

Building evidence for conservation globally

Journal of Threatened Taxa

10.11609/jott.2023.15.5.23139-23282

www.threatenedtaxa.org

26 May 2023 (Online & Print)

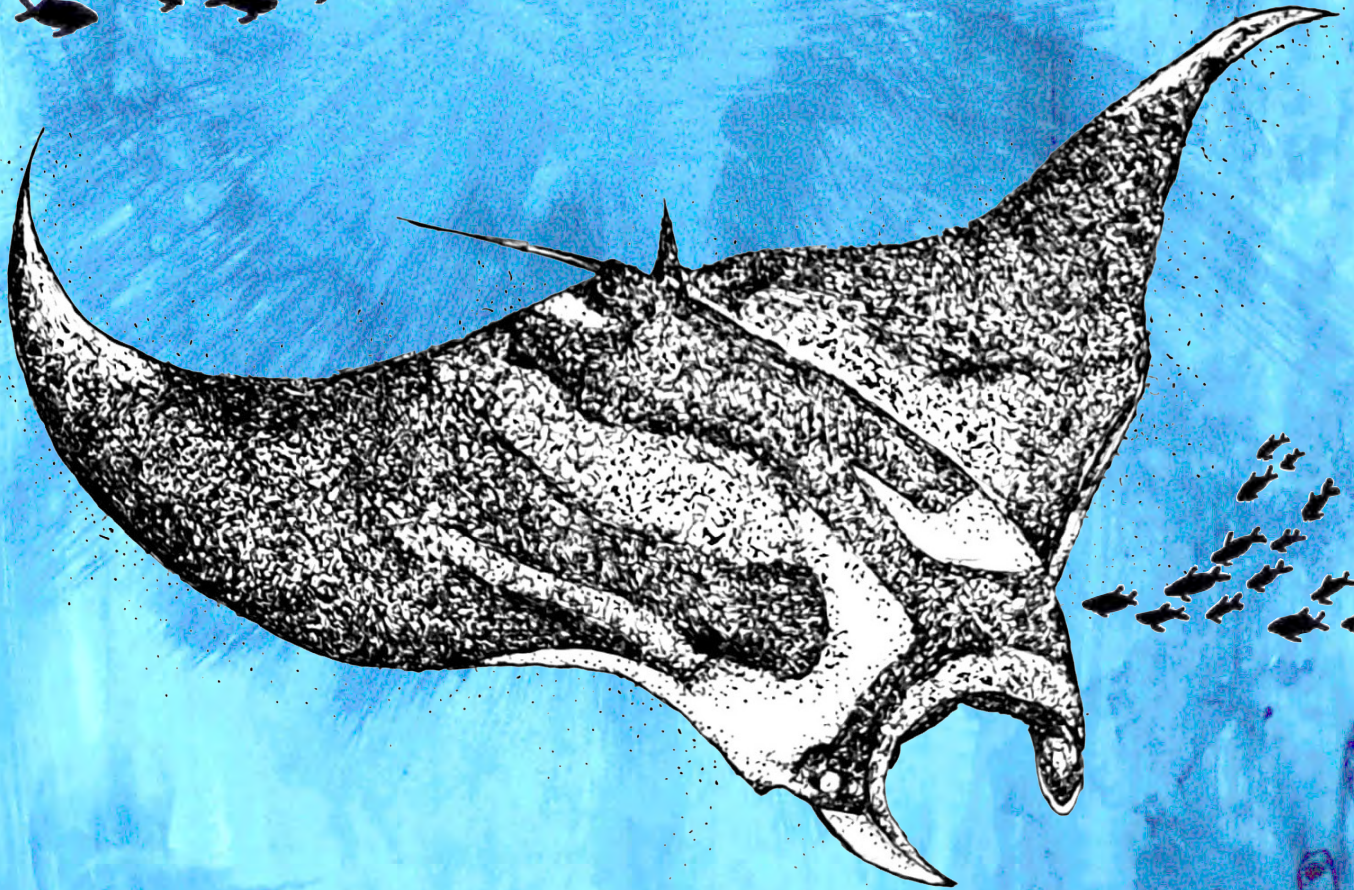
15(5): 23139-23282

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 641006, 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 641006, India

Deputy Chief Editor

Dr. Neelesh Dahanukar

Noida, Uttar Pradesh, India

Managing Editor

Mr. B. Ravichandran, WILD/ZOO, Coimbatore, Tamil Nadu 641006, 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 641006, India

Dr. B.A. Daniel, ZOO/WILD, Coimbatore, Tamil Nadu 641006, 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 Illustrator, 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, Mavinahalla 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 2020–2022

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, Department of Plant and Soil Science, Texas Tech University, Lubbock, Texas, USA.

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 Banos, Laguna, Philippines

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

Dr. Afroz Alam, Banasthali Vidyapith (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. A.G. Pandurangan, Thiruvananthapuram, Kerala, 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, Llandudno, North Wales, LL30 1UP

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

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

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

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: Giant Oceanic Manta Ray *Mobula birostris* in ink on acrylic wash by Elakshi Mahika Molur adapted from scientific illustration by Roger Hall.



Photographic evidence of the Indian Pangolin *Manis crassicaudata* Geoffroy, 1803 (Mammalia: Pholidota: Manidae), in Kaimur Wildlife Sanctuary, Bihar, India

Mujahid Ahamad¹ , Umar Saeed² , Vivek Ranjan³ , Syed Ainul Hussain⁴ , Ruchi Badola⁵
& S. Kumarasamy⁶

¹⁻⁵ Department of Eco-Development Planning and Participatory Management, Wildlife Institute of India, Dehradun, Uttarakhand 248001, India.

⁶ Environment, Forest & Climate Change Department, QFHF+W2H, Office of Divisional Forest Officer, Purnea, Thana Chowk Road, near Head Post Office, PWD Colony, Purnia, Bihar 854301, India.

¹syedmujahidahmad@gmail.com, ²umar2673@gmail.com (corresponding author), ³vivek.nil@gmail.com, ⁴ainul.hussain@gmail.com, ⁵ruchi@wii.gov.in, ⁶samyifs@yahoo.co.in

The Indian Pangolin *Manis crassicaudata* is the most ancient insectivore species belonging to the order Pholidota and the family Manidae (Heath 1995). In India, two species of pangolins are found: the Indian Pangolin *M. crassicaudata*, also called the thick-tailed Pangolin, and the Chinese Pangolin *Manis pentadactyla*. The Indian Pangolin is distributed in southern Asia, from parts of eastern Pakistan through much of India, south of the Himalaya, southern Nepal, Bangladesh, and Sri Lanka (Schlitter 2005; Srinivasulu & Srinivasulu 2012), while the Chinese Pangolin is present in the Himalayan foothills of Nepal, southern Bhutan, and northeastern India (Srinivasulu & Srinivasulu 2012; ZSI 2002). The Indian Pangolin is a medium-sized mammal covered dorsally by 11–13 rows of scales (Mahmood et al. 2020). A terminal scale is also present on the ventral side of the tail, which is absent in the Chinese Pangolin.

The Indian Pangolin is 'Endangered' according to the IUCN Red List (Mahmood et al. 2019). It is also protected

as a Schedule I species under the Wild Life (Protection) Act, 1972, and listed in Appendix I of CITES due to being one of the highest-trafficked animals. There is a significant problem of poaching and high demand for its meat, scales, and use in traditional medicine in the international illegal wildlife trading markets (Anonymous 1992; Brown et al. 1996). Furthermore, it is considered a delicacy in many southeastern Asian and European countries (Newton et al. 2008). These factors have led to a declining population trend of the Indian Pangolin across its range (Heinrich et al. 2016; Mahmood et al. 2019).

The current study was conducted in the Kaimur Wildlife Sanctuary (KWS), which covers an area of 1,504.96 km² in Bihar (24.594–24.978 °N to 83.501–84.078 °E). According to Champion and Seth (1968), the forest type of KWS is Northern mixed deciduous forest. The dominant tree species of KWS is predominantly composed of *Shorea robusta*, *Terminalia chebula*, *Cassia*

Editor: Anwaruddin Choudhury, The Rhino Foundation for Nature in North East India, Guwahati, India.

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

Citation: Ahamad, M., U. Saeed, V. Ranjan, S.A. Hussain, R. Badola & S. Kumarasamy (2023). Photographic evidence of the Indian Pangolin *Manis crassicaudata* Geoffroy, 1803 (Mammalia: Pholidota: Manidae), in Kaimur Wildlife Sanctuary, Bihar, India. *Journal of Threatened Taxa* 15(5): 23270–23272. <https://doi.org/10.11609/jott.8248.15.5.23270-23272>

Copyright: © Ahamad 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: The study is funded by Dedicated Freight Corridor Corporation of India Limited (DFCCIL).

Competing interests: The authors declare no competing interests.



Acknowledgements: We sincerely thank: the Rohtas Forest Division, Sasaram (Environment, Forests and Climate Change Department, Government of Bihar); Brij Lal Manjhi, range officer of Rohtas Forest Range; the forest guards of the concerned beats officer and other field support staff who accompanied us; and Rashmi Das for her review of the manuscript.

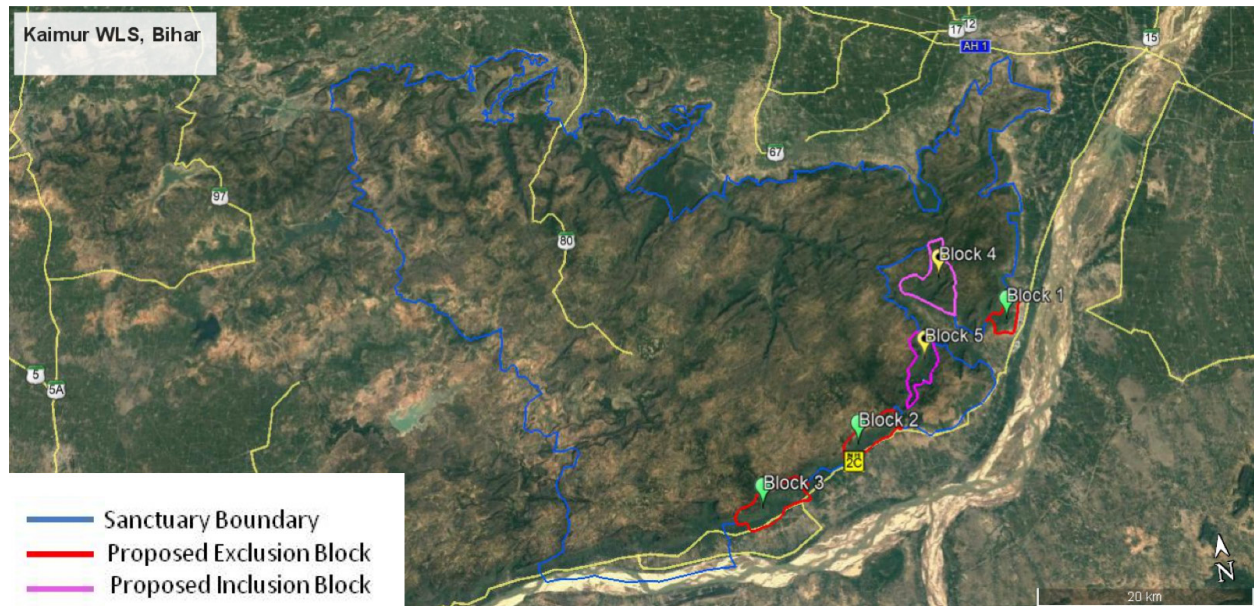


Figure 1. Map of the Kaimur Wildlife Sanctuary, Bihar showing proposed exclusion zone (red colour; Block 1, 2 & 3) and inclusion zone (pink colour Block 4 & 5).



Image 1. Indian Pangolin *Manis crassicaudata* in Kaimur WS, Bihar.

fistula, *Diospyros manoxylon*, *Acacia catechu*, *Terminalia tomentosa*, *Butea monosperma*, *Madhuca indica*, and *Boswellia serrata* (Bhattacharyya & Ghosh 2004). A reconnaissance survey was carried out between 27 June 2019 and 2 July 2019, in the Rohtas and Adhaura range of KWS. The survey aimed to assess the extent and nature of the work involved in the study. A total of 30 km were covered on foot and by vehicle in the exclusion zones (19 km) and inclusion zones (11 km). The specific area i.e., the exclusion block area in question would be excluded from the sanctuary for mining purposes, while another area, i.e., the inclusion block area would be included

within the Sanctuary (block area depicted in Figure 1).

The first photographic documentation of an Indian Pangolin within the KWS has been recorded in the Rohtas region, which is contiguous to the Adhaura range of the Sanctuary. The habitat in this area is dry deciduous, dominated by *Acacia catechu* and *Terminalia tomentosa* species. Literature on the Indian Pangolin at the landscape level is scarce. Due to immense poaching and increasing demand for its meat and scales, as well as its use in traditional medicine in the international illegal wildlife trading markets, the population of Indian Pangolins is declining across their habitat (Mahmood



Image 2. Habitat of Indian Pangolin from Kaimur WS, Bihar.

et al. 2012). According to TRAFFIC India, nearly 6,000 Pangolins were poached in India between 2009 and 2017 (Ghosh 2020). The preliminary observation suggests that the Sanctuary holds significant wildlife value, as approximately 15 mammalian species were recorded during our reconnaissance survey. Therefore, a detailed ecological assessment is essential to evaluate the biodiversity value of the Sanctuary.

References

- Anonymous (1992).** Review of Significant Trade in Animal Species included in CITES Appendix II. Detailed Review of 24 Priority Species. Indian, Malayan and Chinese Pangolin. CITES Animals Committee.
- Bhattacharyya, T.P. & M.K. Ghosh (2004).** Faunal Composition of Kaimur Wild Life Sanctuary (Bihar Conservation Area Series No. 22: Published by the Director, Zool. Surv. India, 1-49 pp.
- Brown, J.R., K. Beckenbach, A.T. Beckenbach & M.J. Smith (1996).** Length variation, heteroplasmy and sequence divergence in the mitochondrial DNA of four species of sturgeon (Acipenser). *Genetics* 142(2): 525–535.
- Challender, D.W., S.R. Harrop & D.C. Macmillan (2015).** Understanding markets to conserve trade-threatened species in CITES. *Biological Conservation* 187: 249–259. <https://doi.org/10.1016/j.biocon.2015.04.015>
- Champion, S.H. & S.K. Seth (1968).** *A Revised Survey of the Forest Types of India*. Delhi, India, 404 pp.
- Ghosh, S. (2020).** One of the world's trafficked animals need focus outside India's protected areas. In: Mongabay series: Beyond Protected Areas. Accessed on 20 October 2022.
- Heath, M.E. (1995).** *Manis crassicaudata*. *Mammalian Species* 513: 1–4.
- Heinrich, S., T.A. Wittmann, T.A. Prowse, J.V. Ross, S. Delean, C.R. Shepherd & P. Cassey (2016).** Where did all the pangolins go? International CITES trade in pangolin species. *Global Ecology and Conservation* 8: 241–253.
- Mahmood, T., R. Hussain, N. Irshad, F. Akrim & M.S. Nadeem (2012).** Illegal mass killing of Indian Pangolin (*Manis crassicaudata*) in Potohar Region, Pakistan. *Pakistan Journal of Zoology* 44(5): 1457–1461.
- Mahmood, T., D. Challender, A. Khatiwada, S. Andleeb, P. Perera, S. Trageser, A. Ghose & R. Mohapatra (2019).** *Manis crassicaudata*. The IUCN Red List of Threatened Species 2019: e.T12761A123583998. Accessed on 22 May 2023. <https://doi.org/10.2305/IUCN.UK.2019-3.RLTS.T12761A123583998.en>
- Newton, P., N. van Thai, S. Robertson & D. Bell (2008).** Pangolins in peril: using local hunters' knowledge to conserve elusive species in Vietnam. *Endangered Species Research* 6(1): 41–53.
- Pantel, E.B.S. & S. Chin (2009).** Proceedings of the Workshop on Trade and Conservation of Pangolins Native to South and Southeast Asia. 30 June – 02 July 2008, Singapore Zoo. Traffic Southeast Asia, Petaling Jaya, Selangor, Malaysia, vii+224 pp.
- Schlitter, D.A. (2005).** *Order pholidota. Mammal Species of the World: A Taxonomic and Geographic Reference*. Johns Hopkins University Press, Baltimore, MD, USA, 530–531.
- Srinivasulu, C. & B. Srinivasulu (2012).** *South Asian mammals: their diversity, distribution, and status*. Springer Science & Business Media, NY, XII+468 pp. https://doi.org/10.1007/978-1-4614-3449-8_2

Dr. Ian J. Kitching, Natural History Museum, Cromwell Road, UK
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. Monsoon Jyoti 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. Uniyal, 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, SACION, 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, Araboo, USA
Dr. Gombobaatar Sunde, 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. P.A. Azeez, Coimbatore, Tamil Nadu, India

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, SACION, 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, SACION, 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 Challender, 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 2020–2022

Due to pausity 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.

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 641006, India
ravi@threatenedtaxa.org

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



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)

May 2023 | Vol. 15 | No. 5 | Pages: 23139–23282

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

DOI: 10.11609/jott.2023.15.5.23139-23282

Articles

Nesting habitat and nest directionality of the Indian Giant Squirrel *Ratufa indica maxima* (Schreber, 1784) (Mammalia: Rodentia: Sciuridae) in the Nelliampathy Reserve Forest, Western Ghats, Kerala, India

– K. Mohan, Joseph J. Erinjery & Mewa Singh, Pp. 23139–23146

Impact of human activities on wild ungulates in Nagarjunsagar Srisaillam Tiger Reserve, Andhra Pradesh, India

– K. Ashok Kumar, Qamar Qureshi & Yadavendrudev V. Jhala, Pp. 23147–23163

Diversity, distribution, and conservation status of fish species in Kallar Stream, Achankovil River, Western Ghats of Kerala, India

– A.S. Vishnu, Melbin Lal, Josin C. Tharian, M.P. Prabhakaran & P.H. Anvar Ali, Pp. 23164–23189

Effect of ecological factors on the grass dynamics at Point Calimere Wildlife Sanctuary, India

– Selvarasu Sathishkumar, Subhasish Arandhara & Nagarajan Baskaran, Pp. 23190–23199

Communications

Current populations of *Colobus vellerosus* (Geoffroy, 1834) & *Cercopithecus lowei* (Thomas, 1923) and land-use, land cover changes in Boabeng-Fiema Monkey Sanctuary, Ghana

– Edward Debrah Wiafe, Karen K. Akuoku, Isaac Sarkodie & Maxwell Kwame Boakye, Pp. 23200–23209

Roadkill records of two civet species on National Highway 715 passing through Kaziranga-Karbi Anglong landscape complex, Assam, India

– Somoyita Sur, Prasanta Kumar Saikia & Malabika Kakati Saikia, Pp. 23210–23215

Evaluating the influence of environmental variables on fish abundance and distribution in the Singhiya River of Morang District, eastern Nepal

– Jash Hang Limbu, Dipak Rajbanshi, Jawan Tumbahangfe, Asmit Subba, Sumnima Tumba & Rakshya Basnet, Pp. 23216–23226

Three new records of odonates (Insecta: Odonata) from Sindhudurg District, Maharashtra, India

– Akshay Dalvi, Yogesh Koli & Rahul Thakur, Pp. 23227–23232

A first report of dung beetle *Garreta smaragdifer* (Walker, 1858) attending the faecal matter of Northern Plain Gray Langur *Semnopithecus entellus* (Dufresne, 1997) with range extension and a checklist of the genus *Garreta* Janssen, 1940

– Aparna Sureshchandra Kalawate & Muhamed Jafer Palot, Pp. 23233–23239

An evaluation of the wetland grass flora of Mizoram, India

– S. Pathak, Pp. 23240–23247

New distribution records of polyporoid fungi (Agaricomycetes: Basidiomycota) from India

– Avneet Kaur, Avneet Pal Singh, Saroj Arora, Ellu Ram, Harpreet Kaur & Gulpaul Singh Dhingra, Pp. 23248–23256

Short Communication

Odonate fauna (Insecta: Odonata) of Kashmir, Jammu & Kashmir, India: a preliminary report

– Nisar Ahmad Paray & Altaf Hussain Mir, Pp. 23257–23261

Notes

Record of Himalayan Marmot *Marmota himalayana* (Hodgson, 1841) (Rodentia: Sciuridae) from Arunachal Pradesh, India

– Hiranmoy Chetia & Murali Krishna Chatakonda, Pp. 23262–23265

First photographic record of the Indian Giant Flying Squirrel *Petaurista philippensis* Elliot, 1839 (Mammalia: Rodentia: Sciuridae) in Badrama Wildlife Sanctuary, Odisha, India

– Phalguni Sarathi Mallik, Nimain Charan Palei & Bhakta Padarbinda Rath, Pp. 23266–23269

Photographic evidence of the Indian Pangolin *Manis crassicaudata* Geoffroy, 1803 (Mammalia: Pholidota: Manidae), in Kaimur Wildlife Sanctuary, Bihar, India

– Mujahid Ahamad, Umar Saeed, Vivek Ranjan, Syed Ainul Hussain, Ruchi Badola & S. Kumarasamy, Pp. 23270–23272

Sighting of Lesser White-fronted Goose *Anser erythropus* (Linnaeus, 1758) (Aves: Anseriformes: Anatidae) in Hadinaru Kere, Mysuru, India

– Basavaraju Shivakumar & Gopal Praphul, Pp. 23273–23275

New distribution records of two jumping spiders (Araneae: Salticidae) from Gujarat, India

– Subhash Parmar & Dhruv A. Prajapati, Pp. 23276–23278

Polychorous Puncture Vine *Tribulus terrestris* L. (Zygophyllaceae), a potential forage source for a guild of insect pollinators during the wet season

– P. Suvarna Raju & A.J. Solomon Raju, Pp. 23279–23282

Publisher & Host

