

Building evidence for conservation globally

# Journal of Threatened Taxa



10.11609/jott.2022.14.7.21331-21486

[www.threatenedtaxa.org](http://www.threatenedtaxa.org)

26 July 2022 (Online & Print)

14(7): 21331-21486

ISSN 0974-7907 (Online)

ISSN 0974-7893 (Print)

Open Access





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

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

Host  
**Zoo Outreach Organization**  
www.zooreach.org

No. 12, Thiruvannamalai Nagar, Saravanampatti - Kalapatti Road, Saravanampatti,  
Coimbatore, Tamil Nadu 641035, India

Ph: +91 9385339863 | [www.threatenedtaxa.org](http://www.threatenedtaxa.org)

Email: [sanjay@threatenedtaxa.org](mailto: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, Mavinhalla PO, Nilgiris, Tamil Nadu 643223, India

**Dr. Martin Fisher**

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

**Dr. John Fellowes**

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

**Prof. Dr. Mirco Solé**

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

**Dr. Rajeev Raghavan**

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

##### English Editors

**Mrs. Mira Bhojwani**, Pune, India

**Dr. Fred Pluthero**, Toronto, Canada

**Mr. P. Ilangovan**, Chennai, India

##### Web Development

**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 2019–2021

##### Fungi

Dr. B. Shivaraju, Bengaluru, Karnataka, India

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

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

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

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

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

##### Plants

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

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

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

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

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

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

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

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

Dr. Merlin Franco, Curtin University, Malaysia

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

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

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

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

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

Dr. Vijayasankar Raman, University of Mississippi, USA

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

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

Dr. Aparna Watve, Pune, Maharashtra, India

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

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

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

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

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

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

Dr. K. 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 Vidyapeeth (accredited A grade by NAAC), Rajasthan, India

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

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

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

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

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

#### Invertebrates

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

Dr. D.B. Bastawade, Maharashtra, India

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

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

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

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

Dr. Brian Fisher, California Academy of Sciences, USA

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

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

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

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

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

For Focus, Scope, Aims, and Policies, visit [https://threatenedtaxa.org/index.php/JoTT/aims\\_scope](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](https://threatenedtaxa.org/index.php/JoTT/policies_various)

continued on the back inside cover

Cover: A female Javan Leopard *Panthera pardus melas* in rehabilitation phase at Cikananga Wildlife Center. © Yayasan Cikananga Konservasi Terpadu.



## *Cetrelia isidiata* (Asahina) W.L. Culb. & C.F. Culb. (Parmeliaceae) – an addition to the Indian lichen biota

Gaurav K. Mishra<sup>1</sup> , Pooja Maurya<sup>2</sup> & Dalip K. Upreti<sup>3</sup>

<sup>1,2,3</sup> Lichenology Laboratory, Plant Diversity Systematics and Herbarium Division, CSIR - National Botanical Research Institute, Rana Pratap Marg, Lucknow, Uttar Pradesh 226001, India.

<sup>2</sup> AcSIR- Academy of Scientific & Innovative Research, Ghaziabad, Uttar Pradesh 201002, India.

<sup>1</sup> gmishrak@gmail.com (corresponding author), <sup>2</sup> pm953516@gmail.com, <sup>3</sup> upretidknbri@gmail.com

**Abstract:** *Cetrelia isidiata* (Asahina) W.L. Culb. & C.F. Culb., is characterized by the presence of isidia, pseudocyphellae on thallus, and containing anziaic acid. The species is reported here as an addition to the Indian lichen biota from Arunachal Pradesh. A detailed description along with key to isidiate species of the genus known is provided.

**Keywords:** Ascomycetes, biodiversity, lichenized, taxonomy.

The genus *Cetrelia* W.L. Culb. & C.F. Culb. (Parmeliaceae) is represented by 18 species from the world Randle et al. (2013), of which 10 species are reported from India (Mishra & Upreti 2015). According to Randle & Saag (2004) the isidiate species of *Cetrelia* show their restricted distribution in Asia whereas sorediate species are found in European and Asian countries. Culberson & Culberson (1968) provided a monograph on the genera *Cetrelia* and clearly mentioned that *Cetrelia isidiata* might be mistaken from *C. pseudolivatorum* in colour spot test as both species produce a pink colour in C reaction, therefore, thin

layer chromatography (TLC) test will be desirable for the recognition of olivetoric and anziaic acids. *Cetrelia braunsiana* (Müll. Arg.) W.L. Culb. & C.F. Culb., and *C. pseudolivatorum* are isidiate species of *Cetrelia* earlier reported from India (Singh & Sinha 2010).

### MATERIALS AND METHODS

The present study is based on the *Cetrelia* specimen preserved in the herbarium of CSIR-National Botanical Research Institute, Lucknow (LWG). The specimen was examined morphologically, anatomically, and chemically. Thin hand-cut sections of thalli were mounted in water or cotton blue and 5% KOH and observed under a compound microscope. For chemical spot tests the usual reagents of K, C, KC, and P were used. TLC was performed in solvent system A (Toluene: 1, 4-dioxane: acetic acid: 180: 60: 8 ml), following the technique of Orange et al. (2001). The specimen was identified up to the species level with the help of publications of Mishra

**Editor:** Anonymity requested.

**Date of publication:** 26 July 2022 (online & print)

**Citation:** Mishra, G.K., P. Maurya & D.K. Upreti (2022). *Cetrelia isidiata* (Asahina) W.L. Culb. & C.F. Culb. (Parmeliaceae) – an addition to the Indian lichen biota. *Journal of Threatened Taxa* 14(7): 21467–21469. <https://doi.org/10.11609/jott.7891.14.7.21467-21469>

**Copyright:** © Mishra et al. 2022. 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:** Council of Scientific and Industrial Research (CSIR)-OLP101B & The University Grants Commission for the award of UGC-JRF.

**Competing interests:** The authors declare no competing interests.

**Acknowledgements:** The authors are thankful to the director of the CSIR-National Botanical Research Institute, Lucknow for providing laboratory facilities under the project number OLP101. The author P. Maurya would like to thanks to the University Grants Commission for award of UGC-JRF. The manuscript number is CSIR-NBRI-MS/2022/02/09.



& Upreti (2015) and Culberson & Culberson (1968).

**RESULT**

*Cetrelia isidiata* was reported earlier from China, Japan, and Taiwan (Randlane & Saag 2004). It is a new record for Indian lichen biota recorded for the first time in Arunachal Pradesh. A detailed taxonomic description of the species is provided together with illustration, key to the isidiate species and comparative characteristic features of Indian isidiate species of the genus *Cetrelia* (Table 1).

***Cetrelia isidiata* (Asahina) W.L. Culb. & C.F. Culb.  
(Image 1, Figure 1)**

Contr. U. S. Natl. Herb. 34: 510 (1968).

= *Cetrelia sanguinea* Schaer. f. *isidiata* Asahina, Nov. Fl. Jap. 5: 73 (1939).

Thallus foliose, corticolous, loosely attached to the substratum, 5–19 cm across; lobes 0.5–1.5 cm broad; upper surface grayish or light brownish, pseudocyphellate; pseudocyphellae tiny and infrequent; isidia present on mostly margin of lobes, simple, globose or sometime coralloid or poorly developed; lower surface black, margins brown or concolorous to upper surface; rhizines black; medulla white. Apothecia and pycnidia not seen.

Chemistry: Medulla K–, C+ pink or red, KC–, P–; anziaic acid as major compound, ±atranorin.

Remarks: *Cetrelia isidiata* morphologically exhibits its similarity with *C. braunsiana* and *C. pseudolivatorum* but differs in presence of anziaic acid in the thallus. The species is also close to *C. sanguinea* (Schaer.) W.L. Culb. & C.F. Culb., in having anziaic acid in the thallus but differs by lacking isidia. In India, the species is found growing on bark of trees at an elevation of 2,966 m in Eastern Himalayan state of Arunachal Pradesh.

Specimen examined: 15-037820 (LWG), 16.vii.2015, India: Arunachal Pradesh, Tawang district, around monastery, on bark, 27.585N, 91.857E, 2,966 m, coll. R. Bajpai.

**A key to the isidiate species of *Cetrelia***

1. Medulla C+ red or pink and thallus containing olivetoric or anziaic acids ..... 2
- 1a. Medulla C- and thallus containing alectoronic and α-collatolic acids ..... *C. braunsiana*
2. Isidia poorly developed and anziaic acid present in the thallus ..... *C. isidiata*
- 2a. Isidia well developed and olivetoric acid present in the thallus ..... *C. pseudolivatorum*



Figure 1. Distribution of *C. isidiata* in India.



Image 1. *Cetrelia isidiata* (Asahina) W.L. Culb. & C.F. Culb. (scale = 1 mm). © G.K. Mishra.

**REFERENCES**

Culberson, W.L. & C.F. Culberson (1968). The lichen genera *Cetrelia* and *Platismatia* (Parmeliaceae), pp. 449–558. In: *Systematic Plant Studies*. Contributions from the United States National Herbarium. Smithsonian Institution Press, Washington.

Mishra, G.K. & D.K. Upreti (2015). The lichen genus *Cetrelia*

**Table 1. Comparative characteristic features of Indian isidate species of the genus *Cetrelia*.**

Characteristics	Name of the species		
	<i>Cetrelia braunsiana</i>	<i>Cetrelia isidiata</i>	<i>Cetrelia pseudoliveterum</i>
<b>Thallus size</b>	8–12 cm across	5–19 cm across	5–15 cm across
<b>Lobes</b>	5–15 mm wide	0.5–1.5 cm wide	0.5–1.5 cm wide
<b>Upper surface</b>	Gray or ashy-white	Grayish or light brownish	Grayish or grayish-white or uniformly light brownish or tan in old herbarium specimens
<b>Isidia</b>	Simple, marginal to sometimes laminal; often coralloid	Mostly on margin of lobes; simple, globose or sometime coralloid or poorly developed	Along margin and on surface; simple or coralloid, turning into dorsiventral dissected lobules
<b>Pseudocyphellae</b>	Punctiform to irregular, rarely more than 1 mm broad	Tiny and infrequent	Punctiform or slightly elongate
<b>Lower surface</b>	Brown to grayish, the margins brown or grayish like the colour of the upper surface	Black, margins brown or concolorous to upper surface	Black, margins brown or concolorous to upper surface
<b>Apothecia</b>	Rare, submarginal, perforate, about 0.5 mm broad, asci 8 spored, ascospores ovoid, 12–15 × 8–9 µm.	Absent	Absent
<b>Pycnidia</b>	Rare, marginal, black, pruinose; conidia 1 × 4–6 µm, rod-shaped	Absent	Absent
<b>Spot test</b>	Medulla K–, C–, KC+ pink, PD–	Medulla K–, C+ pink or red, KC–, P–	Medulla K–, C+ pink or red, KC– or KC+ pink to red, P–
<b>Chemistry</b>	Alectoronic and α-collatolic acids (as major substance), ±atranorin.	Anziaic acid (as major compound), ±atranorin	Olivetoric (acid as major compound), ±atranorin.
<b>Distribution in India</b>	Himachal Pradesh, Sikkim, Uttarakhand and West Bengal	Arunachal Pradesh	Himachal Pradesh, Sikkim, Uttarakhand and West Bengal

(Parmeliaceae, Ascomycota) in India. *Phytotaxa* 236(3): 201–214.

**Orange, A., P.W. James & F.J. White (2001).** *Microchemical Methods for the Identification of Lichens*. British Lichen Society, 101 pp.

**Randlane, T. & A. Saag (2004).** Distribution patterns of some primary and secondary cetrarioid species. *Symbolae Botanicae Upsalienses* 34(1): 359–376.

**Randlane, T., A. Saag, A. Thell & T. Ahti (2013).** Third world list of cetrarioid lichens- in a new database form, with amended phylogenetic and type information. *Mycologie* 34(1): 79–84.

**Singh, K.P. & G.P. Sinha (2010).** *Indian Lichens: An Annotated Checklist*. Botanical Survey of India, 572 pp.





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

#### Fishes

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

#### Amphibians

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

#### Reptiles

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

#### Birds

Dr. Hem Sagar Baral, Charles Sturt University, NSW Australia  
Mr. H. Byju, Coimbatore, Tamil Nadu, India  
Dr. Chris Bowden, Royal Society for the Protection of Birds, Sandy, UK  
Dr. Priya Davidar, Pondicherry University, Kalapet, Puducherry, India  
Dr. J.W. Duckworth, IUCN SSC, Bath, UK  
Dr. Rajah Jayapal, 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 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. M. Zafar-ul Islam, Prince Saud Al Faisal Wildlife Research Center, Taif, Saudi Arabia

#### Mammals

Dr. Giovanni Amori, CNR - Institute of Ecosystem Studies, Rome, Italy  
Dr. Anwaruddin Chowdhury, Guwahati, India  
Dr. David Mallon, Zoological Society of London, UK  
Dr. Shomita Mukherjee, SACON, Coimbatore, Tamil Nadu, India  
Dr. Angie Appel, Wild Cat Network, Germany  
Dr. P. O. Nameer, Kerala Agricultural University, Thrissur, Kerala, India  
Dr. Ian Redmond, UNEP Convention on Migratory Species, Lansdown, UK  
Dr. Heidi S. Riddle, Riddle's Elephant and Wildlife Sanctuary, Arkansas, USA  
Dr. Karin Schwartz, George Mason University, Fairfax, Virginia.  
Dr. Lala A.K. Singh, Bhubaneswar, Orissa, India  
Dr. Mewa Singh, Mysore University, Mysore, India  
Dr. Paul Racey, University of Exeter, Devon, UK  
Dr. Honnavalli N. Kumara, SACON, Anaikatty P.O., Coimbatore, Tamil Nadu, India  
Dr. Nishith Dharaiya, HNG University, Patan, Gujarat, India  
Dr. Spartaco Gippoliti, Socio Onorario Società Italiana per la Storia della Fauna "Giuseppe Altobello", Rome, Italy  
Dr. Justus Joshua, Green Future Foundation, Tiruchirappalli, Tamil Nadu, India  
Dr. H. Raghuram, The American College, Madurai, Tamil Nadu, India  
Dr. Paul Bates, Harison Institute, Kent, UK  
Dr. Jim Sanderson, Small Wild Cat Conservation Foundation, Hartford, USA  
Dr. Dan 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 2019–2021

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

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

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

NAAS rating (India) 5.64

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



[www.threatenedtaxa.org](http://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](http://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)

July 2022 | Vol. 14 | No. 7 | Pages: 21331–21486

Date of Publication: 26 July 2022 (Online & Print)

DOI: 10.11609/jott.2022.14.7.21331-21486

## Articles

**The Javan Leopard *Panthera pardus melas* (Cuvier, 1809) (Mammalia: Carnivora: Felidae) in West Java, Indonesia: estimating population density and occupancy**

– Anton Ario, Senjaya Mercusiana, Ayi Rustiadi, Robi Gumilang, I Gede Gelgel Darma Putra Wirawan & Toni Ahmad Slamet, Pp. 21331–21346

**Breeding phenology and population dynamics of the endangered Forest Spiny Reed Frog *Afrivalus sylvaticus* Schiøtz, 1974 in Shimba Hills, Kenya**

– Alfayo Koskei, George Eshiamwata, Bernard Kirui & Phylus K. Cheruiyot, Pp. 21347–21355

**Ichthyofaunal diversity of Senkhi stream, Itanagar, Arunachal Pradesh: a comparative status between 2004–05 and 2018–19**

– Koj Taro, Lakpa Tamang & D.N. Das, Pp. 21356–21367

**First record of *Proceratium* Roger, 1863, *Zasphinctus* Wheeler, 1918, and *Vollenhovia* Mayr, 1865 (Hymenoptera: Formicidae) from the Western Ghats of peninsular India, description of three new species, and implications for Indian biogeography**

– Kalesh Sadasivan & Manoj Kripakaran, Pp. 21368–21387

## Communications

**New queen? Evidence of a long-living Jaguar *Panthera onca* (Mammalia: Carnivora: Felidae) in Tikal National Park, Guatemala**

– Carlos A. Gaitán, Manolo J. García, M. André Sandoval-Lemus, Vivian R. González-Castillo, Gerber D. Guzmán-Flores & Cristel M. Pineda, Pp. 21388–21395

**First camera trap record of Striped Hyena *Hyaena hyaena* (Linnaeus, 1758) (Mammalia: Carnivora: Hyainidae) in Parsa National Park, Nepal**

– Pramod Raj Regmi, Madhu Chetri, Haribhadra Acharya, Prakash Sigdel, Dipendra Adhikari, Naresh Subedi & Babu Ram Lamichhane, Pp. 21396–21401

**Range extension and new ecoregion records of the Crocodile Monitor *Varanus salvadorii* (Peters & Doria, 1878) (Reptilia: Varanidae) in Papua New Guinea**

– Borja Reh & Jim Thomas, Pp. 21402–21408

**A checklist of fish and shellfishes of the Poonthura estuary, southwestern coast of India**

– Kiranya Bella, Pramila Sahadevan, Giri Bhavan Sreekanth & Rajeev Raghavan, Pp. 21409–21420

**A new species of *Protosticta* Selys, 1885 (Odonata: Zygoptera: Platystictidae) from Western Ghats, India**

– Kalesh Sadasivan, Vinayan P. Nair & K. Abraham Samuel, Pp. 21421–21431

**A case study on utilization and conservation of threatened plants in Sechu Tuan Nalla Wildlife Sanctuary, western Himalaya, India**

– Puneet Kumar, Harminder Singh & Sushil Kumar Singh, Pp. 21432–21441

**A survey of ethno-medicinally important tree species in Nauradehi Wildlife Sanctuary, central India**

– Tinku Kumar, Akash Kumar, Amit Jugnu Bishwas & Pramod Kumar Khare, Pp. 21442–21448

## Short Communications

**Effects of a Bengal Slow Loris *Nycticebus bengalensis* (Primates: Lorisidae) bite: a case study from Murlen National Park, Mizoram, India**

– Amit Kumar Bal, Anthony J. Giordano & Sushanto Gouda, Pp. 21449–21452

**First record of *Garra birostris* Nebeshwar & Vishwanath, 2013 (Cypriniformes: Cyprinidae) from Doyang and Dikhu rivers of Brahmaputra drainage, Nagaland, India**

– Sophiya Ezung, Metevinu Kechu & Pranay Punj Pankaj, Pp. 21453–21457

**Two new records of Lilac Silverline *Apharitis lilacinus* (Lepidoptera: Lycaenidae) from northeastern India**

– Monsoon Jyoti Gogoi, Ngulkholal Khongsai, Biswajit Chakdar & Girish Jathar, Pp. 21458–21461

**Illustrated description of the mantis *Mesopteryx platycephala* (Mantodea: Mantidae) collected from West Bengal, India**

– Gauri Sathaye, Sachin Ranade & Hemant Ghate, Pp. 21462–21466

***Cetrelia isidiata* (Asahina) W.L. Culb. & C.F. Culb. (Parmeliaceae) – an addition to the Indian lichen biota**

– Gaurav K. Mishra, Pooja Maurya & Dalip K. Upreti, Pp. 21467–21469

## Notes

**A new southern distribution record for Pacific Marten *Martes caurina***

– Maximilian L. Allen, Brianne Kenny, Benjamin Crawford & Morgan J. Farmer, Pp. 21470–21472

**First Asian record of Light-mantled Albatross *Phoebastria palpebrata* (Foster, 1785) from Rameswaram Island, Tamil Nadu, India**

– H. Byju & N. Raveendran, Pp. 21473–21475

***Salvia misella* Kunth (Lamiaceae) - a new record for Eastern Ghats of India**

– Prabhat Kumar Das, Pradeep Kumar Kamila & Pratap Chandra Panda, Pp. 21576–21579

***Salsola oppositifolia* Desf. in Great Rann of Kachchh, Gujarat – a new record for India**

– Rakesh Gujar, Vinesh Gamit, Ketan Tatu & R.K. Sugoora, Pp. 21580–21483

**Extended distribution of *Impatiens scapiflora* (Balsaminaceae) to the flora of Eastern Ghats, India**

– T.S. Saravanan, S. Kaliamoorthy, M.Y. Kamble & M.U. Sharief, Pp. 21484–21486

Publisher & Host

