

Building evidence for conservation globally

Journal of Threatened Taxa

10.11609/jott.2023.15.1.22355-22558
www.threatenedtaxa.org

26 January 2023 (Online & Print)
15(1): 22355-22558
ISSN 0974-7907 (Online)
ISSN 0974-7893 (Print)

Open Access





ISSN 0974-7907 (Online); ISSN 0974-7893 (Print)

Publisher
Wildlife Information Liaison Development Society
www.wild.zooreach.org

Host
Zoo Outreach Organization
www.zooreach.org

43/2 Varadarajulu Nagar, 5th Street West, Ganapathy, Coimbatore, Tamil Nadu 641035, India
Registered Office: 3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore, Tamil Nadu 641006, India
Ph: +91 9385339863 | www.threatenedtaxa.org
Email: sanjay@threatenedtaxa.org

EDITORS

Founder & Chief Editor

Dr. Sanjay Molur

Wildlife Information Liaison Development (WILD) Society & Zoo Outreach Organization (ZOO),
43/2 Varadarajulu Nagar, 5th Street West, Ganapathy, Coimbatore, Tamil Nadu 641035, India

Deputy Chief Editor

Dr. Neelesh Dahanukar

Noida, Uttar Pradesh, India

Managing Editor

Mr. B. Ravichandran, WILD/ZOO, Coimbatore, India

Associate Editors

Dr. Mandar Paingankar, Government Science College Gadchiroli, Maharashtra 442605, India

Dr. Ulrike Streicher, Wildlife Veterinarian, Eugene, Oregon, USA

Ms. Priyanka Iyer, ZOO/WILD, Coimbatore, Tamil Nadu 641035, India

Dr. B.A. Daniel, ZOO/WILD, Coimbatore, Tamil Nadu 641035, India

Editorial Board

Dr. Russel Mittermeier

Executive Vice Chair, Conservation International, Arlington, Virginia 22202, USA

Prof. Mewa Singh Ph.D., FASC, FNA, FNASC, FNAPsy

Ramanna Fellow and Life-Long Distinguished Professor, Biopsychology Laboratory, and Institute of Excellence, University of Mysore, Mysuru, Karnataka 570006, India; Honorary Professor, Jawaharlal Nehru Centre for Advanced Scientific Research, Bangalore; and Adjunct Professor, National Institute of Advanced Studies, Bangalore

Stephen D. Nash

Scientific Illustration, Conservation International, Dept. of Anatomical Sciences, Health Sciences Center, T-8, Room 045, Stony Brook University, Stony Brook, NY 11794-8081, USA

Dr. Fred Pluthero

Toronto, Canada

Dr. Priya Davidar

Sigur Nature Trust, Chadapatti, Mavinhalla PO, Nilgiris, Tamil Nadu 643223, India

Dr. Martin Fisher

Senior Associate Professor, Battcock Centre for Experimental Astrophysics, Cavendish Laboratory, JJ Thomson Avenue, Cambridge CB3 0HE, UK

Dr. John Fellowes

Honorary Assistant Professor, The Kadoorie Institute, 8/F, T.T. Tsui Building, The University of Hong Kong, Pokfulam Road, Hong Kong

Prof. Dr. Mirco Solé

Universidade Estadual de Santa Cruz, Departamento de Ciências Biológicas, Vice-coordenador do Programa de Pós-Graduação em Zoologia, Rodovia Ilhéus/Itabuna, Km 16 (45662-000) Salobrinho, Ilhéus - Bahia - Brasil

Dr. Rajeev Raghavan

Professor of Taxonomy, Kerala University of Fisheries & Ocean Studies, Kochi, Kerala, India

English Editors

Mrs. Mira Bhojwani, Pune, India

Dr. Fred Pluthero, Toronto, Canada

Mr. P. Ilangoan, Chennai, India

Ms. Sindhura Stothra Bhashyam, Hyderabad, India

Web Development

Mrs. Latha G. Ravikumar, ZOO/WILD, Coimbatore, India

Typesetting

Mrs. Radhika, ZOO, Coimbatore, India

Mrs. Geetha, ZOO, Coimbatore India

Fundraising/Communications

Mrs. Payal B. Molur, Coimbatore, India

Subject Editors 2019–2021

Fungi

Dr. B. Shivaraju, Bengaluru, Karnataka, India

Dr. R.K. Verma, Tropical Forest Research Institute, Jabalpur, India

Dr. Vatsavaya S. Raju, Kakatiya University, Warangal, Andhra Pradesh, India

Dr. M. Krishnappa, Jnana Sahyadri, Kuvempu University, Shimoga, Karnataka, India

Dr. K.R. Sridhar, Mangalore University, Mangalagangothri, Mangalore, Karnataka, India

Dr. Gunjan Biswas, Vidyasagar University, Midnapore, West Bengal, India

Plants

Dr. G.P. Sinha, Botanical Survey of India, Allahabad, India

Dr. N.P. Balakrishnan, Ret. Joint Director, BSI, Coimbatore, India

Dr. Shonil Bhagwat, Open University and University of Oxford, UK

Prof. D.J. Bhat, Retd. Professor, Goa University, Goa, India

Dr. Ferdinando Boero, Università del Salento, Lecce, Italy

Dr. Dale R. Calder, Royal Ontario Museum, Toronto, Ontario, Canada

Dr. Cleofas Cervancia, Univ. of Philippines Los Baños College Laguna, Philippines

Dr. F.B. Vincent Florens, University of Mauritius, Mauritius

Dr. Merlin Franco, Curtin University, Malaysia

Dr. V. Irudayaraj, St. Xavier's College, Palayamkottai, Tamil Nadu, India

Dr. B.S. Kholia, Botanical Survey of India, Gangtok, Sikkim, India

Dr. Pankaj Kumar, Kadoorie Farm and Botanic Garden Corporation, Hong Kong S.A.R., China

Dr. V. Sampath Kumar, Botanical Survey of India, Howrah, West Bengal, India

Dr. A.J. Solomon Raju, Andhra University, Visakhapatnam, India

Dr. Vijayasankar Raman, University of Mississippi, USA

Dr. B. Ravi Prasad Rao, Sri Krishnadevaraya University, Anantpur, India

Dr. K. Ravikumar, FRLHT, Bengaluru, Karnataka, India

Dr. Aparna Watve, Pune, Maharashtra, India

Dr. Qiang Liu, Xishuangbanna Tropical Botanical Garden, Yunnan, China

Dr. Noor Azhar Mohamed Shazili, Universiti Malaysia Terengganu, Kuala Terengganu, Malaysia

Dr. M.K. Vasudeva Rao, Shiv Ranjani Housing Society, Pune, Maharashtra, India

Prof. A.J. Solomon Raju, Andhra University, Visakhapatnam, India

Dr. Mandar Datar, Agharkar Research Institute, Pune, Maharashtra, India

Dr. M.K. Janarthanam, Goa University, Goa, India

Dr. K. Karthigeyan, Botanical Survey of India, India

Dr. Errol Vela, University of Montpellier, Montpellier, France

Dr. P. Lakshminarasimhan, Botanical Survey of India, Howrah, India

Dr. Larry R. Noblick, Montgomery Botanical Center, Miami, USA

Dr. K. Haridasan, Pallavur, Palakkad District, Kerala, India

Dr. Analinda Manila-Fajard, University of the Philippines Los Baños, Laguna, Philippines

Dr. P.A. Sinu, Central University of Kerala, Kasaragod, Kerala, India

Dr. Afroz Alam, Banasthali Vidyapeeth (accredited A grade by NAAC), Rajasthan, India

Dr. K.P. Rajesh, Zamorin's Guruvayurappan College, GA College PO, Kozhikode, Kerala, India

Dr. David E. Boufford, Harvard University Herbaria, Cambridge, MA 02138-2020, USA

Dr. Ritesh Kumar Choudhary, Agharkar Research Institute, Pune, Maharashtra, India

Dr. Navendu Page, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand, India

Dr. Kannan C.S. Warrior, Institute of Forest Genetics and Tree Breeding, Tamil Nadu, India

Invertebrates

Dr. R.K. Avasthi, Rohtak University, Haryana, India

Dr. D.B. Bastawade, Maharashtra, India

Dr. Partha Pratim Bhattacharjee, Tripura University, Suryamaninagar, India

Dr. Kailash Chandra, Zoological Survey of India, Jabalpur, Madhya Pradesh, India

Dr. Ansie Dippenaar-Schoeman, University of Pretoria, Queenswood, South Africa

Dr. Rory Dow, National Museum of Natural History Naturalis, The Netherlands

Dr. Brian Fisher, California Academy of Sciences, USA

Dr. Richard Gallon, Ilandudno, North Wales, LL30 1UP

Dr. Hemant V. Ghate, Modern College, Pune, India

Dr. M. Monwar Hossain, Jahangirnagar University, Dhaka, Bangladesh

Mr. Jatishwor Singh Irungbam, Biology Centre CAS, Branišovská, Czech Republic.

Dr. Ian J. Kitching, Natural History Museum, Cromwell Road, UK

For Focus, Scope, Aims, and Policies, visit https://threatenedtaxa.org/index.php/JoTT/aims_scope

For Article Submission Guidelines, visit <https://threatenedtaxa.org/index.php/JoTT/about/submissions>

For Policies against Scientific Misconduct, visit https://threatenedtaxa.org/index.php/JoTT/policies_various

continued on the back inside cover

Cover: Whale Shark *Rhincodon typus* and Reef - made with poster colours. © P. Kritika.



First occurrence record of Indian Roundleaf Bat *Hipposideros lankadiva* in Rajasthan, India

Dharmendra Khandal¹ , Dau Lal Bohra²  & Shyamkant S. Talmale³ 

¹Tiger Watch, Maa Farm, Ranthambhore Road, Sawai Madhopur, Rajasthan 322001, India.

²P.G. Department of Zoology, Seth G.B. Podar College, Nawalgarh, Jhunjhunu, Rajasthan 333042, India.

³Zoological Survey of India, Western Regional Centre, Vidyanagar, Sector-29, Ravet Road, PCNT Post, Pune, Maharashtra 411044, India.

¹dharmkhandal@gmail.com (corresponding author), ²daulalbohara@yahoo.com, ³s_talmale@yahoo.co.in

Abstract: An erroneously cited text of Wason by subsequent authors has led to the assumption that *Hipposideros lankadiva* was first recorded in Rajasthan in the Bhim Bharak caves of Jodhpur. A careful review of Wason's note revealed that it in fact mentioned another species from the genus, *H. fulvus*. This erroneous citation has led to several research articles published on the ecological aspects of this species to be misinformed. The authors discovered a small population of *H. lankadiva* in eastern Rajasthan and have monitored this new population since 2010. Since the Bhim Bharak cave location is erroneous, Kased Cave (26.2209N, 77.1024E) is the only location of *H. lankadiva* for Rajasthan and is therefore the first record of the species from the state.

Keywords: Bhim Bharak caves, Chiroptera, Jodhpur, Kased Cave, occurrence, population.

Editor: Paul Racey, University of Exeter, Penryn, UK.

Date of publication: 26 January 2023 (online & print)

Citation: Khandal, D., D.L. Bohra & S.S. Talmale (2023). First occurrence record of Indian Roundleaf Bat *Hipposideros lankadiva* in Rajasthan, India. *Journal of Threatened Taxa* 15(1): 22392–22398. <https://doi.org/10.11609/jott.8034.15.1.22392-22398>

Copyright: © Khandal et al. 2023. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.

Funding: Tiger Watch.

Competing interests: The authors declare no competing interests.

Author details: DR. DHARMENDRA KHANDAL PhD, has served as conservation biologist with Tiger Watch since 2003. His work with Tiger Watch has involved pioneering ground breaking initiatives in proactive anti-poaching, the monitoring of wildlife & scientific research. He has also forged new frontiers in the world of community based conservation through the Village Wildlife Volunteer program in the Ranthambhore Tiger Reserve. He is also the co-author of Unexplored Ranthambhore, a first of its kind book on the canids and striped hyena in Ranthambhore. DR. DAU LAL BOHRA PhD, is currently head of the Department of Zoology at the Seth Gyaniram Bansidhar Podar College in Jhunjhunu, Rajasthan. He has numerous research papers to his credit and is recognised for his significant contributions to vulture conservation in Rajasthan. DR. S. TALMALE PhD, is a taxonomist working on Indian small mammals and (Insecta) Odonata with several research papers and books to his credit. He is currently affiliated with the Zoological Survey of India.

Author contributions: All authors have contributed equally to this paper.

Acknowledgements: The authors are grateful to Mr. Dieter Gutmann & Mrs. Liz Gutmann, and Tiger Watch for their unstinting support.



INTRODUCTION

The Indian Roundleaf Bat *Hipposideros lankadiva* is endemic to southern Asia, and has been recorded from many parts of India, as well as neighbouring nations like Sri Lanka, Bangladesh, and Myanmar (Bates et al. 2015; Saha et al. 2015). *Hipposideros lankadiva* Kelaart, 1850 was described from the city of Kandy in the central hills of Sri Lanka (Bates & Harrison 1997). Three subspecies have been reported for this species of bat. The subspecies described from Sri Lanka is *H. lankadiva lankadiva* (Kelaart, 1850) and the subspecies from India is referred to as *H. lankadiva indus* (Andersen, 1918). The latter is small in size relative to the former (Bates & Harrison 1997). Bates et al. (2015) described a new subspecies, *H. lankadiva gyi* from Myanmar with its distribution in northeastern India, which is morphometrically similar to the Sri Lankan subspecies.

Many taxonomic accounts have contributed to chiropteran studies in Rajasthan, such as Blanford (1891), Ryley (1914), Wroughton (1918), Ellerman & Morrison-Scott (1951), Prakash (1963a,b, 1973), Agrawal (1967), Biswas & Ghosh (1968), and Sinha (1973, 1975, 1976, 1977). The first detailed taxonomic exploration of bats in Rajasthan was conducted by the Zoological Survey of India (Sinha 1980) which documented detailed descriptions, illustrations, and zoogeography of 21 bat species in the state. Later on, various explorers described new occurrence records and ecology of bats in Rajasthan (Sinha 1981; Sharma 1986; Bhupathy 1987; Bohra 2011; Senacha & Dookia 2013).

On the occurrence of *H. lankadiva* in Rajasthan

Bates & Harrison (1997) quoted a published note by Wason (1978) on the occurrence of *H. lankadiva* in the Bhim Bharak caves of Jodhpur, Rajasthan. However, Sinha (1980, 1996) did not discuss this bat's presence in the state, and this led to doubts about the occurrence of *H. lankadiva* in the state. Bats have been studied in the Thar desert by various scientists, especially those based in Jodhpur such as Prakash (1963a,b, 1973), Agrawal (1967), Biswas & Ghosh (1968), Sinha (1973, 1975, 1976, 1977, 1981), Sharma (1986), and Senacha & Dookia (2013). Thus, no prior reports of this species lent credence to the idea that the observation by Bates & Harrison (1997) is incorrect.

A careful review of Wason's (1978) note revealed that it mentioned another species from the genus—*H. fulvus*—and the inclusion of *H. lankadiva* was due to an error by Bates & Harrison (1997).

Srinivasulu et al. (2013), examined published

literature and compiled a list of 25 bat species from Rajasthan, including *H. lankadiva* from the Bhim Bharak caves of Jodhpur. Interestingly, without physically verifying the note by Wason (1978), Srinivasulu et al. (2013) quoted the same distribution area for *H. lankadiva* in Rajasthan. It seems that while they may have followed Bates & Harrison (1997), they cited Wason (1978) for the occurrence of *H. lankadiva* in Rajasthan. Afterwards, many documents have included *H. lankadiva* for the state of Rajasthan (Menon 2014; Bates et al. 2015).

This erroneous citation has led to various research articles published on the ecological aspects of this species to be misinformed. For example, Dookia et al. (2017) expressed concern that *H. lankadiva* was not reported from the Thar desert since 1979. This erroneous location has also been used in spatial studies to predict new possible areas for the species (Venugopal 2020).

However, we recorded a small population of *H. lankadiva* in eastern Rajasthan and have monitored this new population since 2010, which was opportunistically discovered during a wildlife survey of the region. Since the Bhim Bharak cave location is erroneous, Kased Cave (26.2209N, 77.1024E) is the only location of *H. lankadiva* for Rajasthan and it is thus the first record of the species from the state.

Study Area

The population of *H. lankadiva* occurs in a natural cave between the Kailadevi Wildlife Sanctuary and National Chambal Gharial Sanctuary in Karauli, Rajasthan, India. The precise location is a Hindu religious site, known as the Kased Cave (26.2209N & 77.1024E) near the town of Karanpur (Figure 1). The cave is situated on a low hill close to the contiguous Vindhyan hill range of Kailadevi WS. Due to its holy status, no tree felling has occurred in its immediate vicinity although the local community has completely denuded its surrounding areas.

The cave is formed of sand stone. The main chamber of the cave is 12 x 12 m in size. This chamber is used by a "sadhu" (hermit) and other pilgrims alike to shelter, cook food, and perform devotional music. The height of the chamber is around 4.5–5.5 m from the centre, and form a dome shape. The surface is dark black in colour, as a result of exposure to smoke. In the main cave chamber, three narrow tube like tunnels further extend from it, one of them has a slow flowing stream and two of them are dry. When the pilgrims cook food for ritual offerings and create a disturbance, the bats move inside the narrow water tunnels. The water tunnel is 55–60 m long and a small stream flows through it year round. The main tunnel is 1–1.5 m high and 1–3 m wide. The temperature

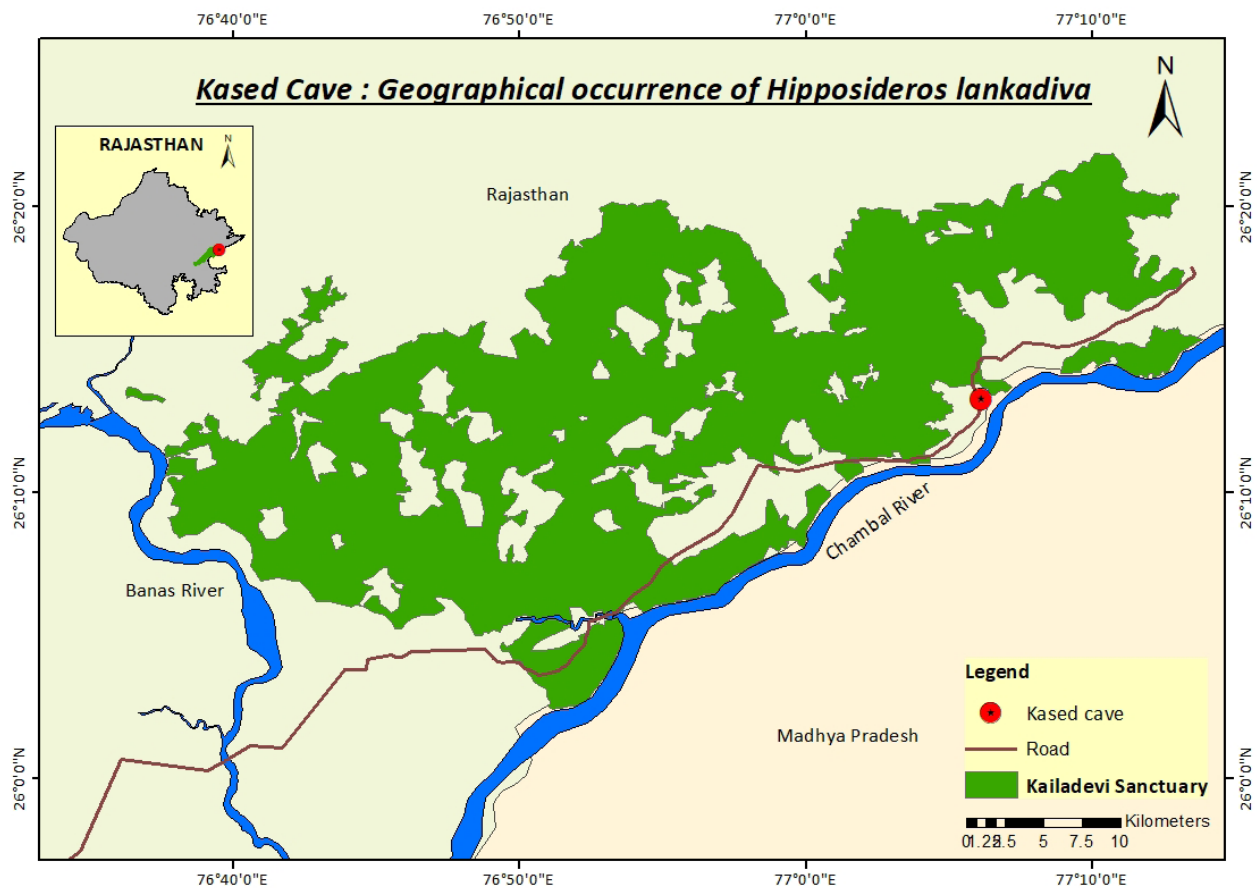


Figure 1. New distribution localities for Indian Roundleaf Bat *Hipposideros lankadiva* in Rajasthan, India

in this water tunnel stays the same year round, because it is underground and not affected by surface weather patterns. The temperature of the cave is usually close to the average annual temperature. During the study we found two other species of bats, *Lyroderma lyra* and *H. fulvus*, along with *H. lankadiva* at the same site.

The tree species found on the hill are *Anogeissus pendula*, *Mitragyna parvifolia*, *Crateva adansonii*, *Butea monosperma*, and exotic trees & herbaceous plants recently planted in the area by the guardians of the temple. A seasonal water stream forms a waterfall nearby. The surrounding area is high and the cave opening is in a depressed area, which makes it moist and cool. The nearby areas are comprised of a mosaic of agriculture fields and scrubland. The Chambal river 1.2km away from the cave site. An undulating landscape consisting of ravines exists between the Chambal river and Kased Cave.

MATERIAL AND METHOD

Basic data of habitat and the surroundings has been collected like measurements of the cave and vegetation species. Five individuals of the species were captured in hand nets at Kased Cave, Karanpur, and Karauli (Figure 1). Specimen and habitat photographs were taken with the help of Nikon D850 DSLR with 300 mm, 17–35 mm lens. Morphological data was taken by manual examination in which measurements were taken with a digital calliper and compared with earlier findings (Srinivasalu et al. 2010; Bates et al. 2015; Saha 2015). The captured bats have been released after taking morphometric measurements. All data was compared with available literature to conclude a final result. Lux meter was used to observe the intensity of light in the cave (Lacoeuilhe et al. 2014). To detect if light intensity influenced roost selection in bats, lux values were observed at places where the bats roost. MS6610 high accuracy 0~50,000 LUX digital luxmeters illuminometer was used to measure the value of light.

RESULTS

We captured 5 individuals of bats (three males and two females) for morphometric analysis. (Table 1). The morphometric data revealed that the bat matches with the subspecies *H. lankadiva indus*. The pelage of the bats varied from yellowish-brown to dark brown (Image 1). They were darker on the head & shoulders and paler on the underside. For species identification we compare morphometric analysis from Srinivasulu et al. (2010), Saha (2015), and Bates et al. (2015). The average value of FA (mm) in three male samples was found to be 85.99 ± 2.12 and in two females to be 83.70 ± 0.65 , respectively. Similarly (Saha 2015) the mean value of FA (mm) was 87.64 ± 3.62 .

In the study of Srinivasulu (2010) the HBL (mm) range was 87.0–106.0 in males and females as well. In this study we have also rendered the range and mean value of HBL (mm) reported in (78.11–98.57) 89.62 ± 10.47 males and (91.28–92.81) 92.05 ± 1.08 females.

On the comparison of tail length, our observation is supported by Srinivasulu et al. (2010) and Bates et al. (2015). According to Bates et al. (2015), the tail length was found to be 35.0–47.0 (mm) in males and 40.0–45.0 (mm) in females. According to Srinivasulu et al. (2010) the vast range length of the tail (mm) was 35.0–58.0. The mean TL (mm) recorded in this study is 33.36 ± 2.24 in males and 37.80 ± 0.48 in females.

Morphologically, there is no extraneous character variation from different species ranges in males and

Table 1. Morphological Characters of *Hipposideros lankadiva* (Kelaart, 1850).

Body characters	Srinivasulu et al. 2010	Saha 2015	Bates et al. 2015		Present study						
			Male	Female	Male				Female		
					Male 1	Male 2	Male 3	AVG	Female 1	Female 2	AVG
Forearm Length FA (mm)	75.0–99.0	87.64±3.62	80.1–87.0	75.0–89.0	86.76	83.59	87.62	85.99±2.12	83.24	84.16	83.70±0.65
Head Body Length HBL (mm)	87.0–106.0	98.1±4.24	NA	NA	78.11	98.57	92.17	89.62±10.47	92.81	91.28	92.05±1.08
Tail Length TL (mm)	35.0–58.0	51.45±2.34	35.0–47.0	40.0–45.0	30.84	35.12	34.12	33.36±2.24	38.14	37.46	37.80±0.48
Hind Foot Length HFL (mm)	12.0–20.0	19.35±1.0	12.0–16.0	13.0–16.0	15.77	19.29	17.53	17.53±1.76	14.52	13.88	14.20±0.45
Ear Length EAR (mm)	19.5–30.0	27.6±2.05	22.0–26.0	19.5–27.0	23.19	26.93	27.11	25.74±2.21	26.39	28.63	27.51±1.58
Length of Tibia TIB (mm)		35.55±2.48			35.02	33.89	34.46	34.46±0.57	33.15	34.09	33.62±0.66
No. of Supplementary Leaflets	4	NA	NA	NA	4	4	4	-	4	4	-
Narial Lappets	Well-developed	NA	NA	NA	Well-developed	Well-developed	Well-developed	-	Well-developed	Well-developed	-
Length of Third Metacarpal 3MT (mm)	NA	67.71±0.79	57.2–63.7	57.0–65.0	56.7	62.18	60.41	59.76±2.80	58.49	58.43	58.46±0.04
Length of Fourth Metacarpal 4MT (mm)	NA	NA	57.2–61.8	55.3–63.6	58.26	55.59	62.31	58.72±3.38	60.18	58.93	59.56±0.88
Length of Fifth Metacarpal 5MT (mm)	NA	NA	50.7–56.9	49.7–58.6	49.73	51.14	50.19	50.35±0.72	47.78	50.12	48.95±1.65
First Phalanx of the Third Digit 3D1P	NA	31.60±1.17	25.4–28.5	26.0–30.0	26.14	25.82	26.15	26.04±0.19	28.43	28.07	28.25±0.25
Second Phalanx of the Third Digit, 3D2P (mm)	NA	34.34±1.23	24.4–28.4	24.5–28.8	28.39	28.79	29.88	29.02±0.77	27.12	27.86	27.49±0.52
First Phalanx of the Fourth Digit 4D1P (mm)	NA	NA	19.0–21.8	19.4–21.1	20.11	21.23	20.44	20.59±0.58	21.16	20.78	20.97±0.27
Second Phalanx of the Fourth Digit 4D2P (mm)	NA	NA	11.2–14.0	12.5–14.1	9.96	11.49	12.23	11.23±1.16	11.56	11.93	11.75±0.26
Nose-leaf	NA	11.17±0.09	NA	NA	9.92	10.19	10.06	10.06±0.14	10.56	10.89	10.73±0.23



© Dharmendra Khandal

Image 1. Portrait of Indian Roundleaf Bat *Hipposideros lankadiva*.

females between our five samples and the reference value (Bates et al. 2015). *H. lankadiva* (Kelaart 1850) is a Large Leaf-nosed Bat having four (additional) supplementary leaflets on the nose-leaf with the 4th leaflet reduced, which is a key character of the species are present in all specimens (Image 1). The length of the ear is also an important parameter by which we can see the account of the species. According to Bates et al. (2015) the range of ear length (mm) in females was found to be 19.5–27.0, but in our study, the maximum value of female ear (mm) was found to be 28.63 and the average value was recorded as 27.51 ± 1.58 . In the same cave, we found 89 *L. lyra* and four *H. fulvus* bats along with *H. lankadiva*.

We also surveyed the Bhima Bharak cave site at Jodhpur. No specimens of *H. lankadiva* were found in the main part of the cave (Shiva Temple) and in the lower part of the cave. We found 39 individuals of *Taphozous*



© Dharmendra Khandal

Image 2. Close of an Indian Roundleaf Bat *Hipposideros lankadiva* face.

perforatus and four *Rhinopoma hardwickii* at the cave. During this study, we personally communicated with Anil Wason to investigate if the species had ever been reported by him in the past, but Wason categorically denied ever observing or reporting *H. lankadiva*.

There was a considerable difference between the internal climate and light intensity inside Kased Cave and outer area of the cave, where the value of light intensity was measured to be 62 lux on the opening of the cave. By comparison, the internal light intensity at the site in Karauli was measured at zero lux. The bats prefer zero lux intensity area of the cave. Humidity of the Kased Cave in Karauli was also recorded at more than 50% with water source availability.

DISCUSSION

The species *H. lankadiva* has been observed for the first time in 2010 by the authors in Rajasthan, but it has been first reported now in 2022. This delay in reporting is because of the species already being listed on the bat checklist of Rajasthan, which was the consequence of the erroneous inclusion. Bates & Harrison (1997) erroneously included the bat in Rajasthan and some other reports strengthened this erroneous record

like Srinivasalu et al. (2013) and Bates et al. (2015). Srinivasalu et al. (2013) and Bates et al. (2015), have not only erroneously included the bat, but also cited a wrong reference for Wason (1978), i.e., Srinivasalu et al. (2013) mentioned “44(5): 305–306”; whereas Bates et al. (2015) mentioned “46(5): 331–332”, while the correct reference is 43(5): 305–306. It seems like they mixed Wason (1978) with another reference, Wason & Misra (1981) and it is important to note that neither mentioned *H. lankadiva*. The erroneous report perpetuated and impacted many other studies like Venugopal (2020).

Venugopal (2020) used a habitat modelling approach (MaxEnt) based on known locations, to predict new possible geographic presence of *H. lankadiva*. The study also included the erroneous Bhim Bharak location, which misinformed the study and, in all likelihood, must have had an adverse impact on the results, which may have expanded the predicted distribution area of the species. Since this erroneous location is far from the other known locations and lies in a new biogeographic zone, the magnitude of the error could be substantial. The majority of the predicted suitable areas were in and around known localities which are in the Western Ghats and central India (Venugopal 2020). The predicted areas around western Gujarat and Rajasthan, may be due to inclusion of sites where this species has been incorrectly identified. The Jodhpur lies in totally different biogeographic zone.

It is proved that the report of *H. lankadiva* from the Bhim Bharak caves, Jodhpur, Rajasthan is erroneous, and must be omitted from the list of bats occurring in that particular part of Rajasthan, so that it does not continue to perpetuate and impact any further studies.

The newly reported site has a very small population and shows a decline in numbers. The Kased Cave location is under observation by the authors since December 2010 and at that time the number of bats was 150–200 as per personal records. At present, the number shows that the bats are declining in the area and their numbers are five times lower. In the most recent survey (October 2021) we recorded only 32–35 bats. The anthropogenic disturbance level in the cave has also increased. The conservation status of *H. lankadiva* is listed by the IUCN Red List as ‘Least Concern’ (Molur et al. 2008). Rajasthan is geographically the most largest state in India and only Sinha (1980) conducted comprehensive chiropteran species exploration work throughout the state. Most other studies are sporadic and opportunistic. There is still an immense opportunity for greater chiropteran exploration in the state.

REFERENCES

- Agrawal, V.C. (1967).** New mammal records from Rajasthan. *Labdev. Journal of Science & Technology* 5(4): 342–344.
- Bates, P.J.J. & D.L. Harrison (1997).** *Bats of the Indian Subcontinent*. Harrison Zoological Museum Publication, Seven oaks, Kent 258 pp.
- Bates, P., O. Tun, M. M. Aung, A. Lu, M.R. Lum & M.M. Sein (2015).** A review of *Hipposideros lankadiva* Kelaart, 1850 (Chiroptera: Hipposideridae) with a description of a new subspecies from Myanmar. *Tropical Natural History* 15(2): 191–204.
- Bhupathy, S. (1987).** Occurrence of the bicoloured leaf-nosed bat (*Hipposideros fulvus*) in Rajasthan. *Journal of the Bombay Natural History Society* 84(1): 199–200.
- Biswas, B. & R.K. Ghosh (1968).** New records of mammals from Rajasthan, India. *Journal of the Bombay Natural History Society* 65: 481–482.
- Blanford, W.T. (1891).** *The Fauna of British India, Mammalia*. Taylor & Francis, London, 617pp.
- Bohra, D. L. (2011).** Conservation status of Bats in Bikaner District of Rajasthan. *Small Mammal Mail* 3(1): 26–27.
- Dookia, S., G. Singh & R. Mishra (2017).** Re-sighting record of Fulvous Leaf-nosed Bat *Hipposideros fulvus* Gray, 1838 (Mammalia: Chiroptera: Hipposideridae) from Thar Desert, Rajasthan, India. *Journal of Threatened Taxa* 9(1): 9764–9767. <https://doi.org/10.11609/jott.2657.9.1.9764-9767>
- Ellerman, J.R. & T.C.S. Morrison-Scott (1951).** *Checklist of Palaearctic and Indian mammals 1758 to 1946*. British Museum (Natural History), 810 pp.
- Lacoeuilhe A., N. Machon, J.F. Julien, A. Le Bocq & C. Kerbirou (2014).** The Influence of Low Intensities of Light Pollution on Bat Communities in a Semi-Natural Context. *PLOS ONE* 9(10): e103042. <https://doi.org/10.1371/journal.pone.0103042>
- Menon, V. (2014).** *Indian Mammals: A Field Guide*. Hachette India, 528 pp.
- Prakash, I. (1963a).** Taxonomic and biological observations on the bats of the Rajasthan desert. *Records of the Indian Museum* 59(1961): 149–170.
- Prakash, I. (1963b).** Zoogeography and evolution of the mammalian fauna of Rajasthan desert. *Mammalia* 27: 342–351.
- Prakash, I. (1973).** The ecology of vertebrates of the Indian desert, pp. 369–420. In: Mani, M.S. (ed.). *Ecology and Biogeography in India*. W. Junk, The Hague, 725 pp.
- Ryley, K.V. (1914).** Bombay Natural History Society’s Mammal Survey of India. No. 12. Palanpur and Mt. Abu. *Journal of the Bombay Natural History Society* 22(4): 684–699.
- Saha, A., M.M. Feeroz & M.K. Hasan (2015).** Indian roundleaf bat, *Hipposideros lankadiva*: first record for Bangladesh. *Journal of the Bombay Natural History Society* 112: 165–193.
- Senacha K.R. & S. Dookia (2013).** Geoffroy’s Trident Leaf-nosed bat, *Asellia tridens* (Geoffroy, E., 1813) from India. *Current Science* 105(1): 21–22.
- Sharma, S.K. (1986).** Painted bats and nests of Baya Weaver Bird. *Journal of the Bombay Natural History Society* 81: 196.
- Sinha, Y.P. (1969).** Taxonomic status of *Rousettus seminudus* (Mammalia: Chiroptera: Pteropidae). *Journal of the Bombay Natural History Society* 65: 764–767.
- Sinha, Y.P. (1970).** Taxonomic notes on some Indian bats. *Mammalia* 34: 81–92.
- Sinha, Y.P. (1973).** Taxonomic studies on the Indian Horseshoe Bats of the genus *Rhinolophus* Lacepede. *Mammalia* 37: 603–630.
- Sinha, Y.P. (1975).** New records of Bats (Chiroptera) from Rajasthan. *Science & Culture* 41: 608–610.
- Sinha, Y.P. (1976).** New record of the Indian Sheath-tailed bat, *Taphozous longimanus*, from Rajasthan with remarks on winter fat deposition in *T. kachhensis*. *Science & Culture* 42: 168–170.
- Sinha, Y.P. (1977).** A new and a rare record of fruit bat (Pteropidae) from Rajasthan (Mammalia: Chiroptera). *Science & Culture* 43: 264–265.

- Sinha Y.P. (1980).** The bats of Rajasthan: taxonomy and zoogeography. *Records of the Zoological Survey of India* 76(1–4): 7–63.
- Sinha, Y.P. (1981).** New record of Black-bearded tomb bat, *Taphozous melanopogon melanopogon* Temminck from Rajasthan. *Geobios* 8(5): 225–226.
- Sinha, Y.P. (1996).** Bats in Indian Thar Desert, pp. 349–352. In: Ghosh, A.K., Q.H. Baqri & I. Prakash (eds.). *Faunal Diversity in the Thar Desert: Gaps in Research*. Scientific Publication, Jodhpur, 410 pp.
- Srinivasulu, C., B. Srinivasulu & Y.P. Sinha (2013).** Chapter 21. Chiropteran Fauna of Rajasthan: Taxonomy, Distribution and Status, pp. 505–548. In: Sharma, B.K., S. Kulshreshtha & A.R. Rahmani (eds.). *Faunal Heritage of Rajasthan, India: General Background and Ecology of Vertebrates*. Springer Science+Business Media, New York, 661 pp.
- Srinivasulu, C., P.A. Racey & S. Mistry (2010).** A key to the bats (Mammalia: Chiroptera) of South Asia. *Journal of Threatened Taxa* 2(7): 1001–1076. <https://doi.org/10.11609/JoTT.o2352.1001-76>
- Venugopal, P. (2020)** An integrated approach to the taxonomy of hipposiderid bats in South Asia. PhD dissertation. School of Biological Sciences, University of Bristol.
- Wason, A. (1978).** Observations on homing ability of some insectivorous bats. *Zeitschrift für Säugetierkunde* 43: 305–306.
- Wason, A. & S.D. Misra (1981).** Observations on the directional differences in homing ability of the rat-tailed bat, *Rhinopoma microphyllum* (Brunnich). *Zeitschrift für Säugetierkunde* 46: 331–332.
- Wroughton, R.C. (1913).** Bombay Natural History Society's Mammal Survey of India, Report No 7 (with K.V. Ryley). Central Provinces. *Journal of the Bombay Natural History Society* 22(1): 45–48



Dr. George Mathew, Kerala Forest Research Institute, Peechi, India
Dr. John Noyes, Natural History Museum, London, UK
Dr. Albert G. Orr, Griffith University, Nathan, Australia
Dr. Sameer Padhye, Katholieke Universiteit Leuven, Belgium
Dr. Nancy van der Poorten, Toronto, Canada
Dr. Kareen Schnabel, NIWA, Wellington, New Zealand
Dr. R.M. Sharma, (Retd.) Scientist, Zoological Survey of India, Pune, India
Dr. Manju Siliwal, WILD, Coimbatore, Tamil Nadu, India
Dr. G.P. Sinha, Botanical Survey of India, Allahabad, India
Dr. K.A. Subramanian, Zoological Survey of India, New Alipore, Kolkata, India
Dr. P.M. Sureshan, Zoological Survey of India, Kozhikode, Kerala, India
Dr. R. Varatharajan, Manipur University, Imphal, Manipur, India
Dr. Eduard Vives, Museu de Ciències Naturals de Barcelona, Terrassa, Spain
Dr. James Young, Hong Kong Lepidopterists' Society, Hong Kong
Dr. R. Sundararaj, Institute of Wood Science & Technology, Bengaluru, India
Dr. M. Nithyanandan, Environmental Department, La Ala Al Kuwait Real Estate. Co. K.S.C., Kuwait
Dr. Himender Bharti, Punjabi University, Punjab, India
Mr. Purnendu Roy, London, UK
Dr. Saito Motoki, The Butterfly Society of Japan, Tokyo, Japan
Dr. Sanjay Sondhi, TITLI TRUST, Kalpavriksh, Dehradun, India
Dr. Nguyen Thi Phuong Lien, Vietnam Academy of Science and Technology, Hanoi, Vietnam
Dr. Nitin Kulkarni, Tropical Research Institute, Jabalpur, India
Dr. Robin Wen Jiang Ngiam, National Parks Board, Singapore
Dr. Lionel Monod, Natural History Museum of Geneva, Genève, Switzerland.
Dr. Asheesh Shivam, Nehru Gram Bharti University, Allahabad, India
Dr. Rosana Moreira da Rocha, Universidade Federal do Paraná, Curitiba, Brasil
Dr. Kurt R. Arnold, North Dakota State University, Saxony, Germany
Dr. James M. Carpenter, American Museum of Natural History, New York, USA
Dr. David M. Claborn, Missouri State University, Springfield, USA
Dr. Kareen Schnabel, Marine Biologist, Wellington, New Zealand
Dr. Amazonas Chagas Júnior, Universidade Federal de Mato Grosso, Cuiabá, Brasil
Mr. Moonsoon Yjoti Gogoi, Assam University, Silchar, Assam, India
Dr. Heo Chong Chin, Universiti Teknologi MARA (UiTM), Selangor, Malaysia
Dr. R.J. Shiel, University of Adelaide, SA 5005, Australia
Dr. Siddharth Kulkarni, The George Washington University, Washington, USA
Dr. Priyadarsanan Dharma Rajan, ATREE, Bengaluru, India
Dr. Phil Alderslade, CSIRO Marine And Atmospheric Research, Hobart, Australia
Dr. John E.N. Veron, Coral Reef Research, Townsville, Australia
Dr. Daniel Whitmore, State Museum of Natural History Stuttgart, Rosenstein, Germany.
Dr. Yu-Feng Hsu, National Taiwan Normal University, Taipei City, Taiwan
Dr. Keith V. Wolfe, Antioch, California, USA
Dr. Siddharth Kulkarni, The Hormiga Lab, The George Washington University, Washington, D.C., USA
Dr. Tomas Ditrich, Faculty of Education, University of South Bohemia in Ceske Budejovice, Czech Republic
Dr. Mihaly Foldvari, Natural History Museum, University of Oslo, Norway
Dr. V.P. Niyal, Wildlife Institute of India, Dehradun, Uttarakhand 248001, India
Dr. John T.D. Caleb, Zoological Survey of India, Kolkata, West Bengal, India
Dr. Priyadarsanan Dharma Rajan, Ashoka Trust for Research in Ecology and the Environment (ATREE), Royal Enclave, Bangalore, Karnataka, India

Fishes

Dr. Neelesh Dahanukar, IISER, Pune, Maharashtra, India
Dr. Topiltzin Contreras MacBeath, Universidad Autónoma del estado de Morelos, México
Dr. Heok Hee Ng, National University of Singapore, Science Drive, Singapore
Dr. Rajeev Raghavan, St. Albert's College, Kochi, Kerala, India
Dr. Robert D. Sluka, Chiltern Gateway Project, A Rocha UK, Southall, Middlesex, UK
Dr. E. Vivekanandan, Central Marine Fisheries Research Institute, Chennai, India
Dr. Davor Zanella, University of Zagreb, Zagreb, Croatia
Dr. A. Biju Kumar, University of Kerala, Thiruvananthapuram, Kerala, India
Dr. Akhilesh K.V., ICAR-Central Marine Fisheries Research Institute, Mumbai Research Centre, Mumbai, Maharashtra, India
Dr. J.A. Johnson, Wildlife Institute of India, Dehradun, Uttarakhand, India
Dr. R. Ravinesh, Gujarat Institute of Desert Ecology, Gujarat, India

Amphibians

Dr. Sushil K. Dutta, Indian Institute of Science, Bengaluru, Karnataka, India
Dr. Annemarie Ohler, Muséum national d'Histoire naturelle, Paris, France

Reptiles

Dr. Gernot Vogel, Heidelberg, Germany
Dr. Raju Vyas, Vadodara, Gujarat, India
Dr. Pritpal S. Soorae, Environment Agency, Abu Dhabi, UAE.
Prof. Dr. Wayne J. Fuller, Near East University, Mersin, Turkey
Prof. Chandrashekher U. Rivonker, Goa University, Taleigao Plateau, Goa, India
Dr. S.R. Ganesh, Chennai Snake Park, Chennai, Tamil Nadu, India
Dr. Himansu Sekhar Das, Terrestrial & Marine Biodiversity, Abu Dhabi, UAE

Birds

Dr. Hem Sagar Baral, Charles Sturt University, NSW Australia
Mr. H. Byju, Coimbatore, Tamil Nadu, India
Dr. Chris Bowden, Royal Society for the Protection of Birds, Sandy, UK
Dr. Priya Davidar, Pondicherry University, Kalapet, Puducherry, India
Dr. J.W. Duckworth, IUCN SSC, Bath, UK
Dr. Rajah Jayapal, SACON, Coimbatore, Tamil Nadu, India
Dr. Rajiv S. Kalsi, M.L.N. College, Yamuna Nagar, Haryana, India
Dr. V. Santharam, Rishi Valley Education Centre, Chittoor Dt., Andhra Pradesh, India
Dr. S. Balachandran, Bombay Natural History Society, Mumbai, India
Mr. J. Praveen, Bengaluru, India
Dr. C. Srinivasulu, Osmania University, Hyderabad, India
Dr. K.S. Gopi Sundar, International Crane Foundation, Baraboo, USA
Dr. Gombobaatar Sundev, Professor of Ornithology, Ulaanbaatar, Mongolia
Prof. Reuven Yosef, International Birding & Research Centre, Eilat, Israel
Dr. Taej Mundkur, Wetlands International, Wageningen, The Netherlands
Dr. Carol Inskipp, Bishop Auckland Co., Durham, UK
Dr. Tim Inskipp, Bishop Auckland Co., Durham, UK
Dr. V. Gokula, National College, Tiruchirappalli, Tamil Nadu, India
Dr. Arkady Lelej, Russian Academy of Sciences, Vladivostok, Russia
Dr. Simon Dowell, Science Director, Chester Zoo, UK
Dr. Mário Gabriel Santiago dos Santos, Universidade de Trás-os-Montes e Alto Douro, Quinta de Prados, Vila Real, Portugal
Dr. Grant Connette, Smithsonian Institution, Royal, VA, USA
Dr. M. Zafar-ul Islam, Prince Saud Al Faisal Wildlife Research Center, Taif, Saudi Arabia

Mammals

Dr. Giovanni Amori, CNR - Institute of Ecosystem Studies, Rome, Italy
Dr. Anwaruddin Chowdhury, Guwahati, India
Dr. David Mallon, Zoological Society of London, UK
Dr. Shomita Mukherjee, SACON, Coimbatore, Tamil Nadu, India
Dr. Angie Appel, Wild Cat Network, Germany
Dr. P.O. Nameer, Kerala Agricultural University, Thrissur, Kerala, India
Dr. Ian Redmond, UNEP Convention on Migratory Species, Lansdown, UK
Dr. Heidi S. Riddle, Riddle's Elephant and Wildlife Sanctuary, Arkansas, USA
Dr. Karin Schwartz, George Mason University, Fairfax, Virginia.
Dr. Lala A.K. Singh, Bhubaneswar, Orissa, India
Dr. Mewa Singh, Mysore University, Mysore, India
Dr. Paul Racey, University of Exeter, Devon, UK
Dr. Honnavalli N. Kumara, SACON, Anaikatty P.O., Coimbatore, Tamil Nadu, India
Dr. Nishith Dharaiya, HNG University, Patan, Gujarat, India
Dr. Spartaco Gippoliti, Socio Onorario Società Italiana per la Storia della Fauna "Giuseppe Altobello", Rome, Italy
Dr. Justus Joshua, Green Future Foundation, Tiruchirappalli, Tamil Nadu, India
Dr. H. Raghuram, The American College, Madurai, Tamil Nadu, India
Dr. Paul Bates, Harison Institute, Kent, UK
Dr. Jim Sanderson, Small Wild Cat Conservation Foundation, Hartford, USA
Dr. Dan Challenger, University of Kent, Canterbury, UK
Dr. David Mallon, Manchester Metropolitan University, Derbyshire, UK
Dr. Brian L. Cypher, California State University-Stanislaus, Bakersfield, CA
Dr. S.S. Talmale, Zoological Survey of India, Pune, Maharashtra, India
Prof. Karan Bahadur Shah, Budhanilakantha Municipality, Kathmandu, Nepal
Dr. Susan Cheyne, Borneo Nature Foundation International, Palangkaraja, Indonesia
Dr. Hemanta Kafley, Wildlife Sciences, Tarleton State University, Texas, USA

Other Disciplines

Dr. Aniruddha Belsare, Columbia MO 65203, USA (Veterinary)
Dr. Mandar S. Paingankar, University of Pune, Pune, Maharashtra, India (Molecular)
Dr. Jack Tordoff, Critical Ecosystem Partnership Fund, Arlington, USA (Communities)
Dr. Ulrike Streicher, University of Oregon, Eugene, USA (Veterinary)
Dr. Hari Balasubramanian, EcoAdvisors, Nova Scotia, Canada (Communities)
Dr. Rayanna Hellem Santos Bezerra, Universidade Federal de Sergipe, São Cristóvão, Brazil
Dr. Jamie R. Wood, Landcare Research, Canterbury, New Zealand
Dr. Wendy Collinson-Jonker, Endangered Wildlife Trust, Gauteng, South Africa
Dr. Rajeshkumar G. Jani, Anand Agricultural University, Anand, Gujarat, India
Dr. O.N. Tiwari, Senior Scientist, ICAR-Indian Agricultural Research Institute (IARI), New Delhi, India
Dr. L.D. Singla, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, India
Dr. Rupika S. Rajakaruna, University of Peradeniya, Peradeniya, Sri Lanka
Dr. Bahar Baviskar, Wild-CER, Nagpur, Maharashtra 440013, India

Reviewers 2019–2021

Due to paucity of space, the list of reviewers for 2018–2020 is available online.

The opinions expressed by the authors do not reflect the views of the Journal of Threatened Taxa, Wildlife Information Liaison Development Society, Zoo Outreach Organization, or any of the partners. The journal, the publisher, the host, and the partners are not responsible for the accuracy of the political boundaries shown in the maps by the authors.

Journal of Threatened Taxa is indexed/abstracted in Bibliography of Systematic Mycology, Biological Abstracts, BIOSIS Previews, CAB Abstracts, EBSCO, Google Scholar, Index Copernicus, Index Fungorum, JournalSeek, National Academy of Agricultural Sciences, NewJour, OCLC WorldCat, SCOPUS, Stanford University Libraries, Virtual Library of Biology, Zoological Records.

NAAS rating (India) 5.64

Print copies of the Journal are available at cost. Write to:
The Managing Editor, JoTT,
c/o Wildlife Information Liaison Development Society,
43/2 Varadarajulu Nagar, 5th Street West, Ganapathy, Coimbatore,
Tamil Nadu 641035, India
ravi@threatenedtaxa.org



www.threatenedtaxa.org

OPEN ACCESS



The Journal of Threatened Taxa (JoTT) is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](https://creativecommons.org/licenses/by/4.0/) unless otherwise mentioned. JoTT allows unrestricted use, reproduction, and distribution of articles in any medium by providing adequate credit to the author(s) and the source of publication.

ISSN 0974-7907 (Online) | ISSN 0974-7893 (Print)

January 2023 | Vol. 15 | No. 1 | Pages: 22355–22558

Date of Publication: 26 January 2023 (Online & Print)

DOI: 10.11609/jott.2023.15.1.22355-22558

Communications

Asiatic Black Bear *Ursus thibetanus* attacks in Kashmir Valley, India

– Aaliya Mir, Shanmugavelu Swaminathan, Rashid Y. Naqash, Thomas Sharp & Attur Shanmugam Arun, Pp. 22355–22363

Food habits of the Red Fox *Vulpes vulpes* (Mammalia: Carnivora: Canidae) in Dachigam National Park of the Kashmir Himalaya, India

– Kulsum Ahmad Bhat, Bilal A. Bhat, Bashir A. Ganai, Aamir Majeed, Naziya Khurshid & Muniza Manzoor, Pp. 22364–22370

Status distribution and factors affecting the habitat selection by Sambar Deer *Rusa unicolor* in Pench Tiger Reserve, Madhya Pradesh, India

– Abdul Haleem & Orus Ilyas, Pp. 22371–22380

Assessing illegal trade networks of two species of pangolins through a questionnaire survey in Nepal

– Nikita Phuyal, Bipana Maiya Sadadev, Reeta Khulal, Rashmi Bhatt, Santosh Bajagain, Nirjala Raut & Bijaya Dhami, Pp. 22381–22391

First occurrence record of Indian Roundleaf Bat *Hipposideros lankadiva* in Rajasthan, India

– Dharmendra Khandal, Dau Lal Bohra & Shyamkant S. Talmale, Pp. 22392–22398

Food availability and food selectivity of Sri Lanka Grey Hornbill *Ocyrceros gingalensis* Shaw, 1811 in Mihintale Sanctuary, Sri Lanka

– Iresha Wijerathne, Pavithra Panduwawala & Sriyani Wickramasinghe, Pp. 22399–22409

Conservation significance of Changaram wetlands - a key wintering site for migratory shorebirds and other waterbirds in the western coast of Kerala, India

– Jasmine Anand, H. Byju, Aymen Nefla, S. Abhijith, Omer R Reshi & K.M. Aarif, Pp. 22410–22418

Long-term monitoring of pelicans in National Chambal Sanctuary, India

– Lala A.K. Singh & Rishikesh Sharma, Pp. 22419–22429

A checklist of avifauna of Mangalore University, Karnataka, India

– K. Maxim Rodrigues, K. Vineeth Kumar, Vivek Hasyagar, M.C. Prashantha Krishna & Deepak Naik, Pp. 22430–22439

Biology of *Bhutanitis ludlowi* Gabriel, 1942 (Lepidoptera: Papilionidae) Bumdeling Wildlife Sanctuary, Bhutan

– Tshering Dendup, Namgay Shacha, Karma Tempa & Tez Bdr Ghalley, Pp. 22440–22447

Biodiversity of butterflies (Lepidoptera: Rhopalocera) in the protected landscape of Nandhour, Uttarakhand, India

– Hem Chandra, Manoj Kumar Arya & Aman Verma, Pp. 22448–22470

A comparison of four sampling techniques for assessing species richness of adult odonates at riverbanks

– Apeksha Darshetkar, Ankur Patwardhan & Pankaj Koparde, Pp. 22471–22478

Floristic diversity of native wild ornamental plants of Aravalli Hill Range: a case study from district Rewari, Haryana, India

– Pradeep Bansal, Amrender Singh Rao, Surender Singh Yadav, M.S. Bhandoria & S.S. Dash, Pp. 22479–22493

Flowering and fruiting of Tape Seagrass *Enhalus acoroides* (L.f.) Royle from the Andaman Islands: observations from inflorescence buds to dehiscent fruits

– Swapnali Gole, Sivakumar Kuppusamy, Himansu Das & Jeyaraj Antony Johnson, Pp. 22494–22500

Short Communications

Status of Swamp Deer *Rucervus duvaucelii duvaucelii* (G. Cuvier, 1823) in grassland-wetland habitats in Dudhwa Tiger Reserve, India

– Sankarshan Rastogi, Ashish Bista, Sanjay Kumar Pathak, Pranav Chanchani & Mudit Gupta, Pp. 22501–22504

First photographic evidence of Indian Pangolin *Manis crassicaudata* Geoffroy, 1803 (Mammalia: Pholidota: Manidae), in Colonel Sher Jung National Park, Himachal Pradesh, India

– Nidhi Singh, Urjit Bhatt, Saurav Chaudhary & Salvador Lyngdoh, Pp. 22505–22509

The Marine Otter *Lontra felina* (Molina, 1782) (Mammalia: Carnivora: Mustelidae) along the marine protected areas in Peru

– José Pizarro-Neyra, Pp. 22510–22514

First record of the genus *Acropyga* Roger, 1862 (Hymenoptera: Formicidae: Formicinae) in Kerala, India

– Merin Elizabeth George & Gopalan Prasad, Pp. 22515–22521

First report of a coreid bug *Aurelianus yunnananus* Xiong, 1987 (Hemiptera: Heteroptera: Coreidae) from India

– Hemant V. Ghate, Pratik Pansare & Rahul Lodh, Pp. 22522–22527

First record of the long-horned beetle *Niphona fuscatrix* (Fabricius, 1792) (Coleoptera: Cerambycidae: Lamiinae) from the Western Ghats, India

– Yogesh K. Mane, Priyanka B. Patil & Sunil M. Gaikwad, Pp. 22528–22532

Incidence of *Clinostomum complanatum* (Trematoda: Clinostomidae) in *Trichogaster fasciata* (Actinopterygii: Osphronemidae), the first report from Deepor Beel, Assam, India

– Bobita Bordoloi & Arup Kumar Hazarika, Pp. 22533–22537

Sauromatum horsfieldii (Araceae): a new addition to the flora of Manipur, northeastern India

– Kazuhrii Eshuo & Adani Lokho, Pp. 22538–22542

Rhynchostegiella menadensis (Sande Lac.) E.B. Bartram and *R. scabriseta* (Schwagr.) Broth.: two new records of mosses (Brachytheciaceae: Bryophyta) for peninsular India

– V.K. Rajilesh, C.N. Manju & R. Prakashkumar, Pp. 22543–22547

Notes

Installation of hot boxes for conservation in the last nursery roost of Greater Horseshoe Bats *Rhinolophus ferrumequinum* in Austria

– Lukas Zangl, Alexander Gutstein, Wolfgang Paill, Edmund Weiss & Peter Sackl, Pp. 22548–22550

New prey record of giant ladybird beetle *Anisolemnia dilatata* (Fabricius) (Coccinellidae: Coleoptera) feeding on Som Plant Aphid *Aiceona* sp.

– Suprakash Pal, Biwash Gurung, Ponnusamy Natarajan & Partha Sarathi Medda, Pp. 22551–22555

Book Review

Book Review - Under the Feet of Living Things

Editors — Aparajita Datta, Rohan Arthur & T.R. Shankar Raman

– Review by Melito Prinson Pinto, Pp. 22556–22558

Publisher & Host

