

Building evidence for conservation globally

Journal of Threatened Taxa



Open Access

10.11609/jott.2023.15.9.23827-23930

www.threatenedtaxa.org

26 September 2023 (Online & Print)

15(9): 23827-23930

ISSN 0974-7907 (Online)

ISSN 0974-7893 (Print)





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

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. 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. Karthikeyan, 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. Warriar, 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. Ghate, Modern College, Pune, India

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

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: Stripe-necked Mongoose *Urva vitticollis* in poster colours, adapted from photograph by Ashni Dhawale, by Pooja Ramdas Patil.



INTRODUCTION

Spotted cuscuses are medium-sized tree-dwelling marsupials that primarily feed on fruits and leaves and are native to tropical forests of Australo-Papua. They belong to the phalangerid genus *Spilocuscus* (Gray, 1862). Previously, Biak Island's Spotted Cuscus was considered belonging to the group *S. maculatus* (Flannery 1995b), but later it was separated as a new species *Spilocuscus wilsoni* Helgen et Flannery, 2004. Among all the species of *Spilocuscus*, this is the only one that possesses blue-green eyes. *S. wilsoni* is one of the smaller species from genus *Spilocuscus* that coexist with *S. maculatus* on Biak Island.

S. wilsoni is found exclusively on the oceanic islands of Biak-Supiori, located in the northern region of New Guinea. Biak-Supiori Island has an area of 2,497 km², located off the coast of Sahul, which has no connection with mainland New Guinea. The endemism and restricted range of *S. wilsoni* make it 'Critically Endangered' on the IUCN Red List (Aplin & Helgen 2016). The description of *S. wilsoni* was based on two samples; a juvenile male (holotype) and an adult male (paratype) from the Rijksmuseum van Natuurlijke Historie, Leiden, Netherlands (RMNH) (now Naturalis) (Helgen & Flannery 2004). Furthermore, an immature individual of unspecified sex, residing as a domesticated animal within a family setting on Biak, was captured in photograph by Flannery 1992, and constitutes an additional paratype (Helgen & Flannery 2004).

The description of *S. wilsoni* is based on craniodental characters and coat color diagnosis of an adult male (paratype) on dry skin. The adult paratype has a pure white coat dorsally and ventrally, shared only with *S.m. maculatus* of northern New Guinea (Helgen & Flannery 2004). The immature holotype is known to be male, however, there is no information about coat color and body size (Helgen & Flannery 2004).

The pelage color description is essential in the identification of species and individuals. Although the identification of species involved adult individuals, immature individuals also need to be known because the pelage colors of mammals are not necessarily fixed throughout their lifetimes (Caro & Mallarino 2020). Baby marsupials, including cuscus, have pink skin and very little hair, and most weigh less than 0.01% of the mother's weight at birth (Hughes & Hall 1988). The difference in pelage color between male and female *S. wilsoni* has not yet been well described morphologically. We found that sub-adult *S. wilsoni* show sexual dichromatism (mottled in females versus spotted and pale color in males), a

limited phenomenon among mammals (Caro 2009) but not unusual among cuscuses (Flannery 1995a,b; Caro 2013).

In this study, we describe the coat color pattern of an adult male, sub-adult male, sub-adult female, and juvenile female of *S. wilsoni*. We also measured the body and marked the location where *S. wilsoni* was found for this distribution data.

MATERIAL AND METHODS

This study was conducted from July 2021 to October 2021. Four individuals of *S. wilsoni* from Biak represented the age categories of adult male, sub-adult male, sub-adult female, and juvenile female, one individual, respectively. Information on the origin of the cuscus habitat was obtained directly from a local resident for 1, 2, and 3 and from a keeper in the Biak Bird and Orchid Park for 4 (Figure 1). The subjects were recorded using Canon EOS 750D digital camera with Canon lens EF-S 18–55 mm/F3.5–5.6 (Canon, Tokyo, Japan) in the RAW format. Photographs of the dorsal, lateral, and ventral areas are made in the same frame with a color checker passport. *S. wilsoni* body measurements include weight (W), head-body length (HBL), tail length (TL), and ear length (EL). All length measurements are in centimeters and weight measurements are in grams. This study has received approval from the IPB Animal Ethics Commission (Number 207-2021 IPB).

RESULTS

Adult male

The adult male appears to have a creamy base color and brown spotted and blotched morphs. The spotted and blotched morphs dominate the dorsum and flank, spreading from the head, back, limbs, and half of the tail. The blotch of the head is very dark, and the ears are covered with hair. The muzzle is hairless and darker in color compared to the chin area. The pelage on the foot is darker than the arms. Some ends of the hair strands look blackish and silvery in the dorsum and flank areas, while the ventral area does not. The ventral coat is creamy from the chin and belly to the limbs. This individual has blue-green eyes. The body measurements are as follows: W = 2,480 g; HBL = 46.5 cm; TL = 44 cm; and EL = 2.5 cm. This individual was found in the secondary forest around Warsa village, northern Biak (Image 1).

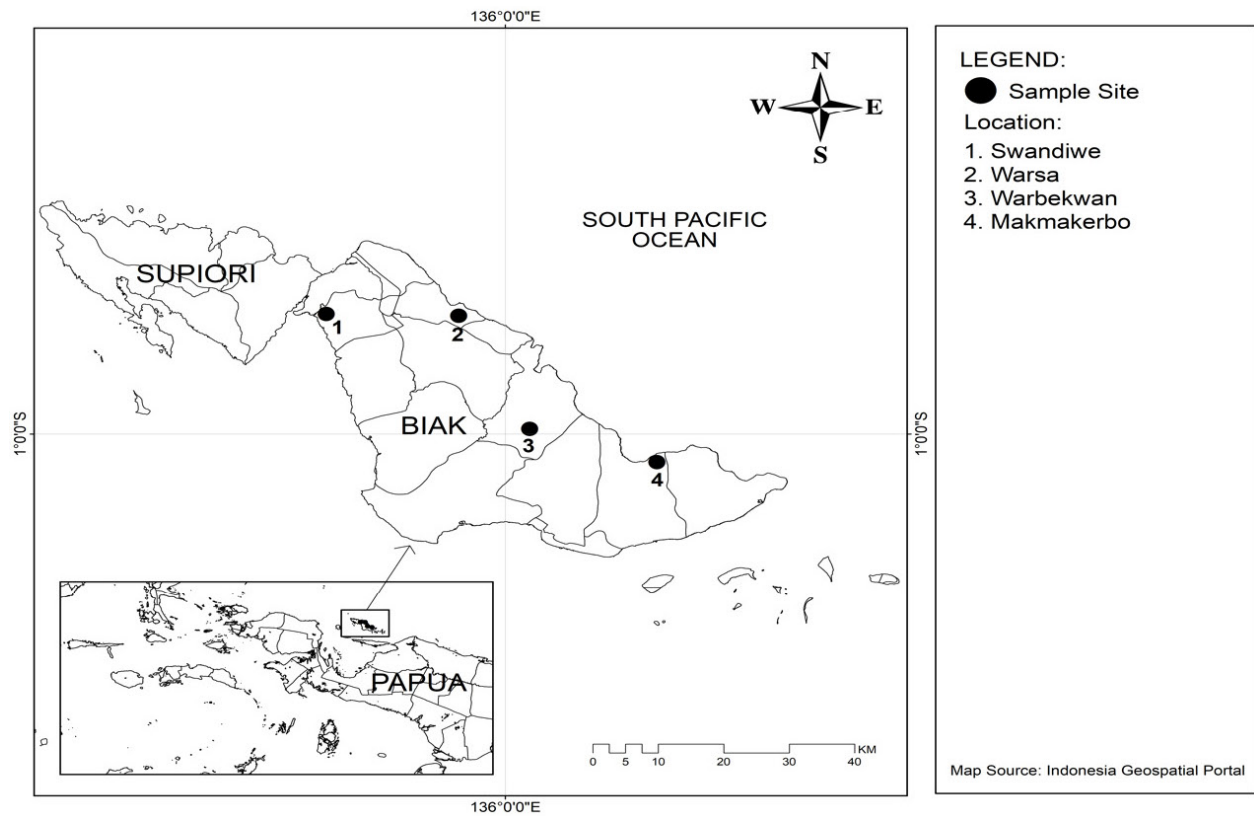


Figure 1. Original habitat of *Spilococcus wilsoni*.



Image 1. Adult male of *Spilococcus wilsoni*. © Yohanita AM, 2021.

Sub-adult male

The sub-adult male appears to have a more dominant creamy base color, and the spotted morph is brown. Spotted morphs spread from the head, back, limbs, and half of the tail but is less than that of adults. The blotch area of the head is brown, the area from the cheeks to the chin is creamy, and the ears are covered with hair. The pelage on the foot is dark. The ventral coat is creamy and a little orange in the chest area. This individual has blue-green eyes. The body measurements are as follows: W = 1,300 g; HBL = 36 cm; TL = 35 cm; and EL = 2 cm. This individual was found in the secondary forest around Makmakerbo Village, eastern Biak (Image 2).

Sub-adult female

The whole body of this sub-adult female is a mixture of creamy, light brown, and dark brown colors. The hair of the head area is a mixture of light brown on the face and dark brown on the head. The ears are covered with brown hair. The hair on the dorsum and flank areas has

a mottled pattern of creamy and dark brown, while the tail area is light brown. The ends of the hair strands on the dorsum and flank areas appear silvery-buff hairs. The pelage on the foot is darker than the arms. The creamy-colored ventral area looks like a coat from head to legs. The belly part has an unopened sac. This individual has blue-green eyes. The body measurements are as follows: W = 1,100 g; HBL = 33 cm; TL = 30.7 cm; and EL = 1.5 cm. This individual was found in the secondary forest around Swandiwe Village, western Biak (Image 3).

Juvenile female

The whole body of this juvenile female looks creamy and unspotted (dorsum, flank, and belly visible). The hair on the head is thinner than that on the body. The muzzle is hairless and pink, and the ears are covered with light yellow hair. The dorsum and flank parts, including the legs, are creamy and look a little yellow in the upper back. Some ends of the hair strand on the dorsum and flank areas appear blackish and silvery. The belly part has an unopened sac. This individual has yellow-green



Image 2. Sub-adult male of *Spilococcus wilsoni*. © Yohanita AM, 2021.



Image 3. Sub-adult female of *Spilocuscus wilsoni*. © Yohanita AM, 2021.



Image 4. Juvenile female of *Spilocuscus wilsoni*. © Yohanita AM, 2021.

Table 1. Differences in pelage coloration and iris color in *Spilocuscus wilsoni* compare to other *Spilocuscus*.

Species	Pelage color		Iris color
	Male	Female	
<i>S. wilsoni</i>	Adult males unspotted are yellowish white (Helgen 2007). Sub-adult has a more dominant creamy base color, and the spotted morph is brown. The adult male has a creamy base color and, more brown blotch that are dominant in the dorsum and flank (present study).	Sub-adult female is red-spotted (ZMB 91706) (Helgen 2007). The juvenile is creamy and unspotted in the entire body (dorsum, flank, and belly visible). Sub-adults have a mottled pattern that looks like a mixture of creamy, light brown, and dark brown colors (present study).	Blue-green (Helgen & Flannery 2004). Yellow-green (juvenile) and blue-green (sub-adult and adult).
<i>S. papuensis</i>	The complete lower surface and base color of the dorsum are creamy in appearance, while the spots covering the back, head, and limbs are dark brown or blackish. Frequently, the upper surface of the body is washed with a yellowish hue and commonly exhibits lighter patches of yellow and brownish speckles, while the tail is typically characterized by gold or red-brown spotting. The markings are more prominent and blotchy in males (Helgen 2007).	The female has the same basic coloration and spot pattern all over the body as the male. However, the spots are smaller and more discrete (Helgen 2007).	Carmine-red (Jentink 1885); as either brown or hazel (Flannery 1994, 1995b; Gray, 1862).
<i>S. maculatus</i> from northern and western New Guinea	Mature males typically have a yellowish-white or orange hue, often featuring substantial orange and white spots or blotches on their mid-back (Helgen 2007).	Mature females exhibit colors ranging from yellowish-white to orange, and some may have yellowish-white coats with orange markings (Helgen 2007).	Brown to hazel (Flannery, 1994, 1995a, 1995b; Gray, 1862).
<i>S. rufoniger</i>	The dorsum of the animal has a creamy base-color with a superimposed pattern of intensely blackish (ranging from jet-black to maroon) spots or blotches on the mid-back and hind legs. The face, head, nape, shoulders, hands, feet, and sometimes the body of the limbs are covered in a vibrant red-orange or golden fur. The tail can be either golden or whitish, and the underside of the throat and chin is typically white fur that often extends as a crescent shape to the cheeks and ears, creating a striking contrast with the intense color of the head (Helgen 2007).	The female displays a coloration identical to that of the male, with the exception of the absence of black spots on the back. Instead, they have a black saddle marking that extends over the mid-back and hind limbs (Helgen 2007).	Brown to hazel (Flannery 1994, 1995a, 1995b; Gray 1862).

eyes. The body measurements are as follows: W = 825 g; HBL = 30 cm; TL = 28.5 cm; and EL = 1.5 cm. This individual cuscus was found in the secondary forest around Warbekwan Village, northern Biak (Image 4).

DISCUSSION

Our observation of the coat colors of four individual *S. wilsoni* showed differences in pelage color patterns between males and females. The female had a mottled pattern throughout the dorsal and lateral to ventral edges and appeared to be wearing a coat. The male had a spotted and blotched pattern on the dorsal and lateral areas, while the ventral area was unspotted. We conclude that the sub-adult *S. wilsoni* shows sexual dichromatism (mottled in females versus spotted and pale color in males). Some cuscuses have spots or dorsal stripes; the spotted cuscuses *S. maculatus* and *S. rufoniger* show sexual dichromatism as females lack spots (Flannery 1995a; Helgen & Flannery 2004; Caro 2013), except for *S. papuensis* in which both males and females had spots (Table 1). The spotted cuscus has a unique color, especially in females, and it is recorded that four

species inhabit the mainland and islands of Papua. The female *S. maculatus* in the northern islands is plain yellowish-white, while in mainland Papua it is yellowish-white with orange markings from mid-back to the abdomen. Furthermore, the *S. rufoniger* female displays black saddle markings that cover both the mid-back and hind limbs (Helgen 2007).

The sub-adult and adult males in this study showed a brown spotted pattern. Nevertheless, the spots on the sub-adult individual are smaller and more discrete, so the beige base is more dominant. In adults, a blotch on the head extends to the upper back to the forelimbs, and a blotch on the lower back area to the tail and hind limbs; therefore, the brown blotch is more dominant. *S. wilsoni* juvenile female has a plain cream coloration all over the body, and it seems that pale, plain colors are common among juveniles of *Spilocuscus*. The colors of mammal pelage may not remain constant over their entire lifespan (Caro & Mallarino 2020). Certain pigs and peccaries experience age-related transformation; for example, they are born with spotted and striped coats that eventually become consistent as their young become mobile (Caro et al. 2018).

The immature *S. wilsoni* photographed by Flannery

in 1992 was of unknown sex and was used as additional paratype information (Helgen & Flannery 2004). We saw similar color patterns between the photo and *S. wilsoni* in this study (Image 3), and we conclude that its morphology belongs to the sub-adult female individual. We also found differences in the iris color of juvenile (yellow-green) and sub-adult or adult individuals (blue-green), but this needs further investigation.

REFERENCES

- Aplin, K. & K. Helgen (2016). *Spilocuscus wilsoni*. The IUCN Red List of Threatened Species 2016. e.T136443A21950078. Downloaded on 04 September 2016. <https://doi.org/10.2305/IUCN.UK.2016-2.RLTS.T136443A21950078.en>
- Caro, T. (2009). Contrasting coloration in terrestrial Mammals. *Philosophical transactions of The Royal society B* 364: 537–548. <https://doi.org/10.1098/rstb.2008.0221>
- Caro, T. (2013). The colours of extant mammals. *Seminar in cell and developmental Biology* 24(6–7): 542–552. <https://doi.org/10.1016/j.semcd.2013.03.016>
- Caro, T. & R. Mallarino (2020). Coloration in Mammals. *Trends in Ecology and evolution* 35(4): 357–366. <https://doi.org/10.1016/j.tree.2019.12.008>
- Caro, T., C. Newell & T. Stankowich (2018). Ecocorrelates of pelage coloration in pigs and peccaries. *Journal of Mammalogy* 99(5): 1093–1100. <https://doi.org/10.1093/jmammal/gyy107>
- Flannery, T.F. (1994). *Possums of the World: a Monograph of the Phalangerioidea*. GEO Productions, Sydney, 240 pp.
- Flannery, T.F. (1995a). *Mammals of New Guinea*. Revised Edition. Cornell University Press, New York, 568 pp.
- Flannery, T.F. (1995b). *Mammals of the South-West Pacific and Moluccan Islands*. Cornell University Press, New York, 464 pp.
- Gray, J.E. (1862). Additional observations on the genus *Cuscus*. *Proceedings of the Zoological Society of London* 1861: 314–321.
- Helgen, K. & T. Flannery (2004). Notes on the Phalangerid marsupial genus *Spilocuscus*, with description of a new species from Papua. *Journal of Mammalogy* 85(5): 825–833. <https://doi.org/10.1644/BER-110>
- Helgen, K.M. (2007). A reassessment of taxonomic diversity and geographic patterning in the Melanesian Mammal fauna. PhD Thesis. The school of Earth and Environmental Sciences, University of Adelaide, 446 pp.
- Hughes, R.L. & L.S. Hall (1988). Structural Adaptations of the Newborn Marsupial, pp. 8–27. In: Tyndale-Biscoe, C.H & P.A. Janssen (eds.). *The Developing Marsupial*. Springer-Verlag Berlin Heidelberg, German, 245 pp.
- Jentink, F.A. (1885). A monograph of the genus *Cuscus*. *Notes from the Leyden Museum* 7: 87–119.

Indonesian Abstract: Kuskus bertotol adalah penghuni pohon berukuran sedang berasal dari hutan tropis Australia-Papua yang memakan buah dan daun. Kuskus bertotol termasuk ke dalam famili Phalangeridae dan genus *Spilocuscus* (Gray, 1862). Perbedaan warna rambut antara *S. wilsoni* jantan dan betina belum terdeskripsikan secara morfologi. Pada penelitian ini, kami mendeskripsikan warna rambut dan mengukur bagian tubuh eksternal dari empat individu *S. wilsoni*: jantan dewasa, jantan dewasa muda, betina dewasa muda, dan betina remaja. Pengambilan foto bagian tubuh area dorsal, lateral, dan ventral dilakukan menggunakan kamera. Pengukuran tubuh meliputi bobot, panjang tubuh, panjang telinga, dan panjang ekor. *S. wilsoni* jantan memiliki pola totol dan bercak berwarna coklat di area dorsal dan lateral, sementara area ventral berwarna krem tanpa totol. Individu jantan dewasa muda memiliki pola totol di area dorsal dan lateral, sementara area ventral berwarna krem tanpa totol. Selanjutnya, individu betina dewasa muda memiliki pola perpaduan bintik warna coklat dan krem yang tampak seperti lurik dengan ujung keperakan. Individu betina remaja, satu-satunya yang tidak memiliki totol maupun bercak dan keseluruhan tubuh berwarna krem sampai kuning muda.



Mr. Jatishwor 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
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 Dubai, UAE.
Prof. Dr. Wayne J. Fuller, Near East University, Mersin, Turkey
Prof. Chandrashekhar 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, SAGON, 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 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, SAGON, 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, SAGON, Anaikatty P.O., Coimbatore, Tamil Nadu, India
Dr. Nishith Dharaia, 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)

September 2023 | Vol. 15 | No. 9 | Pages: 23827–23930

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

DOI: 10.11609/jott.2023.15.9.23837-23930

Article

Phylogenetic insights on the delineation of Mysore and Malabar subspecies of the Grey Slender Loris *Loris lydekkerianus* in southern India

– Vinay Teja, Shivakumara Manu, Honnavalli N. Kumara & Govindhaswamy Umapathy, Pp. 23827–23835

Communications

New localities and sexual dichromatism in Blue-green eyed Spotted Cuscus *Spilocuscus wilsoni* Helgen et Flannery, 2004 (Mammalia: Marsupialia: Phalangeridae) from Biak Island, Indonesia

– Aksamina Maria Yohanita, Kanthi Arum Widayati, Tri Atmowidi, Hiroo Imai & Bambang Suryobroto, Pp. 23836–23842

Nest construction and repairing habits of Baya Weaver *Ploceus philippinus* (Aves: Passeriformes: Ploceidae) in the agricultural landscape of Villupuram District, Tamil Nadu, India

– M. Pandian, Pp. 23843–23856

A checklist of the avifauna of Samanatham tank, Madurai, Tamil Nadu, India

– H. Byju, N. Raveendran, S. Ravichandran & Reshmi Vijayan, Pp. 23857–23869

Composition of avian communities in Ranjit Sagar Conservation Reserve, Punjab, India

– Onkar Singh Brraich, Sunil Kumar Saini & Jagdeep Singh, Pp. 23870–23878

Faunistic overview of the freshwater zooplankton from the urban riverine habitats of Pune, India

– Avinash Isaac Vanjare, Yugandhar Satish Shinde & Sameer Mukund Padhye, Pp. 23879–23888

Utilization of a new restoration technique for the rehabilitation of a degraded mangrove ecosystem: a case study from Koggala Lagoon, Sri Lanka

– Mahanama Gamage Greshan Dhanushka, Maduwe Guruge Manoj Prasanna, Kariyawasam Marthinna Gamage Gehan Jayasuriya & Indupa Hasindi Vitanage, Pp. 23889–23897

Diversity of powdery mildew fungi from protected areas of Jizzak region, Uzbekistan - a checklist

I.M. Mustafaev, I.Z. Ortiqov, K.K. Nuraliev & D.S. Khujaqulova, Pp. 23898–23910

Notes

A case report on chronic renal disease in a captive wild Leopard *Panthera pardus* (Mammalia: Carnivora)

– Abhishek Verma, Rakesh Kumar, Smriti Jamwal, Ankita, Rajendra Damu Patil & Rajesh Kumar Asrani, Pp. 23911–23913

The first photographic evidence of Ruddy Mongoose *Herpestes smithii* Gray, 1837 (Mammalia: Carnivora: Herpestidae) in Katarniaghat Wildlife Sanctuary, Uttar Pradesh, India

– Javed Anver, Vipul Maurya & Sanjay Kumar Pathak, Pp. 23914–23916

New locality record of the Asiatic Long-tailed Climbing Mouse *Vandeleuria oleracea* (Bennett, 1832) (Mammalia: Rodentia: Muridae) from Kohora River Basin, Assam, India

– Sourav Gupta, Ramie H. Begum, Jayanta Kumar Roy, M. Firoz Ahmed & Shyamkant S. Talmale, Pp. 23917–23919

New distribution record of fish *Clupisoma garua* (Hamilton, 1822) (Siluriformes: Ailiidae) from the Sarpang District in southern central part of Bhutan

– Sangay Dorji & Jigme Tenzin, Pp. 23920–23924

Kukumseri: a home to *Colchicum luteum* Baker (Colchicaceae), a rare and endangered medicinal herb

– Rajender Kumar Sharma, Pp. 23925–23927

First record of the Western Himalayan Yew *Taxus contorta* (Gymnosperms: Cupressales: Taxaceae) from Lumbini Province, Nepal

– Santa Bahadur Thing, Deepak Raj Prakash Janga Shahi & Shashi Shrestha, Pp. 23928–23930

Publisher & Host

