

Building evidence for conservation globally

Journal of Threatened Taxa



10.11609/jott.2024.16.11.26063-26186

www.threatenedtaxa.org

26 November 2024 (Online & Print)

16 (11): 26063-26186

ISSN 0974-7907 (Online)

ISSN 0974-7893 (Print)

Open Access





Publisher

Wildlife Information Liaison Development Societywww.wild.zooreach.org

Host

Zoo Outreach Organizationwww.zooreach.org

Srivari Illam, No. 61, Karthik Nagar, 10th Street, Saravanampatty, 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 MolurWildlife 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

Editorial Board

Dr. Russel Mittermeier

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

Prof. Mewa Singh Ph.D., FASc, FNA, FNASC, FNAPsyRamanna 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, Mavinhalia PO, Nilgiris, Tamil Nadu 643223, India

Dr. John FellowesHonorary 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**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 2021–2023

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

Dr. Kiran Ramchandra Ranadive, Annasaheb Magar Mahavidyalaya, Maharashtra, 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. Ferdinand 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. Vijayasanchari 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, Kishuangbanna 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. Mander 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), Rajasthani, 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. Warrier, 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. Jatishwar Singh Irungbam, Biology Centre CAS, Branišovská, Czech Republic.

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

Dr. George Mathew, Kerala Forest Research Institute, Peechi, India

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

Cover: Mixed media with fine liners, colour pencils, and watercolour background of an Indian funnel web spider. © Elakshi Mahika Molur.



Phenotypic variations in Mindoro Warty Pig *Sus oliveri* (Cetartiodactyla: Suidae)

John Carlo Redeña-Santos¹ , Anna Pauline O. de Guia² , Nikki Heherson A. Dagamac³ 
& Fernando García Gil⁴ 

^{1,3} Research Center for the Natural and Applied Sciences, University of Santo Tomas, 1008 España, Manila, Philippines.

^{1,2} Graduate School, University of the Philippines Los Baños, 4031 Laguna, Philippines.

³ Department of Biological Sciences, College of Science, University of Santo Tomas, 1008 España, Manila, Philippines.

^{1,2} Animal Biology Division, Institute of Biological Sciences, College of Arts and Sciences, University of the Philippines Los Baños, Los Baños, 4031, Laguna, Philippines.

^{1,3,4} D'ABOVILLE Foundation and Demo Farm Inc., 1200, Makati City, Philippines.

^{1,3} Initiatives for Conservation, Landscape Ecology, Bioprospecting and Biomodeling (iCOLABB), Research Center for the Natural and Applied Sciences, University of Santo Tomas, España Blvd, Sampaloc, Manila, 1008, Philippines.

³ The Graduate School, University of Santo Tomas, España Blvd, Sampaloc, Manila, 1008, Philippines.

¹ WildlifeLink Research Consultancy Services, 4020, Laguna, Philippines.

¹ santosjcarlo@gmail.com (corresponding author), ²aodeguia@up.edu.ph, ³nhadagamac@gmail.com, ⁴fgarciagil@gmail.com

Four native wild pig species of the *Sus* genus have been identified in the Philippines. Very little information is available on the Mindoro Warty Pig *Sus oliveri*. Formerly, this species was treated as a subspecies of *S. philippensis* until it was recognized as distinct by Groves (1997) based on four skulls and one known skin collected from Mayapang, Rizal, Occidental Mindoro (Groves

2001). There are no recognized subspecies of *S. oliveri*, but it is closely related to two subspecies of *S. philippensis* (Groves 1997). Currently, *S. oliveri* is recognized as Vulnerable and Endangered by the IUCN Red List (Schütz 2016) and the Philippine Red List Committee through Department Administrative Order 2019-09, respectively.

According to Meijaard et al. (2011), the head skin

Editor: Anonymity requested.

Date of publication: 26 November 2024 (online & print)

Citation: Redeña-Santos, J.C., A.P.O. de Guia, N.H.A. Dagamac & F.G. Gil (2024). Phenotypic variations in Mindoro Warty Pig *Sus oliveri* (Cetartiodactyla: Suidae). *Journal of Threatened Taxa* 16(11): 26172-26175. <https://doi.org/10.11609/jott.8727.16.11.26172-26175>

Copyright: © Redeña-Santos et al. 2024. 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: This study is funded by the Department of Science and Technology (DOST)-Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (PCAARRD) through its Grants-In-Aid (GIA) program. JCRS received funding from IDEAWILD Foundation and DOST- Accelerated Science and Technology Human Resource Development Program (ASTHRDP) for the conduct of this survey. NHAD received support from RCNAS and DOST-Balik Scientist Program. FGG and D'ABOVILLE Foundation received funding from Zoologische Gesellschaft für Arten- und Populationschutz (ZGAP), Association française des parcs zoologiques (AFdPZ), Tierpark Berlin, and Mandai Nature for their survey in Aruyan-Malati.

Competing interests: The authors declare no competing interests.

Acknowledgements: JCRS would like to thank the IDEAWILD Foundation for the equipment grant, and the DOST-ASTHRDP for the scholarship granted during the conduct of this research. NHAD would like to acknowledge the DOST-PCAARRD for the support as a Balik Scientist and funding of Project MATPAT. We like to thank WWF for sharing their camera trap photos. We are also grateful for the Mt. Calavite Wildlife Sanctuary Protected Area Management Office (MCWS-PAMO) and the Iraya and Taobuid indigenous communities for their continued support.



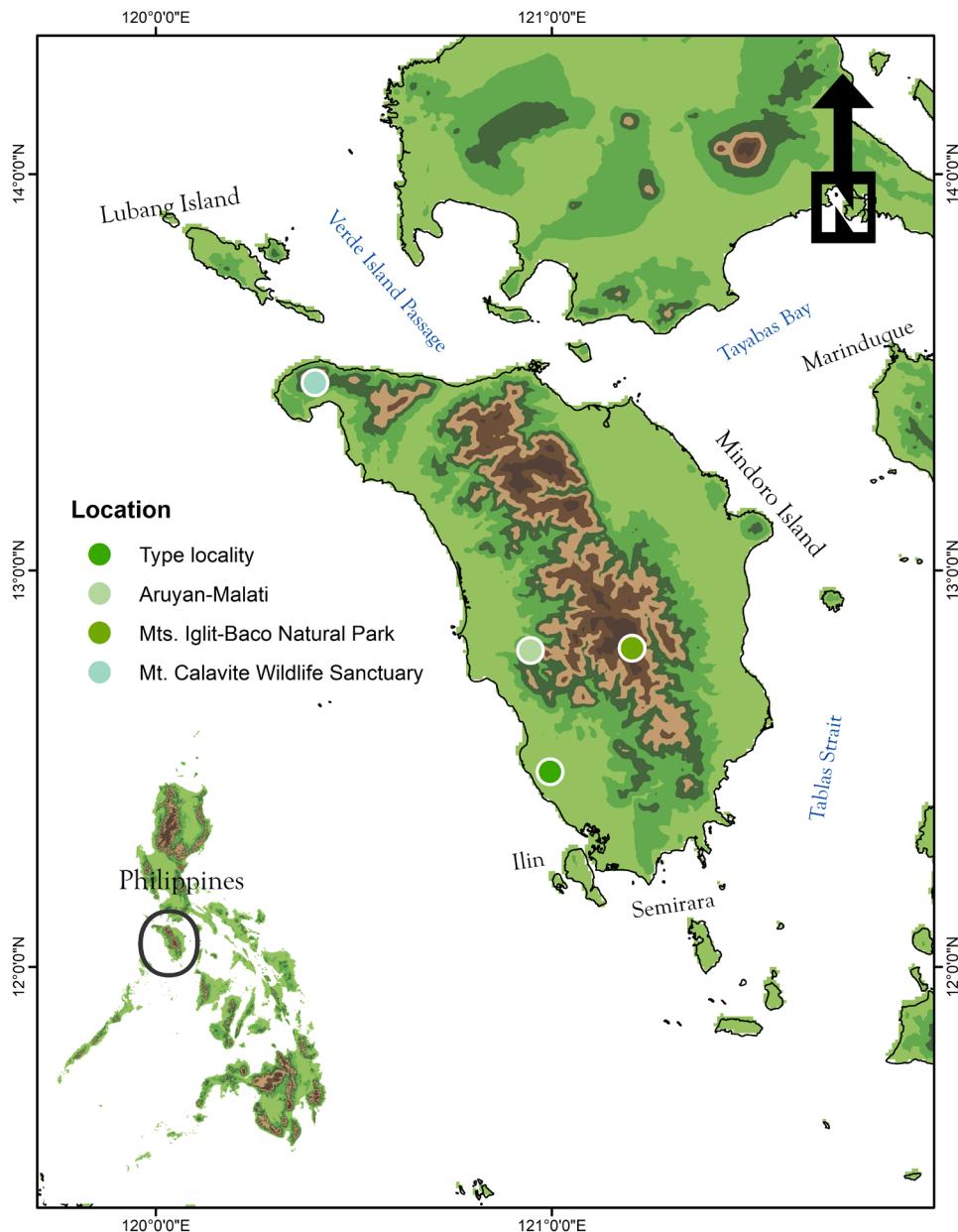


Figure 1. Map of Mindoro showing the area where the type locality and the camera trap photos of *Sus oliveri* were taken from.

of the holotype has sparse, dark brown or bristly black hair, usually longest along the spine and over the neck and back of the head, while the tusks and warts are conspicuous. Moreover, Groves (1997) described the species' head skin as having a black crown tuft mixed with straw-colored hairs, and no forward-directed components. The pre-ocular warts are well-developed with straw-colored gonial tufts. Recently, observations on camera trap photos of the Mindoro Warty Pig revealed a new phenotypic character between subpopulations of the species.

For this study, photos of *S. oliveri* were compiled from

all camera trap surveys conducted in Occidental Mindoro, particularly in Mts. Iglit-Baco Natural Park (MIBNP), Mt. Calavite Wildlife Sanctuary (MCWS), and Aruyan-Malati (Figure 1). MIBNP and MCWS are both declared protected areas in Mindoro while Aruyan-Malati was proposed as a critical habitat under the Philippine laws. Warty pig photos in MCWS and Aruyan-Malati has been gathered from camera trap surveys conducted by the authors from 2020 to 2022. Notably, a total of 53 camera traps were installed in a ~650 ha plot in MCWS from December 2021 to May 2022 totaling 2,095 camera days, with cameras positioned at altitudes ranging 648–1,477 m. A maximum



Image 1. A—Camera trap photos of male *Sus oliveri* in MCWS with clear snout band (© MATAPAT Project) | B—two females in MCWS with clear snout band (© MATAPAT Project) | C—male in Aruyan-Malati without snout band (© DAF) | D—female in Aruyan-Malati with faint snout band (© DAF) | E—group of *S. oliveri* in MIBNP with clear snout band (© WWF Philippines).

of 20 and a minimum of 15 camera traps were deployed in Aruyan-Malati, covering a total of 894.4 ha with 140 camera placements from November 2020 to May 2022, with cameras positioned at altitudes ranging 149–590 m. The warty pig photos from MIBNP were provided by the World Wild Fund for Nature Philippines (WWF) from their camera trapping survey from 2013 to 2018. Originally, these camera trap surveys were intended to assess the distribution of medium- to large-sized mammals in all sites, particularly the ‘Critically Endangered’ Tamaraw *Bubalus mindorensis*.

Forty-six warty pig photos were collected with the animal presence in MIBNP, while our camera trap surveys in MCWS and Aruyan-Malati recorded 15 independent

events (30 min intervals) in each site. For this study, only independent events where the facial appearance of the warty pig is observable were included. Five adult males, four adult females, two adult individuals of unknown sexes, and six juveniles were identified in MCWS. Two adult males and one adult female were identified in Aruyan-Malati. Meanwhile, eleven adults, two subadults, and four juveniles, all of the undetermined sexes, were identified in MIBNP. Based on photos, it has been observed that in both sexes, the faces of adult *S. oliveri* in MCWS and MIBNP (Image 1) are marked with a prominent whitish band in the snout. The white facial band is more conspicuous on adult individuals compared to subadults and juveniles. In contrast, this

white band is absent in the adult males (Image 1) and faint in the females of Aruyan-Malati (Image 1), which was also absent in the holotype description by Groves (1997). According to personal communications with the “amayan” (elders) and “punong balayan” (tribe leaders) of Iraya-Mangyan tribes in MCWS, there are two types of warty pigs in the protected area. As such, they call the warty pig without the white band “baboy-laon” or forest warty pig. These wild pigs are commonly found in the lower elevations of the protected area and are seldom caught in traps they put in their croplands and swidden agriculture areas. In addition, these warty pigs are very common in forested habitats with huge and longstanding trees. On the other hand, they call the warty pig with the white band “baboy-isiw” or Bamboo Warty Pig. This pig is found mostly in the higher elevations. They are less common and more elusive than “baboy-laon” as they inhabit the thick bamboo forests or forested areas in proximity to bamboo habitats.

Very little information is available on the true appearance of the Mindoro Warty Pig since only one head skin was used in describing the species. Compared to all the native *Sus* species in the Philippines, the warty pig in Visayas *S. cebifrons* is the only wild pig with a well-marked whitish band in the snout. Wherein, this white band covers the bridge on the nose and continues to follow the jawline until the angle of the jaw. Although this band is generally less pronounced in females than males, their white stripe is one of the primary distinguishing characteristic that separates this species from other wild pigs in the Philippines (Species Husbandry Guidelines 2003, unpublished). Thus, it is interesting to note that our observations on some *S. oliveri* individuals from camera trap photos found that this species also has a well-marked facial band. Unlike the white stripe in *S. cebifrons*, the white band of *S. oliveri* extends only from the bridge of the snout up to the end of the mouth and does not continue to cover the angle of the jaw. Moreover, it is also important to note that the holotype descriptions by Groves (1997) appear to be similar to the warty pig of Aruyan-Malati (low elevation) but the warty pigs photographed in MIBNP and MCWS (medium to high elevation) resemble more that of *S. cebifrons*.

The study has observed two distinct forms of *S. oliveri*, one variation matches the original holotypic descriptions while the other shows a prominent white snout-band. This difference can occur between the lowland and highland populations of the animals within Occidental Mindoro, as qualitative information through occasional interviews with local communities indicates,

but further research is needed to verify this aspect. These different highland and lowland forms have been verified by the local communities but further research is needed to determine their degree of distinctiveness. In the case of MCWS, this difference likely indicates some kind of isolation between the two morphologies, either physical, behavioral, or reproductive. Although insights from indigenous people affirm that the two forms of *S. oliveri* are morphologically and ecologically distinct from each other, it is difficult to conclude the origin of these differences. Whether they are separate species, they have different adaptations to their environment, or some of their subpopulations are experiencing intense hybridization is currently unknown. The possibility of hybridization between *S. oliveri* and *S. scrofa* may also be considered, particularly in the lowlands and community forests where interbreeding between the two species is likely to occur (Oliver et al. 1995), and such may be the case in the warty pigs of Aruyan-Malati as they are both from lowland areas. Therefore, investigation of genotypes between the two distinct forms should be done to identify the origin of such phenotypic differences. Such efforts should also investigate the rate of introgression with *S. scrofa* to determine the genetic integrity of the species. This also calls for genetic studies to investigate the relationship of *S. oliveri* with other Philippine *Sus* species in order to construct a comprehensive evolutionary history. Overall, the above-mentioned recommendations will aid decision-makers in appropriately assessing the status of *S. oliveri* and formulating appropriate conservation strategies for the species.

References

Heaney, L.R., D.S. Balete, M.L. Dolar & P.S. Ong (1998). A synopsis of the mammalian fauna of the Philippine Islands. *Fieldiana Zoology* 88: 1–61.

Groves, C.P. (1997). Taxonomy of wild pigs (*Sus*) of the Philippines. *Zoological Journal of the Linnean Society* 120: 163–191. <https://doi.org/10.1111/j.1096-3642.1997.tb01277.x>

Groves, C.P. (2001). Taxonomy of wild pigs of southeast Asia. *IUCN/SSC Pigs, Peccaries, and Hippos Specialist Group (PPHSG) Newsletter* 1(1): 3–4.

Schütz, E. (2016). *Sus oliveri*. The IUCN Red List of Threatened Species : e.T136340A44142784. <https://doi.org/10.2305/IUCN.UK.2016-2.RLTS.T136340A44142784.en>. Accessed on 06 September 2023.

Meijaard, E., J.P. D'hart & W.L.R. Oliver (2011). Family Suidae (pigs), pp 248–291. In: Wilson, D. E. & R.A. Mittermeier (eds.). *Handbook of the Mammals of the World, Volume 2, Hoofed Mammals*. Lynx Edicions, Barcelona.

Species Husbandry Guidelines (2003). Visayan Warty Pig (*Sus cebifrons*). Philippines Biodiversity Conservation Programmes. Unpublished.

Oliver, W.L.R. (1995). The taxonomy, distribution and status of Philippine wild pigs. *Ibex, Journal of Mountain Ecology* 3: 26–32.

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. 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. Nitithyanandan, Environmental Department, La 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. Kuri 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. 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, Soughall, 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. 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

Birds

Dr. Hem Sagar Baral, Charles Sturt University, NSW Australia
Mr. H. Biju, 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 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. 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 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. 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, 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 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, Budhanilkantha Municipality, Kathmandu, Nepal
Dr. Susan Cheyne, Borneo Nature Foundation International, Palangkaraya, 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 Helleni 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. Bharat Baviskar, Wild-CER, Nagpur, Maharashtra 440013, India

Reviewers 2021–2023

Due to paucity of space, the list of reviewers for 2021–2023 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,
3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore,
Tamil Nadu 641006, India
ravi@threatenedtaxa.org & ravi@zooreach.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

Articles

Endemicity and diversity of birds of the Kuvempu University Campus, Shivamogga District, Karnataka: an updated checklist

– M.N. Harisha & B.B. Hosetti, Pp. 26063–26077

Unregulated wild orchid trade in Manipur: an analysis of the Imphal Valley markets from the Indo-Burma hotspot

– Kamei Kambuikhonlu Kabuini & Maibam Dhanaraj Meitei, Pp. 26078–26088

Watershed survey of streams in western Bhutan with macroinvertebrates, water chemistry, bacteria and DNA barcodes

– Juliann M. Battle, Bernard W. Sweeney, Bryan Currinder, Anthony Aufdenkampe, Beth A. Fisher & Naimul Islam, Pp. 26089–26103

Communications

Indian Leopard predation on the sub-adult Himalayan Griffon Vulture (Accipitridae: Accipitriformes)

– Soumya Sundar Chakraborty, Debal Ray, Apurba Sen, P.J. Harikrishnan, Nabi Kanta Jha & Rounaq Ghosh, Pp. 26104–26109

Diet composition and diet choice of Lesser Mouse-tailed Bat *Rhinopoma hardwickii* (Gray, 1831) (Rhinopomatidae: Chiroptera)

– Pawan Kumar Misra, Sayma Farheen, ShaktiVardhan Singh & Vadimalai Elangovan, Pp. 26110–26115

DNA barcoding and distribution of *Osteobrama peninsulae* (Teleostei: Cyprinidae) in India

– Boni Amin Laskar, Asha Kiran Tudu, Shibananda Rath & Laishram Kosygin, Pp. 26116–26123

Diving into diversity: aquatic beetles of Sukhna Wildlife Sanctuary, Chandigarh, India

– Karmannye Om Chaudhary, Pp. 26124–26130

Review

An updated checklist of snakes (Reptilia: Squamata) in northeastern India derived from a review of recent literature

– Bijay Basfore, Manab Jyoti Kalita, Narayan Sharma & Ananda Ram Boro, Pp. 26131–26149

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

November 2024 | Vol. 16 | No. 11 | Pages: 26063–26186

Date of Publication: 26 November 2024 (Online & Print)

DOI: [10.11609/jott.2024.16.11.26063-26186](https://doi.org/10.11609/jott.2024.16.11.26063-26186)

Viewpoint

Decades of IUCN recommendations for biocontrol of invasive pest on the Guam cycad: you can lead policy-makers to conservation proposals but you cannot make them follow

– Thomas E. Marler, Anders J. Lindström, L. Irene Terry & Benjamin E. Deloso, Pp. 26150–26162

Short Communications

Photographic record of Kashmir Gliding Squirrel *Eoglaucomys fimbriatus* (J.E. Gray, 1837) from the Gurez Valley, Jammu & Kashmir, India

– G. Mustufa Lone, Bilal A. Bhat, Mir Shabir Hussain & Arif Nabi Lone, Pp. 26163–26166

Winter population of raptor species in the Vellore dump yard of Coimbatore City, India

– V. Balaji & R. Venkitachalam, Pp. 26167–26171

Notes

Phenotypic variations in Mindoro Warty Pig *Sus oliveri* (Cetartiodactyla: Suidae)

– John Carlo Redeña-Santos, Anna Pauline O. de Guia, Nikki Heherson A. Dagamac & Fernando García Gil, Pp. 26172–26175

First photographic evidence of the Chinese Pangolin *Manis pentadactyla* (Linnaeus, 1758) in Raimona National Park, Assam, India

– Dipankar Lahkar, M. Firoz Ahmed, Bhanu Sinha, Pranjal Talukdar, Biswajit Basumatary, Tunu Basumatary, Ramie H. Begum, Nibir Medhi, Nitul Kalita & Abishek Harihar, Pp. 26176–26179

Habenaria spencei (Orchidaceae): rediscovery other than its type locality and new distribution record to Karnataka, India

– Shreyas Betageri & Katrahalli Kotresha, Pp. 26180–26184

Book Review

Fairies of the day and angels of the night

– Chitra Narayanasami, Pp. 26185–26186

Publisher & Host



Threatened Taxa