM. The health conditions of the bird, however, did not improve and it died on the third day. Postmortem examination of the bird revealed that death was due to hemorrhagic enteritis and septicemia.

Case 4: An individual was rescued on 10 March 2018 and received at NKZP on 11 March 2018. At receipt, the vulture was found dull with injury in legs. The vulture was kept at quarantine. Regular dressing was carried out with Betadin⁶. The vulture gradually showed improvement. On completion of the quarantine period (one month), it was housed with the other vultures at NKZP.

Case 5: An individual was rescued from Dara, Durgamaandap of Talcher range of Angul Forest Division, on 10 December 2018 and received at NKZP on 15 December 2018. It was suffering from diarrhoea and observed with drooping of the head, dullness, respiratory distress, and anorexia. It was treated with administration of antibiotic Taxim⁶ 125mg IM and Optineuron⁷ 0.5ml IM. The health condition of the vulture, however, did not improve and it died on 02 January 2019.

The vultures were identified based on diagnostic characters described in the literature (Alström 1997; Grimmett et al. 2011; Praveen et al. 2014; Kazmierczak 2015) and distinguished from *G. indicus* and *G. fulvus*.

The adults remain for most of the year in the breeding grounds while juveniles wander into the plains of southern and southeastern Asia in winter (Naoroji 2006; Rasmussen & Anderton 2012). Like many other large raptors, the juveniles of Himalayan Griffon wander a lot and are not good at finding food. Due to stress, exhaustion, and/ or injury, they come down to the ground and, in some cases, get rescued. All the birds in the present study were also in exhausted condition at the time of rescue and were suffering from injuries to their wings and/ or limbs, indicative of their long migration. Besides, they were suffering from gastrointestinal infections that were revealed in the two postmortem examinations, also indicative of stress.

⁶Alkem House, Senapati Bapat Marg, Mumbai, Maharashtra 400013, India.

⁷Lupin Ltd., Vapi, Gujarat 396195, India.

Though there are reports on the vagrancy of *G. himalayensis* to northeastern, northwestern, and southern India, no record of sighting or occurrence of the species in Odisha was found in the available literature (Grimmett et al. 2011; Rahmani & Nair 2012; Rasmussen & Anderton 2012; Praveen et al. 2014; Kazmierczak 2015; BirdLife International 2017). It is possible that these individuals were vagrants like an earlier reported sighting of juvenile Himalayan Griffon (Praveen et al. 2014). The present observation reports the extension of the range of Himalayan Griffon to Odisha in eastern India.

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Rajesh Kumar Mohapatra¹, Sarat Kumar Sahu², Sudarsan Panda³, Jayant Kumar Das⁴ & Hari Shankar Upadhyay⁵

^{1,2,4&5} Nandankanan Biological Park, Barang, Bhubaneswar, Odisha 754005, India.

Email: rajesh.wildlife@gmail.com (Corresponding author)

² o/o, RCCF, Angul, Odisha 759122, India

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BAR-HEADED GOOSE

First record of migratory bird *Anser indicus* in Gangdua Dam of Bankura District, West Bengal, India



Bar-headed Goose in Gangdua Dam (24 March 2016). a,b,c - a flock of eight individuals of Bar headed Goose, d - southwestern view of Gangdua Dam, Bankura, West Bengal, India. Photo: Ananya Nayak

IUCN Red List:
Least Concern
(BirdLife International, 2018)

Aves
[Class of Birds]

Anseriformes
[Order of screamers and waterfowl]

Anatidae
[Family of ducks, geese and swans]

Anser indicus
[Bar-headed Goose]

Species described by Latham in 1790

The bird life of West Bengal is very rich with 861 reported species including some extremely rare ones (Rahmani et al. 2016). Gangdua Dam or Sali Reservoir (23.405°N & 87.082°E) was constructed on river Sali in Gangajalghati Block of Bankura District in 1978. With a length of 1,494m, the dam mainly serves local farmland irrigation and as a drinking water supply project. A large number of terrestrial and aquatic birds are attracted to the wetland due to the wide variety of habitats occurring near it. The dam is a wintering ground for some migratory bird species. No comprehensive and critical study, however, has been conducted so far on the avian species of the dam.

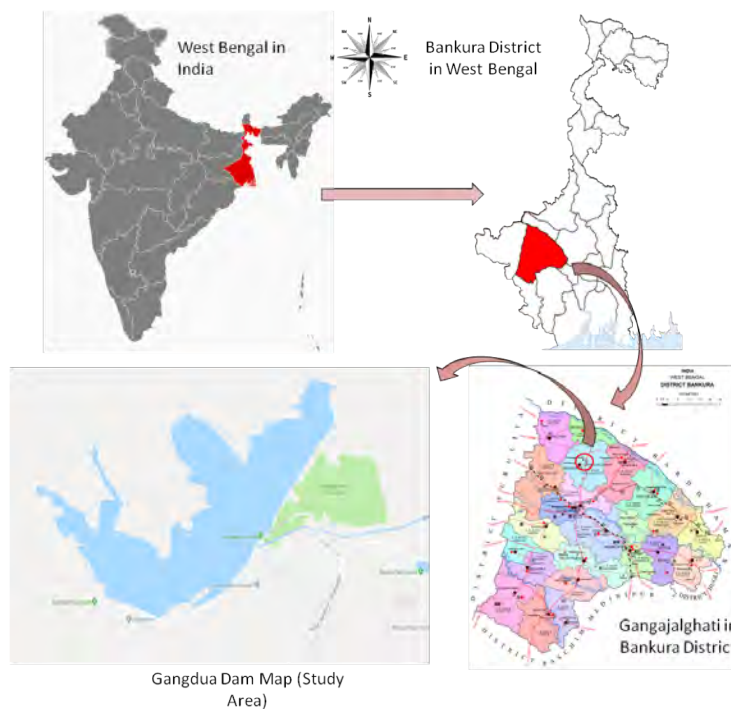
The Bar-headed Goose *Anser indicus* is a monotypic species with a global population of <60,000 individuals in the wild and is distributed throughout India, Bangladesh, Mongolia,

and areas of western and central China (Zhang et al. 2011; Takekawa et al. 2013). The breeding range of this migratory bird extends from Kyrgyzstan to central China, up to Mongolia (Wurdinger 2005; Takekawa et al. 2013). India has a number of wintering grounds that attracts nearly 25–50 % of the world population of this visitor (Javed et al. 2000; Takekawa et al. 2013). To reach its winter terminus in India, these birds migrate over 5,000km from its breeding range in China and Mongolia (Hawkes et al. 2014).

Global Distribution:
 Native: Afghanistan, Bangladesh, Bhutan, China, India, Kazakhstan, Kyrgyzstan, Mongolia, Myanmar, Nepal, Pakistan, Russia, Tajikistan, Thailand, Uzbekistan, Viet Nam.
 Introduced: Canada, Spain
 Vagrant: Guam, Japan, Laos, Micronesia, Palau (BirdLife International 2018)

A number of satellite-controlled studies confirmed that the Bar-headed Goose can fly over the Himalaya at altitudes greater than 5,000m, making it one of the highest flying birds with physiologic traits adapted for sustaining flight at high altitude (Hawkes et al. 2011; Zhang et al. 2011; Takekawa et al. 2013; Scott et al. 2015). Further anecdotal reports support its flying over the highest peaks in the Himalaya, including Mount Everest (Takekawa et al. 2013; Hawkes et al. 2014). Several studies reported that some of its populations are facing many threats in the wild as a result of wetland loss in over-wintering areas, severe climate change-induced habitat alteration on portions of its breeding range, hunting pressure, and susceptibility to diseases like the highly infectious avian influenza H5N1 (Gole 1997; Wang et al. 2008; Takekawa et al. 2013; Batbayar et al. 2014).

The Central Asian Flyway (CAF) covers a large continental area of Eurasia between the Arctic Ocean and the Indian Ocean and comprises several important and overlapping migration routes for different species of waterbirds, most of which extend from Siberia to southern and southwestern Asia (Mundkur 2006). A study by Palm et al. (2015) showed an estimated migration route that includes many districts of West Bengal as the flight corridor of Bar-headed Goose in the CAF.



Gangdua Dam in Gangajalghati block of Bankura District, West Bengal, India (Source: Maps of India & West Bengal from Wikipedia; Bankura District from Census of India 2011, Government of India; Gangdua Dam from Google)

in different parts of southern Bengal districts (Mazumdar et al. 2007; Sinha et al. 2011, 2012; Khan et al. 2016). None of the studies, however, reported the presence of Bar-headed Goose in any part of Bankura and Purulia districts. The present study reports the first sighting of the Bar-headed Goose from Bankura District of West Bengal.

On 24 March 2016, at 11.20h, the author first noticed a flock of eight geese swimming in the Gangdua Dam of Bankura District, West Bengal. A few images were taken using a Sony DSC-H400 compact camera with 63x optical zoom to support further identification. The birds were identified based on physical features with the help of standard field guides (Ali 2002; Grimmett et al. 2011). The geese were again observed on 25, 27, and 28 March. No Bar-headed Goose, however, was documented in the author's next visit to the dam on 04 April.

A flock of 11 Bar-headed Geese was spotted again in the afternoons of 12 and 13 March 2017. This time no photographic documentation was made. Birds were identified using a binocular (Olympus 10×50). A large body of anecdotal evidence collected from the local villagers suggests that these geese have been visiting the dam for several years. The author visited the dam regularly from December to April 2018 but could not find any Bar-headed Goose.

Recently, a number of anthropogenic disturbances were noticed in and around Gangdua Dam such as crop residue burning, water pumping activity from the middle of the dam, overnight fishing, the establishment of a cell tower near the dam, and tourist overcrowding at the newly established ecologic park. These activities might constitute the underlying cause for the distraction of these birds from visiting the dam last year. Further studies are needed to establish the complete migratory route of these birds in Bankura and other southern Bengal districts. Finally, there is an urgent need for generating public awareness to restore the ecologic balance of the dam, making it a safe zone for Bar-headed Goose and other migratory birds.

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Ananya Nayak

Department of Zoology, Bankura Sammilani College, Kenduadihi, Bankura, West Bengal 722102, India.
Email: ananya0001@gmail.com (Corresponding author)

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FALSE IRONWORT

Hyptis capitata: a new flora record for Tamil Nadu, India



Flowering twig of *Hyptis capitata* in Coimbatore District, Tamil Nadu. Photo: S. Jagathes Kumar

IUCN Red List:
Not Assessed

Magnoliopsida

[Class of Dicotyledonous plants]

Lamiales

[Order of flowering plants]

Lamiaceae

[Family of mints]

Hyptis capitata

[False Ironwort]

Species described by
Jacq.

Lamiaceae is one of the largest families of flowering plants, consisting of 250 genera and about 7,200 species distributed throughout the world. The subtribe Hyptidinae of Lamiaceae consists of seven genera, of which *Hyptis* is the largest with over 300 species (Harley 1988). In India, *Hyptis* is represented by four species (Mukerjee 1940). In Tamil Nadu, two species, namely, *H. pectinata* and *H. suaveolens*, were reported (Henry et al. 1987). The present collection of *Hyptis capitata* forms an addition to the flora of Tamil Nadu.

Hyptis capitata Jacq. Icon. Pl. Rar. 1: 11. T. 114. 1781-86; Benth. in DC. Prodr. 12: 106. 1848; Mukerjee, Rec. Bot. Surv. India. 14: 63. 1940; Varghese, J. Bombay Nat. Hist. Soc. 76: 200. 1979; Sivarajan et al., J. Econ. Taxon. Bot. 7: 224-225. 1985; Mandar et al., Ind. J. For. 30(3): 355-356. 2007.

Undershrubs up to 1m high. Stem profusely branched, quadrangular, shallowly furrowed on the sides. Leaves c. 15cm×8cm, broadly ovate-elliptic, serrate at margins, acute at apex, hairy on both surfaces; petioles up to 5cm long. Inflorescence of axillary or terminal, globose heads, c. 2–3 cm across; upper flowering heads smaller c. 1–2 cm across; lower fruiting heads larger, c. 2–4 cm across. Peduncles 3–6 cm long. Bracts 7–8, ovate-oblong, acute, long ciliate along margins at the base. Calyx tubular, tube 1–3 mm long, lobes five, c. 1.5mm across, equal, linear, margin slightly hirsute. Corolla white, 3–3.5 mm long, tube 2mm long, upper lip two-lobed, lobes broader, lower three-lobed, lobes narrow, middle lobe large, deflexed, obtuse at apex, ciliate on the ventral side, side two-lobed, lobes small, acute at apex. Stamens four, didynamous, slightly exerted,

Global Distribution:

Native: Florida, Mexico, Central America, the West Indies and South America.
Naturalized: Australia, Southeast Asia, some tropical islands and India (Kerala, Goa and Tamil Nadu)

filaments c. 1mm long, anther locules confluent. Style glabrous, c. 4mm long; stigma bifid. Nutlets four, elliptic-ovoid, subtrigonus, reddish-brown, c. 0.7mm across.

Flowering and fruiting:

September–January.

Habitat: Very rarely found in

rocky areas of Bhavani riverside near Vajinampalayam Village, Coimbatore District, Tamil Nadu.

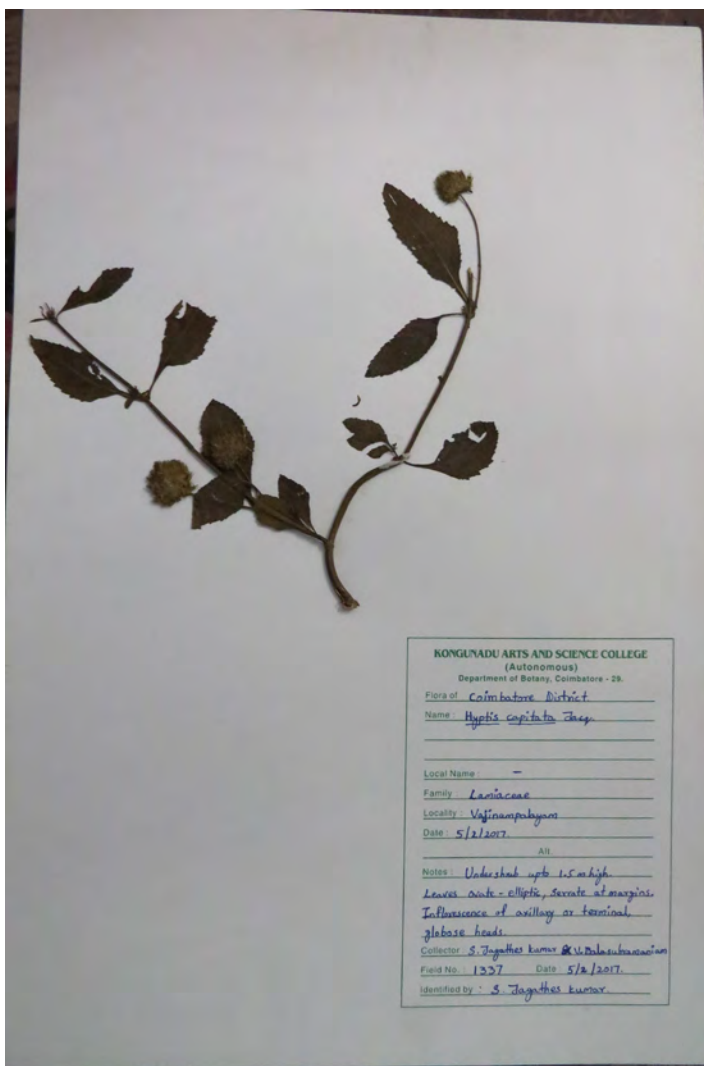
Specimen examined:

1337 (KASCH), 05.ii.2017, India, Tamil Nadu, Coimbatore District, Vajinampalayam, coll. S. Jagathes Kumar & V. Balasubramaniam (11.3371 N & 76.9831 E).

Global Distribution: It is

native to Florida, Central America, the West Indies and South America but naturalized in Australia, Southeast Asia and some tropical islands.

In India: Kerala, Goa and Tamil Nadu.



Herbarium sheet of *Hyptis capitata* (1337 KASCH)

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Shanmugam Jagathes Kumar¹ & Velusamy Balasubramaniam²

^{1,2}PG and Research Department of Botany, Kongunadu Arts and Science College (Autonomous), Coimbatore, Tamil Nadu 641029, India. Emails: ¹jagathesbio@gmail.com (Corresponding author), ²vbalu61@yahoo.co.in

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DUGONG

Opportunistic sighting of *Dugong dugon* from the nearshore waters of South Andaman



© Kumar Kashyap

Dugong sighting at Burmanallah, South Andaman, India

IUCN Red List:
Vulnerable (Marsh & Soltzick 2015)

Mammalia
[Class of Mammals]

Sirenia
[Order of large aquatic herbivorous mammals]

Dugongidae
[Family of dugongs]

Dugong dugon
[Dugong]

Species described by
Müller in 1776

Dugong is the only herbivorous mammal that is strictly marine (Marsh et al. 1982). It is long-living and feeds exclusively on seagrass, especially those belonging to the genera *Halodule* and *Halophila* (Marsh et al. 1999). It is generally found in shallow waters spending 72% of their day in depths <3m (Chilvers et al. 2004), but were also observed in waters up to depths of 37m (Ripple & Perrine 1999). Dugong and all other marine mammals are protected under Schedule I of the Wildlife (Protection) Act, 1972 in India (Vivekanandan & Rajagopalan 2011). In India, its presence was recorded at Palk Bay, Gulf of Mannar, Gulf of Kuchchh, and Andaman & Nicobar Islands (D'Souza & Patankar 2011; Vivekanandan & Jeyabaskaran 2012; D'Souza et al. 2013; Malakar et al. 2015; Venu & Malakar 2015). Declared as the state animal of Andaman & Nicobar Islands, Dugong was once abundant in the islands, but its

abundance and distribution are poorly known at present, with only around 200 individuals present along the coastline of India (D'souza & Patankar 2011; Sivakumar 2013). The decline in the population of the animal was recorded by about 60% over the last two decades in Andaman & Nicobar Islands (D'souza et al. 2013). Sightings of marine mammals play an important role in understanding their diversity, distribution, abundance, and behaviour patterns. Reporting on opportunistic sightings is important data as a dedicated system of long-term monitoring on marine mammals is still lacking in Indian waters (Malakar et al. 2015).

Dugong was sighted opportunistically in shallow nearshore waters of Burmanallah, South Andaman (11.577° N, 92.741° E) on 28 April 2018 during one of the regular coral reef surveys while snorkelling. Images and videos of the mammal were taken using Canon PowerShot G1X Mark II camera with Canon WP-DC53 waterproof case. The species was identified following Vivekanandan & Jeyabaskaran (2012). The coordinates of the location were recorded using a handheld GPS device (Garmin etrex Vista H).

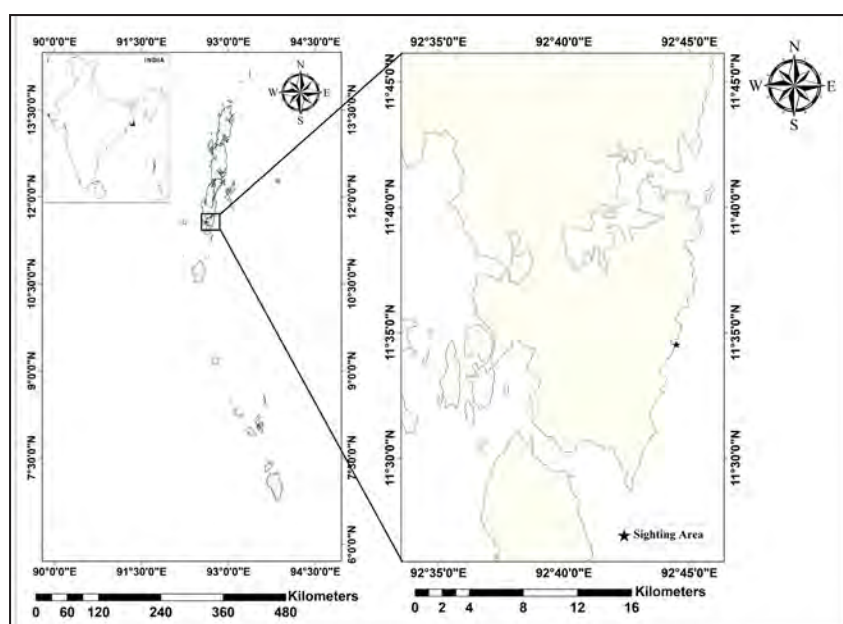
The animal was observed first when it approached one of the authors swimming at the reef edge where the sandy bottom begins. This approach behaviour of the animal can be regarded as the observer-directed behaviour mentioned in D'Souza & Patankar (2009). The animal disappeared for 1–2 min before reappearing for a longer stay.

The animal was healthy and about 3–3.5 m in length. Sex of the animal could not be determined because of poor visibility. It stayed with the authors, swimming for about 4–5 min at an approximate distance of 1–2 m before disappearing towards the north into deeper waters. The depth at the site was 5–6 m.

Marine mammals play very essential roles in the marine ecosystem. They

Global Distribution :

Native: Australia, Bahrain, Brunei Darussalam, Cambodia, China, Cocos (Keeling) Islands, Comoros, Djibouti, Egypt, Eritrea, India (Andaman Is., Laccadive Is., Nicobar Is.), Indonesia, Japan (Nansei-shoto), Jordan, Kenya, Madagascar, Malaysia, Mayotte, Mozambique, New Caledonia, Palau, Papua New Guinea (Bismarck Archipelago), Philippines, Qatar, Saudi Arabia, Seychelles, Singapore, Solomon Islands, Somalia, Sri Lanka, Sudan, Tanzania, Thailand, Timor-Leste, United Arab Emirates, Vanuatu, Viet Nam, Yemen (Socotra)
Regionally extinct: Mauritius, Taiwan (Marsh & Soltzick 2015)



The study site at Burmanallah, South Andaman, India

are the apex predators, primary or secondary consumers, and also indicators of marine ecosystem health (Dierauf & Gulland 2001; Wells et al. 2004; Estes et al. 2011). Hunting, accidental bycatch, and habitat destruction make Dugong endangered (Vivekanandan & Jeyabaskaran 2012). This is the second sighting of the animal in Burmanallah after Malakar et al. (2015) sighted the animal five years ago.

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Kumar Kashyap¹ & Sasidharan Venu²

^{1,2} Department of Ocean Studies and Marine Biology, Pondicherry University, Port Blair, Andaman & Nicobar Islands 744112, India. Email: s.venu1974@gmail.com (Corresponding author)

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DHOLE

Snake in the diet of *Cuon alpinus* (Pallas, 1811) in Kalakad-Mundanthurai Tiger Reserve, Tamil Nadu



Dead specimen of *Uropeltis* sp. showing its dorsal and ventral view recovered from the scat of *Cuon alpinus*

IUCN Red List:
Endangered
(Kamler et al. 2015)

Mammalia
[Class of Mammals]

Carnivora
[Order of Carnivores]

Canidae
[Family of canids]

Cuon alpinus
[Dhole]

Species described by
Pallas in 1811

Dhole or Asiatic Wild Dog *Cuon alpinus* is a pack-living, social carnivore of Asian forests. As stated by the International Union for Conservation of Nature (Kamler et al. 2015) only about 949-2215 mature–3000 individuals of the species are left in the wild and its population is under severe threat due to anthropogenic pressure, prey availability, habitat loss and retaliation (Acharya 2007). Despite its endangered status, this splendid canid receives less conservation attention, unlike its sympatric felids. It is distributed in various habitats from scrub jungle to alpine meadows and eats a number of prey items (Selvan et al. 2013). Food habits of the Dhole were studied in some of the ranges where it is distributed. The species selects larger prey such as Gaur *Bos gaurus* and Sambar *Rusa unicolor* and medium-sized prey such as Chital *Axis axis* and Wild Boar *Sus scrofa* (Johnsingh 1992; Karanth & Sunquist 1995, 2000; Ramesh et al. 2012; Selvan et al. 2013). Dholes are experts in relying on hunting techniques wherein they coordinate with

each other to exhaust the prey before it is eaten alive (Durbin et al. 2004). A study from Pakke Tiger Reserve emphasized that the Dhole's major preferred prey is Wild Boar, which is extremely challenging and risky to handle (Selvan et al. 2013); however, southern (Kumaraguru et al. 2010) and central Indian studies (Acharya 2007) stated that the species does not prefer risky prey.

Here we report the first observation of snake in the diet of Dhole. The observation was made in Kalakad-Mundanthurai Tiger Reserve in Tamil Nadu (KMTR), located at the southernmost end of the Western Ghats in the Ashambu hills (Johnsingh 2001) in India. We were collecting scat samples in the region as part of a preliminary study that is underway to understand the ecology of sympatric large carnivore interactions, and their prey selection and food habits.

On 5 March 2016, we collected the scat of an Asian Wild Dog in Naalumukku Tea Plantation of Bombay Burma Trading Corporation of Ambasamuthiram range of KMTR (N08°32'25.0"/E 077°21'14.5"; 319m elevation). This is the largest and prominent estate in KMTR with tea, cardamom, coffee, and eucalyptus plantation in an area of 3,391ha (Ali & Pai 2001). The Asian Wild Dog scat was confirmed based on its size, shape, and ancillary signs such as scratch and pugmark. Dholes generally consume grass and other vegetation (Barnett et al. 1980; Johnsingh

1983; Durbin et al. 2004; Bashir et al. 2013). It seems that the individual was suffering from digestive problems as the scat contained no remains of birds or mammals such as feathers, fur, teeth, bones, and claws; it contained only grass and the remains of a snake. As the snake was partially digested, we couldn't identify the species beyond the genus *Uropeltis* (total length c. 16.18cm). The present observation was corroborated with previous literature. Rice (1986) stated that Dholes obviously, occasionally, and opportunistically feed on lizards or snakes. He also observed a reptile in Dhole scat collected at Eravikulam National Park in Kerala, though it was uncertain whether it was a lizard or a snake. In the present observation, it is not clear whether the Dhole purposefully consumed the snake or it was accidentally

Global Distribution :

Native: Bangladesh, Bhutan, Cambodia, China, India, Indonesia, Laos, Malaysia, Myanmar, Nepal, Thailand
Possibly extinct: Viet Nam
Regionally extinct: Afghanistan, Kazakhstan, Korea, Kyrgyzstan, Mongolia, Russia, Singapore, Tajikistan, Uzbekistan
(Kamler et al. 2015)



Fresh scat of Dhole *Cuon alpinus* found in a tea estate at Kalakad-Mundanthurai Tiger Reserve, Tamil Nadu

consumed while the individual was feeding on grass. Further investigations are required to have a better understanding of the role of snakes in the diet of the endangered canid.

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B.M. Krishnakumar¹, R. Nagarajan², K. Muthamizh Selvan³ & T. Thinesh⁴

¹ Junior Research Fellow, Salim Ali School of Ecology and Environmental Science, Pondicherry University, R.V. Nagar, Kalapet, Puducherry 605014, India.

^{1,2} PG and Research Department of Zoology and Wildlife, Mannampandal, Mayiladuthurai, Tamil Nadu 609305, India.

³ Scientist D/Joint Director, Project Elephant, Ministry of Environment Forest and Climate Change, Indira Paryavaran Bhawan, New Delhi 110003, India

⁴ Kotharik Post-Doctoral Fellow, Department of Microbiology, Pondicherry University, R.V. Nagar, Kalapet, Puducherry 605014, India

Emails: ¹krishnakumarnympha@gmail.com, ²Oystercatcher@rediffmail.com; ³tamildove@gmail.com (Corresponding author)

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Animal Welfare Fortnight - 2019 at Tata Steel Zoological Park, Jamshedpur

“Do not kill animals, kill the animals inside you”
India abounds in animal laws that contain details governing the use and treatment of domestic and wild animals, but loop-holes in governance their implementation and awareness leave a lot to be desired. Sometimes this also leads to inhumane treatment of animals, so in order to understand these laws help to create awareness amongst people of Jamshedpur, the animal welfare fortnight celebration was organized at Tata zoo with the main purpose to spread awareness among the younger generations about the welfare of animals by standing against cruelty.

The celebration started on 16 Jan 2019 with “Nukkad Natak (street drama)” and continued till 30 January. Radhika Singh Secretary, TSZS was guest for the startup day.

Apart from this around 517 students participated from 8 different schools namely Motilal Nehru Public School, Children Home Ghaghidih, Burmaminse Primary and



A street drama on animal conservation theme



“Keeper Talk” on African Lion and Tiger

Middle School, NML Kerala Public School, Kerala Public School Burmamines, Adarsh Siksha Niketan Adityapur, Dayawanti Public School Chandil and local NGO, “Anwasha”. To achieve the objective many activities were organized such as “Lecture on importance of wildlife conservation in respect to their welfare”, Exploration of life of captive animals through zoo visit, “Touch and Learn Program”, Film show on Wildlife and Keeper Talks on Tiger, Sloth Bear, Mandrill and Butterfly.

The author gave insight on animal welfare during the entire fortnight. The celebration of the fortnight was successfully completed with the young ones leaving with immense knowledge on animal welfare.

The author and her education team viz; Pratap Gill and Bharti (Zoo volunteers) organized the entire fortnight celebrations.

Submitted by Seema Rani, Biologist cum Education Officer, Tata Steel Zoological Park, Jamshedpur. Email: cmarani00@rediffmail.com

World Wetlands Day 2019 at Tata Steel Zoological Park, Jamshedpur



Lecture on “Importance of wetlands and their sustainable use”

As cities grow and demand for land increases, the tendency is to encroach on wetlands which lead to decreasing of surface area of wetlands and subsequently all other uses. Today's current development of human settlements is a major concern for wetland conservation. World Wetlands Day is celebrated all over the world every year on 2 February to create awareness among the public, discuss the value of wetlands, its beneficial aspects as well as to promote its conservation and use for enhancing the overall level of the human health, growth and development.

Jamshedpur is also on the journey towards being one of the developed cities of the world. On this journey our city is losing its natural wetlands. These wetlands are being destroyed to construct buildings and houses. To make the general public as well as school children of Jamshedpur aware of this crisis, Tata Zoo organized a program to celebrate World Wetland Day.

The main purpose of this celebration was to spread the message of wetland conservation and its importance in human life to the audience present. Tata Steel Zoological Park organized a lecture on “Importance of wetlands and their sustainable use by Dr. Hishmi Jamil Husain, Head, Environment and Forest Management Raw Material- Strategy Group, Tata Steel Ltd at Nature education centre. A total of 135 School children from rural areas participated. The program was coordinated by the author along with her education team: Pratap Singh Gill, and zoo volunteer, Bharti.

Submitted by Seema Rani, Biologist cum Education Officer, Tata Steel Zoological Park, Jamshedpur. Email: cmarani00@rediffmail.com

World Wildlife Day celebration at Nehru Zoological Park, Hyderabad, Telangana



Snake awareness programme

World Wildlife Day was celebrated on 3 March, 2019 at Nehru Zoological Park, Hyderabad to promote the importance of aquatic eco-systems and their contribution in maintaining ecological balance. On 20 December 2013, at its 68 session, the United Nations General Assembly (UNGA) proclaimed 3 March, the day of signature of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), as UN World Wildlife Day to celebrate and raise awareness of the world's wild animals and plants. This year's theme "Life Below Water: for People and Planet" was explained to the visitors and school children through talk shows and quiz programmes were also conducted on the theme.

The visitors were given information on various aquatic eco systems, species diversity, habit and habitat, life span, sexual maturity and status



Kshitija IFS, Curator, interacting with students and visitors on the importance of the day

in the wild. The Zoo Education Officer, Zoo Biologists and Shaik Hussain Project Scientist, Universal Eco Foundation, Puducherry, organised these talk shows and programmes with the help of Friends of Snakes and other wildlife educationists. Crocodile show, snakes show and talk shows were conducted and emphasis was laid on the species diversity of all categories of wetlands, biology of species and conservation of wetlands.

Munindra, IFS, Addl PCCF (Admin) and Wildlife; Dr. Sidhanand Kukrety, IFS, Director, Zoo Parks; Kshitija, IFS, Curator; Syed Maqsood Mohiuddin, ACF; and Bhavani Shankar, AC-2 of NZP attended the programme. Speaking on the occasion Munindra, emphasized the importance of wetland ecosystems and urged everyone to conserve them for sustainability and maintenance of ecological balance.

Submitted by: B. Laxmi Narayana*, Biologist, M. Sandeep, Biologist and H.M. Hanifulla, Education Officer, Email: narayana.laxmi8@gmail.com



Students posing with tiger and lion masks

ZOO'S PRINT

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.

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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



