

Research Article

On the Distribution of Coastal Bull Frog *Hoplobatrachus litoralis* Hasan, Kuramoto, Islam, Alam, Khan and Sumida, 2012 (Anura: Dicroglossidae) from Itanagar Wildlife Sanctuary- New state report for Arunachal Pradesh, Northeast India

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ABSTRACT

The distribution of the Coastal Bull Frog, *Hoplobatrachus litoralis* in Arunachal Pradesh was not certain for lack of any tangible report. The occurrence of this species in this Himalayan state of Arunachal Pradesh is reported herein based on recent collection of three individuals from a swampy area from the Senki Valley of the Itanagar Wildlife Sanctuary, Papum Pare district, Arunachal Pradesh. Brief diagnostic characters are also provided based on the observed individuals.

Key words: Arunachal Pradesh, *Hoplobatrachus litoralis*, New Record, Papum Pare, Range extension.

INTRODUCTION

Members of the Dicroglossid genus *Hoplobatrachus* Peters, 1863 are usually large robust frogs with numerous longitudinal folds or warts on the dorsum and extensive webbing between toes (Hasan, *et al.*, 2012). This genus currently has six valid species globally and they are distributed widely from Sub-Saharan Africa south to Angola and South-eastern Asia (Frost, 2023). Among them, three species namely, *H. tigerinus* (Daudin, 1802), *H. crassus* (Jerdon, 1853) and *H. litoralis* Hasan, Kuramoto, Islam, Alam, Khan, and Sumida (2012) are distributed in India (Dinesh *et al.*, 2023). The former two species were discovered long time back, while Bangladesh Coastal Bull frog *H. litoralis* was described by Hasan *et al.* (2012) from Cox's Bazar District, coastal belt of Bangladesh. In India, *H. tigerinus* and *H. crassus* are distributed throughout India (Saikia and Sinha, 2022; Ahmed *et al.*, 2009; Dinesh *et al.*, 2020; Deuti, 2021), while *H. litoralis* is distributed in some isolated pockets of Northeast India and West Bengal (Frost, 2023). All the three species of this genus are categorized as least concern (LC) by the IUCN red list and their population is decreasing day by day due to habitat loss or other anthropogenic factors (IUCN, 2023).

After the discovery of the *H. litoralis*, Mulcahy *et al.* (2018) and Zug (2022) confirmed the distribution of this species from the Myanmar, it has been reported from Tripura of northeastern India (Purkayastha and Basak, 2018), Assam (Bohra *et al.*,

2019), Mizoram (Kundu *et al.*, 2020; Decemson *et al.*, 2021) and Manipur (Lalremsanga *et al.*, 2022); Mondal *et al.* (2018) reported this species from West Bengal and Wangyal *et al.* (2020) reported this species from Bhutan. More recently, Liu *et al.* (2023) extended the distribution range of *H. litoralis* to Baoshan City of the western Yunnan, China. Herein, we report three individuals of *H. litoralis* from the eastern Himalayan State of Arunachal Pradesh for the first time based on morphological characteristics.

MATERIALS AND METHODS

During a herpetological survey in the vicinity of Itanagar Wildlife Sanctuary, Papum Pare District of Arunachal Pradesh, around 2015 h, we encountered three individuals of Bangladesh Coastal Bull Frog and collected them. On the next day, the specimens were fixed in 10% buffered formalin solution overnight and later on stored in 70% alcohol for longer preservation. Prior to fixation, liver tissue was extracted for DNA isolation. Morphometric measurements were taken using digital caliper (Mitutoya) nearest to 0.01mm (Table.1) and identification of the specimens was done following Hasan *et al.* (2012) and Kundu *et al.* (2020). After identification, specimens were deposited at the Wet Collection Repository of National Zoological Collection (NZC) of Zoological Survey of India (ZSI), Arunachal Pradesh Regional Centre (APRC), Itanagar bearing the Registration No. ZSI/APRC/A-274 (A-C).

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Table 1. Morphometric measurements (in mm) of *H. litoralis* from Arunachal Pradesh

Parameters	ZSI/APRC/A-274A (Female)	ZSI/APRC/A-274B (Male)	ZSI/APRC/A-274C (Female)
SVL	55.84	35.01	34.49
HL	22.12	15.67	15.34
HW	18.76	12.17	12.17
MN	18.90	13.41	12.97
IFE	8.78	4.73	4.58
IBE	13.19	7.92	7.68
TYD	4.03	1.91	2.74
TYE	2.41	1.85	1.51
NN	4.69	3.13	2.86
EE	3.34	1.97	1.87
ELW	4.41	2.66	2.93
ED	6.11	5.55	4.55
EN	4.89	2.94	2.98
SN	4.58	2.88	2.92
SL	10.20	6.46	5.71
FLL	18.13	5.96	5.96
HAL	25.32	6.83	6.43
TFL	15.58	3.67	3.21
FL	27.25	14.81	14.71
TL	28.76	16.38	16.24
TFOL	25.39	15.23	15.06
FTL	15.66	9.19	9.06
ITL	5.73	3.98	3.42

Abbreviations: SVL = snout-vent length; HL = head length; HW = head width; MN = mandible-nostril distance; TYD = tympanum diameter (horizontal); TYE = tympanum-eye distance; ED = eye diameter (horizontal); EN = eye-nostril distance; SN = snout-nostril distance; NN = Inter narial distance; EE = Shortest Distance between eyes; SL = snout to eye distance; IFE = distance between the front of eyes; IBE = distance between the back of eyes; FLL = forelimb length; HAL = hand length; TFL = third finger length; FL = femur length; TL = tibia length; TFOL = tarsus-foot length; FTL = fourth toe length; ITL = inner toe length (1st toe length from its base).

RESULTS AND DISCUSSION

The present report is based on three specimens (1 male and 2 females) bearing registration number ZSI/APRC/A-274(A-C) of *Hoplobatrachus* collected from the Senki Valley (27.077°N, 93.597°E; 232 m asl.), Itanagar Wildlife Sanctuary during the herpetological survey. All three specimens having two continuous distinct longitudinal bands, first from anterior corner of eye through the nostrils to anterior edge of upper jaw and second along the lateral margin of upper jaw were observed in the studied specimen, which is the diagnostic feature of *H. litoralis* (Fig. 1C-D) (Hasan *et al.*, 2012; Purkayastha and Basak, 2018; Kundu *et al.*, 2020). Besides, a prominent dark margin in the inner side of the upper arm, inner metatarsal tubercle is black, and inter-orbital distance is narrower than eyelid width and inter-narial distance in the studied specimens. Based on the diagnostic characters and morphological features, we confirmed the collected *Hoplobatrachus* specimens as *H. litoralis* (Fig. 1A-B).

Morphological description:

Dorsum is grayish yellow in life while it is dark brown colour in preservation with numerous dark black spots and blotches. Thin longitudinal folds (warts) are also present in both dorsum and lateral side of the body. A thin mid-dorsal yellowish-white stripe present from tip of the snout to vent. Large transverse black bands are also present in hind limb especially in thigh, tibia and tarsal region. Ventral side is white with dark spots on the lower jaw.

Head is longer than broad (HL/HW ranges from 1.17 to 1.26 (SE± 0.03), obtusely pointed. Loreal region is concave, nostril slightly closer to the tip of snout than eye. Tympanum is distinct, large but smaller than eye diameter, supra-tympanic fold present from behind the eye to posterior margin of tympanum.

Moderate forelimb, fingers free, fingers tips are blunt without disc (Fig. 1E). Relative fingers length F3>F1>F2>F4, sub-articular tubercles are distinct and prominent. Longer hindlimb, tibia and femur length sub-equal. Toes fully webbed; tips are blunt and slightly rounded, toe length T4>T5>T3>T2>T1 (Fig. 1F). Inner metatarsal tubercle is moderate in size and black in colour while outer metatarsal tubercle is absent.

Natural History Notes: Members of the *Holpobarachus* are basically nocturnal in habit and they mostly prefer semi-aquatic habitat, lives near water edges, marshy forests, paddy and flood plains (Ahmed *et al.*, 2009; Hasan *et al.*, 2012). We collected this species from the water-logged area of road side of the Senki Valley of Itanagar WLS around 2015 h following their constant calls. Habitat is moist surrounded by grasses, ferns and most of *Musa sp.* with shrubs like *Lantana camara*, *Mikania micrantha*, etc.

Taxonomic study is a never ending process. Himalayan State of Arunachal Pradesh is home to 97 amphibian species (Sinha and Saikia, 2022; Nath *et al.*, 2023). With this report, the total count of the State record is currently 98. This report extends the distribution range of *H. litoralis* by 688 km (cal) towards NE

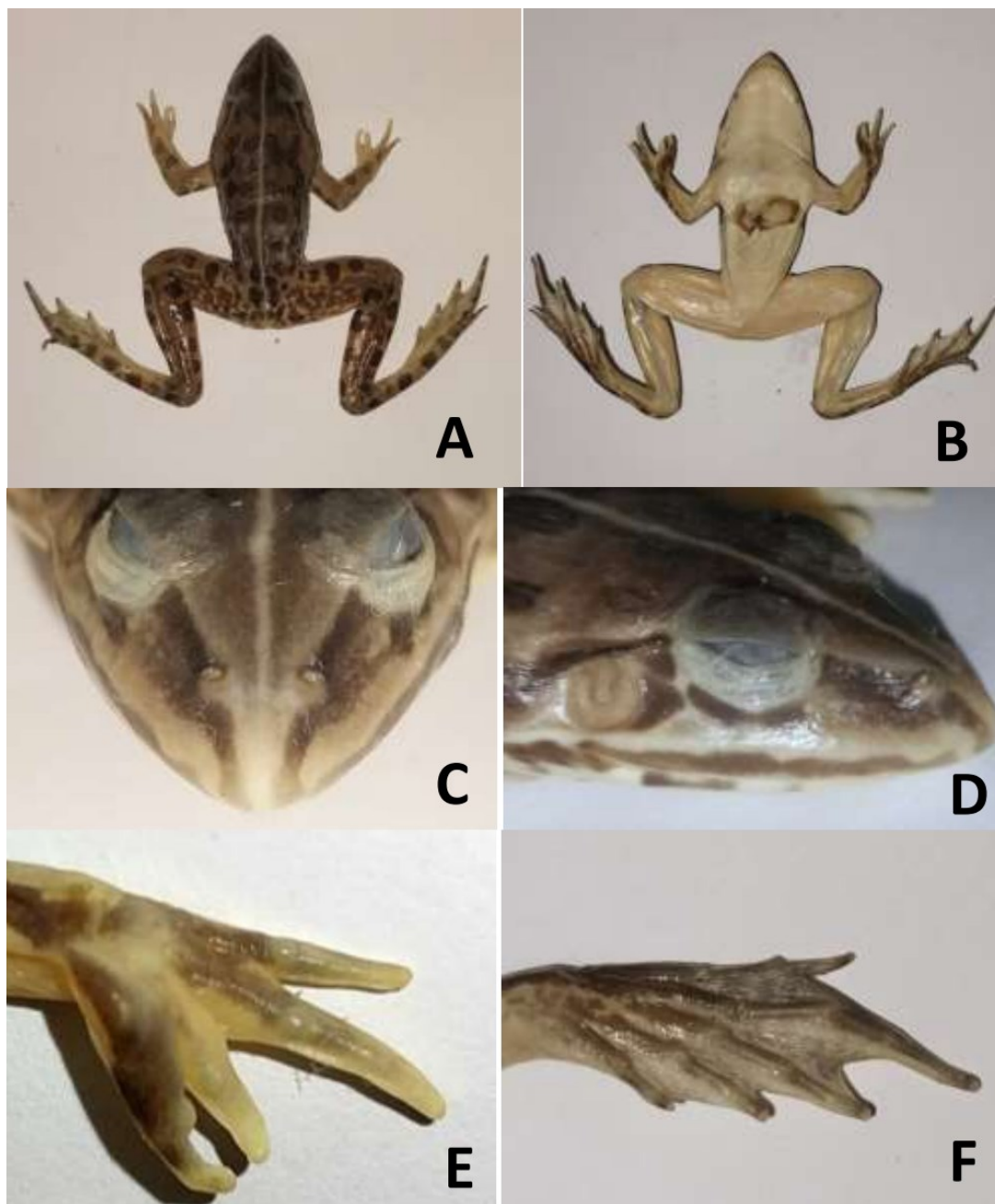


Figure 1. *Hoplobatrachus litoralis* (APRC/A-274 A) from Arunachal Pradesh (in preservation) [A-Dorsal View, B- Ventral View, C-Frontal aspect showing distinct black band, D- Black band in Jaw lining, E- Right Hand of specimen, F- Right Foot of specimen]

direction from its type locality and also 206 km (cal) towards NE direction from the nearest known population in Guwahati, Kamrup District, Assam.

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