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Cover: Pseudo-flying animals and wind-dependent seed & spore dispersers – made with digital painting in Krita. © Melito Prinson Pinto

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COMMUNICATION

Tadpole morphology of Jerdon's Narrow-mouthed Frog *Uperodon montanus* (Jerdon, 1853) with a range and elevation extension report from Western Ghats, India

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Abstract: The study discusses about the new data on larval description, morphological features, larval ecology of stage 25–40 of the Jerdon's Narrow-mouthed Frog *Uperodon montanus* (Jerdon, 1853). Tadpoles were identified up to family and genus level based on the historical literature and the species level confirmation was done with molecular studies. We also present a new northern limit record of this species from the Pushpagiri hill ranges in Karnataka (12.669 N, 75.717 E) and a new highest elevation record of 1,916 m at Vaguvarai, Idukki, Kerala which are outside its currently known distribution and elevation ranges. As per the present work, the distribution range of U. montanus has extended northwards by 130 km and upwards by 216 m. Additionally, the IUCN Red List status for the species is also discussed based on the area of occupancy and extent of occurrence redone considering the new range envelope.

Keywords: Anura, Gosner stage 25, larval stages, montane endemism, Western Ghats.

Kannada abstract: ಪ್ರಸ್ತುತ ಸಂಶೋಧನೆಯಲ್ಲಿ, ಬೆಟ್ಟದ ಗಾಳಿಚೀಲಗಪ್ಪೆಯ (ವೈಜ್ಞಾನಿಕ ಹೆಸರು: *Uperodon montanus* (ಜೆರ್ಡನ್, 1853) ಗೊದ ಮೊಟ್ಟೆಯ ವೈಜ್ಞಾನಿಕ ಬೆಳವಣಿಗೆ ಹಂತ 25 ಹಾಗೂ 40 ರಬಾಹ್ಯ ರೂಪವಿಜ್ಞಾನ ವಿವರಣೆ ಬಗ್ಗೆ ಚರ್ಚಿಸಲಾಗಿದೆ ಮತ್ತು ಈ ಗೊದಮೊಟ್ಟೆಯ ವೈಜ್ಞಾನಿಕ ಪ್ರಭೇದ ಪತ್ತೆ ಹಚ್ಚುವುದಕ್ಕೆ ಆಣ್ವಿಕ ತಂತ್ರಜ್ಞಾನ ಸಹಾಯವನ್ನು ಪಡೆಯಲಾಗಿದೆ. ಈ ಕಪ್ಪೆಯು ಪಶ್ಚಿಮ ಘಟ್ಟದ ಕರ್ನಾಟಕ ಭಾಗದ ಪುಷ್ಪಗಿರಿ ಪರ್ವತ ಶ್ರೇಣಿಯಿಂದ, ತಮಿಳುನಾಡು ಭಾಗದ ತಿರುನಲ್ವೇಲಿಯ ಮುರುಂಗಾ ಮೊಟ್ಟೆ ಅರಣ್ಯಭರಿತ ಪರ್ವತ ಶ್ರೇಣಿಗಳವರೆಗೆ (ಸಮುದ್ರಮಟ್ಟದಿಂದ 800-1916 ಮೀಟರ್) ಇರುವುವಿಕೆಯನ್ನು ದೃಢಪಡಿಸಲಾಗಿದೆ. ಇದರಲ್ಲಿ ಈ ಕಪ್ಪೆಯು, ಪಶ್ಚಿಮ ಘಟ್ಟದಿಂದ ಉತ್ತರ ವ್ಯಾಪ್ತಿಯ ಹಾಗೂ ಸಮುದ್ರಮಟ್ಟದಿಂದ ಎತ್ತರದ ಹೊಸ ಪರಿಧಿಗಳ ದಾಖಲೆಗಳನ್ನು ಒಳಗೊಂಡಿರುತ್ತದೆ. ಹೊಸ ಶ್ರೇಣಿಯ ಆಧಾರದ ಮೇಲೆ ಪ್ರಭೇದದ ಐ ಯು ಸಿ ಎನ್ (IUCN) ಸಂರಕ್ಷಣಾ ಸ್ಥಿತಿಯ ಬಗ್ಗೆಯೂ ಚರ್ಚಿಸಲಾಗಿದೆ.

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Competing interests: The authors declare no competing interests.

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Author contributions: AH carried out field observation, data collection, analysis, interpretation, wrote draft, critical review and revision at different stages; GK has played a crucial role in monitoring and guiding the work; KPD helped in writing paper, generation of sequences, phylogenetics and field data collection.

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INTRODUCTION

Jerdon's Narrow-mouthed Frog *Uperodon montanus* (Jerdon, 1853) is endemic to the Western Ghats where it is distributed from near Wyanad south across the Palghat and the Shencottah gaps to the Agasthyamalai hills (Garg et al. 2018). It was first described by Jerdon in 1853 from the mountain streams of Wyanad (Garg et al. 2018). Later the species details which also include notes on tadpole morphology were added by Parker (1934). Recently, in the revisionary studies of the genus, the species was redescribed based on a freshly collected topotype (Garg et al. 2018). This frog is considered a montane species and is restricted to higher altitude ranges of 800 m to 1,700 m (Frost 2023). For breeding and spawning, it has a much more limited microhabitat within the habitat in landscape (Parker 1934; Garg et al. 2018). Tadpoles of *Uperodon* are free swimming and exotrophic (Altig & Johnston 1989; Garg et al. 2018). The tadpoles of the congeners can be classified and identified based on the variations in their tail morphology, the shape of the spiracular opening and the location of the mouth and spiracle (Garg et al. 2018).

During one of our regular field visits to Coorg, Western Ghats, we surveyed small rock pools beside the mountain streams in which tadpoles were observed. Efforts were made to identify the tadpoles based on the existing literature (Rao 1918, 1937; Parker 1934; Ramaswami 1940; Raj et al. 2017; Garg et al. 2018), and secondly genetic data. In the present study, we have appraised the description of morphometric characters, field observations of the tadpole of *Uperodon montanus*, especially in Gosner stages 25–40 and identification of the tadpole using mt 16S rRNA sequences. We also present new data on the distribution of this species with an extended geographical and elevational range.

MATERIALS AND METHODS

Observations on spawning ground and tadpoles of different stages were made. Tadpoles were photographed in nature without disturbing the individuals from the Brahmagiri range (11.969 N, 75.984 E, elevation 870 m) Coorg District, Karnataka State during the post-monsoon season, November 2021. Additionally, field surveys were conducted in several other parts of the Western Ghats during which *U. montanus* was observed. Developmental stages were identified based on the Gosner stages (Gosner 1960).

For detailed studies, tadpoles were collected (n = 7; Gosner stage 25) and were photographed under controlled conditions; specimens were euthanized using MS222 and tissue samples were fixed in 70% ethanol for molecular studies (n = 1) and morphometric measurement specimens (n = 6) were fixed in 10% buffered formalin for two days and preserved in a 1:1 mixture of 10% buffered formalin at the Gosner stage 25. Tadpole morphology and measurements were done using the Olympus stereo zoom microscope (8x magnification) (to the nearest 0.1 mm). Studied samples were deposited at the National Zoological Collections of the Zoological Survey of India ZSI/WRC/Pune(ZSI/WRC/V/A/2519–2524).

Protocols were followed after Hegde et al. (2020) for the generation of 16S rRNA gene sequence and phylogenetic studies. Sequences used in the studies are provided in Table 1. For calculating uncorrected pairwise genetic distances, MEGA 5.2 (Tamura et al. 2013) was used. The maximum likelihood (Ml) tree was generated with RaxMl (Silvestro & Michalak 2012) under the GTR+GAMMA+I model, with 1,000 thorough bootstrap replicates to assess node support, and FigTree v1.4.0 visualized the final consensus tree.

For mapping, the distribution range of the species was taken from the published literature in addition to the present record of tadpoles and the field studies of KPD and team between the period 2010–2020. The IUCN Red List criteria based on the extent of occurrence (EOO) and area of occupancy (AOO) for the species were estimated using the GeoCAT Geospatial Conservation Assessment Tool (Bachman et al. 2011).

Abbreviations

BH, Body height (the highest height of the body); BW, body width (the highest width of the body); ED, eye diameter (the greatest length of the orbit from the anterior margin to the posterior margin of the eye); END, Eye to nostril distance (from the anterior corner of the eye to the posterior margin of the naris (nostril)); HL, Head length; HW, Head width at the level of eyes; Snout to spiracle distance, from the tip of the snout to the posterior margin of the spiracle; IOD, Inter orbital distance; IND, inter-narial distance (measured from the centres of the narial apertures); LTF, Lower tail fin height (the highest height of the lower fin, from the lower margin of the lower fin to the lower margin of the tail musculature); MTH, Maximum height of tail (the highest height of the tail); tail height at mid-length of tail (including caudal fin); maximum tail height (tail height at the mid-length of the tail including caudal fin and tail musculature); NSD, Nostril to snout distance (from

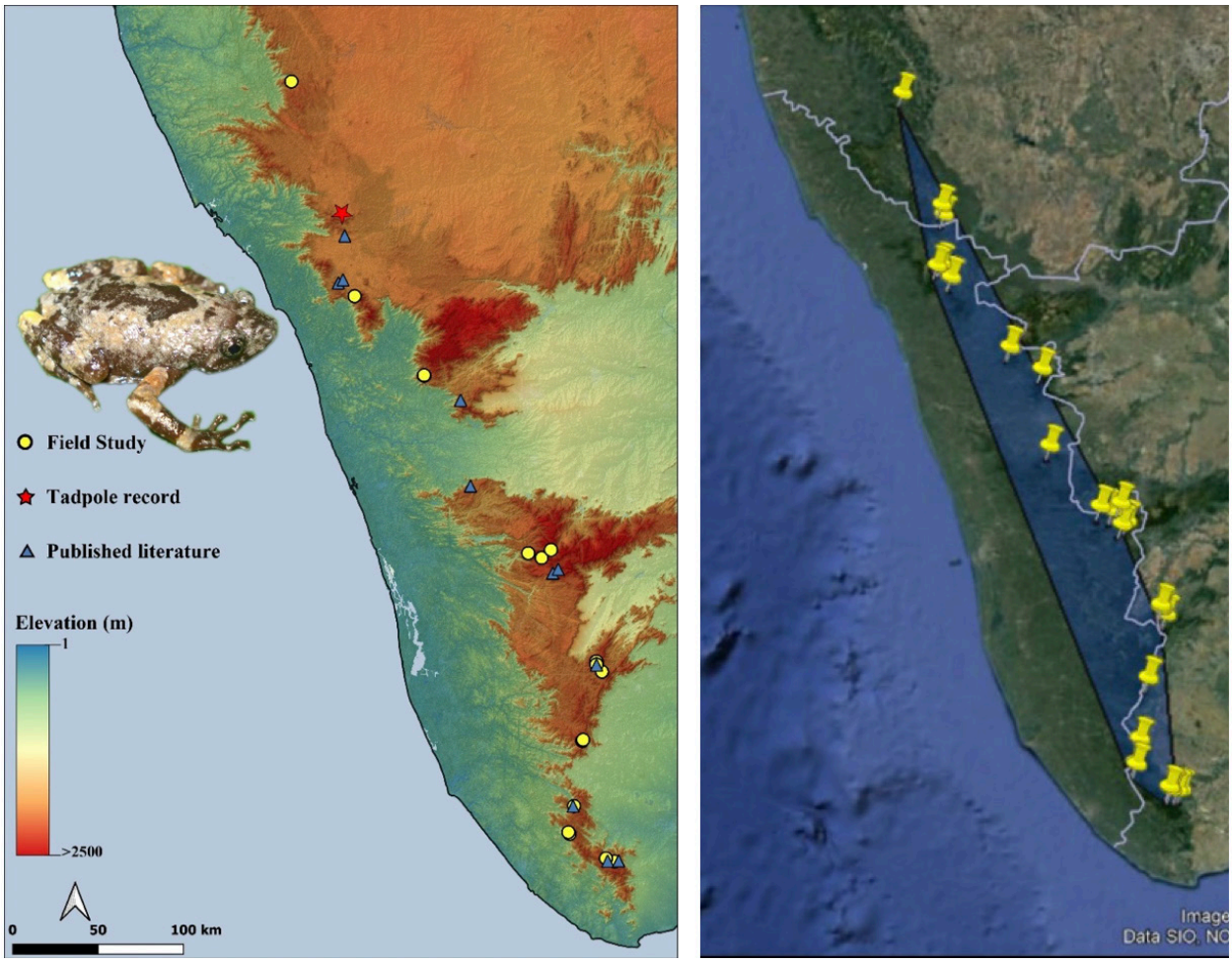

Image 1. Left: Distribution range of *Uperodon montanus* in the central and the southern Western Ghats; Right: extent of occurrence (EOO = 18,412.285 km2) and the area of occupancy (AOO = 96.000 km2).

the anterior margin of the naris to the tip of the snout); Tail length, from the junction of the posterior body and the tail musculature to the tip of the tail; TL, total length (sum of BL and TaL)(from the tip of the snout to the tip of the tail); TMH, Tail muscle height at the base of tail; TMW, tail muscle width (at the beginning of the tail); UTF, Upper tail fin height (the highest height of the upper fin, from the upper margin of the tail musculature to the upper margin of the upper fin).

RESULTS

Tadpole identification was confirmed as *Uperodon montanus* based on the sequences generated from the tadpole tissue samples collected during the present study (Figure 1; Table 2).

A total of 40 tadpoles were observed, out of which 37 tadpoles were of Gosner stage 25 and three tadpoles were of Gosner stage 40 in the rocky pools characterised by 80 cm in length, 50 cm in width and 15.5 cm depth in the steep slopes. These rock pools are situated close to the torrent and cascading third order streams with characteristic of water splashing activity from the stream cascades, especially during monsoon (Image 2H).

Tadpole external morphology (Gosner stage 25): Exotroph, neustonic tadpole, In *U. montanus* head part is dorsoventrally compressed or flattened, the mouth is situated at the terminal end and lateral eyes form part of the dorsal outline of the tadpole. Tail musculature is brown and unicoloured, comparatively denser towards the body and more stressed in the upper tail fin. The external opening of the cloaca is medial, vent-aperture of vent tube is in line with the axis of the ventral fin. The oral disc is terminally positioned without marginated papillae, labial teeth or hard beaks. The upper lip is slightly extended in the middle and emarginated on both the sides which cover the lower lip. During the feeding

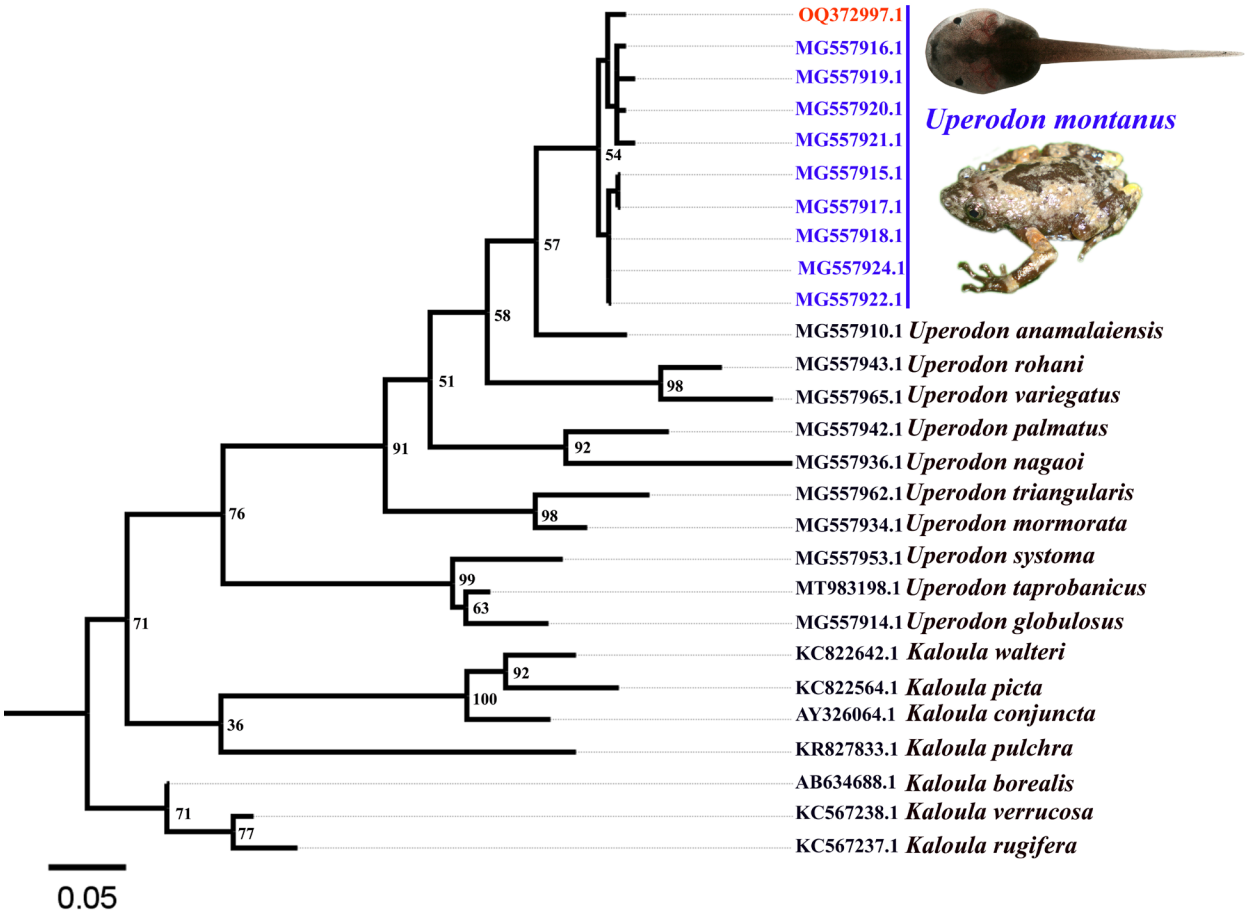

Figure 1. Figure 1. Maximum likelihood phylogeny for the *Uperodon montanus* having distribution in the Western Ghats with the present data based on 529bp mitochondrial 16SrRNA gene.

slight lower lip movement is observed. The lower lip is U-shaped with cuspate rounded jaw sheaths with no keratinisation. The lateral process is a poorly delimited posterolateral extension of the upper jaw, often non-serrate, long-extending well beyond the lower jaw. Paired ventrolateral spiracle, the external opening for the exit of water from the opercular chamber. Long tail fin with a rounded tip (Image 2).

Body measurements: Mean values (in mm) and standard deviations of measurements of the collected tadpoles (n = 6) of *U. montanus* at Gosner stage 25 as follows, TL: 17.2± 8.8; IOD: 2.9± 1.2; ED: 0.5± 0.2; IND: 1.0± 0.4; END: 1.3± 0.6; NSD: 1.0± 0.4; HW: 4.0± 1.7; Snout to spiracle distance: 4.3± 2.0; BW: 4.5± 1.9; HL: 6.3± 2.7; TMW: 1.6± 0.8; LTF: 0.7± 0.3; UTF: 0.8± 0.4; MTH: 2.7± 1.2; Tail length: 11.6± 5.4; TMH: 1.9± 0.9; BH: 2.4± 1.2 (Table 1).

Colour in life (Gosner stage 25): Brown pigment spots all over the body denser towards the forebrain, midbrain and gut regions. Near gills, reddish spots are seen from inside the body as the body is transparent. In notochord region of the tail near the body is dense. Comparatively dull brown patches surrounding the nostril are seen. The vent region is opaque without any brown pigments and the ventral side of the gut region is more transparent compared to the dorsal. The lower part of the tail is more transparent without many brown pigments like the upper part of the tail. Overall colour slightly varied between individuals within the same pool, further studies are needed in this regard (Image 2).

Colour in preservative (Gosner stage 25): The body is roughly dark brown in colouration and the eyes are dark. Brown pigments all over the body which are not uniform, comparatively less pigmented in the lower tail, tail tip, below the gut region and it is transparent outside the body region. Besides the forebrain and midbrain region bright patch is visible from inside the body, compared to the living tadpole.

Notes on the Gosner stage 40: Tadpoles were observed in nature, with no webbing in the hind limbs (subarticular tubercles are seen) and they are banded with golden stripes or radiant yellow. Body regions are

Table 1. Tadpole body measurements (in mm) of *Uperodon montanus* at Gosner stage 25 (n = 6) *(Prefix ZSI/WRC/V/A/) (17 morphometric measurements).

Reg. No*	2519	2520	2521	2522	2523	2524	Average ± SD (n = 6)
TL	15.4	15.8	17.3	23.2	16.7	15.3	17.2 ± 8.8
IOD	2.5	2.8	3.0	3.5	3.3	2.6	2.9 ± 1.2
ED	0.4	0.4	0.5	0.7	0.5	0.5	0.5 ± 0.2
IND	0.8	1.2	0.9	1.4	1.0	1.0	1.0 ± 0.4
END	1.1	1.3	1.3	1.7	1.5	1.2	1.3 ± 0.6
NSD	0.8	0.9	1.2	1.0	1.1	1.0	1.0 ± 0.4
HW	3.3	3.7	4.3	4.7	4.5	3.6	4.0 ± 1.7
Snout to spiracle distance	3.2	4.3	3.6	5.9	4.6	4.3	4.3 ± 2.0
BW	3.7	4.2	4.8	5.4	4.8	4.3	4.5 ± 1.9
HL	5.4	5.9	6.4	7.6	6.8	6.0	6.3 ± 2.7
TMW	1.4	1.4	1.7	2.6	1.8	1.0	1.6 ± 0.8
LTF	0.6	0.6	0.6	0.8	1.0	0.8	0.7 ± 0.3
UTF	0.6	0.7	0.7	0.9	1.1	1.0	0.8 ± 0.4
MTH	2.0	2.4	2.8	3.3	3.3	2.5	2.7 ± 1.2
Tail Length	10.0	10.5	10.9	15.6	13.4	9.3	11.6 ± 5.4
TMH	1.7	1.9	1.6	2.7	1.9	1.7	1.9 ± 0.9
BH	2.2	2.0	2.6	3.4	2.8	1.5	2.4 ± 1.2

coloured with dark brown, golden spots all over the body and it is uniform dorsally. However, near the upper tail notochord region, it is more prominent. Ventrally it is dark brown in colouration (Image 2I). In November (post-monsoon), the tadpoles were seen in the rock pools beside the mountain streams of the evergreen forests. Most of these pools/pockets had organic debris, leaf litter and aquatic insects. Within the single clutch or in the single pool after Gosner stage 25, there wasn't any uniformity in development stages between the tadpoles of this species, this might be related to the diet and competition.

Change in the tadpole body colouration was observed during the day and night. In the daytime, they looked comparatively darker and at night they were slightly transparent, especially observed for the Gosner stage 25. In these small rock pockets, the tadpoles above Gosner stage 25 rarely come to the surface during the daytime and they hide under the dark black decayed leaf litter and brown algal substrate. Tadpoles might be using the substrate as micro refugia. The body colour is adapted to blend with the dark substrate as the light penetration is comparatively low at the bottom (Image 2).

In the daytime, tadpoles of other species were encountered surrounding the study site in Brahmagiri, Kodagu, Karnataka including unidentified *Indosylvirana* and *Nyctibatrachus*. In the same location during

Table 2. Details of mt 16S sequences used for building the maximum likelihood (ML) tree.

GenBank accession number	Species	Reference
MG557910.1	*Uperodon anamalaiensis*	Garg et al. 2018
MG557914.1	*Uperodon globulosus*	Garg et al. 2018
MG557924.1	*Uperodon montanus*	Garg et al. 2018
MG557922.1	*Uperodon montanus*	Garg et al. 2018
MG557921.1	*Uperodon montanus*	Garg et al. 2018
MG557920.1	*Uperodon montanus*	Garg et al. 2018
MG557919.1	*Uperodon montanus*	Garg et al. 2018
MG557918.1	*Uperodon montanus*	Garg et al. 2018
MG557917.1	*Uperodon montanus*	Garg et al. 2018
MG557916.1	*Uperodon montanus*	Garg et al. 2018
MG557915.1	*Uperodon montanus*	Garg et al. 2018
MG557934.1	*Uperodon mormorata*	Garg et al. 2018
MG557936.1	*Uperodon nagaoi*	Garg et al. 2018
MG557942.1	*Uperodon palmatus*	Garg et al. 2018
MG557943.1	*Uperodon rohani*	Garg et al. 2018
MG557953.1	*Uperodon systoma*	Garg et al. 2018
MT983198.1	*Uperodon taprobanicus*	Garg et al. 2018
MG557962.1	*Uperodon triangularis*	Garg et al. 2018
MG557965.1	*Uperodon variegatus*	Garg et al. 2018
OQ372997.1	*Uperodon montanus*	Present study

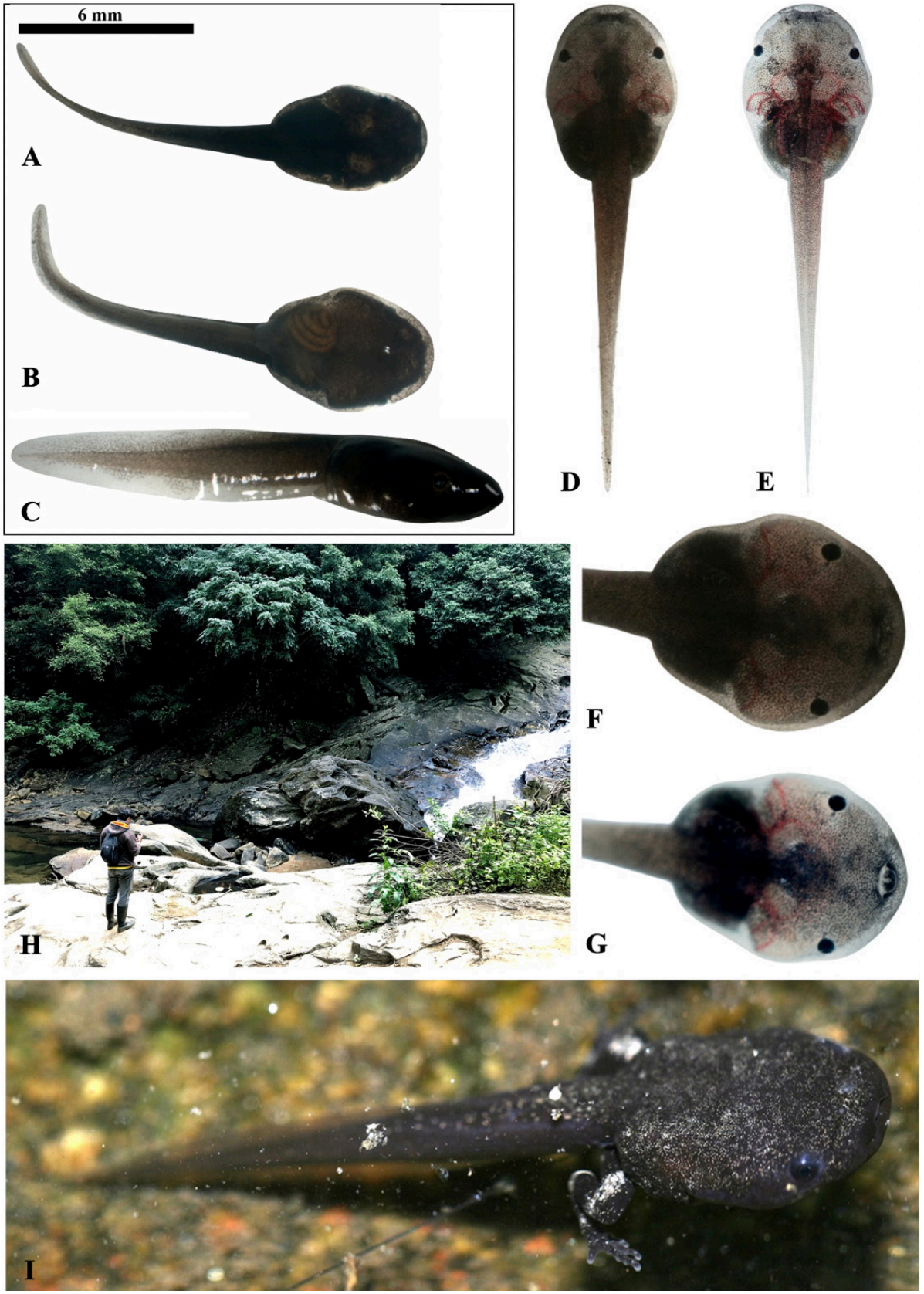

Image 2. Tadpole of *Uperodon montanus* (Gosner stage 25): A—Dorsal view | B—Ventral view | C—Lateral view (In preservation) (To scale); *U. montanus* tadpole in life (Gosner stage 25) dorsal view | D—During the day time | E—During the night time | F—Day time | G—Night time | H—Rocky pockets/pools beside the mountain streams | I—*U. montanus* Gosner stage 40 in natural habitat, in life. © Amit Hegde.

night hours, *Micrixalus*, *Nyctibatrachus*, *Indirana*, *Indosylvirana*, and *Raorchestes* species adults were observed.

Distribution of *U. montanus*:

During the present study, this species was observed from several localities across the Western Ghats (Table 3). The extent of occurrence (EOO) was calculated to be 18,418.65 km^2 which suggests 'Vulnerable' status and the area of occupancy (AOO) amounts to 96.00 km^2 which suggests 'Endangered' (Bachman et al. 2011) status. This species is restricted to mountain forests of the Western Ghats, especially in the southern part of central Western Ghats and southern Western Ghats. Our field data confirms the presence of the species from Toregadde forests in the foothills of Pushpagiri hill ranges in Karnataka which is the northern limit to Murunga mottai forests of Agasthyamalai hill ranges of Tamil Nadu which is the southern limit in the Western Ghats (Image 1). Our studies confirm the higher altitude record of species at 1,916 m that is 216 m above the previous report of 1,700 m (Frost 2023; Garg et al. 2018).

Table 3. Field locality details for the records of Uperodon montanus in the central and southern Western Ghats documented during the present study.

Lat. (N)	Lon. (E)	Altitude (metres)	Location in the Western Ghats
12.669	75.717	904	Tore gadde, Kodagu, Karnataka
11.970	75.985	870	Brahmagiri, Kodagu, Karnataka
11.531	76.053	926	Vythiri, Wyanad , Kerala
11.112	76.421	1,090	Silent Valley, Palakkad, Kerala
11.110	76.423	1,076	Silent Valley, Nilgiris, Tamil Nadu
11.110	76.420	1,089	Silent Valley, Nilgiris, Tamil Nadu
10.186	77.095	1,916	Vaguvarai, Idukki, Kerala
10.168	76.974	1,564	Edamalayar, Idukki, Kerala
10.143	77.045	1,752	Rajamalai, Idukki, Kerala
9.594	77.335	1,801	Brook's Peak, Idukki, Kerala
9.578	77.336	1,556	Upper Manalar, Theni, Tamil Nadu
9.540	77.365	1,494	Vellimalai, Theni, Tamil Nadu
9.540	77.365	1,506	Vellimalai, Theni, Tamil Nadu
9.179	77.265	1,351	Kudraikatti, Tirunelveli, Tamil Nadu
9.173	77.261	1,262	Kudraikatti, Tirunelveli, Tamil Nadu
8.828	77.217	1,249	Pandimalai forest, Kollam, Kerala
8.689	77.187	1,043	Pandipath, Thiruvananthapuram, Kerala
8.680	77.194	1,327	Pandipath, Thiruvananthapuram, Kerala
8.550	77.386	1,263	Kakachi, Tirunelveli, Tamil Nadu
8.533	77.432	1,279	Murunga mottai, Tirunelveli, Tamil Nadu

DISCUSSION

Molecular identification in tadpoles is particularly useful when the habitat has multiple species belonging to the same family or genus, where sympatric species share the same microhabitat. It is also very helpful where the two allopatric species meet at hybridising zones (where high elevation species share the same zone with mid elevational species or two species meet near the biogeographic barrier) or when the tadpoles show a great amount of morphological variation, polymorphism, and plasticity where morphological key characters are difficult to rely on. Historical descriptions provided by Parker (1934) were limited and it would have been difficult to identify the tadpole species without molecular studies in this context. A holistic approach to the morphological character of the tadpoles is much needed with molecular confirmation to make the morphological characters data set handy for the identification of the members of the genus or the family in the field/museum.

Parker's (1934) tadpole descriptions for *U. montanus*, developmental stages (Image 3) are not clear and sample sizes are not mentioned and it is difficult to conclude or compare the tadpole in gross scale; subsequent descriptions of tadpole stages by Gosner (1960) facilitated identifying the stages. Parker mentioned that the largest unstaged tadpole of *U. montanus* measures 45 mm. In our study out of six tadpoles (Gosner stage 25), the larger one measured 23.2 mm and the average was 17.2 mm ± 8.8.

Parker (1934) mentioned that Head length (HL) is one and a half times as long as body width (BW). In the present study, HL is 1.4 times bigger than BW; END is equal to NSD but in this studies, they are not equal and END is slightly longer than NSD; IOD is five times the IND, but in our studies, IOD is double the IND; TL is one and half time long as head length (HL) but in our studies, TL is 2.73 times bigger than the HL; UTF & LTF are not equal, they are highly variable, END is twice the ED (Table 1).

Chromatophores or colour pigments might play a very important role in visual communication between conspecifics and heterospecifics. Tadpoles with respect to different developmental stages show different colour variations, some may be adapted for crypsis and aposematism for survival (Toledo & Haddad 2009). The current study reports natural history observation of *U.*

Tadpole free-swimming. A well-developed specimen of 38 mm., has the following characters: Head and body ovoid, depressed, once and a half as long as broad. Nostrils close together, about midway between the tip of the snout and a line connecting the anterior borders of the eyes. Eyes lateral, the inter-orbital space more than 5 times the internarial. Mouth terminal, twice as wide as the internarial space, the lower lip contractile, the upper nearly straight. Spiraculum median, opening under a transparent flap close to the hinder end of the body. Anus median, the anal tube curving downwards and opening at the level of the hinder side of the thighs. Tail once and a half as long as the head and body, pointed but not flagellate, nearly 3 times as long as deep; caudal crests subequal, about as deep as the muscular portion of the tail at its base. Toes webbed as in the adult.

Greenish brown above, spotted with darker; sides and lower surfaces white, immaculate. Tail brown spotted.

The largest tadpole measures 45 mm. over all, and a newly metamorphosed frog measures 14 mm. from snout to vent.

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Image 3. Tadpole description of *Uperodon montanus* is reproduced as in Parker (1934; p. 92).

montanus in the Gosner stage 25 changes colour with respect to the diel cycle. However, these are based only on visual observation in situ and photographs. More reproducible and objective studies are needed in this regard.

In the present work, Gosner stage 40 showed no webbing (n = 3); however, the sample size is small, so it will be interesting to study more about the tadpole webbing variation and tail fin with respect to different elevational and spawning ground variations. Garg et al. (2018) have already mentioned that the webbing of the *U. montanus* is highly variable and there are some studies reported globally on tadpole webbing variations (Goldberg & Fabrezi 2008). The studies on variations in tadpole morphology with respect to different environmental variables like water depth, temperature, oxygen levels and microhabitat features such as syntopy, predator, density and abundance will also be of great importance.

When the ambient temperature gets comparatively high (especially during the midnoon), water temperature increases, this might be one of the direct threats to several puddle tadpoles where mud puddles dry fast and rock pools (Chandramouli & Kalaimani 2014; Gaitonde et al. 2016) remain warmer for longer durations. Also, desiccation is the main cause of mortality, next to predation by some species of arthropods and aquatic beetles (Wells 2007).

The conservation status of *U. montanus* is listed as Near Threatened in the IUCN Red List (Biju et al. 2016; Das et al. 2020). To ascertain this status, reassessment was attempted in the present study to show the EOO suggesting Vulnerable status and the AOO suggesting Endangered status (Bachman et al. 2011). This species is restricted only to the mountain forests of the Western Ghats like the other two species *U. anamalaiensis* (Rao, 1937) and *U. triangularis* (Gunther, 1876) from the same genus (Garg et al. 2018). Suggesting 'Endangered' status for the species is a high priority conservation measure. Earlier reported northern limit of the range of distribution for this species was Thirunelli in Wyanad hill ranges of Kerala and the southern range of distribution was Kakachi in Agasthyamalai hill ranges of Tamil Nadu (Garg et al. 2018). Garg et al. (2018) presented several literature data citations and respective point localities from Karnataka and even Maharashtra parts of the Western Ghats, as those of *U. montanus*. Such literature records of *U. montanus* (sic) cover areas falling between Bisale Ghats, Karnataka up to Dangs in Gujarat (see Garg et al. 2018). Yet, their map indicates dots only till Goa Gap (Garg et al. 2018). So, due to imprecise taxonomic identities in many such reports, those records north of Wyanad are considered doubtful at best. Now our field data reveals the presence of the species from Tore gadde forests in the foothills of Pushpagiri hill ranges in Karnataka (Image 1) which is 130 km further northwards than the previous limit, Thirunelli. The previous record of altitude limit for the species was 1,700 m (Garg et al. 2018) but our studies extend much higher altitudinal range of 1,916 m from Vaguvarai, Idukki, Kerala. *Uperodon montanus* is an altitude and range specific anuran species that occurs within the central and southern Western Ghats and is known for scanty or imprecise reports (present study; Garg et al. 2018). Further studies are needed to understand its biphasic life, microhabitat preference, morphology, breeding behaviour, ecology, and ontogenetic variations.

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