

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.

## Journal of Threatened Taxa

Building evidence for conservation globally

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

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

### COMMUNICATION

#### A NEW SPECIES OF SHIELDTAIL SNAKE (SQUAMATA: UROPELTIDAE: *UROPELTIS*) FROM THE BENGALURU UPLANDS, INDIA

S.R. Ganesh, K.G. Punith, Omkar D. Adhikari & N.S. Achyuthan

26 May 2021 | Vol. 13 | No. 6 | Pages: 18508–18517

DOI: [10.11609/jott.6736.13.6.18508-18517](https://doi.org/10.11609/jott.6736.13.6.18508-18517)



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)

For reprints, contact [<ravi@threatenedtaxa.org>](mailto: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.

Member



Publisher & Host





## A new species of shieldtail snake (Squamata: Uropeltidae: *Uropeltis*) from the Bengaluru uplands, India

S.R. Ganesh<sup>1</sup>, K.G. Punith<sup>2</sup>, Omkar D. Adhikari<sup>3</sup> & N.S. Achyuthan<sup>4</sup>

<sup>1</sup> Chennai Snake Park, Rajbhavan Post, Chennai, Tamil Nadu 600022, India.

<sup>2</sup> WeRoar (Wild Animal Emancipation Reptile Oriented Awareness & Rescue), Tumkur, Karnataka 572102, India.

<sup>3</sup> Natural history collections, Bombay Natural History Society, Hornbill House, S.B.S. Road, Mumbai, Maharashtra 400023, India.

<sup>4</sup> Center for Ecological Sciences, Indian Institute of Science, Bengaluru, Karnataka 560012, India.

<sup>1</sup>snakeranglerr@gmail.com (corresponding author), <sup>2</sup>punith.kg04@gmail.com, <sup>3</sup>proahaetulla@gmail.com, <sup>4</sup>peltopel@gmail.com

**Abstract:** A new species of shieldtail snake, *Uropeltis jerdoni*, is here described based on eight specimens from Devarayana Durga and Nandi Durga that are under-researched hills near Bengaluru in southern India. The new species is a member of the *Uropeltis ceylanica* group that can be distinguished from related taxa as follows: a truncate and flattened caudal shield with a circumscribed concave disc; part of rostral visible from above subequal to its distance from frontal; rostral partially separating nasal scales; 17: 17: 17 dorsal scale rows; 140–148 ventral scales; 7–9 pairs of subcaudals; dark blackish-grey above, powdered with minute yellow specks, yellow lateral stripes on neck and tail; ventrolateral region with yellow mottling; venter black. This new species is currently known only from two ranges Devarayana Durga and Nandi Durga but judging by the presence of similar, adjacent massifs, is hypothesized to be present in nearby hillocks surrounding Bengaluru City.

**Keywords:** Allopatry, colouration, Devarayana Durga, Nandi Durga, peninsular India, scalation, *Uropeltis jerdoni* sp. nov.

**ZooBank:** urn:lsid:zoobank.org:pub:5165B01C-B278-45D3-AAACD-C540D260D02F

**Editor:** Anonymity requested.

**Date of publication:** 26 May 2021 (online & print)

**Citation:** Ganesh, S.R., K.G. Punith, O.D. Adhikari & N.S. Achyuthan (2021). A new species of shieldtail snake (Squamata: Uropeltidae: *Uropeltis*) from the Bengaluru uplands, India. *Journal of Threatened Taxa* 13(6): 18508–18517. <https://doi.org/10.11609/jott.6736.13.6.18508-18517>

**Copyright:** © Ganesh et al. 2021. 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:** None.

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

**Author details:** DR. S.R. GANESH is the Deputy Director and Scientist at the Chennai Snake Park, conducting research on reptiles and amphibians of southern India. His research themes include documenting the diversity of under-explored ecoregions, updating and refining species characterizations, and elucidating modern-day distribution patterns with respect to southern India's herpetofauna. K.G. PUNITH is a wildlife conservationist, who runs the non-governmental organization WEROAR (Wild Animal Emancipation Reptile Oriented Awareness and Rescue). The organization is creating awareness about nature conservation among Tumkuru (Karnataka, India) public and is also working towards the mitigation of human-wild animal conflicts in the same area. OMKAR D. ADHIKARI is a Junior research fellow in Bombay Natural History Society (BNHS) Museum, working on digitization and maintenance of the natural history collections. His special interest lies in the taxonomy, life history evolution, diversity, ecology, and biogeography of the reptiles in India and Southeast Asia. ACHYUTHAN N. SRIKANTHAN is a researcher with the Centre for Ecological Sciences, Indian Institute of Science, Bangalore studying the systematics, biogeography, ecology of herpetofauna, as well as ecomorphology, evolutionary osteology and specialized integument microstructure characterization of reptiles. Has now initiated his Ph.D. at the Clark University, USA.

**Author contributions:** SRG led the diagnosis of the new species against the comparative materials that he had examined and wrote the manuscript with inputs from NSA and ODA. KGP led the field work and gathered data from the live uncollected specimen and photo-documented the subjects. ODA examined and scored morphological details of historical paratypes and cross-checked data from the recent type specimens, while registering them with the museum. NSA conducted the field surveys and roadkill specimen collections, examined the type specimens and scored morphological details. All authors equally contributed in fine tuning and refining the draft and approved the final version.

**Acknowledgements:** We are grateful to our respective organisations for encouraging our research activities – the executive chairman and board of trustees of the Chennai Snake Park Trust (CSPT), the KS Lab, Drs. Kartik Shanker, S.P. Vijayakumar and all the lab members at the Centre for Ecological Sciences (CES, IISc) and the director and curator of the Bombay Natural History Society (BNHS). SRG thanks Raghunath R Belur & Sugandhi Gadadhar for kindly sharing photos of Nandi Durga and S.D. Gnanaolivu for help with articles on the flora of Nandi Durga. Thanks are due to Smriti Iyer, for helping with the camera and to Drs. Sujay and Nikita for putting us in touch, thereby being instrumental for our collaboration on this and our other joint works.



## INTRODUCTION

Snakes of the family Uropeltidae Müller, 1832 are an under-researched group of small and unassuming fossorial snakes from the Indian subcontinent (Beddome 1886; Smith 1943; Rajendran 1985; Whitaker & Captain 2004; Wallach et al. 2014). The genus *Uropeltis* Cuvier, 1829 currently consists of 25 species occurring in the hills of peninsular India (Pyron et al. 2016; Jins et al. 2018; Ganesh & Achyuthan 2020). The first species in this genus that was described was *Uropeltis ceylanica* Cuvier, 1829, a species that is currently considered to be a complex (Gower et al. 2008; Ganesh et al. 2014) and with an erroneous type locality 'Ceylon' that is outside the known distribution of the species (see Pyron et al. 2016). Of late, two species *U. bicatenata* (Günther, 1864) and *U. shorttii* (Beddome, 1863) previously considered invalid were resurrected and one species *U. madurensis* (Beddome, 1878) that was previously considered a subspecies, was elevated to a full species rank (see Gower et al. 2008; Ganesh et al. 2014). In recent times, two new species *Uropeltis bhupathyi* Jins, Sampaio, Gower, 2018 and *Uropeltis rajendrani* Ganesh & Achyuthan, 2020 were described from the Western Ghats and the Eastern Ghats, respectively (Jins et al. 2018; Ganesh & Achyuthan 2020).

These snakes, owing to their naturally-patchy distribution and high beta diversity, that is a diversified multi-species assemblage of fauna constituted by each having a small, typically non-overlapping distribution range, resulting in turn-over among hill ranges (sensu Socolar et al. 2016), were hypothesized to be potential model organisms for evolutionary studies in the Indian peninsula (Cadle et al. 1990; Bossuyt et al. 2004; Ganesh 2015; Pyron et al. 2016). Molecular phylogenetic studies reveal that this genus of snakes radiated rapidly and recently during early Miocene, some 20 million years ago (Cyriac & Kothandaramiah 2017). Despite these works, the fact is that our current understanding of the diversity and distribution of the genus *Uropeltis* remains incomplete. Here, we describe a new species of *Uropeltis* representing an in nominate population from a locality that is previously-unsampled for shieldtail snakes, a hill-dominated region situated around Bengaluru City that is recently recognised as an important area for herpetological diversity and endemism (see Agarwal et al. 2019).

## MATERIALS & METHODS

The current work is based on our examination of 39 preserved specimens (representing 16 congeners) and the type specimens as well as live uncollected specimens of the new species that is described herein. During our expeditions in the uplands of Bengaluru, we came across three specimens (two dead, one alive) that we could assign to the genus *Uropeltis* sensu Pyron et al. (2016) in lacking mental groove, supraocular, postocular or temporal scales and having a dorso-ventrally depressed tail with a scaly caudal disc. The road kill specimens were noticed having apparent breakage of certain scales in the ventral aspect and indentations in parts of their trunk suggesting a run over by a small vehicle. During our perusal of uropeltid collections in the Bombay Natural History Society Museum, we came across six historical specimens that fully match with the new species. We photographed the subjects using high resolution digital cameras. We scored morphological details like scalation, measurements and colour patterns with the help of magnifying hand lenses (5 X optical zoom). We measured the preserved specimens using vernier calipers (LC 0.1 mm) except for snout-vent length that was measured with a standard measuring tape (LC 1 mm). We followed Smith (1943) for definition and terminology of morphological characters, except for ventral scales for which Gower & Ablett (2006) counting method was followed. Symmetrical head scalation values were given in left / right order. Dentition characters were scored by counting one half (lateral side) of both the upper jaw (maxillary) and the lower jaw (mandibular/dentary). Teeth were counted by manually opening the preserved specimen's mouth and inserting a cotton plug. Counts were done viewing through a Celestron 20–200 X zoom magnification illuminated microscope. A linear incision in the subcaudal was done on the preserved specimens to check for genitalia. Comparisons and differential diagnosis are provided based on the series of preserved voucher specimens in collections that we examined (see Appendix 1) and also on our perusal of original description papers and subsequent taxonomic treatises (see literature cited). The new species belongs to Smith's (1943) Group II, in having an obliquely truncate tail, terminating in a thickened, circumscribed, concave caudal disc covered with multicarinate scales (see Smith 1943). Comparisons are presented as differential diagnosis, following the pattern in works on the genus *Uropeltis* by Ganesh et al. (2014) and Ganesh & Achyuthan (2020). Museum abbreviations are as follows: CSPT—Chennai Snake Park Trust, Chennai, India;



CESS—Centre for Ecological Sciences / Snakes, Indian Institute of Sciences, Bengaluru, India; BNHS—Bombay Natural History Society, Mumbai, India; MAD—Madras Government Museum, Chennai, India.

## TAXONOMY

### *Uropeltis jerdoni* sp. nov.

#### Jerdon's Shieldtail Snake

(Image 1A–G, 3A–B)

urn:lsid:zoobank.org:act:5F121750-8547-4429-8E9E-49D618D31F89

**Holotype:** BNHS 3562, adult female, a rather intact roadkill near village, coll. KGP and NSA in January 2020.

**Type locality:** Devarayana Durga (13.371°N, 77.210°E; 1,060 m) in Tumkur District, Karnataka, India.

**Paratypes (n= 7):** BNHS 3563, adult female, animal in early ecdysis, same data as holotype; BNHS 216 a–b, BNHS 217 a–b, BNHS 218 a–b, coll. Frank Wall from Nandi Durga (13.370°N, 77.681°E; 1,470 m) in Chikballapur District, Karnataka, India; coll. date unknown.

**Referred specimen (n= 1).** One live uncollected adult, sex unknown, same data as holotype.

**Etymology:** Patronym named in genitive singular case, honouring Thomas Caverhill Jerdon (1811–1872), a pioneering English naturalist who described some of the earliest reptiles from the Bengaluru uplands.

**Diagnosis:** A species of *Uropeltis* known from the Bengaluru uplands, characterized by the following combination of characters: caudal shield truncate, with a distinct thickened circumscribed concave disc; part of rostral visible from above subequal to its distance from frontal; rostral scale partially separating nasal scales; snout fairly pointed, subovoid; eye diameter  $\frac{3}{4}$ <sup>th</sup> that of ocular shield; supralabials 4; infralabials 3–4; dorsal scale rows 17:17:17; ventral scales 140–148; subcaudal scales 7–9 pairs; dorsum dark blackish-grey overall with minute yellow speckling; an yellow stripe on either sides on neck and tail; ventrolateral region distinctly mottled with yellow; venter uniform dark blackish-grey, rarely with a few yellow dots.

### Description of holotype

**Habitus:** A fairly small but thick-set and robust shieldtail snake; forebody mildly thicker than the rest of trunk; head not evident, narrower than neck; snout fairly pointed in profile, subovoid; eyes large,  $\frac{3}{4}$  the size of ocular scale; tail with a distinctive flat, thickened, circumscribed disc.

**Measurements in mm:** snout to vent length 186.2;

tail length 11.1; maximum body width 7.1; head length 7.7; head width 4.6; head depth 3.8; internarial distance 1.26; interorbital distance 2.81 at the front of the ocular and 3.41 at the rear of the ocular; eye to snout tip distance 3.67; eye to lip distance 1.12; snout-parietal distance 3.0; posterior end of rostral to posterior end of parietal distance 5.14; tail shield length 9.91; tail shield width 6.12; tail shield depth 3.67; parietal scale length 3.32; parietal scale width 2.71; frontal scale length 1.45; frontal scale width 1.78; ocular scale length 1.41; prefrontal scale length 1.17; midbody ventral scale width 1.33; midbody basal coastal scale width 2.31.

**Scalation:** Rostral visible from above, partly dividing nasals, anteriorly, but posteriorly in contact with one another, behind rostral; part of rostral visible from above subequal to its distance from frontal; nostril piercing nasal, pointed towards rostrum and first supralabial; nasals slightly smaller than prefrontal; ocular scale slightly smaller than nasal and/ or prefrontal; frontal hexagonal, longer than broad; broader anteriorly, posteriorly produced towards a tapering point, wedged deeper within the midline contact of parietals; parietals large, as large as distance between snout tip and anterior end of frontal; ocular scale separating contact between prefrontal and parietal; ocular, in contact with frontal; supralabials 4/4, first supralabial the smallest of all head scales, rectangular; second supralabial subequal to rostral, higher than broad; third supralabial broader than high, higher anteriorly, shorter posteriorly; fourth supralabial the largest, subequal to frontal, smaller than parietal; infralabials 3/4, first infralabial large, second the largest, third/ fourth ones small and elongate; scales overall smooth and glossy, imbricate, cycloid; dorsal scale rows: 17: 17: 17; ventrals 146, 1.5 times as wide as adjacent scale rows; anal scale paired, subequal to ventral scale but larger than subcaudal scale; subcaudals 9, paired; caudal scales across length of tail shield 8; caudal scales across width of tail shield 4; caudals scales with 2–5 keels per scale; tail shield ending with two projecting spurs.

**Colouration:** Dorsum lustrous dark blackish grey overall; anterior end (head, neck) with a brownish tinge, while the posterior end (tail shield) steely bluish-black; dorsum with very fine, scarce yellow powdering all along the trunk from head to near pre-cloacal region; tail and tail shield devoid of yellow patterning above; a distinct pair of yellow ventrolateral stripes from snout tip till tail shield; the yellow stripes rather evident from infralabials till neck, from where onwards the yellow colouration becomes restricted only to scale borders of the last rows of coastal scales; the central part of coastal scales and



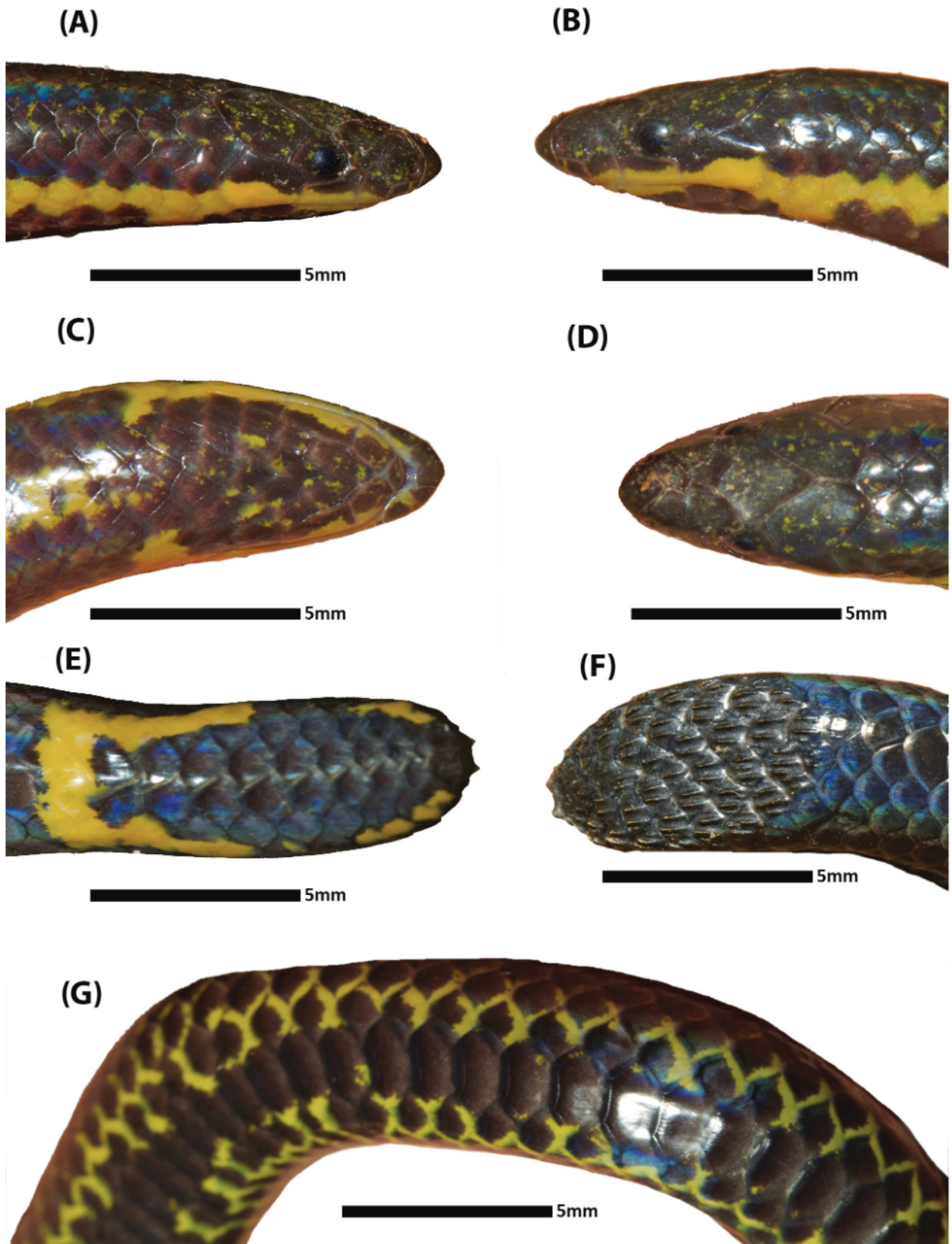


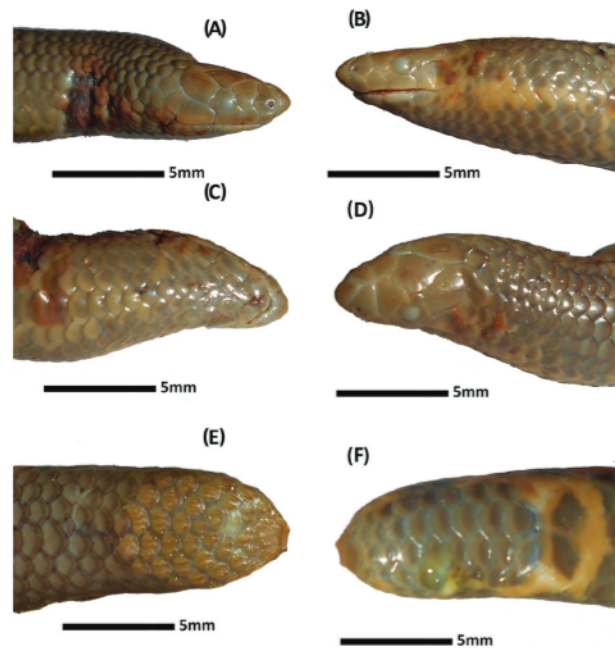
Image 1. Profiles of Holotype BNHS 3562 of *Uropeltis jerdoni* sp. nov.: A—head left view | B—head right view | C—head ventral view | D—head dorsal view | E—tail ventral view | F—tail dorsal view | G—close up of ventral scales. © N.S. Achyuthan.

almost whole of the ventral scales totally black, rarely with any yellow intrusions; thick yellow stripes along subcaudals that widen and meet across the anal shield; tongue dark reddish-brown, darker at the tips; iris black.

**Dentition:** On each side of the jaw, eight maxillary (upper jaw) teeth and five mandibular or dentary (lower jaw) teeth present; teeth conical, visibly curved inwards, uniform in size throughout, except for the two front-most teeth that are slightly smaller; diastema absent.

**Variation shown by paratypes:** Agreeing well with the holotype in general and showing the following intraspecific variations: dorsal scale rows 17:17:17; supralabials 4; infralabials 3/4; ventrals 143–148; subcaudals 7–9; snout to vent length 147–201 mm; tail length 8–13 mm; maximum body width 5.2–7.0 mm; head length 7.0–8.8 mm; head width 3.0–4.3 mm; head depth 3.1–4.1 mm; internarial distance 1.2–1.9 mm; interorbital distance 2.9–3.4 mm front, 3.2–3.7 mm back; eye to snout tip distance 3.0–3.9 mm; eye to lip distance 1.0–1.1 mm; snout-parietal distance 2.8–4.9 mm; posterior end of rostral to posterior end of parietal distance 4.1–5.8 mm; tail shield length 7.3–9.3 mm; tail shield width 4.8–5.9 mm; tail shield depth 3.4–5.1 mm; parietal scale length 2.0–3.5 mm; parietal scale width 1.4–2.8 mm; frontal scale length 1.5–3.7 mm; frontal scale width 1.6–2.9 mm; ocular scale length 1.0–2.1 mm; prefrontal scale length 1.2–1.5 mm; midbody ventral scale width 2.1–3.9 mm; midbody basal coastal scale width 1.1–1.8 mm. Because the paratype from Devarayana Durga was still in ecdysis, its colouration differed to a more brownish than dark blackish colouration overall. The paratypes from Nandi Durga were understandably paler and less intense in colouration, due to long years of preservation. They had overall dull brown body colour with straw yellow side stripes and ventral patches. One historical paratype, BNHS 216a has left lower jaw and right temporal damaged and torn off. All the historical paratypes had posterior parts of underside incised.

**Distribution and Natural History:** *Uropeltis jerdoni* sp. nov. is a poorly-known snake, as this is a so-far unsampled population about which published literature has not dealt with (see Pyron et al. 2016 and references therein). Though Wall had collected this species from “Nandydug” (=Nandi Durga), historical literature during or after Wall’s time (e.g., Smith 1943), never stated the occurrence of any uropeltids near about Bengaluru, except *U. ellioti* that belongs a different species group. The holotype and one paratype were roadkills recently collected from the Ghat road of a hill fort temple – Devarayana Durga. These snakes would have probably been killed the previous night by vehicle plying on the



**Image 2.** Profiles of Paratype BNHS 3563 of *Uropeltis jerdoni* sp. nov.: A—head left view | B—head right view | C—head ventral view | D—head dorsal view | E—tail dorsal view | F—tail ventral view. © O.D. Adhikari.



**Image 3.** *Uropeltis jerdoni* sp. nov. Profiles of Holotype BNHS 3562: A—entire dorsal view | B—entire ventral view; Profiles of Paratype BNHS 3563: C—entire dorsal view | D—entire ventral view. © O.D. Adhikari.

ghat road. A live uncollected adult of unknown sex, measuring about 250 mm total length was sighted in an earthworm farm at the type locality. The snake was dug out from underneath the soil surface by the





© Suchismita Sahu

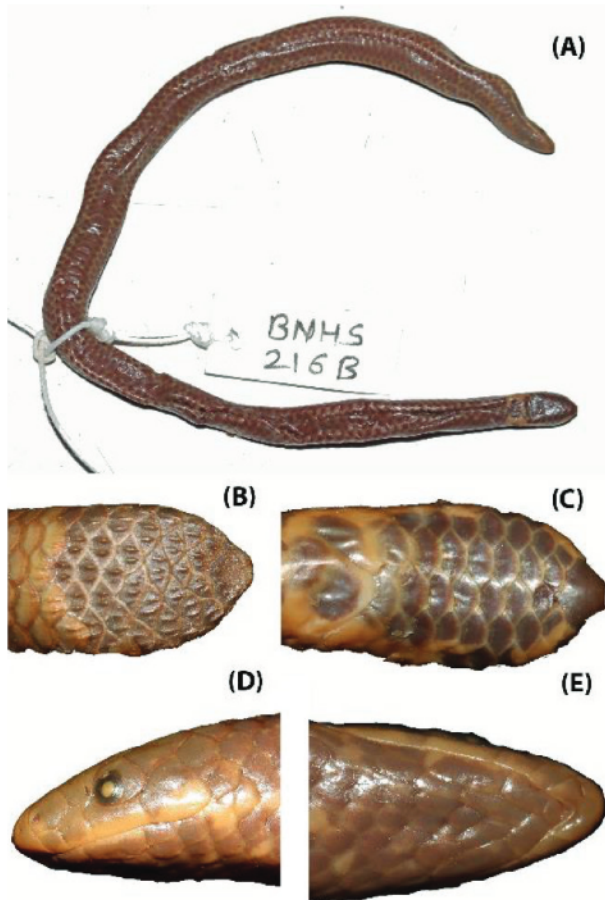
Image 4. Entire view of a live uncollected topotypical adult *Uropeltis jerdoni* sp. nov. showing life colouration and general appearance.

workmen when we authors (PKG and NSA) were present to document biodiversity. The snake was inoffensive and tried to dig underground when exposed and during photography. It had blue-black dorsum; ventrolateral yellow reticulations; black venter; concave, circumscribed tail disc; scale rows 17:17:17; 143 ventrals; paired anal scale; nine pairs of subcaudals, thereby matching in morphology with the preserved specimens. To the best of our knowledge, the only other uropeltid snake sympatric with the new species is *Uropeltis* cf. *elliotti* (Gray, 1858), a distinctly reddish-brown coloured species with evident, convexly-rounded tail shield (Group I of Smith 1943) having a large yellow spot on tail tip (also see Whitaker & Captain 2004; Pyron et al. 2016). The distribution range of *Uropeltis jerdoni* sp. nov. is a mix of deciduous vegetation distributed within a sprawl of predominantly rocky boulder-dominated hilly terrain (Boraiah & Fathima 1970; Bhaskar & Kushalappa 1995), currently known from two peaks north of Bengaluru – Devarayana Durga and Nandi Durga that are 40 airline km apart. *Uropeltis jerdoni* sp. nov. is hypothesized to be a primarily nocturnal, worm-eating, viviparous, fossorial snake that is particularly active during rain, like most members of its family (Rajendran 1985).

**Comparisons and differential diagnosis:** The new species is here compared with the 25 recognized species of *Uropeltis* from India (see Pyron et al. 2016; Jins et al. 2018; Ganesh & Achyuthan 2020). By having

an obliquely truncate tail terminating in a thickened, circumscribed, concave caudal disc covered with multicarinate scales, *Uropeltis jerdoni* sp. nov. differs from the following 14 species: *U. bhupathyi*, *U. elliotti*, *U. nitida*, *U. ocellata*, *U. dindigalensis*, *U. beddomei*, *U. macroryncha*, *U. woodmasoni* (Group-I tail shield of Smith 1943), *U. grandis*, *U. maculata*, *U. petersi*, *U. liura*, *U. pulneyensis* (Group-III tail shield of Smith 1943). Further, *Uropeltis jerdoni* sp. nov. also differs from the remaining congeners (after Gower et al. 2008; Ganesh et al. 2014; Ganesh & Achyuthan 2020) with a thickened, circumscribed, caudal shield categorized under Smith's (1943) Group II A & B as follows (only opposing suite of character states listed): *U. arcticeps* (southern Western Ghats): dorsal scales lacking a clearly defined yellow scale border; ventral scale counts much lower (127–128); *U. bicatenata* (northern Western Ghats): yellowish scalloping chain-like pattern across both sides of the body; ventral scale count 130–141; *U. broughami* (southern Western Ghats): 19 midbody scalerows; rostral scale much produced and ridged with a dorsal keel; dorsum brown with distinct small, yellow-black-edged transverse ocelli; ventral scale counts much higher (181–230); *U. ceylanica* s. auct. (Western Ghats): anterior dorsum without distinct yellow spots; venter lacking a clearly defined brownish scale border; ventral scale counts much lower (119–146; 130 in holotype – Gower et al. 2008); *U. macrolepis* complex





**Image 5.** Historical paratypes of *Uropeltis jerdoni* sp. nov.: A—BNHS 216b entire view | B—BNHS 217b tail dorsal | C— BNHS 217b ventral views | D—BNHS 218b head lateral | E— BNHS 218b head ventral. © O.D. Adhikari.

(northern Western Ghats): 15 midbody scalerows; lower ventral scale counts (120–140); dorsum blackish-brown with yellow broken spots forming zig-zag crossbars or annuli or a pair of distinct, thick, yellowish-orange paravertebral stripes extending across most of the body except near neck, where there are two large orange spots; *U. madurensis* (southern Western Ghats): snout much more rounded in profile; body colour rich brown, dorsal scales with a clearly defined yellow scale border throughout the back, giving a yellow-reticulated appearance; no ventrolateral yellow reticulations, but ventrals with large alternating yellow blotches; ventral scale count 144–157; *U. myhendrae* (southern Western Ghats): dorsum with brownish-black body, each scale with yellowish posterior border forming more or less complete band or annuli; part of rostral visible from above distinctly longer than its distance from frontal; ventral scales 139–156; *U. phipsoni* (northern Western Ghats): a pair of yellowish lateral streaks along both



**Image 6.** Devarayana Durga, the type locality of *Uropeltis jerdoni* sp. nov. showing the rocky hillocks, the vegetation type and the presence of buildings, roads, and tourism. © K.G. Punith.



**Image 7.** Nandi Durga, another locality of *Uropeltis jerdoni* sp. nov. showing the general view of landscape and contemporaneous habitats. © Raghunath R. Belur & Sugandhi Gadadhar.

sides of the body; part of rostral visible from above distinctly longer than its distance from the frontal; ventral scales 138–157; *U. rajendrani* (southern Eastern Ghats): ventrals 146–158; rounded snout profile; body deep ochre brown; presence of yellow colouration in the ventral scales; part of rostral visible from above, not much longer than its distance from frontal; *U. rubromaculata* (southern Western Ghats): presence of two large red caudal spots; much lower ventral counts (127–136); *U. rubrolineata* (southern Western Ghats): presence of two ventrolateral red stripes; much higher ventral counts (165–172); *U. shorttii* (southern Eastern Ghats, allopatric): dorsal body brownish or bluish-black, with distinct yellowish annuli or crossbars; ventral scales 137–156.



Image 8. Physical map of southern India, depicting the distribution of *Uropeltis jerdoni* sp. nov.: Devarayana Durga (type locality)—filled circle | Nandi Durga—open circle.

## DISCUSSION

*Uropeltis jerdoni* sp. nov. is the 26<sup>th</sup> species of *Uropeltis* to be described. Recent descriptions of *Uropeltis* were either from the Western Ghats (Jins et al. 2018) or the Eastern Ghats (Ganesh & Achyuthan 2020). But in the present case, *Uropeltis jerdoni* sp. nov. is described from the intervening region – the Bengaluru uplands, that is flanked by both the Western and the Eastern Ghats on either sides. In fact, the only species of shieldtail snake known from regions in India apart from the Western Ghats and the Eastern Ghats, is the

apparently ‘widespread’ *U. ellioti* (Gray, 1858) reported from most of the hilly areas across the Indian peninsula (Smith 1943; Whitaker & Captain 2004). Thus, *Uropeltis jerdoni* sp. nov. is a previously unsampled new species of shieldtail snake that has not been reported in literature under any incorrect names. This is in contrast to *U. bhupathyi* that was long-thought to be and misreported in literature as *U. ellioti* (see Jins et al. 2018).

*Uropeltis jerdoni* sp. nov. is described based on two, recently preserved, female road-kills (holotype and paratopotype), six historically-collected specimens and one uncollected, unsexed, live individual (referred



material). These materials originate from two, nearby (40 airline km apart) hill ranges – Devarayana Durga (type locality) and Nandi Durga. Shieldtail snakes, especially the diverse genus *Uropeltis* is a radiation of cryptic species (Cyriac & Kodandaramiah 2017), with each of the constituent species displaying very subtle morphological variations (Gower et al. 2008; Ganesh et al. 2014; Jins et al. 2018; Ganesh & Achyuthan 2020) and occupying small, allopatric geographic ranges (Pyron et al. 2013; Ganesh 2015). In the case of *U. jerdoni* sp. nov. its nearest related congeners are *U. shorttii* of Shevaroy that is 200 airline km south off Devarayana Durga-Nandi Durga and *U. ceylanica* s. lat. of the equally-distant Malnad part of the Western Ghats.

The localities where *Uropeltis jerdoni* sp. nov. has been recorded, the Bengaluru uplands, is poorly inventoried for biodiversity, especially herpetofauna. T.C. Jerdon was perhaps the foremost naturalist to explore the area in and around Bengaluru, when he described a new gecko *Cnemaspis mysoriensis* (Jerdon, 1853), over 165 years ago. *Uropeltis jerdoni* sp. nov. is a humble tribute to his pioneering efforts to inventory and describe the reptiles of Bengaluru. In recent times, five more new reptiles were described from places near Bengaluru—*Hemidactylus graniticolus* from Harohalli (Agarwal et al. 2011), *Hemidactylus whitakeri* from Kodalagurki (Mirza et al. 2018), *Cyrtodactylus srilekhae* from Thathaguni (Agarwal 2016), *Hemiphyllodactylus jnana* from Kodigehalli (Agarwal et al. 2019), and a snake *Lycodon deccanensis* from the same Devarayana Durga (Ganesh et al. 2020). These works well indicate that further explorations around Bengaluru would reveal further reptile diversity, endemism and novelties. As for the genus *Uropeltis*, the recent taxonomic research and increase in diversity hints that more studies in this and other genera of uropeltid snakes will add to the growing body of literature on their increased taxonomic diversity.

## REFERENCES

- Agarwal, I., V.B. Giri & A.M. Bauer (2011). A new cryptic rock-dwelling *Hemidactylus* (Squamata: Gekkonidae) from south India. *Zootaxa* 2765: 21–37.
- Agarwal, I. (2016). Two new species of ground-dwelling *Cyrtodactylus* (*Geckoella*) from the Mysore Plateau, south India. *Zootaxa* 4193(2): 228–244. <https://doi.org/10.11646/zootaxa.4193.2.2>
- Agarwal, I., A. Khandekar, V.B. Giri & U. Ramakrishnan (2019). The hills are alive with geckos! A radiation of a dozen species on sky islands across peninsular India (Squamata: Gekkonidae, *Hemiphyllodactylus*) with the description of three new species. *Organisms, Diversity & Evolution* 19: 341–361. <https://doi.org/10.1007/s13127-019-00392-5>
- Beddome, R.H. (1863). Further notes upon the snakes of the Madras Presidency; with descriptions of new species. *Madras Quarterly Journal of medical Science* 6: 41–48.
- Beddome, R.H. (1886). An account of the earth-snakes of the peninsula of India and Ceylon. *Annals and Magazines of Natural History* 17(5): 3–33.
- Bhaskar, V. & C.G. Kushalappa (1995). Dendroflora of Tumkur District, Karnataka. *Myforest* 31: 41–50.
- Boraiah, G. & T. Fathima (1970). *Some aspects of vegetation at Nandi hills*. Research Publication Series, University of Agricultural Sciences, Bangalore 7: 22pp.
- Cyriac, V.P. & U. Kodandaramiah (2017). Paleoclimate determines diversification patterns in the fossorial snake family Uropeltidae Cuvier, 1829. *Molecular Phylogenetics and Evolution* 116: 97–107. <https://doi.org/10.1016/j.ympev.2017.08.017>
- Ganesh, S.R., R. Aengals & E. Ramanujam (2014). Taxonomic reassessment of two Indian shieldtail snakes in the *Uropeltis ceylanicus* species group (Reptilia: Uropeltidae). *Journal of Threatened Taxa* 6(1): 5305–5314. <https://doi.org/10.11609/JoTT.o3636.5305-14>
- Ganesh, S.R. (2015). Shieldtail snakes (Reptilia: Uropeltidae) – the Darwin’s finches of south Indian snake fauna? pp: 13–24. In: Kannan, P. (Ed.) Manual on identification and preparation of keys of snakes with special reference to their venomous nature in India. Proceedings by Govt. Arts College, Udhagamandalam, Tamilnadu, India, 42pp.
- Ganesh, S.R. & N.S. Achyuthan (2020). A new species of shieldtail snake (Reptilia: Squamata: Uropeltidae) from Kolli Hill complex, southern Eastern Ghats, peninsular India. *Journal of Threatened Taxa* 12(4): 15436–15442. <https://doi.org/10.11609/jott.5680.12.4.15436-15442>
- Ganesh, S.R., K. Deuti, K.G. Punith, N.S. Achyuthan, A.K. Mallik, O. Adhikari & G. Vogel (2020). A new species of *Lycodon* (Serpentes: Colubridae) from the Deccan Plateau of India, with notes on the range of *Lycodon travancoricus* (Beddome, 1870) and a revised key to peninsular Indian forms. *Amphibian & Reptile Conservation* 14(3): 74–83.
- Gower, D.J. & J.D. Ablett (2006). Counting ventral scales in Asian anilioid snakes. *The Herpetological Journal* 16: 259–263.
- Gower, D.J., A. Captain & S.S. Thakur (2008). On the taxonomic status of *Uropeltis bicatenata* (Günther) (Reptilia: Serpentes: Uropeltidae). *Hamadryad* 33(1): 64–82.
- Jerdon, T.C. (1853). Catalogue of reptiles inhabiting the peninsula of India. *Journal of the Asiatic Society of Bengal* 22: 462–479.
- Jins, V.J., F.L. Sampaio & D.J. Gower (2018). A new species of *Uropeltis* Cuvier, 1829 (Serpentes: Uropeltidae) from the Anaikatty Hills of the Western Ghats of India. *Zootaxa* 4415(3): 401–422. <https://doi.org/10.11646/zootaxa.4415.3.1>
- Mirza, Z.A., G.G. Gowande, R. Patil, M. Ambekar & H. Patel (2018). First appearance deceives many: disentangling the *Hemidactylus triedrus* species complex using an integrated approach. *PeerJ* 6:e5341. <https://doi.org/10.7717/peerj.5341>
- Pyron R.A., S.R. Ganesh, A. Sayyed, V. Sharma, V. Wallach & R. Somaweera (2016). A catalogue and systematic overview of the shield-tailed snakes (Serpentes: Uropeltidae). *Zoosystema* 38(4): 453–506. <https://doi.org/10.5252/z2016n4a2>
- Rajendran, M.V. (1985). Studies in Uropeltid snakes. Madurai Kamaraj University, Madurai, India, 132pp.
- Smith, M.A. (1943). Fauna of British India including Ceylon and Burma. Vol-III Serpentes. Taylor & Francis, London, 583pp.
- Socolar, J.B., J.J. Gilroy, W.E. Kunin & D.P. Edwards (2016). How should beta-diversity inform biodiversity conservation? *Trends in Ecology & Evolution* 31(1): 67–80. <https://doi.org/10.1016/j.tree.2015.11.005>
- Wallach, V., K.L. Williams & J. Boundy (2014). *Snakes of the World: A Catalogue of Living and Extinct Species*. CRC Press, 1,237pp.
- Whitaker, R. & A. Captain (2004). *Snakes of India – The Field Guide*. Draco Books, Chengelpet, South India, 481pp.



### Appendix 1. List of preserved voucher specimens studied.

**Uropeltis ceylanica:** MAD no number from Perambikulam; another unnumbered specimen from Cochin; MAD 1938 from Attikan (Mysore) E. Barne's collection, from ca. 5000 feet, in June 1938; more unnumbered specimens, from Nilgiris, Cochin and Travancore; CESS 092 from Pakshipathalam, Bramgiri, Kannur District, Kerala; CESS 281, from Coorg, Madikeri District, Karnataka.

**Uropeltis dindigalensis:** MAD no number from Sirumalai, Madura District.

**Uropeltis elliotti:** CESS 079, from Chemmunji, Peppara WLS, Trivandrum District, Kerala; CSPT/S-81 from Shevaroy, Salem District, Tamil Nadu.

**Uropeltis grandis:** MAD no number from Anamalai, Coimbatore District, Tamil Nadu.

**Uropeltis liura:** CSPT/S-3, n= 2, from Madurai hills, Madurai District, Tamil Nadu.

**Uropeltis maculata:** CESS 186 from Anaimudi Shola NP, Idukki District, Kerala; MAD no number from Anamalai, Coimbatore District, Tamil Nadu.

**Uropeltis madurensis:** CSPT/S-6, from High Wavys, Theni District, Tamil Nadu.

**Uropeltis myhendrae:** CSPT/S-5, from Vannathipparai, Kanyakumari District, Tamil Nadu.

**Uropeltis nitida:** CESS 408 from Nelliampathy RF, Palghat District, Kerala.

**Uropeltis cf. ocellata:** MAD no number from Perambikulam; more unnumbered specimens from Cochin (Kerala) and Kodaikanal, Palni hills (Tamil Nadu).

**Uropeltis petersi:** CSPT/S-7a from Kodaikanal, Dindigul District, Tamil Nadu.

**Uropeltis pulneyensis:** MAD 1929, n=6 collected by E. Barnes, during April-May, from 6000–6800 feet, Kodaikanal, Palni hills; CSPT/S-4a, from Kodaikanal, Dindigul District, Tamil Nadu.

**Uropeltis rajendrani:** BNHS 3559 (holotype), BNHS 3560, 3561 (paratypes), n=3, from Bodhamalai hills, Salem-Namakkal Districts, Tamil Nadu.

**Uropeltis rubromaculata:** MAD no number from Anamalai, Coimbatore District; CSPT/S-7 from Anaimalai, Coimbatore District, Tamil Nadu; CESS 322, from Anaimalai WS, Tirupur District, Tamil Nadu.

**Uropeltis shorttii:** CSPT/S-80, n= 2 from Shevaroy Hills, Salem District, Tamil Nadu.

**Uropeltis woodmasoni:** CSPT/S-4, from Anaimalai, Coimbatore District, Tamil Nadu.





www.threatenedtaxa.org

OPEN ACCESS



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

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

May 2021 | Vol. 13 | No. 6 | Pages: 18411–18678

Date of Publication: 26 May 2021 (Online & Print)

DOI: 10.11609/jott.2021.13.6.18411-18678

#### Conservation Application

##### First attempt at rehabilitation of Asiatic Black Bear cubs to the wild in Thailand

– Robert Steinmetz, Worrapan Phumane, Rungnapa Phoonjampa & Suthon Weingdow, Pp. 18411–18418

#### Communications

##### Status of Sumatran Tiger in the Berbak-Sembilang landscape (2020)

– Tomi Ariyanto, Yoan Dinata, Dwiyanto, Erwan Turyanto, Waluyo Sugito, Sophie Kirkin & Rajan Amin, Pp. 18419–18426

##### The diversity of small mammals in Pulau Perhentian Kecil, Terengganu, Malaysia

– Aminuddin Baqi, Isham Azhar, Ean Wee Chen, Faisal Ali Anwarali Khan, Chong Ju Lian, Bryan Raveen Nelson & Jayaraj Vijaya Kumaran, Pp. 18427–18440

##### Patterns, perceptions, and spatial distribution of human-elephant (*Elephas maximus*) incidents in Nepal

– Raj Kumar Koirala, Weihong Ji, Yajna Prasad Timilsina & David Raubenheimer, Pp. 18441–18452

##### Assessing spatio-temporal patterns of human-leopard interactions based on media reports in northwestern India

– Kaushal Chauhan, Arjun Srivathsa & Vidya Athreya, Pp. 18453–18478

##### Bat diversity in the Banpale forest, Pokhara, Nepal during spring season

– Prabhat Kiran Bhattarai, Basant Sharma, Anisha Neupane, Sunita Kunwar & Pratyush Dhungana, Pp. 18479–18489

##### A patho-microbiological study of tissue samples of the Greater Adjutant *Leptoptilos dubius* (Aves: Ciconiidae) that died in Deeporbeel Wildlife Sanctuary, Assam, India

– Derhasar Brahma, Parikshit Kakati, Sophia M. Gogoi, Sharmita Doley, Arpita Bharali, Biswajit Dutta, Taibur Rahman, Saidul Islam, Arfan Ali, Siraj A. Khan, Sailendra Kumar Das & Nagendra Nath Barman, Pp. 18490–18496

##### Vaduvur and Sitheri lakes, Tamil Nadu, India: conservation and management perspective

– V. Gokula & P. Ananth Raj, Pp. 18497–18507

##### A new species of shieldtail snake (Squamata: Uropeltidae: Uropeltis) from the Bengaluru uplands, India

– S.R. Ganesh, K.G. Punith, Omkar D. Adhikari & N.S. Achyuthan, Pp. 18508–18517

##### A looming exotic reptile pet trade in India: patterns and knowledge gaps

– A. Pragatheesh, V. Deepak, H.V. Girisha & Monesh Singh Tomar, Pp. 18518–18531

##### Legal or unenforceable? Violations of trade regulations and the case of the Philippine Sailfin Lizard *Hydrosaurus pustulatus* (Reptilia: Squamata: Agamidae)

– Sarah Heinrich, Adam Toomes & Jordi Janssen, Pp. 18532–18543

##### Conservation breeding of Northern River Terrapin *Batagur baska* (Gray, 1830) in Sundarban Tiger Reserve, India

– Nilanjan Mallick, Shailendra Singh, Dibyadeep Chatterjee & Souritra Sharma, Pp. 18544–18550

##### Discovery of two new populations of the rare endemic freshwater crab *Louisea yabassi* Mvogo Ndongo, von Rintelen & Cumberlidge, 2019 (Brachyura: Potamonautidae) from the Ebo Forest near Yabassi in Cameroon, Central Africa, with recommendations for conservation action

– Pierre A. Mvogo Ndongo, Thomas von Rintelen, Christoph D. Schubart, Paul F. Clark, Kristina von Rintelen, Alain Didier Missouf, Christian Albrecht, Muriel Rabone, Efole Ewoukem, Joseph L. Tamesse, Minette Tomedi-Tabi Eyango & Neil Cumberlidge, Pp. 18551–18558

##### Checklists of subfamilies Dryptinae and Panagaeinae (Insecta: Coleoptera: Carabidae) from the Indian subcontinent

– V.A. Jithmon & Thomas K. Sabu, Pp. 18559–18577

##### Mantids (Insecta: Mantodea) of Uttar Pradesh, India

– Ramesh Singh Yadav & G.P. Painkra, Pp. 18578–18587

##### An assessment of genetic variation in vulnerable Borneo Ironwood *Eusideroxylon zwageri* Teijsm. & Binn. in Sarawak using SSR markers

– Siti Fatimah Md-Isa, Christina Seok Yien Yong, Mohd Nazre Saleh & Rusea Go, Pp. 18588–18597

#### Review

##### Termites (Blattodea: Isoptera) of southern India: current knowledge on distribution and systematic checklist

– M. Ranjith & C.M. Kallelshwaraswamy, Pp. 18598–18613

#### Short Communications

##### Population status and distribution of Ibisbill *Ibidorhyncha struthersii* (Vigors, 1832) (Aves: Charadriiformes: Ibidorhynchidae) in Kashmir Valley, India

– Iqram Ul Haq, Bilal A. Bhat, Khurshed Ahmad & Asad R. Rahmani, Pp. 18614–18617

##### A new fish species of genus *Garra* (Teleostei: Cyprinidae) from Nagaland, India

– Sophiya Ezung, Bungdon Shangningam & Pranay Punj Pankaj, Pp. 18618–18623

##### Occurrence of Tamdil Leaf-litter Frog *Leptobrachella tamdil* (Sengupta et al., 2010) (Amphibia: Megophryidae) from Manipur, India and its phylogenetic position

– Ht. Decemson, Vanlalsiammawii, Lal Biakzuala, Mathipi Vabeiryureilai, Fanai Malsawmdawngliana & H.T. Lalremsanga, Pp. 18624–18630

##### Further additions to the Odonata (Insecta) fauna of Asansol-Durgapur Industrial Area, Paschim Bardhaman, India

– Amar Kumar Nayak & Subhajit Roy, Pp. 18631–18641

##### A note on the ecology and distribution of Little Bloodtail *Lyriothemis acigastra* Brauer, 1868 (Insecta: Odonata: Libellulidae) in Kerala, India

– Jeevan Jose, Muhamed Sherif & A. Vivek Chandran, Pp. 18642–18646

#### Viewpoint

##### A unique archetype of conservation in Himachal Pradesh, western Himalaya, India

– Rupali Sharma, Monika Sharma, Manisha Mathela, Himanshu Bargali & Amit Kumar, Pp. 18647–18650

#### Notes

##### A camera trap record of Asiatic Golden Cat *Catopuma temminckii* (Vigors & Horsfield, 1827) (Mammalia: Carnivora: Felidae) in State Land Forest, Merapoh, Pahang, Malaysia

– Muhamad Hamirul Shah Ab Razak, Kamarul Hambali, Aainaa Amir, Norashikin Fauzi, Nor Hizami Hassin, Muhamad Azahar Abas, Muhammad Firdaus Abdul Karim, Ai Yin Sow, Lukman Ismail, Nor Azmin Huda Mahamad Shubli, Nurul Izzati Adanan, Ainur Izzati Bakar, Nabihah Mohamad, Nur Izyan Fathiah Saimhe, Muhammad Syafiq Mohamad Nor, Muhammad Izzat Hakimi Mat Nafi & Syafiq Sulaiman, Pp. 18651–18654

##### Reappearance of Dhole *Cuon alpinus* (Mammalia: Carnivora: Canidae) in Gujarat after 70 years

– A.A. Kazi, D.N. Rabari, M.I. Dahya & S. Lyngdoh, Pp. 18655–18659

##### Mating behavior of Eastern Spotted Skunk *Spilogale putorius* Linnaeus, 1758 (Mammalia: Carnivora: Mephitidae) revealed by camera trap in Texas, USA

– Alexandra C. Avrin, Charles E. Pekins & Maximillian L. Allen, Pp. 18660–18662

##### Record of Indian Roofed Turtle *Pangshura tecta* (Reptilia: Testudines: Geoemydidae) from Koshi Tappu Wildlife Reserve, Nepal

– Ashmita Shrestha, Ramesh Prasad Sapkota & Kumar Paudel, Pp. 18663–18666

##### Additional distribution records of *Zimiris doriae* Simon, 1882 (Araneae: Gnaphosidae) from India

– Dhruv A. Prajapati, Pp. 18667–18670

##### Notes on new distribution records of *Euaspa motokii* Koivaya, 2002 (Lepidoptera: Lycaenidae: Theclinae) from Bhutan

– Jigme Wangchuk, Dhan Bahadur Subba & Karma Wangdi, Pp. 18671–18674

##### New distribution records of two little known plant species, *Hedychium longipedunculatum* A.R.K. Sastry & D.M. Verma (Zingiberaceae) and *Mazus dentatus* Wall. ex Benth. (Scrophulariaceae), from Meghalaya, India

– M. Murugesan, Pp. 18675–18678

Member



Publisher & Host

