

Building evidence for conservation globally

# Journal of Threatened Taxa



10.11609/jott.2024.16.12.26187-26330

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

26 December 2024 (Online & Print)

16(12): 26187-26330

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](http://www.wild.zooreach.org)

Host  
**Zoo Outreach Organization**  
[www.zooreach.org](http://www.zooreach.org)

Srivari Illam, No. 61, Karthik Nagar, 10th Street, Saravanampatti, Coimbatore, Tamil Nadu 641035, India  
Registered Office: 3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore, Tamil Nadu 641006, 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),  
Coimbatore, Tamil Nadu 641006, India

##### Deputy Chief Editor

**Dr. Neelesh Dahanukar**

Noida, Uttar Pradesh, India

##### Assistant Editor

**Dr. Chaithra Shree J.**, WILD/ZOO, Coimbatore, Tamil Nadu 641006, 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, FNAPs**

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. 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

**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, 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](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: Life and death in one night - wolf hunting the hare. Mixed media—gouache, acrylics, pen & colour pencils. © Dupati Poojitha.



Thailand, and the recently discovered *S. myanmarensis* is endemic to Myanmar (Bänziger et al. 2000; Holden 2010; Tanaka et al. 2019). The Himalayan *Sapria* was first described by the British botanist William Griffith in 1844, which was discovered by him in 1836 from the Mishmi Hills of Arunachal Pradesh, India (Griffith 1844; Dorji et al. 2022). After its discovery, it has been reported only a few times from other regions of northeastern India (Borah & Ghosh 2018; Ahmad et al. 2020; Devi et al. 2022; Singh et al. 2022; Syiemiong et al. 2022). Its distribution range includes Bhutan, northeastern India, Tibet, south-central China, Myanmar, Thailand, and Vietnam (Dorji et al. 2022). The flower of *S. himalayana* is unique and exceptionally beautiful. It is velvety and has 10 distinct perigone lobes. The flower emits a putrid odour. Previous studies have reported that the release of the foul odour attracts insect pollinators that pollinate the dioecious flower (Bänziger 2004; Davis et al. 2008). Very few studies have documented fruiting; fruits are black, 3.1–5 cm long, with a low fruiting rate (Bänziger 2004). The seeds are blackish-brown and 0.6–0.65 mm long, and rodents perform seed dispersal (Bänziger 2004; Borah & Ghosh 2018).

Even though it was discovered almost two centuries

ago, the comprehensive knowledge of Himalayan *Sapria* is still lacking. Here, a new record of *Sapria himalayana* from Eaglenest Wildlife Sanctuary, West Kameng District, Arunachal Pradesh is documented (Image 1). A previous study from 1938 documents the flower's presence from the same district in Aka Hills, near Rupa (Bor 1938; Dorji et al. 2022). That was the second-ever recorded instance of this wildflower. Following an 85-year interval, another record is now documented in this region. Eaglenest Wildlife Sanctuary (WS) is located in the West Kameng District of Arunachal Pradesh, India. Being a part of the Eastern Himalaya Global Biodiversity Hotspot, Eaglenest WS harbours diverse plant species. The WS covers an area of 217 km<sup>2</sup> with an elevation gradient ranging 500–3,300 m. Annual precipitation ranges from roughly 1,500 mm to over 3,000 mm (Mohan & Athreya 2011). The elevation gradient shapes diverse forest ecosystems, transitioning from tropical wet evergreen forest at lower elevations (below 1,000 m) to broadleaved subtropical (between 800–2,000 m), temperate forest at higher elevations (between 1,800–2,800 m), and above 2,800 m, temperate coniferous forest. The elevation gradient hosts various plant species, contributing significantly to the region's rich floral biodiversity. The critically

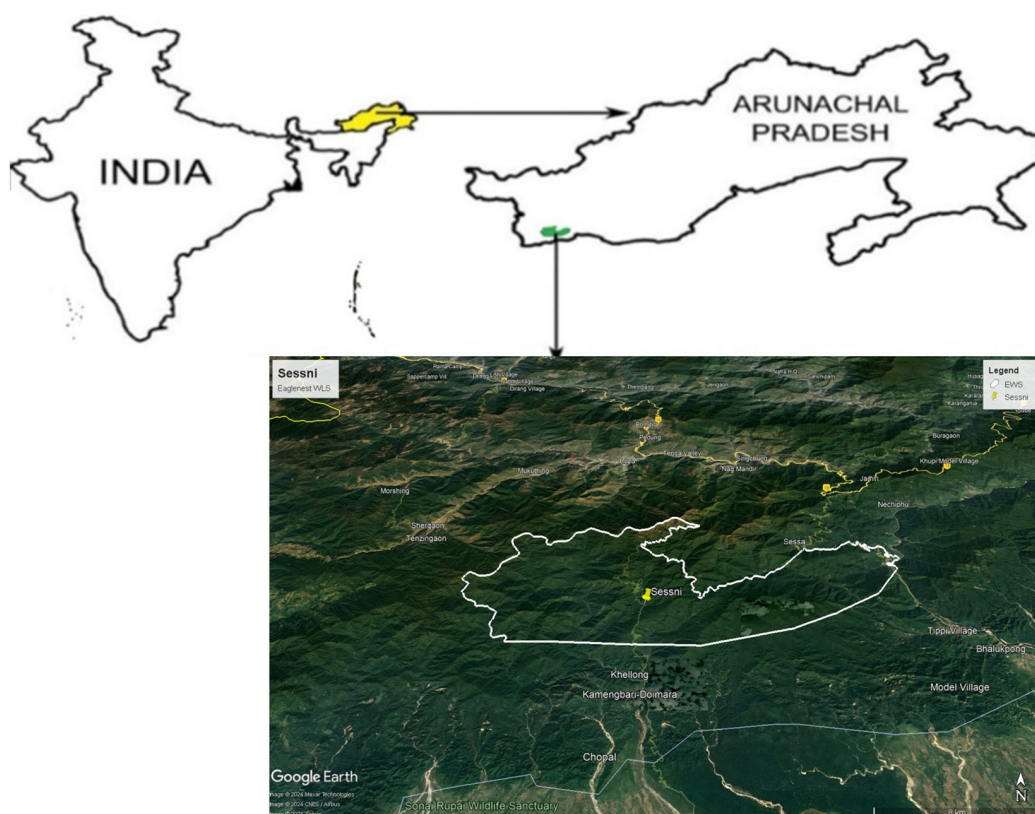


Image 1. The map shows the location of Sessni inside Eaglenest Wildlife Sanctuary, Arunachal Pradesh, India.





Image 2. A bud of *Sapria himalayana* on the forest floor emerging from the host's root.



Image 3. An individual flower of *Sapria himalayana* Griff. in its natural habitat.



Image 4. A naturally aborted *Sapria himalayana* bud beside a healthy bud.



Image 5. A decaying flower of *Sapria himalayana*.



Image 6. A *Sapria himalayana* flower with 12 perigone lobes.



Image 7. Measurements of the *Sapria himalayana* flower's diameter.





Image 8. Measurements of a *Sapria himalayana* mature bud.

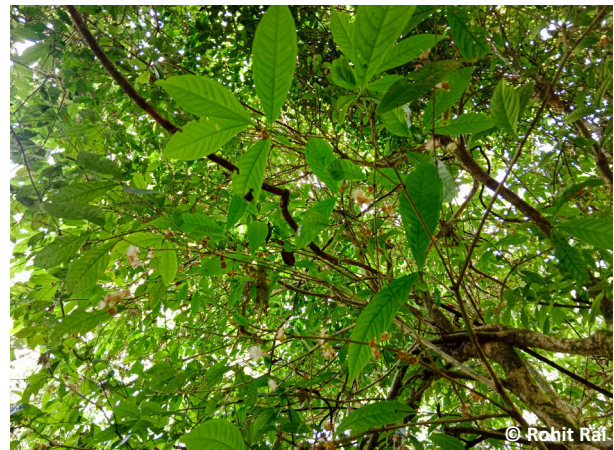


Image 9. The host plant of *Sapria himalayana*, i.e., *Tetrastigma* sp. of Vitaceae.

endangered *Gymnocladus assamicus* and valuable medicinal plants like *Paris polyphylla* are found at higher altitudes. The dominant woody trees at lower elevations include *Magnolia hodgsonii*, *Ficus* spp., *Canarium resiniferum*, *Pinus roxburghii*, *Castanopsis hystrix*, *Gynocardia odorata*, etc. Additionally, the understory is dominated by *Elatostema platyphyllum*, *Strobilanthes hamiltoniana*, *Trivalvaria* sp., and *Achyropermum wallichianum*.

In December 2023, five globose buds were encountered on the forest floor while walking along a trail in the primary forest. Following this initial observation, a systematic investigation was undertaken at the exact site on the next day. Each individual blooming flower was counted and the dimensions were measured (diameter and height) of flowers and buds. Each floral development stage was documented, including fresh buds, aborted flower buds, mature fresh flowers, and decaying flowers.

Accurate geographical coordinates and elevation data were captured using a GPS tracking device for precise locational mapping. Given that the species is IUNC Endangered, the exact coordinates of this record are not shared. Host plants associated with the parasitic flowers were photographed for later taxonomic identification. Subsequent identification of both the parasitic flower and its host plants was carried out using scientific literature and botanical resources.

The *S. himalayana* individuals were discovered near the Sessni camp of Eaglenest WS. Around 21 individuals spanning various developmental stages were observed, from bud emergence to flower maturation, including naturally decaying buds and decaying flowers (Image 2–5). The buds cluster in groups of three or five, scattered across the forest floor. Most flowers grew on gentle

slopes, but some were found on level ground. A nearby water stream may fulfil the specific habitat requirements of this species. The flowers of *S. himalayana* are vibrant red, with sulphur-yellow dots on their perigone lobes. Most of the flowers have 10 perigone lobes in count. An individual *S. himalayana* flower with 12 perigone lobes (Image 6) is also recorded, contrasting with past published literature indicating the flower typically exhibits 10 perigone lobes. The flower was roughly 20 cm (Image 7) in diameter and about 12 cm tall. A mature bud was 12 cm wide (Image 8). The flower emits putrid smells that can be detectable from a few meters away. The vegetative parts of *S. himalayana* grow inside the host's lianas of *Tetrastigma* spp. (Image 9) of Vitaceae. During the reproductive phase, the protocorm emerges from the hosts' roots and then matures into a flower—the flower blooms in the winter, from November to February.

Eaglenest WS faces significant environmental challenges, including climate change and the spread of invasive plants at lower elevations. In this context, *Sapria himalayana* is a poorly understood taxon and highly sensitive to environmental factors. The plant has a naturally high bud mortality rate (Osathanunkul 2019). Extensive research on the fascinating Himalayan *Sapria* has been challenging because of its infrequent, unpredictable, and secretive flowering patterns. The study underscores the urgent need for comprehensive research into the elusive flowering phenology and enigmatic traits of *S. himalayana* to inform practical conservation efforts. In order to establish patterns and solve these mysteries, an annual plant survey is proposed in the Eaglenest WS. Apart from the West Kameng of Arunachal Pradesh, Namdapha National Park

of Changlang District is this plant's most extensively documented habitat (Arunachalam et al. 2004; Borah & Ghosh, 2018). Recent observations also indicate its presence in other parts of Arunachal Pradesh, including the evergreen forests of the East Siang District and the Mehao Wildlife Sanctuary in the Lower Dibang Valley District (Ahmad et al. 2020; Taram et al. 2020).

## REFERENCES

- Ahmad, A., A. Kumar, G.S. Rawat & G.V. Gopi (2020). Recent record of a threatened holoparasitic plant *Sapria himalayana* Griff. in Mehao Wildlife Sanctuary, Arunachal Pradesh, India. *Journal of Threatened Taxa* 12(10): 16399–16401. <https://doi.org/10.11609/jott.5168.12.10.16399-16401>
- Arunachalam, A., D. Adhikari, R. Sarmah, M. Majumder & M.L. Khan (2004). Population and conservation of *Sapria himalayana* Griffith. in Namdapha National Park, Arunachal Pradesh, India. *Biodiversity & Conservation* 13(13): 2391–2397. <https://doi.org/10.1023/B:BIOC.0000048488.94151.f8>
- Bänziger, H., B. Hansen & K. Kreetiyutanont (2000). A new form of the hermit's spittoon, *Sapria himalayana* Griffith f. *albovinosa* Bänziger and Hansen f. nov. (Rafflesiaceae), with notes on its ecology. *Natural History Bulletin of the Siam Society* 48: 213–219.
- Bänziger, H. (2004). *Studies on hitherto unknown fruits and seeds of some Rafflesiaceae, and a method to manually pollinate their flowers for research and conservation*. Linzer Boilogsische Beitrage 36(2): 1175–1198.
- Bor, N.L. (1938). A sketch of the vegetation of the Aka Hills, Assam. A synecological study, Indian Forest Records (new series). *Botany* 1(4): i-ix, 103–221.
- Borah D. & D. Ghosh (2018). *Sapria himalayana*: The Indian Cousin of World's Largest Flower. *Resonance* 23(4): 479–489. <https://doi.org/10.1007/s12045-018-0637-8>
- Davis, C.C., P.K. Endress & D.A. Baum (2008). The evolution of floral gigantism. *Current Opinion in Plant Biology* 11(1): 49–57. <https://doi.org/10.1016/j.pbi.2007.11.003>
- Devi, M.B., D.P.M. Maring & A. Devi (2022). A new distribution record and conservation plea of parasitic angiosperm, *Sapria himalayana* Griffith in Manipur. *Journal of Bioresarch* 1(1): 79–83.
- Dorji, R., P. Phuntsho, U. Dechen, G. Gyeltshen, T. Samdrup, K. Dorji, R.B. Powrel, P. Dorji, K.P. Dhimel & D.G. Long (2022). Discovery, distribution and conservation of the rare parasitic plant *Sapria himalayana* (Rafflesiaceae) in Bhutan. *Curtis's Botanical Magazine* 39(3): 541–554. <https://doi.org/10.1111/curt.12461>
- Elliott, S. (1990). The distribution, status and ecology of *Sapria himalayana* Griff. (Rafflesiaceae) in Thailand. *The Bulletin of British Ecological Society* 11: 246–248.
- Griffith, W., (1844). *Sapria*; *Sapria himalayana*. *Proceedings of the Linnean Society of London* 1: 216–217.
- Holden, J. (2010). Short communication Introducing some charismatic species of Cambodian flora. *Cambodian Journal of Natural History* July 2010(1): 12–14.
- Mohan, D. & R. Athreya (2011). Sustainable bird based tourism in India's remote north-east frontier. *International Journal of Innovation Science* 3(1): 23–28.
- Nayar M.P. & A.R.K. Sastry (1987). *Red Data Book of Indian Plants – Vol. I*. Botanical Survey of India, Calcutta, 310 pp.
- Nikolov, L.A., P.B. Tomlinson, S. Manickam, P.K. Endress, E.M. Kramer & C.C. Davis (2014). Holoparasitic Rafflesiaceae possess the most reduced endophytes and yet give rise to the world's largest flowers. *Annals of Botany* 114(2): 233–242. <https://doi.org/10.1093/aob/mcu114>
- Osathanunkul, M. (2019). eDNA-based monitoring of parasitic plant (*Sapria himalayana*). *Scientific Reports* 9(1): 9161. <https://doi.org/10.1038/s41598-019-45647-5>
- Singh, Y.T., L. Khiantge, S.P. Singh H. Sailo & L. Ralte (2022). New distribution record and DNA barcoding of *Sapria himalayana* Griff. (Rafflesiaceae), a rare and endangered holoparasitic plant from Mizoram, India. *Journal of Threatened Taxa* 14(12): 22215–22220. <https://doi.org/10.11609/jott.7960.14.12.22215-22220>
- Syiemiong, P., S.S. Chaturvedi, T. Arbenz & T. Tămaş (2022). A note on *Sapria himalayana* Griff. (Rafflesiaceae) from Jaintia Hills (Meghalaya, India). *Biodiversity Journal* 13(1): 73–78. <https://doi.org/10.31396/Biodiv.Jour.2022.13.1.73.78>
- Tanaka, N., H. Nagamasu, S. Tagane, M.M. Aung, A.K. Win & P.P. Hnin (2019). Contributions to the F flora of Myanmar IV: a new species and a newly recorded taxon of the genus *Sapria* (Rafflesiaceae). *Taiwania* 64(4): 357. <https://doi.org/10.6165/tai.2019.64.357>
- Taram, M., D. Borah, H. Tag & R.K. Choudhary (2020). An inventory of the native flowering plants in east Siang District of Arunachal Pradesh, India. *Journal of Threatened Taxa* 12(17): 17299–17322. <https://doi.org/10.11609/jott.6241.12.17.17299-17322>





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. 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, 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 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 2021–2023

Due to pausity 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



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)

December 2024 | Vol. 16 | No. 12 | Pages: 26187–26330

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

DOI: 10.11609/jott.2024.16.12.26187-26330

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

## Articles

**Negative interaction or coexistence? Livestock predation and conservation of wild carnivores in Kazinag National Park and adjacent region in the Kashmir Himalaya, India**

– Uzma Dawood & Bilal A. Bhat, Pp. 26187–26197

**Avifaunal diversity and conservation significance of coastal ecosystems on Rameswaram Island, Tamil Nadu, India**

– H. Byju, H. Maitreyi, S. Ravichandran & N. Raveendran, Pp. 26198–26212

**Conservation of sea turtles on the beach areas from Sonadia Island to Saint Martin's Island in the Bay of Bengal in Bangladesh**

– M. Farid Ahsan, Shital Kumar Nath & Ashim Barua, Pp. 26213–26224

**Noteworthy records of vascular plants from the West Bank, occupied Palestinian territories**

– Banan Al-Sheikh, Mazin B. Qumsiyeh & Abdel-Salam Hubbieh, Pp. 26225–26233

## Communications

**Citizen science conservation: a case study using two threatened large aquatic American salamanders (Amphibia: Urodela), the Common Mudpuppy *Necturus maculosus* (Proteidae) and the Eastern Hellbender *Cryptobranchus alleganiensis* (Cryptobranchidae) observations on iNaturalist**

– Shem Unger, Pp. 26234–26239

**A preliminary study of odonate fauna in the high ranges of Munnar, southern Western Ghats, India**

– T.S. Krishnanunni, Nazar Neha, R. Arya & P.O. Nameer, Pp. 26240–26250

**A new species of *Arctodiaptomus* Kiefer, 1932 (Copepoda: Diaptomidae) from the Kumaun Himalaya of India**

– Shaikhom Inaotombi & Debajit Sarma, Pp. 26251–26263

**Morpho-anatomical characterization and conservation status of the Whisk Fern *Psilotum nudum* (L.) P.Beauv. (Polypodiopsida: Psilotaceae) from Cooch Behar District of West Bengal, India**

– Aninda Mandal, Pp. 26264–26271

**Six new reports of corticioid fungi from India**

– Poonam, Avneet Pal Singh & Gurpaul Singh Dhingra, Pp. 26272–26282

**On the *Marvalia echinulata* (Niessl ex Rabenh.) Ono (Pucciniales: Chaconiaceae) with reference to its host range and distribution**

– Sayantan Jash & Asit Baran De, Pp. 26283–26290

## Short Communications

**A rare low elevation photographic record of Himalayan Serow *Capricornis sumatraensis* ssp. *thar* (Hodgson, 1831) from Nameri National Park, Assam, India**

– B. Piraisoodan, Asish Immanuel Baglary, Saumitro Das & Debasish Buragohain, Pp. 26291–26295

**Sightings of Red Goral *Nemorhaedus baileyi* in the community forest of the Upper Siang region, Arunachal Pradesh: an insight into its conservation challenges and implications within a tribal-managed landscape**

– Takhe Bamin, Kishon Tekseng & Daniel Mize, Pp. 26296–26300

**New record of *Sapria himalayana* Griff. (Rafflesiaceae) from Eaglenest Wildlife Sanctuary, Arunachal Pradesh, India**

– Anisha Mandal, Aman Bishwakarma, Dibi Soma Monpa, Kabir Pradhan, Karma Wangdi Monpa & Rohit Rai, Pp. 26301–26305

***Pinnatella limbata* (Bryophyta: Neckeraceae): reassessment of conservation status based on recent findings**

– O.M. Sruthi, C.N. Manju, K.P. Rajesh & J. Enroth, Pp. 26306–26311

**Additions of two genera of liverworts (Marchantiophyta) to the bryoflora of Nagaland, India**

– Kazuharii Eshuo, Kholi Kaini & S.K. Chaturvedi, Pp. 26312–26316

***Phycolepidozia indica* (Marchantiophyta: Jungermanniales) an endemic leafless liverwort from Kerala part of Western Ghats, India**

– T. Krishnendhu, C.N. Manju, Ravi Athira & K.P. Rajesh, Pp. 26317–26321

## Notes

**First photographic documentation of avian egg predation by Common Palm Civet *Paradoxurus hermaphroditus* (Pallas, 1777) (Mammalia: Carnivora: Viverridae)**

– Aritra Bhattacharya, B.N. Achyutha, Nandini Iyer, Somaiah Sundarapandian & Kuppusamy Sivakumar, Pp. 26322–26324

**First record of Eurasian Crag Martin *Ptyonoprogne rupestris* (Scopoli, 1769) (Aves: Passeriformes: Hirundinidae) from Tamil Nadu, India**

– S. Naveenkumar, Pp. 26325–26327

***Megachile vera* Nurse, 1901 (Insecta: Hymenoptera: Megachilidae): a new record of leaf cutter bee from Kerala, India**

– Anju Sara Prakash & C. Bijoy, Pp. 26328–26330

Publisher & Host



Threatened Taxa