

Journal of Threatened Taxa

Building evidence for conservation globally



Open Access

10.11609/jott.2021.13.11.19431-19674
www.threatenedtaxa.org

26 September 2021 (Online & Print)
Vol. 13 | No. 11 | Pages: 19431-19674

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

No. 12, Thiruvannamalai Nagar, Saravanampatti - Kalapatti Road, Saravanampatti,

Coimbatore, Tamil Nadu 641035, 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),
12 Thiruvannamalai Nagar, Saravanampatti, 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 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, Mavinahalli 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. Ilangovan, Chennai, India

Web Maintenance

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

Typesetting

Mr. Arul Jagadish, ZOO, Coimbatore, India

Mrs. Radhika, ZOO, Coimbatore, India

Mrs. Geetha, ZOO, Coimbatore India

Fundraising/Communications

Mrs. Payal B. Molur, Coimbatore, India

Subject Editors 2018–2020

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, Mangalagangotri, 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 Cervanca, 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. Vijaysankar Raman, University of Mississippi, USA

Dr. B. Ravi Prasad Rao, Sri Krishnadevaraya University, Anantapur, 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 Ranjan 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. Janarthanan, 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 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. Navendu Page, Wildlife Institute of India, Chandrabani, Dehradun, Uttarakhand, 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. Hemanth V. Ghate, Modern College, Pune, India

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

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

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

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

Caption: Malabar Slender Loris *Loris lydekkerianus malabaricus* © Dileep Anthikkad.



Intestinal coccidiosis (Apicomplexa: Eimeriidae) in a Himalayan Griffon Vulture *Gyps himalayensis*

Vimalraj Padayatchiar Govindan¹ , Parag Madhukar Dhakate² & Ayush Uniyal³

^{1–3} Uttarakhand Forest Department, Western Circle, Haldwani, Uttarakhand 263139, India.

¹ vemalrajpg@gmail.com (corresponding author), ² cfwestern49@gmail.com, ³ ayushuniyalvett@gmail.com

The Himalayan Griffon Vulture or Himalayan Vulture *Gyps himalayensis* is an Old World scavenger. It is closely related to the European Griffon Vulture *G. fulvus* and is found along the Himalaya and the adjoining Tibetan plateau. It is one of the largest, heaviest, and true raptors. Adults have a long and spiky ruff as pale brown with white streaks. They all have a large wingspan, which allows them to soar with little effort. The head is covered down with yellowish colour in adults and whitish in immature vultures. The under-wing coverts are quite pale brown or buff, being almost white in some specimens. The legs are covered with buffy feathers and the feet can vary from greenish-grey to white. The upper side is unstreaked, pale buff with the tail quills, outer greater coverts and wing quills being a contrasting dark brown. The inner-secondaries have paler tips.

Coccidiosis is an old protozoan parasitic disease, prevalent worldwide and has an inhibitory role in the growth of poultry production industries by disease complex, caused by different species of the parasite *Eimeria*. Coccidia affect both clinically and sub-clinically. The clinical form of the disease manifests through prominent signs of mortality, morbidity, diarrhoea or bloody faeces, and sub-clinical coccidiosis manifests mainly by poor weight gain and reduced efficiency (Williams 1999). The present paper highlights the hemorrhagic intestinal coccidiosis in the Himalayan

Griffon and its importance in wildlife conservation.

A carcass of a free-ranging juvenile Himalayan Griffon from the Haldwani forest range division, Nainital, Uttarakhand was brought in for treatment. The fecal sample was placed in a 100 ml beaker and emulsified with 10–15 ml of water, strained, and centrifuged. A drop of sediment was examined under both low and high power objectives, microscopically (Soulsby 1982) for the presence/absence of parasitic *Eimeria* oocyst.

Microscopic examination of fecal sample from Himalayan Griffon carcass revealed the presence of parasitic *Eimeria* oocyst and confirmed based on the key points oocysts containing four sporocysts each with two sporozoites (Soulsby 1982; Urquhart et al. 1994).

If the oocysts from fecal samples are higher in number preferably coupled with typical clinical signs like bloody diarrhea, hemorrhages in the concerned birds, then the clinical approach should associate the usage of specific drugs like amprolium @ 3 ml of 9.6 per cent solution or potentiated sulphonamide drugs (Jayathangaraj et al. 2008).

Dolnik et al. (2010) reported that the prevalence of infection and intensity depended on the stratum, the gregariousness and the diet of the hosts. Aerial feeders had the lowest prevalence and intensity of infection, besides ground feeders the highest prevalence due to exposure by faeco-oral contamination. Coccidia were

Editor: Bahar S. Baviskar, Society for Wildlife Conservation, Education and Research, Nagpur, India. **Date of publication:** 26 September 2021 (online & print)

Citation: Govindan, V.P., P.M. Dhakate & A. Uniyal (2021). Intestinal coccidiosis (Apicomplexa: Eimeriidae) in a Himalayan Griffon Vulture *Gyps himalayensis*. *Journal of Threatened Taxa* 13(11): 19663–19664. <https://doi.org/10.11609/jott.5869.13.11.19663-19664>

Copyright: © Govindan et al. 2021. 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: None.

Competing interests: The authors declare no competing interests.



Image 1. Infected bird prior to death.



Image 2. Gross lesion showing severe intestinal hemorrhage.

very sensitive to direct sunlight and desiccation, when in shady and humid ground would provide the optimal habitat to survive and transmit infectious oocysts.

Coccidiosis is a serious and widespread disease of birds and needs periodical examination and continuous monitoring. Interestingly, the prevalence and presence of *Eimeria* sp. infection in Himalayan Griffon needs attention as it causes severe enteritis and mortality.

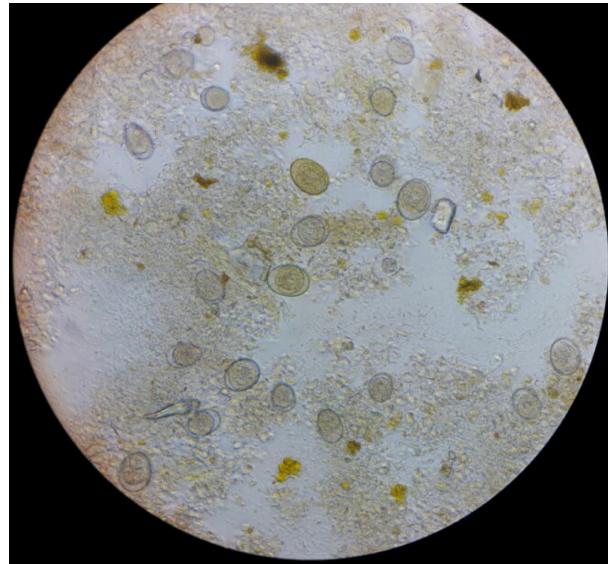


Image 3. Oocyst showing sporocyst.

However, the life cycle of coccidian parasites in free ranging wild birds and their disease transmission needs to be researched in detail.

References

- Dolnik, O.V., V.R. Dolnik & F. Bairlein (2010). The effect of host foraging ecology on the prevalence and intensity of coccidian infection in wild passerine birds. *Ardea* 98: 97–103.
Jayathangaraj, M.G., S. Gomathinayagam & V. Bhakyalakshmi (2008). Incidence of coccidiosis in captive wild birds. *Tamil Nadu Journal of Veterinary & Animal Sciences* 4(4): 156.
Soulsby, E.J. (1982). *Helminths, Arthropods and Protozoa of Domestic Animals*. 7th Edition. ELBS, Bareilly Tindall, London.
Urquhart, G.M., J. Armour, J.L. Duncan, A.M. Dunn & F.W. Jennings (1994). *Veterinary Parasitology*. Longman Scientific and Technical, England.
Williams, R.B. (1999). A compartmentalised model for the estimation of the cost of coccidiosis to the world's chicken production industry. *International Journal of Parasitology* 29: 1209–1229.



Dr. Albert G. Orr, Griffith University, Nathan, Australia
Dr. Sameer Padhye, Katholieke Universiteit Leuven, Belgium
Dr. Nancy van der Poorten, Toronto, Canada
Dr. Karen 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 Al Al Kuwait Real Estate. Co. K.S.C., Kuwait
Dr. Himender Bharti, Panjab 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. Karen 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. Priyadarshan 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. Priyadarshan Dharma Rajan, Ashoka Trust for Research in Ecology and the Environment (ATREE), Royal Enclave, Bangalore, Karnataka, India

Fishes

Dr. Neelish 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

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. Rironker, 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

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

Birds

Dr. Hem Sagar Baral, Charles Sturt University, NSW Australia
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 Jayopal, 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. Gombobaataa 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 Inskip, Bishop Auckland Co., Durham, UK
Dr. Tim Inskip, 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. Honnallini 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 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 2018–2020

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.

Print copies of the Journal are available at cost. Write to:
The Managing Editor, JoTT,
c/o Wildlife Information Liaison Development Society,
No. 12, Thiruvannamalai Nagar, Saravanampatti - Kalapatti Road,
Saravanampatti, Coimbatore, Tamil Nadu 641035, India
ravi@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](#) 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)

September 2021 | Vol. 13 | No. 11 | Pages: 19431-19674

Date of Publication: 26 September 2021 (Online & Print)

DOI: [10.11609/jott.2021.13.11.19431-19674](https://doi.org/10.11609/jott.2021.13.11.19431-19674)

www.threatenedtaxa.org

Articles

Understanding human-flying fox interactions in the Agusan Marsh Wildlife Sanctuary as basis for conservation policy interventions

– Sherry L. Paz & Juan Carlos T. Gonzalez, Pp. 19431–19447

Argentinian odonates (dragonflies and damselflies): current and future distribution and discussion of their conservation

– A. Nava-Bolaños, D.E. Vrech, A.V. Peretti & A. Córdoba-Aguilar, Pp. 19448–19465

Communications

The diel activity pattern of small carnivores of Western Ghats, India: a case study at Nelliampathies in Kerala, India

– Devika Sanghamithra & P.O. Nameer, Pp. 19466–19474

Distribution and threats to Smooth-Coated Otters *Lutrogale perspicillata* (Mammalia: Carnivora: Mustelidae) in Shuklaphanta National Park, Nepal

– Gopi Krishna Joshi, Rajeev Joshi & Bishow Poudel, Pp. 19475–19483

Wildlife hunting practices of the Santal and Oraon communities in Rajshahi, Bangladesh

– Azizul Islam Barkat, Fahmida Tasnim Liza, Sumaiya Akter, Ashikur Rahman Shome & M. Fazle Rabbe, Pp. 19484–19491

Ethnozoological use of primates in northeastern India

– Deborah Daolagupu, Nazimur Rahman Talukdar & Parthakar Choudhury, Pp. 19492–19499

Factors influencing the flush response and flight initiation distance of three owl species in the Andaman Islands

– Shanmugavel Sureshmarimuthu, Santhanakrishnan Babu, Honnavalli Nagaraj Kumara & Nagaraj Rajeshkumar, Pp. 19500–19508

Birds of Barandabhar Corridor Forest, Chitwan, Nepal

– Saneer Lamichhane, Babu Ram Lamichhane, Kapil Pokharel, Pramod Raj Regmi, Tulasi Prasad Dahal, Santosh Bhattacharai, Chiranjibi Prasad Pokhrel, Pabitra Gotame, Trishna Rayamajhi, Ram Chandra Kandel & Aashish Gurung, Pp. 19509–19526

On some additions to the amphibians of Gunung Inas Forest Reserve, Kedah, Peninsular Malaysia

– Shahriza Shahrudin, Pp. 19527–19539

Reviews

A review of research on the distribution, ecology, behaviour, and conservation of the Slender Loris *Loris lydekkerianus* (Mammalia: Primates: Lorisidae) in India

– Mewa Singh, Mridula Singh, Honnavalli N. Kumara, Shanthala Kumar, Smitha D. Gnanaolivu & Ramamoorthy Sasi, Pp. 19540–19552

Bivalves (Mollusca: Bivalvia) in Malaysian Borneo: status and threats

– Abdulla-Al-Asif, Hadi Hamli, Abu Hena Mustafa Kamal, Mohd Hanafi Idris, Geoffrey James Gerusu, Johan Ismail & Muyassar H. Abualreesh, Pp. 19553–19565

Disentangling earthworm taxonomic stumbling blocks using molecular markers

– Azhar Rashid Lone, Samrendra Singh Thakur, Nalini Tiwari, Olusola B. Sokefun & Shweta Yadav, Pp. 19566–19579

A reference of identification keys to plant-parasitic nematodes (Nematoda: Tylenchida\ Tylenchomorpha)

– Reza Ghaderi, Manouchehr Hosseinvand & Ali Eskandari, Pp. 19580–19602

Short Communications

Catalogue of herpetological specimens from Meghalaya, India at the Salim Ali Centre for Ornithology and Natural History

– S.R. Chandramouli, R.S. Naveen, S. Sureshmarimuthu, S. Babu, P.V. Karunakaran & Honnavalli N. Kumara, Pp. 19603–19610

A preliminary assessment of odonate diversity along the river Tirthan, Great Himalayan National Park Conservation Area, India with reference to the impact of climate change

– Amar Paul Singh, Kritish De, Virendra Prasad Uniyal & Sambandam Sathyakumar, Pp. 19611–19615

A checklist of orthopteran fauna (Insecta: Orthoptera) with some new records in the cold arid region of Ladakh, India

– M. Ali, M. Kamil Usmani, Hira Naz, Tajamul Hassan Baba & Mohsin Ali, Pp. 19616–19625

New distribution records of two *Begonias* to the flora of Bhutan

– Phub Gyeltshen & Sherab Jamtsho, Pp. 19626–19631

Rediscovery of *Aponogeton lakhonensis* A. Camus (Aponogetonaceae): a long-lost aquatic plant of India

– Debolina Dey, Shrirang Ramchandra Yadav & Nilakshee Devi, Pp. 19632–19635

Glyphochloa acuminata (Hack.) Clayton var. *laevis* (Poaceae): a new variety from central Western Ghats of Karnataka, India

– H.U. Abhijit & Y.L. Krishnamurthy, Pp. 19636–19639

A cytomorphological investigation of three species of the genus *Sonchus* L. (Asterales: Asteraceae) from Punjab, India

– M.C. Sidhu & Rai Singh, Pp. 19640–19644

Dryopteris lunanensis (Dryopteridaceae) - an addition to the pteridophytic diversity of India

– Chhandam Chanda, Christopher Roy Fraser-Jenkins & Vineet Kumar Rawat, Pp. 19645–19648

Notes

First record of Spotted Linsang *Prionodon pardicolor* (Mammalia: Carnivora: Prionodontidae) with photographic evidence in Meghalaya, India

– Papori Khatonier & Adrian Wansaindor Lyngdoh, Pp. 19649–19651

First record of the Eastern Cat Snake *Boiga gocoal* (Gray, 1835) (Squamata: Colubridae) from Tripura, India

– Sumit Nath, Biswajit Singh, Chiranjib Debnath & Joydeb Majumder, Pp. 19652–19656

First record of the genus *Tibetanja* (Lepidoptera: Eupterotidae: Janinae) from India

– Alka Vaidya & H. Sankararaman, Pp. 19657–19659

Austroborus cordillerae (Mollusca: Gastropoda) from central Argentina: a rare, little-known land snail

– Sandra Gordillo, Pp. 19660–19662

Intestinal coccidiosis (Apicomplexa: Eimeriidae) in a Himalayan Griffon Vulture *Gyps himalayensis*

– Vimalraj Padayatchiar Govindan, Parag Madhukar Dhakate & Ayush Uniyal, Pp. 19663–19664

Two new additions to the orchid flora of Assam, India

– Sanswrang Basumatary, Sanjib Baruah & Lal Ji Singh, Pp. 19665–19670

Wildlife art and illustration – combining black and white ink drawings with colour: some experiments in Auroville, India

– M. Eric Ramanujam & Joss Brooks, Pp. 19671–19674

Publisher & Host

