



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

Journal of Threatened Taxa

Building evidence for conservation globally

www.threatenedtaxa.org

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

SHORT COMMUNICATION

NEW RECORD OF BLUE-EYED EASTERN SPADEFOOT TOAD *LEPTOBRACHIUM BOMPU* (AMPHIBIA: MEGOPHYRIDAE) FROM SARPANG DISTRICT IN BHUTAN

Jigme Tenzin & Jigme Tshelthrim Wangyal

26 February 2019 | Vol. 11 | No. 3 | Pages: 13385–13389

DOI: 10.11609/jott.4134.11.3.13385-13389



For Focus, Scope, Aims, Policies, and Guidelines visit <https://threatenedtaxa.org/index.php/JoTT/about/editorialPolicies#custom-0>

For Article Submission Guidelines, visit <https://threatenedtaxa.org/index.php/JoTT/about/submissions#onlineSubmissions>

For Policies against Scientific Misconduct, visit <https://threatenedtaxa.org/index.php/JoTT/about/editorialPolicies#custom-2>

For reprints, contact <ravi@threatenedtaxa.org>

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.

Partner



صندوق محمد بن زايد
للمحافظة على
الكائنات الحية

The Mohamed bin Zayed
SPECIES CONSERVATION FUND

Member



Publisher & Host





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

NEW RECORD OF BLUE-EYED EASTERN SPADEFOOT TOAD *LEPTOBRACHIUM BOMPU* (AMPHIBIA: MEGOPHRYIDAE) FROM SARPANG DISTRICT IN BHUTAN

Jigme Tenzin¹  & Jigme Tshelthrim Wangyal² 

¹Divisional Forest Office, Sarpang, Department of Forests and Park Services (DoFPS), Ministry of Agriculture & Forests, Sarpang 31002, Bhutan.

²Jigme Khesar Strict Nature Reserve, Haa 15001, Bhutan.

¹jigmetenzin16@gmail.com (corresponding author), ²jigmewangyal@gmail.com

PLATINUM
OPEN ACCESS



Abstract: This study provides the first report of *Leptobrachium bompu* Sondhi & Ohler, 2011 from Bhutan. The species was recorded from Simkhar watershed in Jigmecholing under Sarpang District, at an elevation of 1,610m. Simkhar Stream is small and perennial, shaded and swampy, with a few moss-laden flat stones along the course, and is pollution-free and slow-flowing. The current report extends the distribution record of *L. bompu* towards the east and will help in understanding the range and conservation status of the species.

Keywords: Habitat, Jigmecholing, litter frogs, Megophryids, morphometric measurements, Simkhar watershed.

Leptobrachium bompu was described by Sondhi & Ohler (2011) from Eagle-nest Wildlife Sanctuary in Arunachal Pradesh, India. The distribution of the species was further extended to Talle Village Wildlife Sanctuary in Arunachal Pradesh (Saikia et al. 2017) and Upper Medog in Tibet, China (Liang et al. 2017). This paper presents the first report of the species in Bhutan along with information on its morphometry and habitat.

MATERIALS AND METHODS

Study area

Simkhar watershed in Jigmecholing under Sarpang District is located within 27.031–27.054 °N & 90.495–90.497 °E at an elevation ranging from 1,160–2,646 m (Fig. 1). Geographically, Simkhar watershed falls within biological corridor no. 3, which covers the corridor of Jigme Singye Wangchuck National Park (JSWNP) in the north and Royal Manas National Park (RMNP) towards the east, and runs down to Pibsoo Wildlife Sanctuary in southern Bhutan (Tenzin & Dhendup 2017; Tenzin et al. 2018). Floristically, the study area comprises subtropical broad-leaved forests at the

Megophryids are known as litter frogs and are native to warm southeastern Asian countries from the Himalayan foothills to Indonesia and Greater Sunda Islands in maritime southeastern Asia up to the Philippines (Zweifel 1998). There are currently 230 species in five genera assigned to Megophryidae Bonaparte, 1850 (Frost 2019) in the world, out of which seven species are reported from Bhutan (Wangyal 2014). The Eastern Spadefoot Toad genus *Leptobrachium* was described by Tschudi (1838) and is known to consist of 36 species (Frost 2019).

DOI: <https://doi.org/10.11609/jott.4134.11.3.13385-13389> | **ZooBank:** urn:lsid:zoobank.org:pub:FC11AF19-2649-4B9E-89D1-C62AA5F23DD4

Editor: Neelesh Dahanukar, Indian Institute of Science Education and Research (IISER), Pune, India

Date of publication: 26 February 2019 (online & print)

Manuscript details: #4134 | Received 15 March 2018 | Final received 07 February 2019 | Finally accepted 12 February 2019

Citation: Tenzin, J. & J.T. Wangyal (2019). New record of Blue-eyed Eastern Spadefoot Toad *Leptobrachium bompu* (Amphibia: Megophryidae) from Sarpang District in Bhutan. *Journal of Threatened Taxa* 11(3): 13385–13389; <https://doi.org/10.11609/jott.4134.11.3.13385-13389>

Copyright: © Tenzin & Wangyal 2019. Creative Commons Attribution 4.0 International License. JoTT allows unrestricted use, reproduction, and distribution of this article in any medium by adequate credit to the author(s) and the source of publication.

Funding: Rufford Small Grant Foundation, UK [grant no. is 15631-1].

Competing interests: The authors declare no competing interests.

Acknowledgements: The authors are grateful to Rufford Small Grant Foundation based in UK for funding conservation initiative of *Nanorana leibigii* in Simkhar River, Jigmecholing, under Sarpang District, Bhutan. Dr. L. Scott Mills, Professor at Montana University, USA; Dr. D.B. Gurung, Professor at the College of Natural Resources (CNR), RUB, and Mr. Sangay Wangchuk, UWICER, Bumthang, Bhutan are immensely acknowledged for refereeing above studies. The author is also thankful to the community of Simkhar Village for their resourceful support during the field survey, and to the reviewers for their help in manuscript refinement.



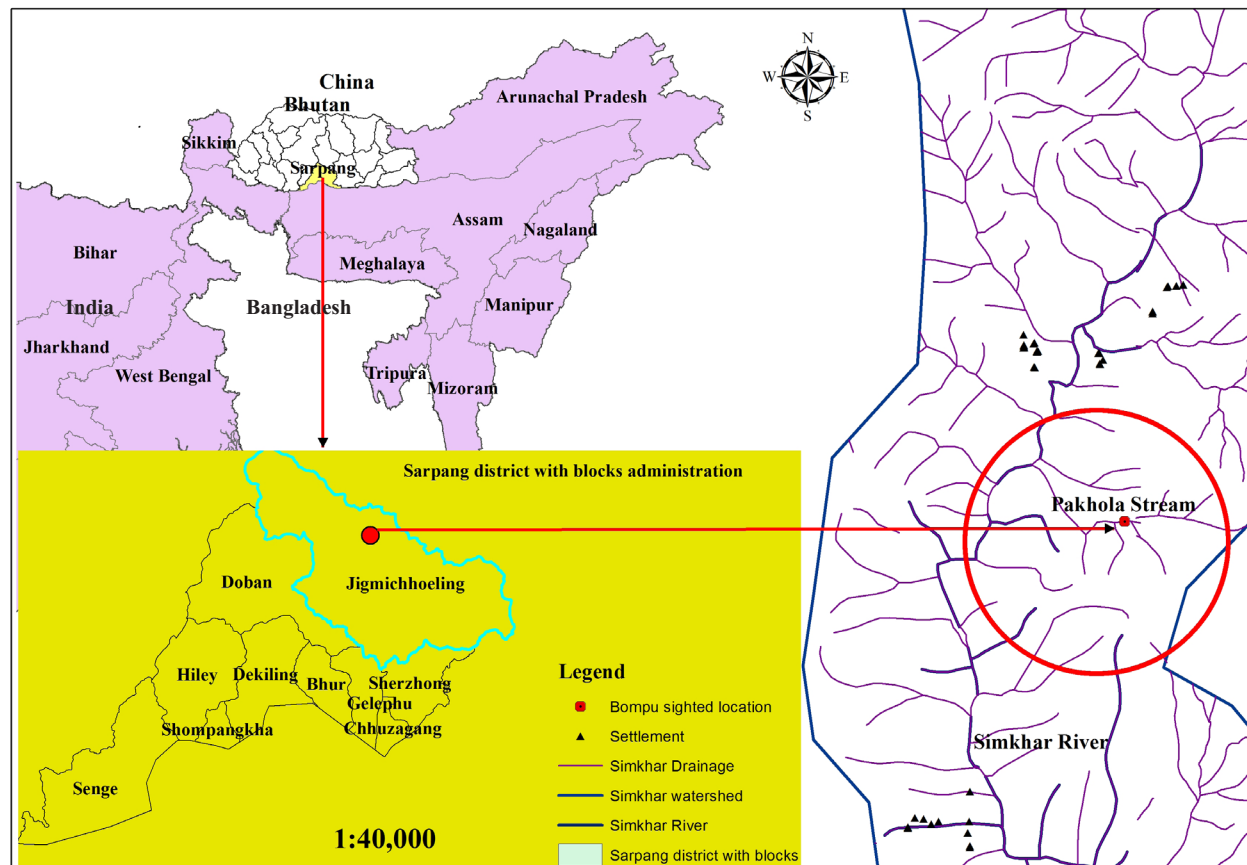


Figure 1. Spatial location of *Leptobranchium bompu* from Pakhola in Sarpang District, Bhutan.

lower altitudes (1,000–2,000 m) to warm temperate forests at the upper altitudes (2,000–2,500 m), which support diverse biologic fauna (Oshawa 1987). Besides its rich biodiversity, Simkhar River has seven major tributaries with more than 10 secondary tributaries that drain to the Mouchu River basin and finally reach the Brahmaputra in Assam.

Morphometric measurements of specimens

All morphometric measurements were taken with a digital calliper under a microscope. All the morphometric measurements used by Sondhi & Ohler (2011) based on one male specimen, Liang et al. (2017) collected from seven specimens, and one male specimen of Saikia et al. (2017) were taken for comparison. Habitat description was recorded. Abbreviations for morphometric measurements taken are provided in Table 1.

Specimen was collected following standard protocol where specimen was euthanized using 0.001% clove oil and treated in 10% formalin for short-time preservation after taking photographs when alive (Gurung et al. 2012; Tenzin & Dhendup 2017). The specimens were

deposited in the museum collection of the Laboratory of the College of Natural Resources (CNR), Lobesa, in Punakha District, Bhutan.

Abbreviations: SVL - snout vent length; EL - eye length; EN - anterior eye corner to nostril distance; HL - head length; HW - head width; IBE - distance between posterior eye corners; IFE - distance between anterior eye corners; IN - internarial distance; IUE - maximum distance between upper eyelids; MBE - posterior mandible corner to posterior eye corner distance; MFE - distance from posterior mandible corner to anterior eye corner; MN - distance from posterior corner of mandible to nostril; NS - snout tip-nostril distance; SL - snout length; UEW - maximum width of the upper eyelid; FLL - forelimb length between elbow to base of outer palmer tubercle; HAL - hand length from base of outer palmer tubercle to the tip of the third finger; TFL - length of third finger (distal part of articulation between proximal phalanges and metacarpal bone of the third finger); Fw3 - width of third finger at mid length; FFTF - distance from maximum incurvation of web between fourth and fifth toe to tip of fourth toe; FL - femur length

from vent to knee; FOL - Foot length from base of inner metatarsal tubercle to the tip of the fourth toe; FTL - fourth toe length (between distal part to the articulation between proximal phalange and metatarsal bone of the fourth toe); IMT - length of inner metatarsal tubercle; ITL - length of the inner toe; MTFF - distance between distal edge of metatarsal tubercle to maximum incurvation of the web between fourth and fifth toe; TFOL - length of tarsus and foot from the base of tarsus to the tip of fourth toe; TFTF - distance between maximum incurvation of web between third and fourth toe to tip of fourth toe; TL - length of tibia; TW - maximum width of tibia; Tw4 - width of the fourth toe at mid length.

RESULTS AND DISCUSSION

Leptobrachium bompu was known only from Bompou (27.116°N & 92.684°E; altitude 1,940m), the northernmost distribution limit of the genus

Leptobrachium (Frost 2016) (Image 1). The new discovery of *L. bompu* in Upper Medog moved the northern limit to northern latitude 29.254°N, 338km (crow-fly distance) from Bompou. A solitary *L. bompu* was spotted coincidentally during the field survey of *Nanorana leibigii* (Gunther, 1864) at Pakhola (27.034°N & 90.494°E) in Jigmecholing under Sarpang District on 26 April 2015, at an altitude of 1,610m. With this new record, Bhutan now has 57 amphibian species (Wangyal 2014). This record extends the record of the species eastward from its known range.

Pakhola is one of the primary tributaries of Simkhar River where herpetofauna are mostly prevalent due to the presence of natural lakes and swampy areas around the lake at the stream head. Many species congregate in this area, especially when there is water scarcity in winter. The area was unexplored and the richness of its biodiversity unknown until 2014 when the first presence



Image 1. *Leptobrachium bompu*. A - live view, B - ventral view, C - dorsal view. © Jigme Tenzin



Image 2. *Leptobrachium bompu* habitat. A - slow-flowing hill stream, B - moss laden rocks. © Jigme Tenzin

Table 1. Morphometric comparison among four specimens

Variables (in mm)	Specimen in current study	Specimen of Liang et al. 2017	Specimen of Saikia et al. 2017	Holotype of Sondhi & Ohler 2011
EL	6.5		6.4	6.5
EN	3.5	3.9	3.0	4.8
FFTF	9.7		8.7	9.6
FL	27.0	21.8	18.6	24.4
FLL	12.3		12.3	12.2
FOL	19.9		17.5	19.8
FTL	9.0		8.2	8.7
Fw3	1.3	2.3	0.9	1.2
HAL	12.9	15.6	10.8	12.8
HL	18.6	21.9	15.6	16.9
HW	20.0	23.6	18.2	18.8
IBE	15.4	17.0	15.4	14.0
IFE	7.9	8.9	8.1	6.3
IMT	3.2	3.4	2.3	3.0
IN	5.6	5.2	4.4	4.7
ITL	3.4	3.7	2.3	3.4
IUE	5.7	5.9	5.8	5.4
MBE	5.1	7.6	4.2	5.0
MFE	11.1	14.2	10.0	11.0
MN	13.9	17.9	13.1	13.5
MTFF	7.2		7.1	1.8
MTTF	7.1		6.8	4.3
NS	4.8	4.6	3.8	5.5
SL	7.7	8.7	7.5	7.6
SVL	44.8	51.8	42.6	47.0
TFL	7.8		7.6	6.4
TFOL	27.0	31.1	24.9	27.3
TFTF	10.5		9.1	10.4
TL	18.3	20.8	17.9	20.9
TW	5.8	6.7	4.4	5.7
Tw4	1.2	2.1	0.9	1.3
UEW	3.9	5.5	3.9	3.9

of *Nanorana leibigii* (Gunther, 1860) was recorded from Simkhar River (Tenzin & Dhendup 2017). Our current record of *L. bompu* from the same stream suggests that Simkhar watershed is likely to have rich amphibian diversity.

Habitat characteristics

Leptobrachium bompu was found under a moss-laden flat stone near a shaded and swampy, pollution-free and slow-flowing perennial stream in Pakhola (Image 2).

The habitat is on the leeward side in a wet subtropical broad-leaved forest (1,000–2,000 m) (forest types as Oshawa 1987) dominated by *Castanopsis hystrix*, *Beilschmiedia gammieana*, *Quercus lamellosa*, *Q. glauca*, *Lithocarpus elegans*, and *Syzygium formosa*. Additionally, as undergrowth, *Elatostema platyphyllum*, *Chimonobambusa callosa*, *Cephalostachyum latifolium*, and *Plectocomia himalayana* were abundant along the banks of the perennial streams. Meanwhile, the riparian area was mostly covered by bamboo thickets *Chimonobambusa callosa* and *Cephalostachyum*

latifolium, *Ligustrum confusum*, *Elatostema platyphyllum*, and *Acconogonon molle*. The streams have a total length of 1.42km, of which *L. bompu* was recorded from only one location (Image 2), which indicates the rarity of its population as per Saikia et al. (2017), WWF (2015), and Sondhi & Ohler (2011).

Sondhi & Ohler (2011) found *L. bompu* under leaf litter in small, slow-flowing perennial streams near campsites of Bompu in Eaglenest Wildlife Sanctuary, Arunachal Pradesh (27.116°N & 92.684°E at an altitude of 2,000m), while Saikia et al. (2017) recorded the species from damp and moist areas near hill streams at Pange Forest (27.546°N & 93.895°E, 1,926m) in Talle Valley Wildlife Sanctuary, Arunachal Pradesh, India. Liang et al. (2017) found seven male adults of the species from Gelin Village (29.224°N & 95.185°E, 1,600m) and Buqiong Lake (29.254°N & 95.224°E, 1,455m) in China within upper reaches of small streams (less than 1m) and tadpoles from lower reaches of two streams in broad-leaved forests. This suggests that *L. bompu* probably prefers moss-laden rocks for hiding, damp and swampy areas for sustenance, and slow-flowing hill streams for breeding and reproduction purposes, and that it can be located only during monsoons owing to its increased activity (Saikia et al. 2017).

In the current study, *L. bompu* was recorded at 1,610m, which is lower than the findings of Sondhi & Ohler (2011) and Saikia et al. (2017), but higher than Liang et al. (2017). This indicates that *L. bompu* may have an elevation range from 1,455–2,000 m, but it still requires extensive study within these geographic ranges in the future. In Bhutan, *L. bompu* was spotted from wet subtropical forests (forest type as per Oshawa 1987), while holotypes and the second specimen were spotted from the same transition forest between eastern Himalayan subtropical wet hill forest in lower altitudes and eastern Himalayan wet temperate forest at higher altitudes of Arunachal Pradesh, India (forest type as per Champion & Seth 1968). Likewise, Liang et al. (2017) also recorded the species from the broad-leaved hill streams of Medog in Tibet, China. This suggests that *L. bompu* prefers hill streams of the wet sub-tropical broad-leaved forest as its niche habitat. The rarity of this population mandates a separate study on abundance, distribution patterns, and conservation threats for adopting long-term conservation of this species.

REFERENCES

- Champion, F.W. & S.K. Seth (1968).** A Revised Survey of Forest Types of India. Government of India Press, Nasik, India, 404pp.
- Frost D. R. (2016).** Amphibian Species of the World: An Online Reference. Version 6.0 (accessed on 8th November 2016). American Museum of Natural History, New York, USA. Electronic Database accessible at <http://research.amnh.org/herpetology/amphibia/index.html>
- Frost, D.R. (2019).** Amphibian Species of the World: An Online Reference. Version 6.0. American Museum of Natural History, New York, USA. Accessed on 10 January 2019. Electronic database accessible at <http://research.amnh.org/herpetology/amphibia/index.html>
- Gurung, D.B., Ugyen & D. Tshering (2012).** Mon-paa Frog Survey Report from Mithun village (24–27 April 2012) under Dophuchen, Samtse District. Unpublished Technical Report. District Forestry Sector, Samtse, Bhutan, 30pp.
- Liang, X., W. Liu, B. Wang, L. Ding., J. Wu, F. Xie & J. Jiang (2017).** *Leptobrachium bompu* (Amphibia, Anura, Megophryidae) discovered in Upper Medog, Tibet, China with descriptions of its tadpoles, advertisement calls and systematic position. *Asian Herpetological Research* 8(2): 137–146; <https://doi.org/10.16373/j.cnki.ahr.160023>
- Oshawa, M. (1987).** Vegetation zones in the Bhutan Himalaya, pp1–71. In: Oshawa, M. (ed.). *Life Zone Ecology of the Bhutan Himalaya*. Yayoicho, Chiba University, Japan, 206pp.
- Saikia, B., B. Sinha & I.J. Kharkongor (2017).** A second record of the Eastern Spadefoot Toad (Amphibia: Anura: Megophryidae: *Leptobrachium bompu* Sondhi & Ohler, 2011) with a note on its morphological variations and natural history. *Journal of Threatened Taxa* 9(9): 10692–10696; <https://doi.org/10.11609/jott.3300.9.9.10692-10696>
- Sondhi, S. & A. Ohler (2011).** A blue-eyed *Leptobrachium* (Anura: Megophryidae) from Arunachal Pradesh. *Zootaxa* 2912: 28–36.
- Tenzin, J. & P. Dhendup (2017).** Habitat characteristics, relative abundance and conservation threats of Himalayan Bull Frogs (*Nanorana leibigii* Gunther, 1860) in primary tributaries of Simkhar River, Bhutan. *Journal of Natural Resources and Development* 4(2): 29–38; <https://doi.org/10.17102/cnr.2017.07>
- Tenzin, J., P. Dhendup, K. Choki & T. Dorji (2018).** Sarpang: At a Glance. Divisional Forest Office, Sarpang, Department of Forests and Park Services, Ministry of Agriculture & Forests, Thimphu, Bhutan, 8pp.
- Tschudi, J.J. (1838).** *Classification der Batrachier, mit Berücksichtigung der fossilen thiere dieser Abtheilung der Reptilien*. Petitpierre, Neuchatel, ii+98pp+6pl.
- Wangyal, J.T. (2014).** The status of herpetofauna of Bhutan. *Journal of the Bhutan Ecological Society* 2(1): 20–39.
- WWF (2015).** Hidden Himalayas: Asia's Wonderland - New Species Discoveries in Eastern Himalayas, Vol. II, 2009–2014 WWF Report: Living Himalayas. WWF Bhutan, Thimphu, Bhutan, 43pp.
- Zweifel, R.G. (1998).** Frogs and toads, pp.76–105. In: Cogger, H.G. & R.G. Zweifel (eds.). *Encyclopedia of Reptiles and Amphibians*. Academic Press, San Diego, 88pp.





PLATINUM
OPEN ACCESS



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

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

February 2019 | Vol. 11 | No. 3 | Pages: 13251–13418

Date of Publication: 26 February 2019 (Online & Print)

DOI: 10.11609/jott.2019.11.3.13251-13418

www.threatenedtaxa.org

Articles

'Non-protected' primates as bushmeat, pets and pests in southeastern Democratic Republic of Congo

– Paul Kaseya Kazaba, Pp. 13251–13260

Diversity, structure and natural history of amphibians in the upper Claro River basin, a buffer zone of the National Natural Park Los Nevados, Central Cordillera of Colombia

– Julián Andrés Rojas-Morales & Mateo Marín-Martínez, Pp. 13261–13277

Communications

Medium and large-sized mammals in an Atlantic Forest fragment of Brazil: recording of threatened species

– Vinícius Nunes Alves, Caroline Marques Maia, Telma Regina Alves & Renata Cristina Batista Fonseca, Pp. 13278–13286

Nuisance behaviors of macaques in Puerto Princesa Subterranean River National Park, Palawan, Philippines

– Lief Erikson Gamalo, Joselito Baril, Judeline Dimalibot, Augusto Asis, Brian Anas, Nevong Puna & Vachel Gay Paller, Pp. 13287–13294

Current data on the reproduction of Four-horned Antelope *Tetracerus quadricornis* in zoological parks

– Gérard Dubost, Stéphane Labes & Armelle Lutz, Pp. 13295–13303

Characterization of dorsal guard hair of the wild goats and sheep (Bovidae: Caprinae) occurring in the Himalaya and Western Ghats of India

– Manokaran Kamalakannan, Pp. 13304–13309

Rediscovery of the 'extinct' bee *Hesperocolletes douglasi* Michener, 1965 (Colletidae: Colletinae: Paracolletini) in Western Australia and first description of the female

– Juliana Pille Arnold, Mark V. Murphy, Raphael K. Didham & Terry F. Houston, Pp. 13310–13319

Butterflies of the myristica swamp forests of Shendurney Wildlife Sanctuary in the southern Western Ghats, Kerala, India

– Prabhakaran Chandrika Sujitha, Gopal Prasad & Kalesh Sadasivan, Pp. 13320–13333

Pollination ecology of three ecologically valuable carpetweed herbs, *Mollugo cerviana*, *M. nudicaulis* and *M. pentaphylla* (Molluginaceae)

– Maddala Sulakshana & Aluri Jacob Solomon Raju, Pp. 13334–13349

Sacred groves: a traditional way of conserving plant diversity in West Midnapore District, West Bengal, India

– Uday Kumar Sen, Pp. 13350–13359

Review

Media reporting on the protected areas in Maharashtra, India: a thematic analysis

– Trupthi Narayan & Pankaj Sekhsaria, Pp. 13360–13376

Short Communications

Avian survey in tourist sites near Putao in northern Myanmar

– Alexey E. Scopin, Vladimir N. Sotnikov, Dmitry V. Skumatov & Alexey A. Sergeev, Pp. 13377–13384

New record of Blue-eyed Eastern Spadefoot Toad *Leptobrachium bompu* (Amphibia: Megophryidae) from Sarpang District in Bhutan

– Jigme Tenzin & Jigme Tshelthrim Wangyal, Pp. 13385–13389

New record of Low's Flatfaced Longhorn Beetle *Sarothrocerus lowii* White, 1846 (Coleoptera: Cerambycidae: Lamiinae: Lamiini) in Nagaland, India, along with first-time descriptions of male and female genitalia

– Kolla Sreedevi, Manisha Sharma & Hemant Vasant Ghatge, Pp. 13390–13394

On the rediscovery of *Onychomesa susainathani*, an emesine bug endemic to India (Heteroptera: Reduviidae: Emesinae)

– Hemant Vasant Ghatge & Balasaheb Sarode, Pp. 13395–13401

First record of the callianassid ghost shrimp *Neocallichirus jousseumei* (Nobili, 1904) (Decapoda: Axiidea) from India

– Imtiaz Belem, Pares Poriya & Bharatsinh Gohil, Pp. 13402–13405

New distribution records of four species of crop wild relatives to India

– K. Pradheep, K. Joseph John, G.D. Harish, S.M. Sultan, I. Jaisankar, K. Naveen, S.P. Ahlawat & Manish Kanwat, Pp. 13406–13414

Note

Animal-fungal interactions 3: first report of mycophagy by the African Brush-tailed Porcupine *Atherurus africanus* Gray, 1842 (Mammalia: Rodentia: Hystricidae)

– Todd F. Elliott, Camille Truong, Olivier Séné & Terry W. Henkel, Pp. 13415–13418

Partner



صندوق محمد بن زايد
للمحافظة على
الكائنات الحية

The Mohamed bin Zayed
SPECIES CONSERVATION FUND

Member



Publisher & Host

