

Building evidence for conservation globally

Journal of Threatened TAXA



10.11609/jott.2025.17.6.27035-27170
www.threatenedtaxa.org

26 June 2025 (Online & Print)
17(6): 27035-27170
ISSN 0974-7907 (Online)
ISSN 0974-7893 (Print)



Open Access





Publisher

Wildlife Information Liaison Development Societywww.wild.zooreach.org

Host

Zoo Outreach Organizationwww.zooreach.org

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

Email: 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

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

Board of Editors

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. 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

Copy Editors

Ms. Usha Madgunki, Zooreach, Coimbatore, India**Ms. Trisa Bhattacharjee**, Zooreach. Coimbatore, India**Ms. Paloma Noronha**, Daman & Diu, India

Web Development

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

Typesetting

Mrs. Radhika, Zooreach, Coimbatore, India**Mrs. Geetha**, Zooreach, 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, Kuvenpu University, Shimoga, Karnataka, India**Dr. K.R. Sridhar**, Mangalore University, Mangalagangotri, Mangalore, Karnataka, India**Dr. Gunjan Biswas**, Vidyasagar University, Midnapore, West Bengal, India**Dr. Kiran Ramchandra Ranadive**, Annaheb Magar Mahavidyalaya, Maharashtra, India

Plants

Dr. G.P. Sinha, Botanical Survey of India, Allahabad, India**Dr. N.P. Balakrishnan**, Ret. Joint Director, BSI, Coimbatore, India**Dr. Shonil Bhagwat**, Open University and University of Oxford, UK**Prof. D.J. Bhat**, Retd. Professor, Goa University, Goa, India**Dr. Ferdinand Boero**, Università del Salento, Lecce, Italy**Dr. Dale R. Calder**, Royal Ontario Museum, Toronto, Ontario, Canada**Dr. Cleofas Cervancia**, Univ. of Philippines Los Baños College Laguna, Philippines**Dr. F.B. Vincent Florens**, University of Mauritius, Mauritius**Dr. Merlin Franco**, Curtin University, Malaysia**Dr. V. Irudayaraj**, St. Xavier's College, Palayamkottai, Tamil Nadu, India**Dr. B.S. Kholia**, Botanical Survey of India, Gangtok, Sikkim, India**Dr. Pankaj Kumar**, Department of Plant and Soil Science, Texas Tech University, Lubbock, Texas, USA.**Dr. V. Sampath Kumar**, Botanical Survey of India, Howrah, West Bengal, India**Dr. A.J. Solomon Raju**, Andhra University, Visakhapatnam, India**Dr. Vijayasankar Raman**, University of Mississippi, USA**Dr. B. Ravi Prasad Rao**, Sri Krishnadevaraya University, Anantapur, India**Dr. K. Ravikumar**, FRLHT, Bengaluru, Karnataka, India**Dr. Aparna Watve**, Pune, Maharashtra, India**Dr. Qiang Liu**, Xishuangbanna Tropical Botanical Garden, Yunnan, China**Dr. Noor Azhar Mohamed Shazili**, Universiti Malaysia Terengganu, Kuala Terengganu, Malaysia**Dr. M.K. Vasudeva Rao**, Shiv Ranjan Housing Society, Pune, Maharashtra, India**Prof. A.J. Solomon Raju**, Andhra University, Visakhapatnam, India**Dr. Manda Datar**, Agharkar Research Institute, Pune, Maharashtra, India**Dr. M.K. Janarthanam**, Goa University, Goa, India**Dr. K. Karthigeyan**, Botanical Survey of India, India**Dr. Errol Vela**, University of Montpellier, Montpellier, France**Dr. P. Lakshminarasiham**, Botanical Survey of India, Howrah, India**Dr. Larry R. Noblick**, Montgomery Botanical Center, Miami, USA**Dr. K. Haridasan**, Pallavur, Palakkad District, Kerala, India**Dr. Analinda Manila-Fajard**, University of the Philippines Los Baños, Laguna, Philippines**Dr. P.A. Siru**, 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. Warrier**, Institute of Forest Genetics and Tree Breeding, Tamil Nadu, India

Invertebrates

Dr. R.K. Avasthi, Rohtak University, Haryana, India**Dr. D.B. Bastawade**, Maharashtra, India**Dr. Partha Pratim Bhattacharjee**, Tripura University, Suryamaninagar, India**Dr. Kailash Chandra**, Zoological Survey of India, Jabalpur, Madhya Pradesh, India**Dr. Ansie Dippenaar-Schoeman**, University of Pretoria, Queenswood, South Africa**Dr. Rory Dow**, National Museum of natural History Naturalis, The Netherlands**Dr. Brian Fisher**, California Academy of Sciences, USA**Dr. Richard Gallon**, Ilandudno, North Wales, LL30 1UP**Dr. Hemant V. Ghate**, Modern College, Pune, India**Dr. M. Monwar Hossain**, Jahangirnagar University, Dhaka, BangladeshFor Focus, Scope, Aims, and Policies, visit https://threatenedtaxa.org/index.php/JoTT/aims_scopeFor Article Submission Guidelines, visit <https://threatenedtaxa.org/index.php/JoTT/about/submissions>For Policies against Scientific Misconduct, visit https://threatenedtaxa.org/index.php/JoTT/policies_various

continued on the back inside cover

Cover: A mesmerising Indian Luna moth *Actias selene* is dancing through the starry night (by Vincent van Gogh) moonlit sky, displaying its ballistic display of feather tail. Digital artwork by Vyshnavee Sneha Jaijar.



A pioneer study of orchids on Nusa Barung Island of Indonesia

Toni Artaka¹ , Bina Swasta Sitepu² , Fajar Dwi Nur Aji³ , Suryadi⁴  & Tri Atmoko⁵ 

¹ Bromo Tengger Semeru National Park, Ministry of Forestry, Malang, East Java, 65126, Indonesia.

^{2,5} Research Center for Ecology and Ethnobiology, National Research and Innovation Agency (BRIN), Cibinong, Bogor, West Java, 16911, Indonesia.

³ Division of Natural Resources Conservation (BBKSDA) Jawa Timur, Ministry of Forestry, Surabaya, East Java, 61253, Indonesia.

⁴ Yayasan Pakarti, Malang, East Java, 65154, Indonesia.

⁵ Research Center for Applied Zoology, National Research and Innovation Agency (BRIN), Cibinong, Bogor, West Java, 16911, Indonesia.

¹toniartaka@yahoo.com, ²bina004@brin.go.id, ³fajardwinuraji@gmail.com, ⁴gondrongsuryadi66@gmail.com,

⁵tri.atmoko@brin.go.id (corresponding author)

Abstract: This is the first study specifically on orchids in the Nusa Barung Island Wildlife Reserve. Nusa Barung Island has restricted access. We conducted a 14-day exploration across seven transects, covering a total distance of 12 km. Previous research only recorded five species of orchids, whereas our findings identified 17 species, of which 80 % were new records for this island. Three species of terrestrial orchids were found, namely *Eulophia picta*, *Nervilia plicata*, and *N. simplex*, while the other 14 species were epiphytes/lithophytes. *Vanda limbata* is abundant and can be found growing on cliffs, while other epiphytes can be found on tree trunks & branches in Jeruk Bay, and Kandangan Bay.

Keywords: Epiphytes, Orchidaceae, small island, transects, terrestrial orchids, *Vanda limbata*, wildlife reserve.

Abstrak: Ini adalah studi pertama yang secara khusus meneliti anggrek di Suaka Margasatwa Pulau Nusa Barung. Akses ke Pulau Nusa Barung sulit dan terbatas. Kami melakukan eksplorasi selama 14 hari menyusuri tujuh transek, dengan total jarak 12 km. Penelitian sebelumnya hanya mencatat lima jenis anggrek, sedangkan temuan kami mengidentifikasi 17 jenis, di mana 80% adalah catatan baru untuk pulau ini. Tiga jenis anggrek tanah ditemukan, yaitu *Eulophia picta*, *Nervilia plicata*, dan *N. simplex*, sementara 14 jenis lainnya adalah epifit/litofit. *Vanda limbata* ditemukan melimpah dan dapat ditemukan tumbuh di tebing, sementara epifit lainnya dapat ditemukan di batang dan cabang pohon yang tumbuh di Teluk Jeruk dan Teluk Kandangan.

Editor: Pankaj Kumar, Department of Biology, Health and Wellness, Miami Dade College, Miami, Florida, USA. **Date of publication:** 26 June 2025 (online & print)

Citation: Artaka, T., B.S. Sitepu, F.D.N. Aji, Suryadi & T. Atmoko (2025). A pioneer study of orchids on Nusa Barung Island of Indonesia. *Journal of Threatened Taxa* 17(6): 27110-27115. <https://doi.org/10.11609/jott.9529.17.6.27110-27115>

Copyright: © Artaka et al. 2025. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use, reproduction, and distribution of this article in any medium by providing adequate credit to the author(s) and the source of publication.

Funding: This study was funded by the National Research and Innovation Agency of Indonesia (BRIN) and the Educational Fund Management Institution (LPDP), Ministry of Finance of Indonesia, through the Riset dan Inovasi untuk Indonesia Maju (RIIM) 2023 scheme (Contract Number: B-3838/II.7.5/FR.06.00/11/2023). Tri Atmoko was assigned the funding as the principal Investigator and coordinator of the project.

Competing interests: The authors declare no competing interests.

Author details: TONI ARTAKA: Forest Ecosystem Controller (PEH) for wild flora and breeder manager of in situ orchids for ex-situ conservation in Bromo Tengger Semeru National Park. BINA SWASTA SITEPU: Botanist and junior researcher for forest ecology at the National Research and Innovation Agency of Indonesia. FAJAR DWI NUR AJI: Forest Ecosystem Controller (PEH) for wild flora and fauna at Division of Natural Resources Conservation (BBKSDA) Jawa Timur. SURYADI: Nature enthusiasts are interested in orchids and other ornamental plants at Yayasan Pakarti. TRI ATMOKO: Principal researcher of wildlife bio-ecology and nature conservation at the National Research and Innovation Agency of Indonesia.

Author contributions: Toni Artaka conceptualised research, methodology, data curation, and writing. Tri Atmoko was a principal investigator, conceptualised the methodology, served as supervisor, data curation, writing lead, and funding recipient. Bina SS, Suryadi, and Fajar DNA were involved in data curation and writing.

Acknowledgements: The authors sincerely thank BRIN and LPDP for funding support of this work. We acknowledge the kind support of the Head of BBKSDA Jawa Timur for issuing the research and sample collection permit (Permit number SI.889/K.2/BIDTEK.1/KSA/5/2024 and SK.21/K2/BIDTEK.1/KSA/6/2024). We express our gratitude to the Nusa Barung Research Team, Yayasan Pakarti, Yayasan BBC, and the local community for supporting us in our field surveys.



INTRODUCTION

Indonesia is an archipelagic country with more than 17 thousand islands (Indonesian Government 2024). Of that number, 111 are the outermost small islands, one of which is Nusa Barung Island (Presidential Decree of Indonesia 2017). The uninhabited Nusa Barung Island is a wildlife reserve that humans rarely visit due to its relatively difficult accessibility. To reach it, one must cross the Indian Ocean, which is known for its large waves, unpredictable weather, and the island itself has limited freshwater sources. These are the limiting factor for biodiversity research activities on this island, resulting in a lack of data on its flora and fauna, including the orchid species (Orchidaceae).

Indonesia is one of the World's orchid biodiversity centers (Vitt et al. 2023). The country has a natural distribution of more than 5,500 orchid species or about one-fifth of the species in the world (Chase et al. 2017; Wati et al. 2023). Of these, 731 species are found on the island of Java, and 231 are endemic (Comber 1990). Orchids are an important part of the ecosystem and have high economic and conservation appeal with their morphological, ecological, and adaptation to various environmental conditions (Sharma et al. 2024). Orchids are able to survive and thrive in various habitats on Earth (Ziegler 2011).

Much research on orchid diversity on the island of Java has been conducted in past (Comber 1990; Nurfadilah et al. 2016; Rindyastuti et al. 2018; Sadili 2019), but these surveys were not conducted specifically on Nusa Barung Island. General information on plant diversity in Nusa Barung was collected by Jacobs (1958) and Partomihardjo & Ismail (2005). Both provided basic knowledge of the plant species in Nusa Barung Island, although their exploration area was limited. The previous study (Partomihardjo & Ismail 2005), only explored the coastal areas at limited locations. The present study included several inland areas that had not been visited before. This information is essential considering the unique ecosystem on Nusa Barung Island, which is a small island dominated by karst.

This biodiversity database provides invaluable information that will serve as a foundation for managing conservation areas. This study is hence, a valuable first step in gathering biodiversity data on Nusa Barung Island for managers. This paper is the result of the first study aimed at identifying and documenting orchid species on Nusa Barung Island.

STUDY SITE AND METHODS

The study was conducted for two weeks in July 2024 on Nusa Barung Island, a 76.4 km² wildlife reserve located in the Indian Ocean. Administratively, it is located in Puger District, Jember Regency, East Java (Figure 1). Based on DEM SRTM data (<https://earthexplorer.usgs.gov/>), this island has an altitude ranging 0–279 m with flat as well as undulating topography. Based on our general observations, forest types include coastal, lowland, karst, and mangrove forests. Based on NASA POWER data (<https://power.larc.nasa.gov/>) for the past 10 years, the weather patterns are as follows: annual rainfall ranging 1,129–2,421 mm/ year, an average air temperature of 26.9 °C (min-max: 24.1–28.8 °C), and an average air humidity of 81.1 % (min-max: 77.3–85.1 %).

Exploration was carried out following a standard methodology, for example, in field tracking was conducted on the observation transects and its surroundings with a width of approximately 15 m from the transect. Fourteen days were spent to cover seven routes with a total distance of approximately 12 km, in Plirik-Monyetan (2,083 m), Kedok Watu (2,508 m), Kandangan Bay (1,530 m), Jeruk Bay (2,549 m), Ketimo (715 m), Pucung Prau (1,140 m), and Cambah Bay-Sumber Gempol (1,544 m). Observations were made on terrestrial and epiphytic orchids. The epiphytic orchids on the high branches were observed with a binocular and documented with DSLR digital camera with tele lens. This study was mostly limited to the observation of individual orchids on high branches more than 20 m from the ground. The orchids found were identified and documented; the number of individuals/clumps was counted, and certain individuals were collected for further identification in Herbarium Wanariset (WAN). We identified the species by referring to the field guide provided by Comber (1990) and Artaka (2019).

RESULTS AND DISCUSSION

During the survey, 17 species of orchids of 13 genera were found (Table 1; Image 1). Three species found were terrestrial orchids, namely, *Eulophia picta* (Image 1F), *Nervilia plicata* (Image 1I), and *N. simplex* (Image 1J). The other species include the epiphyte and lithophyte groups. *Vanda tricolor* in Kandangan Bay uses the Bayur Tree *Pterospermum javanicum* as its host, while *Luisia zollingeri* (Image 1H), found around Kandangan Bay, attaches to the trunk of the *Dysoxylum* sp. The presence of *Vanda limbata* (Image 1P), is abundant, growing

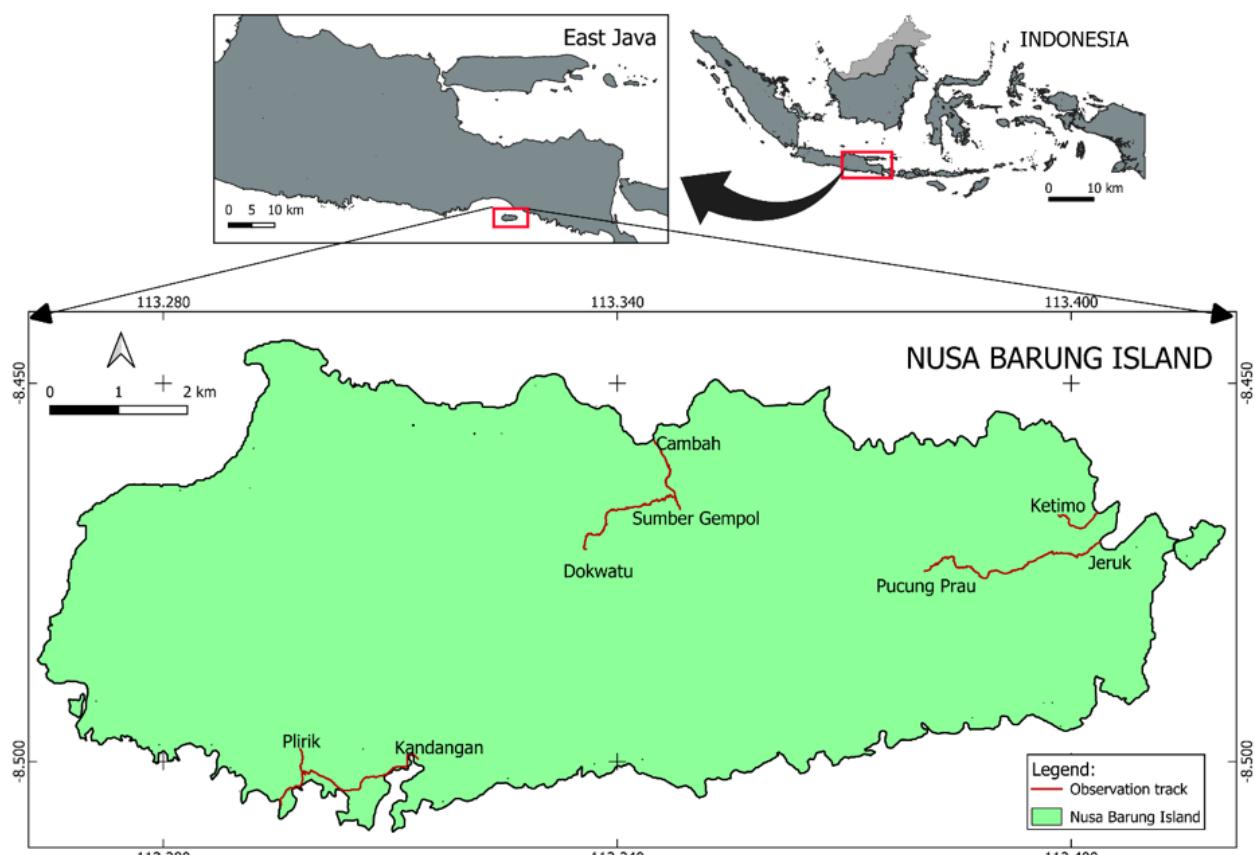


Figure 1. The study site, Nusa Barung Island in Indonesia.

on cliffs and rocks around Jeruk Bay. Meanwhile, those around Kandangan Bay grow as epiphytes with *Rhynchostylis retusa* (Image 1L), on the *Syzygium* sp. as a host.

Although we did not create a permanent plot to calculate abundance, based on individual/clump counting, several orchid species were found in small numbers, such as *Cymbidium* sp., *Dendrobium crumenatum*, *Liparis parviflora*, and *Polystachya concreta* (Table 1). Protection and prevention of illegal harvesting of this species needs to be done more because it has high vulnerability and potential for local extinction.

Vanda limbata was most commonly found in this study mainly in Kandangan Bay and Jeruk Bay. That is in line with the results of previous studies. During the exploration activities, Jacobs (1958) also reported the discovery of *V. limbata* in Nusa Barung, alongside species such as *Taeniothallis* sp. and *Aerides* sp. Partomihardjo & Ismail (2005) conducted a survey and found *V. limbata*, *Dendrobium crumenatum*, *Phaius flavus*, and *Taeniothallis* sp. among a total of 282 flora species. We

were unable to find *Phaius flavus* in this survey.

Indonesia has a high diversity of *Vanda*. Out of 90 species of *Vanda* in the world (POWO 2025), 20 species grow naturally in Indonesia (Metusala 2011). This is a species that was initially known to be endemic to the island of Java until it was later found in Bali, the Nusa Tenggara Islands, Sulawesi, and Maluku (Metusala 2011). This species exhibits a relatively diverse habitat distribution, ranging from karst cliffs and seashores to attaching itself as an epiphyte on large tree trunks at altitudes exceeding 500 m (Yulia & Budiharta 2011). Setiawan (2018) also noted the presence of *V. limbata* as an epiphyte on tamarind trees *Tamarindus indica* planted as shade trees in Bangkalan, Madura Islands (East Java).

Sempu Island, a small island also located south of Java Island, has at least seven orchid species, one of which is also found on Nusa Barung Island, namely *Dendrobium crumenatum* (Sadili 2019); other species are *Ascochilus emarginatus*, *D. subulatum*, *Thrixspermum subulatum*, *T. acuminatissimum* (Rindyastuti et al. 2018), *Taeniothallis biocellatum* (Nurfadilah et al. 2016), and

Table 1. Species and distribution of orchids in the Nusa Barung Island Wildlife Reserve, Indonesia.

	Species	Habitus	Individuals/ Clump					
			A	B	C	D	E	F
1	<i>Aerides odorata</i> Lour. (Image 1A)	Epiphytic	6	40	18			
2	<i>Arachnis sulingi</i> (Blume) Rchb.f. (Image 1B)	Lithophytic			18			
3	<i>Cymbidium</i> sp. (Image 1C)	Epiphytic				1		
4	<i>Dendrobium crumenatum</i> Sw. (Image 1D)	Epiphytic				1		
5	<i>Dendrobium macrostachyum</i> Lindl. (Image 1E)	Epiphytic			4			
6	<i>Eulophia picta</i> (R.Br.) Ormerod (Image 1F)	Terrestrial					8	
7	<i>Liparis parviflora</i> (Blume) Lindl. (Image 1G)	Epiphytic				2		
8	<i>Luisia zollingeri</i> Rchb.f. (Image 1H)	Epiphytic	7		1			
9	<i>Nervilia plicata</i> (Andrews) Schltr. (Image 1I)	Terrestrial			23			
10	<i>Nervilia simplex</i> (Thouars) Schltr. (Image 1J)	Terrestrial		8		4		
11	<i>Polystachya concreta</i> (Jacq.) Garay & H.R.Sweet (Image 1K)	Epiphytic			2			
12	<i>Rhynchostylis retusa</i> (L.) Blume (Image 1L)	Epiphytic	4		26			
13	<i>Taeniophyllum hasseltii</i> Rchb.f. (Image 1M)	Epiphytic	18		3			
14	<i>Taeniophyllum</i> sp. (Image 1N)	Epiphytic			6			2
15	<i>Thrixspermum ciborskii</i> J.J.Sm. (Image 1O)	Epiphytic					2	8
16	<i>Vanda limbata</i> Bl. (Image 1P)	Lithophytic, Epiphytic	66				abundant	
17	<i>Vanda tricolor</i> Lindl. (Image 1Q)	Epiphytic	4	15	2			

A—Kandangan Bay | B—Plirik-Monyetan | C—Cambah Bay-Sumber Gempol | D—Kedok Watu | E—Jeruk Bay | F—Pucung Prau.

Grosourdya appendiculata (Sadili 2019). When compared to the closest location on the mainland of Java Island, as many as five species of orchids in Nusa Barung are the same as those found in Bromo Tengger Semeru National Park (Artaka 2019), and three species are the same as in Meru Betiri National Park (Puspitaningtyas 2007). This phenomenon shows that distribution of propagules from the main island affects the biodiversity of Nusa Barung Island as a result of the dispersion by biotic and abiotic agents, as well as native species that already existed in this area when the island was separated from it due to rising sea levels (Schrader et al. 2020).

This survey only covered a small part of Nusa Barung Island, hence it is assumed that more orchid species may still exist on the island, waiting to be discovered. Several obstacles during the survey included the limitation in collecting epiphytic orchid species that grow attached to the crown of large trees at a height of more than 20 m. Another obstacle was that only a few orchid species were found flowering during the survey, which coincided with the dry season in Indonesia (April–September) without flowers, which is a problem for further identification at the species level. The specimens without flower were identified only at the genus level, except for the species that have important identification character on their

vegetative organs (e.g., leaf, bulb and root).

Several species, although not with generative organs, can still be identified at the species level based on the special vegetative characteristics they have, such as the *Eulophia picta* species. That species is easily recognized even when it is not flowering because it has a distinctive habitus and tubers (pseudobulbs). The *E. picta* was only found with as many as eight individuals growing on sandy coastal soil media shaded by the canopy of the *Hibiscus tiliaceus* tree in Jeruk Bay. The tubers have a depth of 5–7 cm in the sandy soil and are characterized by fine-haired roots.

Dendrobium macrostachyum is commonly found attached to trees around the rain-fed lake (Sumber Gempol). This species is recognized because of its distinctive habitat, and it always grows hanging. Preferring shady and windy habitats, it grows together with *Polystachya concreta*, *Luisia zollingeri*, and *Taeniophyllum hasseltii*.

The *Cymbidium* species was found dead on the forest floor. The genus *Cymbidium* is recognized from its oval pseudobulbs covered by leaf sheaths. It is very difficult to determine the species without a flower. Same is the case with *Taeniophyllum* sp., which was also found in vegetative phase.



Image 1. Orchid species found on Nusa Barung Island: A—*Aerides odorata* | B—*Arachnis sulingi* | C—*Cymbidium* sp. | D—*Dendrobium crumenatum* | E—*Dendrobium macrostachyum* | F—*Eulophia picta* | G—*Liparis parviflora* | H—*Luisia zollingeri* | I—*Nervilia plicata* | J—*Nervilia simplex* | K—*Polystachya concreta*. © Toni Artaka

Further surveys are recommended during the transition from the rainy to the dry season (October–March) to obtain more complete information on orchid species with possibly different phenological times. Several terrestrial orchids typical of the lowlands primarily grow with completed generative parts during these seasons (Artaka 2019). Expansion of the exploration area is also needed to reach the inland

forest areas that have not been visited yet. This study also supports area managers for an updated biodiversity database, primarily as a source of natural orchid germplasm to support cultivation.

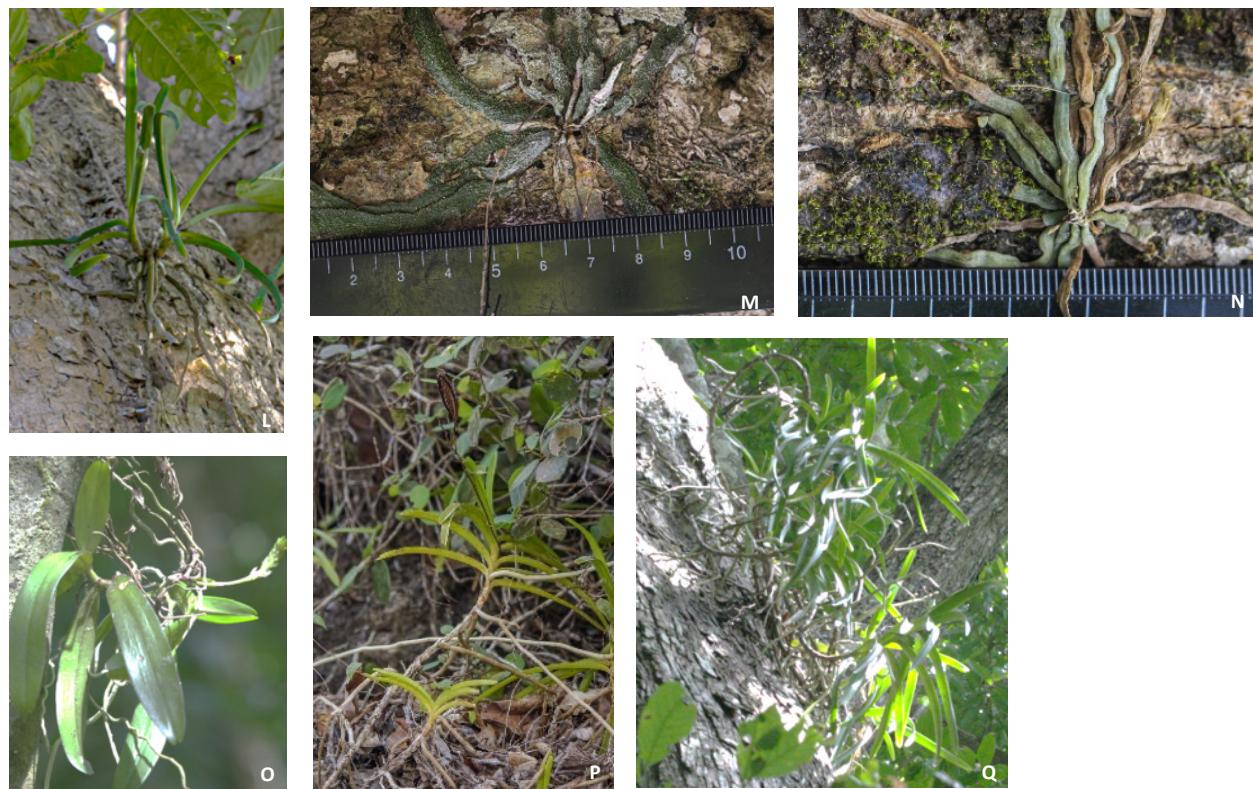


Image 1 cont. The orchid species found on Nusa Barung Island: L—*Rhyynchostylis retusa* | M—*Taeniophyllum hasseltii* | N—*Taeniophyllum* sp. | O—*Thrixspermum raciborskii* | P—*Vanda limbata* | Q—*Vanda tricolor* © Toni Artaka.

REFERENCES

Artaka, T. (2019). *Orchids of the Bromo Tenger Semeru National Park*. Bromo Tenger Semeru National Park Office: Malang, 156 pp.

Chase, M.W., M.J.M. Christenhusz & T. Mirenda (2017). *The Book of Orchids: A Life-Size Guide to Six Hundred Species from Around the World*. University of Chicago Press, Chicago, 656 pp.

Comber, J.B. (1990). *Orchids of Java*. Bentham Moxon Trust. Royal Botanic Gardens, Kew, 407 pp.

Indonesia Government (2024). Indonesian Biodiversity Strategy and Action Plan (IBSAP) 2025–2045. Government of Republic of Indonesia: Jakarta, 208 pp.

Jacobs, M. (1958). Botanical reconnaissance of Nusa Barung and Blambangan, South East Java. *Blumea* (Supplement) 4(1): 68–86.

Metusala, D. (2011). Keragaman *Vanda* spp. (Orchidaceae) di Kepulauan Sunda Kecil—Indonesia. *Berk, Penel, Hayati* (Edisi Khusus) 5A: 29–33.

Nurfadilah, S., N.D. Yulia & E.E. Ariyanti (2016). Morphology, anatomy, and mycorrhizal fungi colonisation in roots of epiphytic orchids of Sempu Island, East Java, Indonesia. *Biodiversitas* 17: 592–603. <https://doi.org/10.13057/biodiv/d170229>

Partomihardjo, T. & Ismail (2005). Keanekaragaman flora Cagar Alam Nusa Barong, Jember Jawa Timur. *Berita Biologi* 9(1): 67–80.

POWO (2025). *Vanda*. In: Plants of the World Online. Facilitated by the Royal Botanic Gardens, Kew. <https://powo.science.kew.org/> Downloaded on 20 May 2025.

Presidential Decree of Indonesia (2017). *Presidential Decree of Indonesia, Number 6 about Determination of The Outermost Small Islands*. Republic of Indonesia, Jakarta.

Puspitaningtyas, D.M. (2007). Orchid inventory and the host in Meru Betiri National Park, East Java. *Biodiversitas* 8(3): 210–214. <https://doi.org/10.13057/biodiv/d080309>

Rindyastuti, R., S. Nurfadilah, A. Rahadiantoro, L. Hapsari & I.K. Abywijaya (2018). Leaf anatomical characters of four epiphytic orchids of Sempu Island, East Java, Indonesia: The importance in identification and ecological adaptation. *Biodiversitas* 19: 1906–1918. <https://doi.org/10.13057/biodiv/d190543>

Sadili, A. (2019). Structure, distribution, and spatial patterns of epiphytic orchids (Orchidaceae) at coastal forest of the Sempu Island Nature Reserve, Malang, East Java. *Journal of Forest Science* 13: 38–47. <https://doi.org/10.22146/jik.46143>

Schrader, J., C. König, K.A. Triantis, P. Trigas, H. Kreft & P. Weigelt (2020). Species-area relationships on small islands differ among plant growth forms. *Global Ecology and Biogeography* 29: 814–829. <https://doi.org/10.1111/geb.13056>

Setiawan, E. (2018). Population diversity of Tamarind (*Tamarindus indica* L.) populations in Socah-Arosbaya Highway, Bangkalan District and conservation strategies. *Rekayasa* 11(2): 95–103.

Sharma, B.P., S. Marni & S. Kumar (2024). *Orchids of India, Food, Medicinal and Ecological*. APRF Publishers, India, 84 pp. <https://doi.org/10.5281/zenodo.11209084>

Vitt, P., A. Taylor, D. Rakosy, H. Kreft, A. Meyer, P. Weigelt & T.M. Knight (2023). Global conservation prioritization for the Orchidaceae. *Scientific Reports* 13: 6718. <https://doi.org/10.1038/s41598-023-30177-y>

Wati, R.K., I.P. Astuti & R. Cahyaningsih (2023). Inventorying medicinal orchid in Indonesia from global database. *E3S Web of Conferences* 373: 05009. <https://doi.org/10.1051/e3sconf/202337305009>

Yulia, N.D. & S. Budiharta (2011). Epiphytic orchids and host trees diversity at Gunung Manyutan Forest Reserve, Wilis Mountain, Ponorogo, East Java. *Biodiversitas* 12(1): 22–27. <https://doi.org/10.13057/biodiv/d120105>

Ziegler, C. (2011). *Deceptive Beauties: The World of Wild Orchids*. University of Chicago Press, Chicago, 184 pp.

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

Fishes

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

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

NAAS rating (India) 5.64

Birds

Dr. Hem Sagar Baral, Charles Sturt University, NSW Australia
Mr. H. Biju, Coimbatore, Tamil Nadu, India
Dr. Chris Bowden, Royal Society for the Protection of Birds, Sandy, UK
Dr. Priya Davidar, Pondicherry University, Kalapet, Puducherry, India
Dr. J.W. Duckworth, IUCN SSC, Bath, UK
Dr. Rajah Jayopal, SACON, Coimbatore, Tamil Nadu, India
Dr. Rajiv S. Kalsi, M.L.N. College, Yamuna Nagar, Haryana, India
Dr. V. Santharam, Rishi Valley Education Centre, Chittoor Dt., Andhra Pradesh, India
Dr. S. Balachandran, Bombay Natural History Society, Mumbai, India
Mr. J. Praveen, Bengaluru, India
Dr. C. Srinivasulu, Osmania University, Hyderabad, India
Dr. K.S. Gopi Sundar, International Crane Foundation, Baraboo, USA
Dr. Gombobaatar Sundev, Professor of Ornithology, Ulaanbaatar, Mongolia
Prof. Reuven Yosef, International Birding & Research Centre, Eilat, Israel
Dr. Taej Mundkur, Wetlands International, Wageningen, The Netherlands
Dr. Carol Inskip, Bishop Auckland Co., Durham, UK
Dr. Tim Inskip, Bishop Auckland Co., Durham, UK
Dr. V. Gokula, National College, Tiruchirappalli, Tamil Nadu, India
Dr. Arkady Lelej, Russian Academy of Sciences, Vladivostok, Russia
Dr. Simon Dowell, Science Director, Chester Zoo, UK
Dr. Mário Gabriel Santiago dos Santos, Universidade de Trás-os-Montes e Alto Douro, Quinta de Prados, Vila Real, Portugal
Dr. Grant Connette, Smithsonian Institution, Royal, VA, USA
Dr. P.A. Azeez, Coimbatore, Tamil Nadu, India

Mammals

Dr. Giovanni Amori, CNR - Institute of Ecosystem Studies, Rome, Italy
Dr. Anwaruddin Chowdhury, Guwahati, India
Dr. David Mallon, Zoological Society of London, UK
Dr. Shomita Mukherjee, SACON, Coimbatore, Tamil Nadu, India
Dr. Angie Appel, Wild Cat Network, Germany
Dr. P.O. Nameer, Kerala Agricultural University, Thrissur, Kerala, India
Dr. Ian Redmond, UNEP Convention on Migratory Species, Lansdown, UK
Dr. Heidi S. Riddle, Riddle's Elephant and Wildlife Sanctuary, Arkansas, USA
Dr. Karin Schwartz, George Mason University, Fairfax, Virginia.
Dr. Lala A.K. Singh, Bhubaneswar, Orissa, India
Dr. Mewa Singh, Mysore University, Mysore, India
Dr. Paul Racey, University of Exeter, Devon, UK
Dr. Honnavalli N. Kumara, SACON, Anaikatty P.O., Coimbatore, Tamil Nadu, India
Dr. Nishith Dharaiya, HNG University, Patan, Gujarat, India
Dr. Spartaco Gippoliti, Socio Onorario Società Italiana per la Storia della Fauna "Giuseppe Altobello", Rome, Italy
Dr. Justus Joshua, Green Future Foundation, Tiruchirappalli, Tamil Nadu, India
Dr. H. Raghuram, The American College, Madurai, Tamil Nadu, India
Dr. Paul Bates, Harison Institute, Kent, UK
Dr. Jim Sanderson, Small Wild Cat Conservation Foundation, Hartford, USA
Dr. Dan Challender, University of Kent, Canterbury, UK
Dr. David Mallon, Manchester Metropolitan University, Derbyshire, UK
Dr. Brian L. Cypher, California State University-Stanislaus, Bakersfield, CA
Dr. S.S. Talmale, Zoological Survey of India, Pune, Maharashtra, India
Prof. Karan Bahadur Shah, Budhanilkantha Municipality, Kathmandu, Nepal
Dr. Susan Cheyne, Borneo Nature Foundation International, Palangkaraya, Indonesia
Dr. Hemanta Kafley, Wildlife Sciences, Tarleton State University, Texas, USA

Other Disciplines

Dr. Aniruddha Belsare, Columbia MO 65203, USA (Veterinary)
Dr. Mandar S. Paingankar, University of Pune, Pune, Maharashtra, India (Molecular)
Dr. Jack Tordoff, Critical Ecosystem Partnership Fund, Arlington, USA (Communities)
Dr. Ulrike Streicher, University of Oregon, Eugene, USA (Veterinary)
Dr. Hari Balasubramanian, EcoAdvisors, Nova Scotia, Canada (Communities)
Dr. Rayanna Helleni Santos Bezerra, Universidade Federal de Sergipe, São Cristóvão, Brazil
Dr. Jamie R. Wood, Landcare Research, Canterbury, New Zealand
Dr. Wendy Collinson-Jonker, Endangered Wildlife Trust, Gauteng, South Africa
Dr. Rajeshkumar G. Jani, Anand Agricultural University, Anand, Gujarat, India
Dr. O.N. Tiwari, Senior Scientist, ICAR-Indian Agricultural Research Institute (IARI), New Delhi, India
Dr. L.D. Singla, Guru Angad Dev Veterinary and Animal Sciences University, Ludhiana, India
Dr. Rupika S. Rajakaruna, University of Peradeniya, Peradeniya, Sri Lanka
Dr. Bharat Baviskar, Wild-CER, Nagpur, Maharashtra 440013, India

Reviewers 2021–2023

Due to paucity of space, the list of reviewers for 2021–2023 is available online.

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

Print copies of the Journal are available at cost. Write to:
The Managing Editor, JoTT,
c/o Wildlife Information Liaison Development Society,
3A2 Varadarajulu Nagar, FCI Road, Ganapathy, Coimbatore,
Tamil Nadu 641006, India
ravi@threatenedtaxa.org & ravi@zooreach.org



OPEN ACCESS



The Journal of Threatened Taxa (JoTT) is dedicated to building evidence for conservation globally by publishing peer-reviewed articles online every month at a reasonably rapid rate at www.threatenedtaxa.org. All articles published in JoTT are registered under [Creative Commons Attribution 4.0 International License](#) unless otherwise mentioned. JoTT allows unrestricted use, reproduction, and distribution of articles in any medium by providing adequate credit to the author(s) and the source of publication.

www.threatenedtaxa.org

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

June 2025 | Vol. 17 | No. 6 | Pages: 27035–27170

Date of Publication: 26 June 2025 (Online & Print)

DOI: [10.11609/jott.2025.17.6.27035-27170](https://doi.org/10.11609/jott.2025.17.6.27035-27170)

Articles

Inventory of traditional medicinal plants and ethnobotanical knowledge from Hassan District, Karnataka, India

– Kushavara Venkatesh Amara, Gotravalli Manjunatha Prashanth Kumar & Rajkumar Hanumanthrao Garampalli, Pp. 27035–27063

An annotated checklist of lianas in Manipur, India

– Longjam Malemnganbee Chanu & Debjyoti Bhattacharyya, Pp. 27064–27074

New records and typification in family Poaceae from western Himalaya, India

– Smita Tiwari, Dileshwar Prasad, Sangam Sharma, Supriya Tiwari & Priyanka Agnihotri, Pp. 27075–27086

Collection and lipid analysis of marine unicellular cyanobacteria: a case study from the southeastern coast of India

– Selvam Selvapriya & Sundaram Rajakumar, Pp. 27087–27097

Range expansion of Indian Grey Hornbill population: a case study based on land use, land cover, and vegetation changes in Vadodara, Gujarat, India

– Parikshit Dhaduk & Geeta Padate, Pp. 27098–27109

Communications

A pioneer study of orchids on Nusa Barung Island of Indonesia

– Toni Artaka, Bina Swasta Sitepu, Fajar Dwi Nur Aji, Suryadi & Tri Atmoko, Pp. 27110–27115

A bibliometric visualization of trends in Philippine sharks studies published in Scopus-indexed journals over the past five decades

– Merfat Ampong Sali, Najeeb Razul Ampong Sali, Araniza M. Diansuy, Anina Haslee A. Julkanain-Ong & Richard Nami Muallil, Pp. 27116–27124

First camera-trap evidence of Dhole *Cuon alpinus* Pallas, 1811 (Carnivora: Canidae) from the Kaziranga-Karbi Anglong landscape, Assam, India

– Mujahid Ahamad, Jyotish Ranjan Deka, Priyanka Borah, Umar Saeed, Ruchi Badola & Syed Ainul Hussain, Pp. 27125–27130

Distribution, habitat use and conservation status of Smooth-coated Otter *Lutrogale perspicillata* along the Cauvery and Kabini rivers, Karnataka, India

– Allison Amavisca, Raghunath Belur & Sugandhi Gadadhar, Pp. 27131–27140

Review

An annotated checklist of the genus *Amorphophallus* Blume ex Decne. (Araceae): an update on the distribution and conservation status of its species

– Norilyn Fontarum-Bulawin, Michael A. Calaramo & Grecebio Jonathan D. Alejandro, Pp. 27141–27158

Short Communications

***Embelia ribes* Burm.f. (Primulaceae) – an ayurvedic plant with ethnobotanical notes from Manipur, India**

– Robert Panmei, Soyala Kashung, Lanrilu Dangmei, Akojam Surviya & Ungpemmi Ningshen, Pp. 27159–27162

First record of marine isopod *Synidotea variegata* (Collinge, 1917), (Crustacea: Isopoda: Valvifera) from the Gulf of Kutch, Gujarat, northwestern coast of India

– Deep D. Dudiya, Mansi S. Goswami & Pranav J. Pandya, Pp. 27163–27166

Lesser Blue-wing *Rhyothemis triangularis* Kirby, 1889 (Insecta: Libellulidae), a new addition to the dragonfly diversity of Rajasthan, India

– Anil Sarsavan, Manohar Pawar, Satish Kumar Sharma & Vinod Paliwal, Pp. 27167–27170

Publisher & Host



Threatened Taxa