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Vint Marrie Barris



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Cover photo: Smooth-coated Otter at Kiliyur Lake by T. Siva.

STOP THE INVADERS TThe Brown The Shake

Wild Young Minds

Brown tree Snakes are

Ovange!

is Invasive To

Indepesid

Don't support exotic pet sellers and traders. If you come across an invasive vol. 367 Nol 2021 Animal Control.

Just because we want a certain pet, we are releasing animals in places they don't belong. Invasive animals are animals that don't belong in a habitat. They are usually brought there by pet trade. They can harm the native animals.



Avyukt Dev Shome, Bengaluru Age: 8 years The Brown Tree

snake is native to Australia.

Zoo's Print

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# Remarkable predatory skills in Mugger Crocodiles makes them the apex predators of freshwater ecosystems



Image 1. A Mugger or Marsh Crocodile *Crocodylus palustris* reigning over freshwater ecosystems as the ultimate predator. ©Raju Vyas.

Among Indian reptiles, the Mugger or Marsh Crocodile *Crocodylus palustris* is known to be one of the most intelligent and skilful predators in the freshwater ecosystems (Image 1). This species preys upon a variety of animals, including small insects and large mammals (Stevenson 2019); even the hatchlings feed on diverse prey species – such as insects, amphibians, fishes, and crustaceans. As they grow, the adults graduate to feed on larger vertebrates like fish, turtles, lizards, larger snakes (pythons), birds, monkeys, leopards, and livestock (Daniel 2002; Bhatnagar & Mahur 2010; Murugan et al. 2020). However, they are capable of attacking even larger mammals such as buffaloes, Sambar, and Spotted Deer, and occasionally humans too (de Silva 2013; Choudhury & de Silva 2013). It has been observed that the larger adults later shift their predatory habits completely towards larger prey species to fulfil their increased food requirements. There have been numerous incidences where one large adult mugger is involved in a conflict, either with another crocodile, or sometimes other



larger preys, such as livestock, or even humans (Vyas & Stevenson 2017).

This note presents some remarkable examples of Mugger predation involving large wild cats based on published literature. A recently published note mentions how a Mugger is an efficient predator as it can predate a large adult cat with skilful acumen (Vyas 2020). On two different occasions, Leopards Panthera pardus fusca lost their lives while tussling with large Muggers in Gir forest, Gujarat, India (Vyas 2020). Both the Leopard and Mugger are expert apex predators governing their respective habitats and ecosystems. Leopards being prime predators in terrestrial forest habitats and crocodiles in freshwater ecosystems. Previously, there have been cases where predators devoured young muggers or eggs,

thus including hatchlings, juveniles and large adults too (Somaweera et al. 2013; Vyas 2008 2019b). However, large crocodile predating wild cats (Scognamillo et al. 2003; Da Silveira et al. 2010; Somaweera et al 2013; Pérez-Flores 2018) and vice versa, i.e., large wild cats predating upon crocodilians (Image 2) are comparatively uncommon occurrences (Lydekker 1894; Pandit 2012; Vyas 2020), but Jaguars *Panthera onca* is well known for frequent predation on two Caiman species *Caiman crocodilus* and *Melanosuchus niger* (Da Silveira et al. 2010; Azevedo & Verdade 2012; Somaweera et al. 2013).

Very few incidents have been published on this subject. Literature surveys indicate an earlier record whereby a Leopard was predated by an Estuarian Crocodile *C*.



Image 2. Illustrative evidence: Mugger *Crocodylus palustris* attacking a Royal Bengal Tiger *Panthera tigris* (Credit: *The Royal Natural History Volume I*, authored by Richard Lydekker).





Image 3. Illustrative evidence: Depicting interaction between Bengal Tiger *Panthera tigris* named 'Machhali' and a massive Mugger, about 13ft long *Crocodylus palustris* in the wild, at Ranthambhore Tiger Reserve, Rajasthan, India (after Somaweera et al 2013 based on the image taken by Murli Dhar Parashar).

porosus in Sri Lanka (Tennant 1861). Another similar record from Madhya Pradesh, India mentions how a Leopard was predated by a Mugger (Pitman 1913). A famous female Tiger *Panthera tigris* named 'Machhli' (=Fish) from Ranthambore Tiger Reserve, Rajasthan, India (Image 3) is also popular for preving habits with Muggers (https://en.wikipedia. org/wiki/Machali \_(tigress). Even though smaller wild cat is capable of skilfully hunting a baby crocodilian, it was only recently that with due evidence a video was presented by Conner De Monte (2020: See: https:// www.dailymail.co.uk/news/article-8619029/ Florida-bobcat-baby-alligator-battle-deathyard.html) depicting a small wild bob cat Lynx rufus that was hunting an alligator hatchling at Port Charlotte, Florida.

Sir J. Emerson Tennant noted an interesting incidence in the book 'The Natural History of Ceylon' (1861) about a Leopard being preyed upon by a massive salt water crocodile: "A curios incident occurred some years ago on the Maguruganga, a stream which flows through the Pasdnn Corle, to join the Bentolle (probable River Kalu Ganga or Kalu-Kukule) river. A man was fishing seated on the branch of a tree that overhangs the water; and to shelter himself from the drizzling rain, he covered his head and shoulders with a long folded into a shape common with natives. While in this attitude, a leopard sprung upon him from the jungle, but missing its aim, seized the bag and not the man, and falls into the river. Here a crocodile, which had been eyeing the angler in despair, seized the leopard as it fell, and sunk with it to the bottom". The above-mentioned crocodile species is most probably Crocodylus porosus.

Another incident described by C.R. Pitman (1913) quotes: "While camping on the

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banks of the River Wainganga (a tributary of Godavari River), in the Central Provinces (now Madhya Pradesh) some villagers, one day, on 27<sup>th</sup> March, brought me a half-grown panther measuring about 5'-6" that they had picked up dead near the river and which from the nature of the wounds on it, undoubtedly had been killed by a crocodile *C. palustris*".

In the first week of September 2014, an interesting incidence was noted at Madhuvanti Dam, Gir West, Junagadh. A group of four to five Muggers were found feasting on a 7-8-year-old adult Asiatic Gir Lion Panthera leo persica. The Madhuvani Dam (21.257N, 70.490E) is situated on the edge of Gir National Park and Wildlife Sanctuary, Gujarat, India. It is a smallsized man-made water body constructed for irrigation, located on the edge of a protected area. Therefore it serves as one of the best water sources for wildlife during any water crisis or periods of drought. It is home to about 56 large muggers, as per the latest count (Vyas 2019a). The question remains, as to how such a large predator was victimized by few muggers. The local forest officer (Dy. Conservator of Forest, West Gir Division) stated that the lion's death was not directly caused by any feud between the muggers and the lion, but rather "this adult lion lost his life in a fierce battle with another lion, the previous night. Later, somehow the muggers might have managed to drag the dead lion in the water and were ultimately found devouring it" (Kateshiya 2014). In Africa, Nile Crocodile Crocodylus niloticus is well-known for its Leopard-hunting habits, with a good number of accounts supporting

this tendency (Cott 1961; Bailey 1993; Hunter 2013; Swanepoel et al. 2015). Likewise, muggers and estuarine crocodiles can be considered evenly skilful when it comes to specific predation of wild cats. The fact that crocodilians are the ultimate apex predators of freshwater ecosystems is well established (Grigg & Kirshner 2015; Somaweera et al. 2020). All the crocodilians share intense aggressive traits and are proven to be opportunistic predators, devouring whatsoever comes across their way, in and around their habitats. The likelihood of any mugger allowing a predator from another species to have an absolute dominance within its territory is nill. If at all there are power conflicts, they usually result in fatal feuds, with either the large wild cat or another crocodilian member suffering a loss of their lives.

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# A partial checklist of moths from Adyar Eco-Park, Chennai, India: a baseline study

A study was conducted at the Adyar Eco-Park at Chennai, a tropical dry evergreen and estuarine habitat, to evaluate the diversity of moths. The duration of the study was from March 2019 to March 2020. The study aimed to shed light on moth biodiversity from the park which could serve as baseline data for future surveys in Chennai. We selected the Adyar Eco-Park due to its rich habitat and good sightings of moths during public walks by the authors. The Adyar Eco-Park (13.019°N, 80.263°W) was established in 2011 by the Government of Tamil Nadu (Chennai Rivers Restoration Trust 2020). During this period, 15 surveys were conducted at night from 19.30 to 00.00 h. A single diurnal survey was done in November 2020, to observe larval activity and check for day-flying moths. Parameters like temperature, humidity, and lunar phase were also noted. The surveys were conducted at the same time period to maintain uniformity of effort. Two sites were studied to record the moths in the park. A white cloth was used as a light sheet along with a 160W mercury vapour lamp. The lamp was connected to the plug points available in the building and the lamp was placed above the cloth using a lamp holder. No lures or sticky traps were used and no moths were







#### Table 1. Checklist of adult moths seen during the study at Adyar Eco-Park (2019–20).

	Super-family	Family	Sub-family	Name of the Species
1	Geometroidea	Geometridae	Ennominae	Chiasmia nora Walker, 1861
2	Geometroidea	Geometridae	Ennominae	Chiasmia eleonora Hubner, 1818
3	Geometroidea	Geometridae	Ennominae	Cleora sp.
4	Geometroidea	Geometridae	Ennominae	Alcis sp.
5	Geometroidea	Geometridae	Ennominae	<i>Isturgia</i> sp.
6	Geometroidea	Geometridae	Sterrhinae	Traminda mundissima Walker, 1861
7	Geometroidea	Geometridae	Sterrhinae	Idaea macroscipla Prout, 1926
8	Geometroidea	Geometridae	Sterrhinae	Idaea sp.
9	Geometroidea	Geometridae	Sterrhinae	Idaea gemmerica Hampson,1866
10	Geometroidea	Geometridae	Geometrinae	Comostola pyrrhogona Walker, 1866
11	Geometroidea	Geometridae	Geometrinae	Pelagodes sp.
12	Geometroidea	Geometridae	Geometrinae	Microloxia sp.
13	Geometroidea	Geometridae	Sterrhinae	Scopulini sp.
14	Geometroidea	Uraniidae	Epipleminae	Phazaca theclata Guenée, 1857
15	Geometroidea	Uraniidae	Epipleminae	Phazaca leucocera Hampson, 1891
16	Noctuoidea	Erebidae	Erebinae	Achaea serva Fabricius, 1775
17	Noctuoidea	Erebidae	Erebinae	Achaea janata Linnaeus, 1758
18	Noctuoidea	Erebidae	Erebinae	Acantholipes cf. similis Moore, 1879
19	Noctuoidea	Erebidae	Erebinae	Attatha ino Drury, 1782
20	Noctuoidea	Erebidae	Erebinae	Bastilla joviana Stoll, 1782
21	Noctuoidea	Erebidae	Erebinae	Dysgonia sp.
22	Noctuoidea	Erebidae	Erebinae	Ericeia inangulata Guenée, 1852
23	Noctuoidea	Erebidae	Erebinae	Grammodes geometrica Fabricius, 1775
24	Noctuoidea	Erebidae	Erebinae	Hypocala deflorata Fabricius, 1794
25	Noctuoidea	Erebidae	Erebinae	Mocis undata Fabricius, 1775
26	Noctuoidea	Erebidae	Erebinae	Thyas coronata Fabricius, 1775
27	Noctuoidea	Erebidae	Erebinae	Thyas honesta Hübner, 1824
28	Noctuoidea	Erebidae	Erebinae	Trigonodes hyppasia Cramer, 1779
29	Noctuoidea	Erebidae	Erebinae	Pericyma sp.
30	Noctuoidea	Erebidae	Erebinae	Ophiusa mejanesi/triphaenoides Guenée, 1852/Walker, 1858
31	Noctuoidea	Erebidae	Erebinae	Spirama retorta Clerck, 1764
32	Noctuoidea	Erebidae	Erebinae	Pandesma sp.
33	Noctuoidea	Erebidae	Herminiinae	Naarda sp.
34	Noctuoidea	Erebidae	Boletobiinae	Eublemma baccalix Swinhoe, 1886
35	Noctuoidea	Erebidae	Boletobiinae	Eublemma rivula Moore, 1882
36	Noctuoidea	Erebidae	Arctiinae	Amata passalis Fabricius, 1781
37	Noctuoidea	Erebidae	Aganainae	Asota caricae Fabricius, 1775
38	Noctuoidea	Erebidae	Aganainae	Asota ficus Fabricius, 1775

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	Super-family	Family	Sub-family	Name of the Species
39	Noctuoidea	Erebidae	Calpinae	Calyptra sp.
40	Noctuoidea	Erebidae	Calpinae	Eudocima materna Linnaeus, 1767
41	Noctuoidea	Erebidae	Calpinae	Eudocima phalonia Linnaeus, 1763
42	Noctuoidea	Erebidae	Calpinae	Oraesia emarginata Fabricius, 1794
43	Noctuoidea	Erebidae	Aganainae	Sommeria hearseyana Moore, 1859
44	Noctuoidea	Noctuidae		Crithote sp. (horridipes ?)
45	Noctuoidea	Noctuidae	Noctuinae	Spodoptera litura Fabricius, 1775
46	Noctuoidea	Noctuidae	Noctuinae	Spodoptera exigua Hubner, 1808
47	Noctuoidea	Noctuidae	Acontiinae	Acontia marmoralis Fabricius, 1794
48	Noctuoidea	Noctuidae	-	Adisura marginalis Walker, 1858
49	Noctuoidea	Nolidae	Nolinae	Nola sp.
50	Noctuoidea	Nolidae	Chloephorinae	Maurilia iconica Walker 1858
51	Noctuoidea	Nolidae	Chloephorinae	Maurilia undaira Swinhoe, 1918
52	Noctuoidea	Euteliidae	Euteliinae	Penicillaria jocosatrix Guenée, 1852
53	Noctuoidea	Noctuidae	Bagisarinae	Amyna sp.
54	Noctuoidea	Noctuidae	Heliothinae	Helicoverpa armigera Hübner, 1809
55	Tortricoidea	Tortricidae	Olethreutinae	Loboschiza koenigiana Fabricius, 1775
56	Tortricoidea	Tortricidae	Olethreutinae	Grapholita tristrigana Clemens, 1865
57	Pyraloidea	Crambidae	Schoenobiinae	Scirpophaga incertulas Walker, 1863
58	Pyraloidea	Crambidae	Spilomelinae	Cnaphalocrocis rutilalis Walker, 1859
59	Pyraloidea	Crambidae	Spilomelinae	Parotis marginata Hampson, 1893
60	Pyraloidea	Crambidae	Spilomelinae	Diaphania indica Saunders, 1851
61	Pyraloidea	Crambidae	Spilomelinae	Pygospila tyres Cramer, 1780
62	Pyraloidea	Crambidae	Spilomelinae	Spoladea recurvalis Fabricius, 1775
63	Pyraloidea	Crambidae	Spilomelinae	Sameodes cancellalis Zeller, 1852
64	Pyraloidea	Crambidae	Spilomelinae	Poliobotys ablactalis Walker, 1859
65	Pyraloidea	Crambidae	Pyraustinae	Isocentris filalis Guenée, 1854
66	Pyraloidea	Crambidae	Acentropinae	Parapoynx stagnalis Zeller, 1852
67	Pyraloidea	Crambidae	Cybalomiinae	Ptychopseustis plumbeolinealis Hampson, 1896
68	Pyraloidea	Pyralidae	Phycitinae	Plodia interpunctella Hübner, 1813
69	Pyraloidea	Pyralidae	Pyralinae	Endotricha repandalis Fabricius, 1794
70	Yponomeutoidea	Plutellidae		Plutella xylostella Linnaeus, 1758
71	Bombycoidea	Sphingidae	Macroglossinae	Cephonodes picus Crammer, 1777
72	Bombycoidea	Sphingidae	Macroglossinae	Cephonodes hylas Linnaeus, 1771
73	Bombycoidea	Sphingidae	Macroglossinae	Hippotion celerio Linnaeus, 1758
74	Bombycoidea	Sphingidae	Macroglossinae	Macroglossum assimilis Swainson, 1821
75	Bombycoidea	Sphingidae	Macroglossinae	Macroglossum gyrans Walker, 1856
76	Bombycoidea	Sphingidae	Macroglossinae	Nephele hespera Fabricius, 1775
77	Bombycoidea	Sphingidae	Macroglossinae	Hippotion sp.
78	Bombycoidea	Sphingidae	Sphinginae	Psilogramma vates Butler, 1875

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	Super-family	Family	Sub-family	Name of the Species
79	Bombycoidea	Saturniidae	Saturniinae	Antheraea paphia Linnaeus, 1758
80	Bombycoidea	Bombycidae	Bombycinae	Trilocha varians Walker, 1855
81	Lasiocampoidea	Lasiocampidae	Lasiocampinae	Metanastria hyrtaca Cramer, 1779
82	Hyblaeoidea	Hyblaeidae		Hyblaea puera Cramer, 1777
83	Gelechioidea	Oecophoridae	Stathmopodinae	Stathmopoda sp.
84	Gelechioidea	Cosmopterigidae		Ramphis sp.
85	Gelechioidea	Depressariidae	Ethmiinae	Ethmia sp.
86	Gelechioidea	Scythrididae	Scythridinae	Erethmocera impactella Walker, 1864
87	Gelechioidea	Scythrididae	Scythridinae	Erethmocera sp.
88	Tineoidea	Tineidae	Perissomasticinae	Edosa varians walker, 1886
89	Zygaenoidea	Limacodidae	Limacodinae	Miresa sp. (?)
90	Thyridoidea	Thyrididae	Striglininae	Banisia sp.

collected. Identification was done using Hampson's Volumes on Moths (Hampson 1892), Moths of India website (Sondhi et al. 2020), Field Guide to Indian Moths by V. Shubhalaxmi (2018), and comparing our images with other published articles from southern India.

During the study, notable host plants recorded in the Park include *Syzygium cumini, Ficus racemosa, Terminalia arjuna, Alangium salvifolium, Vitex negundo, and Barringtonia acutangula.* The ripe syconia of *Ficus religiosa* attracted moths such as *Pericyma* spp., *Cnaphalocrocis medinalis, Eudocima materna, Hybleca puera, Polioboytes ablactalis, Dysgonia* sp., *Amyna* sp., *Parotis* sp., and *Eudocima* sp. in the last weeks of September at night. Hawkmoth pollination was observed on *Sansevieria zeylanica.* 

Ninety species from 75 genera and 23 families were recorded in our study. The

maximum number of genera was recorded from the Noctuoidea superfamily. Only a single species was recorded from Tineidae, Saturniidae, Thyrididae, Hyblaeoidae, Lasiocampidae, and Bombycidae families. Among the species we recorded, several are known to be endemic to the Indian subcontinent or to sub-regions within it. Macroglossum assimilis, described as endemic to southern India and Sri Lanka (Iyer & Kitching 2019) was also recorded during the study. Loboschiza keonigiana, Dysgonia sp., Eudocima materna, Spodoptera litura, Spoladea recurvalis, Idaea sp., Traminda mundissima, Alcis spp., and Plutella xylostella were the most commonly seen species during the study. Among the sphingid moths, Nephele hespera and Macroglossum gyrans were recorded in multiple surveys. A pictorial representation of the moth diversity recorded has been shown in Fig 1. The species recorded in the study have been tabulated in Table 1. The only literature available from Chennai is from historical work by Hampson

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Gallery of a selected species of moths recorded in the study.



Images 1–6. 1–*Chiasmia eleonora* | 2–*Chiasmia nora* | 3–*Cleora* sp. | 4–*Alcis* sp. | 5–*Idaea gemmerica* | 6–*Idaea macroscipla* | © Vikas Madhav Nagarajan.



Images 7–12. 7–*Idaea* sp. | 8–*Traminda mundissima* | 9–*Microloxia* sp. | 10–*Pelagodes* sp. | 11– *Phazaca leucocera* | 12–*Phazaca theclata* | © Vikas Madhav Nagarajan.







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Images 13–18. 13–*Achaea janata* | 14–*Achaea serva* | 15–*Attatha ino* | 16–*Bastilla joviana* | 17– *Dysgonia* sp. | 18–*Ericeia inangulata* | © Vikas Madhav Nagarajan.







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Images 19–24. 19–*Thyas coronata* | 20–*Trigonodes hyppasia* | 21–*Pericyma* sp. | 22–*Ophiusa mejanesi/triphaenoides* | 23–*Spirama* cf. *retorta* | 24–*Hypocala deflorata* | © Vikas Madhav Nagarajan and M Yuvan.





Images 25–30. | 25–*Eublemma baccalix* | 26–*Eublemma rivula* | 27–*Asota caricae* | 28–*Asota ficus* | 29–*Eudocima maternal* | 30–*Eudocima phalonia* | © Rohith Srinivasan, Vikas Madhav Nagarajan, and M Yuvan.



Images 31–36. 31–*Sommeria hearseyana* | 32–*Acontia marmoralis* | 33–*Spodoptera litura* | 34– *Spodoptera exigua* | 35–*Adisura marginalis* | 36–*Nola* sp. | © Vikas Madhav Nagarajan.



Images 37–42. 37*—Maurilia undaira* | 38*—Penicillaria jocosatrix* | 39*—Naarda* sp. | 40*—Helicoverpa armigera* | 41*—Crithote* sp. | 42*—Ramphis* sp. | © Vikas Madhav Nagarajan.





Images 43–48. 43–*Stathmopoda* sp. | 44–*Grapholita* Sp. (?) | 45–*Loboschiza koenigiana* | 46– *Sameodes cancellalis* | 47–*Scirpophaga incertulas* | 48–*Parotis marginata* | © Vikas Madhav Nagarajan.







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Images 49–54. 49–*Diaphania indica* | 50–*Pygospila tyres* | 51–*Poliobotys ablactalis* | 52–*Isocentris filalis* | 53–*Parapoynx stagnalis* | 54–*Endotricha* cf. *repandalis* | © Vikas Madhav Nagarajan.



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Images 55–60. 55–*Plutella xylostella* | 56–*Cephonodes picus* | 57–*Macroglossum assimilis* | 58– *Macroglossum assimilis* | 59–*Hippotion sp.* | 60–*Nephele hespera* | © Vikas Madhav Nagarajan.





Images 61–66. 61–*Psilogramma vates* | 62–*Trilocha varians* | 63–*Metanastria hyrtaca* | 64–*Banisia* sp.(?) |65–*Erethmocera cf impactella* | 66–*Miresa* sp.(?) | © Vikas Madhav Nagarajan and M Yuvan.



and Dru Drury, who collected samples from Madras (the former name of Chennai). Study on moths have been conducted from the state of Tamil Nadu (Kathirvelu et al. 2019), especially along the Western Ghats (Sivasankaran & Ignacimuthu 2014; Sivasankaran et al. 2015).

A peak in diversity was seen from July-September 2019, during the pre-monsoon season. The next highest diversity was seen from March–June 2019. Following this, during the period of October-December 2019 we recorded 18 species. The lowest number of species was seen during January--March 2020. Most number of species was observed during the survey on the 27 July 2019 when 44 species were recorded, while the lowest activity was recorded on the 20 February 2020, when no moths came to the screen. However, further studies have to be conducted to observe the trends in moth diversity and to understand the status, ecology, and diversity of moths found here.

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Himalayan Goral camera trapped ShNP 2020.

First report of Himalayan Goral from Nepal's Shuklaphanta National Park

Himalayan Goral *Naemorhedus goral Hardwicke, 1825* belongs to order Cetartiodactyla and family Bovidae. It is listed on CITES Appendix I and classified as Near Threatened on the IUCN Red List and Nepal's National Red List (Duckworth & MacKinnon 2008; Jnawali et al. 2011).

Himalayan Goral is a goat-antelope; an adult with 65–70cm height and 25–30kg weight (Baral & Shah 2008). Both sexes are mostly alike; having a short tail and two about 15cm long brown-grey horns which grow backwards. It has short and coarse grey coat with a lighter white patch of hair on throat; the males have manes from their necks to their chests, and females have four mammae (Baral & Shah 2008). Himalayan Goral has two recognized subspecies, *Naemorhedus goral goral* in Bhutan, China, India, & Nepal, and *N. g. bedfordi in India* & Pakistan (Duckworth & MacKinnon 2008). The recent study shows that the subspecies recorded eastward from Nepal is *N.g. goral* and westward from Nepal is *N.g. bedfordi* (Joshi et al. 2020). Nepal may have held both the subspecies.

In Nepal, the Himalayan Goral is widely distributed on the forested slopes and steep mountainous areas up to the tree-line (Wegge & Oli 1997); however, it is mainly distributed across the Churia and mid-hills between elevations of 300m and 3.000m (Jnawali et al. 2011). It is recorded from Khaptad, Rara, Shey-Phoksundo, Langtang, Sagarmatha, Makalu-Barun, Shivapuri-Nagarjun, Parsa, Chitwan, Banke, and Bardia national parks; Api-Nampa, Annapurna, Manaslu, Gaurishankar, and Kanchenjunga conservation areas; and Dhorpatan Hunting Reserve (Suwal & Verheugt 1995; Wegge & Oli 1997; Poudel 2009; Katuwal et al. 2013; Khanal et al. 2020; Koju et al. 2020). Goral was reported from the Kanchanpur District (Suwal & Verheugt 1995); however, till the



Map showing Goral presence in ShNP.

early 2019, there was no documented photographic evidence of the record of this species from the Shuklaphanta National Park (ShNP). Here, in this paper, we report sightings and the first photographic record of Himalayan Goral from the park. With an area of 305km<sup>2</sup>, the ShNP is situated in the southwestern Nepal between 28.763–29.047 N latitudes and 80.095–80.361 E longitudes in Kanchanpur District (Poudyal et al. 2020). The altitude ranges 175– 1,300 m.

We walked along the available trail in the Churia foothills to search the species; once we observed the hoof prints of the possible Himalayan Goral on the riverbank, we installed the motion sensor camera with a high likelihood of animals being photographed. We recorded date, time, habitat information, elevation, and geographic locations where the Himalayan Goral were sighted or photographed.

#### First observation: On

29 November 2019, we observed two individuals at 11.03h from Badepani area (29.038N and 80.361E; 385m) along the stream in the mixed forest of mountain cliff. However, we couldn't get a photograph because of quick response of the species.

#### Second observation: On 19

October 2020, we observed three individuals at 10.49h at Badepani area (426m) towards north along the stream in the mixed forest and mountain cliff landslide area on the south facing slope of Siwalik Hill; and those were captured on Canon 1300D DLSR camera. The captured photograph was not clear; however it was good enough to recognize the species. This remains the first photographic evidence of the Himalayan Goral captured inside ShNP.

#### Third observation: On 2 November 2020, we visited the same area. At 12.22h, from where the gorals were

observed on 19 October 2020, we observed a single goral and the hoof prints in the lower bank of the stream. At the same time, we installed a camera trap (Pantheracam V6) at Badepani Stream bank (29.025 N and 80.350 E; 426m)

**Fourth observation:** The installed camera was checked on 20 November 2020 for the photographs. Finally, we reconfirmed presence of goral as there were two individuals captured at 11.19 h on 7 November 2020.

As the population and distribution of this species in ShNP is unknown, we recommend studies on distribution and population estimate then harmonize the periodic monitoring. The elevation measured in ShNP for goral presence is lower than currently given by IUCN as the lower elevation limit of 900m (Duckworth & MacKinnon 2008). The current lower elevation for goral presence in ShNP is 426m. This record was approximately 15km farther south than the range map provided by Duckworth & MacKinnon (2008); so we suggest to the IUCN to amend the geographic range map further south touching the northern part of ShNP.

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# Smooth-coated Otter spotted in Kiliyur Lake, Tamil Nadu, India



Image 1. Smooth-coated Otter in Kiliyur Lake.

Otters are semi-aquatic mammals and classified in order Carnivora of family Mustelidae. Smooth-coated Otter has flattened head, thick muscular tail, smooth & dense epidermis, and large paws that are webbed between fingers. There are 13 species of otters spread all over the world except Antarctica and Australia, and India has three species—Smooth-coated Otter *Lutrogale perspicillata*, Small-clawed Otter *Aonyx cinerea*, and the Eurasian Otter *Lutra lutra* (Johnsingh & Manjrekar 2013; Menon 2014). In the Cauvery Basin, Smooth-coated Otters are well documented (Shenoy 2003; Shenoy et. al. 2006). Smooth-coated Otters have a large family and are highly social, they mainly eat shrimps, crustaceans, oysters, invertebrates, fishes, and even birds (Duplaix & Savage, 2018). Kolappan (2018) reported the presence of Smooth-coated Otters in the Vaduvoor Birds Sanctuary.

According to IUCN Red List (2015), the Smooth-coated Otter is listed as "Vulnerable" species and its presence indicates a healthy aquatic ecosystem. In the Indian Wildlife Protection Act of 1972, the otter is included under schedule II and listed in appendix II



Images 2–9. Antics of Smooth-coated Otter on loose soil and grass.



Image 10. Missing back leg foot observed in Smooth-coated Otter from Kiliyur Lake.

under CITES. We observed and recorded the presence of otters in Kiliyur Lake in Tiruchirappalli District, Tamil Nadu. Major threats to the otter population are the conversion of wetlands for settlements and agriculture, loss of wetland habitats due to the construction of largescale hydroelectric projects, reduction in prey biomass, poaching, and contamination of waterways by pesticides (Hussain 1999; de Silva et al. 2008; Nawab 2007, 2009; Shenoy et al. 2006).

# Smooth-coated Otter sighting in Kiliyur Lake

Kiliyur Lake (10.81346 N & 78.84825 E) is located in Kiliyur Village in Tiruverumbur Taluk of Tiruchirappalli District in Tamil Nadu. This lake receives water from Cauvery River via Vellar River. Kiliyur Lake is one of the bird diversity hotspots in Tiruchirappalli District. The surrounding area is fully covered by agricultural landscape and mostly cultivated for paddy crop. During bird watching in Kilivur Lake we observed and recorded one Smoothcoated Otter (Neer Nai -Tamil) in the central mound of the lake under the plant Prosopis juliflora. The otter was photographed using Nikon D3300 with zoom lens 500mm and photos were analyzed and later

identified using a field guide (Menon 2014) as Smoothcoated Otter. The sighting of Smooth-coated Otter was on 01 January 2021 at 09.48h. The otter was observed for more than 10 minutes basking and vigorously rubbing its fur on loose sand, soil and grass on the ground, rolling and blowing of air into the fur. This was the first time we observed the otter in this lake. From the photographs we realized that the Smooth-coated Otter has only three legs.

The otters hind left foot was missing as it appeared to be cut and healed. There can be many possible reasons for the injured cut foot. The otter may have got trapped in some hunter's bait; cut in the fishing net or lost to predators. The presence of the otter in this lake can become a suitable place to study its behavior, ecology, and biology.

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#### #70 21 February 2021

# Bird-o-soar

### Fish eating by Common Sandpiper

Common Sandpiper Actitis hypoleucos is a small size wader bird of the family Scolopacidae having a vertical white stripe between wing shoulder and dusky breast-band. A narrow white-wing bar is clearly visible in jerking flight low over the water. It is a common winter visitor to inland water and seashores of southeastern and eastern Afghanistan, Baluchistan, and Indus Valley (Pakistan), all India including Assam Valley, South Assam hills, Lakshadweep, and Andaman & Nicobar Islands, Sri Lanka, and the Maldives (Ali & Ripley 2007; Rasmussen & Anderton 2012).

I visited the wetland of Arwad (Bhilwara) Rajasthan (29.828N & 74.818E) on 8 April 2017. The water from the wetland is used for irrigation chiefly and it is a government authorized fish farming site. The water of the dam had almost dried up besides a few ditches and the catchment area of the dam was almost covered by the zaid crops. Walking along the bankside, a clutch of birds was seen around a ditch having two Little Egrets *Egretta garzetta*, two Pond Herons *Ardeola grayii*, three Intermediate Egrets *Mesophoyx intermedia*, two River Terns *Sterna aurantia*, two Black-headed Ibis *Threskiornis melanocephalus*, and two

Image 1. Common Sandpiper approaching water.

> Common Sandpipers *Actitis hypoleucos*. There were a lot of small fishes in the ditch and the birds were actively engaged in catching them. The activities of the birds were clicked with Canon 1200 DSLR camera keeping a safe distance from behind a Desi Babool or Gum Arabic Tree *Vachellia nilotica*. Among these birds, two Common Sandpipers walked along the sloped edge of the ditch and suddenly one of them caught a fish in its beak (Image 1&2), ran three-four meters away (Image 3 & 4) and put it on the ground, possibly to save its food from other birds.

It was a fish fingerling approximately 6cm long. In no time, the bird again picked the fish and gulped it from the head side and again approached the water. The other Common Sandpiper also picked a fish after an unsuccessful attempt, took away, and swallowed it. The diet of Common Sandpiper



including earthworms (Lumbricidae), insects like mayfly (Ephemeroptera), caddisfly (Trichoptera) & stonefly (Plecoptera) larvae, beetles (Elateridae), crustaceans, and tiny mollusks, but fish is not recorded as a food of Common Sandpiper in studies (Yalden 1986; Natiamoa-Baidu et al. 1998; Robinson 2005; Ali & Ripley 2007; Vyas 2013; Kazmierczak 2014;

Grewal et al. 2017).

comprises invertebrates

The presence of plenty of gastropod shells in the drier part of the dam indicated that there was enough food available before for the Common Sandpipers. But since the water had almost dried up, the scarcity of food had diverted the bird towards an easily available food option. Therefore, fish may be added as an occasional food choice of the Common Sandpiper.

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### Avian fauna of village pond of Mote Majra, Punjab, India



Image 1. Study area.

From the beginning of civilization, humans have had an important relation with water bodies. Most of the cities are situated around water bodies whether, a lake, river or an ocean. Even villages are established around ponds to meet the daily needs of humans. One-thousand-three-hundredand-forty (1340) bird species are reported in India, out of which 310 species are known to depend on different water bodies (Kumar & Gupta 2009). From last few years, local people use ponds for the production of Water Chestnut Trapa natans commonly known as Singhara. Ponds, whether natural or manmade, sustain their ecological properties and these are hubs of biodiversity (Karakaş 2017). Wetland birds assemble at these sites due to plenty of food and habitat accessibility (Paracuellos 2006; Cereghino et al. 2014).

Ponds also channelize the migratory birds from one place to another as flock of birds use these ponds as stopover and refueling destinations for few days during their migration before moving towards their final destination (Hassall 2014). Most of the earlier studies in Punjab mainly focuses on avian diversity of the wetlands (Bal & Dua 2010) but with this study authors acknowledge the importance of village ponds in context to avian diversity.

The present study site, Mote Majra (Image 1) is located in between longitude 30.5873°N to 76.7010°E latitude near Banur, S.A.S Nagar, Mohali having area of 32 acres and is one of the biggest ponds of Punjab. This pond is also known as Kalyanpur Dhaab by the locals. It is named after the famous saint

"Kalyan Ji" and Dhaab word is used for water body which is larger than a pond but smaller than a lake.

Data was collected from November 2018 to December 2019 once a week and twice a day. For the summer season, the survey was conducted from 06.00 to 09.00 h and 17.00 to 19.30 h and for winter season from 07.00 to 10.00 h and 16.00 to 18.30 h. Observations were made while walking slowly along the shore of the pond or by sitting at vantage points. Point count and direct observation was used for counting of birds during the field survey (Bibby et al. 2000).

Bird identification was done with the aid of binoculars (Olympus 8-16\*40 zoom DPS-I) and using field guides (Ali 1996; Grimmet et al. 2003). Photography was done with DSLR camera (Canon 7D with 100–400mm zoom lens and 1200D 75–300mm lens). Photographic documentation and a checklist of birds visiting the site were prepared with standard common and scientific names (Manakadan & Pittie 2001).

The major aspect of the survey was to evaluate the bird diversity of this village pond. During the survey, a total of 160 bird species were found belonging to 18 orders and 53 families (Table 1). Maximum numbers of birds were found during the winter season, as aqua cultural practices were done in summers, therefore, it poses minimum hindrance to the occurrence of birds during the winters.

Most of the birds found at Mote Majra were herbivorous as they feed on residues of Water chestnut crop in winter season. Spot-

billed Duck, Ruddy Shelduck, Northern Shoveler, Lesser Whistling Duck, Gadwall, Common Pochard, Bar-headed Goose, Common Moorhen, Common Coot, Redwattled Lapwing, White-breasted Kingfisher, Purple Moorhen, Common Moorhen, Little Cormorant, Large Cormorant, Tree Pie, and Plain Prinia are the most common birds found in this region. Vegetation around the pond comprises of Abutilon indicum (Country mallow), Leucaena leucocephala (Horse tamarind), Cucumis melo var. agrestis (Wild melon), Parthenium hysterophorus (Congress grass), Trianthema portulacastrum (Giant pigweed), Cynodon dactylon (Bermuda grass), Calotropis procera (Rubber bush), Ipomoea aquatic (Swamp cabbage), Spirodela polyrhiza (Great duck weed), Cannabis sativa (Hump), Ricinus communis (Arand, Castor-oil plant), Prosopis juliflora (Mesquite), Azadirachta indica (Neem), Melia azedarach (Dek), Morus alba (Mulberry), Eucalyptus oblique (Eucalyptus), Acacia nilotica Indica (Babul Acacia), Ficus virens (Pilkhan or White fig), Ficus religiosa (Peepal), and *Ficus benghalensis* (Banyan) which provide different habitats and unique structures for many bird species. Booted eagle, Greater spotted eagle, Eurasian marsh harrier, Steppe Eagle, Common shelduck, Dunlin, Greater white-fronted goose, Mallard, Eurasian spoonbill, Eurasian wryneck, Oriental darter, Greater flamingo were rare in this area as seen once or twice during the survey.

Maximum numbers of migratory birds belong to waterfowl's category which included highest number of Bar-headed Goose, Northern Shoveler, Common Coot, Gadwall and Ruddy Shelduck. It provides breeding sites for Cattle Egret, Pheasant-tailed Jacana,

#### Table 1. Showing scientific and common names of birds as well as their conservation status.

	Common name	n name Scientific name		Order	IUCN RL status
Accip	pitriformes: Accipitridae				
1.	Black Kite	Milvus migrans			LC
2.	Black-shouldered Kite	Elanus caeruleus	-		LC
3.	Booted Eagle	Hieraaetus pennatus			LC
4.	Greater Spotted Eagle	Aquila clanga	Accipitridae	Accipitriformes	VU
5.	Western Marsh-Harrier	Circus aeruginosus			LC
6.	Shikra	Accipiter badius			LC
7.	Steppe Eagle	Aquila nipalensis			EN
Anse	riformes: Anatidae				
8.	Bar-headed Goose	Anser indicus			LC
9.	Comb Duck	Sarkidiornis melanotos			LC
10.	Common Pochard	Aythya ferina			VU
11.	Common Shelduck	Tadorna tadorna			LC
12.	Common Teal	Anas crecca			LC
13	Cotton Teal	Nettapus coromandelianus			LC
14.	Ferruginous Pochard	Aythya nyroca			NT
15.	Gadwall	Anas Strepera	_	Anseriformes	LC
16.	Garganey	Anas querquedula	Anatidae		LC
17.	Greater White-fronted Goose	Anser albifrons			LC
18.	Greylag Goose	Anser anser			LC
19.	Lesser Whistling-Duck	Dendrocygna javanica	_		LC
20.	Mallard	Anas platyrhynchos			LC
21.	Northern Shoveller	Anas clypeata			LC
22	Northern Pintail	Anas acuta	_		LC
23.	Red-crested Pochard	Netta rufina	_		LC
24	Brahminy Shelduck	Tadorna ferruginea	_		LC
25.	Spot-billed Duck	Anas poecilorhyncha	_		LC
26.	Eurasian Wigeon	Anas Penelope			LC
27	House Swift	Apus affinis	Apodidae	Apodiformes	LC
28.	Little Ringed Plover	Charadrius dubius	_		LC
29.	Red-wattled Lapwing	Vanellus indicus	Charadriidae		LC
30.	White-tailed Lapwing	Vanellus leucurus		_	LC
31.	Small Pratincole	Glareola lacteal	Glareolidae	Charadriiformes	LC
32.	Pheasant-tailed Jacana	Hydrophasianus chirurgus	Jacanidae		LC
33.	Black-winged Stilt	Himantopus himantopus	Becunvirostridae		LC
34	Pied Avocet	Recurvirostra avosetta	I ISOUI VII USUIUAC		LC

	Common name	Scientific name	Family	Order	IUCN RL status
35.	Black-tailed Godwit	Limosa limosa			NT
36.	Common Redshank	Tringa tetanus			LC
37.	Common Sandpiper	Actitis hypoleucos			LC
38.	Common Snipe	Gallinago gallinago			LC
39.	Dunlin	Calidris alpine			LC
40.	Eurasian Curlew	Numenius arquata			NT
41.	Green Sandpiper	Tringa ochropus		Ob and shifts may a	LC
42.	Common Greenshank	Tringa nebularia	Scolopacidae	Charadriiformes	LC
43.	Marsh Sandpiper	Tringa stagnatilis			LC
44.	Little Stint	Calidris minuta			LC
45.	Ruff	Philomachus pugnax			LC
46.	Spotted Redshank	Tringa erythropus			LC
47.	Temminck's Stint	Calidris temminckii			LC
48.	Wood Sandpiper	Tringa glareola			LC
49.	Asian Openbill Stork	Anastomus oscitans			LC
50.	Painted Stork	Mycteria eucocephala	Ciconiidae	Ciconiiformes	NT
51.	White-necked Stork	Ciconia episcopus	Ciconia episcopus		VU
52.	Blue Rock Pigeon	Columba livia			LC
53.	Yellow-legged Green-Pigeon	Treron phoenicoptera		Columbiformes	LC
54.	Laughing Dove	Streptopelia senegalensis	Calurahidaa		LC
55.	Red Collared-Dove	Streptopelia tranquebarica	Columbidae		LC
56.	Eurasian Collared-Dove	Streptopelia decaocto			LC
57.	Spotted Dove	Streptopelia chinensis			LC
58.	Common Kingfisher	Alcedo atthis			LC
59.	White-breasted Kingfisher	Halcyon smyrnensis	Alceultildae		LC
60.	Indian Grey Hornbill	Ocyceros birostris	Bucerotidae		LC
61.	Indian Roller	Coracias benghalensis	Coraciidae	Coraciiformes	LC
62.	Blue-tailed Bee-eater	Merops philippinus	Moropidao		LC
63.	Small Bee-eater	Merops orientalis	Meropidae		LC
64.	Common Hoopoe	Upupa epops	Upupidae		LC
65.	Greater Coucal	Centropus sinensis			LC
66.	Pied Crested Cuckoo	Clamator jacobinus	Cuculidae	Cuculiformes	LC
67.	Asian Koel	Eudynamys scolopacea			LC
68.	Grey Francolin	Francolinus pondicerianus	Phasinidae	Galliformes	LC
69.	Indian Peafowl	Pavo cristatus		Camornes	LC
70.	Common Moorhen	Gallinula chloropus			LC
71.	Common Coot	Fulica atra	Ballidae	Gruiformes	LC
72.	Purple Moorhen	Porphyrio porphyrio			LC
73.	White-breasted Waterhen	Amaurornis phoenicurus			LC

	Common name	Scientific name	Family	Order	IUCN RL status
74.	Blyth's Reed-Warbler	Acrocephalus dumetorum			LC
75.	Booted Warbler	Hippolais caligata	Acrocephalidae		LC
76.	Sykes's Warbler	Iduna rama			LC
77.	Common Crested Lark	Galerida cristata	Alaudidae		LC
78.	Ashy Prinia	Prinia socialis			LC
79.	Plain Prinia	Prinia inornata	Ciationlidea		LC
80.	Streaked Fantail Warbler	Zitting cisticola	Cisticolidae		LC
81.	Common Tailorbird	Orthotomus sutorius			LC
82.	House Crow	Corvus splendens			LC
83.	Jungle Crow	Corvus macrorhynchos	Corvidae		LC
84.	Indian Treepie	Dendrocitta vagabunda			LC
85.	Black Drongo	Dicrurus macrocercus	Dicruridae		LC
86.	Black-headed Bunting	Emberiza melanocephala	Freela estimitada e		LC
87.	Rock Bunting	Emberiza cia	Emperizidae		LC
88.	Red Munia	Amandava amandava			LC
89.	Spotted Munia	Lonchura punctulata	Estrildidae		LC
90.	White-throated Munia	Lonchura malabarica			LC
91.	Red-rumped Swallow	Hirundo daurica			LC
92.	Common Swallow	Hirundo rustica			LC
93.	Grey-throated Martin	Riparia chinensis	Hirundinidae	Passeriformes	LC
94.	Wire-tailed Swallow	Hirundo smithii			LC
95.	Bay-backed Shrike	Lanius vittatus			LC
96.	Brown Shrike	Lanius cristatus	Laniidae		LC
97.	Long-tailed Minivet	Pericrocotus ethologus			LC
98.	Common Babbler	Turdoides caudatus			LC
99.	Jungle Babbler	Turdoides striatus	Leiothrichidae		LC
100.	Large Grey Babbler	Turdoides malcolmi			LC
101.	Citrine Wagtail	Motacilla citreola			LC
102.	Grey Wagtail	Motacilla cinereal			LC
103.	Paddyfield Pipit	Anthus rufulus			LC
104.	Richard's Pipit	Anthus richardi	Matasillidaa		LC
105.	Rosy Pipit	Anthus roseatus			LC
106.	Eurasian Tree Pipit	Anthus trivialis			LC
107.	White Wagtail	Motacilla alba			LC
108.	Yellow Wagtail	Motacilla flava			LC
109.	Black Redstart	Phoenicurus ochruros			LC
110	Blue Rock-Thrush	Monticola solitarius	Muscicapidae		LC
111.	Bluethroat	Luscinia svecica			LC

	Common name	Scientific name	Family	Order	IUCN RL status
112.	Indian Chat	Cercomela fusca			LC
113	Siberian Stonechat	Saxicola maurus			LC
114.	Indian Robin	Saxicoloides fulicata			LC
115.	Oriental Magpie-Robin	Copsychus saularis	Muscicapidae		LC
116.	Pied Bushchat	Saxicola caprata	Saxicola caprata		LC
117.	Verditer Flycatcher	Eumyias thalassina			LC
118.	White-tailed Stonechat	Saxicola leucurus			LC
119.	Purple Sunbird	Nectarinia asiatica	Nectariniidae		LC
120.	Eurasian Golden Oriole	Oriolus oriolus	Oriolidae		LC
121.	Yellow-eyed Babbler	Chrysomma sinense	Paradoxornithidae		LC
122.	Cinereous Tit	Parus cinereus	Paridae		LC
123.	Sind Sparrow	Passer pyrrhonotus	Passeridae	Desserviterrase	LC
124.	Common Chiffchaff	Phylloscopus collybita	Dhuille e a mide e	Passenformes	LC
125.	Siberian Chiffchaff	Phylloscopus tristis	Phylioscopidae		LC
126.	Baya Weaver	Ploceus philippinus	Ploceidae		LC
127.	Red-vented Bulbul	Pycnonotus cafer	Pycnonotidae		LC
128.	Asian Pied Starling	Sturnus contra			LC
129.	Bank Myna	Acridotheres ginginianus	Cturnidaa		LC
130.	Brahminy Starling	Sturnus pagodarum	pagodarum		LC
131.	Common Myna	Acridotheres tristis			LC
132.	Greater Whitethroat	Sylvia communis	Outviidee		LC
133.	Common Lesser Whitethroat	Sylvia curruca	Sylviidae		LC
134.	Scaly Thrush	Zoothera dauma	Turdidae		LC
135.	Indian White-eye	Zosterops palpebrosus	Zosteropidae		LC
136.	Cattle Egret	Bubulcus ibis			LC
137.	Grey Heron	Ardea cinerea			LC
138.	Indian Pond Heron	Ardeola grayii			LC
139	Large Egret	Casmerodius albus			LC
140.	Little Egret	Egretta garzetta	Ardeidae		LC
141.	Intermediate Egret	Ardea intermedia			LC
142.	Black-crowned Night-Heron	Nycticorax nycticorax		Pelecaniformes	LC
143.	Purple Heron	Ardea purpurea			LC
144.	Yellow Bittern	Ixobrychus sinensis			LC
145.	Black Ibis	Pseudibis papillosa			LC
146.	Eurasian Spoonbill	Platalea leucorodia	_ Threskiornithidae		LC
147.	Black Headed White Ibis/ Oriental White Ibis	Threskiornis melanocephalus			NT
148.	Greater Flamingo	Phoenicopterus ruber	Phoenicopteridae	Phoenicopteriformes	LC
149.	Coppersmith Barbet	Megalaima haemacephala	Megalaimidae	Piciformes	LC

	Common name	Scientific name	Family	Order	IUCN RL status
150.	Brown-headed Barbet	Megalaima zeylanica	Megalaimidae		LC
151.	Lesser Golden-backed Woodpecker	Dinopium benghalense	Picidae	Piciformes	LC
152.	Eurasian Wryneck	Jynx torquilla	Picidae		LC
153.	Great Crested Grebe	Podiceps cristatus	De dicire e diele e	Podicipediformes	LC
154.	Little Grebe	Tachybaptus ruficollis	Podicipedidae		LC
155.	Alexandrine Parakeet	Psittacula eupatria	Psittaculidae	Deitte eifermen	NT
156.	Rose-ringed Parakeet	Psittacula krameri	Psittacidae	Psittaciformes	LC
157.	Spotted Owlet	Athene brama	Strigidae	Strigiformes	LC
158.	Great Cormorant	Phalacrocorax carbo	Dhalaan ay a sidaa		LC
159.	Little Cormorant	Phalacrocorax niger	Phalacrocoracidae	Suliformes	LC
160.	Darter	Anhinga melanogaster	Anhingidae		NT



#### Figure 1. Number of bird species under different orders.

Rose-ringed Parakeet, Little Grebe, Little Egret, Night Heron, Spotted Munia, Baya Weaver, Common Moorhen, Purple Moorhen, and Blue Rock Pigeon as their nests and occurrence of juveniles were also documented. Similar observations have been recorded near water bodies in Tehsil, Kharar Ropar District, Punjab (Singh & Sodhi 1985).

Threat: This habitat is facing

threat from urbanization as this pond is surrounded by human habitation and agricultural fields. Half of the pond has a welldefined boundary marked by road and the other part is surrounded by agricultural fields. The fellow area between the agricultural land and pond provides breeding and resting sites for birds, but it is observed that the pond size is reducing every year due to encroachment and reclamation by farmers to enhance their agricultural practices and use of crackers to control birds invading in agricultural fields which affect the behavior of the birds. Resultantly. decline in the number of migratory birds have been observed in the last few years as explained by the villagers and reported in local newspapers. The sewage waste from village adversely affects the water quality. During the course of present investigations, serious efforts have been made to generate the awareness regarding importance of pond and its conservation measures amongst the villagers.

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Figure 2. Percentage occurrence of birds which comes under IUCN Threatened categories at pond of village Mote majra.

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### First sighting of Asian Openbill Stork in Haridwar, India



Asian Openbill in Haridwar.

A total of 19 species of storks are found worldwide. Out of these, nine species are found in the Indian subcontinent (Ali & Ripley 1978). The Asian Openbill Stork Anastomus oscitans is a local migrant wetland bird belonging to the family Ciconiidae. It is a whitish-grey stork with greyish bill and an open space between the mandibles (Robson 2000). It is widely distributed in India, Sri Lanka, Myanmar, and Thailand but uncommon species in Pakistan. It is a resident colonial breeder (Ali & Ripley 1978). The Asian Openbill measures 64-65 cm in length and weighs 1,300-8,200 g. The name of this species is due to the distinctive gap formed between the curved lower and arched upper mandible of the beak in adult birds but young ones do not have this gap (Gosner 1993). They breed during July to September in northern India, and November

to March in southern India (Sunder 2006). Asian Openbills prepare their nest in trees or areas that are mainly inundated with water. It has generally been accepted that the configuration and composition of vegetation of a habitat acts as one of the determining factors for the distribution and abundance of bird species (Cody 1985). In this note, we document the first photographic record of Asian Openbill in Haridwar, Uttarakhand, India.

We first observed two individuals of Asian Openbills at two different locations in the Chilla Forest Range (29.957N & 78.188E; 310m) and (29.964N & 78.201E; 310m), Haridwar Uttarakhand. First individual was observed on 22 September 2020 and second individual was observed on 28 September 2020. Our observation represents the first



**Observation area (Chilla Forest Range), Haridwar.** 

photographic record of this species in Haridwar. During the winter season, many avian species (resident and migratory both) were reported in the area. Majority of plant species in the study area are Jhingan Lannea coromandilica, Sain Termanalia tomentos, Gular Ficus racemosa, Amaltas Casia fistula, and Sandan Desmodium oojlinese. The common bamboo was also observed in this area. The region is situated right at the edge of the Haridwar City and surrounded by different types of forest species (personal observation). Some previous studies showed that Asian Openbill Stork is also found in other parts of Uttarakhand like Corbett landscape (Bhatt et al. 2015).

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# Vet Brief

# Coprological prevalence of parasitic worms in Asiatic Lion and Leopard at Sakkarbaug Zoological Park, Gujarat, India

It is important to study the parasitic dynamics in wild animals especially in predatory animals as parasites can significantly affect population growth of a species (Marathe et al. 2002). Scatological analysis provides information on structure of diet, preferences of prey, ecological importance, endoparasitic dynamics, and health condition of animals (Patton et al. 1986).

The research work was conducted from August 2019 to March 2020. Faecal samples of Asiatic Lions and Leopards were collected from Sakkarbaug Zoological Park, Junagadh, Gujarat. Each sample was sealed in plastic zip lock bags labeled with name, sex and date. Samples were examined by direct smear examination method, floatation, and sedimentation method (Thawait et al. 2014).

Parasitic worms were identified by studying the morphology of the eggs as described by Basith et al. (2006) and Zajac & Conboy (2012).

A total of 129 samples were examined out of which, 20 (15.50%) samples were positive. Samples had eggs of *Paragonimus westermani* (Kerbert, 1878), *Spirometra felis* (Manson, 1882), and *Strongyloides spp.* (Grassi, 1879). Similar study was conducted by Parsani et al. (2001) of captive animals at Municipal Corporation Zoo, Rajkot, Gujarat. They had examined 28 faecal samples out of which 17 (60.71%) were positive. In our study, 20 (15.50%) samples were positive for parasitic worm infection.

Our results differ from the carnivore animals of Nandan Van Zoo, Raipur, Chhattisgarh reported by Thawait et al. (2014). Those animals were infected by *Toxocara* sp. and *Diphyllobothrium* sp. *Spirometra* was found in carnivores and small mammals of Dhaka Zoo, Bangladesh studied by Raja et al. (2014).

Male lions in Sakkarbaug Zoological Park were not infected with parasitic worms. In females only 2 (3.7%) samples were positive for *Spirometra felis* and 1 (1.85%) sample was positive for *Paragonimus westermani* (Table 2). Similar study was done by Sulehria, et al. (2014), prevalence of endoparasite in African lion- *Panthera leo*. Overall prevalence was: cestodes (*Taenia* sp.) 14.28%, nematodes (*Toxocara* sp.) 33.3% and mixed infection 14.28% prevalent. It was recorded by Sulehria et al. (2014), that prevalence of endoparasite was higher in female lions 38.9% as compared to male lions 28.5%.

#### Table 1. Prevalence of parasitic worm in Asiatic Lion and Leopard at Sakkarbaug Zoological Park.

Common Name	Name of parasitic worm	No. of positive cases (Total samples)	Prevalence (%)
	Paragonimus westermani	1(54)	1.85%
Asiatic Lion	Spirometra felis	2(54)	3.70%
	Strongyloides spp.	0(54)	0
	Paragonimus westermani	8(75)	10.66%
Leopard	Spirometra felis	8(75)	10.66%
	Strongyloides spp.	1(75)	1.33%

# Table 2. Prevalence of parasitic worms in male and female of Asiatic Lion and Leopard at SakkarbaugZoological Park.

	Sex	Sex No. of screened samples	No. of positive samples	Prevalence of parasitic worms			
Common name				Paragonimus westermani	Spirometra felis	Strongyloides spp.	
	M(n=4)	24	0	0	0	0	
Asiatic Lion	F (n=6)	30	3	1(1.85%)	2 (3.70%)	0	
	M(n=8)	65	15	7(9.33%)	7(9.33%)	1(1.33%)	
Leopard	F (n=2)	10	2	1(1.33%)	1(1.33%)	0	
M–Male   F–Female   n–number of animals							

### Table 3. Age group wise prevalence of parasitic worms in Asiatic Lion and Leopard at SakkarbaugZoological Park.

Common Name	Age group	No. of screened samples	No. of positive samples	Paragonimus westermani	Spirometra felis	Strongloides spp.
	Young (1–10 years) (n=8)	46	03	1(1.85%)	2 (3.70%)	0
Asiatic Lion	Adult (10–20 years) (n=2)	08	0	0	0	0
	Old (Above 20 years) (n=0)	0	0	0	0	0
	Young (1–10 years) (n=3)	27	3	1 (1.33%)	2 (2.66%)	0
Leopard	Adult (10–20 years) (n=6)	45	14	7 (9.33%)	6 (7.99%)	1(1.33%)
	Old (Above 20 years) (n=1)	3	0	0	0	0
n-number of anima	lls.					

# Vet Brief

In this study, Leopard males were more infected as compare to females. Highest prevalence of parasitic worms was 7 (9.33%) *Paragonimus westermani* and 7 (9.33%) *Spirometra felis.* Prevalence of *Strongloides spp.* was 1 (1.33%). While in females, prevalence of *Paragonimus westermani* and *Spirometra felis* was 1 (1.33%) respectively (Table 2).

The prevalence of parasitic worms with the age has been reported by Varadhrajan & Subramanian (2003). They observed age influence on the prevalence of helminthic infections and revealed that the animals aged one year in both herbivores and omnivores had higher prevalence of infection, (71.62% and 65.9%) as compared to the animals aged one month to one year. Carnivore animals were infected by *Ancylostoma, Toxocara, Toxascaris, Strongyloides, Capillaria, Spirurid, Diphyllobothrium, Hymenolepis,* and *Paragonimus.* 

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### **BOOK REVIEW**

### A Field Guide providing the comprehensive documentation of the Butterfly fauna of a City and its outskirts -- A Book Review of "Butterflies of Bengaluru"

By Krushnamegh Kunte & Nitin Ravikanthachari Published by Indian Foundation for Butterflies; Price: Rs. 550.00 (196 pages)

Western Ghats, one of the 4 biodiversity hotspots in India, hosts 336+ species of butterflies. Growing awareness towards nature, access to handy digital resources and socializing platforms, has immensely helped in nurturing a substantial army of butterfly enthusiasts, who have extensively contributed to the various citizen science initiatives for scientific documentation of butterflies.

These initiatives have resulted in the formation of substantial online repositories in documenting butterflies, their earlystages, larval host plants and nectar plants.

Butterflies of India Portal (https://ifoundbutteflies. org), India Biodiversity Portal (https:// indiabiodiversity.org/) and iNaturalist Portal (https:// www.inaturalist.org) provides



systematic documentation of butterflies from Indian subcontinent. Social media platforms like Facebook and Instagram are getting flooded with butterfly photographs on a regular basis to add to this vast knowledge pool. Several authors have taken this opportunity to publish Field guides, Research Papers, Coffee Tables books and even colourful brochures on butterflies with the help of photographs acquired from Butterfly Enthusiasts across the nation.

### **BOOK REVIEW**

"Butterflies of Bengaluru" by Dr Krushnamegh Kunte and Nitin Ravikanthachari is possibly the first illustrated pictorial guide that has done great justice to the winged beauties of the Garden City of Bengaluru. The book consists of 196 pages and documents 179 species of butterflies recorded from the city and its outskirts.

Each species is briefly described with vivid field images and accompanies its habitat, location in the city, larval host plants, seasonal occurrence bar graph and a miniature distribution map. The book also describes the various butterfly hotspots in and around the city, introduces butterfly families with significant scientific approach and a Systematic Checklist of Butterflies of Bengaluru. The book also touched upon a few Nectar Plants, though not comprehensive.

One of the key features of this book is the Reverse LHP-butterfly checklist of butterflies of Bengaluru, which can be used by common man to develop a butterfly habitat in



their backyard. The book categorically highlights the efforts by the members of Bengaluru Butterfly Club and Karnataka Forest department in spreading awareness to common citizens about butterflies and their importance to nature.

Though the book has not deliberated on various other interesting aspects on butterflies like migration, symbiosis, mimicry and early stages, still it is a substantial work at a very reasonable cost and can help any person to get hooked to the fascinating world of butterflies.

Reviewed by Ashok Sengupta, Post Graduate Teacher, Computer Science, Kendriya Vidyalaya No. 1, Jalahalli West, Bengaluru 560015. Email: ashokjbp@gmail.com

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