

APRIL 2021, VOL:1, NO:1

prithivya

AN OFFICIAL NEWSLETTER OF
WCB RESEARCH FOUNDATION &
WCB RESEARCH LAB



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Read about

Sighting of Sociable lapwing
in Banni grasslands





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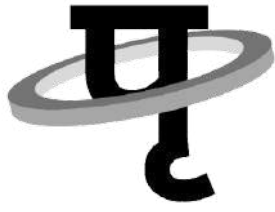


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Cover Photo
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(*Vanellus gregarius*)
By Keyur Naria

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WCB Research Foundation, India

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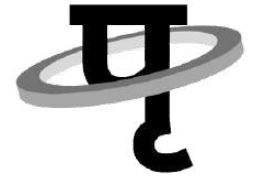
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EDITORIAL NOTE



माता भूमिःपुत्रोऽहं पृथिव्या।

According to this quote from Atharvaved, Earth is our mother and we all are her children. Therefore, all the species on the earth are connected by a common ancestral thread. We humans being considered to be the most evolved species of all, must take responsibility of conserving the signature of uniqueness and diversity of each of the living being present on our planet Earth. With a spirit of spreading the message of biodiversity conservation, WCB Research Foundation is dedicated to its cause and this first volume of 'Prithivya' Newsletter, stands testimony to mark our journey towards spreading awareness regarding conservation and sustainable development. A thing of beauty is a joy forever and so is the interesting mix of scientific articles brought to you by Prithivya, in its maiden attempt. It encompasses and also acquaints the readers with a wide range of topics on Wildlife scenario across the forests of India. I am confident that this would ignite the curiosity among our readers and inspire them to know more about these topics, after getting a glimpse of the articles included in our first issue.

Though year 2020 was very challenging it realigned the entire world to the norms of living with Covid virus. On one hand the human race reeled under the impact of the viral attack, turning its life to a standstill but on the other, Mother Nature showed remarkable resilience in replenishing its natural wealth with less of human interference. This pandemic period, however, has posed many other challenges for wildlife conservation such as diversion of funds, increase in poaching, mining, and hunting due to the absence of human surveillance. Overall health management of plant and animal species in the protected forest zones has also taken a back seat and the impacts of these fallacies would be felt in the long run. Therefore, the short and long term assessment of the effects of pandemic on Wildlife and Biodiversity Conservation, could be a prime area for research in the near future.

These restrictive environments for keeping in sync with the system have led to the adoption of newer modes of communication and therefore, Prithivya's first volume is being published online. With the New Year 2021, there is new hope and new excitement. Team Prithivya wholeheartedly thank its contributors for their support and welcomes the aspiring workers of the scientific communities to join hands with us in our journey. Such endeavors would ensure good health and wellbeing of the scientific community and would be a measure of our success as a scientifically progressed nation.

On behalf of Team Prithivya, I congratulate all authors for being a part of this initiative of WCB Research Foundation. Also, would like to appeal to all the readers to join us in our efforts to keep the flame of scientific pursuits burning strongly and engage themselves in lending a helping hand in the cause of protecting our Mother Earth...

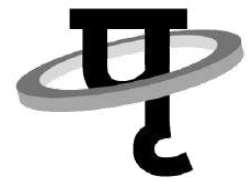
Until we meet again with our next issue, wishing you all a happy reading time.



Chief Editor

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DIRECTOR'S COLUMN

On behalf of the Board of Directors, I welcome all the readers of “Prithivya”, our official newsletter in collaboration with Wildlife & Conservation Biology Research Lab of Hemchandracharya North Gujarat University. This newsletter will provide a scientific platform to all the wildlife and conservation biologists to share their work, knowledge and experience.

The foundation is here to help the students and wildlife researchers giving opportunity to work and contribute to the society through science based conservation. We are organizing training and capacity building programmes on different aspects of conservation biology. This year 2021 is very tough and painful for all of us, we cannot go out in the field or institutes for our work or study. In this situation, we have introduced a modular One2One internship programme under the supervision of our learned and experienced life member, who are experts in their respective areas. In this programme one can select the area of their interest and choose their own module of internship based on their needs. The internship is on hybrid mode (online and offline) following all the precautions and guidelines of Covid19.

My hope and expectation is that, this foundation will involve and help more wildlife aspires and researchers that allows us to grow as an organization and increases our conservation outreach while maintaining our core values that are rooted in adding science to conservation. We are very much looking forward to your feedback and the recommendations to make this foundation more approachable. Please feel free to write us or reach us with more suggestions to improve the services of our foundation.

I would like to use the opportunity to express my gratitude to the governing council of this foundation, advisors and the member of the editorial board of this newsletter for providing their constant support and time to the foundation. WCB Life Members have always contributed in the foundation through their services and knowledge and I truly appreciate this and will look forward for the same support from all of you in future.



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Observation of Painted Stork (*Mycteria leucocephala*) Nesting colonies at Kodadha Village, Patan

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The Painted stork is a large wader with distinctive pink flight feathers of the adults, and it has a big yellow bill with a down-curved tip, bare orange head and pinkish legs listed as a Near Threatened (IUCN 2007) (Grimmett *et al*, 2016). Males and females have similar resemblance only males are larger than the females (Animalia.bio). This species is known for the colonial nesting (Koli *et al*, 2013).

Juvenile Painted stork outside the nest, ready to fly

Agricultural landscapes and wetlands provide a wide variety of avian fauna habitats that vary seasonally. During the December field study of wetland birds, four large habitats in the lake were observed. These were the habitats of Painted stork (*Mycteria leucocephala*), Asian Openbill (*Anastomus oscitans*), Eurasian Spoonbill (*Platalea leucorodia*), and Black ibis (*Pseudibis papillosa*) (Sundar, 2006).

We visited Kodadha village lake (23°33'07.5"N 71°29'52.8"E) about 41 Km to Sami Taluka on 20th December 2020 during my field study. The village lake is filled with water, having an elevation of *Prosopis juliflora* and *Salvadora* genus at the periphery of the lake. The wetland water is used by villagers for irrigation, drinking, or bathing purpose by cattle.

The sky is voluble with the flock of Painted stork. In December 2020, about 45 adults were seen on the nest and soaring in the sky. They had nested on *P. juliflora* grown on wetland bed, about 20 juveniles were standing on the nest and with some on the bed of wetland and few sitting on a tree.

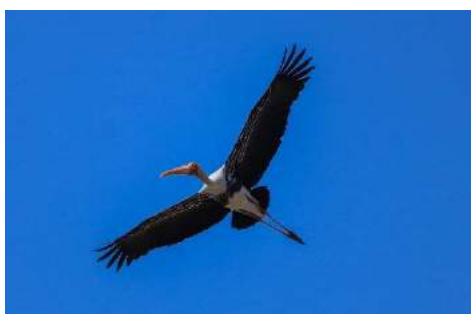


Unique plumage pattern of juvenile Painted stork



They were old enough to fly using their wings but these juveniles were mainly opaque whitish with a yellowish-grey bill and blackish facial skin, having a brownish plumage. Urfi (1993) and Tere (2006) some colonies of these birds were also observed in their study area. These species also build nest on trees like Banyan (*Ficus bengalensis*), Peepal (*F. religiosa*), Neem (*Azadirachta indica*), Babul (*Acacia nilotica*), etc., in Gujarat and other parts of the country.

The colony of Painted stork nest was counted on more than 15 nests on *P. juliflora* bushes and the number of nests on each bush varied between 2 and 6, usually 3 and the observations took place by using binoculars (Olympus 10x50S). This nesting site was spread over the wetland. Storks had used thorny sticks of *P. juliflora* as nesting material. All nests and trees were looking white due to the deposition of excreta of the birds.



Adult Painted stork soaring above the water body

Other water-birds like Pond heron (*Ardeola grayii*), Black crowned night heron (*Nycticorax nycticorax*), Ibises, and Spoonbills also used the same trees for roosting and nesting (Urfi, 1993). Along with these large birds and other waders like Common snipe, Sandpipers, Spot-billed ducks, Egrets, Northern Shoveller, Swallows, Swifts, etc. were also observed.

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Acknowledgements:

Mr. Anurag Bhatu is acknowledged hereby for providing these photographs of Painted stork. Also, the author grateful to WCB Research Foundation for funding and facilities.

Suggested citation:

Bhati R. (2021). Observation of Painted Stork (Mycteria leucocephala) Nesting colonies at Kodadha Village, Patan, Gujarat, India. Prithivya, An Official Newsletter of WCB Research Foundation and WCB Research Lab. Vol 1(1) xx-xx.





An Interesting Observation: Monitor Lizard (*Varanus bengalensis*) using the Den of Indian Fox (*Vulpes bengalensis*)

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The Monitor Lizard or Common Indian Monitor Lizard (*Varanus bengalensis*) is widely distributed lizard across South-Central and Southeast Asia (Papenfuss et al., 2010). Occupying both terrestrial and fresh water it occurs in variety of habitats from forest to scrubland, desert to floodplains at elevation below 1500 m (Papenfuss et al., 2010). However, it is reported more common in human dominated landscapes including agriculture fields, dams and gardens (Auffenberg, 1994). The species due to its wide distribution and generalized niche is listed as Least Concern in IUCN Red list; however, in India it is listed as Schedule I animal under the Indian Wildlife Protection Act (1972) as it is heavily exploited animal for its skin (Koch et al., 2013; Bhattacharya & Koch, 2018; Varadraju, 2013).



Image 1. Indian monitor lizard entering the fox den (October 19, 2020)

Indian Monitor Lizard prefers drier places compared to the Asian Water Monitor Lizards (*Varanus salvator*). Monitor Lizards take refuge to burrows on land and under trees, hollows of trees, dense vegetation, creeks and crevices (Manakadan & Rahmani, 2000; Varadraju, 2013; Yang & Lok chan, 2020).

Indian Fox makes den with multiple openings to ensure their protection and sanitization purposes (Jhonsinh and Jhala, 2004). Although all these openings are not used as regular basis by fox, hence such unused openings are often used by some other rodents like gerbil and reptiles like lizards as a place to hide or rest (Gompper and Vanak, 2006). Manakadan and Rahmani (2000) observed presence

of the Indian Monitor Lizard in the active den of Indian Fox in South India and noted that the presence of Indian Monitor Lizard as a threat to Indian Fox because monitor lizard killed Indian fox pups (Manakadan & Rahmani, 2000).



We are monitoring the fox dens under our ongoing denning study in the degraded habitats of North Gujarat since 2019. During this monitoring, on October 19th, 2020 we have observed a monitor lizard entering in one of the openings of the fox den at 07:30 hrs. (Image 1 and 2). This particular den covered nearly 12 sq. m area inside the ground with 7 openings. Nearby



Image 2: Indian monitor lizard entering the fox den (October 19, 2020)

water source and human settlement is approximately 150 m and 350 m away respectively from the den. Such observation is very surprising and new for us. Hence, with the loads of curiosity, we have visited the same den (location) on the next day (October 20th, 2020).

Here, we have again observed one individual of monitor lizard moving in and out in the same opening.



Image 3: Monitor lizard observed on the next day on same den opening on next day (October 20, 2020)

other openings were closed or unused except the one where we observed the lizard. This indicates the regular use that opening by monitor lizard.

For more information we have inspected the den in the evening (18:40 hrs) and did close verification. However, we did not notice any activity of monitor lizard inside the den (Image 3).

Close verifications reveal that Monitor Lizard was approximately two feet interior in the den from the opening. While observing the other openings of the den, we found all

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Suggested citation:

Desai P; Patel S and Chaudhary S. (2021). An Interesting Observation: Monitor Lizard (*Varanus bengalensis*) using the Den of Indian Fox (*Vulpes bengalensis*) Gujarat, India. *Prithivya, An Official Newsletter of WCB Research Foundation and WCB Research Lab. Vol 1(1) xx-xx*





My experience of trapping sloth bear in camera traps

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Studying and understanding wildlife in its natural habitat has always been a topic of curiosity for humans since the beginning. Over the period of time, innumerable research work has been generated using different approaches. On the parallel side, new techniques were continuously discovered especially for observing elusive species. One such technique that revolutionised the research on observing animal behaviour in wild was camera trapping. Introduction of camera traps for observing and recording wildlife movement dates back to 80s. This enabled researchers to capture images of rare wildlife species for understanding and developing conservation strategies. However, as interesting it sounds to employ a camera trap in wild, I learned it a hard way that not always technology can be of aid to you in studying animal behaviour in wild.

I got introduced to sloth bear in my childhood as dancing bear used as a source of entertainment. Years later, an unplanned trek to a temple site in Jessore sanctuary led me to a sloth bear sighting in its natural habitat. As fascinating it was to observe this species with my own eyes, it also troubled me to watch it foraging on leftover food in the surroundings of the temple. Being a myrmecophagy animal, it was confusing to observe an alteration in their behaviour. Jessore sloth bear sanctuary, lying in the foothills of Aravalli is well known for inhabiting a good number of sloth bear in the state of Gujarat (Garcia et al., 2016). Lately, increase in the number of human bear conflict cases were reported mainly due to encroachment by locals and habitat degradation (Dharaiya and Ratnayeke, 2009). Working with wildlife and conservation biology lab gave me an opportunity to monitor sloth bear movement in two sloth bear sanctuaries of north Gujarat.

Funded by International Association for Bear Research and Management, I began my research in Jessore and Balaram sloth bear sanctuary. Initial field visits gave me an understanding of the area, the undulating landscapes sporadically comprised by tribal houses along with the villages in the peripheral region. These locals rely on forest produce for their livelihoods. Every



Setting up camera trap in Sloth bear sanctuary Photo by: V. Shah

morning these villagers plies through the forest for livestock grazing. It is interesting to interact with these people as one might come across some rare observations recorded by them. Captivated by the idea of monitoring a sloth bear in wild, I tried to employ camera traps inside of both the sanctuaries.

It is a protocol to work with forest department while conducting a research in the Protected Area. The compelling thing to observe is the knowledge of tribal residing inside the sanctuary area. One can be surprised to hear all stories related to wild animals and how to avoid attacks. Depicting the walking style and noise sloth bears make was quite

fascinating. I proceeded with instalments of camera traps on pre identified routes taken by sloth bears or other wildlife with the help of forest officials. It was planned to leave 10 camera traps in each sanctuary for a specific period of time to collect sufficient data. To my surprise 6 out of 10 camera traps were stolen in the first week of installation. Over a period of time, I was losing camera traps from the field without any trace left. It was quite bewildering in the beginning to figure out a way to keep the camera traps intact inside the forests. Later on, I stumbled upon my mistake of missing out an important element out of the whole strategy of conducting research and monitoring. And that crucial element was local community that has been ignored during the whole process. It makes sense to include locals as they are frequent visitors of the forest, who can be a better candidate to locate and assure safety of camera traps in the area. Besides, including them as a part of research opens a window for combining both traditional and scientific knowledge. Also, regular monitoring becomes easy with their assistance as they are an integral part of the ecosystem being studied. It was observed that locals shares the same level of curiosity with the scientist towards wildlife activity. Allowing them to assimilate their archaic information with the new technologies and scientific ideas will benefits both communities. It will help in creating awareness among the locals by understanding and promoting co-existence in the area. By losing those camera traps has made me realise that participatory approach can be a good start in conducting scientific research in areas inhabiting tribal.

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Suggested citation:

Malik A. (2021). My experience of trapping sloth bear in camera traps. Prithivya, An Official Newsletter of WCB Research Foundation and WCB Research Lab. Vol 1(1) xx-xx.





Unusual nesting location of Red-vented bulbul (*Pycnonotus cafer*) at Thol Lake Bird Sanctuary

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The Red-vented Bulbul, *Pycnonotus cafer* is an Asian passerine bird and one of the globally successful invasive Sp. (Thibault *et al.* 2018). Red-vented Bulbul belongs to Pycnonotidae family which is known for its adaptation to new conditions. The Red-vented Bulbul is further divided in to eight subspecies and also classified as one of the 100 invasive species on the earth (Nowakowski and Dulisz, 2019). Red-vented Bulbul is a local and habitual breeder (during summer, May-August) in the Thol Lake Bird Sanctuary which is one of the popular hotspots of Gujarat for bird sighting. Nest building and nest location play a very crucial role in the lifecycle of any bird. The nest site and the location are influenced by several factors such as the risk of predators, availability of vegetation, nesting material and food. Nesting ecology and behaviour of Red-vented Bulbul were well studied by two major groups in India Chisty *et al.* (2020) and Rao *et al.* (2013). Chisty and co-workers (2020) observed 38 nests and confirmed that Red-vented bulbul generally selects 1-9 m height for the building of a nest. Nest building was exceptionally observed at 12 m height in the urban areas due to the unavailability of proper location. Rao and co-worker (2013) observed a total of 28 nests in two breeding seasons and confirmed that Red-vented bulbul does not prefer low height such as <1 m.

In the present study, an unusual nest altitude of the Red-vented Bulbul was observed at Thol Lake Bird Sanctuary. Thol Lake Bird Sanctuary is situated between 23.25 to 23.50N and 72.500 to 72.75E (Desai *et al.* 2018). Thol Lake is man-made and initially prepared for the irrigation purposes, further declared as sanctuary due to reach in avifauna and floristic diversity (Vyas and Patel, 2015). The observation was done by



Image 1: Location of Red-vented Bulbul nest at Thol Lake Sanctuary



Nikon A211 binocular and further photographic evidence collected by the Canon 90D with 55-250 mm lens. Video graphic evidence was collected by the Cannon 35X point shoot camera. All the observations (number of observation 10) were done from the minimum 10 ft. distance to avoid human interference to the breeding pair and their chicks. The location of the study site was 23°8.334N, 72°23.578E. As shown in Image 1 and Video file 1 <https://youtu.be/mNm8q2AuBWk> nesting was observed under 2ft. height.

The red round in Image 1 represents the location of a nest. Image 2 represents the nest with four chicks. This is the unique and first report of the nesting at such a low altitude to the best of the author's knowledge and literature survey.



Image 2: Successful breeding and developed chicks in the nest

Every species have a specific shape and site location according to need. Nesting sites may vary due to habitat loss and urbanization (Chisty et al. (2020). But, changing in location or altitude is very rare in the sanctuary areas as such areas fulfil all the necessary requirements for the successful breeding of habitual birds. Further, detailed observation of such

location and nesting ecology need to be studied to observe changes in the local ecosystem and bird behaviour.

Acknowledgment

We owe our sincere gratitude to the Gujarat Forest Department and All the ground staff members of Thol Lake Bird Sanctuary.

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Suggested citation:

Patel BV and Patel RB(2021). Unusual nesting location of Red-vented Bulbul (*Pycnonotus cafer*) at Thol Lake Bird Sanctuary, Gujarat, India. *Prithivya, An Official Newsletter of WCB Research Foundation and WCB Research Lab. Vol 1(1)xx-xx*





Black Eagle (*Inctinaetus malayensis*) Sighting in Jambughoda Wildlife Sanctuary, Gujarat

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Raptors are considered on the third or fourth level consumers and playing an important role in the ecosystem and also known for controlling the rodent and small mammal population. They are categorized as a focal species, being sensitive to environmental change, such as impacts to their ecosystems, and vulnerable to pollution, hence they serve as an icon for conservation initiatives (Withaningsih et al. 2019).



Image 1: Black eagle soaring above Shivrajpur

A raptor with the vivid yellow bill and feet was soaring in the clear and bright sky during the field visit at the Jambughoda Wildlife Sanctuary (WLS), Panchmahal district of Gujarat. It was November month in the year 2016. After looking in the reference book (Grimmett et al. 1999), we concluded that it is a Black Eagle (*Inctinaetusmalayensis*). The coordinates of the sighting is 22° 25' 26.60" N & 73° 37' 07.11" E.



Image 2: Sighting of the Black eagle in Jambughoda wildlife sanctuary, Panchmahal District, Gujarat.

The Jambughoda is the area with forested mountains and hills in the central Gujarat. While walking transect in the Shivrajpur village we observed this Raptor. This species has been reported from Jambughoda forest by Ali on November 11, 1945 after that, it was recorded by Trivedi and Soni continuously for four years (2002, 2003,



2004 and 2005) in the same area and also in Purna WLS in year 2001 (Parasharya 2010). Vikas (2015) have listed Black Eagle from Vansda National Park, this indicates its range of distribution in central and southern part of the state. Along with Black eagle, we also observed other raptors like Shikra (*Accipiter badius*), Short-toed Snake Eagle (*Circaetus gallicus*), Oriental Honey-buzzard (*Pernis ptilorhynchus*), Black-winged kite (*Elanus caeruleus*), Crested Serpent Eagle (*Spilornis cheela*) and Osprey (*Pandion haliaetus*).

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Suggested citation:

Mesaria S V (2021). Black Eagle (*Ictinaetus malayensis*) Sighting in the Jambughoda Wildlife Sanctuary, Gujarat, India. Prithivya, An Official Newsletter of WCB Research Foundation and WCB Research Lab. Vol 1(1) xx-xx





Fearless fox in Vagadipolo, a degraded land of North Gujarat

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There are several un-protected areas which need to explore for their biological wealth and presence of some rare and endangered species there in. Unawareness or ignorance of these areas may be a reason that why such areas getting degraded due to immense biotic pressure and encroachment.



Figure 1: Pups of Indian fox

Vagadipolo is such un-classed and unexplored forest area located near the village, Vithoda of Kheralu Taluka of Mehsana, Gujarat, India (N23.9377, E72.5150 & N23.9353, E 72.5337) is studied by me in dissertation work. The area is surrounded by agriculture land owned by the villagers who used to exploit this land for cattle grazing and trespassing. Though highly degraded the

area harbors good faunal diversity including reptiles, terrestrial birds and mammals. Indian fox (*Vulpes bengalensis*), one of the unappreciated and least studied small sized carnivore of the area. Den sites, breeding sites and their feeding habit were studied in this area and tried to understand how they live in such a degraded and human dominated landscape. Fifteen dens were covered within the area of approx 1.5 km², out of which around five were the active dens. Dens have minimum two and maximum 30 openings.

In February, fox pups coming out and pop-up their head, this is season when fox pups are coming out. I came across such situations many times and found myself lucky to witness the successful breeding of fox in this area. But this area is not more secure for Indian fox, during my search in Vagadipolo, found a dead male fox, with a bite marks on its body. The fox was looking so healthy but this may be a case of dog bites during the territory fight. Interrogation with locals gave information about poaching and poisoning of other animals that are considered



as agricultural pests. Additionally, other anthropogenic activities and encroachment in are being lethal for such small and isolated population of wild mammals. I found a great sense of



conservation among the locals for the biodiversity due to mythological and ethical understanding along with the social responsibility to protect the land for grazing. Many such degraded lands demanding study and conservation act to conserve small and

Figure 2: Indian Fox (*Vulpes bengalensis*)

neglected populations of wild animals.

Suggested citation:

Desai P. (2021). *Fearless Fox of Vagadipolo, Mehsana, Gujarat, India. Prithivya, An Official Newsletter of WCB Research Foundation and WCB Research Lab. Vol 1(1) xx-xx*





Sighting of Sociable lapwing (*Vanellus gregarius*) from Banni Grassland of Kachchh, Gujarat, India

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Abstract:

*In this paper, we report the recent sightings of the Sociable Lapwing (*Vanellus gregarius*) from new location in Banni grassland of Kachchh district. Further as the Sociable Lapwing is a Critically Endangered Species due to Habitat loss and Hunting understanding its current distribution and abundance is necessary. Thus our sighting is important as the species was found from an unprotected grassland area.*

Key Words: Sociable lapwing, Grassland, Banni, Kachchh

Introduction:

Sociable Lapwing (*Vanellus gregarius*), Family Charadriidae (Plovers) is categorized as Critically Endangered (IUCN 2020, Bird life International, 2021). There are total 11,200 individual are present and they are in decreased gradually (Bird life International, 2021). It is migratory species (Del Hoyo, 1996) and flocks of several thousand birds have been known to gather before migration in Siberia and Kazakhstan, but migration itself usually occurs in small groups of 15-20 birds (Del Hoyo 1996; Johnsgard, 1981). It arrives on its wintering grounds in India and Pakistan by September-October, and in Sudan by late October (Del Hoyo, 1996) However, very occasionally larger flocks of over 100 birds have been recorded (Johnsgard, 1981). They usually stay at wintering ground from September to late March that depends on the weather conditions of the wintering ground. The early Indian records indicate the species migrated in very large flocks (Baker 1922–1930).

The wintering range of Sociable lapwing is lies in the northern and western parts of the India, especially in the states of Himachal Pradesh, Punjab, Haryana, Delhi, Uttar Pradesh, Bihar, Rajasthan, Gujarat, Madhya Pradesh, Maharashtra and some parts of Karnataka and Kerala.

Study Area:

Banni region, situated at 23°19'N to 23°52'N to 68°56'E to 70°32'E comprises around 3000 sq.km area under Bhuj taluka of Kutch district, is home of Muslim nomadic pastoralists and Meghwal Hindus.



Figure 1. Map showing occurrence of Sociable lapwings in Grassland area of Banni (Kachchh).

Banni is located in Arid climate, with high temperature in most of time which reached maximum up to 48°C -50°C during May, June and winter temperature goes down to 2°C -

8°C during December January. Average Annual rainfall, occurring through Southwest monsoon between June to September, is very low of 317mm with coefficient of variation of 65%. However, there is inherent salinity in the soil, pastoral communities dug up Virdas, shallow well of 9-12ft deep that collects rain water in its soil particle, for livestock and themselves. There have been numerous natural wetlands in Banni and the largest one is known as Chhari – Dhandh, a saucer shaped wetland which is recently declared as Conservation Reserve.

Methodology:

Bird survey was carried out during daytime however birds were more active during morning and evening time. Birds were observed using 8×40 (Nikon action) binoculars and identified on the basis of standard books by Kazmierczak (2000) and Grimmett et al. (2011).

Observations:

On January 22, 2021, while surveying at the plains of Bhirandiyara village (Figure 1). At 1310 h a flock of lapwings grabbed my attention, they were slightly smaller than the Red-wattled lapwing *Vanellus indicus* but with white color supercilium and black legs and bill, they are distinguished from Red-wattled lapwing. I could take their



Image 1: Sociable Lapwing in plains of Bhirandiyara Village, Banni Grassland (Kachchh) 22 January 2021



photographs easily, which helped me to identifying the flock as Sociable Lapwing *Vanellus gregarius* (Image 1). With the help of Kazmierczak (2000) and Grimmett et al. (2011).

After identify them, I'm trying to count the total individual of Sociable Lapwing with help of binoculars and I observed total 18 individuals of them; They were primarily resting with little movement, although a few individuals were feeding occasionally.

While observing the surrounding Habitat of the Sociable lapwing, I found 4 individuals of Red-wattled lapwing which are also foraging with the flock of Sociable lapwings; and 9 individuals of Cream-coloured courser *Cursorius cursor* and 8 individuals of Indian courser *Cursorius coromandelicus* are also observed nearby flock of sociable lapwings.



Image 2: Sociable Lapwing in plains of Shervo Village, Banni Grassland (Kachchh), 25 January 2021

On January 25, 2021 while surveying near by the Shervo wetland (Kachchh, Gujarat), At 1357 h, I observed 3 birds in flight. And I also heard the short call "kyek" by one individual during flight (Image 2). On February 02, 2021, at 1040 h, I observed a flock of 24 individuals in flight at different location (490 meters away from the earlier sighting at Bhirandiyara village). Later on February 06, 2021, at 0950 h again while surveying

near plains of Bhirandiyara village, I found only 1 individual foraging in the plains with the folks of Greater short-toed larks *Calandrella brachydactyla* (Image 3).

Table 1: Observations of Sociable lapwing at different study sites

Date	Site	# birds
22/01/2021	Bhirandiyara	18
25/01/2021	Shervo	3
02/02/2021	Bhirandiyara	24
06/02/2021	Bhirandiyara	1



Image 3: Sociable lapwing in plains of Bhirandiyara Village, Banni Grassland (Kachchh), 06 February 2021



Discussion:

During my surveys, a total of 46 sightings of sociable lapwing were noted on 4 different occasions. Though some of the sightings may be of the same individual seen at different times and dates, there is no doubt that more than 24 birds were present in this area.

India has around 465 Important Bird Areas, amid them the Sociable Lapwing is found only in eight Important Bird Areas (Islam and Rahmani 2004). In India, the species's habitat has majorly declined due to the expansion of agriculture area and spread of exotic plant species like *Prosopis juliflora*. Which results in disappearance of open areas, fallow lands and grass-lands. So the present sighting of the sociable lapwings were doesn't fall into any kind of Protected Area network. Hence, I'm suggest that such grass-land areas should be given more protection; which helps to conserve this critically endangered bird species.

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Suggested citation:

Naria KH and Rathod JY (2021). Sighting of Sociable lapwing (*Vanellus gregarius*) from Banni Grassland of Kachchh, Gujarat, India. Prithivya, An Official Newsletter of WCB Research Foundation and WCB Research Lab. Vol 1(1)xx-xx.





Study of some sacred groves and sacred plants with their ethno-botanical importance in Ambaji forest of North Gujarat, India

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Abstract:

Ambaji range forest of North Gujarat belongs to Banaskantha District. It is a part of Ambaji-Balaram wildlife sanctuary. North Gujarat is falling under *Boswellia* forest type I. The Adivasi (local people) dwelling in the forest has good knowledge of herbal medicine. The term 'Ethnobotany' was first coined to encompass entire studies concerning plants, which describe local people interaction with the natural environment. Its scope was much elaborated later. Present Ethnobotany links diverse disciplines such as anthropology, botany, linguistics, nutrition, ecology, conservation, economics and pharmacology, opening a wide field yet to enrich the human knowledge. Present paper deals with an ethnobotanical study of medicinal plants used in sacred groves like Mahadev Ramapir SGs: (Village- Banodara), Nageshwar Mahadeva Sacred Grove SGs (Village-Padaliya), and Bhakhar Babo Bavji SGs (Village - Ambalimala-Saraschapri), of Ambaji forest. The 31 plant species belonging to 25 families were collected and explained its exact botanical name with family, local name and folk uses for number of diseases. These sacred groves are being protected for generations together to maintain the unique diversity, endemic, medicinal and useful valued species. Extensive field trips were carried out in the sacred grove at monthly intervals. Specimens of flowering plants were collected and identified with the aid of different regional floras.

Key words: Ethnomedicinal Plants, Sacred Groves, Ambaji forest.

Introduction:

The traditional worship practices show the symbiotic relation of human beings and nature. Indigenous communities all over the world lived in harmony with the nature and conserved its valuable biodiversity. Plant has a vital role in human welfare and are continued to be valued industrial, economic, commercial and medicinal resources and some subcontinent with its wealth and variety of medicinal, many of which are even today in common uses much of which is steadily being eroded (Dastur, 1951; Mitra, 1922; Schulted, 1960).

The aim of Ethnobotany is to study how and why people use and conceptualize plants in their local environments. Plants have been used in the traditional healthcare from time immemorial, particularly among tribal communities (Laloo et al. 2006) Sacred groves are one of the ways to of the conservation of biodiversity. While trying to understand and document the indigenous knowledge of resource management practices. Collection and removal of any material from the Sacred Groves is prohibited (Khan & Rai, 1987; Tripathi et al., 1989). Sacred groves or sacred trees serve as a home for birds and mammals, and hence, they indirectly help in the



conservation of living organisms (Islam et al.,1998. Vasudeva et al.,2003; Airi et al.,1997). Protection of a large number of medicinal plants in sacred forests of different parts of India is some of the well documented by earlier studies (Vartak et al., 1987; Bhakat & Pandit 2003) It is also observed that more than 35,000 plant species are being used around the world for medicinal purposes. The communities residing in these rich biodiversity areas have rich traditional wisdom of herbal medicines. Almost every village has a Bhuva (tantric/cosmic healers), a Bhagat (religious healers) or a Vaida (herbal healers) who are carriers of the traditional Knowledge. This is much evident from various studies and documentation undertaken in the past in the areas of ethno-botany, ethno-medicine, tribal culture, livelihood, veterinary medicine etc. (Bedi, 1968; Shah, 1983 and Umadevi, 1988; Oza, 1991; Punjabi, 1998).

Methodology:***Study area:***

Ambaji range forest is a part of Danta taluka situated on eastern part of the Banaskantha district in North Gujarat. Out of 300 sq. km. geographical area of the range, about 542 sq. km is notified as Ambaji-Balaram wildlife sanctuary. These forests are inhabited by a variety of ethnic groups including the tribes like Bubadiya, Parghi, Taral, Bhemiyat, Dhrangi, Khair, Laur, Makwana, Dabhi, Solanki, Chauhan, Gamar, Parmar, Rohisa, Rathod, Mansi, Damor, Khermal, Kodarvi etc. These tribes cover 48 per cent of the total population. The two main rivers Banas and Sabarmati and their tributaries are contributing to the enrichment of floral components. The average annual rainfall is about 725mm. Ambaji range forest is representing 434 angiosperm species (20% of the Gujarat flora) belonging to 85 families. The forest type is dry deciduous and scrub (Champion and Seth, 1968) and it harbors about 400 tracheophyte plant species, including pteridophytes, gymnosperms and angiosperms. These forest areas are inhabited by around 20 tribes. Tribal people of Ambaji forest range directly depend upon forest resources for their daily needs.

Data collection:

The study area was surveyed regularly to record the floristic wealth of sacred grove of Ambaji forest areas. Various field trips were arranged and specimens were collected, identified with the help of Flora of the Presidency of Bombay and Gujarat Flora and properly processed through standard methods. Special note on the ethno botany were noted. Plant species were arranged according to Bentham and Hooker's classification given in the Gujarat Flora. Here



documented 31 plant species were belonging to 29 genera and 25 families. Field notes with special reference to their distributional and regeneration status were noted. The data were collected from the following sacred groves.

Mahadev Ramapir SGs

Caretaker: Kesarbhai Senabhai Kodarvi

History: Mahadev Ramapir sacred grove is 35 years old, situated in dense forest of Ambaji – Danta at the village Banodara. The idols are in sequence such as Mahadev Ramapir, Gogabapji, Mamaji & Ashapuramataji. Tribal people of this area worship to god in the Gujarati month of “Vaishakh” at morning & evening time & also special adoration at every Saturday in evening time. No acceptance of any gift from tribal people. Caretaker Senabhai had given this knowledge to his son Kesarbhai & further will be given to Kesarbhai’s son Jayantibhai. This temple is established inside the house.

Pledge: In case of infertility & typhoid the tribal lady pledge to the god Ramadev pir. In case of disease & severe pain they worship to the god Bholenath. In case of mental disease they worship to the god Mamaji Dev. The folk belief that after fulfillment of the wish the deity is respected by Coconut & the sweet “Mohanthal”. It’s called “Mithipuja”.

Nageshwar Mahadev SGs

Caretaker: -Bhagaram

History: Nageshwar Mahadev sacred grove is situated in dense forest. Sacrifice is done in week & wood of the plant sandal wood is used. The person passing by goes to Darshan of God. After fulfilling many of the wishes deity represents the sweet “SAKARIYA” to the god.

Bhakhar Babo Bavji SGs

Caretaker: Vakhtabhai Bhagora- 85 years

History: This grove is 100 years old and situated on top of the hill at Ambalimala-Saraschapri village. It is built on the Babodev Hill. The tribal people worship & take vow before God & on completion of that vow, they represent horse idol, Sukhdi, Coconut, full dish. If there is a big vow, they also represent goat sacrifice. Sukhdi is dedicated on the morning of Diwali. The grove is mainly under *Terminalia*, *Albizia*, *Holarrhena*, *Cassia fistula*. According to their belief, they do not cut these trees because it is God's place.



Informators: Devliben Parmar - 45 years, Kedi baa Parmar- 75 years, Reshmabhai Bhagora- 19 years, Peniben Bhagora, Hamira bhai.



Sacred groves and plants at Ambaji forest, North Gujarat, India

Results and Observations

Present works deals with identify folklore medicinally important plants frequently used by rural communities of sacred groves in central India. A total of 3 sacred groves and 31 Ethnomedicinal Plants were enumerated.

Sacred Plants with Their Ethno-Botanical Importance in Ambaji Forest

1. *Milusa tomentosa* (Roxb.) Sinclair [UMPH, UMBIYO]; Annonaceae
 - Fresh roots are tied at abdomen to cure tumors [Jivabhai].
2. *Crateva nurvala* Buch.-Ham. [VAYVARNO]; Capparaceae
 - Dried bark paste is applied twice a day on abscess [Somabhai].
3. *Flacourtia indica* (Burm. f.) Merr. [KANTI]; Flacourtiaceae
 - Few root pieces are boiled in water and applied on the poisonous animal bites [Somabhai].
4. *Bombax ceiba* L. [SIMLO, SAVAR]; Bombacaceae



About 100g of fresh inner bark is crushed into paste and applied on broken horn of cattle. It sets well in few days. [Nopabhai].

Fresh stem bark paste (paste is made by rubbing stem bark on a moist stone) and applied on skin diseases and pimples. [Somabhai].

5. *Grewia hirsuta* Vahl. [SISOTI]; Tiliaceae

A glassful of stem extract is taken in the morning with empty stomach to join bones of human beings and cattles [Khemabhai].

6. *Aegle marmelos* (L.) Coec. [BILI]; Rutaceae

Boiled fresh leaves are applied for blood clotting [Arjanbhai].

Ripe fruits are edible and having medicinal properties [Shirmiben].

7. *Boswellia serrata* Roxb. [SALAD, DHUPELIO, GUGAL]; Burseraceae

Fresh leaves paste discarded water and bathing with this cures vomiting [Somabhai].

8. *Azadirachta indica* A. Juss. [NEEM, LIMDO]; Meliaceae

Inner bark is mixed with black pepper, salt and water. The mixture is taken thrice a day to cure fever. [Arjanbhai].

9. *Sapindus laurifolius* Vahl. [ARITHU]; Sapindaceae

Boiled leaf juice is given to children for curing vomiting. Leaves are used as fodder [Devabhai].

About 50ml of fresh leaf juice is taken regularly to cure fever after delivery [Somabhai].

10. *Mangifera indica* L. [KERI, AMBO]; Anacardiaceae

Dried malformed inflorescence are powdered and given with water to animals, as a cure for swollen stomach [Somabhai].

11. *Butea monosperma* (Lam.) Taub. [KHAKHRO, KESUDO]; Papilionaceae

About 250g fresh stem-bark is crushed with water and filtrate is taken once in a day to cure Diarrhea [Somabhai].

12. *Delonix elata* (L.) Gamble [HINDRO, SANDSRO]; Caesalpiniaceae

Four to five leaves are crushed with water and paste is made it is applied on eyelids for removal of eye diseases [Somabhai].

13. *Acacia nilotica* (L.) Del. subsp. *indica* (Bth.) Brenan [BAVAL]; Mimosaceae

100ml of stem bark decoction is taken once a day to cure stomach pain [Anabhai].

Leaf juice is given to cure sunstroke [Jivabhai].

14. *Anogeissus latifolia* (Roxb.) Wall. ex Bedd. [DHAVIDO]; Combretaceae

Fifty grams of fresh stem bark is chewed regularly for curing cough [Jivabhai].

15. *Terminalia bellirica* (Gaern.) Roxb. [BEHDR, BEHDA]; Combretaceae



About 5g of fruit powder is mixed with a glass of water and taken twice a day to cure sleeplessness. [Jivabhai].

16. *Alangium salvifolium* (L. f.) Wang. [ANKOLI, ANKOL]; Alangiaceae

About 100g fresh roots are rubbed with water and applied on the poisonous animal sting [Jivabhai].

17. *Adina cordifolia* (Roxb.) Bth. & Hk. f. ex Brandis [HALDU]; Rubiaceae

About 200g fresh stem bark is boiled in 400ml water, with sugar or honey. The mixture taken twice in a day to cure jaundice [Devabhai].

Five-inch piece of fresh stem bark is crushed with water and applied on mumps [Somabhai].

18. *Diospyros melanoxylon* Roxb. [TIBRU, TIMBRU]; Ebenaceae

Dried stem bark is smoke is inhaled to cure Asthma [Somabhai].

19. *Holarrhena antidysenterica* (L.) Wall ex G. Don [KUDA, DOLA KUDA]; Apocynaceae

Fresh roots are crushed with water, a tea spoonfull of this filtrate is taken once a day early in the morning cures diarrhoea [Nopabhai].

About 25g fresh roots are pounded with 100ml water and taken one spoonful as a for cure stomach pain [Nanabhai].

20. *Cordia dichotoma* Forsk. [VADGUNDO, MOTOGUNDO]; Boraginaceae

A glass of fresh leaf juice is taken thrice a day regularly to women as pain killer after delivery [Jivabhai].

21. *Cordia gharaf* (Forsk.) F. N. Will [GUNDI, NANI GUNDI]; Boraginaceae

A tea spoonfull of stem bark juice is given orally to cure dysentery [Somabhai].

About 50ml of leaf juice is given to cure dysentery. [Jivabhai].

22. *Tecomella undulata* (Sm.) Seem [RAGAT ROHIDO]; Bignoniaceae

A teaspoonful of leaf juice is taken thrice a day to cure fever [Somabhai].

A tea spoonful of flowers powder is taken thrice a day regularly to cure cancer [Karimbhai].

23. *Clerodendrum multiflorum* (Burm. f) O. Ktze. [ARNI]; Verbenaceae

About 100 gms fresh leaves or soft stem branches are crushed and poultice is made used to relieve eye pain [Jivabhai].

24. *Lantana camara* L. [DHANI DHARIYA]; Verbenaceae

Leaf paste is applied on animal ulcers [Devabhai].

25. *Vitex negundo* L. [NAGOD]; Verbenaceae.

Leaf paste is applied on rheumatic swellings [Devabhai and Somabhai].

26. *Euphorbia nerifolia* L. [THOR]; Euphorbiaceae

Fresh leaf paste is applied on abscess [Arjanbhai].



27. *Jatropha curcas* L. [RATANJOT]; Euphorbiaceae

□ Lalex is applied to cure toothache [Jallobhai].

28. *Ficus benghalensis* L. [VAD, VALLO]; Moraceae

□ Yellow old leaves are steamed and applied on abdomen to cure stomach pain [Devabhai].

29. *Ficus racemosa* L. [UMARO]; Moraceae

□ Fresh latex is applied on tongue to cure cough [Somabhai].

30. *Phoenix sylvestris* (L.) Roxb. [KHAJURI]; Arecaceae

□ A teaspoonful of root juice is taken twice a day to cure stomach pain [Nopabhai].

31. *Dendrocalamus strictus* Nees. [LAKADI]; Poaceae

Young shoot paste is applied externally to stop bleeding [Somabhai].

Conclusion:

The herbal medicines are mostly administered in the form of juice, decoction, paste or powder, prepared by a crude method from different plant parts such as root, bark, leaves, flowers, fruits, seeds and whole plant. In Madhya Pradesh of central India 265 sacred groves are reported (Srivastava, 1994) and plant worship in a way maintains local bio-diversity and plays an important role in its management and conservation. Women particularly, in both rural and urban areas, have developed faith in the number of plants by protection of the plant species. The sacred plants of Bundelkhand are actually worshipped throughout the areas to its mythological significance. Sacred groves homes of mother goddesses abound and some types of trees have attained great importance in *Hinduism*. In India out of 3000 communities 1/3, i.e., 1000 are endogenous groups practice totemism (Malhotra, 2005). Among many tribal communities, numbers of clans are named after plants and animals which are conserved (Jain and Sharma, 1996). Work on Traditional knowledge and indigenous medicinal plants used by tribal and local old age peoples of Amarkantak region and central India has been carried out by Kumar et al., (2004) and Sahu, (2010). Total 29 Sacred groves are reported from Ambaji forest of Banaskantha district of North Gujarat, India (Patel, 2015). These plants also play a vital role in the life of the people in the form of medicines treating various ailments. The present work suggests for natural conservation of sacred & medicinal plants and to provide incentives to local people participation for the same and also necessary action should be taken to preserve sacred groves of the forests conserved by indigenous people.

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Suggested citation:

Patel R. S. (2021). Some sacred groves and sacred plants with their ethno-botanical importance in Ambaji forest of North Gujarat, India. Prithivya, An Official Newsletter of WCB Research Foundation and WCB Research Lab. Vol 1(1) xx-xx.





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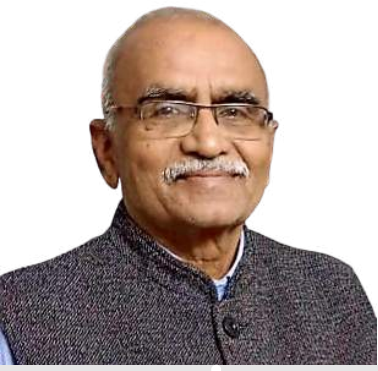


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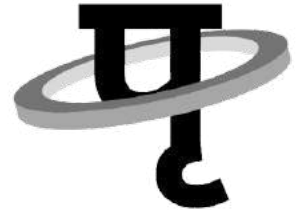
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In the Memory of Dr. M. I. Patel



It is my great pleasure to introduce my friend and a well-known academician Dr. Mafatbhai I. Patel, Ph.D. (popularly known as 'M I' of Visnagar). First time, I met him when he was doing his M.Sc. at Zoology Department, Gujarat University, Ahmedabad. Later on, I came to know that soon after the completion of his Masters, he joined as a lecturer in the college service of Govt. of Gujarat. We came in close contact as we both met at Rajkot; he was a lecturer at Kotak Science College and I was serving at the Department of Bioscience, Saurashtra University at Rajkot.

Shri Patel joined the Department of Bioscience, Saurashtra University to pursue his Ph.D. studies in Ornithology under the guidance of my colleague Prof. R. M. Naik. Since I was also working in the same field, we used to meet on many occasions like field-work, and allied discussions of his doctoral studies. We enjoyed each other's company in the field work. He was with very pleasant personality, always keen to help others, jolly and agreeable. We had lot of academic discussions too; he was very studious with scholarly approach.

He was shouldering many responsibilities like his family duties, college service and his Ph.D. studies but he was very hard working and trustworthy for his commitments. He was a well-read person. His scholarly attitude attracted many of his students during his service as a lecturer. He obtained his Ph.D. degree in Zoology from the Saurashtra University.

He also carried out his duties as a principal of several Govt. Colleges in Gujarat such as Lalan College, Bhuj and M.N. College, Visnagar (his home town). He joined M.N. College in July 1996. He was very sharp and quick at his administrative capabilities. He very well managed the college administration wherever he worked as a principal. He got retired in June 2010.

He was a nice, amicable, hardworking and of studious nature. His administrative abilities were robust. His special quality was his excellence in the public speaking. Above all, he was a loving, elegant and noble friend with pleasant personality.



Dr. V. C. Soni
Retd. Professor



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- Choudhary, D. N., Mandal, J. N., Mishra, A., & Ghosh, T. K., 2010. First ever breeding record of Black-necked Stork *Ephippiorhynchus asiaticus* from Bihar. *Pruthiviya*6 (3): 80–82.

Books

- Futehally, Z. (ed.) 2006. *India through its birds*. 1st ed. Bangalore, India: Dronequill Publishers Pvt. Ltd. Pp. i–ii, 1–214.
- Pittie, A., 2010. *Birds in books: three hundred years of South Asian ornithology—a bibliography*. 1st ed. Ranikhet: Permanent Black. Pp. i–xxi, 1–845.
- Sashikumar, C., Praveen J., Palot, M. J., & Nameer, P. O., 2011. *Birds of Kerala: status and distribution*. 1st ed. Kottayam, Kerala: DC Books. Pp. 1–835.

Book chapter

- Pittie, A., 2011. Stray Feathers (1872–1899) (p. 247). In: *Priority! The dating of scientific names in ornithology: a directory to the literature and its*



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